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Honda CRV Shop Manual

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SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The CR-V SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items will require special precautions and tools, and should be done only by an authorized Honda dealer.

WARNING

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS could lead to personal injury caused by unintentional deployment of the airbags and side airbags.
- Do not bump the SRS unit. Otherwise, the system may fail in a collision, or the airbags may deploy when the ignition switch is ON (II).
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

Introduction

How to Use This Manual

The 2002 CR-V Shop Manual is divided into 23 sections. The first page of each section is marked with a black tab that lines up with its corresponding thumb index tab on this page.
You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.
Each section includes:

1. A table of contents, or an exploded view index showing:
   - Parts disassembly sequence.
   - Bolt torques and thread sizes.
   - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
4. Testing/troubleshooting.
5. Repair.
6. Adjustments.

Safety Messages

Your safety, and the safety of others, is very important. To help you make informed decisions, we have provided safety messages, and other safety information throughout this manual. Of course, it is not practical or possible to warn you about all the hazards associated with servicing this vehicle. You must use your own good judgement.

You will find important safety information in a variety of forms including:

- **Safety Labels** - on the vehicle.
- **Safety Messages** - preceded by a safety alert symbol and one of the three signals words, DANGER, WARNING, or CAUTION.

  These signal words mean:

DANGER
You Will be KILLED or SERIOUSLY HURT if you don't follow instructions.

WARNING
You CAN be Killed or SERIOUSLY HURT if you don't follow instructions.

CAUTION
You CAN be HURT if you don't follow instructions.

- **Instructions** - how to service this vehicle correctly and safely

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As you read this manual, you will find information that is preceded by a **NOTICE** symbol. The purpose of this message is to help prevent damage to your vehicle, other property, or the environment.

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Service Publication Office

As sections with * include SRS components;
special precautions are required when servicing.

General Info
Specifications
Maintenance
Engine Electrical
Engine
Cooling
Fuel and Emissions
*Transaxle
*Steering
Suspension
*Brakes (Including ABS)
*Body
*Heating, Ventilation and Air Conditioning
*Body Electrical
*Restrains

A Few Words About Safety

Service Information

The service and repair information contained in this manual is intended for use by qualified, professional technicians. Attempting service or repairs without the proper training, tools, and equipment could cause injury to you or others. It could also damage the vehicle or create an unsafe condition.

This manual describes the proper methods and procedures for performing service, maintenance, and repairs. Some procedures require the use of specially designed tools and dedicated equipment. Any person who intends to use a replacement part, service procedure or a tool that is not recommended by Honda, must determine the risks to their personal safety and the safe operation of the vehicle.

If you need to replace a part, use genuine Honda parts with the correct part number or an equivalent part. We strongly recommend that you do not use replacement parts of inferior quality.

FOR YOUR CUSTOMER'S SAFETY

Proper service and maintenance are essential to the customer's safety and the reliability of the vehicle. Any error or oversight while servicing a vehicle can result in faulty operation, damage to the vehicle, or injury to others.

WARNING

Improper service or repairs can create an unsafe condition that can cause your customer or others to be seriously hurt or killed.

Follow the procedures and precautions in this manual and other service materials carefully.

FOR YOUR SAFETY

Because this manual is intended for the professional service technician, we do not provide warnings about many basic shop safety practices (e.g., Hot parts - wear gloves). If you have not received shop safety training or do not feel confident about your knowledge of safe servicing practices, we recommend that you do not attempt to perform the procedures described in this manual.

WARNING

Failure to properly follow instructions and precautions can cause you to be seriously hurt or killed.
Follow the procedures and precautions in this manual carefully.

Some of the most important general service safety precautions are given below. However, we cannot warn you of every conceivable hazard that can arise in performing service and repair procedures. Only you can decide whether or not you should perform a given task.

A Few Words About Safety

IMPORTANT SAFETY PRECAUTIONS

- Make sure you have a clear understanding of all basic shop safety practices and that you are wearing appropriate clothing and using safety equipment. When performing any service task, be especially careful of the following:
  - Read all of the instructions before you begin, and make sure you have the tools, the replacement or repair parts, and the skills required to perform the tasks safely and completely.
  - Protect your eyes by using proper safety glasses, goggles or face shields any time you hammer, drill, grind, or work around pressurized air or liquids and springs or other stored-energy components. If there is any doubt, put on eye protection.
  - Use other protective wear when necessary, for example gloves or safety shoes. Handling hot or sharp parts can cause severe burns or cuts. Before you grab something that looks like it can hurt you, stop and put on gloves.
  - Protect yourself and others whenever you have the vehicle up in the air. Any time you lift the vehicle, either with a hoist or a jack, make sure that it is always securely supported. Use jack stands.

- Make sure the engine is off before you begin any servicing procedures, unless the instruction tells you to do otherwise. This will help eliminate several potential hazards:
  - Carbon monoxide poisoning from engine exhaust. Be sure there is adequate ventilation whenever you run the engine.
  - Burns from hot parts or coolant. Let the engine and exhaust system cool before working in those areas.
  - Injury from moving parts. If the instruction tells you to run the engine, be sure your hands, fingers, and clothing are out of the way.

- Gasoline vapors and hydrogen gases from batteries are explosive. To reduce the possibility of a fire or explosion, be careful when working around gasoline or batteries.
  - Use only a nonflammable solvent, not gasoline to clean parts.
  - Never drain or store gasoline in an open container.
  - Keep all cigarettes, sparks, and flames away from the battery and all fuel-related parts.

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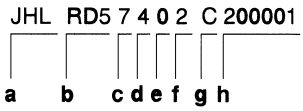
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Chassis and Engine Numbers

Vehicle Identification Number



a. **Manufacturer, Make and Type of Vehicle**
   - JHL: HONDA MOTOR CO., LTD. HONDA Passenger vehicle
   - SHS: HONDA OF THE U.K. MANUFACTURING LTD. HONDA Passenger vehicle

b. **Line, Body and Engine Type**
   - RD5: CR-V/K20A4, K20A5
   - RD7: CR-V/K24A1
   - RD8: CR-V/K20A4

c. **Body Type and Transmission Type**
   - 7: 4-door Stationwagon/5-speed Manual
   - 8: 4-door Stationwagon/4-speed Automatic

d. **Vehicle Grade (Series)**
   - 1: ES
   - 2: ES, LS
   - 3: ES
   - 4: BASE, ES, LX, RV-i, SE
   - 5: RV-i, RV-iH, SES
   - 6: LS
   - 7: ES
   - 8: EX, RV-Si
   - 9: RV-Si, RV-SiH

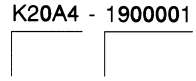
e. **Fixed Code or Check Digit**

f. **Model Year Code**
   - 2: 2002

g. **Factory Code**
   - C: Saitama Factory in Japan (Sayama)
   - U: Honda of the U.K. Manufacturing (England)

h. **Serial Number**

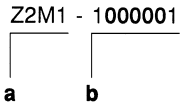
Engine Number



a. **Engine Type**
   - K20A4: 2.0 / DOHC VTEC Sequential Multiport Fuel-injected engine with three way catalytic converter
   - K20A5: 2.0 / DOHC VTEC Sequential Multiport Fuel-injected engine without three way catalytic converter
   - K24A1: 2.4 / DOHC VTEC Sequential Multiport Fuel-injected engine with three way catalytic converter

b. **Serial Number**

Transmission Number



a. **Transmission Type**
   - Z2M1: 5-speed manual
   - Z2M3: 5-speed manual
   - MCVA: 4-speed Automatic (2WD)
   - MRVA: 4-speed Automatic (4WD)

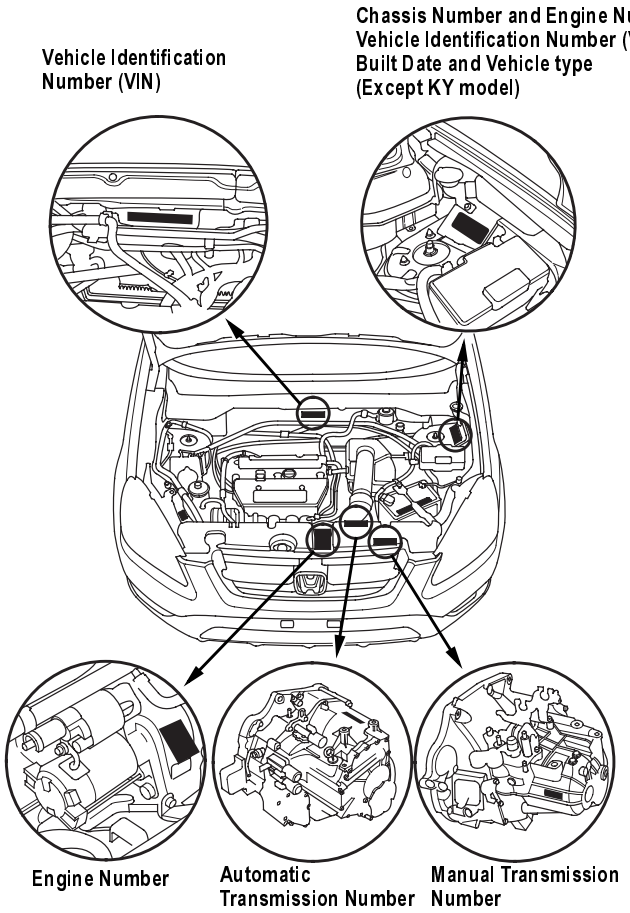
b. **Serial Number**

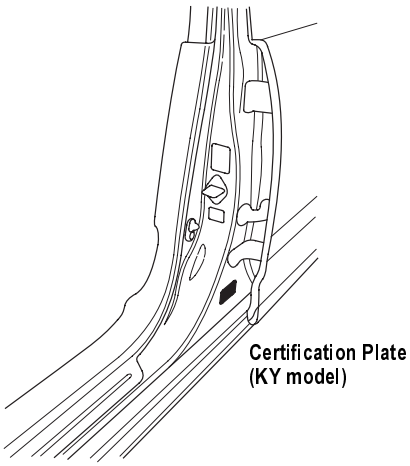
Chassis and Engine Numbers (cont'd)

Applicable Area Code/VIN/Engine Number/Transmission Number List

MODEL	APPLICABLE AREA CODE	GRADE NAME	TRANSMISSION TYPE	VEHICLE IDENTIFICATION NUMBER	ENGINE NUMBER	TRANSMISSION NUMBER
CR-V	KE	SE	5MT	SHSRD87402U000001-	K20A4-1000001-	Z2M1-1500001-
			4AT	SHSRD88402U000001-	K20A4-1000001-	MRVA-1000001-
		SES	5MT	SHSRD87502U000001-	K20A4-1000001-	Z2M1-1500001-
			4AT	SHSRD88502U000001-	K20A4-1000001-	MRVA-1000001-
	KG	LS	5MT	SHSRD87602U000001-	K20A4-1000001-	Z2M1-1500001-
			4AT	SHSRD88602U000001-	K20A4-1000001-	MRVA-1000001-
		ES	5MT	SHSRD87702U000001-	K20A4-1000001-	Z2M1-1500001-
			4AT	SHSRD88702U000001-	K20A4-1000001-	MRVA-1000001-
	KR	LS	5MT	SHSRD87202U000001-	K20A4-1000001-	Z2M1-1500001-
			4AT	SHSRD88202U000001-	K20A4-1000001-	MRVA-1000001-
		ES	5MT	SHSRD87302U000001-	K20A4-1000001-	Z2M1-1500001-
			4AT	SHSRD88302U000001-	K20A4-1000001-	MRVA-1000001-
	KS	ES	5MT	SHSRD87102U000001-	K20A4-1000001-	Z2M1-1500001-
			4AT	SHSRD88202U000001-	K20A4-1000001-	MRVA-1000001-
	KQ	RV-i	5MT	JHLRD77402C200001-	K24A1-1400001-	Z2M3-1000001-
			4AT	JHLRD78402C200001-	K24A1-1400001-	MRVA-1000001-
		RV-Si	5MT	JHLRD77802C200001-	K24A1-1400001-	Z2M3-1000001-
			4AT	JHLRD78802C200001-	K24A1-1400001-	MRVA-1000001-
	KH	BASE	5MT	JHLRD57402C200001-	K20A4-1900001-	Z2M1-1000001-
			4AT	JHLRD58402C200001-	K20A4-1900001-	MRVA-1000001-
	KK	LX	5MT	JHLRD77402C200001-	K24A1-1900001-	Z2M3-1000001-
			4AT	JHLRD78402C200001-	K24A1-1900001-	MRVA-1000001-
		EX	5MT	JHLRD77802C200001-	K24A1-1900001-	Z2M3-1000001-
			4AT	JHLRD78802C200001-	K24A1-1900001-	MRVA-1000001-
		LX	4AT	JHLRD68402C200001-	K24A1-1900001-	MCVA-1000001-
	KM	RV-Si	5MT	JHLRD77802C200001-	K24A1-1900001-	Z2M3-1000001-
			4AT	JHLRD78802C200001-	K24A1-1900001-	MRVA-1000001-
	KN	RV-i	5MT	JHLRD57402C200001-	K20A4-1900001-	Z2M1-1000001-
			4AT	JHLRD58402C200001-	K20A4-1900001-	MRVA-1000001-
		RV-Si	5MT	JHLRD57802C200001-	K20A4-1900001-	Z2M1-1000001-
			4AT	JHLRD58802C200001-	K20A4-1900001-	MRVA-1000001-
	KP	RV-i	5MT	JHLRD57402C200001-	K20A5-1000001-	Z2M1-1000001-
			4AT	JHLRD58402C200001-	K20A5-1000001-	MRVA-1000001-
		RV-Si	5MT	JHLRD57802C200001-	K20A5-1000001-	Z2M1-1000001-
			4AT	JHLRD58802C200001-	K20A5-1000001-	MRVA-1000001-
	KT	BASE	5MT	JHLRD57402C200001-	K20A5-1000001-	Z2M1-1000001-
			4AT	JHLRD58402C200001-	K20A5-1000001-	MRVA-1000001-
	KU	RV-i	4AT	JHLRD58402C200001-	K20A4-1900001-	MRVA-1000001-
		RV-iH	4AT	JHLRD58502C200001-	K20A4-1900001-	MRVA-1000001-
		RV-SI	4AT	JHLRD58802C200001-	K20A4-1900001-	MRVA-1000001-
		RV-SiH	4AT	JHLRD58902C200001-	K20A4-1900001-	MRVA-1000001-
	KW	BASE	5MT	JHLRD57402C200001-	K20A5-1000001-	Z2M1-1000001-
			4AT	JHLRD58402C200001-	K20A5-1000001-	MRVA-1000001-
	KY	RV-i	5MT	JHLRD574*2C400001-	K20A4-1900001-	Z2M1-1000001-
				JHLRD575*2C400001-	K20A4-1900001-	Z2M1-1000001-
			4AT	JHLRD584*2C400001-	K20A4-1900001-	MRVA-1000001-
				JHLRD585*2C400001-	K20A4-1900001-	MRVA-1000001-
		RV-Si	5MT	JHLRD578*2C400001-	K20A4-1900001-	Z2M1-1000001-
				JHLRD579*2C400001-	K20A4-1900001-	Z2M1-1000001-
			4AT	JHLRD588*2C400001-	K20A4-1900001-	MRVA-1000001-
				JHLRD589*2C400001-	K20A4-1900001-	MRVA-1000001-

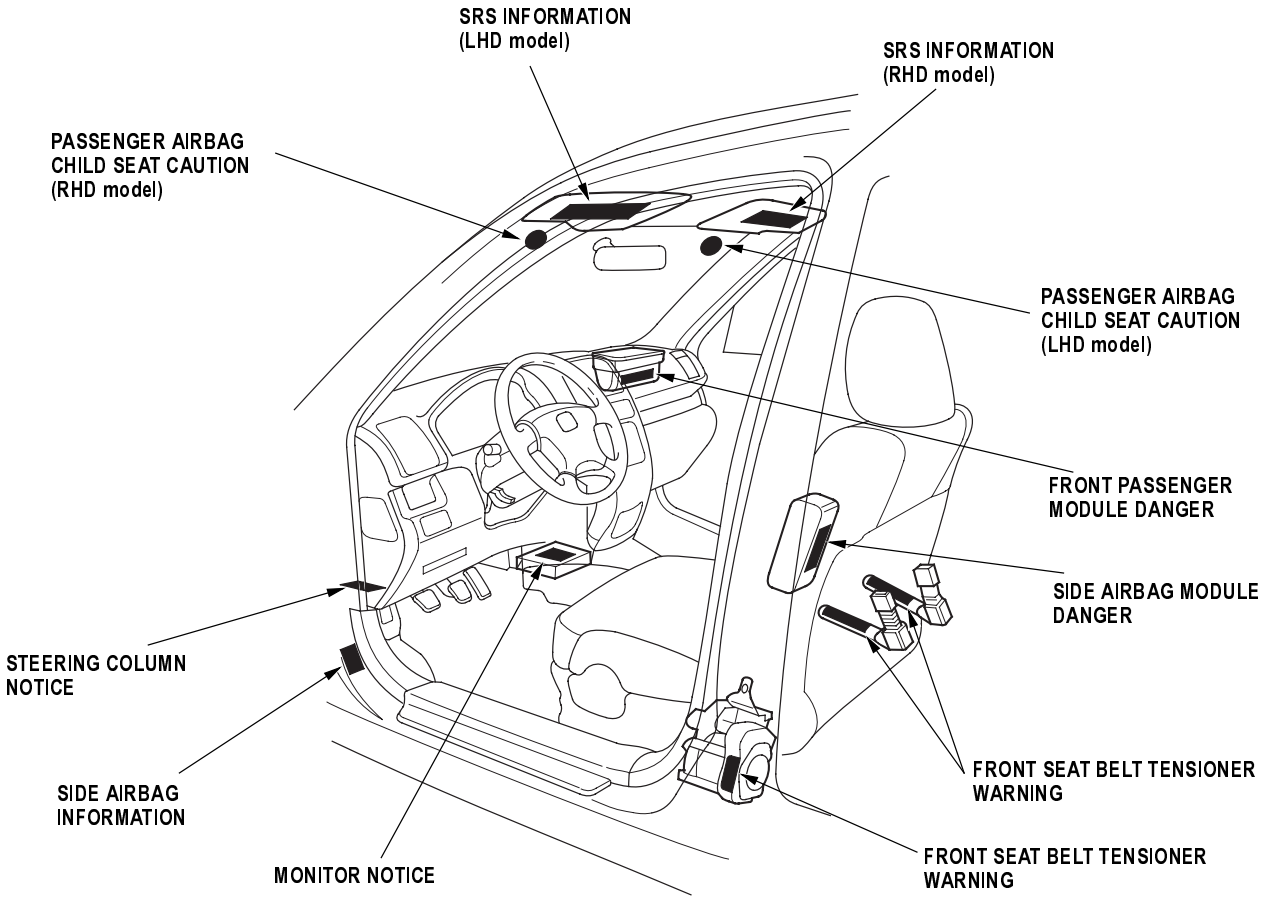
Identification Number Locations

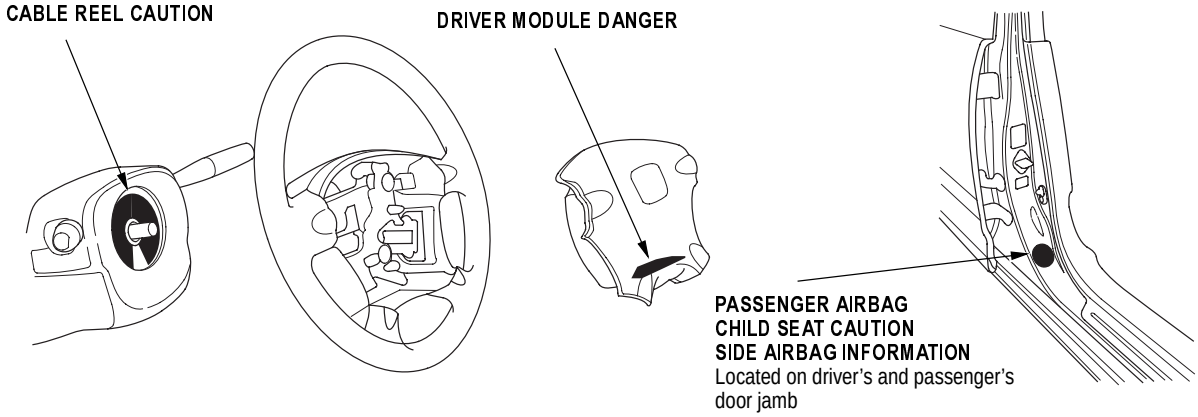




Warning/Caution Label Locations

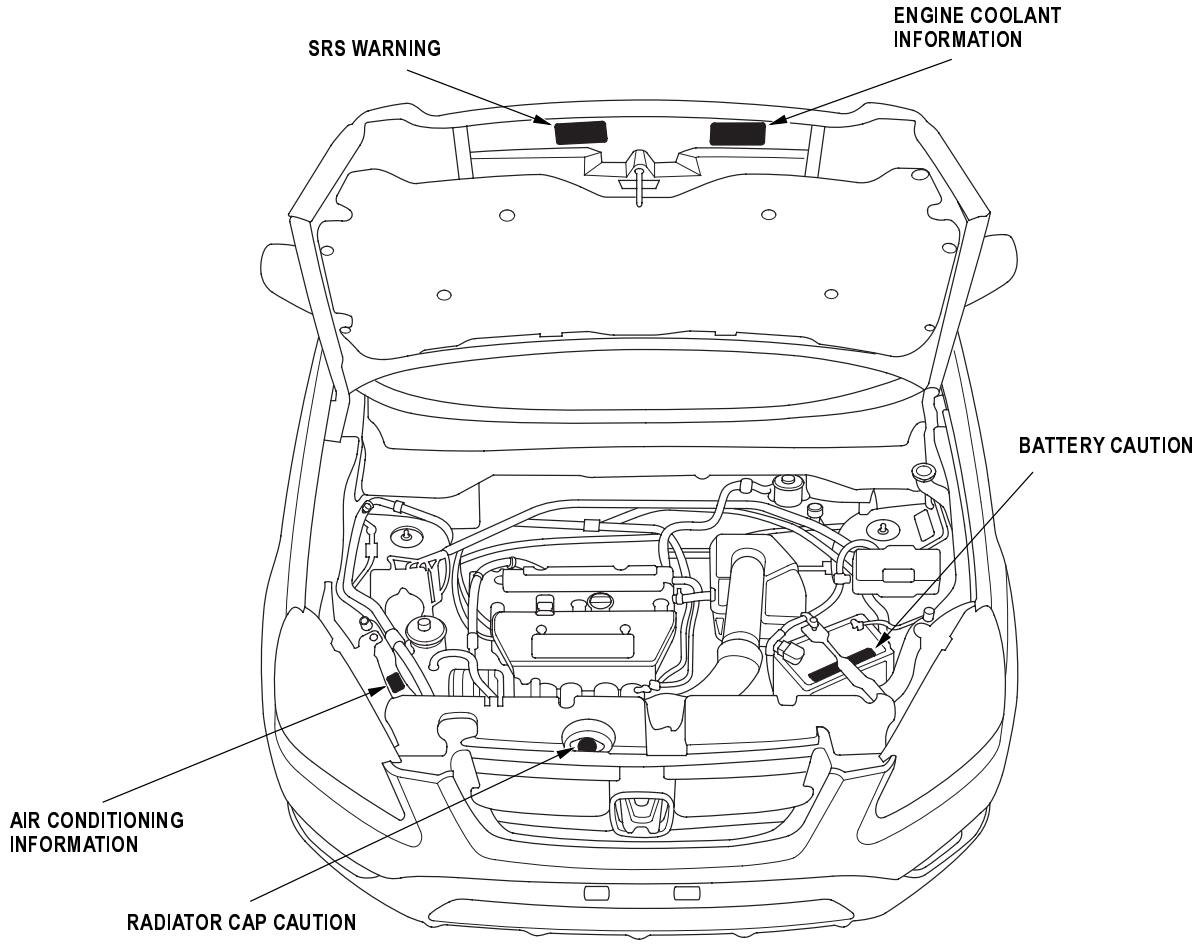
NOTE:
- The illustration shows the LHD model; RHD is symmetrical.
- SIDE AIRBAG INFORMATION labels are located on the driver's and passenger's doorjamb.



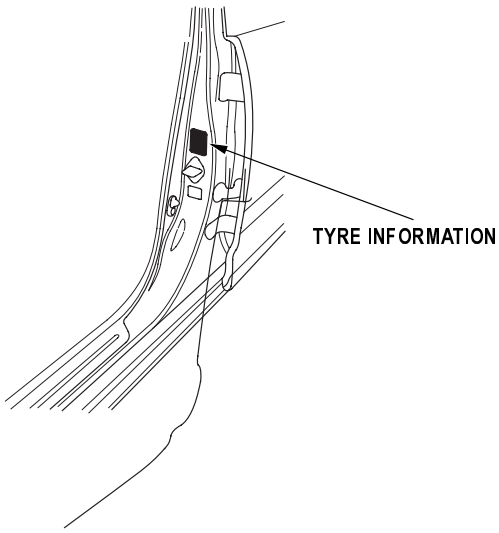


(cont'd)

Warning/Caution Label Locations (cont'd)



DRIVER'S DOORJAMB:



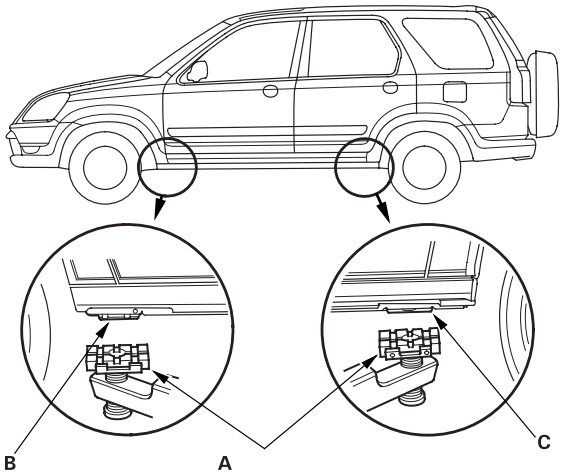
NOTE: The illustration shows the LHD model; RHD is symmetrical.

Lift and Support Points

NOTE: If you are going to remove heavy components such as suspension or the fuel tank from the rear of the vehicle, first support the front of the vehicle with tall safety stands. When substantial weight is removed from the rear of the vehicle, the center of gravity can change and cause the vehicle to tip forward on the hoist.

Frame Hoist

1. Position the hoist lift blocks (A), or safety stands, under the vehicle's front support points (B) and rear support points (C).



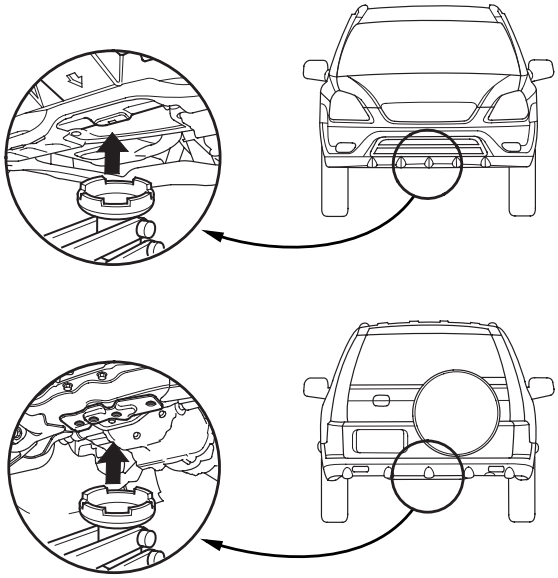
2. Raise the hoist a few inches, and rock the vehicle gently to be sure it is firmly supported.
3. Raise the hoist to full height, and inspect the lift points for solid contact with the lift blocks.

Safety Stands

To support the vehicle on safety stands, use the same support points (B and C) as for a frame hoist. Always use safety stands when working on or under any vehicle that is supported only by a jack.

Floor Jack

1. Block the rear wheels when raising the front of the vehicle; block the front wheels when raising the rear of the vehicle.
   Place the blocks behind and ahead of the wheels.
2. Raise the vehicle high enough to insert the safety stands.
3. Adjust and place the safety stands so the vehicle will be approximately level, then lower the vehicle onto them.



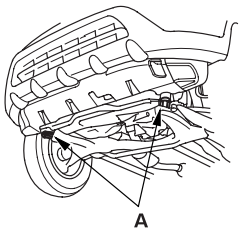
Towing

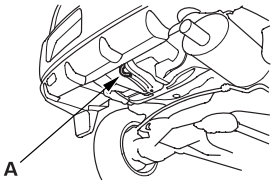
If the vehicle needs to be towed, call a professional towing service. Never tow the vehicle behind another vehicle with just a rope or chain. It is very dangerous.

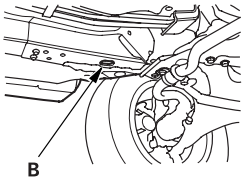
Emergency Towing
There are three popular methods of towing a vehicle.

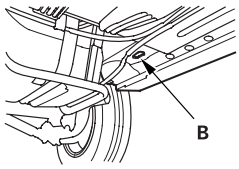
Flat-bed Equipment- The operator loads the vehicle on the back of a truck. This is the best way of transporting the vehicle.

To accommodate flat-bed equipment, the vehicle is equipped with towing hooks (A) and tie down hook slots (B).
The towing hooks can be used with a winch to pull the vehicle onto the truck, and the tie down hook slots can be used to secure the vehicle to the truck.









Wheel Lift Equipment- The tow truck uses two pivoting arms that go under the tires (front or rear) and lift them off the ground. The other two wheels remain on the ground.

Sling-type Equipment- The tow truck uses metal cables with hooks on the ends. These hooks go around parts of the frame or suspension and the cables lift that end of the vehicle off the ground. The vehicle's suspension and body can be seriously damaged if this method of towing is attempted. This method of towing the CR-V is unacceptable.

The only recommended way of towing the CR-V is on a flat-bed truck.
Towing the 4WD CR-V with only two wheels on the ground will damage parts of the 4WD system.
The 2WD CR-V may also be towed with the front wheels off the ground, or with all four wheels on the ground.

If the 2WD CR-V cannot be transported by flat-bed, it should be towed with the front wheels off the ground. If due to damage, the vehicle must be towed with the front wheels on the ground, or if the vehicle is towed with all four wheels on the ground, do the following:

Manual Transmission
- Release the parking brake.
- Shift the transmission in Neutral.

Automatic Transmission
- Release the parking brake.
- Start the engine.
- Shift to [D] position, then [N] position.
- Turn off the engine.

It is best to tow the vehicle no farther than 50 miles (80 km), and keep the speed below 35 mph (55 km/h).

NOTICE

- Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine (automatic transmission), the vehicle must be transported on a flat-bed.
- Trying to lift or tow the vehicle by the bumpers will cause serious damage. The bumpers are not designed to support the vehicle's weight.

Service Precautions

4WD model Information

The 4WD CR-V does not have the feature that mechanically switches between 4WD (four-wheel drive) and 2WD (front-wheel drive).

Do not drive the vehicle with rear wheels on the ground even though the front wheels are off the ground. The front wheel power is conveyed to the rear wheels, and the vehicle will start off.

Always lift the vehicle up so all four wheels are off the ground when troubleshooting, testing and inspecting the vehicle to rotate the wheels.

Use the free rollers under the rear wheels when performing test the vehicle with the speedometer tester.

Precautions on using free rollers:

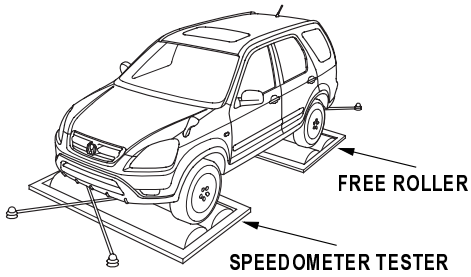
- Inspecting and testing using a chassis dynamometer is not feasible.
- Do not operate the accelerator pedal, brake pedal or steering wheel abruptly. It may cause the vehicle to roll and create a hazardous condition.
- The maximum testing speed should be 50 km/h (31 mph).
- The maximum continuous operating time should be 3 minutes.
- Make sure to tie down the vehicle securely with the side anchor wires. The free rollers are to be set under the rear wheels.

⚠ CAUTION ⚠

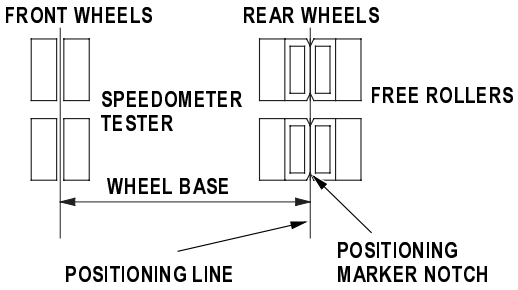
- Make sure to place the free rollers parallel to the roller of each speedometer tester.
- Putting the front and rear wheels on the speedometer testers and free rollers inappropriately may cause the vehicle to roll off or over the free rollers and create a hazardous condition.
- The side anchor wires must be appropriately tensioned. If the wires have too much slack, the expected tie-down efficiency cannot be obtained.
- When attaching the side anchor wires, make sure they are not interfering with the bumper and other parts of the vehicle body.
- Do not attach the wires to any place other than the designed areas.
- Do not a operate the speedometer testers at a speed more than 50 km/h (31 mph) or for more than 3 minutes.

Speedometer Testing Procedures

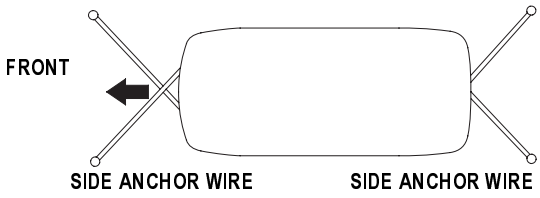
1. Set the free rollers according to the wheel base and tread of the vehicle.



NOTE: Align the position marker notch to the postioning line.



2. Move the vehicle to position the front wheels on the speedometer testers and the rear wheels on the free rollers. Make sure to align the center of the wheels to the center of the speedometer testers and the free rollers.



3. Tie down the vehicle securely using the towing hooks to prevent the vehicle from rolling off or over the free rollers.
4. Start the engine, shift the transmission to 3rd gear (manual transmission) or to [D] position (automatic transmission), accelerate the vehicle gradually, and measure the vehicle speed.
5. After measurement, use the brake pedal to gradually decelerate and stop the vehicle.

(cont'd)

Service Precautions (cont'd)

General

⚠ CAUTION ⚠

Observe all safety precautions and notes while working.

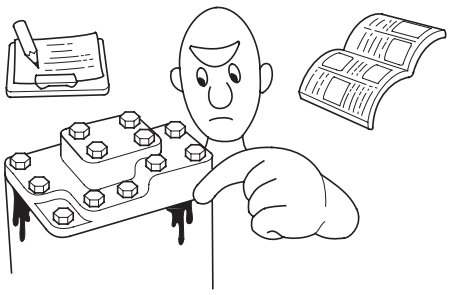
- Protect all painted surfaces and seats against dirt and scratches with a clean cloth or vinyl cover.



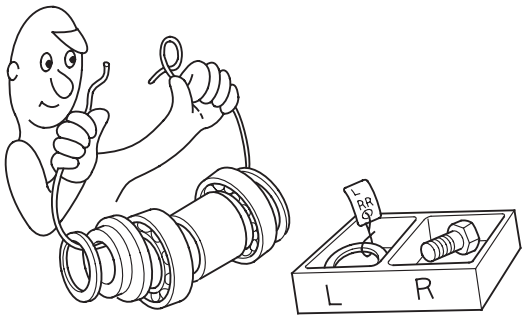
- Work safety and give your work your undivided attention. When either the front or rear wheels are to be raised, block the remaining wheels securely. Communicate at frequently as possible when work involves two or more workers. Do not run the engine unless the shop or working area is well ventilated.



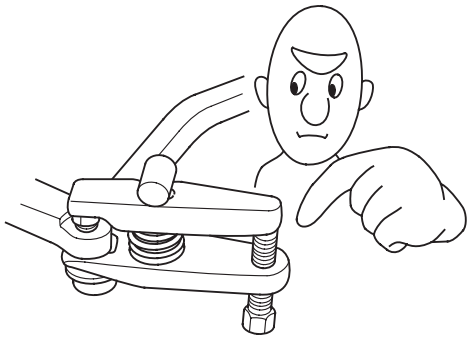
- Before removing or disassembling parts, they must be inspected carefully to isolate the cause for which service is necessary. Observe all safety notes and precautions and follow the proper procedures as described in this manual.



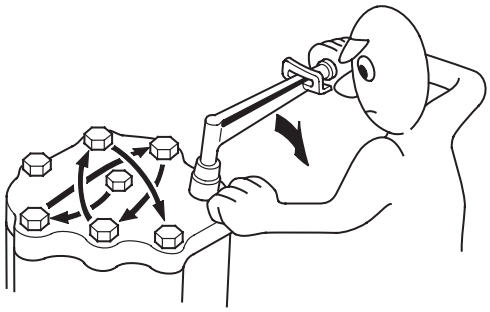
- Mark or place all removed parts in order in a parts rack so they can be reassembled in their original places.



- Use the special tool when use of such a tool is specified.



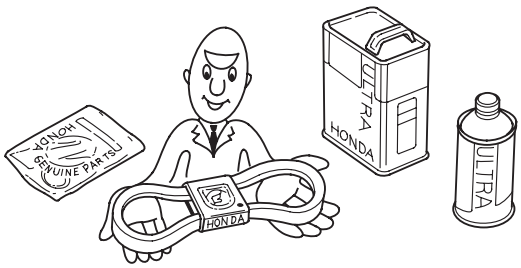
- Parts must be assembled with the proper torque according to the maintenance standards established.
- When tightening a series of bolts or nuts, begin with the center or large diameter bolts and tighten them in crisscross pattern in two or more steps.



- Use new packings, gaskets, O-rings and cotter pins whenever reassembling.
- Do not reuse parts that must be required to replace. Always replace them.



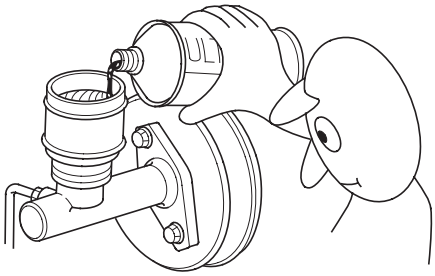
- Use genuine HONDA parts and lubricants or those equivalent. When parts are to be reused, they must be inspected carefully to make sure they are not damaged or deteriorated and are in good usable condition.



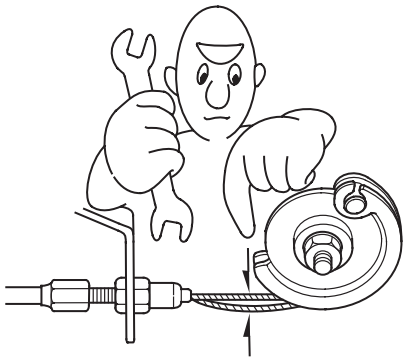
- Coat or fill parts with specified grease as specified (see page 03-2). Clean all removed parts with solvent upon disassembly.



- Brake fluid and hydraulic components
  - When replenishing the system, use extreme care to prevent dust and dirt from entering the system.
  - Do not mix different brands of fluid as they may not be compatible.
  - Do not reuse drained brake fluid.
  - Because brake fluid can cause damage to painted and resin surfaces, care should be taken not to spill it on such materials. If spilled accidentally, quickly rinse it with water or warm water from painted or resin surfaces.
  - After disconnecting brake hoses or pipes, be sure to plug the openings to prevent loss of brake fluid.
  - Clean all disassembled parts only in clean BRAKE FLUID. Blow open all holes and passages with compressed air.
  - Keep disassembled parts from air-borne dust and abrasives.
  - Check that parts are clean before assembly.



- Avoid oil or grease getting on rubber parts and tubes, unless specified.
- Upon assembling, check every part for proper installation and operation.



(cont'd)

Service Precautions (cont'd)

Electrical Troubleshooting Information

Before Troubleshooting

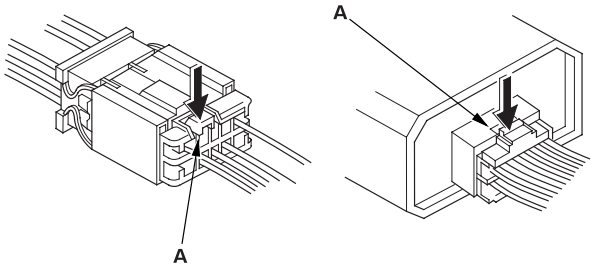
1. Check applicable fuses in the appropriate fuse/relay box.
2. Check the battery for damage, state of charge, and clean and tighten the connections.

   NOTICE

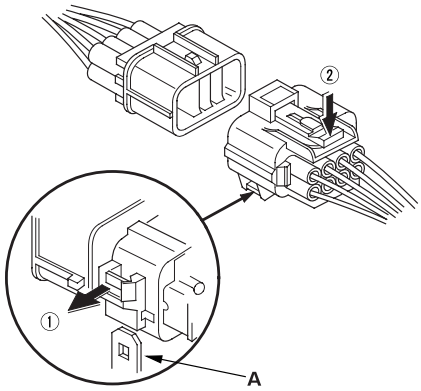
   - Do not quick-charge a battery unless the battery ground cable has been disconnected, otherwise you will damage the alternator diodes.
   - Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.
3. Check the alternator belt tension.

Handling Connectors

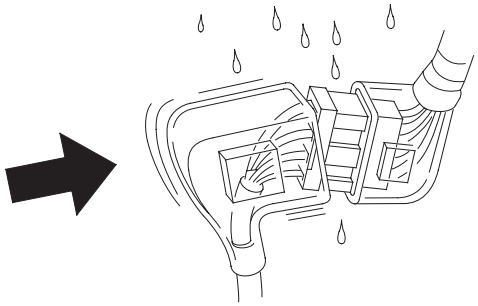
- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks (A).



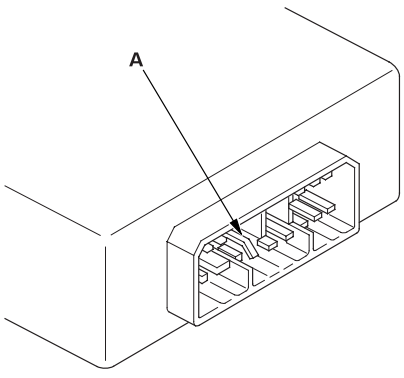
- Some connectors have a clip on their side used to attach them to a mounting bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its mount bracket (A).



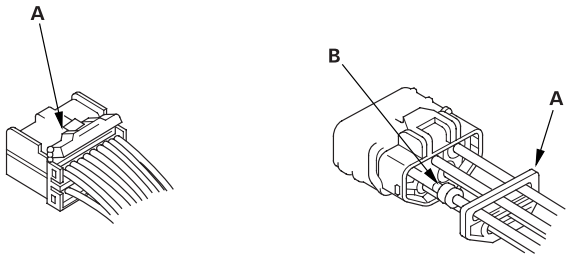
- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



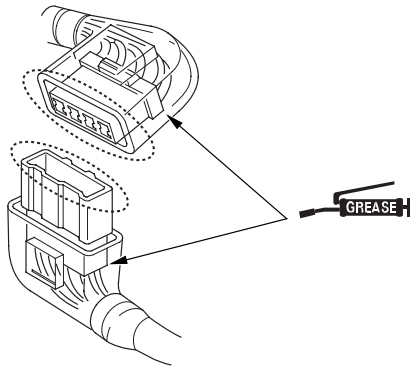
- Before connecting connectors, make sure the terminals (A) are in place and not bent.



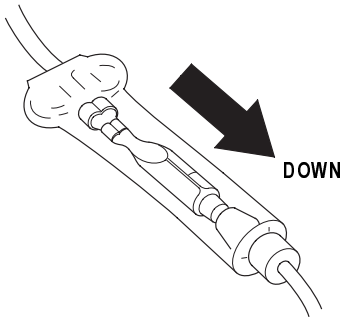
- Check for loose retainer (A) and rubber seals (B).



- The backs of some connectors are packed with grease. Add grease if necessary. If the grease is contaminated, replace it.

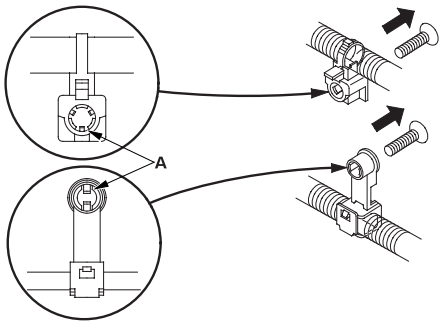


- Insert the connector all the way and make sure it is securely locked.
- Position wires so that the open end of the cover faces down.

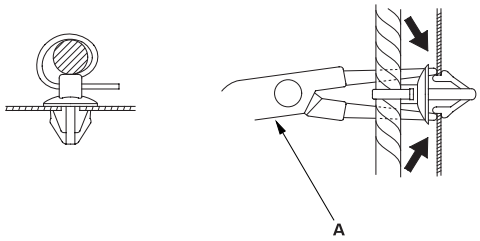


Handling Wires and Harnesses

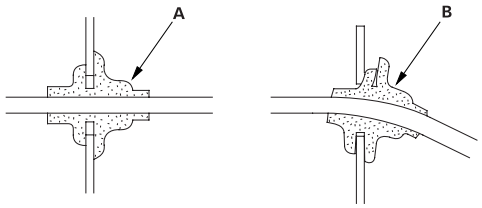
- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks (A).



- Slip pliers (A) under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.



- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.
- Seat grommets in their grooves properly (A). Do not leave grommets distorted (B).

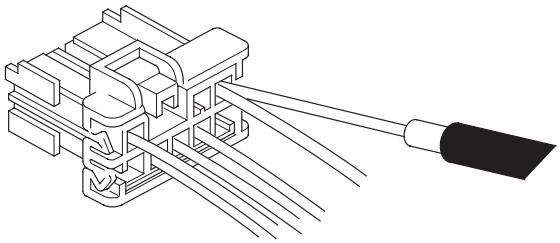


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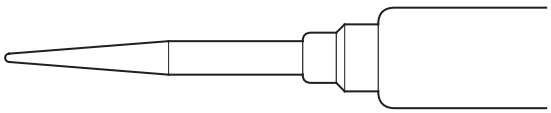
Service Precautions (cont'd)

Testing and Repairs

- Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- After installing parts, make sure that no wires are pinched under them.
- When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- If possible, insert the probe of the tester from the wire side (except waterproof connector).

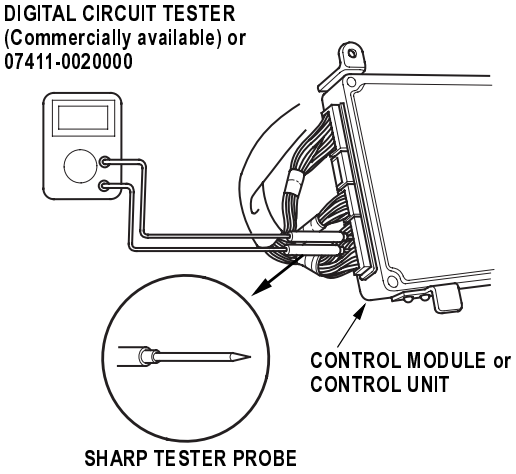


- Use a probe with a tapered tip.



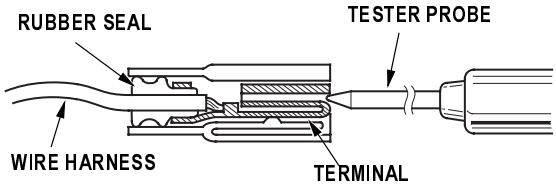
- Refer to the instructions in the Honda Terminal Kit for identification and replacement of connector terminals.

When checking any control module(s) or unit(s) connector terminals, gently slide the sharp tester probe from the wire side into the connector until it comes in contact with the terminal end of the wire.



CAUTION

- Puncturing the insulation on a wire can cause poor or intermittent electrical connections.
- For testing at connectors, bring the tester probe into contact with the terminal from the connector side of wire harness connectors in the engine compartment. For female connectors, just touch lightly with the tester probe and do not insert the probe.



Five-step Troubleshooting

1. Verify The Complaint

Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. Analyze The Schematic

Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause.

Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.

3. Isolate The Problem By Testing The Circuit

Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

4. Fix The Problem

Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

5. Make Sure The Circuit Works

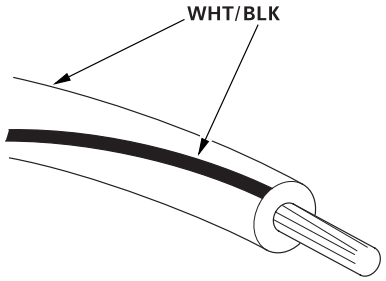
Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on the fuse. Make sure no new problems turn up and the original problem does not recur.

Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics:

WHT	White
YEL	Yellow
BLK	Black
BLU	Blue
GRN	Green
RED	Red
ORN	Orange
PNK	Pink
BRN	Brown
GRY	Gray
PUR	Purple
LT BLU	Light Blue
LT GRN	Light Green

The wire insulation has one color or one color with another color stripe. The second color is the stripe.



Abbreviations

List of automotive abbreviations which may be used in shop manual.

ABS	Anti-lock Brake System
A/C	Air Conditioning, Air Conditioner
ACL	Air Cleaner
A/F	Air Fuel Ratio
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Ampere(s)
ANT	Antenna
API	American Petroleum Institute
APPROX.	Approximately
ASSY	Assembly
A/T	Automatic Transmission
ATDC	After Top Dead Center
ATF	Automatic Transmission Fluid
ATT	Attachment
ATTS	Active Torque Transfer System
AUTO	Automatic
AUX	Auxiliary
BARO	Barometric
BAT	Battery
BDC	Bottom Dead Center
BTDC	Before Top Dead Center
CARB	Carburetor
CAT or CATA	Catalytic Converter
CHG	Charge
CKF	Crankshaft Speed Fluctuation
CKP	Crankshaft Position
CO	Carbon Monoxide
COMP	Complete
CPB	Clutch Pressure Back up
CPC	Clutch Pressure Control
CPU	Central Processing Unit
CVT	Continuously Variable Transmission
CYL	Cylinder
CYP	Cylinder Position
DI	Distributor Ignition
DIFF	Differential
DLC	Data Link Connector
DOHC	Double Overhead Camshaft
DPI	Dual Point Injection
DTC	Diagnostic Trouble Code
EBD	Electronic Brake Distribution
ECM	Engine Control Module
ECT	Engine Coolant Temperature
EGR	Exhaust Gas Recirculation
ELD	Electrical Load Detector
EPR	Evaporator Pressure Regulator
EPS	Electrical Power Steering
EVAP	Evaporative
EX	Exhaust
F	Front
FIA	Fuel Injection Air
FL	Front Left
FP	Fuel Pump
FR	Front Right
FSR.	Fail Safe Relay
FWD	Front Wheel Drive
GAL	Gallon
GND	Ground
GPS	Global Positioning System
H/B	Hatchback
HC	Hydrocarbons
HID	High Intensity Discharge
HO2S	Heated Oxygen Sensor
IAB	Intake Air Bypass
IAC	Idle Air Control
IACV	Idle Air Control Valve
IAR	Intake Air Resonator
IAT	Intake Air Temperature
ICM	Ignition Control Module
ID	Identification
ID or I.D.	Inside Diameter
IG or IGN	Ignition
IMA	Idle Mixture Adjustment Integrated Motor Assisted
IMMOBI.	Immobilizer (Immobiliser)
IN	Intake
INJ	Injection
INT	Intermittent
KS	Knock Sensor
L	Left
L/C	Lock-up Clutch
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LEV	Low Emission Vehicle
LF	Left Front
LH	Left Handle
LHD	Left Handle Drive
LR	Left Rear
LSD	Limited Slip Differential
L-4	In-line Four Cylinder (engine)

MAP	Manifold Absolute Pressure
MAX.	Maximum
MBS	Mainshaft Brake System
MCK	Motor Check
MCU	Moment Control Unit
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MPI	Multi Point Injection
M/S	Manual Steering
M/T	Manual Transmission
N	Neutral
NOx	Oxides of Nitrogen
OBD	On-board Diagnostic
O2S	Oxygen Sensor
OD or O.D.	Outside Diameter
P	Park
PAIR	Pulsed Secondary Air Injection
PCM	Powertrain Control Module
PCV	Positive Crankcase Ventilation Proportioning Control Valve
PDU	Power Drive Unit
PGM-FI	Programmed-fuel Injection
PGM-IG	Programmed Ignition
PH	Pressure High
PL	Pilot Light or Pressure Low
PMR	Pump Motor Relay
P/N	Part Number
PRI	Primary
P/S	Power Steering
PSF	Power Steering Fluid
PSP	Power Steering Pressure
PSW	Pressure Switch
Qty	Quantity
R	Right
REF	Reference
RGB	Red, Green, Black
RH	Right Handle
RHD	Right Handle Drive
RL	Rear Left
RON	Research Octane Number
RR	Rear Right
SAE	Society of Automotive Engineers
SCS	Service Check Signal
SEC	Second Secondary
SOHC	Single Overhead Camshaft
SOL	Solenoid
SPEC	Specification
S/R	Sun Roof
SRS	Supplemental Restraint System
STD	Standard
SW	Switch
T	Torque
TB	Throttle Body
T/B	Timing Belt
TC	Torque Converter
TCM	Transmission Control Module
TCS	Traction Control System
TDC	Top Dead Center
TFT	Thin Film Transistor
T/N	Tool Number
TP	Throttle Position
TWC	Three Way Catalytic Converter
VC	Viscous Coupling
VIN	Vehicle Identification Number
VSS	Vehicle Speed Sensor
VTEC	Variable Valve Timing & Valve Lift Electronic Control
VVIS	Variable Volume Intake System
W	With
W/O	Without
WOT	Wide Open Throttle
2WD	Two Wheel Drive
4WD	Four Wheel Drive
2WS	Two Wheel Steering
4AT	4-speed Automatic Transmission
5MT	5-speed Manual Transmission
6MT	6-speed Manual Transmission
[P]	Park
[R]	Reverse
[N]	Neutral
[D4]	Drive (1st through 4th gear)
[D3]	Drive (1st through 3rd gear)
[2]	Second
[1]	First
[D]	Drive
[S]	Second
[L]	Low
O/D	Over Drive
1ST	Low (gear)
2ND	Second (gear)
3RD	Third (gear)
4TH	Fourth (gear)
5TH	Fifth (gear)
6TH	Sixth (gear)

02

specs

Specifications

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Body Specifications **02-21**

Standards and Service Limits

Engine Electrical

Item	Measurement	Qualification	Standard or New	Service Limit
Ignition coil	Rated voltage		12 V	
	Firing order		1 - 3 - 4 - 2	
Spark plug	Type		NGK: ZFR6K-11 DENSO: KJ20DR-M11	
	Gap		1.0 - 1.1 mm (0.039 - 0.043 in.)	———
Ignition timing		At idle (check the ***red*** mark)	M/T (in neutral): 8 ± 2° BTDC at 650 ± 50 rpm (min^{-1})	
			A/T (in [**N**] or [**P**]): 8 ± 2° BTDC at 650 ± 50 rpm (min^{-1})	
Alternator	Output	At 13.5 V and normal engine temperature	90 A	
	Coil (rotor) resistance	at 20 C° (68 F°)	1.84 - 2.10 Ω	
	Slip ring O.D.		22.7 mm (0.89 in.)	21.7 mm (0.85 in.)
	Brush length		19.0 mm (0.75 in.)	5.0 mm (0.20 in.)
	Brush spring tension		3.3 - 4.1 N (0.34 - 0.42 kgf, 0.7 - 0.9 lbs)	
Starter (MITSUBA)	Output		1.2 kW, 1.6 kW	
	Commutator mica depth		0.4 - 0.5 mm (0.016 - 0.020 in.)	0.15 mm (0.006 in.)
	Commutator runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	Commutator O.D.		28.0 - 28.1 mm (1.102 - 1.106 in.)	27.5 mm (1.083 in.)
	Brush length		11.1 - 11.5 mm (0.44 - 0.45 in.)	4.3 mm (0.17 in.)
Starter (DENSO)	Output		1.0 kW, 1.1 kW	
	Commutator mica depth		0.50 - 0.80 mm (0.020 - 0.031 in.)	0.2 mm (0.008 in.)
	Commutator runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	Commutator O.D.		28.0 mm (1.10 in.)	27.0 mm (1.06 in.)
	Brush length		14.0 - 14.5 mm (0.55 - 0.57 in.)	9.0 mm (0.35 in.)
	Brush spring tension		13.7 - 17.7 N (1.40 - 1.80 kgf, 3.09 - 3.98 lbs)	

Engine Assembly

Item	Measurement	Qualification	Standard or New	Service Limit
Compression	Pressure check at 250 (min^{-1}) rpm with wide open throttle. (See Design Specs for ratio)	Minimum	930 kPa (9.5 kgf/cm^2, 135 psi)	———
		Maximum variation	200 kPa (2.0 kgf/cm^2, 28 psi)	———

Cylinder Head

Item	Measurement	Qualification	Standard or New	Service Limit
Head	Warpage		———	0.05 mm (0.002 in.)
	Height		103.95 - 104.05 mm (4.093 - 4.096 in.)	———
Camshaft	End play		0.05 - 0.20 mm (0.002 - 0.008 in.)	0.4 mm (0.02 in.)
	Camshaft-to-holder oil clearance	No.1 journal	0.030 - 0.069 mm (0.001 - 0.003 in.)	0.15 mm (0.006 in.)
		No.2, 3, 4, 5 journals	0.060 - 0.099 mm (0.002 - 0.004 in.)	0.15 mm (0.006 in.)
	Total runout		0.03 mm (0.001 in.) max.	0.04 mm (0.002 in.)
	Cam lobe height	Intake, primary	33.925 mm (1.3356 in.)	———
		Intake, secondary	29.638 mm (1.1668 in.)	———
		Exhaust	34.092 mm (1.3422 in.)	———
Valves	Clearance (cold)	Intake	0.21 - 0.25 mm (0.008 - 0.010 in.)	———
		Exhaust	0.28 - 0.32 mm (0.011 - 0.013 in.)	———
	Stem O.D.	Intake	5.475 - 5.485 mm (0.2156 - 0.2159 in.)	5.445 mm (0.214 in.)
		Exhaust	5.450 - 5.460 mm (0.2146 - 0.2150 in.)	5.42 mm (0.213 in.)
	Stem-to-guide clearance	Intake	0.030 - 0.055 mm (0.0012 - 0.0022 in.)	0.08 mm (0.003 in.)
		Exhaust	0.055 - 0.080 mm (0.0022 - 0.0031 in.)	0.11 mm (0.004 in.)
Valve seats	Width	Intake	1.25 - 1.55 mm (0.049 - 0.061 in.)	2.00 mm (0.079 in.)
		Exhaust	1.25 - 1.55 mm (0.049 - 0.061 in.)	2.00 mm (0.079 in.)
	Stem installed height	Intake	40.8 - 41.0 mm (1.606 - 1.614 in.)	———
		Exhaust	54.6 - 54.8 mm (2.150 - 2.157 in.)	———
Valve springs	Free length	Intake	47.61 mm (1.874 in.)	———
		Exhaust	49.64 mm (1.954 in.) 49.63 mm (1.954 in.)	———
Valve guides	I.D.	Intake	5.515 - 5.530 mm (0.2171 - 0.2177 in.)	5.55 mm (0.219 in.)
		Exhaust	5.515 - 5.530 mm (0.2171 - 0.2177 in.)	5.55 mm (0.219 in.)
	Installed height	Intake	15.2 - 16.2 mm (0.598 - 0.638 in.)	———
		Exhaust	15.5 - 16.5 mm (0.610 - 0.650 in.)	———
Rocker arms	Arm-to-shaft clearance	Intake	0.025 - 0.052 mm (0.0010 - 0.0020 in.)	0.08 mm (0.003 in.)
		Exhaust	0.018 - 0.056 mm (0.0007 - 0.0022 in.)	0.08 mm (0.003 in.)

Engine Block

Item	Measurement	Qualification	Standard or New	Service Limit
Block	Warpage of deck		0.07 mm (0.003 in.) max.	0.10 mm (0.004 in.)
	Bore diameter (K20A4, K20A5 engines)	A or I	86.010 - 86.020 mm (3.3862 - 3.3866 in.)	86.070 mm (3.3886 in.)
		B or II	86.000 - 86.010 mm (3.3858 - 3.3862 in.)	86.070 mm (3.3886 in.)
	Bore diameter (K24A1 engines)	A or I	87.010 - 87.020 mm (3.4256 - 3.4260 in.)	87.070 mm (3.4279 in.)
		B or II	87.000 - 87.010 mm (3.4252 - 3.4256 in.)	87.070 mm (3.4279 in.)
	Bore taper		———	0.05 mm (0.002 in.)
	Reboring limit		———	0.25 mm (0.01 in.)
Piston	Skirt O.D. at 11 mm (0.4 in.) from bottom of skirt (K20A4, K20A5 engines)	No letter or A	85.980 - 85.990 mm (3.3850 - 3.3854 in.)	85.930 mm (3.3831 in.)
		Letter B	85.970 - 85.980 mm (3.3846 - 3.3850 in.)	85.920 mm (3.3827 in.)
	Skirt O.D. at 13 mm (0.5 in.) from bottom of skirt (K24A1 engine)	No letter or A	86.980 - 86.990 mm (3.4244 - v3.4248 in.)	86.930 mm (3.4224 in.)
		Letter B	86.970 - 86.980 mm (3.4240 - 3.4244 in.)	86.920 mm (3.4220 in.)
	Clearance in cylinder		0.020 - 0.040 mm (0.0008 - 0.0016 in.)	0.05 mm (0.002 in.)
	Ring groove width	Top (K20A4, K20A5 engines)	1.220 - 1.230 mm (0.0481 - 0.0484 in.)	1.25 mm (0.049 in.)
		Top (K24A1 engine)	1.230 - 1.240 mm (0.0484 - 0.0488 in.)	1.26 mm (0.0450 in.)
		Second (K20A4, K20A5 engines)	1.220 - 1.230 mm (0.0481 - 0.0484 in.)	1.25 mm (0.049 in.)
		Second (K24A1 engine)	1.240 - 1.250 mm (0.0488 - 0.0492 in.)	1.270 mm (0.050 in.)
		Oil (K20A4, K24A1 engines)	2.005 - 2.025 mm (0.0789 - 0.0797 in.)	2.05 mm (0.081 in.)
		Oil (K20A5 engine)	2.805 - 2.825 mm (0.1104 - 0.1112 in.)	2.85 mm (0.112 in.)
Piston ring	Ring-to-groove clearance	Top (K20A4 engine)	0.035 - 0.060 mm (0.0014 - 0.0024 in.)	0.13 mm (0.005 in.)
		Top (K20A5 engine)	0.030 - 0.055 mm (0.0012 - 0.0022 in.)	0.13 mm (0.005 in.)
		Top (K24A1 engine)	0.045 - 0.070 mm (0.0018 - 0.0028 in.)	0.13 mm (0.005 in.)
		Second (K20A4, K20A5 engines)	0.030 - 0.055 mm (0.0012 - 0.0022 in.)	0.13 mm (0.005 in.)
		Second (K24A1 engine)	0.050 - 0.075 mm (0.0020 - 0.0030 in.)	0.13 mm (0.005 in.)
	Ring end gap	Top	0.20 - 0.35 mm (0.008 - 0.014 in.)	0.60 mm (0.024 in.)
		Second	0.40 - 0.55 mm (0.016 - 0.022 in.)	0.70 mm (0.028 in.)
		Oil (K20A4 (Except KY models) engine)	0.25 - 0.65 mm (0.010 - 0.026 in.)	0.75 mm (0.030 in.)
		Oil (K20A4 (KY model), K20A5, K24A1 engines)	0.20 - 0.70 mm (0.008 - 0.028 in.)	0.80 mm (0.031 in.)
Piston pin	O.D.		21.961 - 21.965 mm (0.8646 - 0.8648 in.)	21.953 mm (0.8643 in.)
	Pin-to-piston clearance		-0.005- +0.002 mm (-0.00020- + 0.00008 in.)	0.005 mm (0.0002 in.)
Connecting rod	Pin-to-rod clearance		0.005 - 0.015 mm (0.0002 - 0.0006 in.)	0.02 mm (0.0008 in.)
	Small-end bore diameter		21.970 - 21.976 mm (0.8650 - 0.8652 in.)	———
	Large-end bore diameter (Normal)	K20A4, K20A5 engines	48.0 mm (1.89 in.)	———
		K24A1 engine	51.0 mm (2.01 in.)	———
	End play installed on crankshaft		0.15 - 0.30 mm (0.006 - 0.012 in.)	0.40 mm (0.016 in.)

Item	Measurement	Qualification	Standard or New	Service Limit
Crankshaft	Main journal diameter	No. 1 journal No. 2 journal No. 4 journal No. 5 journal	54.984 - 55.008 mm (2.1648 - 2.1657 in.)	———
		No. 3 journal	54.976 - 55.000 mm (2.1644 - 2.1654 in.)	———
	Rod journal diameter	K20A4, K20A5 engines	44.976 - 45.000 mm (1.7707 - 1.7717 in.)	———
		K24A1 engine	47.976 - 48.000 mm (1.8888 - 1.8898 in.)	———
	Rod/main journal taper		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	Rod/main journal out-of-round		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	End play		0.10 - 0.35 mm (0.004 - 0.014 in.)	0.45 mm (0.018 in.)
	Runout		0.03 mm (0.0012 in.) max.	0.04 mm (0.0016 in.)
Crankshaft bearings	Main bearing-to-journal oil clearance	No. 1 journal No. 2 journal No. 4 journal No. 5 journal	0.017 - 0.041 mm (0.0007 - 0.0016 in.)	0.050 mm (0.0020 in.)
		No. 3 journal	0.025 - 0.049 mm (0.0010 - 0.0019 in.)	0.055 mm (0.0022 in.)
	Rod bearing clearance		0.021 - 0.049 mm (0.0008 - 0.0019 in.)	0.060 mm (0.0024 in.)

Engine Lubrication

Item	Measurement	Qualification	Standard or New	Service Limit
Engine oil	Capacity		5.3 *l* (5.6 US qt, 4.7 lmp qt) for engine overhaul 4.2 *l* (4.4 US qt, 3.7 lmp qt) for oil change, including filter 4.0 *l* (4.2 US qt, 3.5 lmp qt) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance		0.02 - 0.16 mm (0.001 - 0.006 in.)	0.20 mm (0.008 in.)
	Pump housing-to-outer rotor clearance		0.15 - 0.21 mm (0.006 - 0.008 in.)	0.23 mm (0.009 in.)
	Pump housing-to-rotor axial clearance		0.02 - 0.07 mm (0.001 - 0.003 in.)	0.12 mm (0.005 in.)
	Balancer shafts, journal diameter	No. 1 journal, front shaft	19.938 - 19.950 mm (0.7850 - 0.7854 in.)	19.92 mm (0.784 in.)
		No. 1 journal, rear shaft	23.938 - 23.950 mm (0.9424 - 0.9429 in.)	23.92 mm (0.942 in.)
		No. 2 journal, front and rear shaft	32.949 - 32.961 mm (1.2972 - 1.2977 in.)	32.93 mm (1.296 in.)
	Balancer shafts, journal taper		0.005 mm (0.0002 in.) max.	———
	Balancer shafts, end play	Front	0.070 - 0.135 mm (0.0028 - 0.0053 in.)	0.15 mm (0.006 in.)
		Rear	0.070 - 0.135 mm (0.0028 - 0.0053 in.)	0.15 mm (0.006 in.)
	Balancer shafts, shaft-to-bearing clearance	No. 1 journal, front shaft	0.050 - 0.082 mm (0.0020 - 0.0032 in.)	0.10 mm (0.004 in.)
		No. 1 journal, rear shaft	0.050 - 0.082 mm (0.0020 - 0.0032 in.)	0.10 mm (0.004 in.)
		No. 2 journal, front and rear shaft	0.060 - 0.120 mm (0.0024 - 0.0047 in.)	0.15 mm (0.006 in.)
	Balancer shaft bearings, I.D.	No. 1 journal, front shaft	20.000 - 20.020 mm (0.7874 - 0.7882 in.)	20.03 mm (0.789 in.)
		No. 1 journal, rear shaft	24.000 - 24.020 mm (0.9449 - 0.9457 in.)	24.03 mm (0.946 in.)
		No. 2 journal, front and rear shaft	33.021 - 33.069 mm (1.3000 - 1.3019 in.)	33.09 mm (1.303 in.)
	Relief valve, oil pressure with oil temperature at 80 °C (176 z°F)	At idle	70 kPa (0.7 kgf/cm^2, 10 psi) min.	
		at 3,000 rpm (min^{-1})	300 kPa (3.1 kgf/cm^2, 44 psi) min.	

Cooling

Item	Measurement	Qualification	Standard or New	Service Limit
Radiator	Coolant capacity for K20A4 and K20A5 engines (including engine, heater, hoses, and reservoir)	M/T: engine overhaul	7.1 L (7.5 US qt, 6.2 Imp qt)	
		M/T: coolant change	5.4 L (5.7 US qt, 4.8 Imp qt)	
		A/T: engine overhaul	7.0 *l* (7.4 US qt, 6.2 Imp qt)	
		A/T: coolant change	5.3 *l* (5.6 US qt, 4.7 Imp qt)	
	Coolant capacity for K24A1 engine (includes engine, heater, hoses, and reservoir)	M/T at engine overhaul	7.2 L (7.6 US qt, 6.3 Imp qt)	
		M/T at coolant change	5.5 L (5.8 US qt, 4.8 Imp qt)	
		A/T at engine overhaul	7.1 L (7.5 US qt, 6.2 Imp qt)	
		A/T at coolant change	5.4 L (5.7 US qt, 4.8 Imp qt)	
Reservoir	Coolant capacity		0.55 L (0.58 US qt, 0.48 Imp qt)	
Radiator cap	Opening pressure		93 - 123 kPa (0.95 - 1.25 kgf/cm^2, 14 - 18 psi)	
Thermostat	Opening temperature	Begins to open	76 - 80°C (169 - 176°F)	
		Fully open	90°C (194°F)	
	Valve lift at fully open		8.0 mm (0.31 in.) min.	
Radiator fan switch	Switching temperature	Turns ON	91 - 95°C (196 - 203°F)	
		Turns OFF	Subtract 3 - 8 °C (5 - 15 °F) from actual ON temperature	

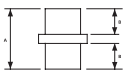
Fuel and Emissions

Item	Measurement	Qualification	Standard or New	Service Limit
Fuel pressure regulator	Pressure with fuel pressure gauge connected		338 - 348 kPa (3.45 - 3.55 kgf/cm^2, 49 - 50 psi)	
Fuel tank	Capacity		58 L (15 US gal, 13 Imp gal)	
Engine idle	Idle speed without a load	M/T in neutral	650 ± 50 rpm (min^{-1})	
		A/T in [**N**] or [**P**] position	650 ± 50 rpm (min^{-1})	
	Fast idle	M/T in neutral	1,600 ± 200 rpm (min^{-1})	
		A/T in [**N**] or [**P**] position	1,600 ± 200 rpm (min^{-1})	
	Idle CO %		0.1 max.	

Clutch

Item	Measurement	Qualification	Standard or New	Service Limit
Clutch pedal	Height from floor		200 mm (7.87 in.)	———
	Stroke		125 - 135 mm (4.92 - 5.31 in.)	———
	Play		6 - 17 mm (0.24 - 0.67 in.)	———
	Disengagement height from floor		112 mm (4.41 in.) min.	———
Flywheel	Runout on clutch mating surface		0.05 mm (0.002 in.) max.	0.15 mm (0.006 in.)
Clutch disc	Rivet head depth		1.65 - 2.25 mm (0.065 - 0.089 in.)	0.7 mm (0.03 in.)
	Thickness		8.7 - 9.3 mm (0.34 - 0.37 in.)	6.0 mm (0.24 in.)
Pressure plate	Warpage		0.03 mm (0.001 in.) max.	0.15 mm (0.006 in.)
	Height of diaphragm spring fingers measured with special tool and feeler gauge		0.6 mm (0.02 in.) max.	0.8 mm (0.03 in.)

Manual Transmission and M/T Differential

Item	Measurement	Qualification	Standard or New	Service Limit
Transmission fluid	Capacity	4WD at fluid change	1.9 L (2.0 US qt, 1.7 Imp qt)	
		4WD at overhaul	2.3 L (2.4 US qt, 2.0 Imp qt)	
		2WD at fluid change	1.9 L (2.0 US qt, 1.7 Imp qt)	
		2WD at overhaul	2.1 L (2.2 US qt, 1.8 Imp qt)	
Mainshaft	End play		0.11 - 0.17 mm (0.004 - 0.007 in.)	Adjust
	Diameter of bushing surface		20.80 - 20.85 mm (0.8189 - 0.8209 in.)	20.75 mm (0.817 in.)
	Diameter of distance collar		31.984 - 32.000 mm (1.2594 - 1.2598 in.)	31.93 mm (1.257 in.)
	Diameter of ball bearing contact area (clutch housing side)		27.977 - 27.990 mm (1.1015 - 1.1020 in.)	27.94 mm (1.100 in.)
	Diameter of needle bearing contact area		38.984 - 39.000 mm (1.5348 - 1.5354 in.)	38.93 mm (1.533 in.)
	Diameter of ball bearing contact area (transmission housing side)		27.987 - 28.000 mm (1.1019 - 1.1024 in.)	27.94 mm (1.100 in.)
	Runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
Mainshaft 3rd, 4th and 5th gears	I.D.		44.009 - 44.025 mm (1.7326 - 1.7333 in.)	44.08 mm (1.735 in.)
	End play		0.06 - 0.16 mm (0.002 - 0.006 in.)	0.25 mm (0.010 in.)
	Thickness		23.92 - 23.97 mm (0.981 - 0.944 in.)	23.80 mm (0.937 in.)
Countershaft	Diameter of needle bearing contact area (clutch housing side) Diameter of distance collar contact area		35.000 - 35.015 mm (1.3780 - 1.3785 in.)	34.95 mm (1.376 in.)
			39.937 - 39.950 mm (1.5723 - 1.5728 in.)	39.88 mm (1.570 in.)
	Diameter of ball bearing contact area (transmission housing side)		30.020 - 30.033 mm (1.1819 - 1.1824 in.)	29.97 mm (1.180 in.)
	Run out		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	35 mm shim-to-bearing inner race clearance		0.04 - 0.10 mm (0.0016 - 0.0039 in.)	Adjust
Countershaft 1st gear	I.D.		52.010 - 52.029 mm (2.0476 - 2.0484 in.)	52.08 mm (2.050 in.)
	End play		0.06 - 0.16 mm (0.002 - 0.006 in.)	0.25 mm (0.010 in.)
	Thickness		22.92 - 22.97 mm (0.902 - 0.904 in.)	22.87 mm (0.900 in.)
Countershaft 2nd gear	I.D.		52.010 - 52.029 mm (2.0476 - 2.0484 in.)	52.08 mm (2.050 in.)
	End play		0.06 - 0.16 mm (0.002 - 0.006 in.)	0.25 mm (0.010 in.)
	Thickness		27.92 - 27.97 mm (1.099 - 1.101 in.)	27.87 mm (1.097 in.)
Countershaft 1st gear distance collar	I.D.		39.95 - 39.96 mm (1.5728 - 1.5732 in.)	39.97 mm (1.574 in.)
	O.D.		46.989 - 47.000 mm (1.8499 - 1.8504 in.)	46.94 mm (1.848 in.)
	Length		23.03 - 23.08 mm (0.907 - 0.909 in.)	———
Countershaft 2nd gear distance collar	I.D.		39.95 - 39.96 mm (1.5728 - 1.5732 in.)	39.97 mm (1.574 in.)
	O.D.		46.989 - 47.000 mm (1.8499 - 1.8504 in.)	46.94 mm (1.848 in.)
	Length		28.03 - 28.08 mm (1.104 - 1.106 in.)	———
Mainshaft 4th and 5th gears distance collar	I.D.		32.00 - 32.01 mm (1.2598 - 1.2602 in.)	32.02 mm (1.261 in.)
	O.D.		38.989 - 39.000 mm (1.5350 - 1.5354 in.)	38.94 mm (1.533 in.)
	Length 	A	51.95 - 52.05 mm (2.045 - 2.049 in.)	———
		B	24.03 - 24.08 mm (0.946 - 0.947 in.)	———
MBS distance collar	I.D.		28.00 - 28.01 mm (1.102 - 1.103 in.)	28.02 mm (1.103 in.)
	Length		23.95 - 24.05 mm (0.943 - 0.947 in.)	———

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Manual Transmission and M/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Reverse idler gear	I.D.		20.016 - 20.043 mm (0.7880 - 0.7891 in.)	20.90 mm (0.832 in.)
	Gear-to-reverse gear shaft clearance		0.036 - 0.084 mm (0.0014 - 0.0033 in.)	0.16 mm (0.006 in.)
Synchro ring	Ring-to-gear clearance	Ring pushed against gear	0.70 - 1.49 mm (0.028 - 0.059 in.)	0.4 mm (0.016 in.)
Double cone synchro	Outer synchro ring-to-synchro cone clearance	Ring pushed against gear	0.70 - 1.19 mm (0.028 - 0.047 in.)	0.3 mm (0.012 in.)
	Synchro cone-to-gear clearance	Ring pushed against gear	0.50 - 1.04 mm (0.020 - 0.041 in.)	0.3 mm (0.012 in.)
	Outer synchro ring-to-gear cone clearance	Ring pushed against gear	0.95 - 1.68 mm (0.037 - 0.066 in.)	0.6 mm (0.024 in.)
Triple cone synchro	Outer synchro ring-to-synchro cone clearance	Ring pushed against gear	0.70 - 1.19 mm (0.028 - 0.047 in.)	0.3 mm (0.012 in.)
	Synchro cone-to-gear clearance	Ring pushed against gear	0.50 - 1.04 mm (0.020 - 0.041 in.)	0.3 mm (0.012 in.)
	Outer synchro ring-to-gear cone clearance	Ring pushed against gear	0.95 - 1.68 mm (0.037 - 0.066 in.)	0.6 mm (0.024 in.)
Shift fork	Finger thickness		7.4 - 7.6 mm (0.29 - 0.30 in.)	———
	Fork-to-synchro sleeve clearance		0.35 - 0.65 mm (0.014 - 0.026 in.)	1.0 mm (0.039 in.)
Reverse shift fork	Finger thinkness		13.4 - 13.7 mm (0.527 - 0.539 in.)	———
	Fork-to-reverse idler gear clearance		0.20 - 0.59 mm (0.007 - 0.024 in.)	1.2 mm (0.047 in.)
Shift arm	I.D.		13.973 - 14.000 mm (0.5501 - 0.5512 in.)	———
	Shift fork diameter at contact area		16.9 - 17.0 mm (0.665 - 0.669 in.)	———
	Shift arm-to-shift lever clearance		0.2 - 0.5 mm (0.008 - 0.020 in.)	0.60 mm (0.023 in.)
Select lever	Finger width		14.85 - 14.95 mm (0.585 - 0.589 in.)	———
Shift lever	Shaft-to-select lever clearance		0.05 - 0.25 mm (0.002 - 0.010 in.)	0.50 mm (0.020 in.)
	Groove (to select lever)		15.00 - 15.10 mm (0.591 - 0.594 in.)	———
	Shaft-to-shift arm clearance		0.013 - 0.07 mm (0.0005 - 0.003 in.)	0.1 mm (0.004 in.)
M/T differential carrier	Pinion shaft contact area I.D.		18.010 - 18.028 mm (0.7091 - 0.7098 in.)	———
	Carrier-to-pinion shaft clearance		0.027 - 0.057 mm (0.0011 - 0.0022 in.)	0.1 mm (0.004 in.)
	Driveshaft contact area I.D.		28.025 - 28.045 mm (1.1033 - 1.1041 in.)	———
M/T differential pinion gear	Backlash		0.05 - 0.15 mm (0.002 - 0.006 in.)	———
	I.D.		18.042 - 18.066 mm (0.7103 - 0.7113 in.)	———
	Pinion gear-to-pinion shaft clearance		0.059 - 0.095 mm (0.0023 - 0.0037 in.)	0.15 mm (0.006 in.)
80 mm shim	80 mm shim-to-bearing outer race clearance in transmission housing		0 - 0.10 mm (0 - 0.0039 in.)	Adjust
Transfer	Diameter of tapered roller bearing contact area (transfer shaft)		24.975 - 24.990 mm (0.9833 - 0.9838 in.)	24.92 mm (0.9811 in.)
	Diameter of tapered roller bearing contact area (transfer drive gear)		40.002 - 40.018 mm (1.5749 - 1.5755 in.)	38.95 mm (1.5335 in.)
	Diameter of tapered roller bearing contact area (driven gear side)		35.002 - 35.018 mm (1.3780 - 1.3786 in.)	34.95 mm (1.3760 in.)
	Diameter of tapered roller bearing contact area (splined side)		26.975 - 26.988 mm (1.0620 - 1.0625 in.)	26.92 mm (1.0598 in.)
	Transfer gear backlash		0.06 - 0.16 mm (0.0024 - 0.0063 in.)	Adjust
	Total starting torque		2.24 - 3.71 N·m (22.0 - 36.4 kgf·cm, 19.1 - 31.6 lbf·in)	Adjust

Automatic Transmission and A/T Differential

Item	Measurement	Qualification	Standard or New	Service Limit
ATF (Automatic Transmission Fluid)	Capacity Use Genuine Honda ATF-Z1	4WD at fluid change	3.1 L (3.3 US qt, 2.7 Imp qt)	
		2WD at fluid change	2.9 L (3.1 US qt, 2.6 Imp qt)	
		4WD at overhaul	7.2 L (7.6 US qt, 6.3 Imp qt)	
		2WD at overhaul	6.5 L (6.9 US qt, 5.7 Imp qt)	
ATF pressure	Line pressure	at 2,000 rpm (min^{-1}) in [**P**] or [**N**] position	900 - 960 kPa (9.2 - 9.8 kgf/cm^2, 130 - 140 psi)	850 kPa (8.7 kgf/cm^2, 120 psi)
	1st clutch pressure	at 2,000 rpm (min^{-1}) in 1st gear in [**1**] position	890 - 970 kPa (9.1 - 9.9 kgf/cm^2, 130 - 140 psi)	840 kPa (8.6 kgf/cm^2, 120 psi)
	2nd clutch pressure	at 2,000 rpm (min^{-1}) in 2nd gear in [**2**] position	890 - 970 kPa (9.1 - 9.9 kgf/cm^2, 130 - 140 psi)	840 kPa (8.6 kgf/cm^2, 120 psi)
	3rd clutch pressure	at 2,000 rpm (min^{-1}) in 3rd gear in [**D**] position	890 - 970 kPa (9.1 - 9.9 kgf/cm^2, 130 - 140 psi)	840 kPa (8.6 kgf/cm^2, 120 psi)
	4th clutch pressure	at 2,000 rpm (min^{-1}) in 4th gear in [**D**] position	890 - 970 kPa (9.1 - 9.9 kgf/cm^2, 130 - 140 psi)	840 kPa (8.6 kgf/cm^2, 120 psi)
Torque converter	Stall speed Check with vehicle on level ground		2,320 rpm (min^{-1})	2,170 - 2,470 rpm (min^{-1})
Clutch K20A4 and K20A5 engine models	Clutch end plate-to-top disc clearance	1st	———	1.23 - 1.43 mm (0.048 - 0.056 in.)
		2nd	———	0.75 - 0.95 mm (0.030 - 0.037 in.)
		3rd and 4th	———	0.73 - 0.93 mm (0.029 - 0.037 in.)
	Clutch return spring free length	1st and 2nd	50.8 mm (2.00 in.)	48.8 mm (1.92 in.)
		3rd and 4th	33.5 mm (1.32 in.)	31.5 mm (1.24 in.)
	Clutch disc thickness		1.94 mm (0.076 in.)	———
	Clutch plate thickness		2.00 mm (0.079 in.)	When discolored
	Clutch waved-plate phase difference		0.07 - 0.20 mm (0.003 - 0.008 in.)	0.05 mm (0.002 in)
	1st Clutch end plate thickness	Mark 1	2.3 mm (0.091 in.)	When discolored
		Mark 2	2.4 mm (0.094 in.)	When discolored
		Mark 3	2.5 mm (0.098 in.)	When discolored
		Mark 4	2.6 mm (0.102 in.)	When discolored
		Mark 5	2.7 mm (0.106 in.)	When discolored
		Mark 6	2.8 mm (0.110 in.)	When discolored
		Mark 7	2.9 mm (0.114 in.)	When discolored
		Mark 8	3.0 mm (0.118 in.)	When discolored
		Mark 9	3.1 mm (0.122 in.)	When discolored
		Mark 10	3.2 mm (0.126 in.)	When discolored
		Mark 11	3.3 mm (0.130 in.)	When discolored
		Mark 12	3.4 mm (0.134 in.)	When discolored
	2nd clutch end plate thickness	Mark 1	2.6 mm (0.102 in.)	When discolored
		Mark 2	2.7 mm (0.106 in.)	When discolored
		Mark 3	2.8 mm (0.110 in.)	When discolored
		Mark 4	2.9 mm (0.114 in.)	When discolored
		Mark 5	3.0 mm (0.118 in.)	When discolored
		Mark 6	3.1 mm (0.122 in.)	When discolored
		Mark 7	3.2 mm (0.126 in.)	When discolored
		Mark 8	3.3 mm (0.130 in.)	When discolored
		Mark 9	3.4 mm (0.134 in.)	When discolored

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Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Clutch K20A4 and K20A5 engine models (cont'd)	3rd and 4th clutch end plate thickness	Mark 11	3.1 mm (0.122 in.)	When discolored
		Mark 12	3.2 mm (0.126 in.)	When discolored
		Mark 13	3.3 mm (0.130 in.)	When discolored
		Mark 14	3.4 mm (0.134 in.)	When discolored
		Mark 15	3.5 mm (0.138 in.)	When discolored
		Mark 16	3.6 mm (0.142 in.)	When discolored
		Mark 17	3.7 mm (0.146 in.)	When discolored
		Mark 18	3.8 mm (0.150 in.)	When discolored
		Mark 19	3.9 mm (0.154 in.)	When discolored
Clutch K24A1 engine model	Clutch end plate-to-top disc clearance	1st	———	1.28 - 1.48 mm (0.050 - 0.058 in.)
		2nd	———	0.85 - 1.05 mm (0.033 - 0.041 in.)
		3rd and 4th	———	0.73 - 0.93 mm (0.029 - 0.037 in.)
	Clutch return spring free length	1st and 2nd	50.8 mm (2.00 in.)	48.8 mm (1.92 in.)
		3rd and 4th	33.5 mm (1.32 in.)	31.5 mm (1.24 in.)
	Clutch disc thickness		1.94 mm (0.076 in.)	———
	Clutch plate thickness	1st	1.6 mm (0.063 in.)	When discolored
		2nd	2.0 mm (0.079 in.)	When discolored
		3rd and 4th	2.3 mm (0.091 in.)	When discolored
	Clutch waved-plate phase difference		0.07 - 0.20 mm (0.003 - 0.008 in.)	0.05 mm (0.002 in)
	1st Clutch end plate thickness	Mark 1	2.6 mm (0.102 in.)	When discolored
		Mark 2	2.7 mm (0.106 in.)	When discolored
		Mark 3	2.8 mm (0.110 in.)	When discolored
		Mark 4	2.9 mm (0.114 in.)	When discolored
		Mark 5	3.0 mm (0.118 in.)	When discolored
		Mark 6	3.1 mm (0.122 in.)	When discolored
		Mark 7	3.2 mm (0.126 in.)	When discolored
		Mark 8	3.3 mm (0.130 in.)	When discolored
		Mark 9	3.4 mm (0.134 in.)	When discolored
	2nd clutch end plate thickness	Mark 1	2.6 mm (0.102 in.)	When discolored
		Mark 2	2.7 mm (0.106 in.)	When discolored
		Mark 3	2.8 mm (0.110 in.)	When discolored
		Mark 4	2.9 mm (0.114 in.)	When discolored
		Mark 5	3.0 mm (0.118 in.)	When discolored
		Mark 6	3.1 mm (0.122 in.)	When discolored
		Mark 7	3.2 mm (0.126 in.)	When discolored
		Mark 8	3.3 mm (0.130 in.)	When discolored
		Mark 9	3.4 mm (0.134 in.)	When discolored
	3rd and 4th clutch end plate thickness	Mark 1	2.1 mm (0.083 in.)	When discolored
		Mark 2	2.2 mm (0.087 in.)	When discolored
		Mark 3	2.3 mm (0.091 in.)	When discolored
		Mark 4	2.4 mm (0.094 in.)	When discolored
		Mark 5	2.5 mm (0.098 in.)	When discolored
		Mark 6	2.6 mm (0.102 in.)	When discolored
		Mark 7	2.7 mm (0.106 in.)	When discolored
		Mark 8	2.8 mm (0.110 in.)	When discolored
		Mark 9	2.9 mm (0.114 in.)	When discolored

Item	Measurement	Qualification	Standard or New	Service Limit
Mainshaft	Diameter of needle bearing contact area	at stator shaft	22.984 - 23.000 mm (0.905 - 0.906 in.)	When worn or damaged
		at 3rd gear	51.975 - 51.991 mm (2.046 - 2.047 in.)	When worn or damaged
		at 4th gear collar	33.975 - 33.991 mm (1.3376 - 1.3382 in.)	When worn or damaged
	I.D. of gears	3rd gear	57.000 - 57.019 mm (2.2441 - 2.2448 in.)	When worn or damaged
		4th gear	40.000 - 40.016 mm (1.5748 - 1.5754 in.)	When worn or damaged
	End play of gears	3rd gear	0.03 - 0.31 mm (0.001 - 0.012 in.)	———
		4th gear	0.1 - 0.212 mm (0.004-0.008 in.)	———
	41 x 68 mm thrust washer thickness	No. 1	6.35 mm (0.250 in.)	When worn or damaged
		No. 2	6.40 mm (0.252 in.)	When worn or damaged
		No. 3	6.45 mm (0.254 in.)	When worn or damaged
		No. 4	6.50 mm (0.256 in.)	When worn or damaged
		No. 5	6.55 mm (0.258 in.)	When worn or damaged
		No. 6	6.60 mm (0.260 in.)	When worn or damaged
	4th gear collar length		66.3 - 66.4 mm (2.610 - 2.614 in.)	———
	Length of 4th gear collar flange from end		19.15 - 19.30 mm (0.754 - 0.760 in.)	When worn or damaged
	Sealing ring thickness		1.91 - 1.97 mm (0.0752 - 0.0776 in.)	1.86 (0.0732 in.)
	Width of sealing ring groove		2.025 - 2.060 mm (0.0797 - 0.0811 in.)	2.080 mm (0.0819 in.)
	Clutch feed pipe O.D.		7.97 - 7.98 mm (0.3138 - 0.3142 in.)	7.95 mm (0.313 in.)
	Clutch feed pipe bushing I.D.		8.000 - 8.015 mm (0.3150 - 0.3156 in.)	8.030 mm (0.3161 in.)
Countershaft	Diameter of needle bearing contact area	at torque converter housing	36.005-36.015 mm (1.4175 - 1.4179 in.)	When worn or damaged
		at 4th gear collar	37.982 - 37.996 mm (1.4954 - 1.4959 in.)	When worn or damaged
		at reverse gear collar	39.979 - 40.000 mm (1.5740 - 1.5748 in.)	When worn or damaged
	I.D. of gears	4th gear	43.000 - 43.016 mm (1.6929 - 1.6935 in.)	When worn or damaged
		Reverse gear	46.000 - 46.016 mm (1.8110 - 1.8116 in.)	When worn or damaged
	End play of gears	1st gear	0.10 - 0.42 mm (0.004 - 0.017 in.)	———
		2nd gear	0.10 - 0.42 mm (0.004 - 0.017 in.)	———
		3rd gear	0.10 - 0.42 mm (0.004 - 0.017 in.)	———
		4th gear	0.1 - 0.2 mm (0.004 - 0.008 in.)	———
		Reverse gear	0.10 - 0.25 mm (0.004 - 0.010 in.)	———
	4th gear collar length		24.00 - 24.05 mm (0.945 - 0.947 in.)	———
	Distance collar length		74.25 - 74.30 mm (2.923 - 2.925 in.)	———
	Reverse selector hub width		25.45 - 25.65 mm (1.002 - 1.010 in.)	———
	Reverse selector hub O.D.		55.87 - 55.90 mm (2.200 - 2.201 in.)	When worn or damaged

(cont'd)

Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Secondary shaft	Diameter of needle bearing contact area	at 1st gear	39.986 - 39.999 mm (1.5742 - 1.5748 in.)	When worn or damaged
		at 2nd gear	39.986 - 39.999 mm (1.5742 - 1.5748 in.)	When worn or damaged
	I.D. of gears	1st gear	47.000 - 47.016 mm (1.8504 - 1.8510 in.)	When worn or damaged
		2nd gear	46.000 - 46.016 mm (1.8110 - 1.8116 in.)	When worn or damaged
	End play of gears	1st gear	0.07 - 0.15 mm (0.003 - 0.006 in.)	———
		2nd gear	0.04 - 0.12 mm (0.002 - 0.005 in.)	———
	37 x 58 mm thrust washer thickness	No. 1	3.900 mm (0.154 in.)	When worn or damaged
		No. 2	3.925 mm (0.155 in.)	When worn or damaged
		No. 3	3.950 mm (0.156 in.)	When worn or damaged
		No. 4	3.975 mm (0.156 in.)	When worn or damaged
		No. 5	4.000 mm (0.157 in.)	When worn or damaged
		No. 6	4.025 mm (0.158 in.)	When worn or damaged
		No. 7	4.050 mm (0.159 in.)	When worn or damaged
		No. 8	4.075 mm (0.160 in.)	When worn or damaged
		No. 9	4.100 mm (0.161 in.)	When worn or damaged
		No. 10	4.125 mm (0.162 in.)	When worn or damaged
		No. 11	4.150 mm (0.163 in.)	When worn or damaged
		No. 12	4.175 mm (0.164 in.)	When worn or damaged
		No. 13	4.200 mm (0.165 in.)	When worn or damaged
		No. 14	4.225 mm (0.166 in.)	When worn or damaged
		No. 15	4.250 mm (0.167 in.)	When worn or damaged
		No. 16	4.275 mm (0.168 in.)	When worn or damaged
		No. 17	4.300 mm (0.169 in.)	When worn or damaged
		No. 18	4.325 mm (0.170 in.)	When worn or damaged
		No. 19	4.350 mm (0.171 in.)	When worn or damaged
		No. 20	4.375 mm (0.172 in.)	When worn or damaged
	40 x 51.5 mm thrust washer thickness	No. 1	4.80 mm (0.189 in.)	When worn or damaged
		No. 2	4.85 mm (0.191 in.)	When worn or damaged
		No. 3	4.90 mm (0.193 in.)	When worn or damaged
		No. 4	4.95 mm (0.195 in.)	When worn or damaged
		No. 5	5.00 mm (0.197 in.)	When worn or damaged
		No. 6	5.05 mm (0.199 in.)	When worn or damaged
	27 x 45 x 44 mm collar length		43.9 - 44.0 mm (1.728 - 1.732 in.)	———
	Sealing ring thickness		1.91 - 1.97 mm (0.0752 - 0.0776 in.)	1.86 (0.0732 in.)
	Width of sealing ring groove		2.025 - 2.060 mm (0.0797 - 0.0811 in.)	2.080 mm (0.0819 in.)
	Clutch feed pipe O.D.		7.97 - 7.98 mm (0.3138 - 0.3142 in.)	7.95 mm (0.3130 in.)
	Clutch feed pipe bushing O.D.		8.000 - 8.015 mm (0.3150 - 0.3156 in.)	8.030 mm (0.3161 in.)
	ATF guide of sealing ring contact I.D.		29.000 - 29.021 mm (1.1417 - 1.1426 in.)	29.05 mm (1.144 in.)

Item	Measurement	Qualification	Standard or New	Service Limit
Idler gear shaft	Diameter of needle bearing contact area	End cover side	32.003 - 32.013 mm (1.2600 - 1.2604 in.)	When worn or damaged
	Thickness of cotters		1.39 - 1.42 mm (0.0547 - 0.0559 in.)	———
Reverse idler gear	Reverse idler gear shaft diameter at needle bearing contact area		14.99 - 15.00 mm (0.5902 - 0.5906 in.)	When worn or damaged
	I.D.		20.007 - 20.020 mm (0.7877 - 0.7882 in.)	When worn or damaged
	I.D. of reverse idler gear shaft contact area on transmission housing		14.800 - 14.818 mm (0.5827 - 0.5834 in.)	———
	I.D. of reverse idler gear shaft holder		14.800 - 14.824 mm (0.5827 - 0.5836 in.)	When worn or damaged
ATF pump	ATF pump thrust clearance		0.03 - 0.05 mm (0.001 - 0.002 in.)	0.07 mm (0.003 in.)
	ATF pump gear-to-body clearance	Drive gear	0.210 - 0.265 mm (0.08 - 0.010 in.)	———
		Driven gear	0.070 - 0.125 mm (0.003 - 0.005 in.)	———
	ATF pump driven gear I.D.		14.016 - 14.034 mm (0.5518 - 0.5525 in.)	When worn or damaged
	ATF pump driven gear shaft O.D.		13.980 - 13.990 mm (0.5504 - 0.5508 in.)	When worn or damaged
Stator shaft	Needle bearing contact I.D.	Torque converter side	27.000 - 27.021 mm (1.063 - 1.064 in.)	When worn or damaged
		ATF pump side	29.000 - 29.021 mm (1.1417 - 1.1426 in.)	———
	Sealing ring contact area I.D.		29.000 - 29.021 mm (1.1417 - 1.1426 in.)	29.05 mm (1.144 in.)
Reverse shift fork	Fork finger thickness		5.90 - 6.00 mm (0.232 - 0.236 in.)	5.40 mm (0.213 in.)
Park gear and pawl			———	When worn or damaged
Servo body	Shift fork shaft bore I.D.		14.000 - 14.010 mm (0.5512 - 0.5516 in.)	———
	Shift fork shaft valve bore I.D.		37.000 - 37.039 mm (1.4567 - 1.4582 in.)	37.045 mm (1.4585 in.)
Regulator valve body	Sealing ring contact I.D.		29.000 - 29.021 mm (1.1417 - 1.1426 in.)	29.05 mm (1.144 in.)

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coil
Main valve body springs (see page 14-209)	Shift valve A spring		0.8 mm (0.031 in.)	5.6 mm (0.220 in.)	28.1 mm (1.106 in.)	15.9
	Shift valve B spring		0.8 mm (0.031 in.)	5.6 mm (0.220 in.)	28.1 mm (1.106 in.)	15.9
	Shift valve C spring		0.8 mm (0.031 in.)	5.6 mm (0.220 in.)	28.1 mm (1.106 in.)	15.9
	Relief valve spring		1.0 mm (0.039 in.)	9.6 mm (0.378 in.)	34.1 mm (1.343 in.)	10.2
	Lock-up control valve spring		0.65 mm (0.026 in.)	7.1 mm (0.280 in.)	23.1 mm (0.909 in.)	12.7
	Cooler check valve spring		0.9 mm (0.035 in.)	6.6 mm (0.260 in.)	26.5 mm (1.043 in.)	12.6
	Servo control valve spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	35.7 mm (1.406 in.)	17.2
	Shift valve E spring		0.8 mm (0.031 in.)	5.6 mm (0.220 in.)	28.1 mm (1.106 in.)	15.9

(cont'd)

Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coil
Regulator valve body springs (see page 14-211)	Stator reaction spring		4.5 mm (0.177 in.)	35.4 mm (1.394 in.)	30.3 mm (1.193 in.)	1.92
	Regulator valve spring A		1.9 mm (0.075 in.)	14.7 mm (0.579 in.)	80.6 mm (3.173 in.)	16.1
	Regulator valve spring B		1.6 mm (0.063 in.)	9.2 mm (0.362 in.)	44.0 mm (1.732 in.)	12.5
	Torque converter check valve spring		1.2 mm (0.047 in.)	8.6 mm (0.339 in.)	33.8 mm (1.331 in.)	12.2
	Lock-up shift valve spring		1.0 mm (0.039 in.)	6.6 mm (0.260 in.)	35.5 mm (1.398 in.)	18.2
	3rd accumulator spring		2.5 mm (0.098 in.)	14.6 mm (0.575 in.)	29.9 mm (1.177 in.)	4.9
	1st accumulator spring A		2.4 mm (0.094 in.)	18.6 mm (0.732 in.)	49.0 mm (1.929 in.)	7.1
	1st accumulator spring B		2.3 mm (0.091 in.)	12.2 mm (0.480 in.)	31.5 mm (1.240 in.)	6.6
Servo body springs (see page 14-212)	CPB valve spring		0.7 mm (0.028 in.)	9.1 mm (0.358 in.)	32.3 mm (1.272 in.)	8.6
	4th accumulator spring B		2.3 mm (0.091 in.)	12.2 mm (0.480 in.)	31.5 mm (1.240 in.)	6.6
	4th accumulator spring A		2.4 mm (0.094 in.)	18.6 mm (0.732 in.)	49.0 mm (1.929 in.)	7.1
	2nd accumulator spring B		2.0 mm (0.079 in.)	10.6 mm (0.417 in.)	34.0 mm (1.339 in.)	8.0
	2nd accumulator spring A		2.2 mm (0.087 in.)	16.6 mm (0.654 in.)	48.2 mm (1.898 in.)	8.5
	3th accumulator spring		2.5 mm (0.098 in.)	14.6 mm (0.575 in.)	29.9 mm (1.177 in.)	4.9

Item	Measurement	Qualification	Standard or New	Service Limit
A/T differential carrier	Pinion shaft contact area I.D.		18.000 - 18.025 mm (0.709 - 0.710 in.)	———
	Carrier-to-pinion shaft clearance		0.013 - 0.054 mm (0.001 - 0.002 in.)	0.1 mm (0.004 in.)
	Driveshaft contact area I.D.		28.015 - 28.045 mm (1.103 - 1.104 in.)	———
	Carrier-to-driveshaft clearance		0.035 - 0.086 mm (0.001 - 0.003 in.)	0.12 mm (0.005 in.)
	Intermediate shaft contact I.D.		28.015 - 28.045 mm (1.103 - 1.104 in.)	———
	Carrier-to-intermediate shaft clearance		0.065 - 0.111 mm (0.003 - 0.004 in.)	0.12 mm (0.005 in.)
	Carrier bearing starting torque (preload)	For new bearing	2.7 - 3.9 N·m (28 - 40 kgf·cm, 24 - 35 lbf·in)	Adjust
		For bearing reused	2.5 - 3.6 N·m (25 - 37 kgf·cm, 22 - 32 lbf·in)	Adjust
	Final driven gear backlash	(references)	0.087 - 0.146 mm (0.003 - 0.006 in.)	0.2 mm (0.008 in.)
A/T differential pinion gear	Backlash		0.05 - 0.15 mm (0.002 - 0.006 in.)	———
	I.D.		18.042 - 18.066 mm (0.7103 - 0.7113 in.)	———
	Pinion gear-to-pinion shaft clearance		0.055 - 0.095 mm (0.0022 - 0.0037 in.)	0.12 mm (0.005 in.)

Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Transfer (4WD)	Diameter of transfer shaft on bearing contact area	at roller bearing	38.485 - 38.500 mm (1.5152 - 1.5157 in.)	38.43 mm (1.513 in.)
		at tapered roller bearing	24.975 - 24.990 mm (0.9833 - 0.9839 in.)	24.92 mm (0.9811 in.)
	Transfer drive gear diameter	at tapered roller bearing	40.002 - 40.018 mm (1.5749 - 1.5755 in.)	38.95 mm (1.533 in.)
	Diameter of transfer driven gear on tapered roller bearing contact area	at driven gear side	35.002 - 35.018 mm (1.3780 - 1.3787 in.)	34.95 mm (1.376 in.)
		at shaft splines side	26.975 - 26.988 mm (1.0620 - 1.0625 in.)	26.92 mm (1.060 in.)
	Transfer gear backlash		0.06 - 0.16 mm (0.002 - 0.006 in.)	Adjust
	Total starting torque (Preload)		2.16 - 3.57 N·m (22.0 - 36.4 kgf·cm, 19.2 - 31.6 lbf·in)	Adjust

Rear Differential

Item	Measurement	Qualification	Standard or New	Service Limit
Differential fluid	Capacity Use genuine Honda DPSF	at fluid change	1.0 L (1.1 US qt, 0.9 Imp qt)	
		at overhaul	1.2 L (1.3 US qt, 1.1 Imp qt)	

Steering

Item	Measurement	Qualification	Standard or New	Service Limit
Steering wheel	Rotational play measured at outside edge with engine running		0 - 10 mm (0 - 0.39 in.)	
	Starting load measured at outside edge with engine running		29 N (3.0 kgf, 6.6 lbs)	
Gearbox	Angle of rack guide screw loosened from locked position		20° Max.	
Pump	Output pressure with shut-off valve closed		6,900 - 7,500 kPa (70 - 77 kgf/cm^2, 1,000 - 1,100 psi)	
Power steering fluid	Capacity Use genuine Honda power steering fluid	Fluid change	0.2 L (0.21 US qt, 0.18 Imp qt)	
		System overhaul	0.72 L (0.74 US qt, 0.63 Imp qt)	
Drive belt			Auto adjust	

Suspension

Item	Measurement	Qualification	Standard or New	Service Limit
Wheel alignment	Camber	Front	0°00' ± 45'	
		Rear	- 1°00' ± 45'	
	Caster	Front	1°45' ± 1°	
	Total Toe	Front	0±2 mm (0 ± 0.08 in.)	
		Rear	IN 2^{+2}_{-1} mm ($0.08^{+0.08}_{-0.04}$ in.)	
	Front wheel turning angle	Inside wheel	39°45' ± 2°	
		Outside wheel	32°30' ± 1° (Reference)	
Wheel	Aluminum wheel runout	Axial	0 - 0.7 mm (0 - 0.03 in.)	2.0 mm (0.08 in.)
		Radial	0 - 0.7 mm (0 - 0.03 in.)	1.5 mm (0.06 in.)
	Steel wheel runout	Axial	0 - 1.0 mm (0 - 0.04 in.)	2.0 mm (0.08 in.)
		Radial	0 - 1.0 mm (0 - 0.04 in.)	1.5 mm (0.06 in.)
Wheel bearing	End play	Front	0 - 0.05 mm (0 - 0.002 in.)	
		Rear	0 - 0.05 mm (0 - 0.002 in.)	

Brakes

Item	Measurement	Qualification	Standard or New	Service Limit
Parking brake lever	Distance travelled when lever pulled with 196 N (20 kgf, 44 lbs) of force		5 - 9 clicks	
Brake pedal	Pedal height (carpet removed)		173 mm (6 13/16 in.)	
	Free play		1 - 5 mm (0.04 - 0.2 in.)	
Master cylinder	Piston-to-pushrod clearance		0 - 0.4 mm (0 - 0.02 in.)	
Brake disc	Disc thickness	Front	23.0 mm (0.91 in.)	21.0 mm (0.83 in.)
		Rear	9.0 mm (0.35 in.)	7.0 mm (0.28 in.)
	Disc runout	Front and rear	———	0.10 mm (0.004 in.)
	Disc parallelism	Front and rear	———	0.015 mm (0.0006 in.)
	Pad thickness	Front	11.0 mm (0.43 in.)	1.6 mm (0.06 in.)
		Rear	9.0 mm (0.35 in.)	1.0 mm (0.04 in.)
Rear parking brake	Brake drum I.D.		170 mm (6.69 in.)	171 mm (6.73 in.)
	Brake shoe lining thickness		3.2 mm (0.13 in.)	1.0 mm (0.04 in.)
Brake booster	Master cylinder fluid pressure with pressing brake pedal with 98 N (10 kgf, 22 lbs)	at 0 kPa (0 mmHg, 0 in.Hg) of vacuum	1,040 kPa (10.8 kgf/cm^2, 151 psi)	
		at 40.0 kPa (300 mmHg, 11.8 in.Hg) of vacuum	7,129 kPa (72.7 kgf/cm^2, 1,030 psi)	
		at 66.7 kPa (500 mmHg, 19.7 in.Hg) of vacuum	11,248 kPa (114.7 kgf/cm^2, 1,631 psi)	

Air Conditioning

Item	Measurement	Qualification	Standard or New	Service Limit
Refrigerant	Type		HFC-134 a (R-134 a)	
	Capacity of system		650 - 700 g (22.9 - 24.7 oz)	
Refrigerant oil	Type		ND-OIL8	
	Capacity of components	Condenser	50 mL (1 2/3 fl oz, 1.3 Imp oz)	
		Evaporator	40 mL (1 1/3 fl oz, 1.4 Imp oz)	
		Each line and hose	10 mL (1/3 fl oz, 0.4 Imp oz)	
		Compressor	160 - 175 mL (5 2/5 - 6 fl oz, 5.6 - 6.2 Imp oz)	
Compressor	Starter coil resistance	at 60°C (20°F)	3.9 - 4.3 Ω	
	Pulley-to-pressure plate clearance		0.35 - 0.6 mm (0.014 - 0.024 in.)	

Design Specifications

Item	Measurement	Qualification	Specification
Dimensions	Overall length	European models	4,575 mm (180.1 in.)
		KQ (RVi)	4,535 mm (178.5 in.)
		KQ (RVSi)	4,565 mm (179.7 in.)
		KH (South America)	4,535 mm (178.5 in.)
		KH (China)	4,570 mm (179.9 in.)
		KK (LX)	4,535 mm (178.5 in.)
		KK (EX)	4,550 mm (179.1 in.)
		KM	4,550 mm (179.1 in.)
		KU	4,535 mm (178.5 in.)
		KY (RVi)	4,555 mm (179.3 in.)
		KY (RVSi)	4,570 mm (179.9 in.)
	Overall width		1,780 mm (70.1 in.)
	Overall height		1,710 mm (67.3 in.)
	Wheelbase		2,620 mm (103.1 in.)
	Track	Front	1,535 mm (60.4 in.)
		Rear	1,540 mm (60.6 in.)
	Seating capacity		five (5)
Weight	Curb Weight	European models	1,458 - 1,542 kg (3,214 - 3,399 lbs)
		KQ	1,475 - 1,515 kg (3,252 - 3,340 lbs)
		KH (China)	1,495 - 1,520 kg (3,296 - 3,351 lbs)
		KY	1,470 - 1,505 kg (3,241 - 3,318 lbs)
		KU	1,480 - 1,495 kg (3,263 - 3,296 lbs)
		KH (South America), KK, KM, KN,KP KT, KW	1,440 - 1,510 kg (3,175 - 3,329 lbs)
	Max. permissible Weight	M/T	1,930 kg (4,255 lbs)
		A/T	1,960 kg (4,321 lbs)
	Max. Loaded Vehicle Weight (ADR)	M/T	1,910 kg (4,211 lbs)
		A/T	1,940 kg (4,277 lbs)

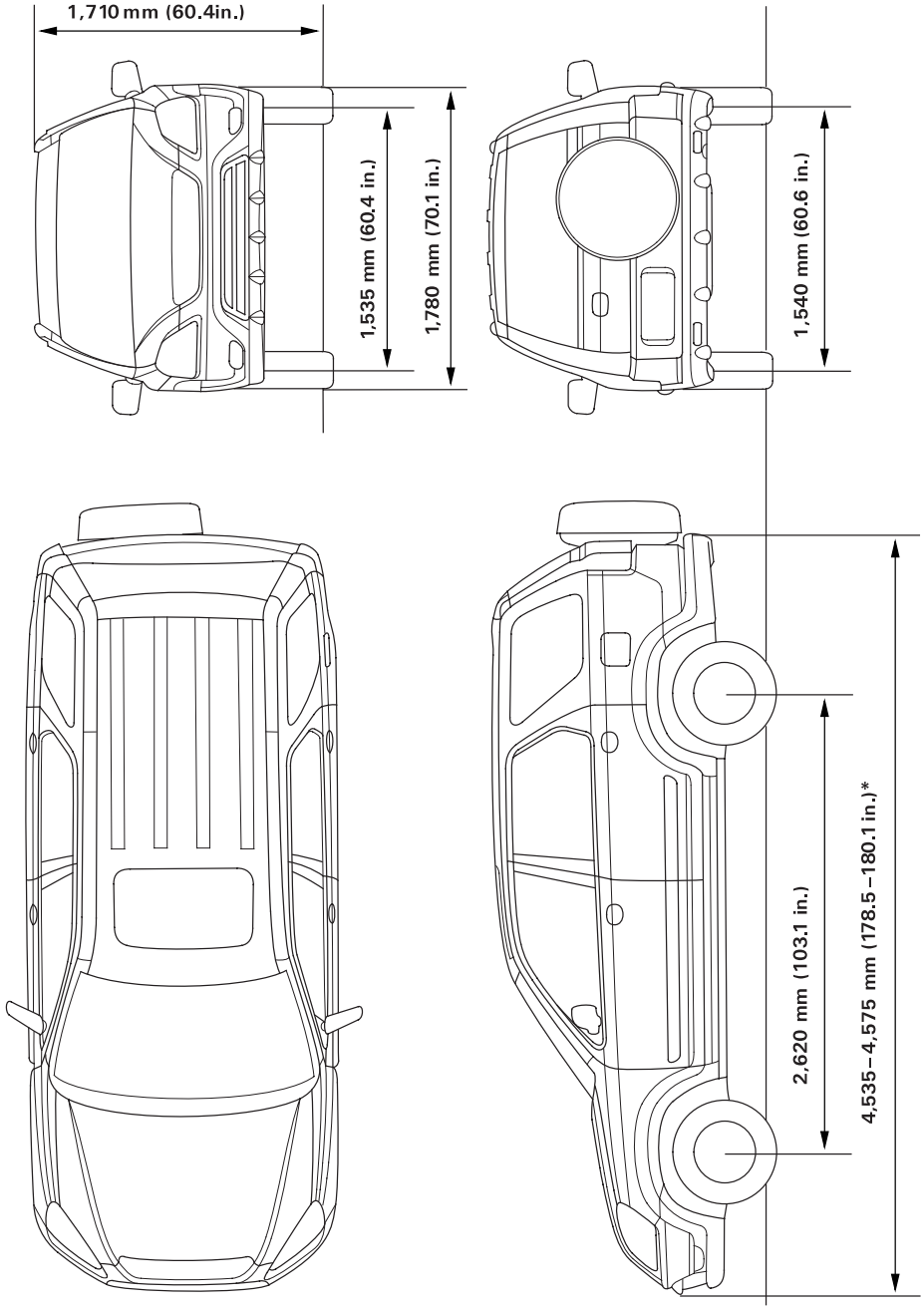
Item	Measurement	Qualification	Specification
Engine	Type		Water cooled, 4-stroke DOHC VTEC engine
	Cylinder arrangement		Inline 4-cylinder, transverse
	Bore and stroke	K20A4, K20A5 engines	86 X 86 mm (3.39 X 3.39 in.)
		K24A1 engine	87 X 99 mm (3.43 X 3.90 in.)
	Displacement	K20A4, K20A5 engines	1,998 cm^3 (122 cu in.)
		K24A1 engine	2,354 cm^3 (143 cu in.)
	Compression ratio	K20A4, K20A5 engines	9.8
		K24A1 engine	9.6
	Valve train		Chain drive, DOHC VTEC 4 valves per cylinder
	Lubrication system		Forced, wet sump, with trochoid pump
	Oil pump displacement	at 6,000 engine rpm (min^{-1})	54.3 / (57.4 US qt, 47.8 Imp qt)/minute
	Water pump displacement	at 6,000 engine rpm (min^{-1})	82 / (87 US qt, 72 Imp qt)/minute
	Fuel required	K20A4 engine European models	UNLEADED gasoline with 95 research octane number or higher
		K20A4 engine Except European models	UNLEADED gasoline with 91 research octane number or higher
		K20A5 engine KP, KT models	LEADED gasoline with 91 research octane number or higher
		K20A5 engine KW model	LEADED gasoline with 88 research octane number or higher
		K24A1 engine	UNLEADED gasoline with 91 research octane number or higher
Starter	Type		Gear reduction
	Normal output	K20A4 (KZ models) engine	1.0 kW
		K20A4 (KE, KG, KR, KS models) engine	1.1 kW
		K20A4 (Except KE, KG, KR, KS, KZ models), K20A5 engines	1.2 kW
		K24A1 engine	1.6 kW
	Nominal voltage		12 V
	Hour rating		30 seconds
	Direction of rotation		Clockwise as viewed from gear end
Clutch	Clutch type	M/T	Single plate dry, diaphragm spring
		A/T	3-element torque converter with lock-up clutch
	Clutch friction material surface area	M/T	174 cm^2 (26.97 sq in.)
Z2C1, Z2M1 Manual Transmission	Type		Synchronized, 5-speed forward, 1 reverse
	Primary reduction		Direct 1:1
	Gear ratio	1st	3.533
		2nd	1.769
		3rd	1.212
		4th	0.921
		5th	0.714
		Reverse	3.583
	Transfer gear	Type	Hypoid gear
		Gear ratio	0.904
	Differential final gear	Type	Single helical gear
		Gear ratio	5.062

Item	Measurement	Qualification	Specification
Z2M3 Manual Transmission	Type		Synchronized, 5-speed forward, 1 reverse
	Primary reduction		Direct 1:1
	Gear ratio	1st	3.533
		2nd	1.880
		3rd	1.212
		4th	0.921
		5th	0.738
		Reverse	3.583
	Transfer gear	Type	Hypoid gear
		Gear ratio	0.904
	Differential final gear	Type	Single helical gear
		Gear ratio	4.764
Automatic Transmission	Type		Electronically controlled automatic, 4-speed forward, 1 reverse
	Primary reduction		Direct 1:1
	Gear ratio K20A4, K20A5 engine models	1st	2.684
		2nd	1.534
		3rd	1.081
		4th	0.695
		Reverse	2.000
	Gear ratio K24A1 engine model	1st	2.684
		2nd	1.534
		3rd	1.974
		4th	0.638
		Reverse	2.000
	Transfer gear	Type	Hypoid gear
		Gear ratio	0.904
	Differential final gear	Type	Single helical gear
		Gear ratio K20A4, K20A5 engine models	4.562
		Gear ratio K24A1 engine model	4.437
Steering	Type		Power-assisted rack and pinion
	Overall ratio		15.06
	Turns, lock-to-lock		2.64
	Steering wheel diameter		360 mm (14.2 in)
Suspension	Type	Front	Independent strut with stabilizer, coil spring
		Rear	Double wishbone
	Shock absorber	Front	Telescopic, hydraulic, nitrogen gas-filled
		Rear	Telescopic, hydraulic, nitrogen gas-filled
Wheel Alignment	Camber	Front	0°
		Rear	-1°
	Caster	Front	1°45'
	Total toe	Front	0 mm (0 in.)
		Rear	In 2 mm (1/16 in.)
Brakes	Type of service brake	Front	Power-assisted self-adjusting ventilated disc
		Rear	Power-assisted self-adjusting solid disc
	Type of parking brake		Mechanical actuating, rear wheels
	Pad friction surface area	Front	42 cm^2 (6.5 sq in.) x 2
		Rear	21 cm^2 (3.3 sq in.) x 2
	Shoe friction surface area	Rear	49.0 cm^2 (7.60 sq in.) x 2

(cont'd)

Item	Measurement	Qualification	Specification
Tyres	Size of front and rear tires		205/70R15 95S
	Size of spare tire	Regular type	205/70R15 95S
		Compact type	T145/80 D16
Air Condition-ing	Compressor	Type	Scroll
		Number of cylinder	———
		Capacity	85.7 m/ (5.23 cu in.)/rev.
		Maximum speed	12,000 rpm (min^{-1})
		Lubricant capacity	130 m/ (4 1/3 fl oz)
		Lubricant type	ND-OIL8
	Condenser	Type	Corrugated fin
	Evaporator	Type	Corrugated fin
	Blower	Type	Sirocco fan
		Motor type	220 W/12 V
		Speed control	Infinite variable
		Maximum capacity	480 m^3 (16.900 cu ft)/h
	Temperature control		Air-mix type
	Compressor clutch	Type	Dry, single plate, poly-V belt drive
		Electrical power consumption at 20 °C (68 °F)	42 W maximum at 12 V
	Refrigerant	Type	HFC-134a (R-134a)
		Capacity	650 - 700 g (22.9 - 24.7 oz)
Electrical Ratings	Battery		12 V - 36 AH/5 HR, 12 V - 45 AH/20 HR
	Starter		12 V - 1.2 kW, 1.6 kW
	Alternator		12 V - 90A
	Fuses	Under-hood fuse relay box	100 A, 40 A, 30 A, 20 A, 15 A, 10 A
		Under-dash fuse relay box	30A, 20 A, 15 A, 10 A, 7.5 A
	Light bulbs	Headlight high beam	12 V - 60 W
		Headlight low beam	12 V - 55 W
		Front turn signal lights	12 V - 21 W
		Front side marker lights	12 V - 5 W
		Front parking lights	12 V - 5 W
		Rear turn signal lights	12 V - - 21 W
		Side turn signal lights	12 V - 5 W
		Brake/taillights	12 V - 21/5 W
		Taillights	12 V - 5 W (Except Taiwan model), 12 V - 3 CP (Taiwan model)
		Rear fog lights	12 V - 21 W
		Front fog lights	12 V - 51 W
		High mount brake light	12 V - 21 W
		Back-up lights	12 V - 21 W
		License plate light	12 V - 5 W
		Ceiling lights	12 V - 8 W
		Spotlights without roof console	12 V - 8 W
		Spotlights with roof console	12 V - 4 CP
		Gauge lights	12 V-1.4 W
		Indicator lights	LED, 12 V - 1.4 W

Body Specifications



*:Overall length: Refer to Design Spec. (see page 02-17).

03

Maintenance

Lubricants and Fluids **03-2**

Maintenance Schedule for Normal Conditions **03-4**
(European Model)
Listed by Maintenance Item 03-4

Maintenance Schedule for Severe Conditions **03-6**
(European Model)
Listed by Maintenance Item 03-6

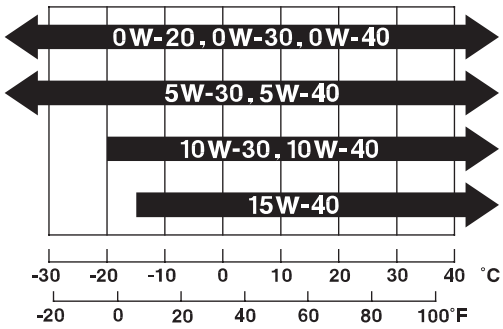
Maintenance Schedule for Normal Conditions **03-8**
(Australia and New Zealand Models)
Listed by Maintenance Item 03-8

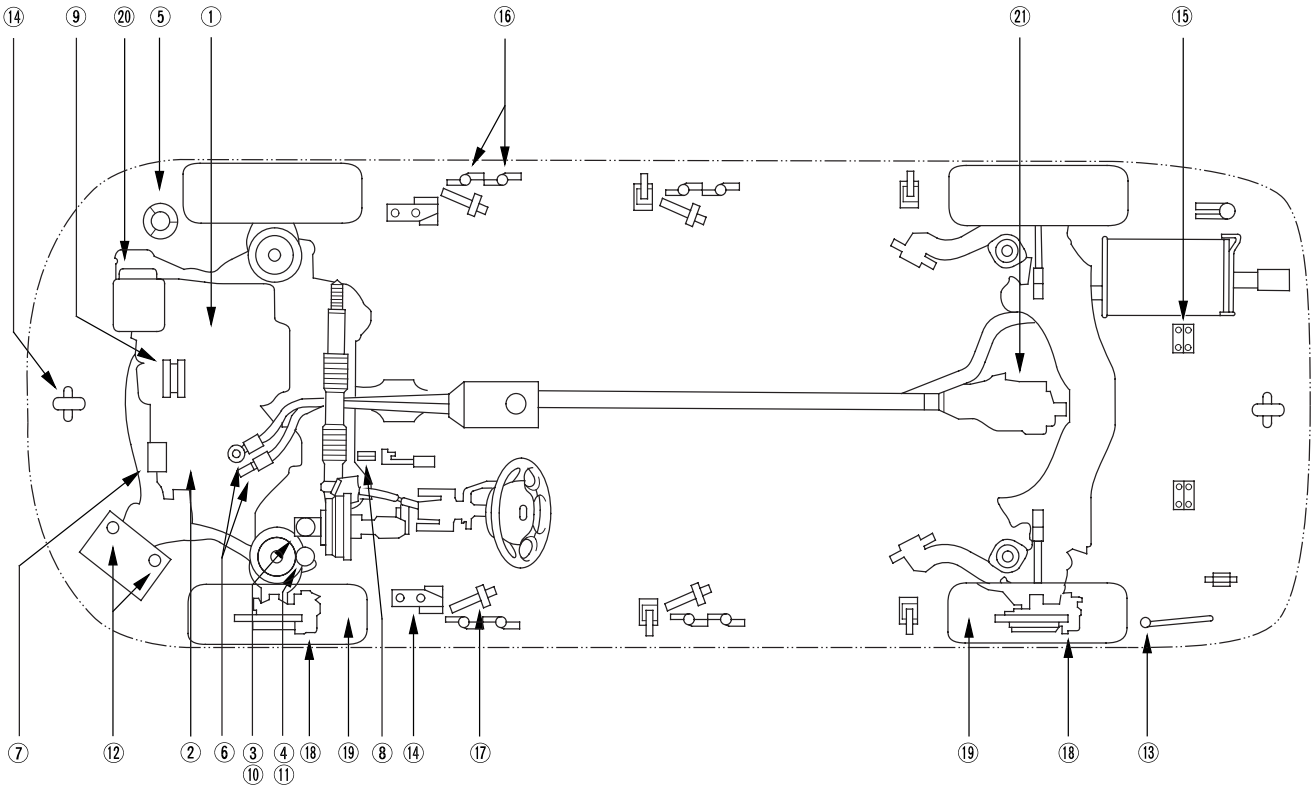
Maintenance Schedule for Severe Conditions **03-10**
(Australia and New Zealand Models)
Listed by Maintenance Item 03-10

Maintenance Schedule **03-12**
(Except European, Australia and New Zealand Models)
Listed by Maintenance Item 03-12

Lubricants and Fluids

For the details of lubrication points and type of lubricants to be applied, refer to the illustrated index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

NO.	LUBRICATION POINTS	LUBRICANT
1	Engine	Always use fuel-efficient oil is that says "API service SG, SH or SJ" **Recommended Engine Oil** Engine oil viscosity for ambient temperature ranges  **⚠ CAUTION ⚠** Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.
2	Manual Transmission	Genuine Honda Manual Transmission Fluid (MTF) Always use genuine Honda MTF. Using motor oil can cause stiffer shifting because it does contain the proper additives.
	Automatic Transmission	Genuine Honda ATF-Z1 Always use genuine Honda ATF-Z1. Using a non-Honda ATF can affect shift quality.
3	Brake system (includes ABS line)	Brake fluid DOT 3 or DOT 4 We recommend genuine Honda Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
4	Clutch line (manual transmission)	Brake fluid DOT 3 or DOT 4
5	Power steering system	Honda Power steering Fluid (V or ll) Always use Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.
6 7	Shift and select cable ends (manual transmission) Release fork (manual transmission)	Super High Temp Urea Grease (P/N 08798-9002)
8	Throttle cable end (dashboard lower panel hole)	Silicon grease
9 10 11 12 13	Throttle cable end (throttle link) Brake master cylinder pushrod Clutch master cylinder pushrod Battery terminals Fuel fill lid	Multi-purpose grease
14 15 16 17	Hood hinges and latch Tailgate hinges Door hinges, upper and lower Door opening detent	Honda White Lithium Grease
18	Brake caliper piston boot, caliper pins and boots	Silicon grease
19	Brake line joints (front and rear wheelhouse)	Rust preventives
20	Air conditioning compressor	Compressor oil: DENSO ND-OIL8 (P/N 38897-PR7-003 or 38899-PR7-A01) for refrigerant HFC-134a (R-134a)
21	Rear differential (4WD model)	Genuine Honda DPSF


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⑦ ⑫ ② ⑥ ③ ④ ⑱ ⑲ ⑧ ⑭ ⑰ ⑲ ⑱ ⑬
⑩ ⑪

Maintenance Schedule for Normal Conditions (European Model)

Listed by Maintenance Item

Follow the Normal Conditions Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule (see page 03-6) do not apply.

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Replace engine oil (see page 08-5)		●	●	●	●	●	●	●	●	●	●
Replace engine oil filter (see page 08-6)		●	●	●	●	●	●	●	●	●	●
Inspect front and rear brakes • Check the brake pad and disc thickness. Check for damage or cracks (see page 19A-12), (see page 19A-18), (see page 19A-30), (see page 19A-32). • Check the brake linings for cracking, grazing, wear and contamination (see page 19A-39). • Check the calipers for damage, leaks, and tightness (see page 19A-3).		●	●	●	●	●	●	●	●	●	●
Check parking brake adjustment (see page 19A-6).		●	●		●		●		●		●
Check lights alignment • Check the position of the headlights (see page 22A-96).		●	●	●	●	●	●	●	●	●	●
Test drive (noise, stability dashboard operation) • Check for road stability, noise, vibration and dashboard operation.		●	●	●	●	●	●	●	●	●	●
Visually inspect the following items: • Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.											
Tie rod ends, steering gearbox, and boots • Check rack grease and steering linkage. Check the boot for damage and leaking grease (see page 17-8).		●	●	●	●	●	●	●	●	●	●
Suspension components • Check the bolts for tightness. • Check all dust cover for deterioration and damage. (see page 18-2).											
Driveshaft boots • Check the boot and boot band for cracks. • Check rack grease. • (see page 16-3).											
Brake hoses and lines (including ABS) • Check the master cylinder, proportioning control valve and ABS modulator and leakage (see page 19B-36).											
All fluid levels and condition of fluids • Check levels and check for leaks. If necessary, add engine coolant (see page 10-6), MTF (see page 13-4), ATF (see page 14-131), DPSF (4WD) (see page 15-13). brake fluid (see page 19A-9), windshield fluid, and battery fluid.											
Exhaust system • Check the exhaust pipe and muffler for damage, leaks and tightness (see page 09-9).											
Fuel lines and connections • Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts (see page 11-156).											
Tyre condition • Check for pressure, puncture, cuts, and irregular thread wear.											

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Replace air cleaner element (see page 11-182).		Every 40,000 km (24,000 miles)									
Replace spark plugs (see page 04-23).											
Inspect valve clearance (see page 06-9).											
Inspect and adjust drive belts • Check for cracks, damage, deflection and tension (see page 04-29).			●		●		●		●		●
Replace dust and pollen filter (see page 21-25).		Every 30,000 km (18,000 miles) or 1 year									
Replace fuel filter (see page 11-166).							●				
Inspect idle speed (see page 11-148).							●				
Replace manual transmission fluid • Use genuine Honda Manual Transmission Fluid (MTF) (see page 13-4).		Every 120,000 km (72,000 miles) or 8 years									
Replace automatic transmission fluid • Use genuine Honda ATF-Z1 (see page 14-131).		At 120,000 km (72,000 miles) or 8 years, then replace every 80,000 km (48,000 miles) or 4 years									
Replace rear differential fluid (4WD model) • Use genuine Honda DPSF (see page 15-13).		At 120,000 km (72,000 miles) or 8 years, then replace every 60,000 km (36,000 miles) or 4 years									
Replace engine coolant • Use Honda All Season Antifreeze/Coolant Type 2 (see page 10-6).		At 200,000 km (120,000 miles) or 10 years, then replace every 100,000 km (60,000 miles) or 5 years									
Replace brake fluid • Use only DOT 3 or DOT 4 brake fluid. We recommend Genuine Honda Brake Fluid. Check that brake fluid level between the upper and lower marks on the reservoir (see page 19A-9).		Every 3 years									

Maintenance Schedule for Severe Conditions (European Model)

Listed by Maintenance Item

Follow the Severe Conditions Maintenance Schedule if the customer's vehicle is driven MAINLY under one or more of the following conditions:

- Driving less than 8 km (5 miles) per trip or, in freezing temperatures, driving less than 16 km (10 miles) per trip.
- Driving in extremely hot over 35 °C (95 °F) conditions.
- Extensive idling, or long periods of stop-and-go-driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty, or de-iced roads.

If the customer's vehicle is driven OCCASIONALLY under severe conditions, follow the Normal Conditions Maintenance Schedule (see page 03-4).

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Replace engine oil (see page 08-5)		Every 10,000 km (6,000 miles) or 6 months									
Replace engine oil filter (see page 08-6)		●	●	●	●	●	●	●	●	●	●
Inspect front and rear brakes • Check the brake pad and disc thickness. Check for damage or cracks (see page 19A-12), (see page 19A-18), (see page 19A-30), (see page 19A-32). • Check the brake linings for cracking, grazing, wear and contamination (see page 19A-39). • Check the calipers for damage, leaks, and tightness. (see page 19A-3)		Every 10,000 km (6,000 miles) or 6 months									
Check parking brake adjustment (see page 19A-6).		●	●	●	●	●	●	●	●	●	●
Check lights alignment • Check the position of the headlights (see page 22A-96).		●	●	●	●	●	●	●	●	●	●
Test drive (noise, stability dashboard operation) • Check for road stability, noise, vibration and dashboard operation.		●	●	●	●	●	●	●	●	●	●
Visually inspect the following items: • Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.											
Tie rod ends, steering gearbox, and boots • Check rack grease and steering linkage. Check the boot for damage and leaking grease (see page 17-8).		Inspect every 10,000 km (6,000 miles) or 6 months									
Suspension components (see page 18-3). • Check the bolts for tightness. • Check all dust cover for deterioration and damage.											
Driveshaft boots • Check the boot and boot band for cracks (see page 16-3). • Check rack grease.											

Service at the indicated distance or time whichever comes first.											
	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Brake hoses and lines (including ABS) • Check the master cylinder, proportioning control valve and ABS modulator and leakage (see page 19B-36).		●	●	●	●	●	●	●	●	●	●
All fluid levels and condition of fluids • Check levels and check for leaks. If necessary, add engine coolant (see page 10-6), MTF (see page 13-4), ATF (see page 14-131), DPSF (4WD) (see page 15-13), brake fluid (see page 19A-9), windshield fluid, and battery fluid.											
Exhaust system • Check the exhaust pipe and muffler for damage, leaks and tightness (see page 09-9).											
Fuel lines and connections • Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts. (see page 11-156)											
Tyre condition • Check for pressure, puncture, cuts, and irregular thread wear.											
Clean (O) or replace (●) air cleaner element (see page 11-182).	Wet type	●	●	●	●	●	●	●	●	●	●
	Dry type	O	●	O	●	O	●	O	●	O	●
Replace spark plugs (see page 04-23).		Every 40,000 km (24,000 miles)									
Inspect valve clearance (see page 06-9).											
Inspect and adjust drive belts • Check for cracks, damage, deflection and tension (see page 04-29).			●		●		●		●		●
Replace dust and pollen filter (see page 21-25).		Every 30,000 km (18,000 miles) or 1 year									
Replace fuel filter (see page 11-166).							●				
Inspect idle speed (see page 11-148).							●				
Replace manual transmission fluid • Use genuine Honda Manual Transmission Fluid (MTF) (see page 13-4).		Every 60,000 km (36,000 miles) or 4 years									
Replace automatic transmission fluid • Use genuine Honda ATF-Z1 (see page 14-131).		At 60,000 km (36,000 miles) or 4 years, then replace every 40,000 km (24,000 miles) or 2 years									
Replace rear differential fluid (4WD model) • Use genuine Honda DPSF (see page 15-13).		At 80,000 km (48,000 miles) or 5 years, then replace every 40,000 km (24,000 miles) or 3 years									
Replace engine Coolant • Use Honda All Season Antifreeze/Coolant Type 2 (see page 10-6).		At 200,000 km (120,000 miles) or 10 years, then replace every 100,000 km (60,000 miles) or 5 years									
Replace brake fluid • Use only DOT 3 or DOT 4 brake fluid. We recommend genuine Honda Brake Fluid. Check that brake fluid level between the upper and lower marks on the reservoir (see page 19A-9).		Every 3 years									

Maintenance Schedule for Normal Conditions (Australia and New Zealand Models)

Listed by Maintenance Item

Follow the Normal Conditions Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule (see page 03-10) do not apply.

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Replace engine oil (see page 08-5)		Every 10,000 km (6,000 miles) or 1 year									
Replace engine oil filter (see page 08-6)		●	●	●	●	●	●	●	●	●	●
Replace air cleaner element (see page 11-182)			●		●		●		●		●
Inspect valve clearance • Check valve clearance (see page 06-9)			●		●		●		●		●
Replace fuel filter (see page 11-166)			●		●		●		●		●
Replace spark plugs (see page 04-23)			●		●		●		●		●
Inspect and adjust drive belts • Check for cracks, damage, deflection and tension (see page 04-29)			●		●		●		●		●
Inspect idle speed (see page 11-148)						●					
Replace engine coolant • Use Honda All Season Antifreeze/Coolant Type 2 (see page 10-6)		At 200,000 km (120,000 miles) or 10 years, then replace every 100,000 km (60,000 miles) or 5 years									
Replace manual transmission fluid • Use genuine Honda manual Transmission Fluid (MTF) (see page 13-4).							●				
Replace automatic transmission fluid • Use genuine Honda ATF-Z1 (see page 14-131).		At 120,000 km (72,000 miles) or 6 years, then replace every 80,000 km (48,000 miles) or 4 years									
Replace rear differential fluid (4WD model) • Use genuine Honda DPSF (see page 15-13).							●			●	
Inspect front and rear brakes • Check the brake pad and disc thickness. Check for damage or cracks. • Check the brake linings for cracking, grazing, wear, or contamination. • Check the calipers for damage, leaks, and tightness (see page 15-13).		●	●	●	●	●	●	●	●	●	●
Replace brake fluid • Use only DOT 3 or DOT 4 brake fluid. We recommend Genuine Honda Brake Fluid. • Check that brake fluid level is between upper and lower marks on the reservoir. (see page 19A-9)		Every 3 years									
Check parking brake adjustment • Check the parking brake operation (see page 19A-6)		●	●		●		●		●		●
Check light alignment • Check the position of the headlight (see page 22A-96).		●	●	●	●	●	●	●	●	●	●
Test drive • Check for road stability, noise, vibrations and dashboard operation.		●	●	●	●	●	●	●	●	●	●

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Visually inspect the following items: • Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.											
Tie rod ends, steering gearbox, and boots • Check rack grease and steering linkage. Check the boot for damage and leaking grease. (see page 17-8)		●	●	●	●	●	●	●	●	●	●
Suspension components • Check the bolts for tightness. • Check all dust cover for deterioration and damage. (see page 18-3)											
Driveshaft boots • Check the boot and boot band for cracks. • Check rack grease. (see page 16-3)											
Brake hoses and lines (including ABS) • Check the master cylinder, proportioning control valve and ABS modulator and leakage. (see page 19A-3)											
All fluid levels and condition of fluids • Check levels and check for leaks. If necessary, add engine coolant (see page 10-6), MTF (see page 13-4), ATF (see page 14-131), DPSP (4WD) (see page 15-13), brake fluid (see page 19A-9), windshield fluid, and battery fluid.											
Exhaust system • Check the exhaust pipe and muffler for damage, leaks and tightness. (see page 09-9)											
Fuel lines and connections • Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts. (see page 11-156)											
Tyre connection • Check for pressure, puncture, cuts, and irregular thread wear.											

Maintenance Schedule for Severe Conditions (Australia and New Zealand Models)

Listed by Maintenance Item

Follow the Severe Conditions schedule if the vehicle is driven MAINLY under one or more of the following conditions:

- Driving less than 8 km (5 miles) per trip or, in freezing temperatures, driving less than 16 km (10 miles) per trip.
- Driving in extremely hot over 35 °C (95 °F) conditions.
- Extensive idling, or long periods of stop-and-go-driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty, or de-iced roads.

NOTE: If the vehicle is driven OCCASIONALLY under severe conditions, follow the Normal Conditions Maintenance Schedule (see page 03-8).

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Replace engine oil (see page 08-5)		Every 10,000 km (6,000 miles) or 1 year									
Replace engine oil filter (see page 08-6)		●	●	●	●	●	●	●	●	●	●
Replace air cleaner element • Use normal schedule except in dusty conditions (see page 11-182)		●	●	●	●	●	●	●	●	●	●
Inspect valve clearance • Check valve clearance (see page 06-9)			●		●		●		●		●
Replace fuel filter (see page 11-166)			●		●		●		●		●
Replace spark plugs (see page 04-23)			●		●		●		●		●
Inspect and adjust drive belts • Check for cracks, damage, deflection and tension (see page 04-29)			●		●		●		●		●
Inspect idle speed (see page 11-148)						●					
Replace engine coolant • Use Honda All Season Antifreeze/Coolant Type 2 (see page 10-6)		At 200,000 km (120,000 miles) or 10 years, then replace every 100,000 km (60,000 miles) or 5 years									
Replace manual transmission fluid • Use genuine Honda manual Transmission Fluid (MTF) (see page 13-4)				●			●			●	
Replace automatic transmission fluid • Use genuine Honda ATF-Z1 (see page 14-131).				●		●		●		●	
Replace rear differential fluid (4WD model) • Use genuine Honda DPSF (see page 15-13).					●		●		●		●
Inspect front and rear brakes • Check the brake pad and disc thickness. Check for damage or cracks. • Check the brake linings for cracking, grazing, wear, or contamination. • Check the calipers for damage, leaks, and tightness. (see page 19A-3)		Every 10,000 km (6,000 miles) or 6 months									
Replace brake fluid • Use only DOT 3 or DOT 4 brake fluid. We recommend Genuine Honda Brake Fluid. • Check that brake fluid level is between upper and lower marks on the reservoir. (see page 19A-9)		Every 3 years									
Check parking brake adjustment • Check the parking brake operation (see page 19A-6).		●	●		●		●		●		●

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Check lights alignment (see page 22A-96). • Check for road stability, noise, vibrations and dashboard operation.		●	●	●	●	●	●	●	●	●	●
Test drive • Check for road stability, noise, vibrations and dashboard operation.		●	●	●	●	●	●	●	●	●	●
Visually inspect the following items: • Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.											
Tie rod ends, steering gearbox, and boots • Check rack grease and steering linkage. Check the boot for damage and leaking grease. (see page 17-8)		Every 10,000 km (6,000 miles) or 6 months									
Suspension components • Check the bolts for tightness. • Check all dust cover for deterioration and damage. (see page 18-3)											
Driveshaft boots • Check the boot and boot band for cracks. • Check rack grease. (see page 16-3)											
Brake hoses and lines (including ABS) • Check the master cylinder, proportioning control valve and ABS modulator and leakage. (see page 19A-4)		●	●	●	●	●	●	●	●	●	●
All fluid levels and condition of fluids • Check levels and check for leaks. If necessary, add engine coolant (see page 10-6), MTF (see page 13-4), ATF (see page 14-131), DSPF (4WD) (see page 15-13), brake fluid (see page 19A-9), windshield fluid, and battery fluid.											
Exhaust system • Check the exhaust pipe and muffler for damage, leaks and tightness. (see page 09-9)											
Fuel lines and connections • Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts. (see page 11-156)											
Tyre connection • Check for pressure, puncture, cuts, and irregular thread wear.											
Test drive • Check for road stability, noise, vibrations and dashboard operation.		●	●	●	●	●	●	●	●	●	●

Maintenance Schedule (Except European, Australia and New Zealand Models)

Listed by Maintenance Item

- For K20A5 engine model; replace engine oil and engine oil filter following the Severe Conditions Schedule.
- For K20A4 and K24A1 engine models; follow the Severe Conditions schedule for replacing engine oil and engine oil filter, if the vehicle is driven MAINLY under one or more of the following conditions:
  - Driving less than 8 km (5 miles) per trip or, in freezing temperatures, driving less than 16 km (10 miles) per trip.
  - Driving in extremely hot over 35 °C (95 °F) conditions.
  - Extensive idling, or long periods of stop-and-go-driving.
  - Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
  - Driving on muddy, dusty, or de-iced roads.

If the vehicle is driven OCCASIONALLY under severe conditions, replace engine oil and engine oil filter according to the normal conditions schedule.

- Follow the Severe Conditions schedule for replacing transmission fluid, if the vehicle is drive MAINLY under one or more of the following conditions:
  - Driving in extremely hot over 35 °C (95 °F) conditions
  - Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.

If the vehicle is driven OCCASIONALLY under severe conditions, replace transmission fluid according to the normal conditions schedule.

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Replace engine oil (see page 08-5)	Normal Conditions	Every 10,000 km (6,000 miles) or 1 year									
	Severe Conditions	Every 5,000 km (3,000 miles) or 6 months									
Replace engine oil filter (see page 08-6)	Normal Conditions	Every 20,000 km (12,000 miles) or 1 year									
	Severe Conditions	Every 10,000 km (6,000 miles) or 6 months									
Replace air cleaner element (see page 11-182)		Every 20,000 km (12,000 miles)									
Inspect valve clearance • Check valve clearance (see page 06-9)	K20A4, K24A1 engine models	Every 40,000 km (24,000 miles)									
	K20A5 engine model	Every 20,000 km (12,000 miles)									
Replace fuel filter (see page 11-166)			●		●		●		●		●
Replace spark plugs (see page 04-23).	K20A4, K24A1 engine models	Every 40,000 km (24,000 miles)									
	K20A5 engine model	Every 20,000 km (12,000 miles)									
Inspect and adjust drive belts • Check for cracks, damage, deflection and tension (see page 04-29)			●		●		●		●		●
Inspect idle speed (see page 11-148)	K20A4, K24A1 engine models						●				
	K24A5 engine model			●			●			●	
Replace engine coolant • Use Honda All Season Antifreeze/Coolant Type 2 (see page 10-6)		At 200,000 km (120,000 miles) or 10 years, then replace every 100,000 km (60,000 miles) or 5 years									
Replace manual transmission fluid • Use Genuine Honda MTF (see page 13-4)	Normal Conditions						●				
	Severe Conditions			●			●			●	
Replace automatic transmission fluid • Use Genuine Honda ATF-Z1 (see page 14-131)	Normal Conditions						●				
	Severe Conditions			●			●			●	
Replace rear differential fluid (4WD) • Use genuine Honda DPSF (see page 15-13).					●		●		●		●
Inspect front and rear brakes • Check the brake pad and disc thickness. Check for damage or cracks. • Check the brake linings for cracking, grazing, wear, or contamination. • Check the calipers for damage, leaks, and tightness. (see page 19A-3)		Every 10,000 km (6,000 miles) or 6 months									

Service at the indicated distance or time whichever comes first.	km x 1,000	20	40	60	80	100	120	140	160	180	200
	miles x 1,000	12	24	36	48	60	72	84	96	108	120
	months	12	24	36	48	60	72	84	96	108	120
Replace brake fluid • Use only DOT 3 or DOT 4 brake fluid. We recommend Genuine Honda Brake Fluid. • Check that brake fluid level is between upper and lower marks on the reservoir. (see page 19A-9)		Every 3 years									
Check parking brake adjustment • Check the parking brake operation (see page 19A-6)		●	●		●		●		●		●
Replace dust and pollen filter (see page 21-25).		Every 30,000 km (18,000 miles) or 12 months									
Rotate tyres, and check tyre inflation and condition at least per month • The suggested rotation method is shown in the diagram of the Owner's Manual.		Rotate tyres every 10,000 km (6,000 miles)									
Visually inspect the following items: • Check for correct installation and position, check for cracks, deterioration, rust, and leaks. • Check tightness of screws, nuts, and joints. If necessary, retighten.											
Tie rod ends, steering gearbox, and boots • Check rack grease and steering linkage. Check the boot for damage and leaking grease. (see page 17-8)		Every 10,000 km (6,000 miles) or 6 months									
Suspension components • Check the bolts for tightness. • Check all dust cover for deterioration and damage. (see page 18-3)											
Driveshaft boots • Check the boot and boot band for cracks. • Check rack grease. • (see page 16-3)											
Brake hoses and lines (including ABS) • Check the master cylinder, proportioning control valve and ABS modulator and leakage. (see page 19A-3)		●	●	●	●	●	●	●	●	●	●
All fluid levels and condition of fluids • Check levels and check for leaks. If necessary, add engine coolant (see page 10-6), MTF (see page 13-4), ATF (see page 14-131), DPSF (4WD) (see page 15-13), brake fluid (see page 19A-9), windshield fluid, and battery fluid.											
Exhaust system • Check the exhaust pipe and muffler for damage, leaks and tightness. (see page 09-9)											
Fuel lines and connections • Check fuel lines for loose connections, cracks and deterioration. Retighten loose connections and replace any damaged parts. (see page 11-156)											

04

Engine Electrical

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- Starter Circuit Troubleshooting 04-5
- Starter Solenoid Test 04-6
- Starter Performance Test 04-7
- Starter Replacement 04-9
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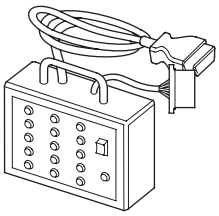
Ignition System **04-18**
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Charging System **04-24**
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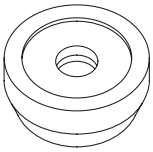
Cruise Control **04-39**
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Special Tools

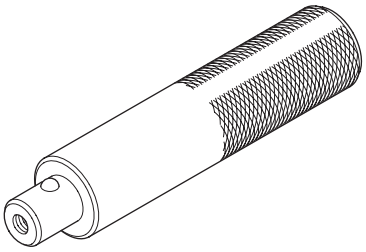
Ref. No.	Tool Number	Description	Qty
1	07WAJ-0010100	DLC Pin Box	1
2	07746-0010400	Driver Attachment, 52 x 55 mm	1
3	07749-0010000	Handle Driver	1



1



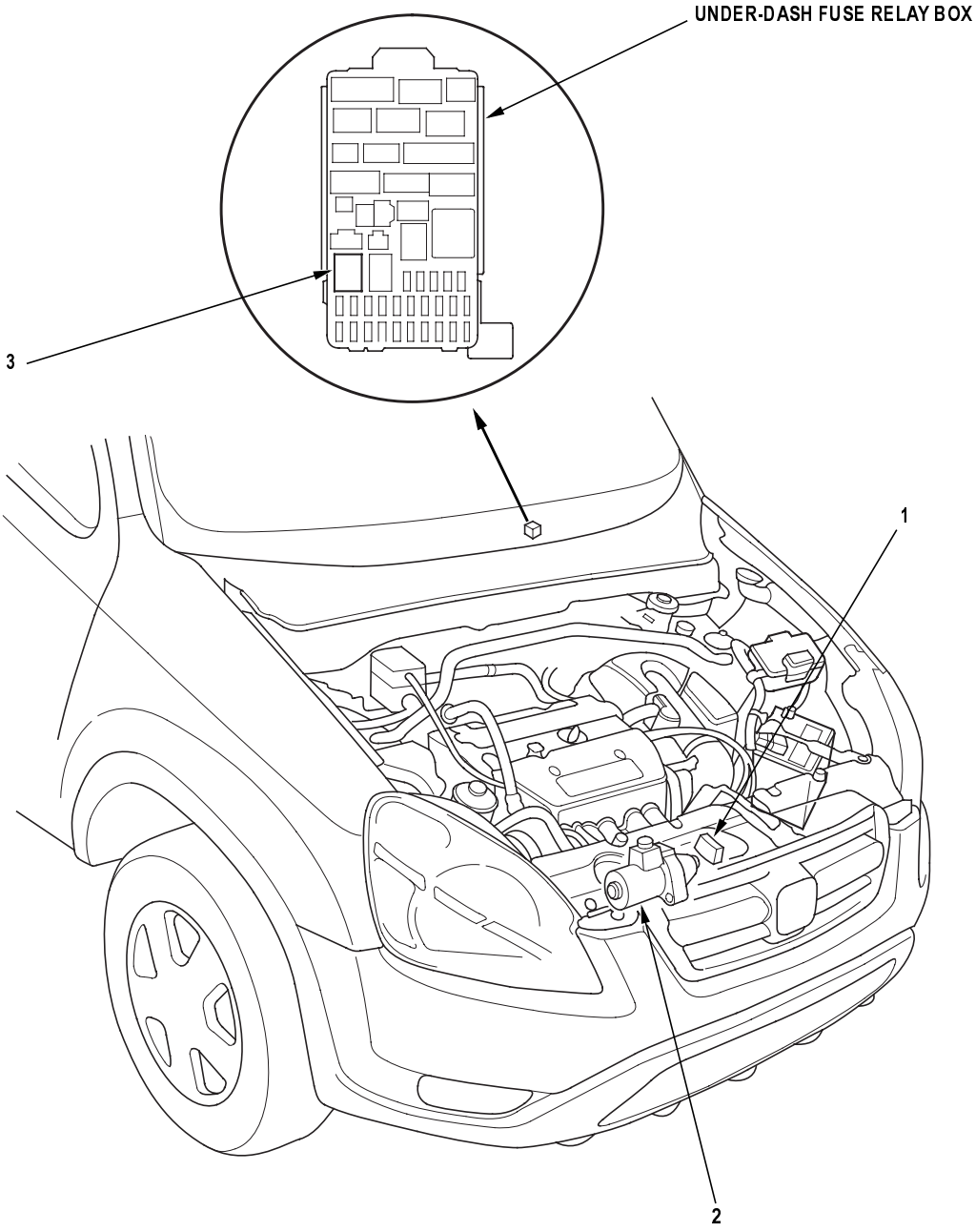
2



3

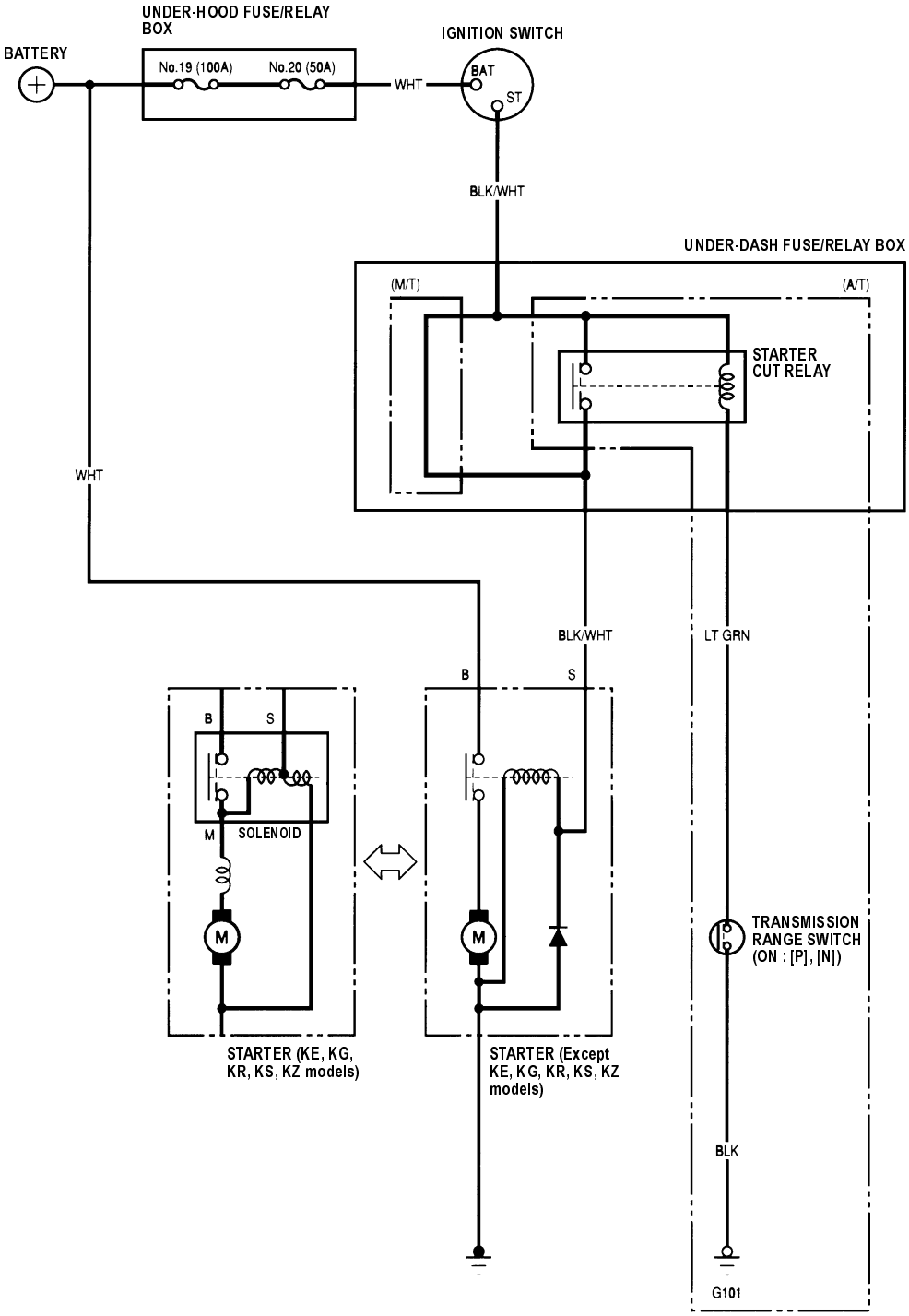
Starting System

Component Location Index



1	TRANSMISSION RANGE SWITCH (A/T)	Test, page 14-168; Replacement, page 14-169
2	STARTER	Starter Circuit Troubleshooting, page 04-5; Solenoid Test, page 04-6; Performance, page 04-7; Replacement, page 04-9; Overhaul, page 04-10
3	STARTER CUT RELAY (A/T)	Test, page 22A-60

Circuit Diagram



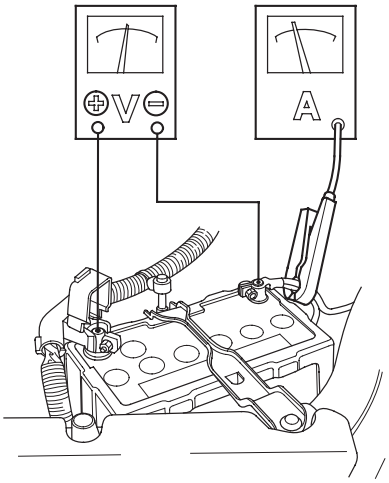
Starter Circuit Troubleshooting

NOTE:
- Air temperature must be between 15° and 38°C (59° and 100°F) during this procedure.
- After this test, or any subsequent repair, reset the Engine Control Module (ECM)/Powertrain Control Module (PCM) to clear any Diagnostic Trouble Codes (DTCs) (see page 11-4).
- The battery must be in good condition and full charged (see page 22A-59).

Recommended Procedure:
- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.

Alternate Procedure

1. Hook up the following equipment:
- Ammeter, 0 - 400 A
- Voltmeter, 0 - 20 V (accurate within 0.1 volt)
- Tachometer, 0 - 1200 rpm (min^{-1})



2. Remove the No. 6 (15A) fuse from the under-hood fuse/relay box.

3. With the shift lever in [N] or [P] (A/T), turn the ignition switch to start (III).

Did the starter crank the engine normally?

Yes The starting system is OK.■

No If starter will not crank the engine at all, go to step 4. If it cranks the engine erratically or too slowly, go to step 7. If it won't disengage from the flywheel or torque converter ring gear when you release the key, check for the following until you find the cause.
- Solenoid plunger and switch malfunction
- Dirty drive gear or damaged overrunning clutch

4. Check the battery condition. Check electrical connections at the battery, the negative battery cable to body, the engine ground cables and the starter for looseness and corrosion. Then try starting the engine again.

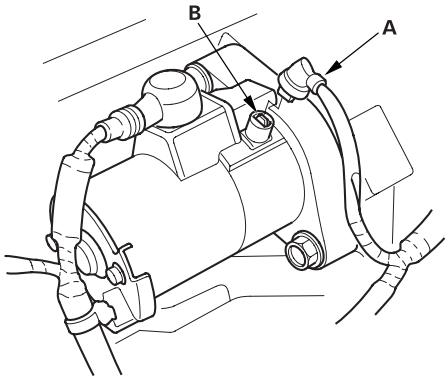
Did the starter crank the engine?

Yes Repairing the loose connection repaired the problem. The starting system is OK.■

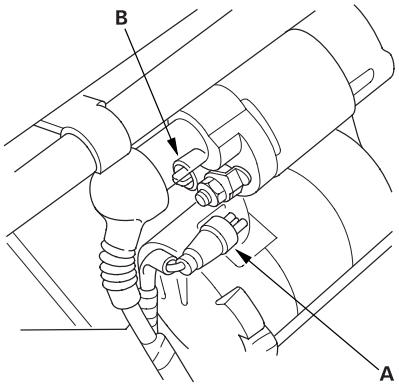
No Go to step 5.

5. Make sure the transmission is in neutral, then disconnect the BLK/WHT wire (A) from the starter solenoid (B). Connect a jumper wire from the battery positive terminal to the solenoid terminal.

Except KE, KG, KR, KS, KZ models:



KE, KG, KR, KS, KZ models:



Did the starter crank the engine?

Yes Go to step 6.

No Remove the starter, and repair or replace as necessary.

(cont'd)

Starter Circuit Troubleshooting (cont'd)

Alternate Procedure (cont'd)

6. Check the following items in the order listed until you find the open circuit.
- Check the BLK/WHT wire and connectors between the under-dash fuse/relay box and the ignition switch, and between the under-dash fuse/relay box and the starter.
- Check the ignition switch (see page 11-3).
- Check the transmission range switch and connector (A/T).
- Check the starter cut relay (A/T).

7. Check the engine speed while cranking the engine.

Is the engine speed above 100 rpm (min^{-1})?

Yes Go to step 8.

No Replace the starter, or remove and disassemble it, and check for the following until you find the cause.
- Excessively worn starter brushes
- Open circuit in commutator brushes
- Dirty or damaged helical splines or drive gear
- Faulty drive gear clutch

8. Check the cranking voltage and current draw.

Is cranking voltage greater than or equal to 8.5 V (Except KE, KG, KR, KS, KZ models) /8.7 V (KE, KG, KR, KS, KZ models) and current draw less than or equal to 350 A (K20A4 (Except KE, KG, KR, KS, KZ models), K20A5 engines) /380 A (K24A1 engine) /230 A (K20A4 (KE, KG, KR, KS, KZ models) engine) ?

Yes Go to step 9.

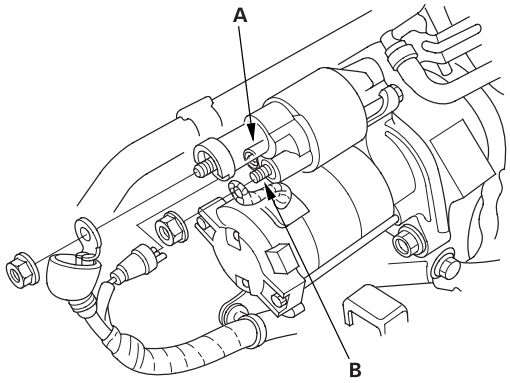
No Replace the starter, or remove and disassemble it, and check for the following until you find the cause.
- Open circuit in starter armature commutator segments
- Starter armature dragging
- Shorted armature winding
- Excessive drag in engine

9. Remove the starter, and inspect its drive gear and the flywheel or torque converter ring gear for damage. Replace any damaged parts.■

Starter Solenoid Test

KE, KG, KR, KS, KZ models

1. Check the hold-in coil for continuity between the S terminal (A) and the armature housing (ground). There should be continuity.
- If there is continuity, go to step 2.
- If there is no continuity, replace the solenoid.

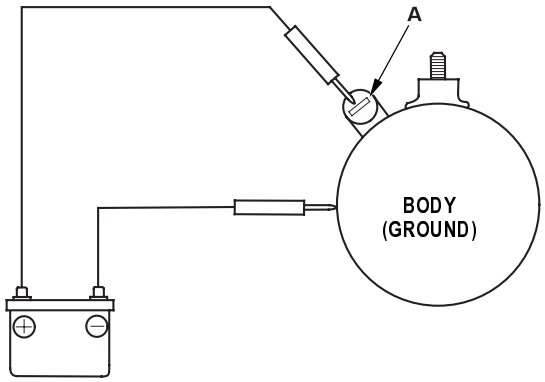


2. Check the pull-in coil for continuity between the S terminal (A) and M terminal (B). There should be continuity.
- If there is continuity, the solenoid is OK.
- If there is no continuity, replace the solenoid.

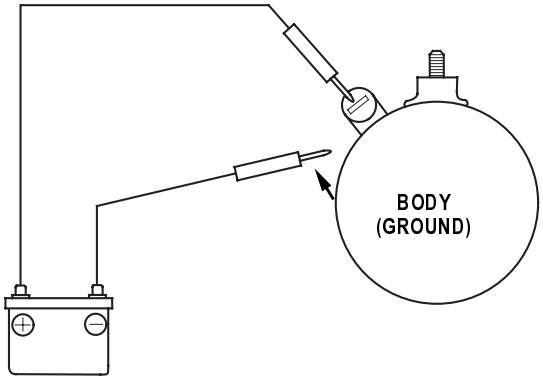
Starter Performance Test

Except KE, KG, KR, KS, KZ models

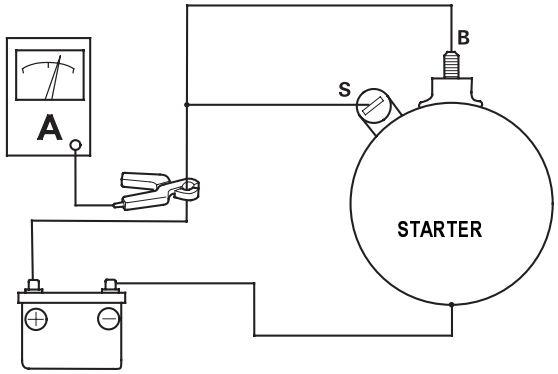
1. Disconnect the wire from the S terminal (A).
2. Make the connections as described below using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle). To avoid damaging the starter, never leave the battery connected for more than 10 seconds.
3. Connect the battery as shown. If the starter pinion moves out, it is working properly.



4. Disconnect the battery from the body. If the pinion retracts immediately, it is working properly.



5. Clamp the starter firmly in a vise.
6. Connect the starter to the battery as described in the diagram below, and confirm that the motor starts and keeps rotating.



7. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

Specifications:

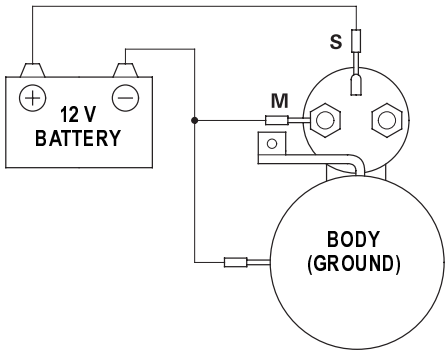
Electric current:	**80 A or less**
Motor speed:	
K20A4, K20A5 engines:	**2,600 rpm (min^{-1}) or more**
K24A1 engine:	**2,300 rpm (min^{-1}) or more**

(cont'd)

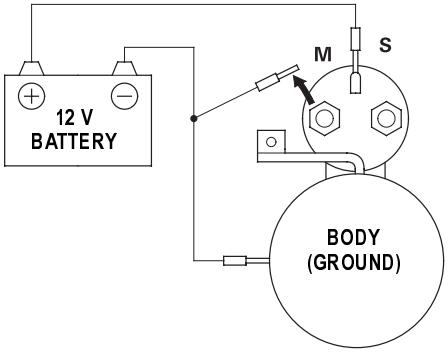
Starter Performance Test (cont'd)

KE, KG, KR, KS, KZ models

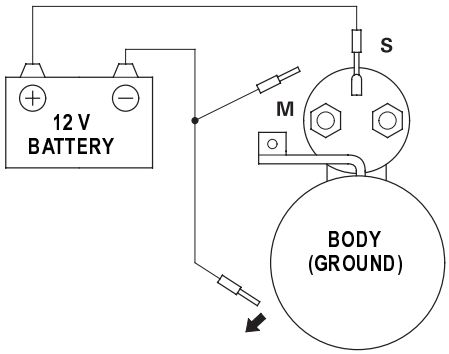
1. Disconnect the wires from the S terminal and the M terminal.
2. Make the connections as described below using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle). To avoid damaging the starter, never leave the battery connected for more than 10 seconds.
3. Connect the battery as shown. If the starter pinion moves out, it is working properly.



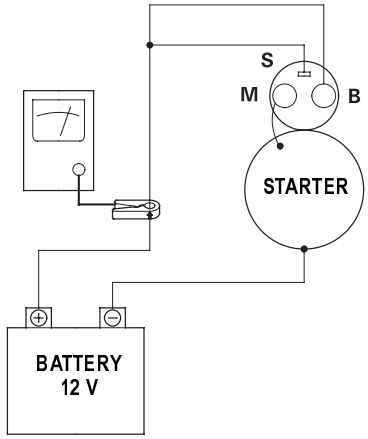
4. Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil is working properly.



5. Disconnect the battery from the body. If the pinion retracts immediately, it is working properly.



6. Clamp the starter firmly in a vise.
7. Connect the starter to the battery as described in the diagram below, and confirm that the motor starts and keeps rotating.

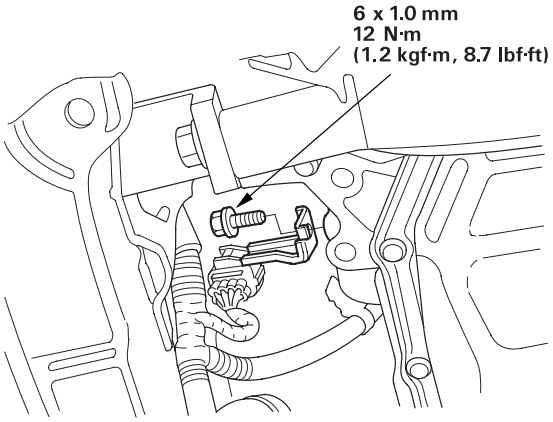


8. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

Specifications:
Electric current: 90 A or less
Motor speed: 3,000 rpm (min^{-1}) or more

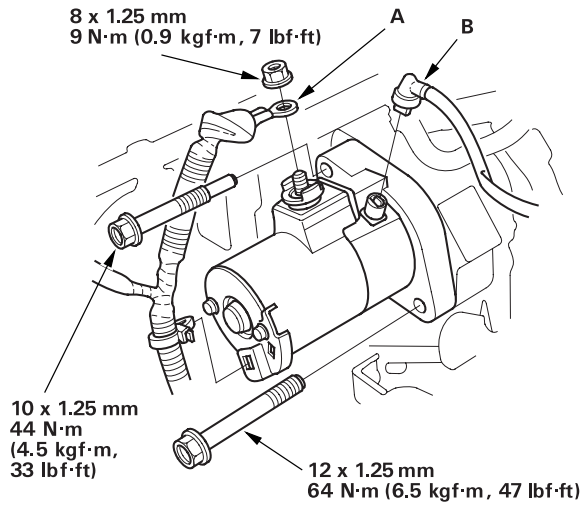
Starter Replacement

1. Disconnect the battery negative cable, then disconnect the positive cable.
2. Disconnect the knock sensor connector.
3. Disconnect the bolt securing the harness bracket.

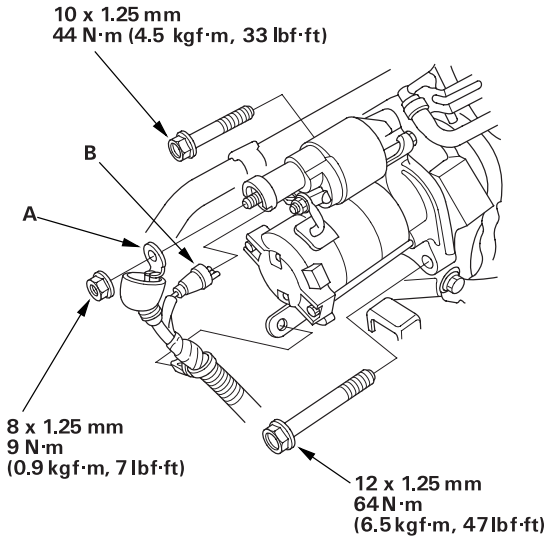


4. Disconnect the starter cable (A) from the B terminal on the solenoid, then disconnect the BLK/WHT wire (B) from the S terminal.

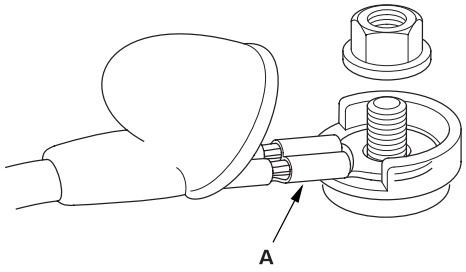
Except KE, KG, KR, KS, KZ models:



KE, KG, KR, KS, KZ models:



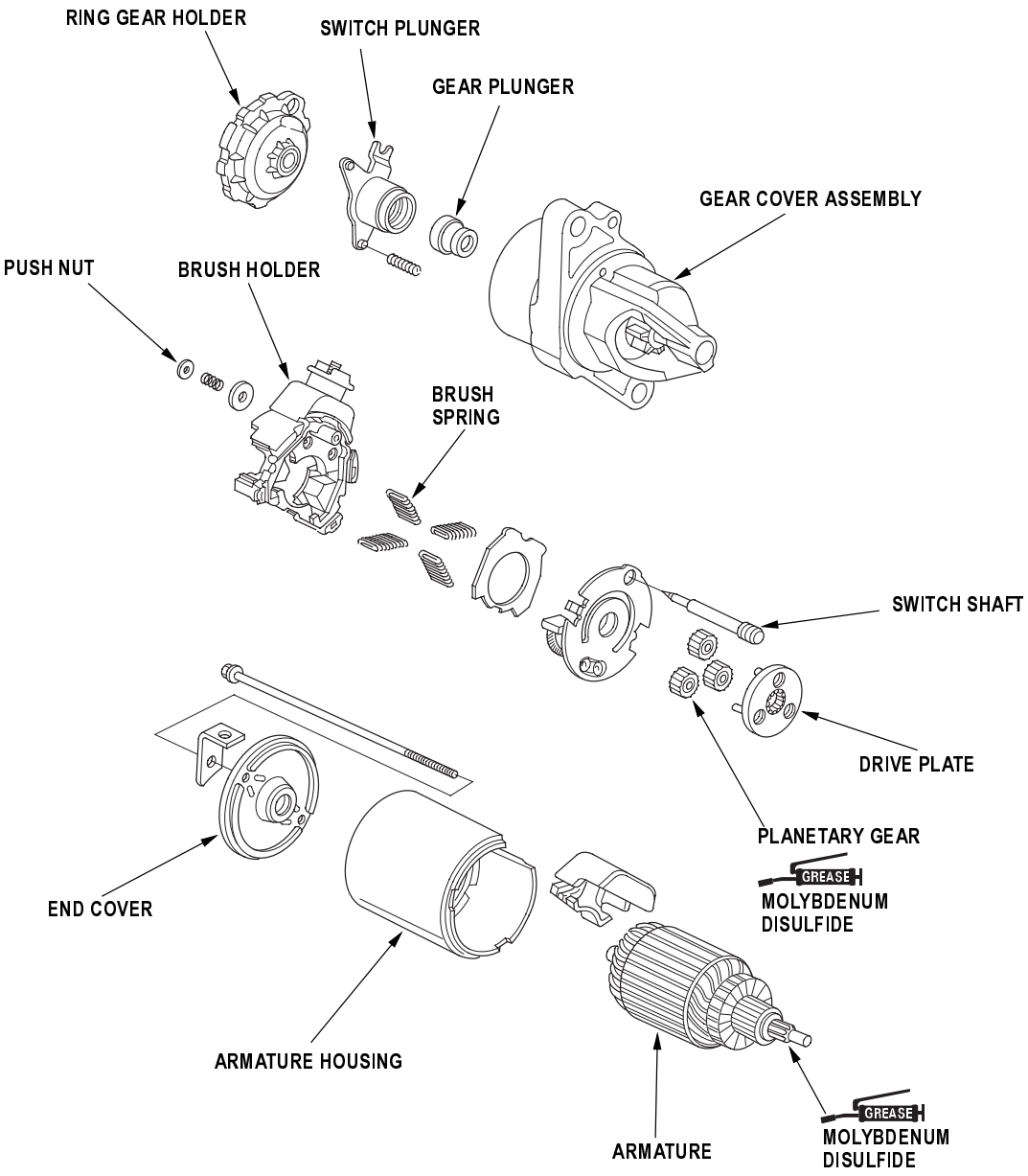
5. Remove the two bolts holding the starter, then remove the starter.
6. Install the starter in the reverse order of removal. Make sure the crimped side of the ring terminal (A) is facing out.



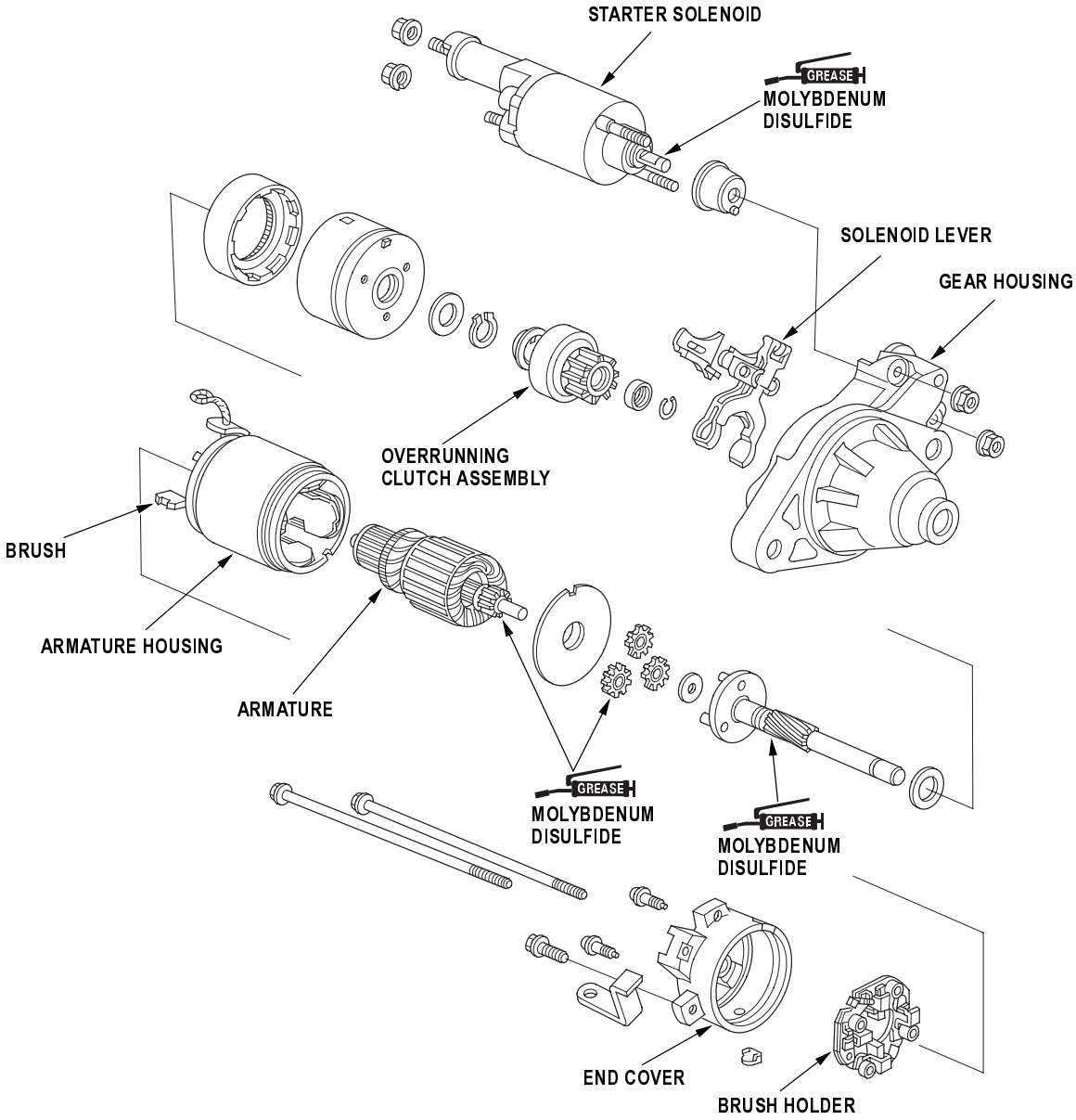
7. Connect the battery positive cable and negative cable to the battery.
8. Start the engine to make sure the starter operates properly.

Starter Overhaul

Disassembly/Reassembly-Except KE, KG, KR, KS, KZ models



Disassembly/Reassembly-KE, KG, KR, KS, KZ models

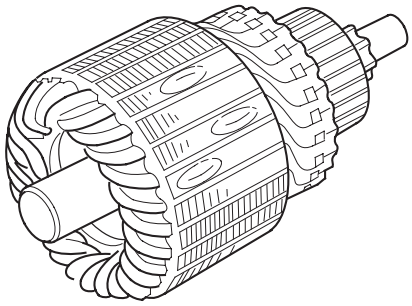


(cont'd)

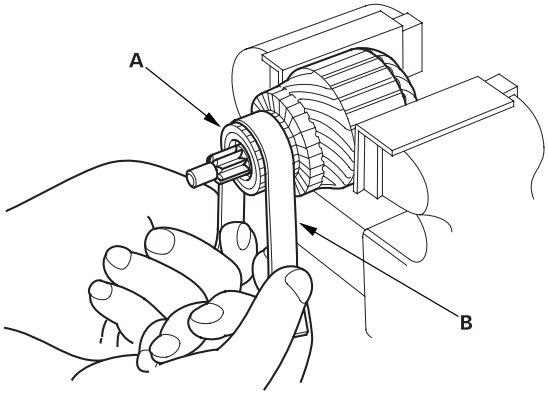
Starter Overhaul (cont'd)

Armature Inspection and Test

1. Remove the starter (see page 04-9).
2. Disassemble the starter as shown at the beginning of this procedure.
3. Inspect the armature for wear or damage from contact with the permanent magnet. If there is wear or damage, replace the armature.

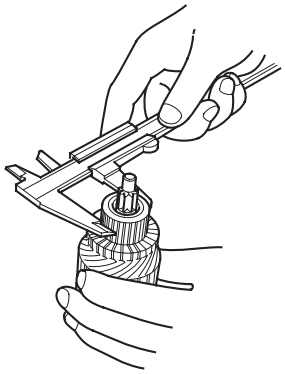


4. Check the commutator (A) surface. If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications, or recondition with #500 or #600 sandpaper (B).



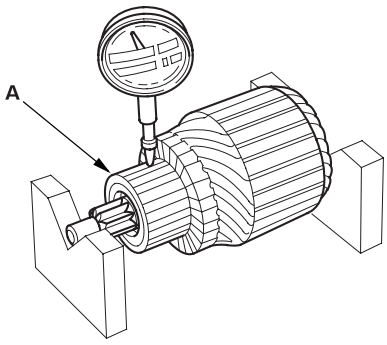
5. Check the commutator diameter. If the diameter is below the service limit, replace the armature.

Commutator Diameter:
Except KE, KG, KR, KS, KZ models:
Standard (New): 28. 0 - 28.1 mm (1.102 - 1.106 in.)
Service Limit: 27.5 mm (1.083 in.)
KE, KG, KR, KS, KZ models:
Standard (New): 28.0 mm (1.10 in.)
Service Limit: 27.0 mm (1.06 in.)



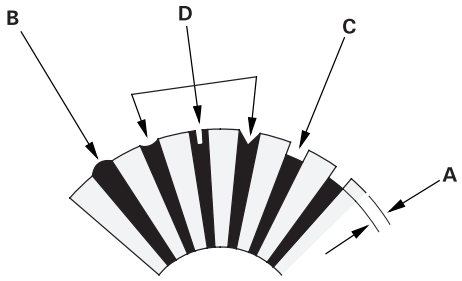
6. Measure the commutator (A) runout.
   - If the commutator runout is within the service limit, check the commutator for carbon dust or brass chips between the segments.
   - If the commutator runout is not within the service limit, replace the armature.

Commutator Runout
Standard (New): 0.02 mm (0.001in.) max
Service Limit: 0.05 mm (0.002 in.)

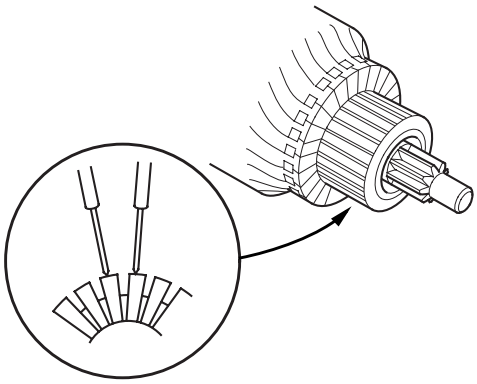


7. Check the mica depth (A). If the mica is too high (B), undercut the mica with a hacksaw blade to the proper depth. Cut away all the mica (C) between the commutator segments. The undercut should not be too shallow, too narrow, or V-shaped (D).

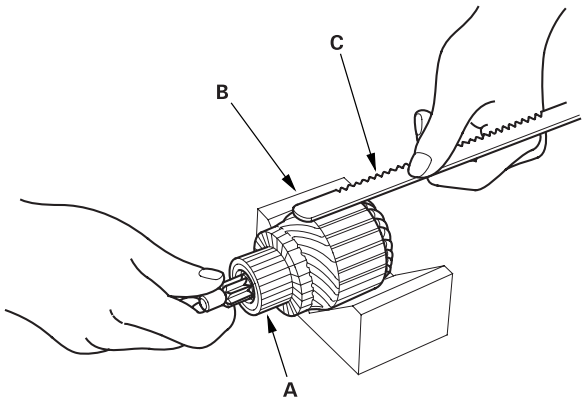
Commutator Mica Depth:
Except KE, KG, KR, KS, KZ models:
Standard (New): 0.40 - 0.50 mm (0.016 - 0.020 in.)
Service Limit: 0.15 mm (0.006 in.)
KE, KG, KR, KS, KZ models:
Standard (New): 0.50 - 0.80 mm (0.020 - 0.031 in.)
Service Limit: 0.20 mm (0.008 in.)



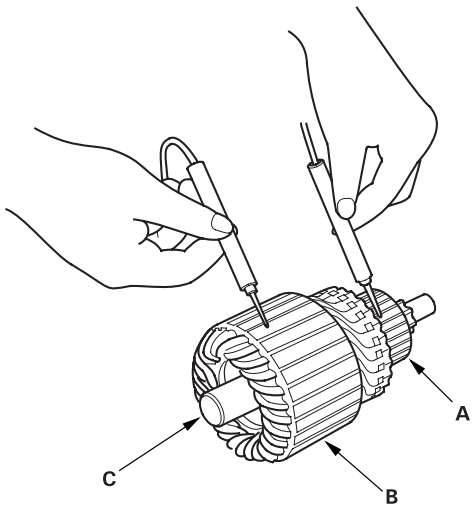
8. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.



9. Place the armature (A) on an armature tester (B). Hold a hacksaw blade (C) on the armature core. If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.



10. Check with an ohmmeter that no continuity exists between the commutator (A) and armature coil core (B), and between the commutator and armature shaft (C). If continuity exists, replace the armature.



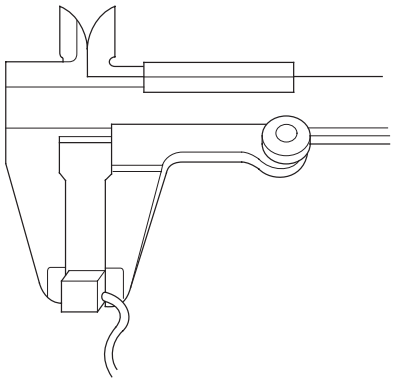
(cont'd)

Starter Overhaul (cont'd)

Starter Brush Inspection

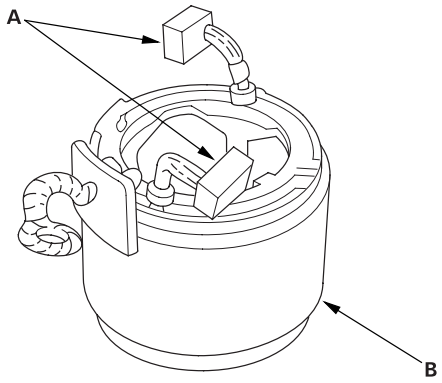
11. Measure the brush length. If it is not within the service limit, replace the brush holder assembly.

Brush Length
Except KE, KG, KR, KS, KZ models:
Standard (New): 11.1 - 11.5 mm (0.44 - 0.45 in.)
Service Limit: 4.3 mm (0.17 in.)
KE, KG, KR, KS, KZ models:
Standard (New): 14.0 - 14.5 mm (0.55 - 0.57 in.)
Service Limit: 9.0 mm (0.35 in.)



Starter Field Winding Test (KE, KG, KR, KS, KZ models)

12. Check for continuity between the brushes (A). If there is no continuity, replace the armature housing (B).

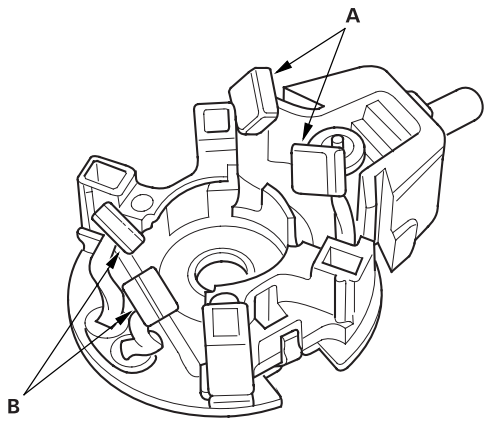


13. Check for continuity between each brush (A) and the armature housing (B). If there is continuity, replace the armature housing.

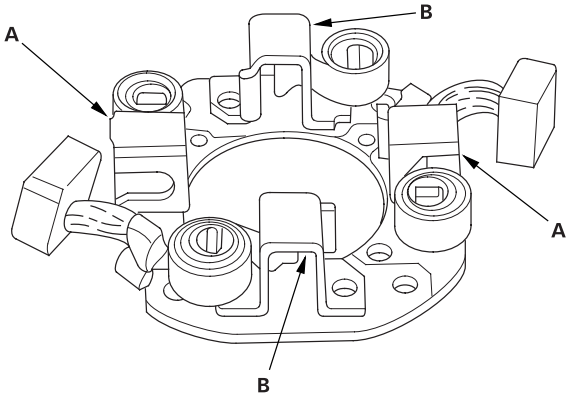
Starter Brush Holder Test

14. Check that there is no continuity between the (+) brush holder (A) and (-) brush holder (B). If there is continuity, replace the brush holder assembly.

Excpet KE, KG, KR, KS, KZ models:



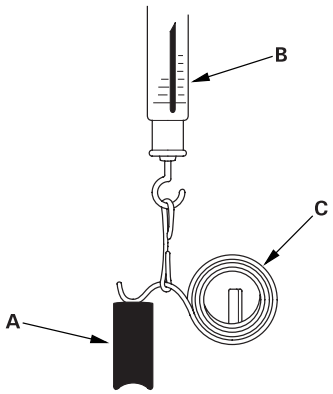
KE, KG, KR, KS, KZ models:



Brush Spring Inspection (KE, KG, KR, KS, KZ models)

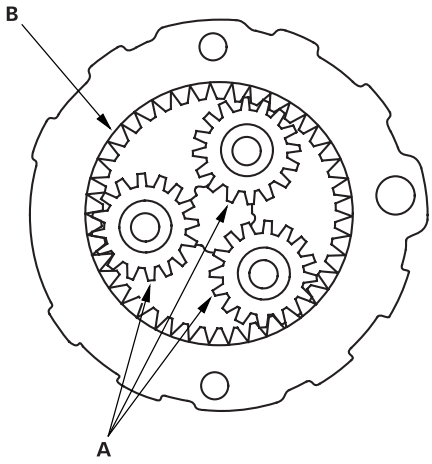
15. Insert the brush (A) into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale (B) to the spring (C). Measure the spring tension at the moment the spring lifts off the brush. If the spring tension is not within specification, replace the spring.

Spring Tension: 13.7 - 17.7 N (1.40 - 1.80 kgf, 3.09 - 3.97 lbf)



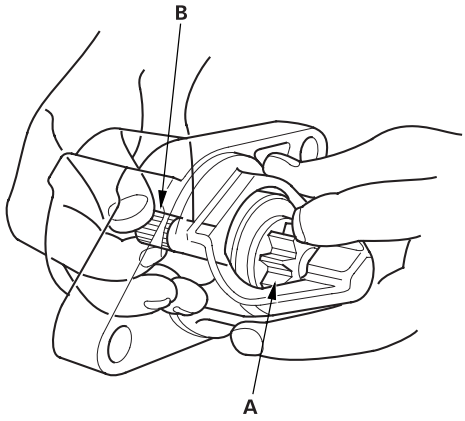
Planetary Gear Inspection

16. Check the planetary gears (A) and ring gear (B). Replace them if they are worn or damaged.



Overrunning Clutch Inspection (Except KE, KG, KR, KS, KZ models)

17. Holding the drive gear (A), turn the gear shaft (B) clockwise. Check that the drive gear comes out to the other end. If the drive gear does not move smoothly, replace the gear cover assembly.



18. Holding the drive gear, turn the gear shaft counterclockwise. The gear shaft should rotate freely. If the gear shaft does not rotate smoothly, replace the gear cover assembly.

19. If the starter drive gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.
Check the condition of the flywheel or torque converter ring gear. Replace it if the starter drive gear teeth are damaged.

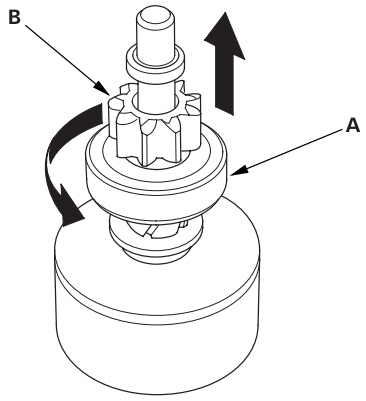
(cont'd)

Starter Overhaul (cont'd)

Overrunning Clutch Inspection (KE, KG, KR, KS, KZ models)

20. Slide the overrunning clutch along the shaft. Replace it, if it does not slide smoothly.

21. Rotate the overrunning clutch (A) both ways. Does it lock in one direction and rotate smoothly in reverse? If it does not lock in either direction or it locks in both directions, replace it.

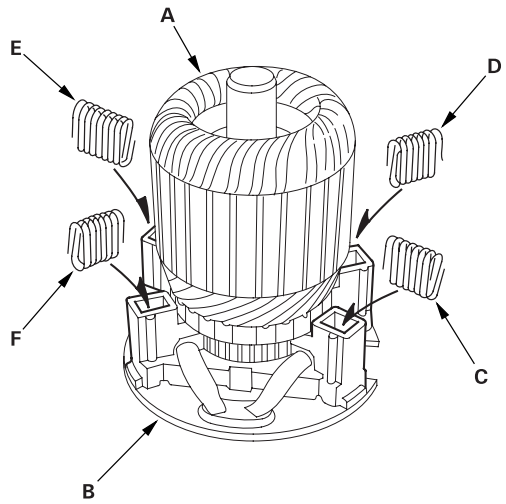


22. If the starter drive gear (B) is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.
Check the condition of the flywheel ring gear. Replace it if the starter drive gear teeth are damaged.

Starter Reassembly (Except KE, KG, KR, KS, KZ models)

23. Install the brush into the brush holder, and set the armature (A) in the brush holder (B).

NOTE: To seat the new brushes, slip a strip of #500 or #600 sandpaper, with the grit side up, between the commutator and each brush, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.



24. Squeezing a spring (C), insert it in the hole on the brush holder, and push it until it bottoms. Repeat this for the other three springs (D, E and F).

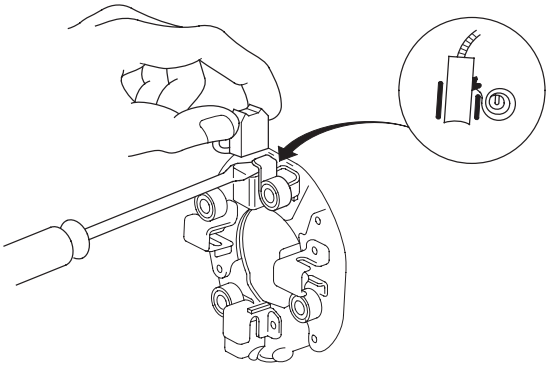
25. Install the armature and brush holder assembly into the housing.

NOTE: Make sure the armature stays in the holder.

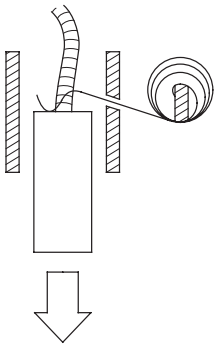
Starter Reassembly (KE, KG, KR, KS, KZ models)

26. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.

NOTE: To seat the new brushes, slip a strip of #500 or #600 sandpaper, with the grit side up, between the commutator and each brush, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.



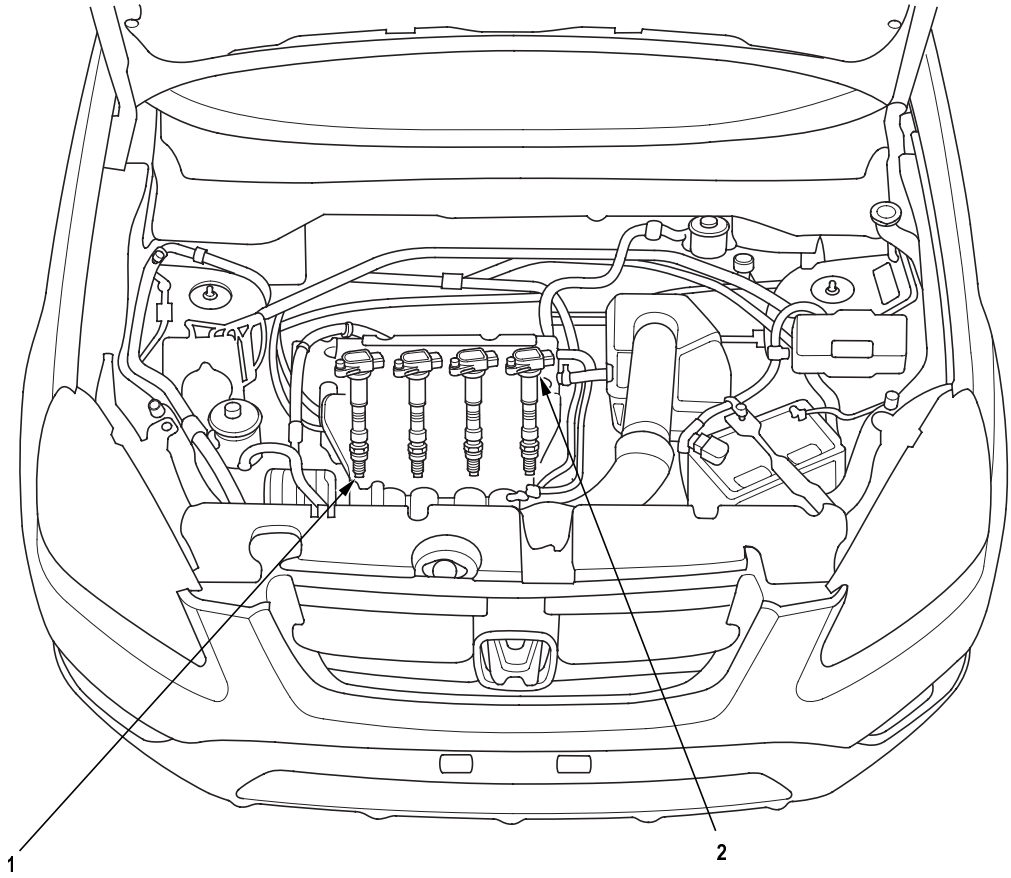
27. Install the armature in the housing, and install the brush holder. Next, pry back each brush spring again, and push the brush down until it seats against the commutator, then release the spring against the end of the brush.



28. Install the starter end cover to retain the brush holder.

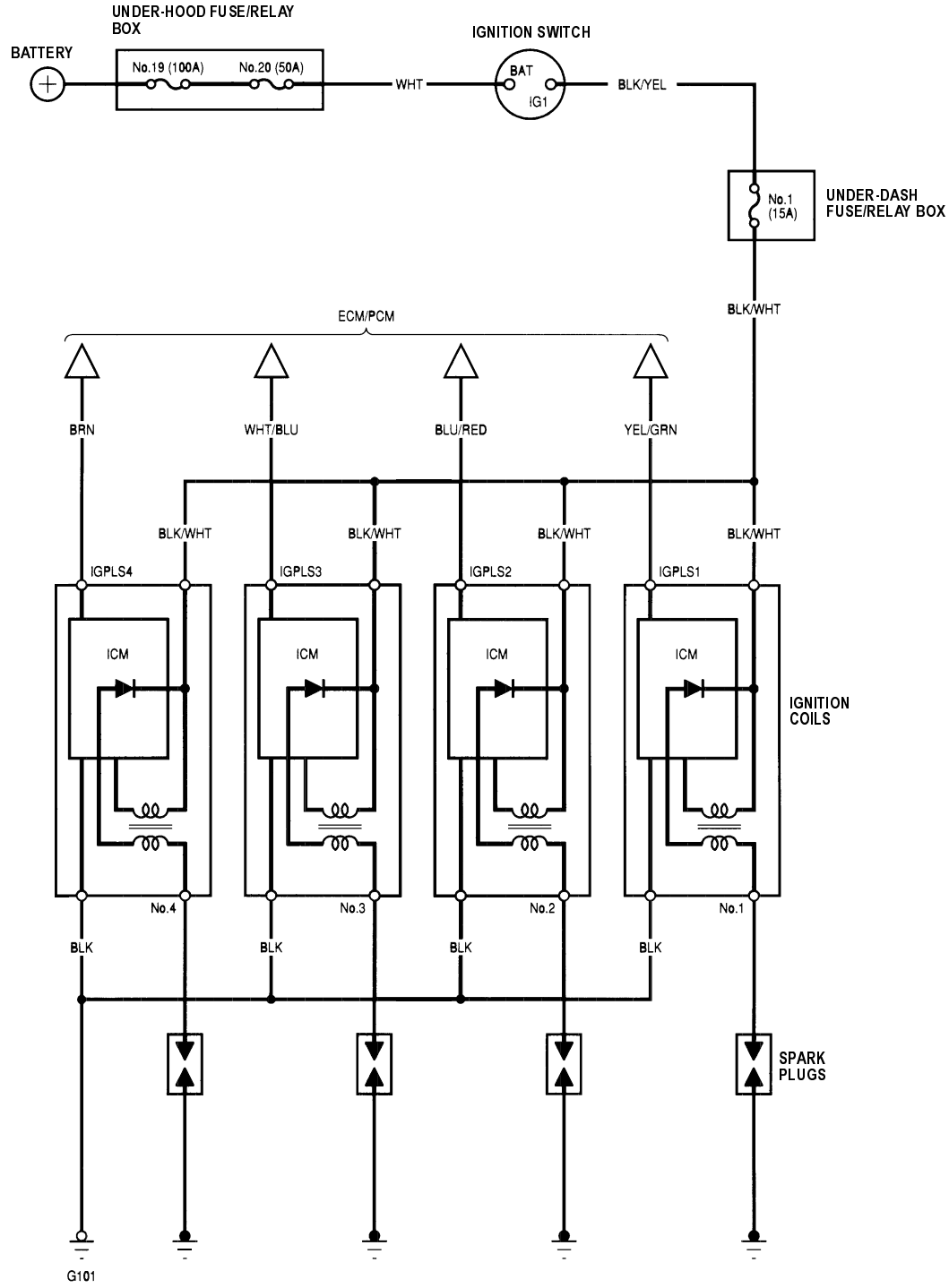
Ignition System

Component Location Index



1	SPARK PLUG	Inspection, page 04-23
2	IGNITION COIL	Ignition Timing Inspection, page 04-20 Removal/Installation, page 04-21 Troubleshooting, page 04-21

Circuit Diagram

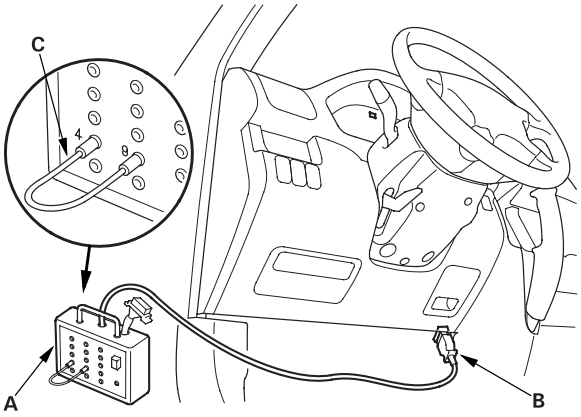


ICM: Ignition Control Module

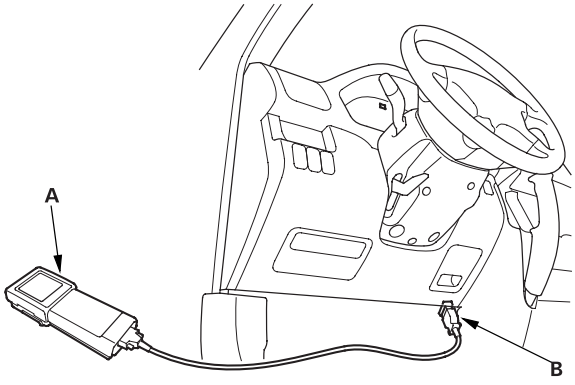
Ignition Timing Inspection

Special Tools Required
DLC pin box 07WAJ-0010100

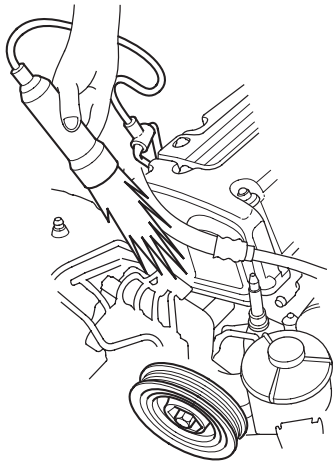
1. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or Neutral) until the radiator fan comes on, then let it idle.
2. Check the idle speed (see page 11-148).
3. Short the SCS terminal to ground by using the DLC pin box: Connect the DLC pin box (A) to the Data Link Connector (DLC) (16P) (B), then connect the No. 4 and No. 9 terminals on the DLC pin box with a jamper wire (C), and push the switch.



4. Short the SCS terminal to ground by using the Honda PGM Tester: Connect the Honda PGM tester (A) to the data link connector (16P) (B).

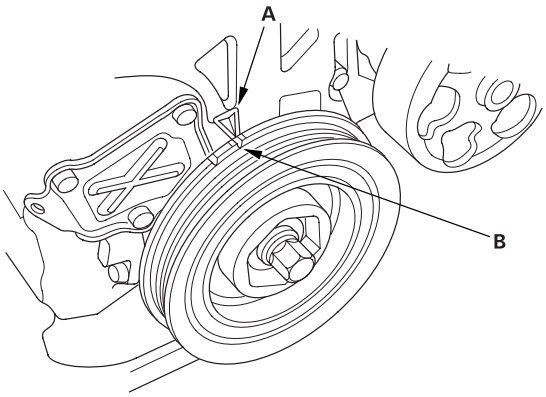


5. Connect the timing light to the service loop.



6. Point the light toward the pointers (A) on the chain case. Check the ignition timing under no load conditions: headlights, blower fan, rear window defogger, and air conditioner are not operating.

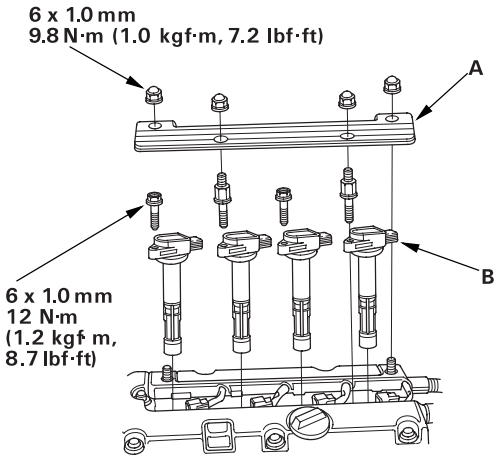
Ignition Timing:
M/T: 8° ± 2° BTDC (RED mark (B)) during idling in neutral
A/T: 8° ± 2° BTDC (RED mark (B)) during idling in [P] or [N]



7. If the ignition timing differs from the specification, replace the Engine Control Module (ECM)/ Powertrain Control Module (PCM) (see page 11-4).
8. Disconnect the special tool/Honda PGM Tester and the timing light.

Ignition Coil Removal/Installation

1. Remove the ignition coil cover (A), then remove the ignition coils (B).



2. Install the ignition coils in the reverse order of removal.

Ignition Coil Troubleshooting

1. Remove the four ignition coils (see page 04-21).
2. Remove the spark plugs from the cylinder head, and inspect the spark plug (see page 04-23).

   Is the spark plug OK?

   Yes Go to step 3.

   No Replace the spark plug.■
3. Disconnect the four injector connectors (see page 11-117).
4. Install the spark plugs on the ignition coils.
5. Connect the ignition coil connector, and connect the spark plug on the ground.
6. With the shift lever in [N] or [P] (A/T), turn the ignition switch to start (III), and check the spark.

   Does the plug spark?

   Yes Ignition coil is OK.■

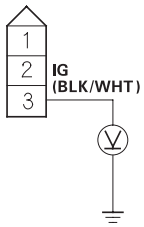
   No Go to step 7.
7. Substitute a known-good ignition coil, and recheck the spark.

   Does the plug spark?

   Yes Replace the original ignition coil.■

   No Go to step 8.
8. Disconnect the ignition coil 3P connector.
9. Turn the ignition switch ON (II).
10. Measure voltage between the ignition coil 3P connector terminal No. 3 and body ground.

IGNITION COIL 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Go to step 11.

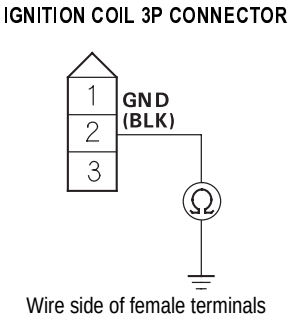
No Repair open in the wire between ignition coil and No. 1 (15A) fuse in the under-dash fuse/relay box.■

(cont'd)

Ignition Coil Troubleshooting (cont'd)

11. Turn the ignition switch OFF.

12. Check for continuity between the ignition coil 3P connector terminal No. 2 and body ground.



Is there continuity?

Yes Go to step 13.

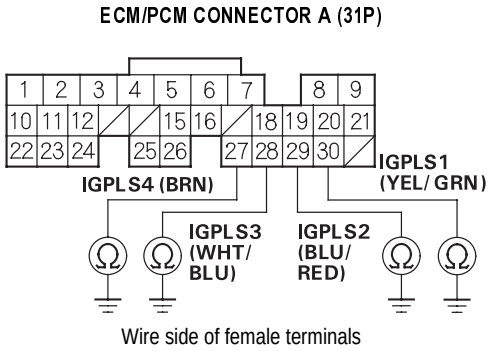
No Repair open in the wire between the ignition coil and G101.■

13. Disconnect the negative cable from the battery.

14. Disconnect Engine Control Module (ECM)/ Powertrain Control Module (PCM) connector A (31P).

15. Check for continuity between body ground and following ECM/PCM connector terminal.

- A27 (No. 4 ignition coil)
- A28 (No. 3 ignition coil)
- A29 (No. 2 ignition coil)
- A30 (No. 1 ignition coil)

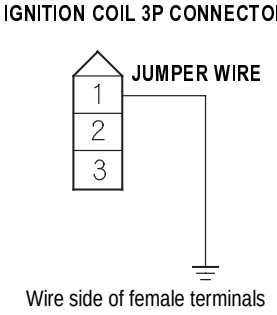


Is there continuity?

Yes Repair short in the wire between the ECM/ PCM and the ignition coil.■

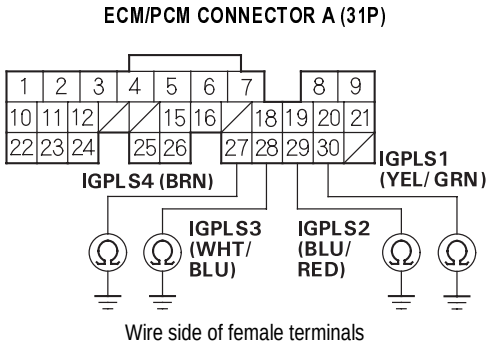
No Go to step 16.

16. Connect the ignition coil 3P connector terminal No. 1 and body ground with a jumper wire.



17. Check for continuity between body ground and following ECM/PCM connector terminal.

- A27 (No. 4 ignition coil)
- A28 (No. 3 ignition coil)
- A29 (No. 2 ignition coil)
- A30 (No. 1 ignition coil)



Is there continuity?

Yes Substitute a known-good ECM/PCM, and recheck (see page 11-5).■

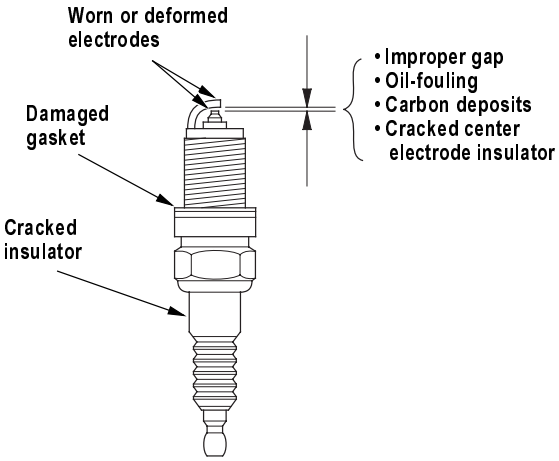
No Repair open in the wire between the ECM/ PCM and the ignition coil.■

Spark Plug Inspection

1. Inspect the electrodes and ceramic insulator.

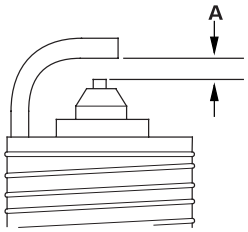
Burned or worn electrodes may be caused by:
- Advanced ignition timing
- Loose spark plug
- Plug heat range too hot
- Insufficient cooling

Fouled plug may be caused by:
- Retarded ignition timing
- Oil in combustion chamber
- Incorrect spark plug gap
- Plug heat range too cold
- Excessive idling/low speed running
- Clogged air cleaner element
- Deteriorated ignition coils



2. Check the electrode gap (A). If the gap is over the standard, adjust the gap with suitable gapping tool.

Electrode Gap:
Standard (New): 1.0 - 1.1 mm (0.039 - 0.043 in.)

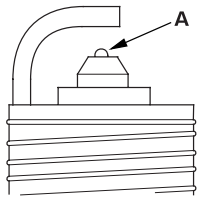


3. Replace the plug at the specified interval, or if the center electrode is rounded (A). Use only the spark plugs listed below.

Spark Plugs:

ZFR6K-11 (NGK)

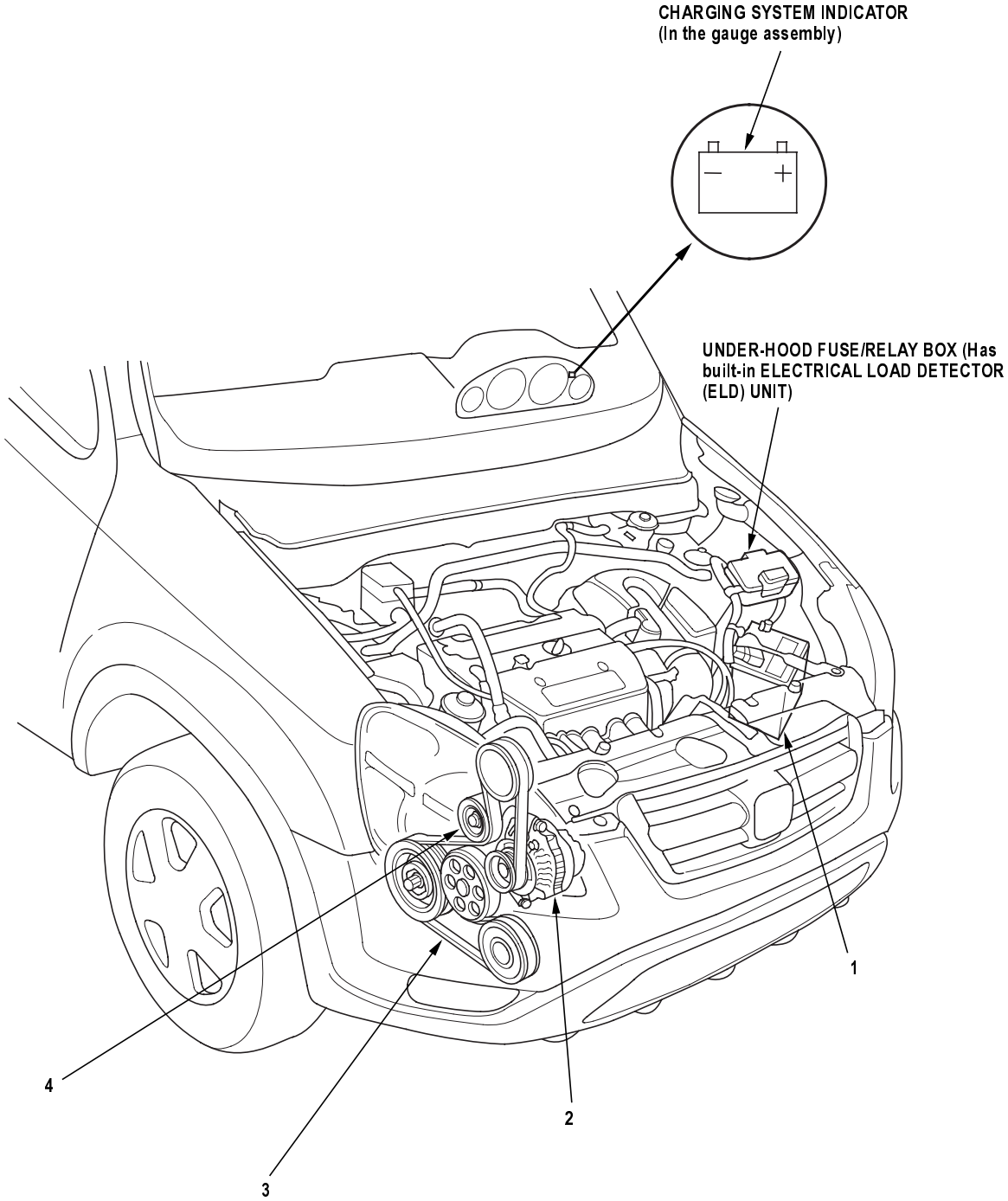
KJ20DR-M11 (DENSO)



4. Apply a small quantity of anti-seize compound to the plug threads, and screw the plugs into the cylinder head finger-tight. Then torque them to 18 N·m (1.8 kgf·m, 13 lbf·ft).

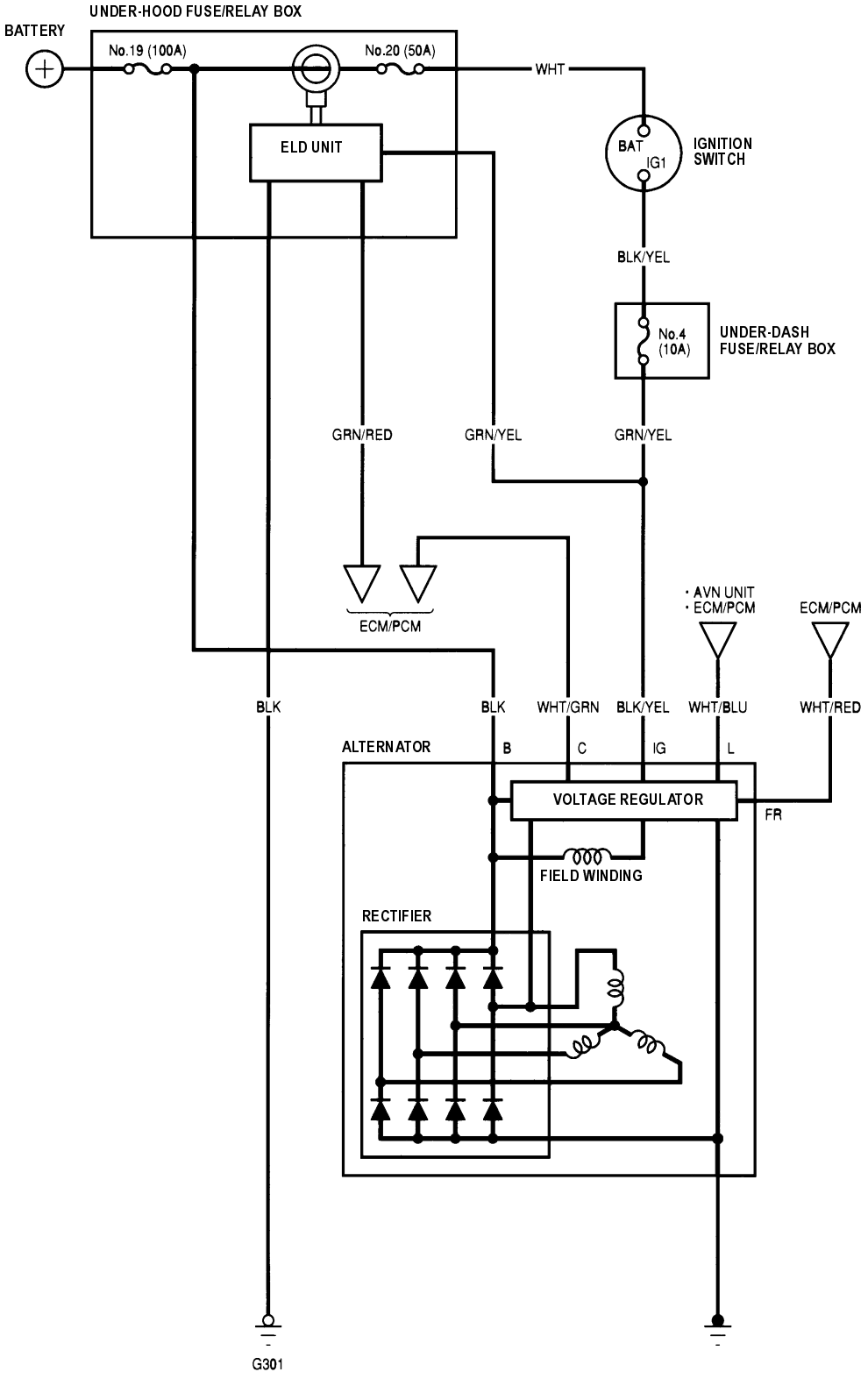
Charging System

Component Location Index



1	BATTERY	Test, page 22A-59
2	ALTERNATOR	Troubleshooting, page 04-26; Replacement, page 04-32; Overhaul, page 04-34
3	DRIVE BELT	Inspection, page 04-29; Replacement, page 04-30
4	AUTO-TENSIONER	Inspection, page 04-30; Replacement, page 04-31

Circuit Diagram

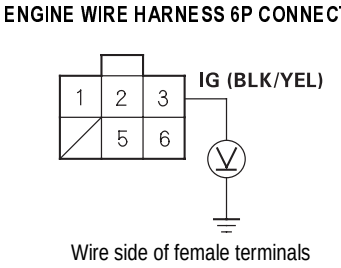


Charging Circuit Troubleshooting

If the charging system indicator does not come on or does not go off, or the battery is dead or low, test the following items in the order listed below:
Battery (see page 22A-59)
Charging system indicator
Alternator and regulator circuit
Alternator control system

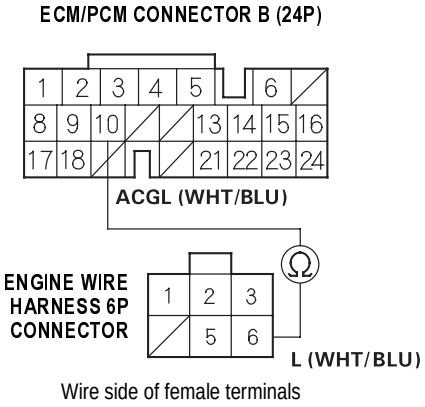
Charging System Indicator Test

1. Turn the ignition switch ON (II).
   Does the charging system indicator come on?
   Yes Go to step 2.
   No Go to step 3.
2. Start the engine.
   Does the charging system indicator go off?
   Yes Charging system indicator circuit is OK.■
   No Go to step 3.
3. Turn the ignition switch OFF.
4. Troubleshoot the multiplex control system (see page 22A-231).
   Is the multiplex control system OK?
   Yes Without navigation system. Go to step 7.
   Yes With navigation system. Go to step 5.
   No Check the multiplex control system as indicated by the Diagnostic Trouble Code (DTC) (see step 8 on page 22A-232).■
5. Disconnect the 12P connector from the AVN unit.
6. Start the engine.
   Does the charging system indicator go off?
   Yes Check that the terminals are firmly seated at the connectors. If OK, substitute a known-good AVN unit and recheck.■
   No Go to step 7.
7. Disconnect the engine wire harness 6P connector from the starter sub-harness 6P connector.
8. Measure the voltage at the No. 3 terminal of the engine wire harness 6P connector with the ignition switch ON (II).



   Is there battery voltage?
   Yes Go to step 9.
   No Check for a blown No.4 (10A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the alternator and the under-dash fuse/relay box.■
9. Turn the ignition switch OFF.
10. Disconnect the negative cable from the battery.
11. Disconnect Engine Control Module (ECM)/ Powertrain Control Module (PCM) connector B (24P).

12. Check continuity between the ECM/PCM connector terminal B10 and engine wire harness 6P connector terminal No. 6.



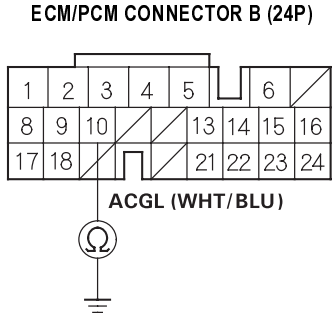
Wire side of female terminals

Is there continuity?

Yes Go to step 13.

No Repair open in the wire between the alternator and the ECM/PCM.■

13. Check continuity between the ECM/PCM connector terminal B10 and body ground.



Wire side of female terminals

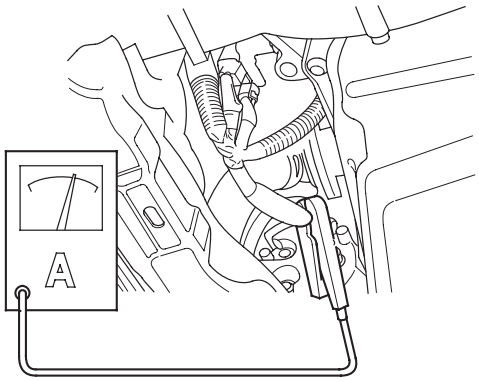
Is there continuity?

Yes Repair short in the wire between the alternator and the ECM/PCM.■

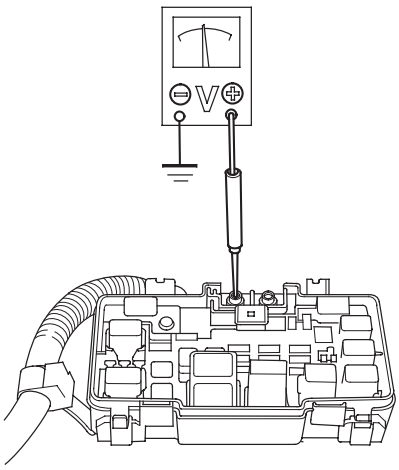
No Reconnect the negative cable to the battery, and go to alternator and regulator test.

Alternator and Regulator Circuit Test

1. Be sure the battery is sufficiently charged and in good condition (see page 22A-59).
2. Raise the hoist to full height.
3. Hook up the ammeter, 0 - 400 A, to the starter sub-harness.



4. Lower the hoist.
5. Hook up the voltmeter, 0 - 20 V (accurate within 0.1 V), to T101.



(cont'd)

Charging Circuit Troubleshooting (cont'd)

Alternator and Regulator Circuit Test (cont'd)

6. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or Neutral) until the radiator fan comes on then let it idle.
7. Raise the engine speed to 2,000 rpm (min^{-1}) and hold it there.
8. Turn the headlights (high beam) on, and measure voltage at the under-hood fuse/relay box terminal.

   Is the voltage between 13.9 and 15.1 V?

   Yes Go to step 9.

   No Repair or replace the alternator (see page 04-34).■
9. Read the amperage at 13.5 V.

   NOTE: Adjust the voltage by turning the blower motor, rear window defogger, brake lights, etc. ON.

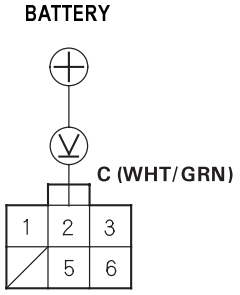
   Is the amperage 60A or more?

   Yes Alternator/regulator operation is OK.■

   No Repair or replace the alternator (see page 04-34).■

Alternator Control System Test

1. Check for proper operation of the Electrical Load Detector (ELD) by checking the Malfunction Indicator Lamp (MIL) (see page 11-3).
2. Disconnect the engine wire harness 6P connector from the starter sub-harness 6P connector.
3. Start the engine, and turn the headlights (high beam) ON.
4. Measure voltage between the engine wire harness 6P connector terminal No. 2 and the positive terminal of the battery.



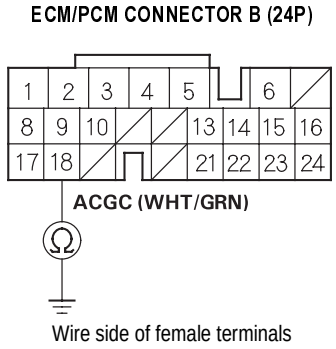
ENGINE WIRE HARNESS 6P CONNECTOR
Wire side of female terminals

   Is there 1 V or less?

   Yes Go to step 9.

   No Go to step 5.
5. Turn the headlights and ignition switch OFF.
6. Disconnect the negative cable from the battery.
7. Disconnect ECM/PCM connector B (24P).

8. Check for continuity between ECM/PCM connector terminal B18 and body ground.

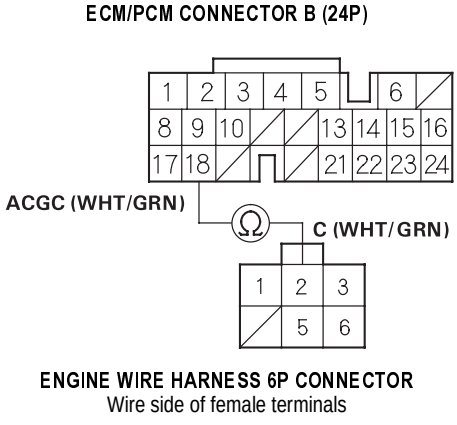


Is there continuity?

Yes Repair short in the wire between the alternator and the ECM/PCM.■

No Check that the terminals are firmly seated at the connector. If OK, substitute a known-good ECM/PCM, and recheck (see page 11-5). If the prescribed voltage is now available, replace the original ECM/PCM.■

9. Turn the headlights and ignition switch OFF.
10. Disconnect the negative cable from the battery.
11. Disconnect ECM/PCM connector B (24P).
12. Check for continuity between ECM/PCM connector terminal B18 and engine wire harness 6P connector terminal No. 2.



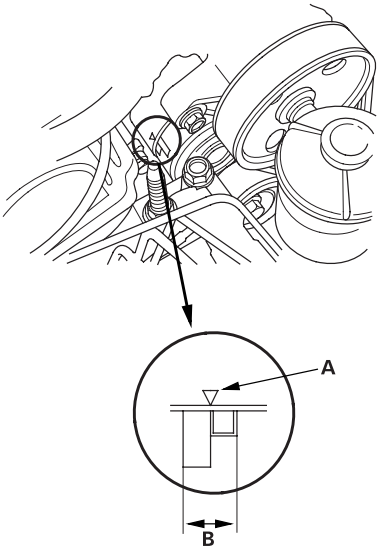
Is there continuity?

Yes Repair or replace the alternator (see page 04-34).■

No Repair open in the wire between the alternator and the ECM/PCM.■

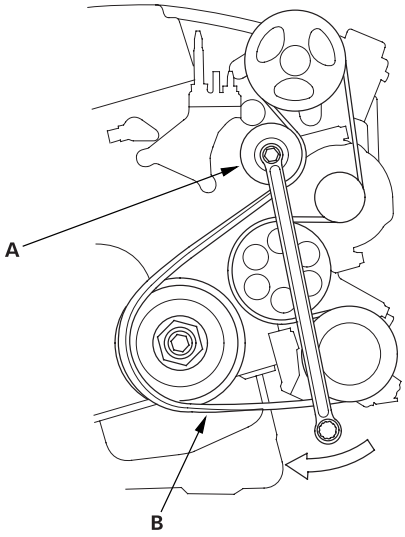
Drive Belt Inspection

Check that the auto-tensioner indicator (A) is within the standard range (B) as shown. If it is out of the standard range, replace the drive belt (see page 04-30).



Drive Belt Replacement

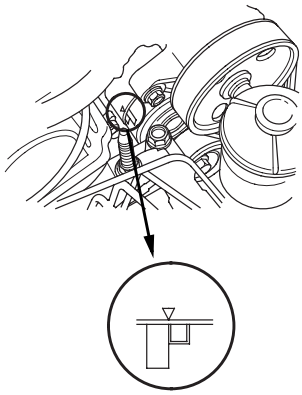
1. Remove the splash shield (see step 21 on page 05-6).
2. Move the auto-tensioner (A) to relieve tension from the drive belt (B), and remove the drive belt.



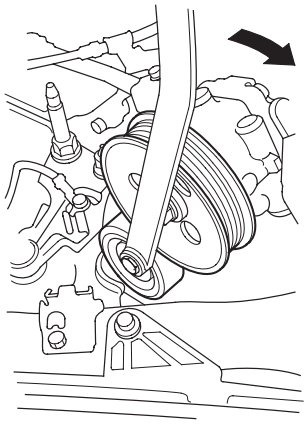
3. Install the new belt in the reverse order of removal.

Drive Belt Auto-tensioner Inspection

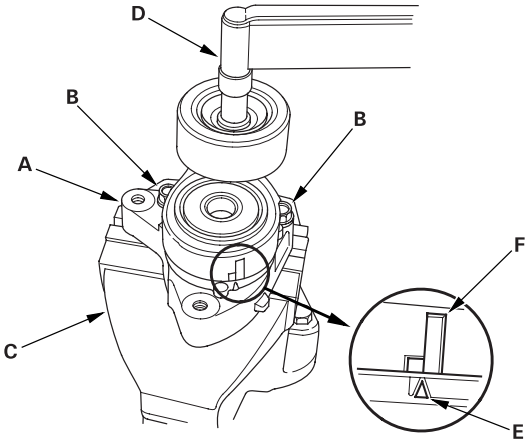
1. Check whether there is a change in the position of the auto-tensioner indicator before starting the engine and after starting the engine. If there is a change in the position, replace the auto-tensioner.



2. Check for abnormal noise from the tensioner pulley. If abnormal noise is heard, replace the tensioner pulley.
3. Remove the drive belt (see page 04-30).
4. Move the auto-tensioner within its limit with the belt tension release tool in the direction shown. Check that the tensioner moves smoothly and without any abnormal noise. If the tensioner does not move smoothly or there is abnormal noise, replace the auto-tensioner.



5. Remove the auto-tensioner (see page 04-31).
6. Install the tensioner pulley.
7. Clamp the auto-tensioner (A) by using two 8 mm bolts (B) and a vise (C) as shown. Do not clamp the auto-tensioner itself.



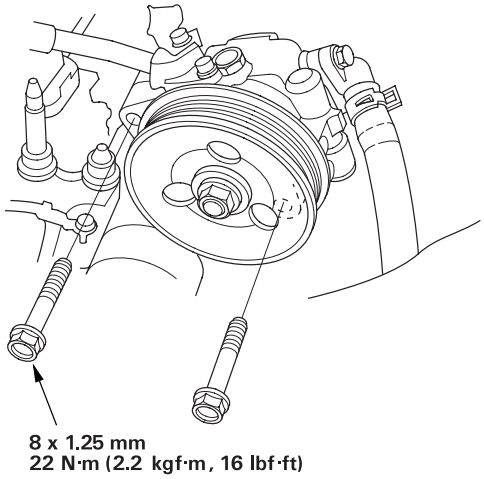
8. Set the torque wrench (D) on the pulley bolt.
9. Align the indicator (E) on the tensioner base with center mark (F) on the tensioner arm by using the torque wrench, and measure the torque. If the torque value is out of specification, replace the auto-tensioner.

   NOTE: If the indicator exceeds the center mark, recheck the torque.

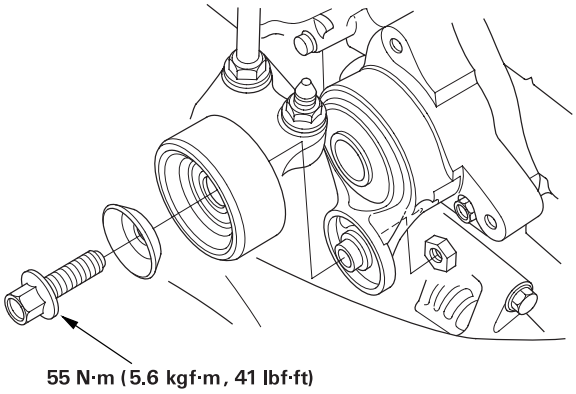
   Auto-tensioner spring torque:
   26.5 - 36.3 N·m (2.7 - 3.7 kg·m, 19.5 - 26.8 lbf·ft)

Drive Belt Auto-tensioner Replacement

1. Remove the drive belt (see page 04-30).
2. Remove the Power Steering (P/S) pump without disconnecting the P/S hoses.



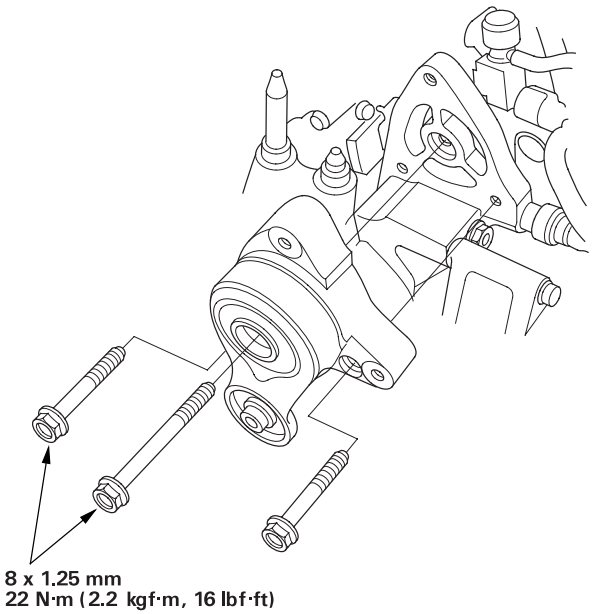
3. Remove the tensioner pulley.



(cont'd)

Drive Belt Auto-tensioner Replacement (cont'd)

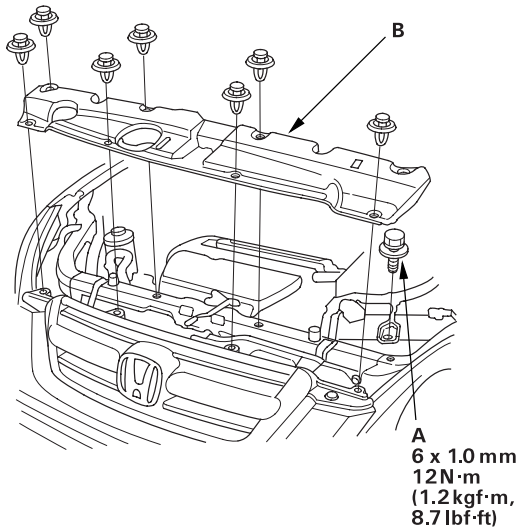
4. Remove the auto-tensioner.



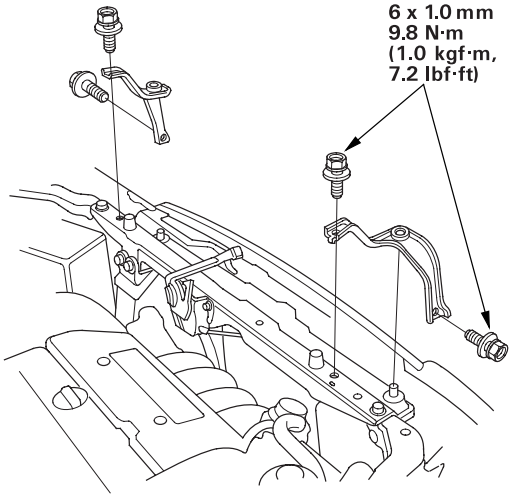
5. Install in the reverse order of removal.

Alternator Replacement

1. Disconnect the battery negative cable, then disconnect the positive cable.
2. Remove the bolt (A) securing the battery clamp, then remove the bulkhead cover (B).

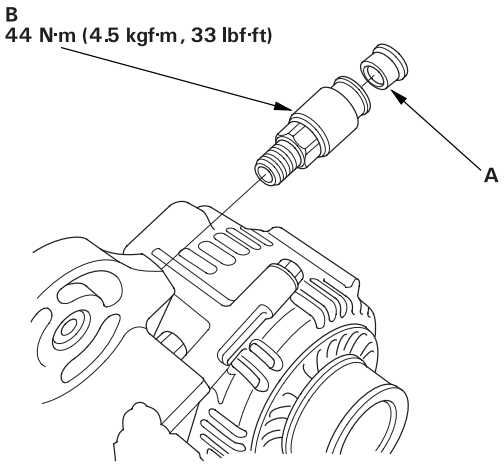


3. Remove the upper bracket and cushion.

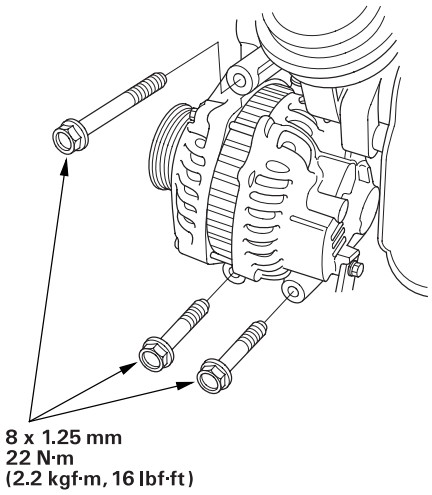


4. Remove the drive belt (see page 04-30).
5. Remove the auto-tensioner (see page 04-31).

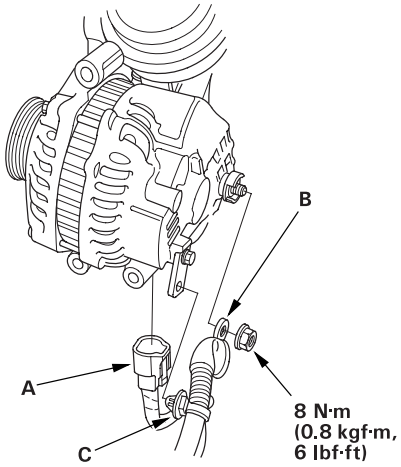
6. Remove the gasket (A), then remove the Positive Crankcase Ventilation (PCV) valve holder (B) with a hex wrench.



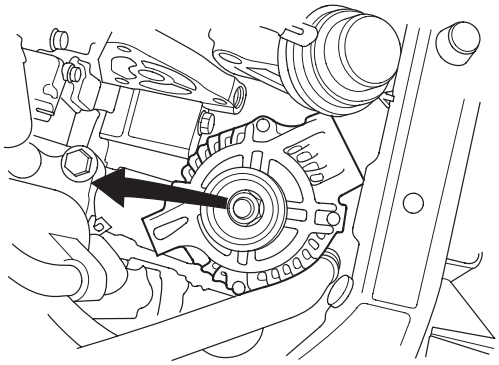
7. Remove the three bolts securing the alternator.



8. Disconnect the alternator connector (A), BLK wire (B) and harness clamp (C) from the alternator.



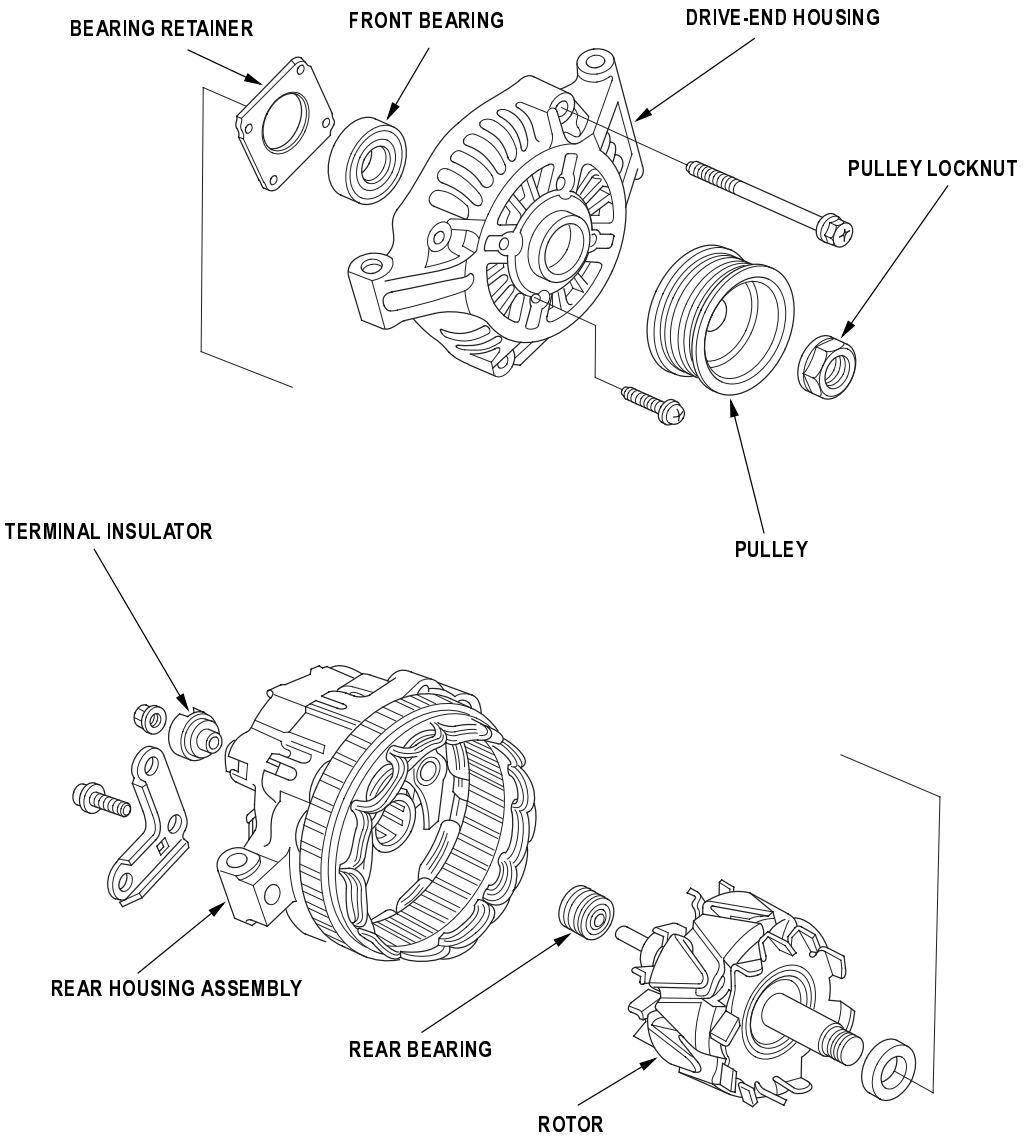
9. Remove the alternator.



10. Install the alternator and drive belt in the reverse order of removal.
11. Apply liquid gasket to the PCV valve holder threads, then install the PCV valve holder.
12. Install the upper bracket and cushion. Make sure they are set securely.
13. Connect the battery positive cable and negative cable to the battery.

Alternator Overhaul

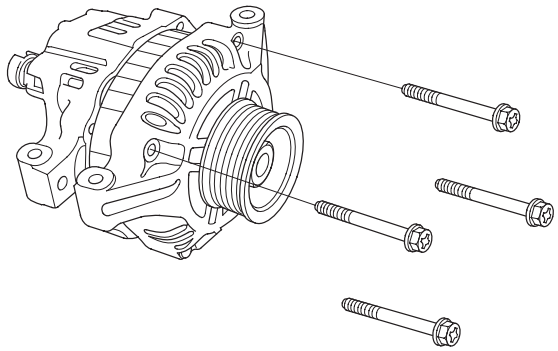
Exploded View



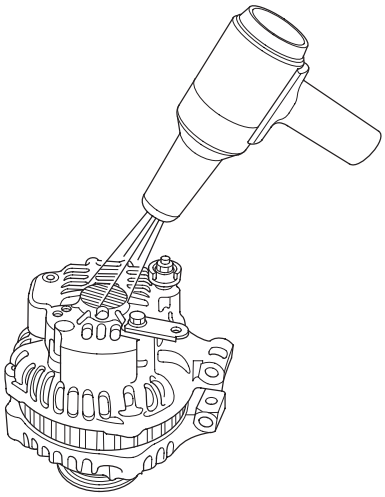
Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 52 x 55 mm 07746-0010400

NOTE: Refer to the Exploded View as needed during this procedure.

1. Test the alternator and regulator before you remove them (see page 04-26).
2. Remove the alternator (see page 04-32).
3. Remove the four through bolts.

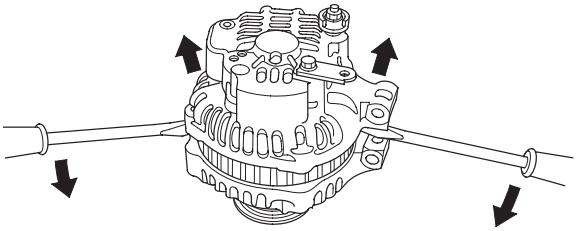


4. Heat the rear bearing seat with a 1,000 W hair drier for about 5 minutes (50 - 60°C, 129 - 140°F).

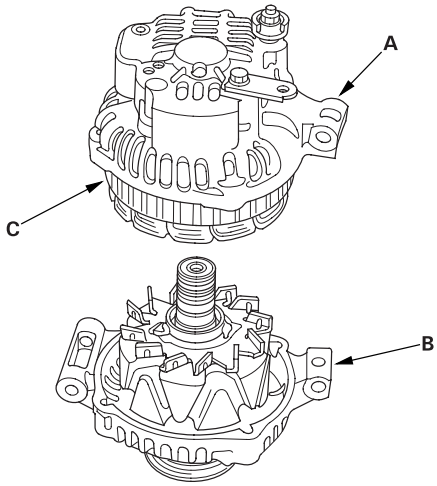


5. Separate the rear housing from the drive-end housing by inserting a flat tip screwdriver into the openings and prying them apart.

   NOTE: Be careful not to damage the stator with the tip of the screwdriver.



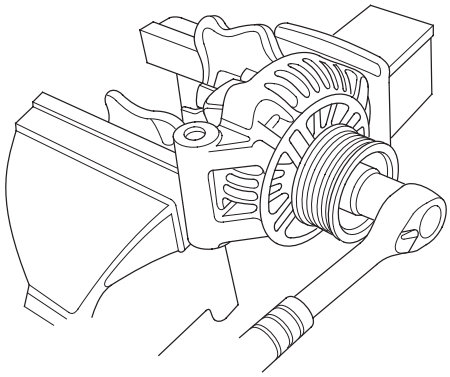
6. Separate the rear housing (A) and drive-end housing (B) with the stator (C) attached to the rear housing.



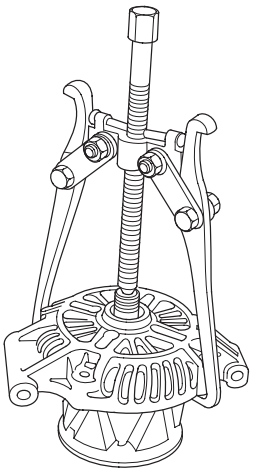
(cont'd)

Alternator Overhaul (cont'd)

7. If you are not replacing the front bearing and/or rear bearing, go to step 15. Clamp the rotor in a soft-jawed vise, then remove the pulley locknut.



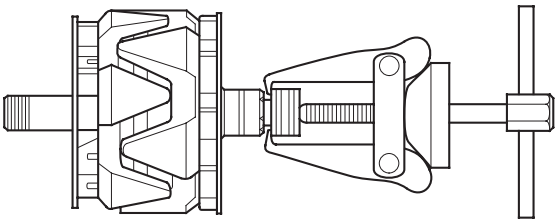
8. Remove the rotor using a puller as shown.



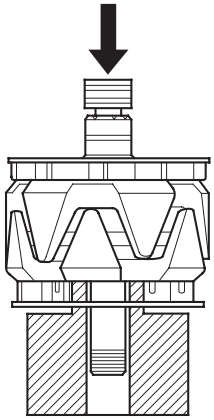
9. Inspect the rotor shaft for scoring, and inspect the bearing journal surface in the drive-end housing for seizure marks.

- If either the rotor or drive-end housing is damaged, replace the alternator.
- If both the rotor and the drive-end housing are OK, go to step 10.

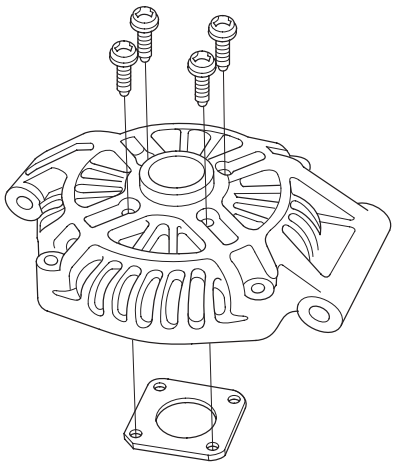
10. Remove the rear bearing using the puller as shown.



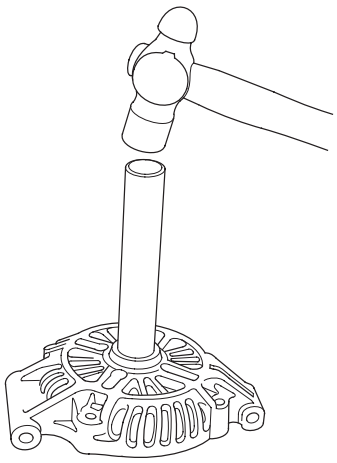
11. Use a hand press to install the new rear bearing. Apply pressure only on the inner race to avoid damaging the bearing.



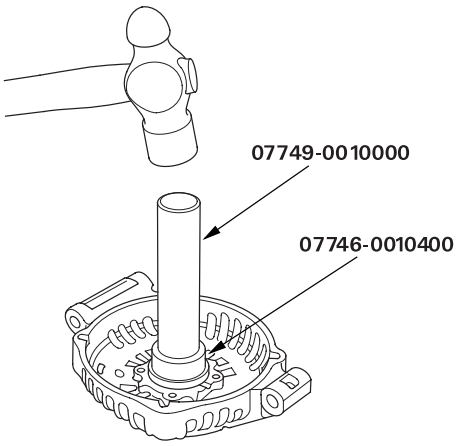
12. Remove the front bearing retainer plate.



13. Support the drive-end housing in a vise, and drive out the front bearing with a brass drift and hammer.



14. With a hammer and the special tools, install a new front bearing in the drive-end housing.

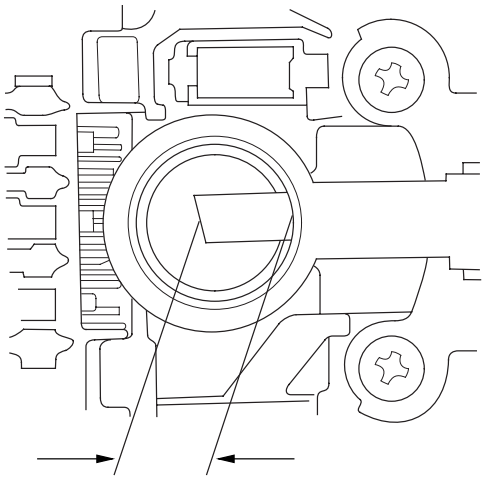


Alternator Brush Inspection

15. Measure the length of both brushes with a vernier caliper.

- If either brush is shorter than the service limit, replace the rear housing assembly.
- If brush length is OK, go to step 16.

Alternator Brush Length:
Standard (New): 19.0 mm (0.75 in.)
Service Limit: 5.0 mm (0.2 in.)

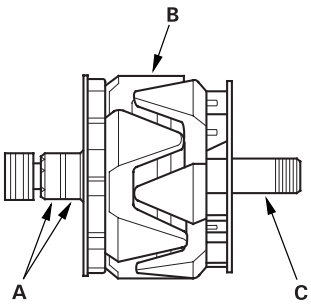


(cont'd)

Alternator Overhaul (cont'd)

Rotor Slip Ring Test

16. Check that there is continuity between the slip rings (A).
- If there is continuity, go to step 17.
- If there is no continuity, replace the rotor assembly.



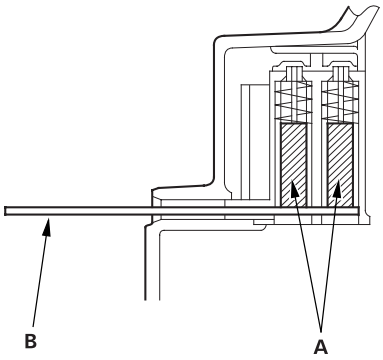
17. Check that there is no continuity between each slip ring (A) and the rotor (B) and the rotor shaft (C).
- If there is no continuity, replace the rear housing assembly, go to step 18.
- If there is continuity, replace the rotor assembly.

Alternator Reassembly

18. If you removed the pulley, put the rotor in the drive-end housing, then tighten its locknut to 111 N·m (11.3 kgf·m, 81.7 lbf·ft).

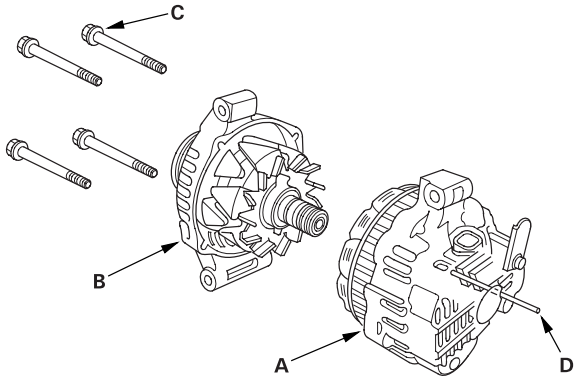
19. Remove any grease or any oil from the slip rings.

20. Push the brushes (A) in, then insert a pin or drill bit (B) (about 1.8 mm (0.77 in.) diameter) to hold them there.



21. Heat the rear bearing seat with a 1,000 W hair drier for about 5 minutes (50 - 60°C, 129 - 140°F).

22. Put the rear housing assembly (A) and drive-end housing/rotor assembly (B) together, tighten the four through bolts (C) and pull out the pin (D).

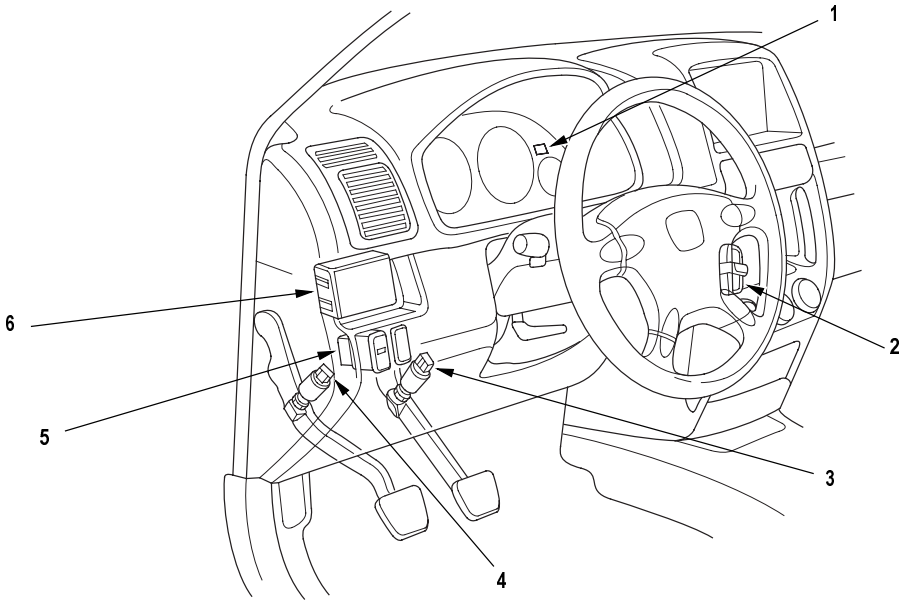


23. After assembling the alternator, turn the pulley by hand to make sure the rotor rotates smoothly and without noise.

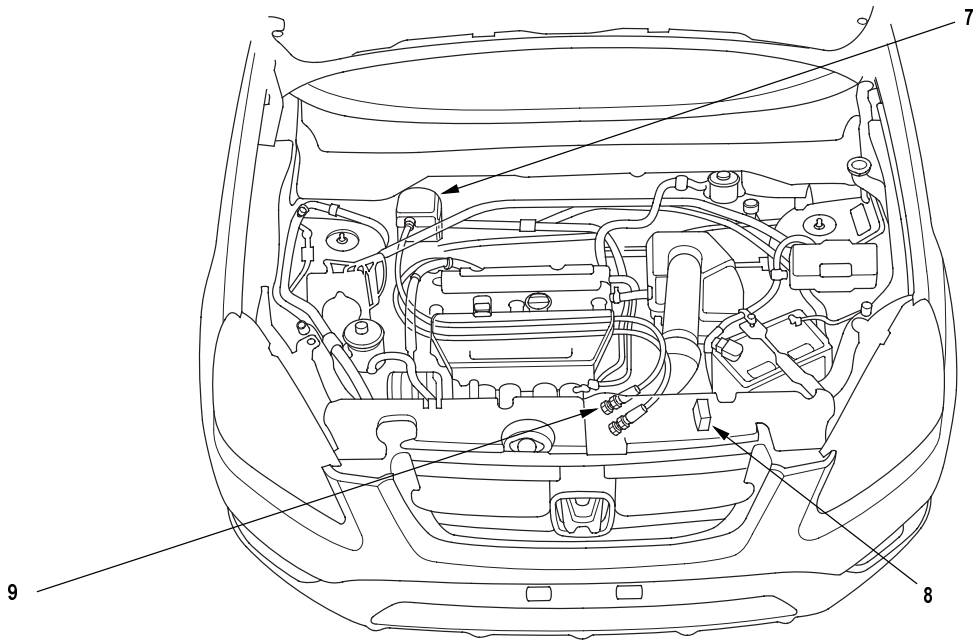
24. Install the alternator and drive belt (see page 04-32).

Cruise Control

Component Location Index

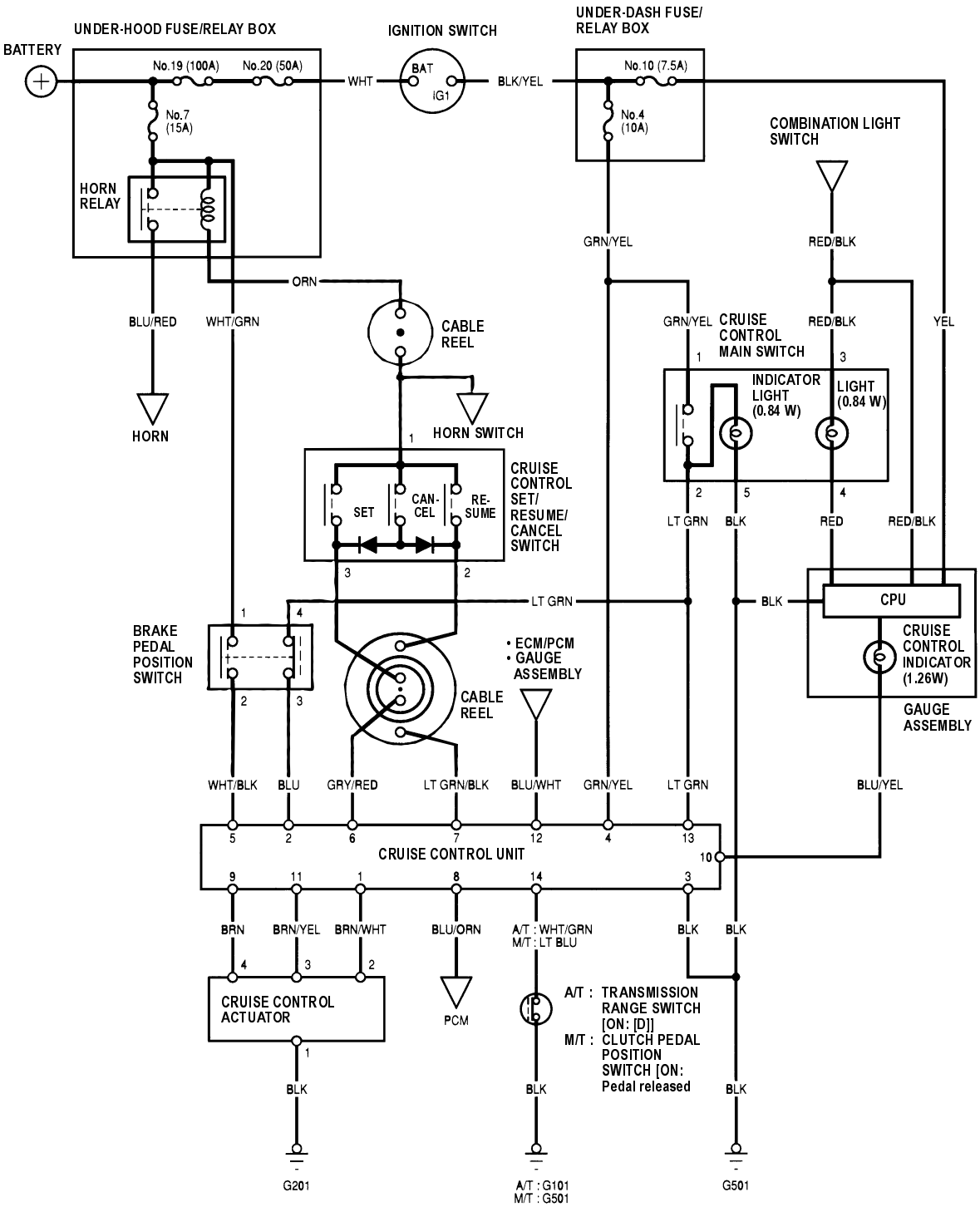


1	CRUISE CONTROL INDICATOR (Built into gauge assembly)	
2	CRUISE CONTROL SET/RESUME/CANCEL SWITCH	Test/Replacement, page 04-46
3	BRAKE PEDAL POSITION SWITCH	Test, page 22A-99; Pedal Height Adjustment, page 19A-5
4	CLUTCH PEDAL POSITION SWITCH (M/T)	Test, page 04-49; Clutch Pedal Adjustment, page 12-4
5	CRUISE CONTROL MAIN SWITCH	Test/Replacement, page 04-46
6	CRUISE CONTROL UNIT	Input Test, page 04-44



7	CRUISE CONTROL ACTUATOR	Test, page 04-47; Replacement, page 04-48
8	TRANSMISSION RANGE SWITCH (A/T)	Test, page 14-168
9	ACTUATOR CABLE	Adjustment, page 04-49

Circuit Diagram



Symptom Troubleshooting Index

NOTE:
- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting.
  - check the No. 10 (7.5A) and No. 4 (10A) fuses in the under-dash fuse/relay box, and the No. 7 (15A) fuse in the under-hood fuse/relay box.
  - check that the horn sounds.
  - check the tachometer to see if it works properly.

Symptom	Diagnostic procedure	Also check for
Cruise control cannot be set	1. Check main switch (see page 04-46) 2. Check SET/RESUME/CANCEL switch (see page 04-46) 3. Test brake pedal position switch (see page 22A-99) and check its adjustment (see page 19A-5) 4. Test clutch pedal position switch (see page 04-49) and check its adjustment (M/T) (see page 12-4) 5. Check transmission range switch (A/T) (see page 14-168) 6. Check control unit (see page 04-44)	• Poor ground: G101 (A/T), G501 (M/T) • Open circuit, loose or disconnected terminals: LT GRN, GRN/YEL, GRY/RED, BLU, WHT/GRN (A/T), LT BLU (M/T), BLU/WHT
Cruise control can be set but indicator light does not go on	1. Check cruise control indicator bulb in gauge assembly (see page 22A-73) 2. Check control unit (see page 04-44)	• Poor ground: G501 • Open circuit, loose or disconnected terminals: YEL, BLU/YEL
Cruise speed is noticeably higher or lower than what was set	1. Check Vehicle Speed Sensor (VSS) (see page 22A-75) 2. Check actuator (see page 04-47) 3. Check control unit (see page 04-44)	
Excessive overshooting or undershooting when trying to set speed	1. Check actuator (see page 04-47) 2. Check Vehicle Speed Sensor (VSS) (see page 22A-75) 3. Check control unit (see page 04-44)	
Speed fluctuation on a flat road with cruise control set	1. Check Vehicle Speed Sensor (VSS) (see page 22A-75) 2. Check actuator (see page 04-47) 3. Check control unit (see page 04-44)	
Vehicle does not decelerate or accelerate accordingly when SET/RESUME/CANCEL button is pushed	1. Check SET/RESUME/CANCEL switch (see page 04-46) 2. Check control unit (see page 04-44)	Open circuit, loose or disconnected terminals: GRY/RED, LT GRN/BLK
Set speed not cancelled (engine rpm stays high) when clutch pedal is pushed (M/T)	1. Test clutch pedal position switch (see page 04-49) and check its adjustment (see page 12-4) 2. Check control unit (see page 04-44)	Short to ground in the LT BLU wire
Set speed not cancelled when shift lever is moved to Neutral position (A/T)	1. Check transmission range switch (see page 14-168) 2. Check control unit (see page 04-44)	Short to ground in the WHT/GRN wire
Set speed not cancelled when brake pedal is pushed	1. Test brake pedal position switch (see page 22A-99) and check its adjustment (see page 19A-5) 2. Check control unit (see page 04-44)	Open circuit, loose or disconnected terminals: WHT/BLK

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Diagnostic procedure	Also check for
Set speed, does not cancel when main switch is pushed OFF	1. Check main switch (see page 04-46) 2. Check control unit (see page 04-44)	Short to power in the LT GRN wire.
Set speed, does not cancel when CANCEL button is pushed	1. Check SET/RESUME/CANCEL switch (see page 04-46) 2. Check control unit (see page 04-44)	Open circuit, loose or disconnected terminals: GRY/RED, LT GRN/BLK
Set speed will not resume when RESUME button is pushed (with main switch on, when set speed is temporarily cancelled by pressing the brake pedal)	1. Check SET/RESUME/CANCEL switch (see page 04-46) 2. Check control unit (see page 04-44)	Open circuit, loose or disconnected terminals: LT GRN/BLK
The transmission shifts down slower than normal when going up a hill with the cruise control on (A/T)	1. Troubleshoot the cruise control communication circuit (see page 04-43)	Open circuit, loose or disconnected terminals: BLU/ORN

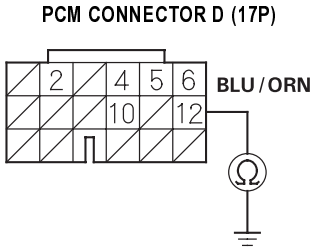
Cruise Control Communication Circuit Troubleshooting

1. Start the engine.
2. Turn on the cruise control main switch, then drive the vehicle to speeds over 25 mph (40 km/h) with the cruise control.

   Does the cruise control operate?

   Yes Go to step 3.

   No Check the cruise control unit (see page 04-44) or cruise control actuator.■
3. Turn the ignition switch OFF.
4. Disconnect the negative cable from the battery.
5. Disconnect Powertrain Control Module (PCM) connector D (17P) and cruise control unit 14P connector.
6. Check for continuity between PCM connector terminal D12 and body ground.

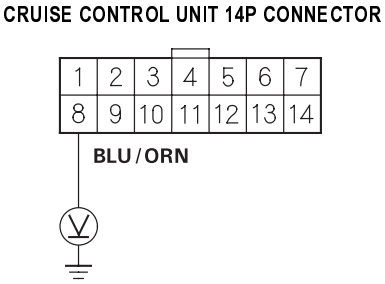


Wire side of female terminals

   Is there continuity?

   Yes Repair short to ground in the wire between PCM connector terminal D12 and the cruise control unit 14P connector terminal No. 8.■

   No Go to step 7.
7. Reconnect PCM connector D (17P) and the cruise control unit 14P connector.
8. Connect the negative cable to the battery.
9. Connect a voltmeter between cruise control unit 14P connector terminal No. 8 and body ground. Test-drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set, and watch the voltmeter.

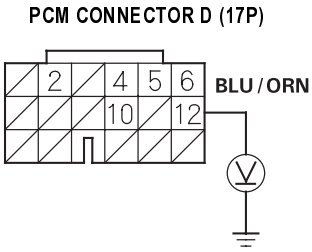


Wire side of female terminals

   Is there about 1 V?

   Yes Go to step 10.

   No Substitute a known-good cruise control unit. If the system works properly, replace the cruise control unit.■
10. Connect a voltmeter between PCM connector terminal D12 and body ground. Drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set, and watch the voltmeter.



Wire side of female terminals

   Is there about 1 V?

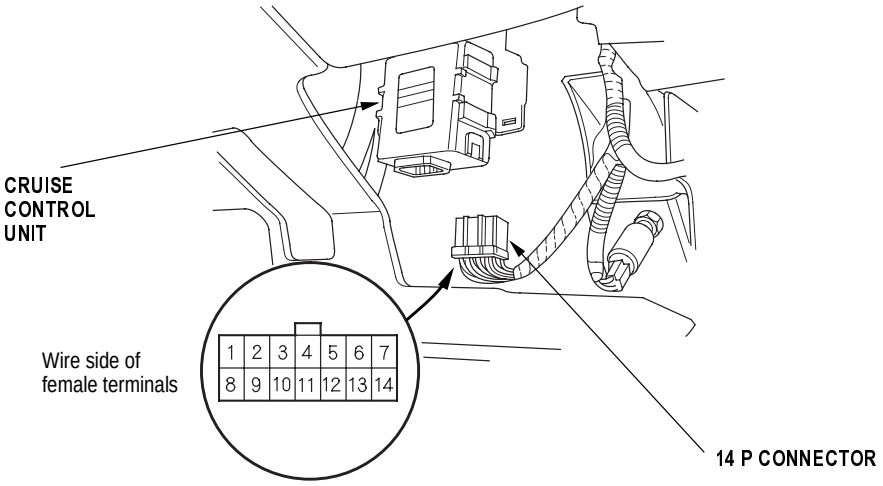
   Yes Check for loose connectors of the BLU/ORN wire between the cruise control unit and the PCM. If necessary replace the PCM and recheck (see page 11-4).■

   No Repair open in the wire between PCM connector terminal D12 and the control unit 14P connector terminal No. 8.■

Control Unit Input Test

SRS components are located in this area. Review the SRS component locations (see page 23-14) and precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Disconnect the 14P connector from the control unit.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 3.



3. With the 14P connector disconnected, make these input tests.

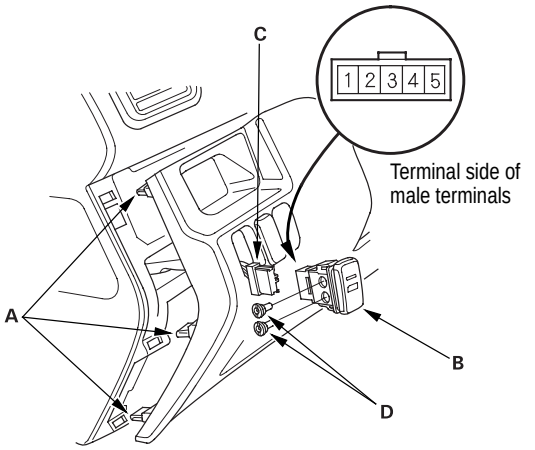
Cavity	Wire	Test Condition	Test: Desired Result	Possible cause if result is not obtained
1	BRN/WHT	Connect battery power	Check the operation of the magnetic clutch: Clutch should click and output link should be locked.	• Faulty actuator • Poor ground (G201) • An open in the wire • Short to ground
2	BLU	Ignition switch ON (II), main switch ON and brake pedal pressed, then released	Check for voltage to ground: There should be 0 V with the pedal pressed and battery voltage with the pedal released.	• Faulty brake pedal position switch • An open in the wire • Open in cruise control main switch • Blown No. 4 (10A) fuse in the under-dash fuse/relay box
3	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
4	GRN/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (10A) fuse in the under-dash fuse/relay box • An open in the wire
5	WHT/BLK	Brake pedal pressed, then released	Check for voltage to ground: There should be battery voltage with the pedal pressed, and 0 V with the pedal released.	• Blown No. 7 (15A) fuse in the under-hood fuse/relay box • Faulty brake pedal position switch • An open in the wire

Cavity	Wire	Test Condition	Test: Desired Result	Possible cause if result is not obtained
6	GRY/RED	Set button pushed	Check for voltage to ground: There should be battery voltage. When testing terminal No. 6, there should be no voltage on terminal No. 7.	• Blown No. 7 (15A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty set/resume/cancel switch • Faulty cable reel • An open in the wire
7	LT GRN/BLK	Resume button pushed	Check for voltage to ground: There should be battery voltage. When testing terminal No. 7, there should be no voltage on terminal No. 6.	
9	BRN	Connect battery power to the BRN terminal and ground to the BRN/YEL terminal	Check the operation of the actuator motor: You should be able to hear the motor.	• Faulty actuator • An open in the wire
11	BRN/YEL			
10	BLU/YEL	Ignition switch ON (II)	Attach to ground: Cruise indicator light in the gauge assembly should comes on.	• Blown No. 10 (7.5A) fuse in the under-dash fuse/relay box • Faulty gauge assembly • An open in the wire
12	BLU/WHT	Ignition switch ON (II) and main switch ON; raise the front of the vehicle, and rotate one wheel slowly while holding the other wheel	Check for voltage between the BLU/WHT (+) and BLK (-) terminals: There should be 0 - 5 V or more repeatedly.	• Faulty ECM/PCM • An open in the wire • Short to ground
13	LT GRN	Ignition switch ON (II) and main switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (10A) fuse in the under-dash fuse/relay box • Faulty main switch • An open in the wire
14	WHT/GRN (A/T) LT BLU (M/T)	A/T: Shift lever in [D] or [D_3] M/T: Clutch pedal released	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity when the clutch pedal is pressed or when the shift lever is in other positions.	• Faulty transmission range switch • Faulty clutch pedal position switch • Poor ground (M/T: G501, A/T: G101) • An open in the wire
8	BLU/ORN	Reconnect the cruise control unit 14P connector, start the engine, turn the main switch ON and drive the vehicle to speeds over 25 mph (40 km/h) with the cruise control set.	Check for voltage to ground: There should be about 1V	• Loose connection at the PCM • Faulty cruise control unit • Short to ground

4. If any test indicates a problem, find and correct the cause, then recheck the system. If all the input tests prove OK, the control unit may be faulty. Substitute a known-good control unit and retest. If the system works properly, replace the control unit.

Main Switch Test/Replacement

1. Detach the three clips (A), to create clearance between the dashboard and dashboard panel.

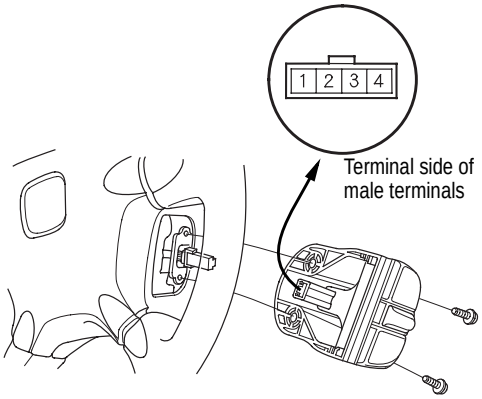


2. Release the clips of the main switch, and push the main switch (B) out of the panel, then disconnect the 5P connector (C) from the main switch.
3. Check for continuity between the terminals in each switch position according to the table. If there is no continuity, replace the illumination bulbs (D) or the switch.

Terminal / Position	2		5	1	3		4
OFF	○	⌇	○		○	⌇	○
ON	○	⌇	○	○	○	⌇	○

Set/Resume/Cancel Switch Test/ Replacement

1. Remove the two screws, then remove the switch.

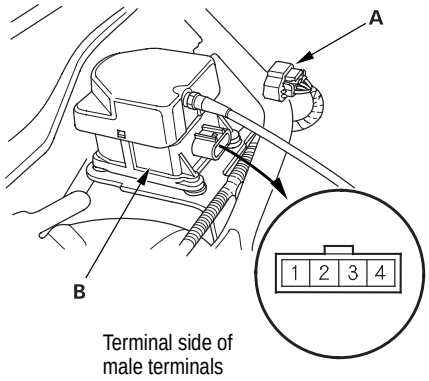


2. Check for continuity between the terminals in each switch position according to the table.
   - If there is continuity, and it matches the table, but switch failure occurred on the cruise control unit input test, check and repair the wire harness on the switch circuit.
   - If there is no continuity in one or both positions, replace the switch.

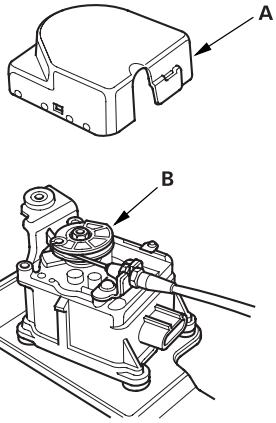
Terminal / Position	1		2	3
SET (ON)	○			○
RESUME (ON)	○		○	
CANCEL (ON)	○	▷	▷ ○	○

Actuator Test

1. Disconnect the 4P connector (A) from the actuator (B).



2. Remove the cover (A), and check the output linkage (B) for smooth movement.



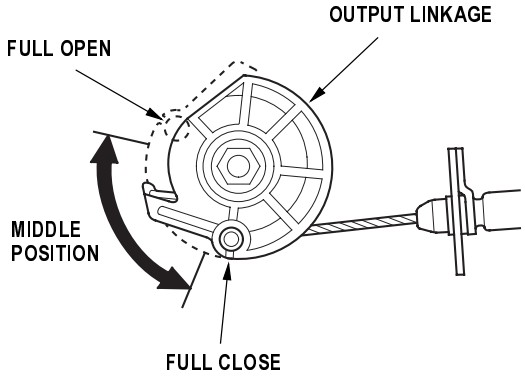
3. Connect battery power to the No. 2 terminal and ground to the No. 1 terminal.

4. Check for a clicking sound from the magnetic clutch. The output linkage should be locked.

5. If the output linkage is not locked, replace the actuator assembly.

6. Check the operation of the actuator motor in each output linkage position according to the table. You should be able to hear the motor.

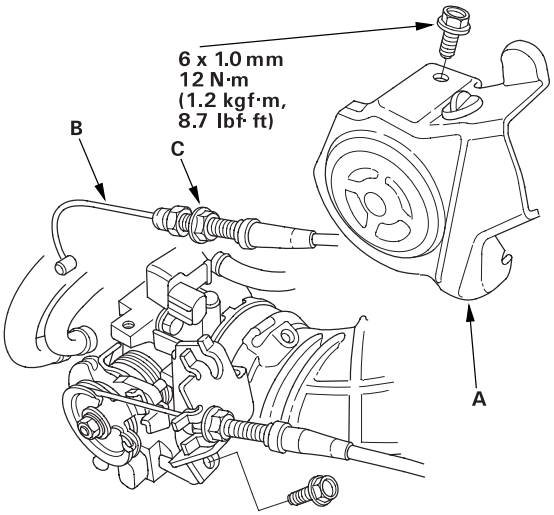
Battery power polarities		Output linkage position		
(+)	(-)	FULL CLOSE	MIDDLE POSITION	FULL OPEN
No. 4 Terminal	No. 3 Terminal	The motor runs.	The motor runs.	The motor stops.
No. 3 Terminal	No. 4 Terminal	The motor stops.	The motor runs.	The motor runs.



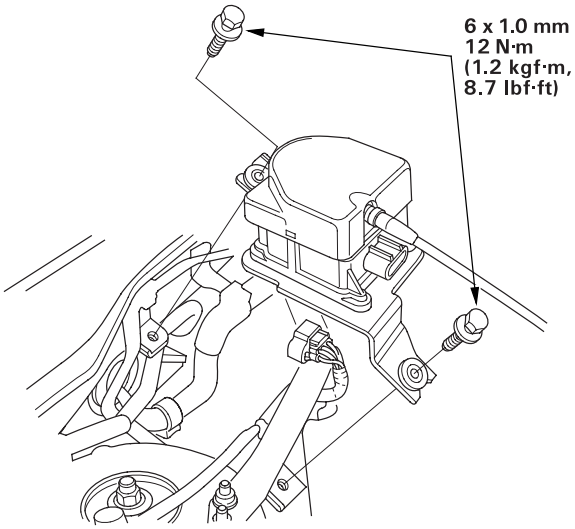
7. If the actuator motor does not operate as specified, replace the actuator assembly.

Actuator/Cable Replacement

1. Remove the throttle cable cover (A), fully open the cruise control link by hand, then remove the cruise control cable (B) from link. Loosen the locknut (C), and remove the cable from the bracket.

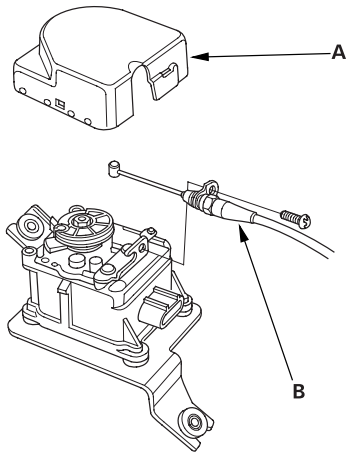


2. Disconnect the 4P connector, and remove the two bolts securing the actuator.

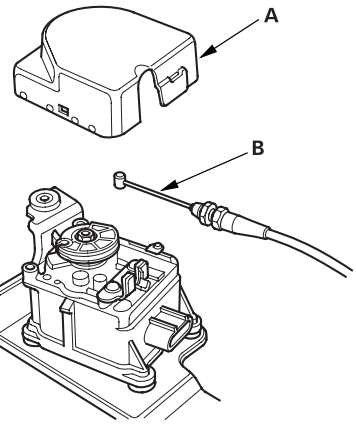


3. Remove the actuator cover (A), then remove the actuator cable (B) from the actuator.

LHD models:



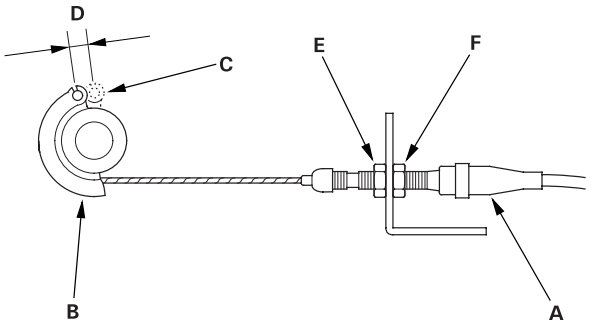
RHD models:



4. Install in the reverse order of removal, and adjust the free play at the throttle linkage after connecting the actuator cable.

Actuator Cable Adjustment

1. Check that the actuator cable (A) moves smoothly with no binding or sticking.

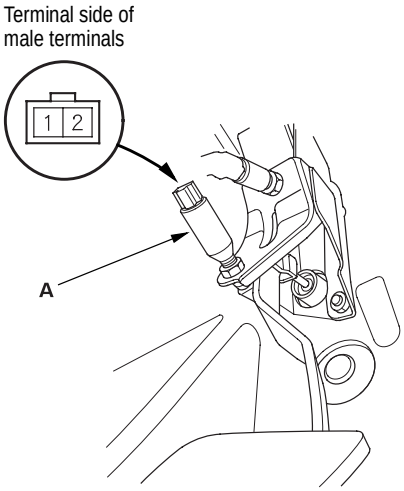


2. Measure the amount of movement of the output linkage (B) until the engine speed starts to increase. At first, the output linkage should be located at the fully closed position (C). The free play (D) should be 3.75 ± 0.5 mm (0.15 ± 0.02 in.).
3. If the free play is not within specs, loosen the locknut (E), and turn the adjusting nut (F) until the free play is as specified, then retighten the locknut.

Clutch Pedal Position Switch Test

1. Disconnect the 2P connector from the clutch pedal position switch (A).

CLUTCH PEDAL POSITION SWITCH 2P CONNECTOR



2. Remove the clutch pedal position switch.
3. Check for continuity between the terminals according to the table.
   - If the continuity is not as specified, replace the clutch pedal position switch.
   - If OK, install the clutch pedal position switch and adjust the pedal height (see page 12-4).

Terminal / Clutch Pedal Postion Switch	1	2
PRESSED		
RELEASED	○	○

05

Engine Mechanical

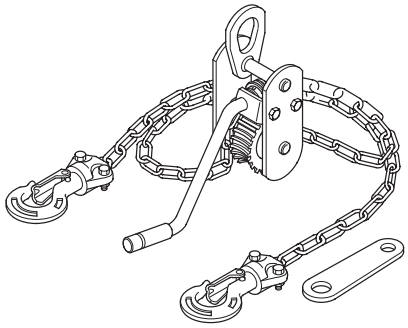
Engine Assembly **05-2**
Special Tools 05-2
Engine Removal 05-3
Engine Installation 05-10



Engine Assembly

Special Tools

Ref. No.	Tool Number	Description	Qty
1	07KAK-SJ40101	Engine Tilt Hanger Set	1



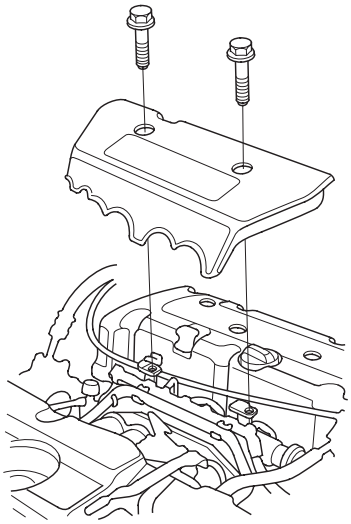
1

Engine Removal

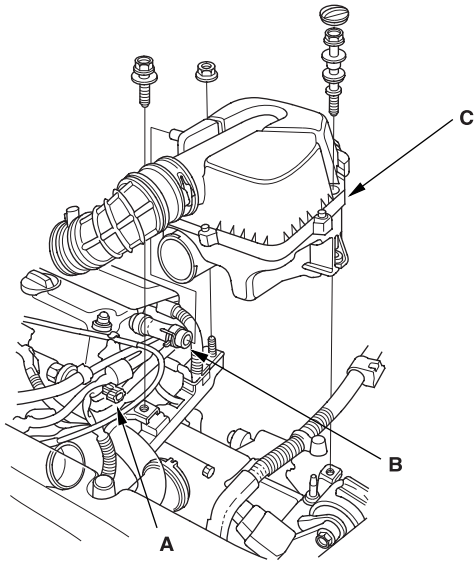
Special Tools Required
- Engine tilt hanger set 07KAK-SJ40101

NOTE:
- Use fender covers to avoid damaging painted surfeces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

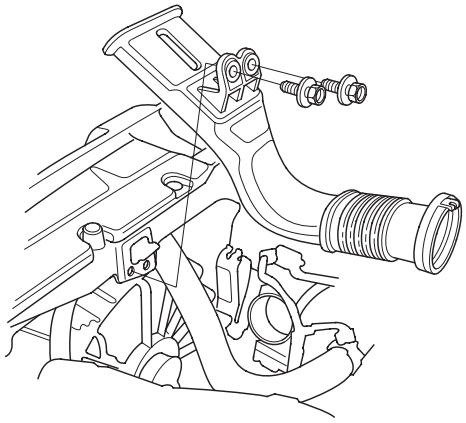
1. Secure the hood in the wide open position (support rod in the lower hole).
2. Disconnect the negative cable from the battery first, then the positive cable.
3. Remove the battery.
4. Remove the intake manifold cover.



5. Disconnect the Intake Air Temperature (IAT) sensor connector (A), and remove the breather hose (B), then remove the air cleaner housing (C).



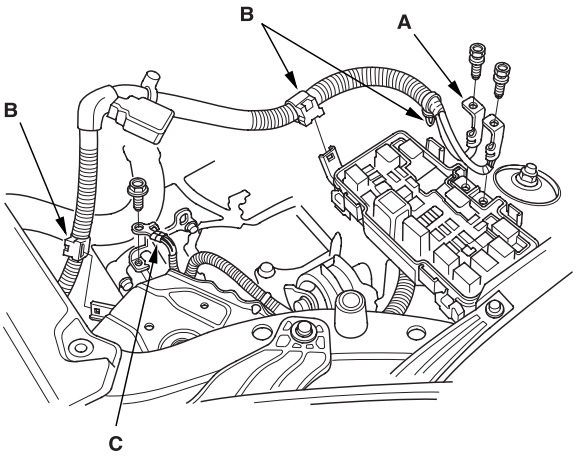
6. Remove the intake air duct.



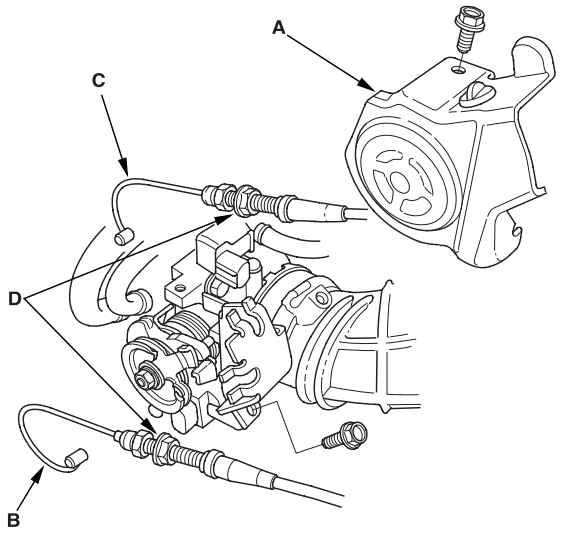
(cont'd)

Engine Removal (cont'd)

7. Remove the battery cables (A) from the under-hood fuse/relay box, then remove the harness clamps (B) and ground cable (C).

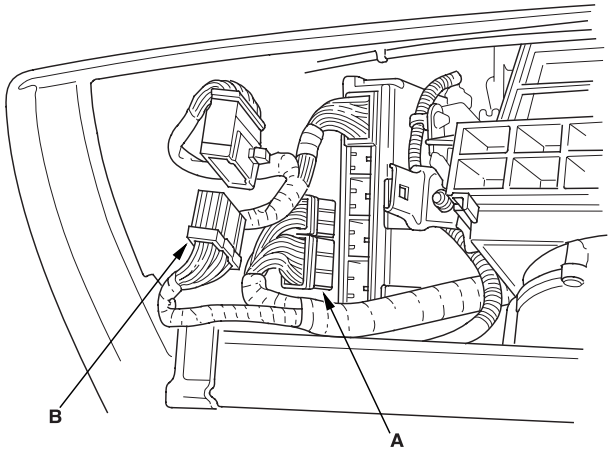


8. Remove the throttle cover (A). Fully open the throttle link and cruise control link by hand, then remove the throttle cable (B) and cruise control cable (C) from the links. Loosen the locknuts (D), and remove the cables from the bracket.

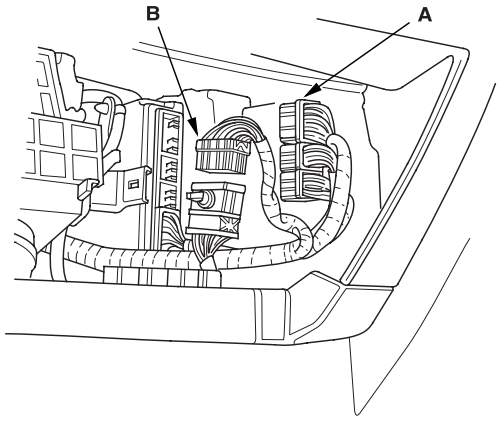


9. Disconnect the Engine Control Module (ECM)/ Powertrain Control Module (PCM) connectors (A) and main wire harness connector (B).

LHD models:

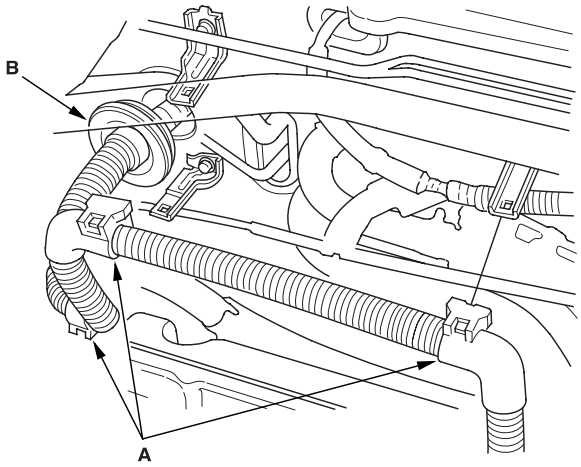


RHD models:

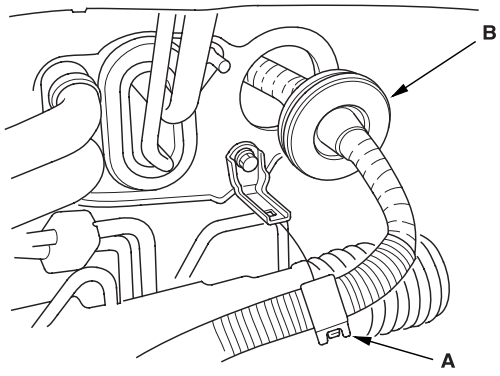


10. Remove the harness clamps (A) and grommet (B), then pull the engine wire harness through the bulkhead.

LHD models:



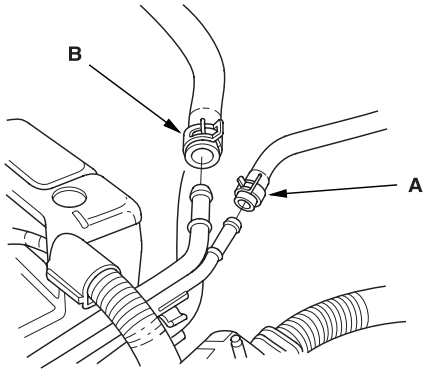
RHD models:



11. Relieve fuel pressure (see page 11-154).

12. Disconnect the fuel feed hose (see page 11-161).

13. Remove the Evaporative Emission (EVAP) canister hose (A) and brake booster vacuum hose (B).

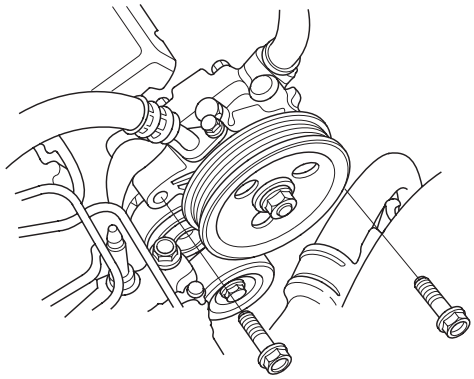


14. Remove the clutch slave cylinder and clutch line bracket (M/T) (see page 12-6).

15. Remove the shift cable and select cable (M/T) (see step 7 on page 13-5).

16. Remove the drive belt (see page 04-30).

17. Remove the Power Steering (P/S) pump without disconnecting the P/S hoses.



(cont'd)

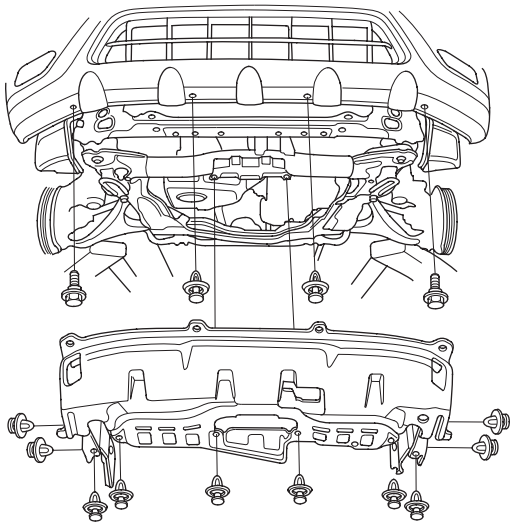
Engine Removal (cont'd)

18. Remove the radiator cap.

19. Raise the hoist to full height.

20. Remove the front tires/wheels.

21. Remove the splash shield.



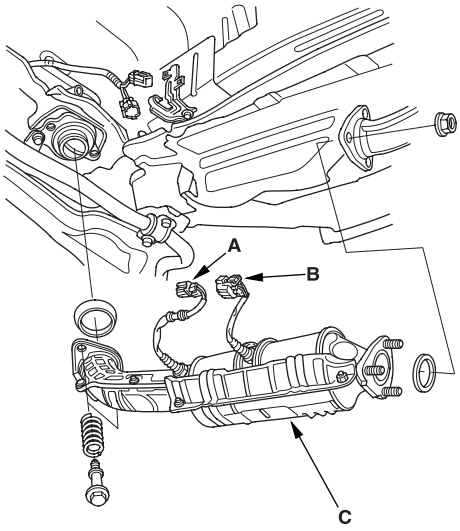
22. Loosen the drain plug in the radiator, drain the engine coolant (see page 10-6).

23. Drain the transmission fluid:

- Manual transmission (see page 13-4).
- Automatic transmission (see page 14-131).

24. Drain the engine oil (see page 08-5).

25. Disconnect the primary Heated Oxygen Sensor (primary HO2S) connector (A) (Except K20A5 engine).



26. Disconnect the secondary Heated Oxygen Sensor (secondary HO2S) connector (B) (KE, KG, KS, KR, KU, KZ, KQ, FO models).

27. Remove the Three Way Catalytic Converter (TWC) assembly (C) (K20A4, K24A1 engines) or exhaust chamber (C) (K20A5 engine).

28. Separate the propeller shaft from the transfer (4WD models) (see page 13-64).

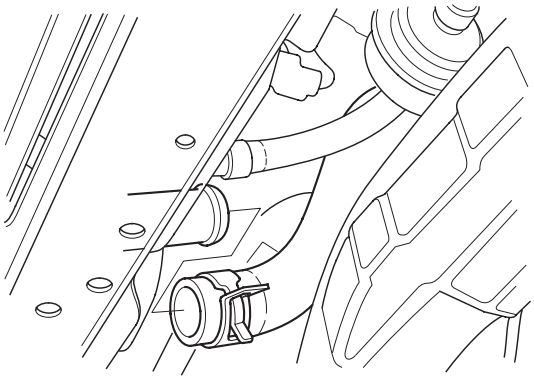
29. Disconnect the stabilizer links (see page 18-18).

30. Disconnect the suspension lower arm ball joints (see page 18-20).

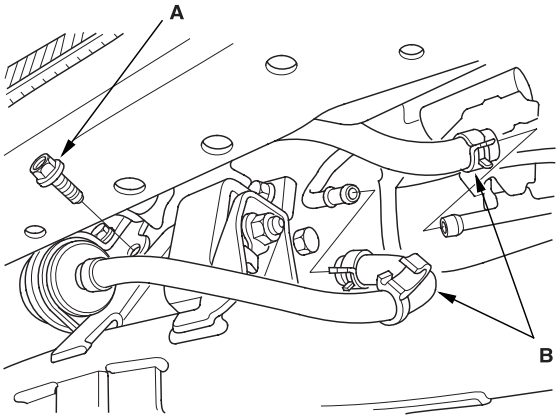
31. Remove the driveshafts (see page 16-3). Coat all precision finished surfaces with clean engine oil. Tie plastic bags over the driveshaft ends.

32. Remove the shift cable (A/T) (see page 14-157).

33. Remove the lower hose.



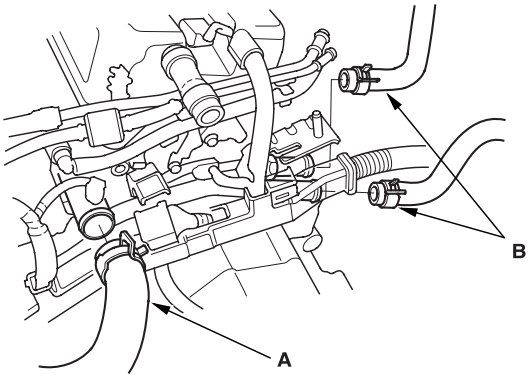
34. Remove the ATF filter mounting bolt (A) (A/T).



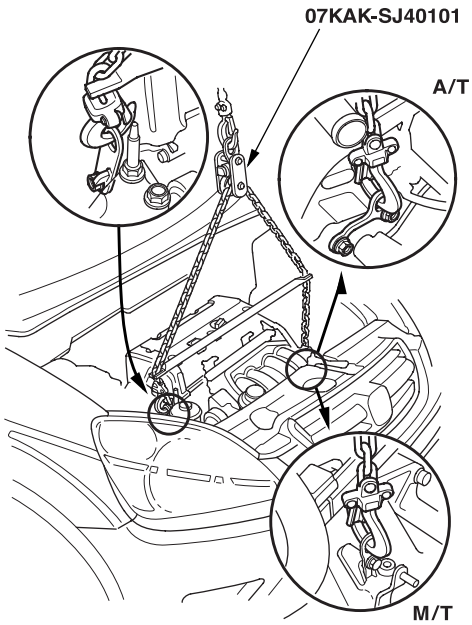
35. Remove the ATF cooler hoses (B), then plug the ATF cooler hoses and lines (A/T).

36. Lower the hoist.

37. Remove the upper hose (A) and heater hoses (B).



38. Attach the engine tilt hanger set (Commercially available tool for EU models) to the engine as shown.

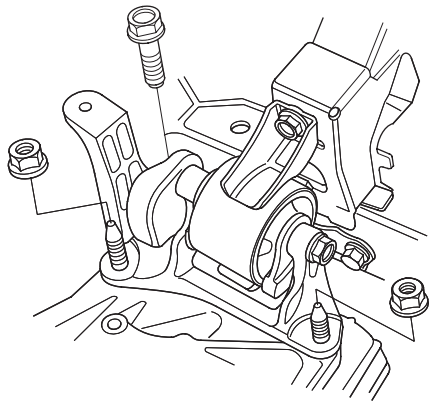


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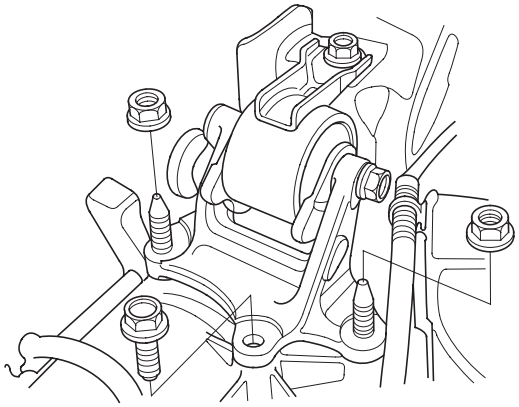
Engine Removal (cont'd)

39. Remove the transmission mount bracket support bolt/nuts.

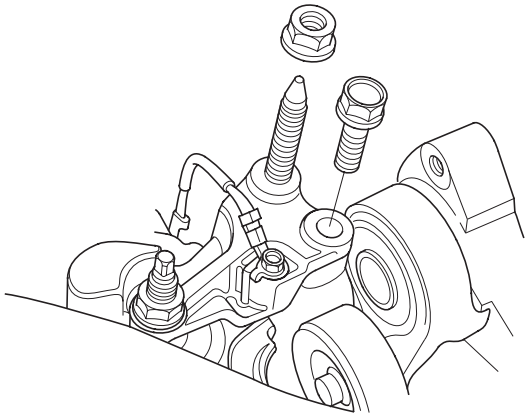
M/T:



A/T:

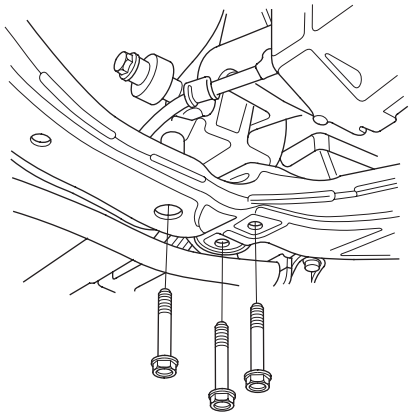


40. Remove the upper bracket mounting bolt and nut.

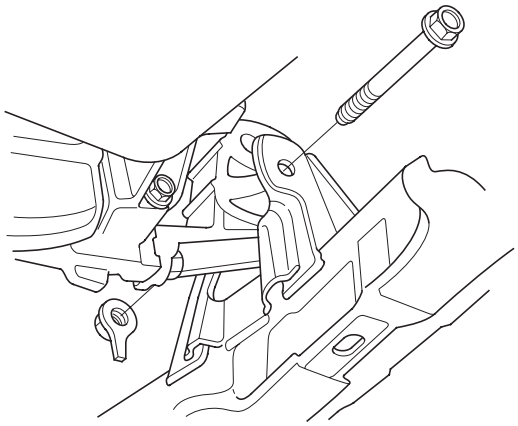


41. Make sure the hoist brackets are positioned properly. Raise the hoist to full height.

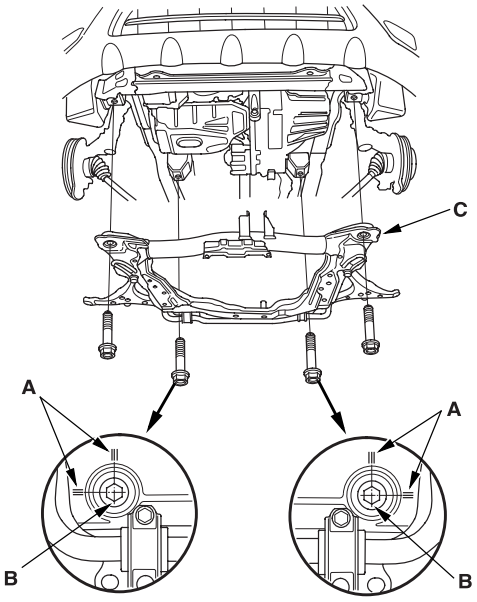
42. Remove the rear mount mounting bolts.



43. Remove the front mount mounting bolt.

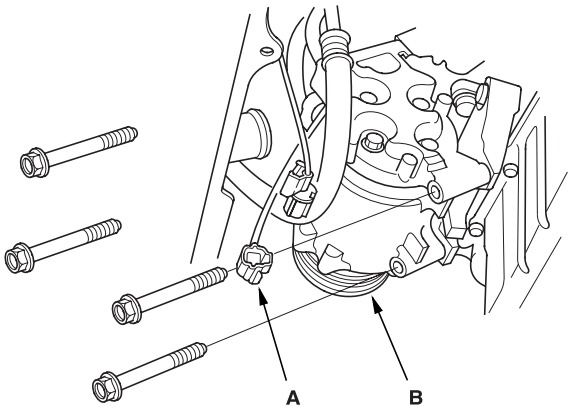


44. Use a marker to make alignment marks on the reference lines (A) that align with the centers of the rear sub-frame mounting bolts (B).



45. Remove the front sub-frame (C).

46. Disconnect the compressor clutch connector (A), then remove the A/C compressor (B) without disconnecting the A/C hoses.



47. Check that the engine/transmission is completely free of vacuum hoses, fuel and coolant hoses, and electrical wiring.

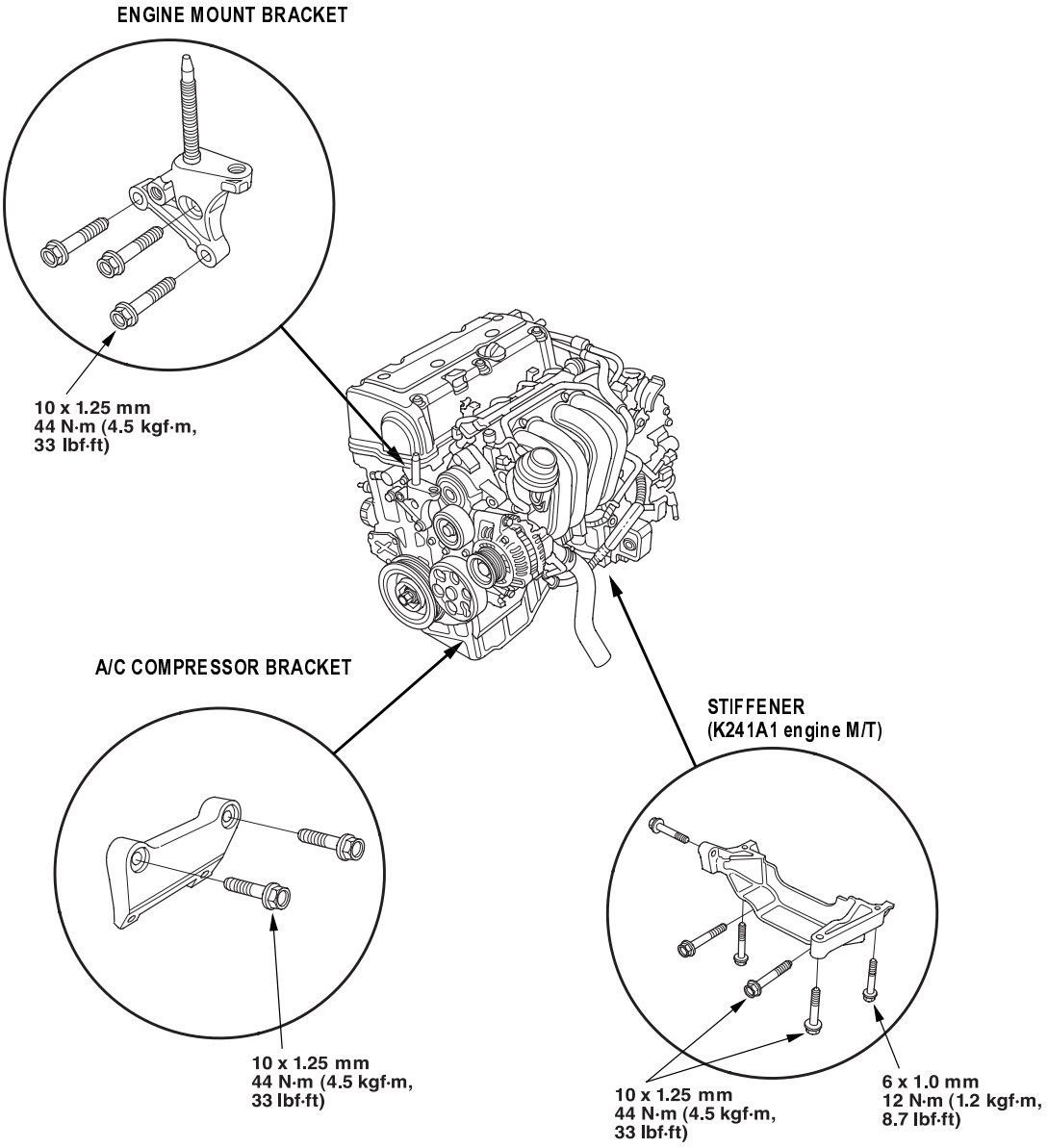
48. Slowly lower the engine about 150 mm (6 in.). Check once again that all hoses and wires are disconnected from the engine/transmission.

49. Lower the engine all the way. Remove the chain hoist from the engine.

50. Remove the engine from under the vehicle.

Engine Installation

1. Install the accessory brackets, and tighten their bolts and nuts to the specified torques.

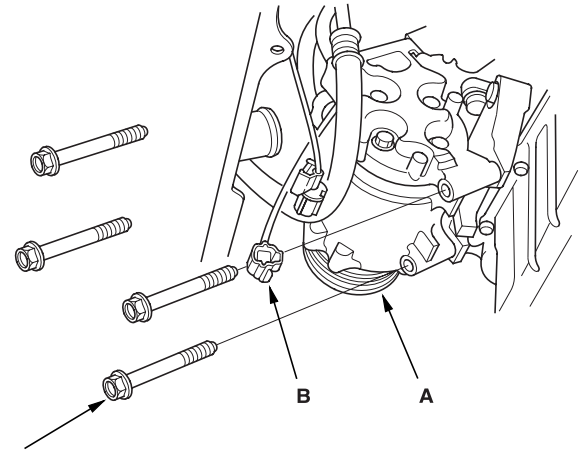


2. Position the engine under the vehicle. Attach the chain hoist to the engine, then lift the engine into position in the vehicle.

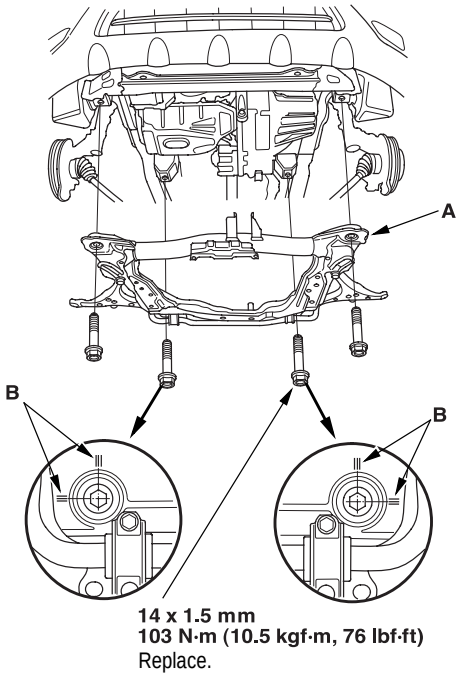
NOTICE

Reinstall the mounting bolts/support nuts in the sequence given. Failure to follow this sequence may cause excessive noise and vibration, and reduce bushing life.

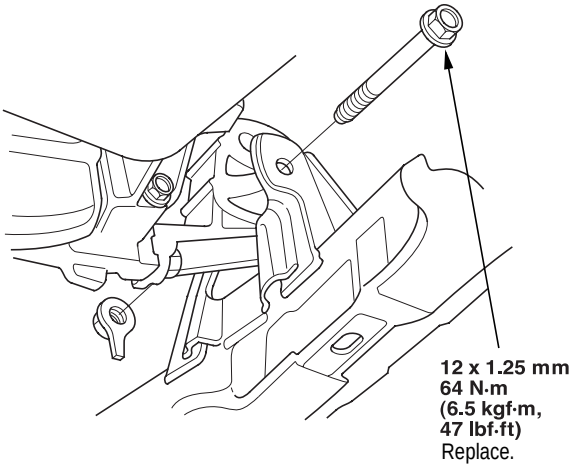
3. Install the A/C compressor (A), and connect the compressor clutch connector (B).



4. Install the sub-frame (A). Align the reference lines (B) on the sub-frame with the bolt head center, then tighten the bolts.



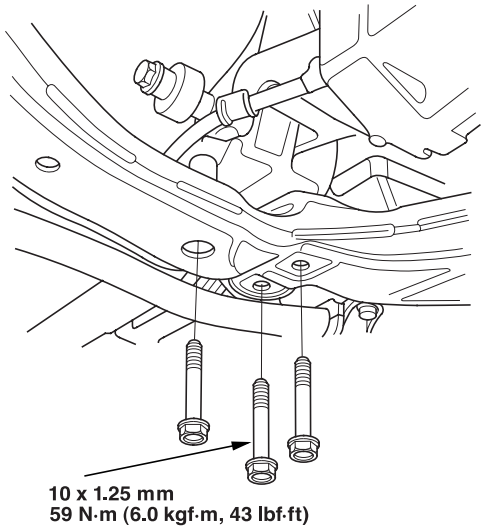
5. Tighten the front mount mounting bolt.



(cont'd)

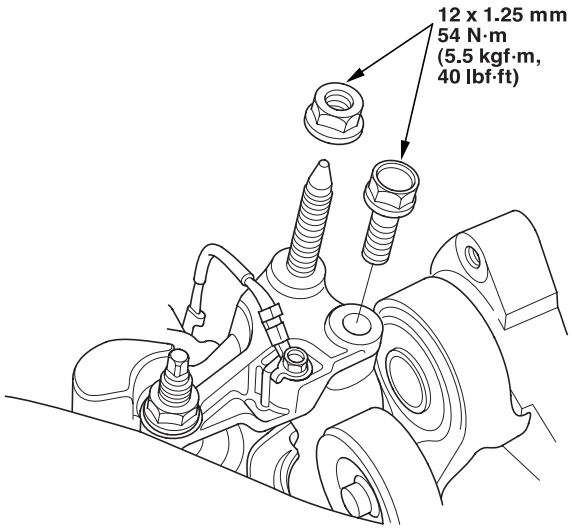
Engine Installation (cont'd)

6. Tighten the rear mount mounting bolts.



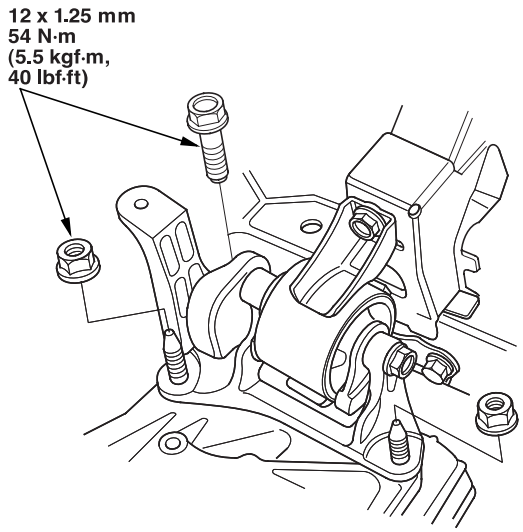
7. Lower the hoist.

8. Tighten the upper bracket mounting bolt and nut.

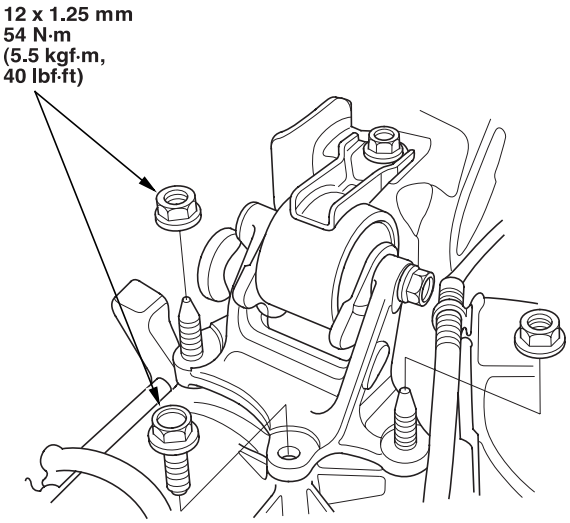


9. Tighten the transmission mount bracket support bolt/nuts.

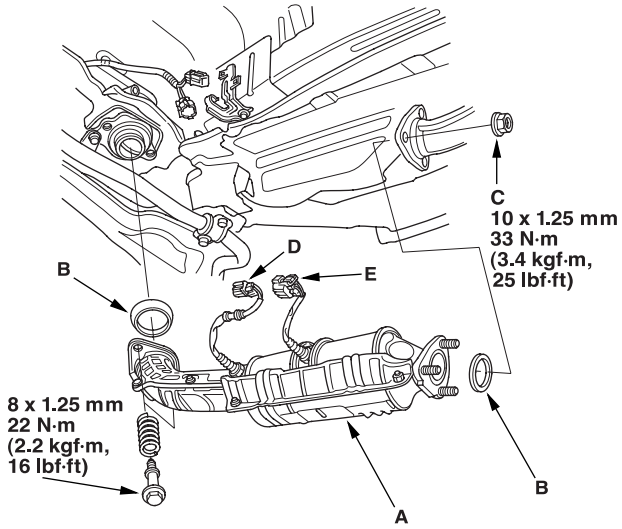
M/T:



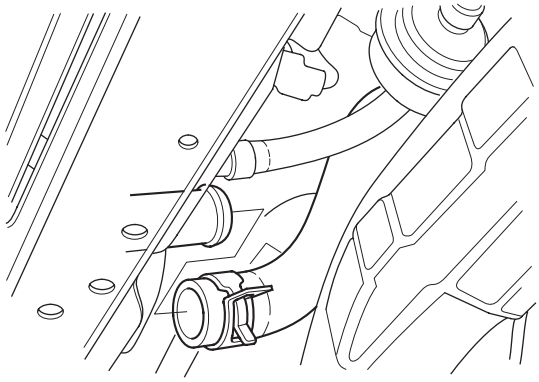
A/T:



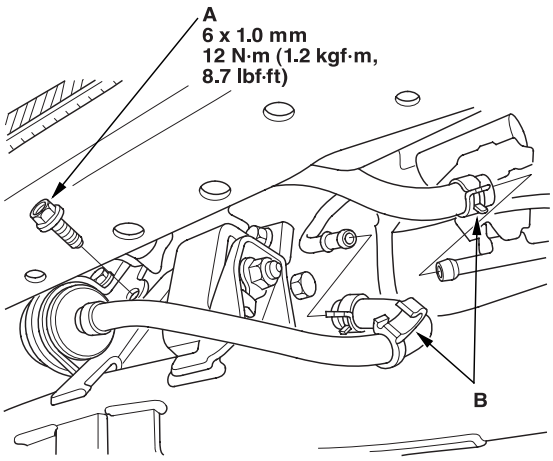
10. Remove the chain hoist from the engine.
11. Raise the hoist to full height.
12. Install a new set ring on the end of each driveshaft, then install the driveshafts. Make sure each ring ''clicks'' into place in the differential and intermediate shaft.
13. Connect the suspension lower arm ball joints (see page 18-20).
14. Connect the stabilizer links (see page 18-18).
15. Install the propeller shaft to the transfer (4WD) (see step 3 on (see page 13-64)).
16. Install the shift cable (A/T) (see page 14-157).
17. Install Three Way Catalytic Converter (TWC) assembly (A) (K20A4, K24A1 engines) or exhaust chamber (A) (K20A5 engine); use new gaskets (B) and new self locking nuts (C).



18. Connect the primary Heated Oxygen Sensor (primary HO2S) connector (D) (Except K20A5 engine).
19. Connect the secondary Heated Oxygen Sensor (secondary HO2S) connector (E) (KE, KG, KS, KR, KU, KZ, KQ, FO models)
20. Install the lower radiator hose.



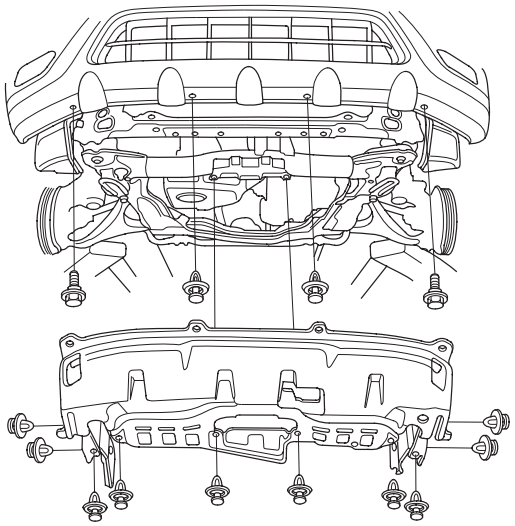
21. Tighten the Automatic Transmission Fluid (ATF) filter mounting bolt (A), and install the ATF cooler hoses (B) (A/T).



(cont'd)

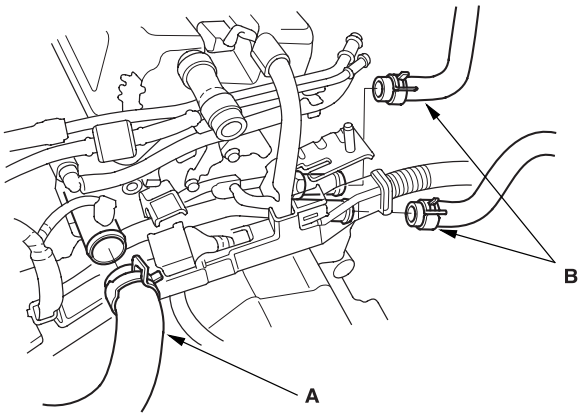
Engine Installation (cont'd)

22. Install the splash shield.

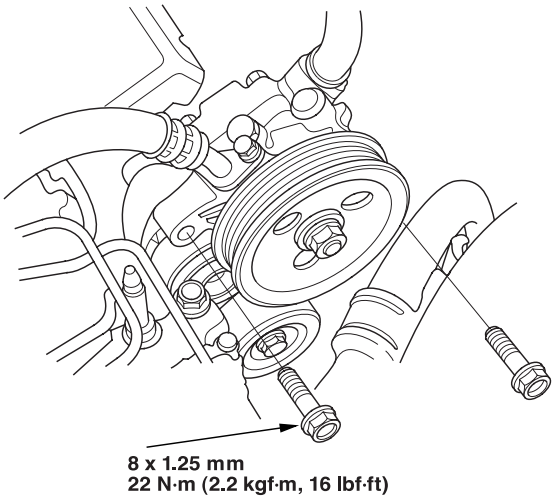


23. Lower the hoist.

24. Install the upper radiator hose (A) and heater hoses (B).



25. Install the Power Steering (P/S) pump.



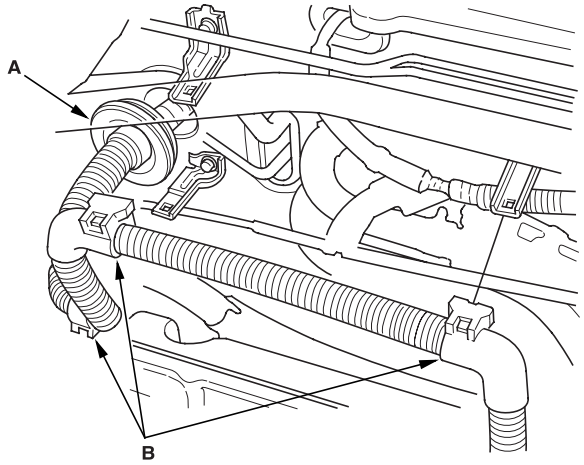
26. Install the drive belt.

27. Install the throttle cable (see page 11-184), then adjust the cable (see page 11-183).

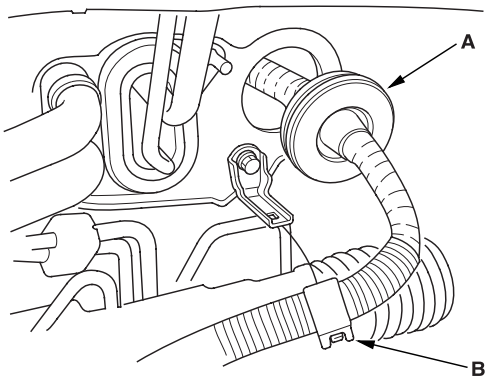
28. Install the cruise control cable, then adjust the cable (see page 04-49).

29. Push the Engine Control Module (ECM)/Power train Control Module (PCM) connectors through the bulkhead, then install the grommet (A).

LHD models:



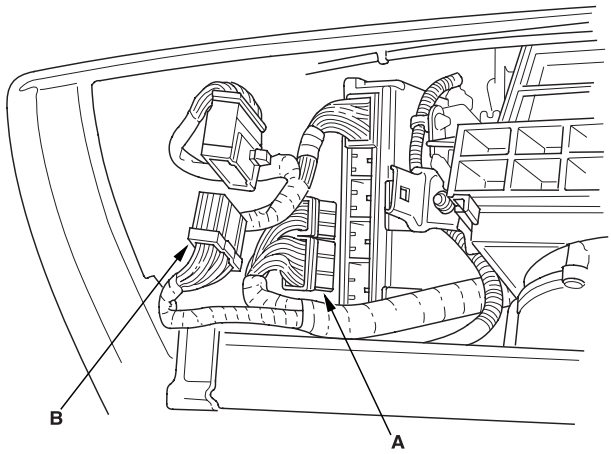
RHD models:



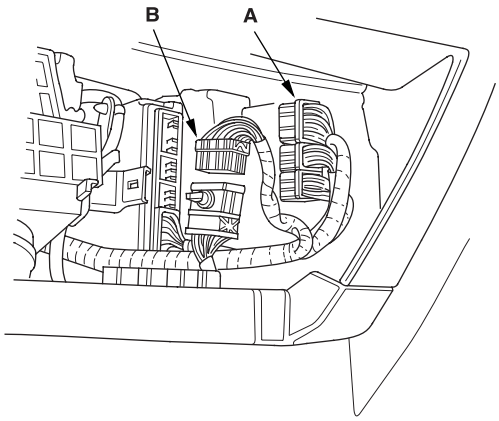
30. Install the harness clamps (B).

31. Connect the ECM/PCM connectors (A) and main wire harness connector (B).

LHD models:



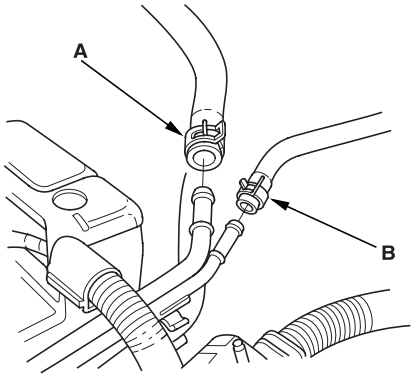
RHD models:



(cont'd)

Engine Installation (cont'd)

32. Install the brake booster vacuum hose (A) and the Evaporative Emission (EVAP) canister hose (B).

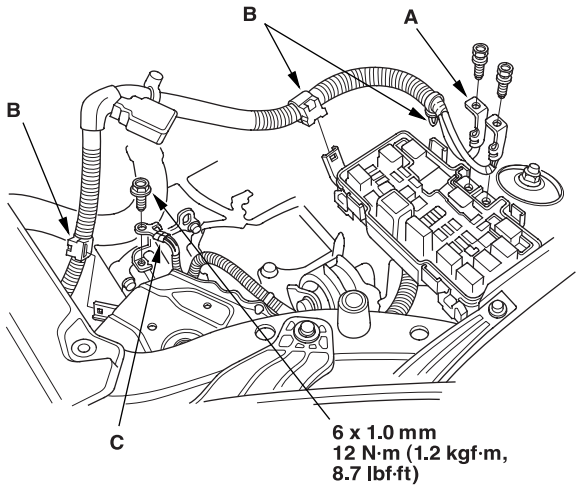


33. Connect the fuel feed hose (see page 11-162).

34. Install the select cable and shift cable (M/T) (see step 25 on page 13-14).

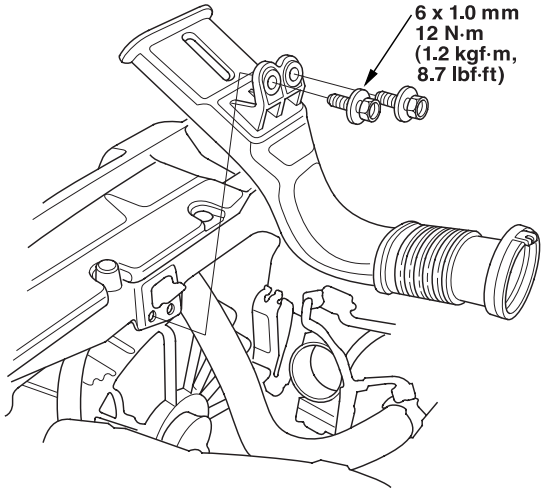
35. Install the clutch slave cylinder and clutch line bracket (M/T) (see step 24 on page 13-14).

36. Install the battery cables (A) on the under-hood fuse/relay box, then install the harness clamps (B).

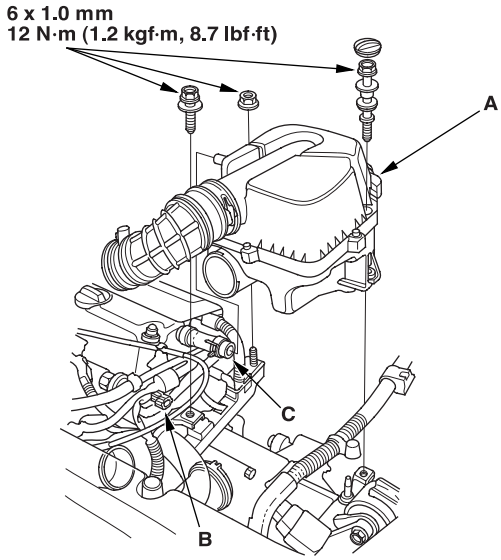


37. Install the ground cable (C).

38. Install the intake air duct.

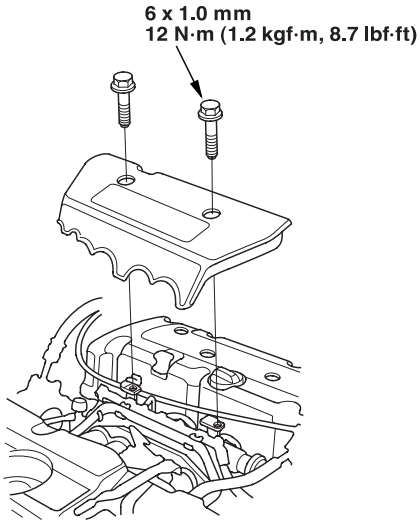


39. Install the air cleaner housing (A) and connect the Intake Air Temperature (IAT) sensor connector (B).



40. Install the breather hose (C).

41. Install the intake manifold cover.



42. Install the battery. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.

43. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch (A/T).

44. Check that the transmission shifts into gear smoothly (M/T).

45. Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so that the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.

46. Refill the engine with engine oil (see page 08-5).

47. Refill the transmission with fluid:

- Manual transmission (see page 13-4).
- Automatic transmission (see page 14-131).

48. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-6).

49. Inspect the idle speed (see page 11-148).

50. Inspect the ignition timing (see page 04-20).

51. Check the wheel alignment (see page 18-4).

06

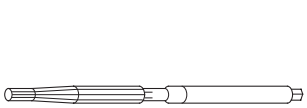
Engine Mechanical

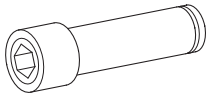
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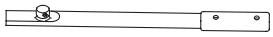
Cylinder Head

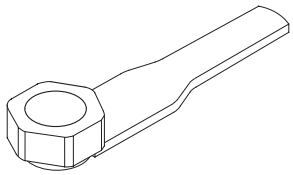
Special Tools

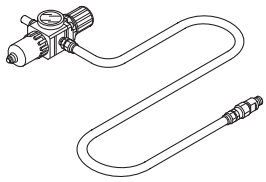
Ref. No.	Tool Number	Description	Qty
1	07HAH-PJ70100	Valve Guide Reamer, 5.525 mm	1
2	07JAA-0010200	Socket Wrench, 19 mm	1
3	07JAB-0010200	Handle	1
4	07JAB-0010400	Pulley Holder Attachment, HEX 50 mm	1
5	07LAJ-PR30101	Valve Inspection Set	1
6	07ZAJ-PNA0101	VTEC Air Adapter	2
7	07ZAJ-PNA0200	VTEC Air Stopper	1
8	07ZAJ-PNA0300	Air Joint Adapter	1
9	07ZAJ-PNA0400	Air Socket Adapter	1
10	07PAD-0010000	Stem Seal Driver	1
11	07742-0010100	Valve Guide Driver, 5.5 mm	1
12	07746-0010400	Driver Attachment, 52 x 55 mm	1
13	07749-0010000	Handle Driver	1
14	07757-PJ10100	Valve Spring Compressor Attachment	1
15	07757-0010000	Valve Spring Compressor	1

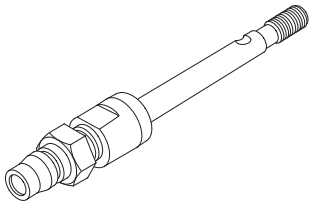

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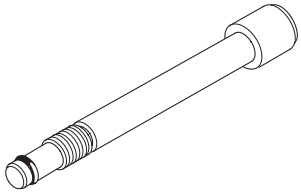

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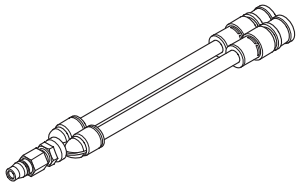

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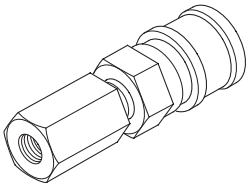

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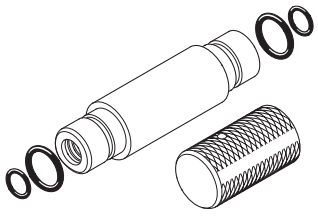

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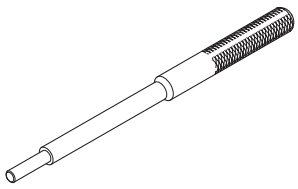

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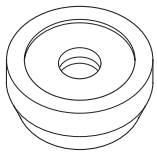

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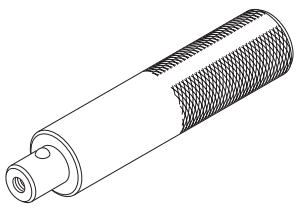

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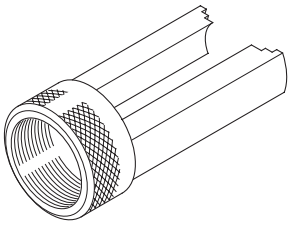

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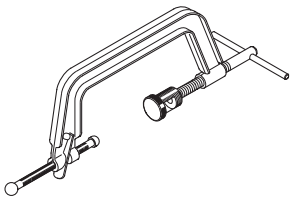

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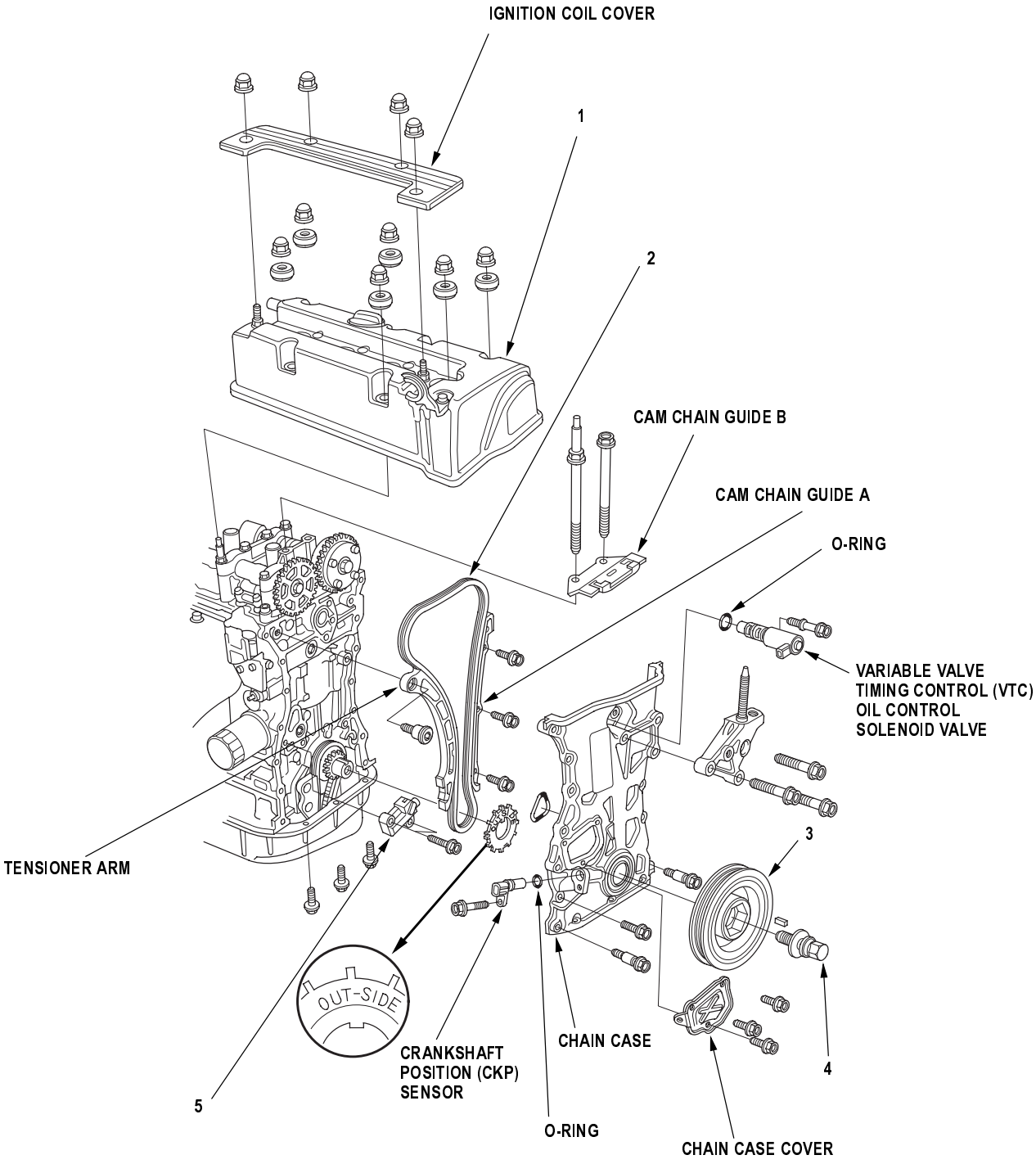

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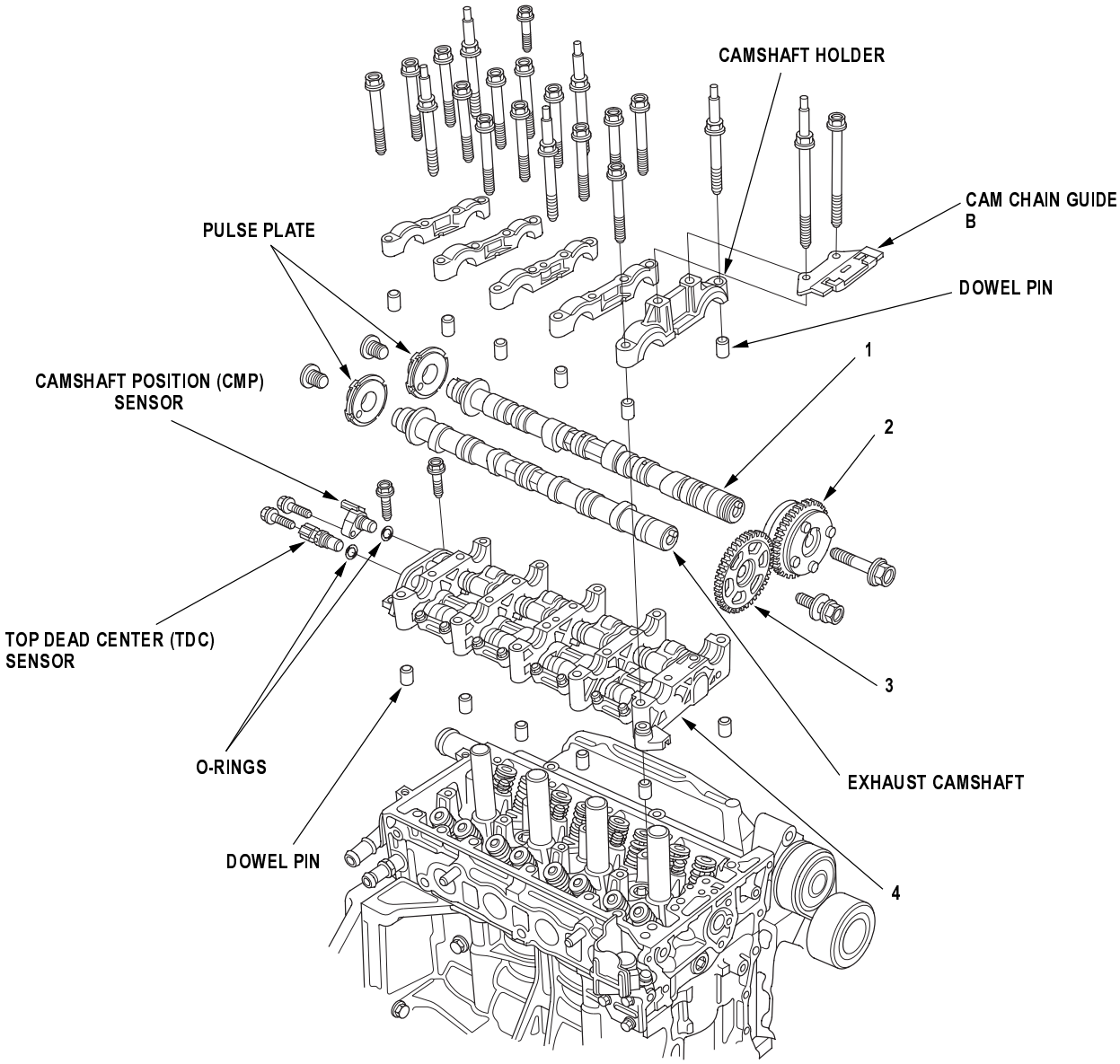
Component Location Index



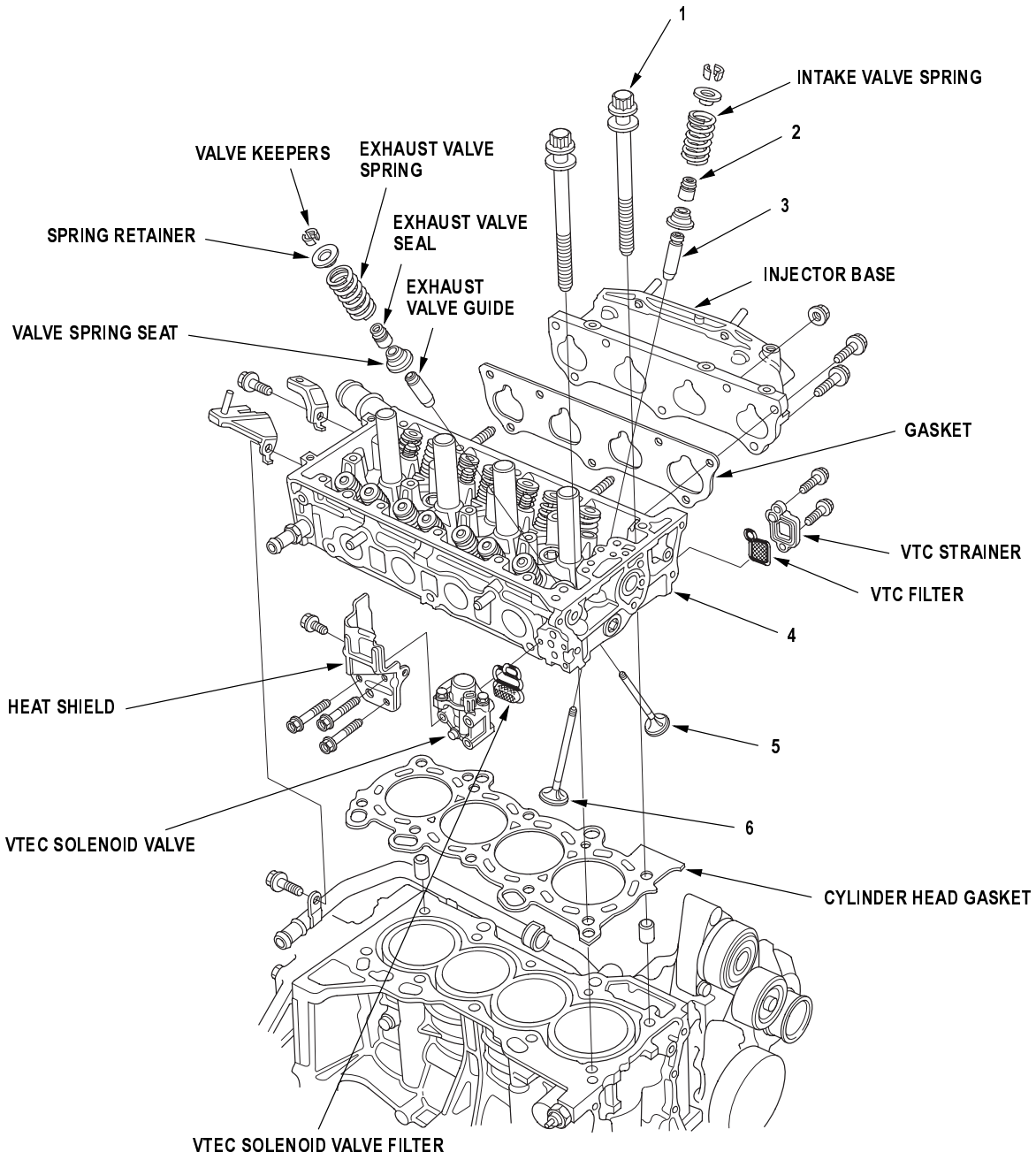
1	CYLINDER HEAD COVER	Removal, page 06-23 Installation, page 06-42
2	CAM CHAIN	Removal, page 06-12 Installation, page 06-15 Inspection, page 06-22
3	CRANKSHAFT PULLEY	Replacement, page 06-11
4	CRANKSHAFT PULLEY BOLT	Replacement, page 06-11
5	AUTO-TENSIONER	Replacement, page 06-19

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Component Location Index (cont'd)



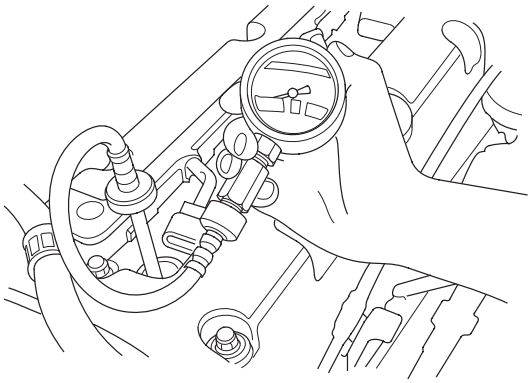
1	INTAKE CAMSHAFT	Inspection, page 06-30
2	VTC ACTUATOR	Removal, page 06-25 Installation, page 06-26
3	EXHAUST CAMSHAFT SPROCKET	Removal, page 06-25 Installation, page 06-26
4	ROCKER ARM ASSEMBLY	Overhaul, page 06-28 Inspection, page 06-29



1	CYLINDER HEAD BOLT	Inspection, page 06-40
2	INTAKE VALVE SPRING	Replacement, page 06-32
3	INTAKE VALVE GUIDE	Replacement, page 06-34
4	CYLINDER HEAD	Removal, page 06-34 Inspection, page 06-26 Installation, page 06-40
5	EXHAUST VALVE	Removal, page 06-32 Installation, page 06-38
6	INTAKE VALVE	Removal, page 06-32 Installation, page 06-38

Engine Compression Inspection

1. Warm up the engine to normal operating temperature (cooling fan comes on).
2. Turn the ignition switch OFF.
3. Remove the intake manifold cover (see step 1 on page 06-23).
4. Disconnect all four injector connectors.
5. Start the engine, and let it run until it stalls.
6. Remove the four ignition coils (see page 04-21).
7. Remove the four spark plugs.
8. Attach the compression gauge to the spark plug hole.



9. Connect a tachometer.
10. Open the throttle fully, then crank the engine with the starter motor and measure the compression.

    Compression Pressure:
    Above 930 kpa (9.5 kgf/cm² 135 psi)-250 rpm (min^{-1})

11. Measure the compression on the remaining cylinders.

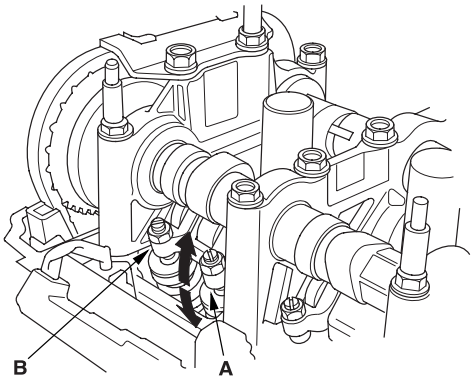
    Maximum variation:
    Within 200 kPa (2.0 kgf/cm², 28 psi)

12. If the compression is not within specifications, check the following items, then remeasure the compression.
    - Damaged or worn valves and seats
    - Damaged cylinder head gasket
    - Damaged or worn piston rings
    - Damaged or worn piston and cylinder bore

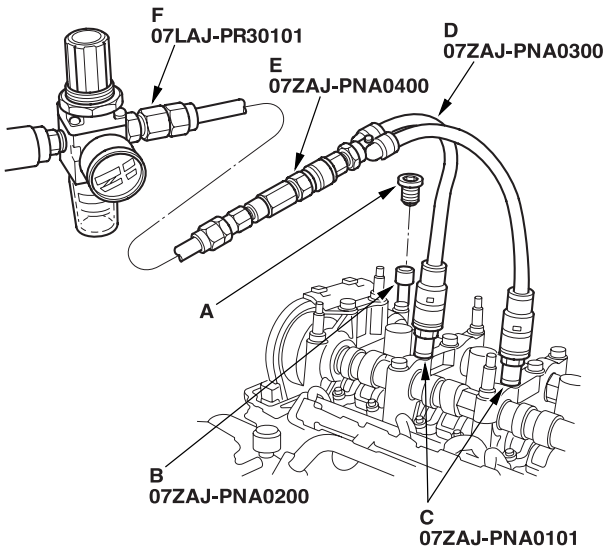
VTEC Rocker Arm Test

Special Tools Required
- Valve inspection set 07LAJ-PR30101
- VTEC air adapter 07ZAJ-PNA0101
- VTEC air stopper 07ZAJ-PNA0200
- Air joint adapter 07ZAJ-PNA0300
- Air socket adapter 07ZAJ-PNA0400

1. Remove the cylinder head cover (see page 06-23).
2. Set the No. 1 piston at Top Dead Center (TDC), (see step 1 on page 06-12).
3. Verify that the intake primary rocker arm (A) moves independently of the intake secondary rocker arm (B).
   - If the intake primary rocker arm does not move, remove the primary and secondary rocker arms as an assembly and check that the pistons in the secondary and primary rocker arms move smoothly. If any rocker arm needs replacing, replace the primary and secondary rocker arms as an assembly, and test.
   - If the intake primary rocker arm moves freely, go to step 4.



4. Repeat step 3 on the remaining intake primary rocker arms with each piston at TDC. When all the primary rocker arms pass the test, go to step 5.
5. Check that the air pressure on the shop air compressor gauge indicates over 400 kPa (4 kgf/cm², 57 psi).
6. Inspect the valve clearance (see page 06-9).
7. Remove the sealing bolt (A) from the relief hole, and install the VTEC air stopper (B).



8. Remove the No. 2 and No. 3 camshaft holder bolts, and install the VTEC air adapters (C) finger-tight.
9. Connect the air joint adapter (D), air socket adapter (E), and valve inspection set (F).

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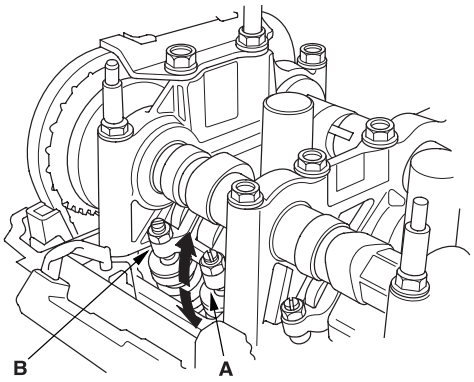
VTEC Rocker Arm Test (cont'd)t

10. Loosen the valve on the regulator, and apply the specified air pressure.

    Specified air pressure:
    290 kPa (3.0m kgf/cm², 42 psi)

    NOTE: If the synchronizing piston does not move after applying air pressure; move the primary or secondary rocker arm up and down manually by rotating the crankshaft clockwise.

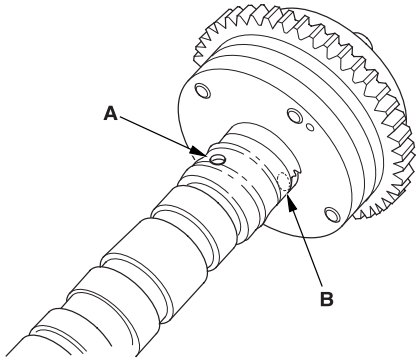
11. With the specified air pressure applied, move the intake primary rocker arm (A) for the No. 1 cylinder. The primary rocker arm and secondary rocker arm (B) should move together.
    - If the intake secondary rocker arm does not move, remove the primary and secondary rocker arms as an assembly and check that the pistons in the primary and secondary rocker arms move smoothly. If any rocker arm needs replacing, replace the primary and secondary rocker arms as an assembly, and test.



12. Remove the special tools.
13. Tighten the camshaft holder mounting bolts to 22 N·m (2.2 kgf·m, 16 lbf·ft).
14. Tighten the sealing bolt to 20 N·m (2.0 kgf·m, 14 lbf·ft).
15. Install the cylinder head cover (see page 06-42).

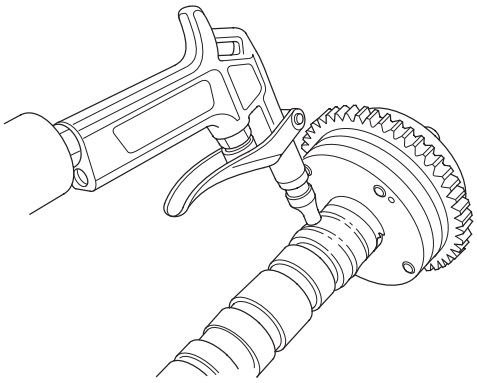
VTC Actuator Inspection

1. Remove the cylinder head cover (see page 06-23).
2. Remove the auto-tensioner (see page 06-19).
3. Loosen the rocker arm adjusting screws (see step 2 on page 06-27).
4. Remove the camshaft holder (see step 3 on page 06-27).
5. Remove the intake camshaft.
6. Check that the Variable Valve Timing Control (VTC) actuator is locked by turning the VTC actuator clockwise and counterclockwise. If the VTC actuator is not locked, replace the VTC actuator.
7. Seal the advance holes (A) and retard holes (B) in the No. 1 camshaft journal with the tape.

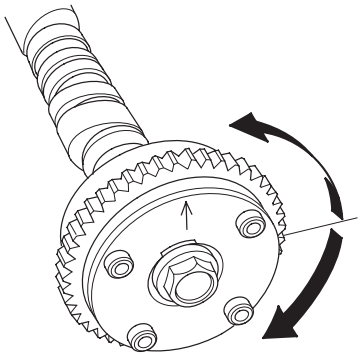


8. Punch a hole in the tape over one of the advance holes.

9. Apply air to the advance hole to release the lock.



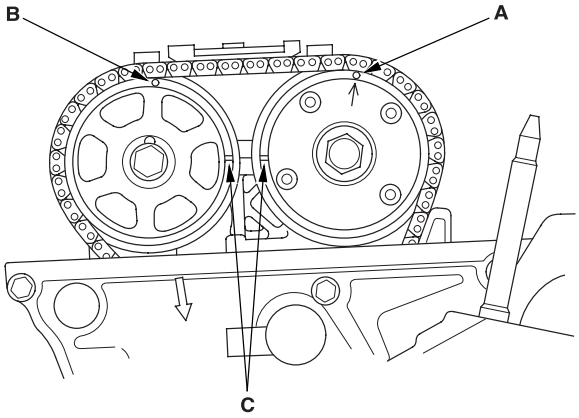
10. Check that the VTC actuator moves smoothly. If the VTC actuator does not move smoothly, replace the VTC actuator.



Valve Clearance Adjustment

NOTE: Adjust the valves only when the cylinder head temperature is less than 38°C (100°F).

1. Remove the cylinder head cover (see page 06-23).
2. Set the No. 1 piston at Top Dead Center (TDC). The punch mark (A) marked with an arrow on the Variable Valve Timing Control (VTC) actuator and the punch mark (B) on the exhaust camshaft sprocket should be at the top. Align the TDC marks (C) on the VTC actuator and exhaust camshaft sprocket.



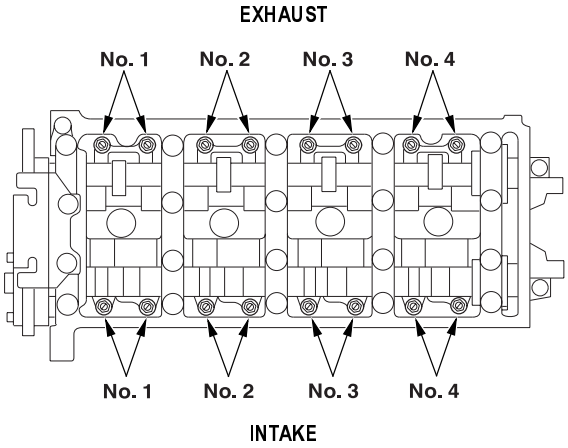
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Valve Clearance Adjustment (cont'd)

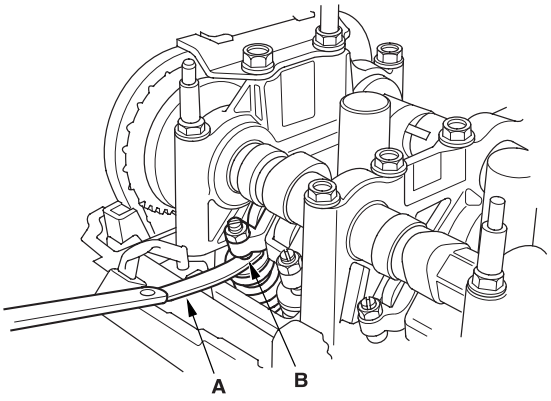
3. Select the correct thickness feeler gauge for the valves you're going to check.

Intake: 0.21 - 0.25 mm (0.008 - 0.010 in.)
Exhaust: 0.28 - 0.32 mm (0.011 - 0.013 in.)

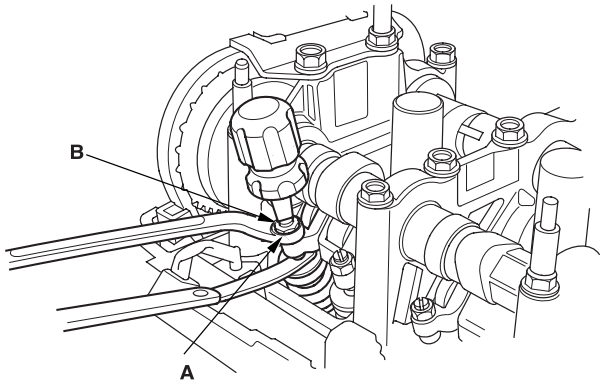
Adjusting screw locations:



4. Insert the feeler gauge (A) between the adjusting screw (B) and the end of the valve stem and slide it back and forth; you should feel a slight amount of drag.

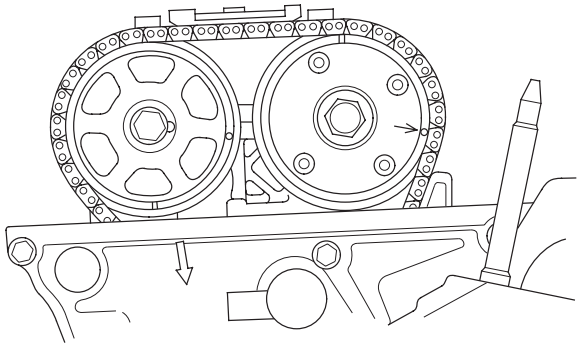


5. If you feel too much or too little drag, loosen the locknut (A), and turn the adjusting screw (B) until the drag on the feeler gauge is correct.



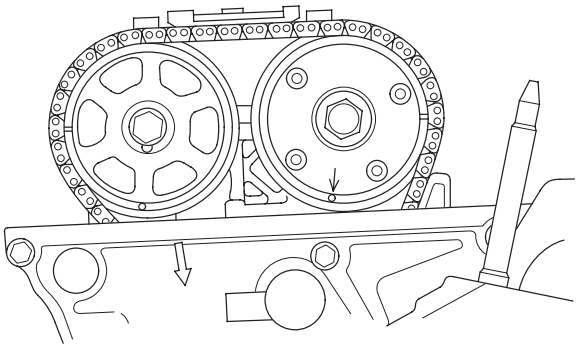
6. Tighten the locknut and recheck the clearance. Repeat the adjustment if necessary.

7. Rotate the crankshaft 180° clockwise (camshaft pulley turns 90°).

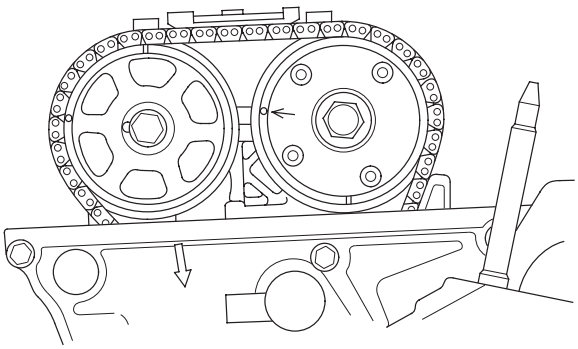


8. Check and, if necessary, adjust the valve clearance on No. 3 cylinder.

9. Rotate the crankshaft 180° clockwise camshaft pulley turns 90°).



10. Check and, if necessary, adjust the valve clearance on No. 4 cylinder.
11. Rotate the crankshaft 180°) clockwise (camshaft pulley turns 90°).



12. Check and, if necessary, adjust the valve clearance on No. 2 cylinder.
13. Install the cylinder head cover (see page 06-42).

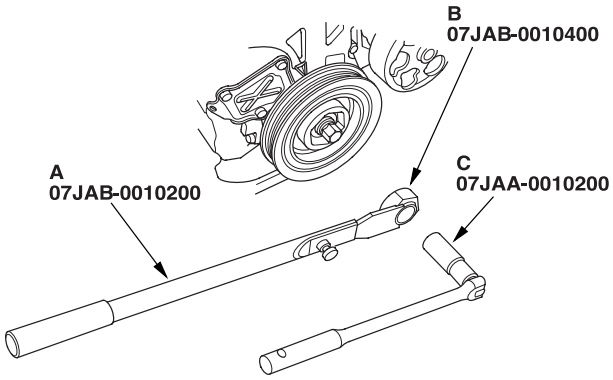
Crankshaft Pulley Removal and Installation

Special Tools Required

- Handle 07JAB-0010200
- Pulley holder attachment, HEX 50 mm 07JAB-0010400
- Socket wrench, 19 mm 07JAA-0010200

Removal

1. Remove front tires/wheels.
2. Remove the splash shield (see step 3 on page 06-12).
3. Hold the pulley with handle (A) and holder attachment (B).



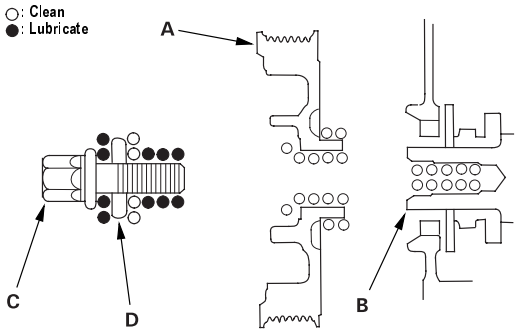
4. Remove the bolt with a 19 mm socket (C) and breaker bar.

(cont'd)

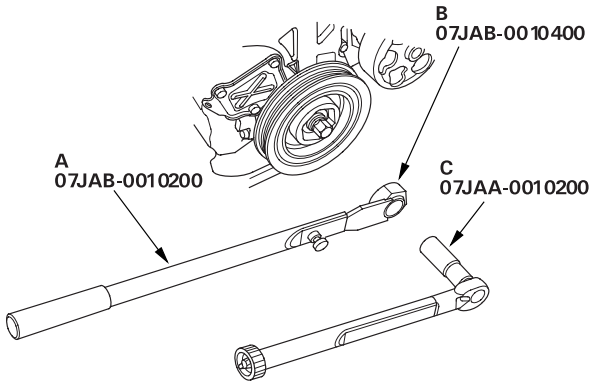
Crankshaft Pulley Removal and Installation (cont'd)

Installation

1. Clean the crankshaft pulley (A), crankshaft (B), bolt (C), and washer (D). Lubricate as shown below.



2. Install the crankshaft pulley, and hold the pulley with handle (A) and holder attachment (B).

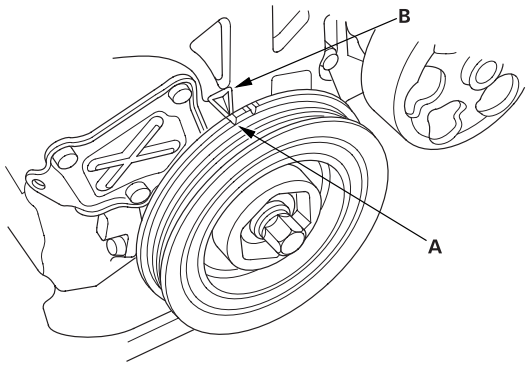


3. Tighten the bolt to 245 N·m (25.0 kgf·m, 181 lbf·ft) with a torque wrench and 19 mm socket (C). Do not use an impact wrench.
4. Install the splash shield (see step 24 on page 06-19).
5. Install front tires/wheels.

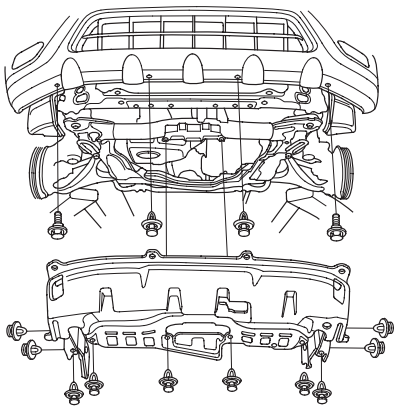
Cam Chain Removal

NOTE: Keep the cam chain away from magnetic fields.

1. Turn the crankshaft pulley so its Top Dead Center (TDC) mark (A) lines up with the pointer (B).

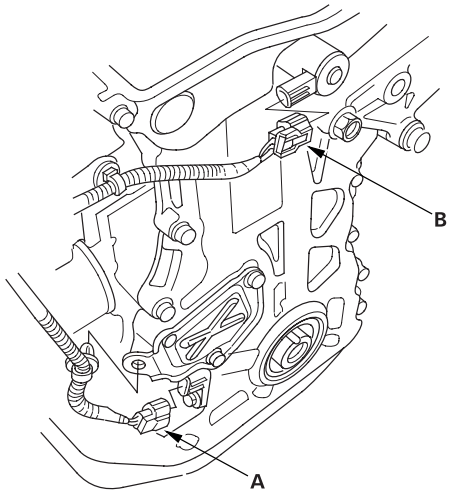


2. Remove the front tires/wheels.
3. Remove the splash shield.

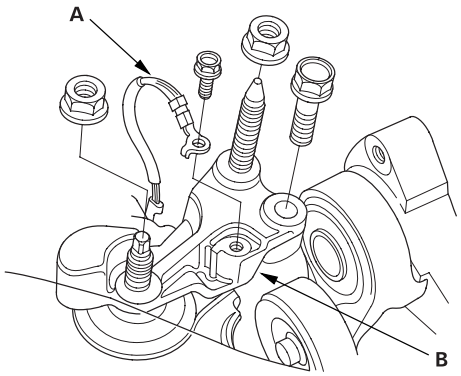


4. Remove the drive belt (see page 04-29).
5. Remove the cylinder head cover (see page 06-23).
6. Remove the crankshaft pulley (see page 06-11).

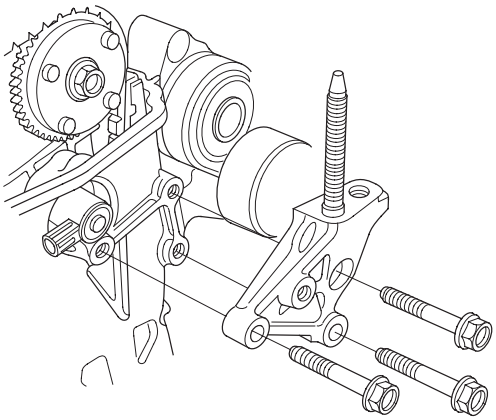
7. Disconnect the Crankshaft Position (CKP) sensor connector (A) and Variable Valve Timing Control (VTC) oil control solenoid valve connector (B).



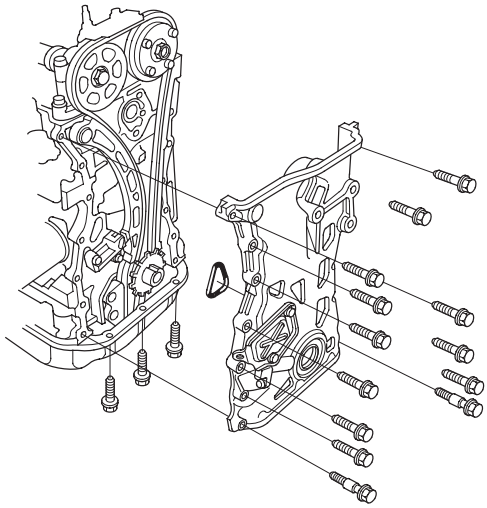
8. Remove the VTC oil control solenoid valve (see step 1 on page 11-137).
9. Support the engine with a jack and wood block under the oil pan.
10. Remove the ground cable (A), and remove the upper bracket (B).



11. Remove the side engine mount bracket.



12. Remove the chain case.

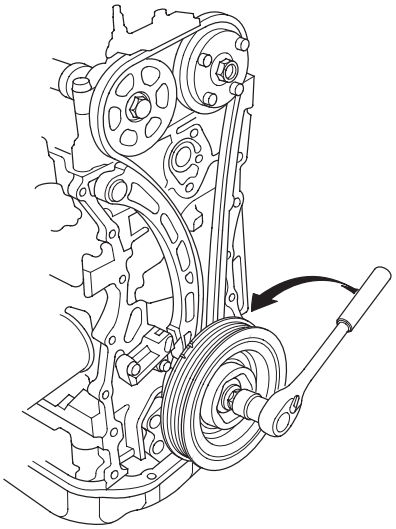


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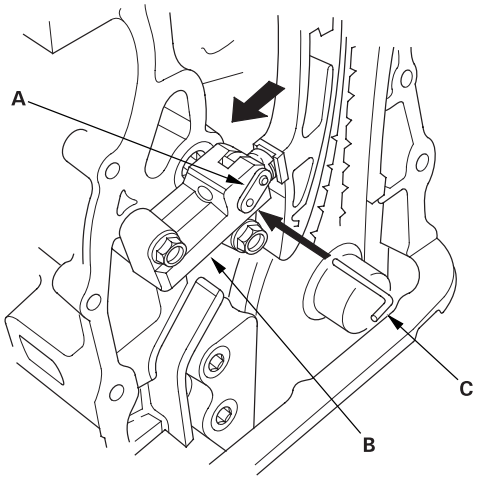
Cam Chain Removal (cont'd)

13. Loosely install the crankshaft pulley.

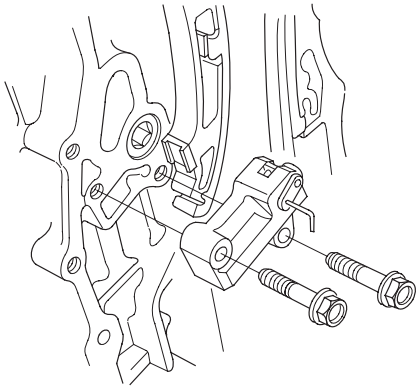
14. Turn the crankshaft counterclockwise to compress the auto-tensioner.



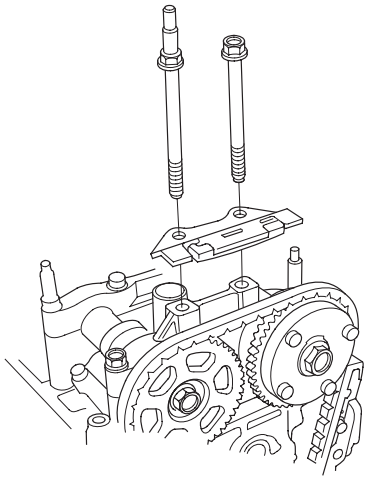
15. Align the holes on the lock (A) and the auto-tensioner (B), then insert a 1.5 mm (0.06 in.) diameter pin (C) into the holes. Turn the crankshaft clockwise to secure the pin.



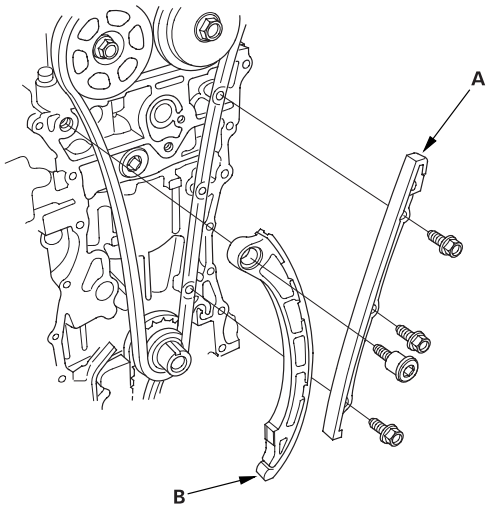
16. Remove the auto-tensioner.



17. Remove the cam chain guide B.



18. Remove the cam chain guide A (A) and tensioner arm (B).

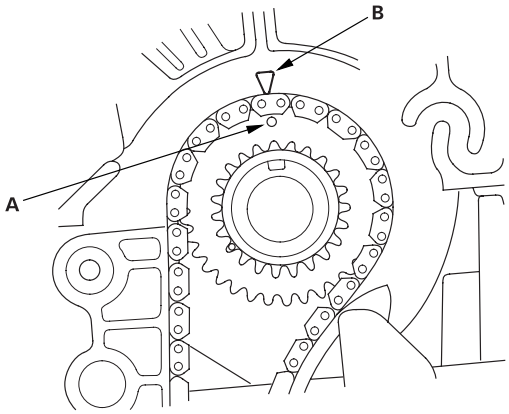


19. Remove the cam chain.

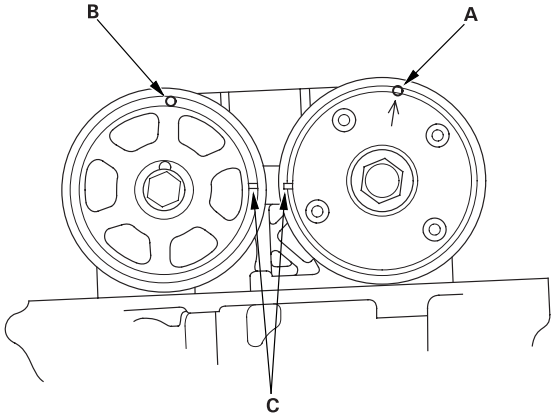
Cam Chain Installation

NOTE: Keep the cam chain away from magnetic fields.

1. Set the crankshaft to Top Dead Center (TDC). Align the TDC mark (A) on the crankshaft sprocket with the pointer (B) on the cylinder block.



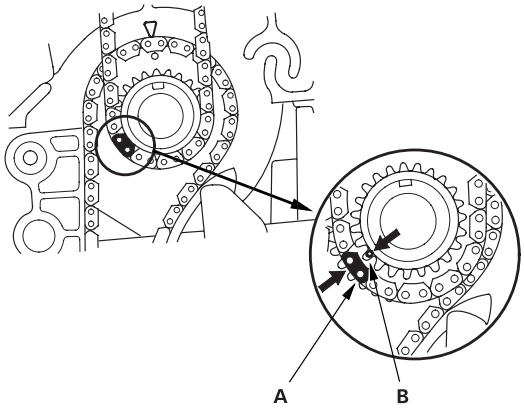
2. Set the camshafts to TDC. The punch mark (A) marked with an arrow on the Variable Valve Timing Control (VTC) actuator and the punch mark (B) on the exhaust camshaft sprocket should be at the top. Align the TDC marks (C) on the VTC actuator and exhaust camshaft sprocket.



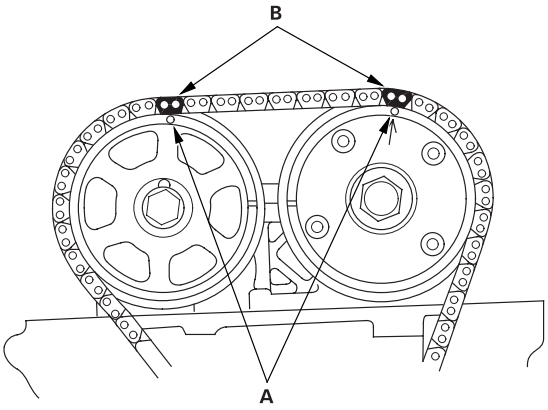
(cont'd)

Cam Chain Installation (cont'd)

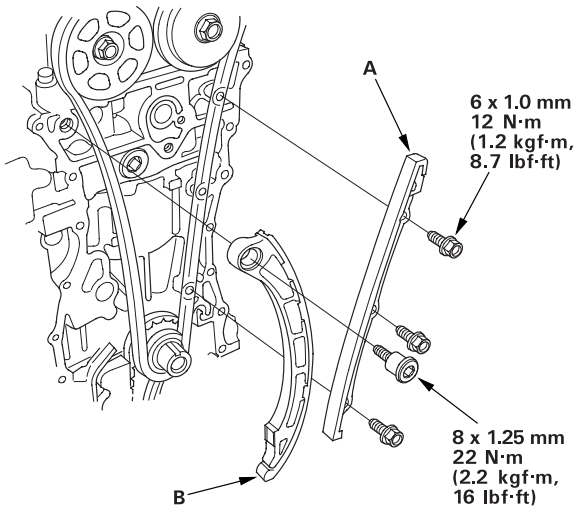
3. Install the cam chain on the crankshaft sprocket with the colored piece (A) aligned with the punch mark (B) on the crankshaft sprocket.



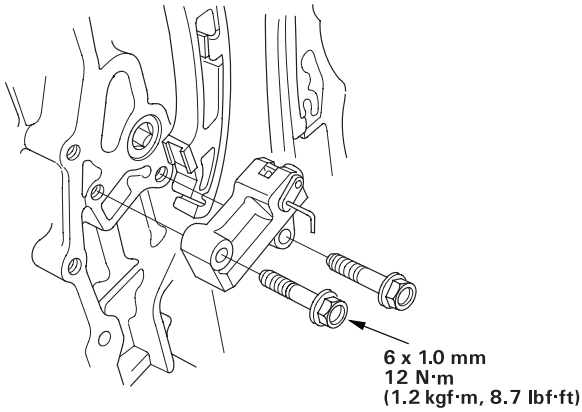
4. Install the cam chain on the VTC actuator and exhaust camshaft sprocket with the punch marks (A) aligned with the two colored pieces (B).



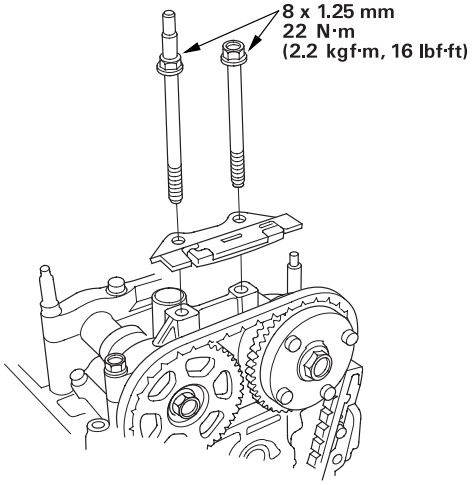
5. Install the cam chain guide A (A) and tensioner arm (B).



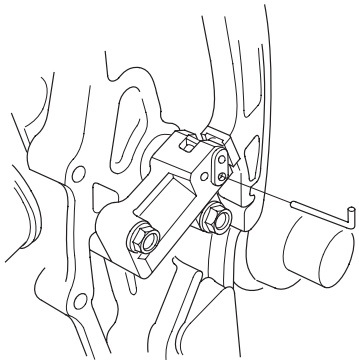
6. Install the auto-tensioner.



7. Install the cam chain guide B.



8. Remove the pin from the auto-tensioner.

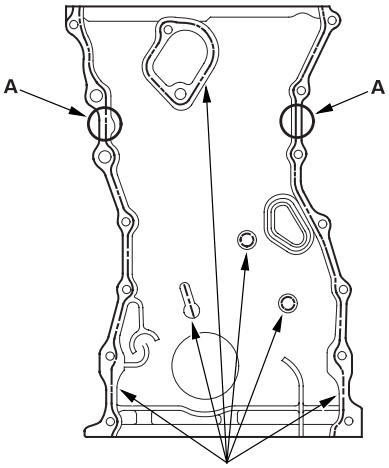


9. Check the chain case oil seal for damage. If the oil seal is damaged, replace the chain case oil seal (see page 06-21).

10. Remove old liquid gasket from the chain case mating surfaces, bolts, and bolt holes.

11. Clean and dry the chain case mating surfaces.

12. Apply liquid gasket, P/N 08C70-K0234M, 08C70-K0334M or 08C70-X0331S, evenly to the cylinder block mating surface of the chain case and to the inner threads of the holes.

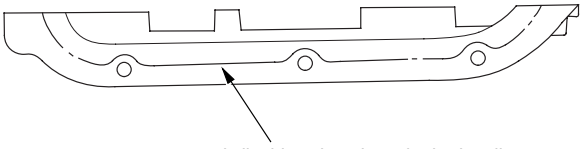


Apply liquid gasket along the broken line.

13. Apply liquid gasket to the cylinder block upper surface contact areas (A) on the chain case.

14. Apply liquid gasket, P/N 08C70-K0334M or 08C70-X0331S, evenly to the oil pan mating surface of the chain case and to the inner threads of the holes.

NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.



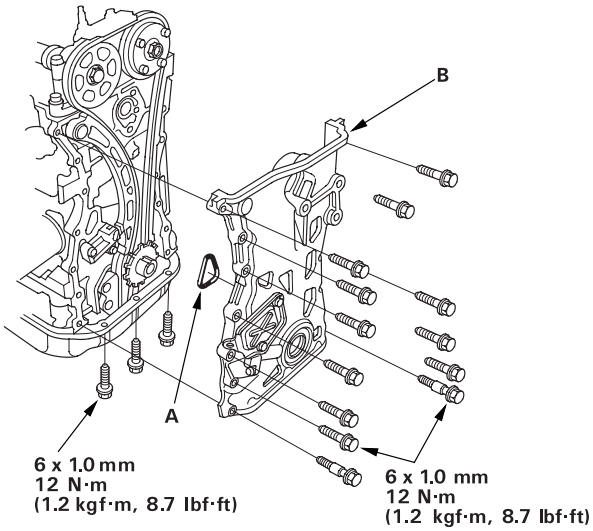
Apply liquid gasket along the broken line.

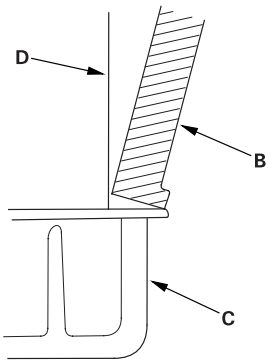
(cont'd)

Cam Chain Installation (cont'd)

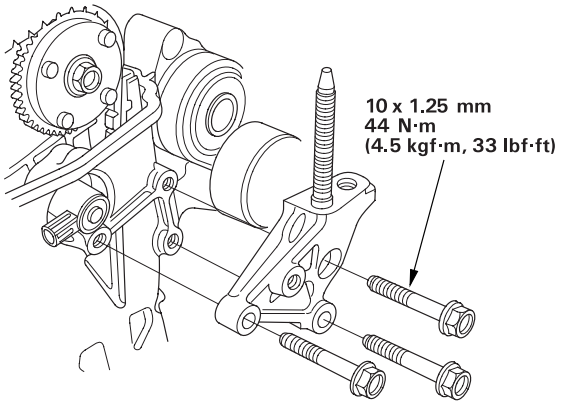
15. Install the new O-ring (A) on the chain case. Set the edge of the chain case (B) to the edge of the oil pan (C), then install the chain case on the cylinder block (D).

NOTE: When installing the chain case, do not slide the bottom surface on the oil pan mounting surface.

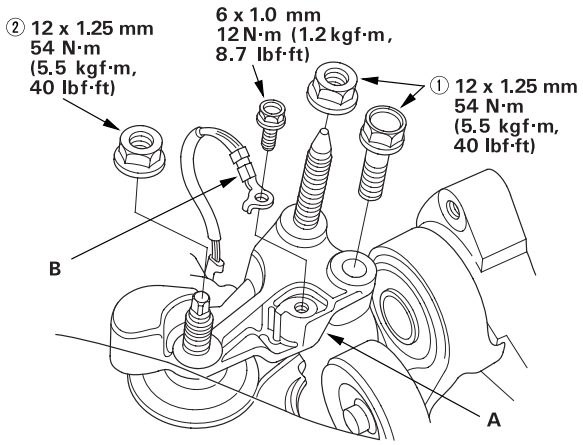




16. Install the side engine mount bracket.

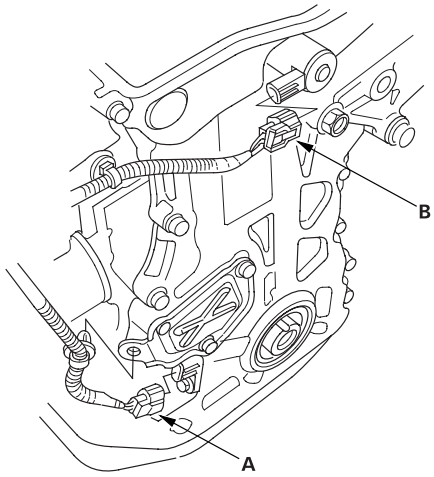


17. Install the upper bracket (A), then tighten the bolt/nuts in the numbered sequence shown.

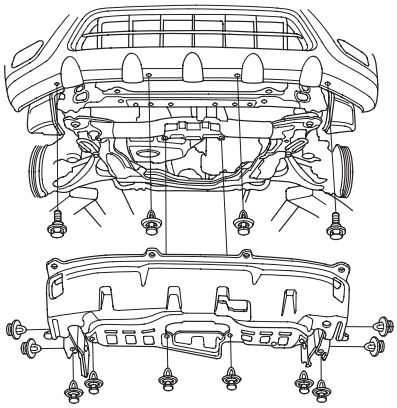


18. Install the ground cable (B).

19. Install the VTC oil control solenoid valve (see step 1 on page 11-137).
20. Connect the Crankshaft Position (CKP) sensor connector (A) and VTC oil control solenoid valve connector (B).



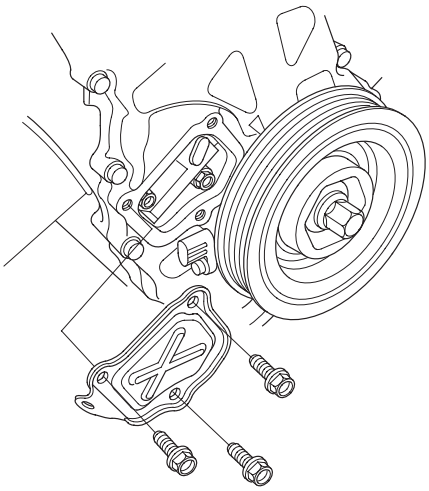
21. Install the crankshaft pulley (see page 06-11).
22. Install the cylinder head cover (see page 06-42).
23. Install the drive belt.
24. Install the splash shield.



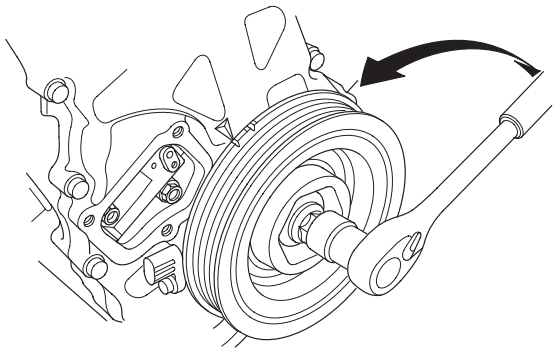
Auto-Tensioner Removal/Installation

Removal:

1. Remove the chain case cover.



2. Turn the crankshaft counterclockwise to compress the auto-tensioner.

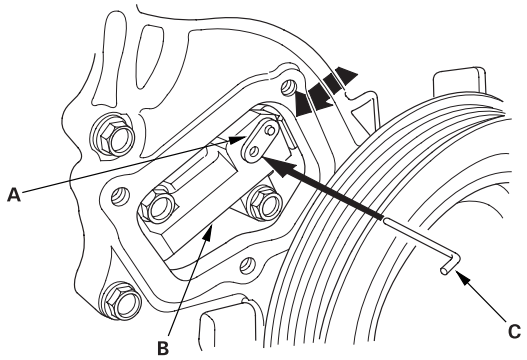


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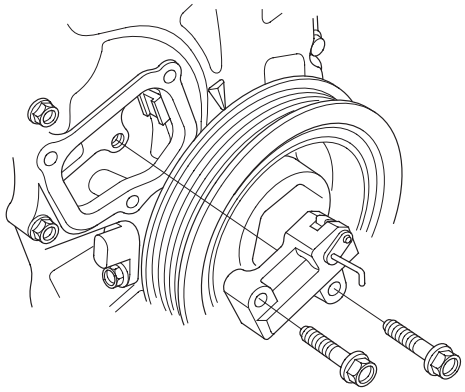
Auto-Tensioner Removal/Installation (cont'd)

Removal: (cont'd)

3. Align the holes on the lock (A) and the auto-tensioner (B), then insert a 1.5 mm (0.06 in.) diameter pin (C) into the holes. Turn the crankshaft clockwise to secure the pin.

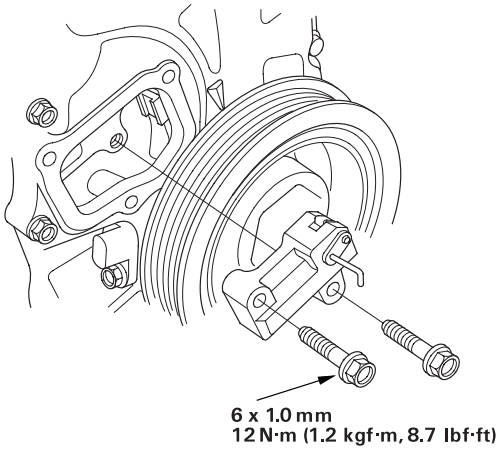


4. Remove the auto-tensioner.

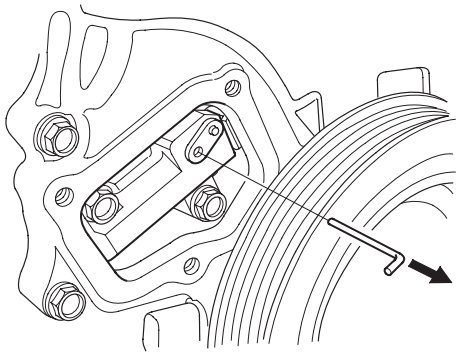


Installation:

1. Install the auto-tensioner.

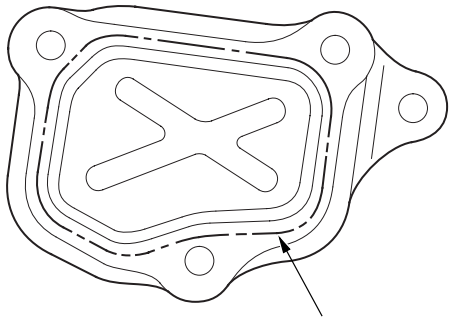


2. Remove the pin from the auto-tensioner.

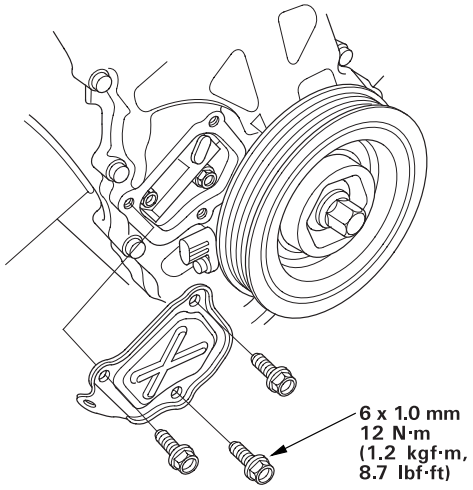


3. Remove old liquid gasket from the chain case cover mating surfaces, bolts and bolt holes.
4. Clean and dry the chain case cover mating surfaces.
5. Apply liquid gasket, P/N 08C70-K0234M, 08C70-K0334M or 08C70-X0331S, evenly to the chain case mating surface of the chain case cover and to the inner threads of the holes.

   NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.



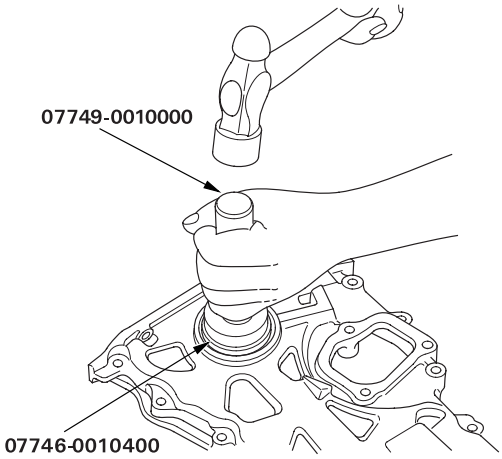
6. Install the chain case cover.



Chain Case Oil Seal Installation

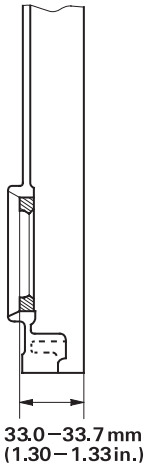
Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 52 x 55 mm 07746-0010400

1. Use the special tools to drive a new oil seal squarely into the chain case to the specified installed height.



2. Measure the distance between the chain case surface and oil seal.

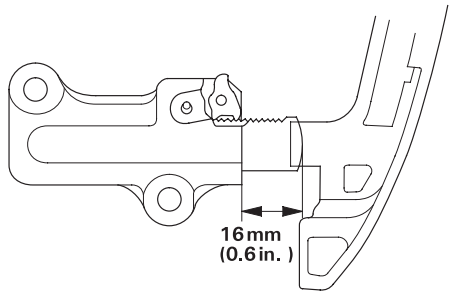
   Oil Seal Installed Height:
   33.0 - 33.7 mm (1.30 - 1.33 in.)



Cam Chain Inspection

1. Remove the front tires/wheels.
2. Remove the splash shield (see step 3 on page 06-12).
3. Remove the drive belt (see page 04-30).
4. Remove the cylinder head cover (see page 06-23).
5. Remove the crankshaft pulley (see step 7 on page 06-13).
6. Disconnect the Crankshaft Position (CKP) sensor connector and Variable Valve Timing Control (VTC) oil control solenoid valve connector (see step 7 on page 06-13).
7. Remove the VTC oil control valve (see step 1 on page 11-137).
8. Support the engine with a jack and wood block under the oil pan.
9. Remove the ground cable, and remove the upper bracket (see step 10 on page 06-13).
10. Remove the side engine mount bracket (see step 11 on page 06-13).
11. Remove the chain case (see step 12 on page 06-13).
12. Measure the tensioner rod length. If the length is over the tolerance, replace the cam chain and oil pump chain.

    Tensioner Rod Length
    Service Limit: 16 mm (0.6 in.)



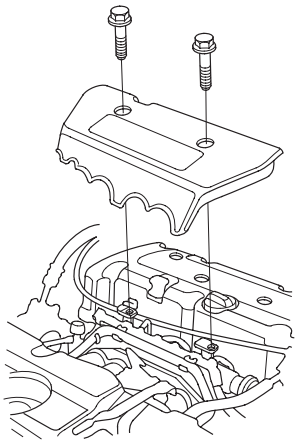
13. Check the chain case oil seal for damage. If the oil seal is damaged, replace the chain case oil seal (see page 06-21).
14. Remove old liquid gasket from the chain case mating surfaces, bolts and bolt holes.
15. Clean and dry the chain case mating surfaces.
16. Apply liquid gasket, P/N 08C70-K0234M, 08C70-K0334M or 08C70-X0331S, evenly to the cylinder block mating surface of the chain case and to the inner threads of the holes (see step 12 on page 06-17).
17. Apply liquid gasket to the cylinder block upper surface contact areas on the chain case (see step 13 on page 06-17).
18. Apply liquid gasket, P/N 08C70-K0334M or 08C70-X0331S, evenly to the oil pan mating surface of the chain case and to the inner threads of the holes (see step 14 on page 06-17).

    NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
19. Install the new O-ring on the chain case. Set the edge of the chain case to the edge of the oil pan, then install the chain case on the cylinder block (see step 15 on page 06-18).

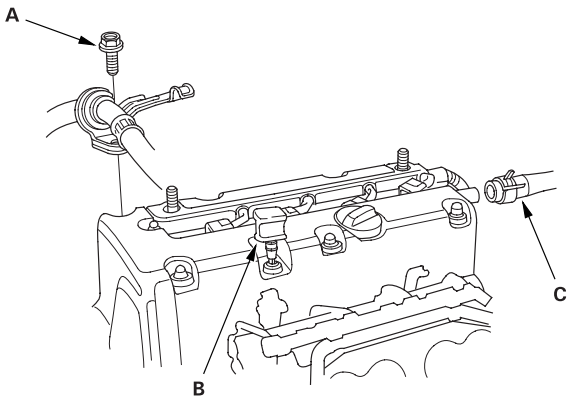
    NOTE: When installing the chain case, do not slide the bottom surface on the oil pan mounting surface.
20. Install the side engine mount bracket (see step 16 on page 06-18).
21. Install the upper bracket and the ground cable (see step 17 on page 06-18).
22. Install the VTC oil control solenoid valve (see page 11-137).
23. Connect the CKP sensor connector and VTC oil control solenoid valve connector (see step 20 on page 06-19).
24. Install the crankshaft pulley (see page 06-12).
25. Install the cylinder head cover (see page 06-42).
26. Install the drive belt.
27. Install the splash shield (see step 24 on page 06-19).
28. Install the front tires/wheels.

Cylinder Head Cover Removal

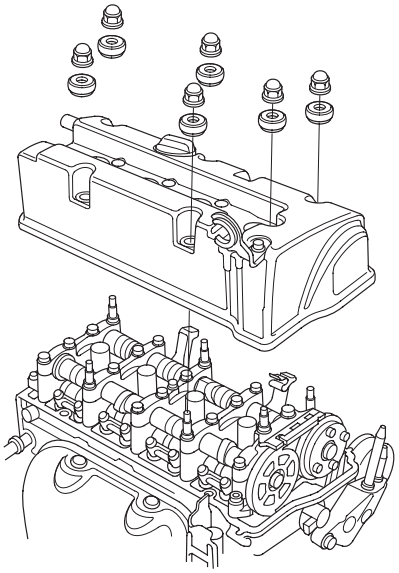
1. Remove the intake manifold cover.



2. Remove the four ignition coils (see page 04-21).
3. Remove the bolt (A) securing the power steering hose bracket.



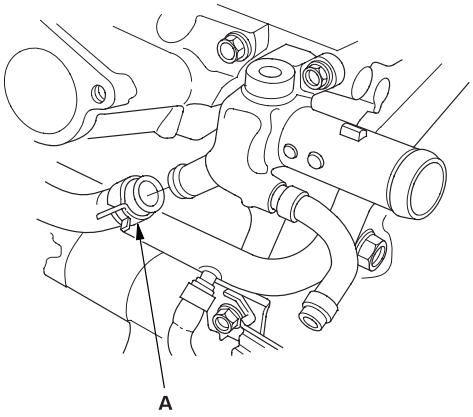
4. Remove the dipstick (B) and breather hose (C).
5. Remove the cylinder head cover.



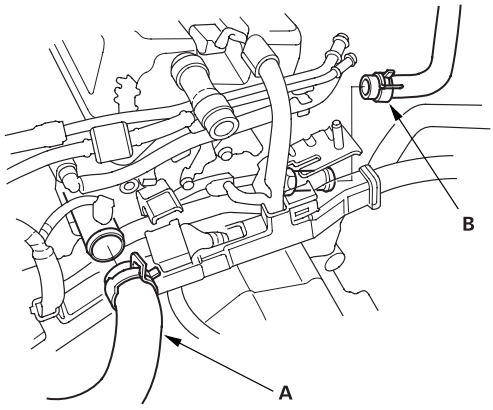
Cylinder Head Removal

NOTE:
- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 38°C (100°F) before loosening the cylinder head bolts.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

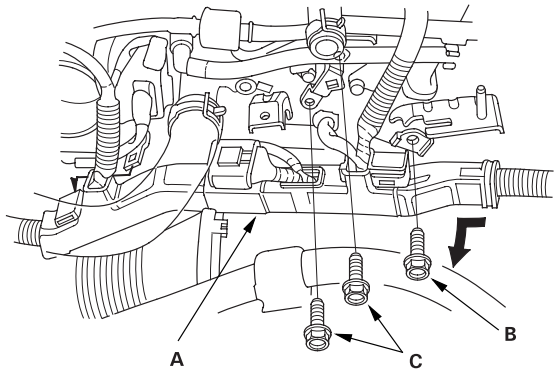
1. Drain the engine coolant (see page 10-6).
2. Relieve fuel pressure (see page 11-154).
3. Disconnect the fuel feed hose (see page 11-156).
4. Remove the drive belt (see page 04-30).
5. Remove the intake manifold (see page 09-3).
6. Remove the water bypass hose (A).



7. Remove the exhaust manifold (see page 09-8).
8. Remove the cam chain (see page 06-12).
9. Remove the engine wire harness connectors and wire harness clamps from the cylinder head.
   - Four injector connectors
   - Engine Coolant Temperature (ECT) sensor connector
   - Top Dead Center (TDC) sensor connector
   - Camshaft Position (CMP) sensor connector
10. Remove the upper radiator hose (A) and heater hose (B).

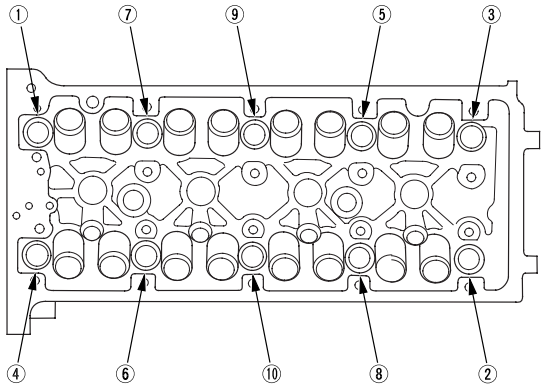


11. Remove the harness holder (A) from the bracket, then remove the connecting pipe mounting bolt (B) and brake booster vacuum line mounting bolts (C).



12. Remove the rocker arm assembly (see page 06-27).
13. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

CYLINDER HEAD BOLTS LOOSENING SEQUENCE:

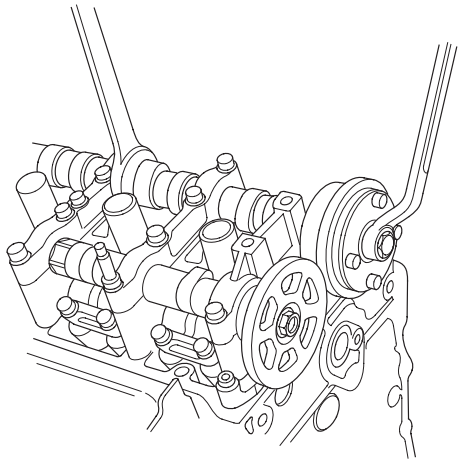


14. Remove the cylinder head.

VTC Actuator, Exhaust Camshaft Sprocket Replacement

Removal:

1. Remove the cam chain (see page 06-12).
2. Hold the camshaft with an open-end wrench, then loosen the Variable Valve Timing Control (VTC) actuator mounting bolt and exhaust camshaft sprocket mounting bolt.



3. Remove the VTC actuator and exhaust camshaft sprocket.

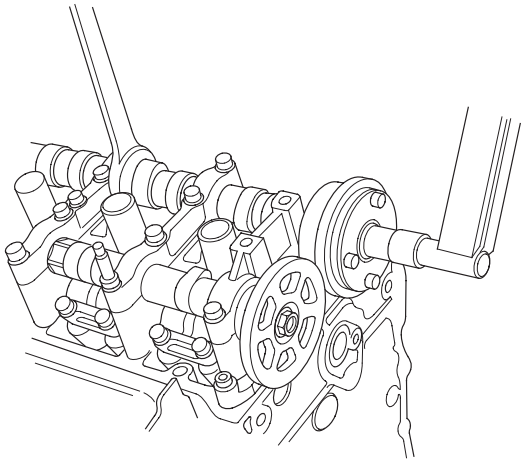
(cont'd)

VTC Actuator, Exhaust Camshaft Sprocket Replacement (cont'd)

Installation:

1. Install the VTC actuator and exhaust camshaft sprocket.
2. Apply engine oil to the threads of the VTC actuator mounting bolt and exhaust camshaft mounting bolt, then install them.
3. Hold the camshaft with an open-end wrench, then tighten the bolts.

   Specified torque:
   VTC actuator mounting bolt:
   113 N·m (11.5 kgf·m, 83 lbf·ft)
   Exhaust camshaft sprocket mounting bolt:
   72 N·m (7.3 kgf·m, 53 lbf·ft)

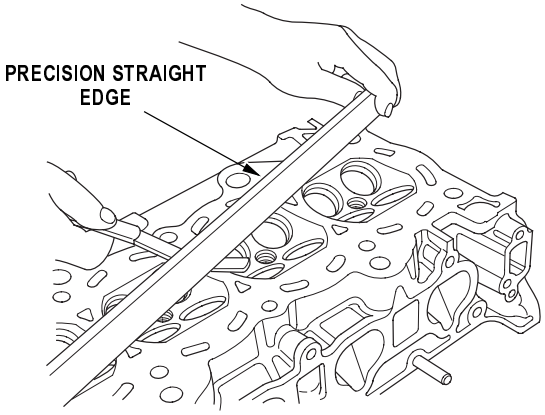


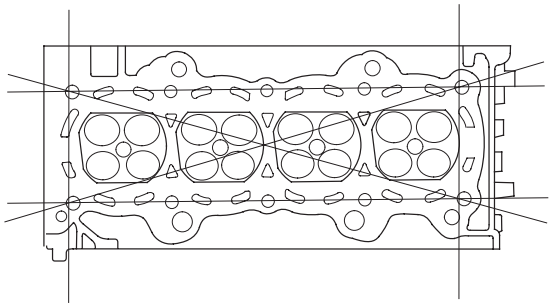
4. Install the cam chain (see page 06-15).

Cylinder Head Inspection for Warpage

1. Remove the cylinder head (see page 06-24).
2. Inspect the camshaft (see page 06-30).
3. Check the cylinder head for warpage. Measure along the edges, and three ways across the center.
   - If warpage is less than 0.05 mm (0.002 in.) cylinder head resurfacing is not required.
   - If warpage is between 0.05 mm (0.002 in.) and 0.2 mm (0.008 in.), resurface the cylinder head.
   - Maximum resurface limit is 0.2 mm (0.008 in.) based on a height of 104 mm (4.09 in.).

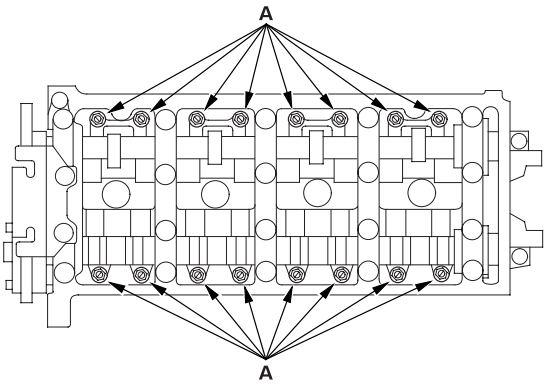
   Cylinder Head Height:
   Standard (New): 103.95 - 104.05 mm (4.093 -4.096 in.)





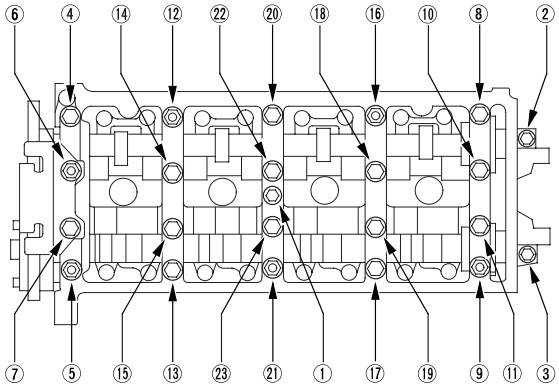
Rocker Arm Assembly Removal

1. Remove the cam chain (see page 06-12).
2. Loosen the rocker arm adjusting screws (A).

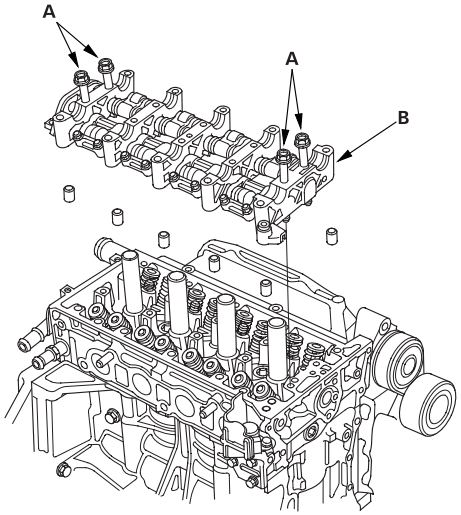


3. Remove the camshaft holder bolts. To prevent damaging the camshafts, unscrew the bolts two turns at a time, in a crisscross pattern.

CAMSHAFT HOLDER BOLTS LOOSENING SEQUENCE:

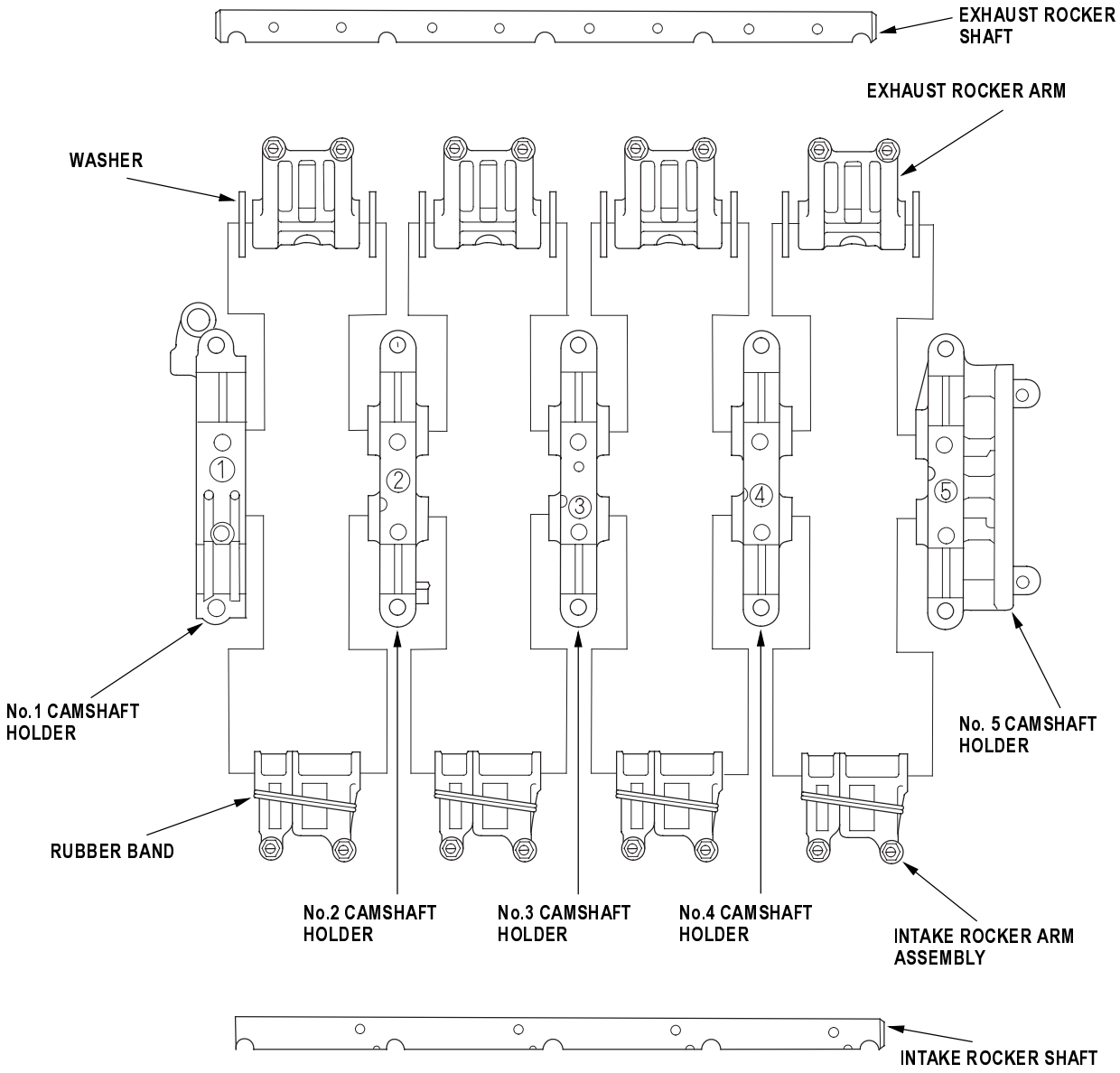


4. Remove the cam chain guide B, camshaft holders, and camshafts.
5. Insert the bolts (A) into the rocker shaft holder, then remove the rocker arm assembly (B).



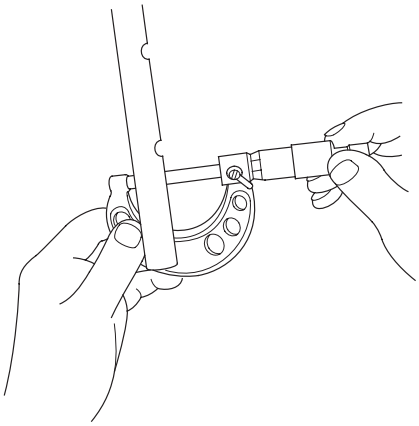
Rocker Arms and Shafts Disassembly/Reassembly

NOTE:
- Identify parts as they are removed to ensure reinstallation in original location.
- Inspect the rocker shafts and rocker arms (see page 06-29).
- The rocker arms must be installed in the same positions if reused.
- When removing or installing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders, springs and rocker arms on the shaft.
- Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact points.
- Bundle the rocker arms with rubber bands to keep them together as a set.

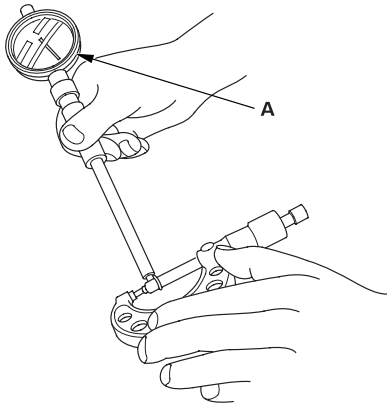


Rocker Arms and Shafts Inspection

1. Remove the rocker arm assembly (see page 06-27).
2. Measure the diameter of the shaft at the first rocker location.



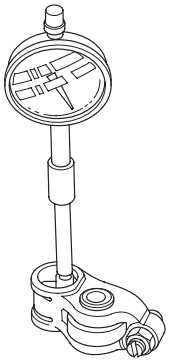
3. Zero the gauge (A) to the shaft diameter.



4. Measure the inside diameter of the rocker arm, and check it for an out-of-round condition.

Rocker Arm-to-Shaft Clearance:

Standard (New):	
Intake:	**0.025 - 0.052 mm (0.0010 - 0.0020 in.)**
Exhaust:	**0.018 - 0.056 mm (0.0007 0.0022 in.)**
Service Limit:	**0.08 mm (0.003 in.)**



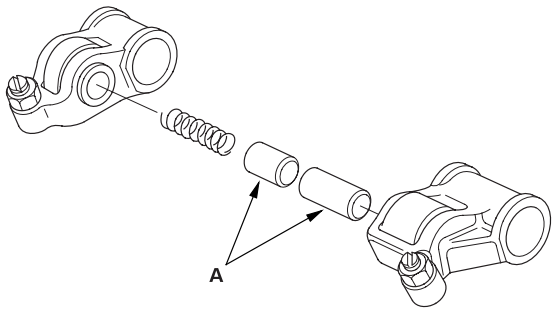
5. Repeat for all rocker arms and both shafts. If the clearance is over the limit, replace the rocker shaft and all overtolerance rocker arms. If any VTEC rocker arm needs replacement, replace rocker arms (primary and secondary) as a set.

(cont'd)

Rocker Arms and Shafts Inspection (cont'd)

6. Inspect the rocker arm pistons (A). Push each piston manually.
   If it does not move smoothly, replace the rocker arm set.

   NOTE: Apply oil to the pistons when reassembling.

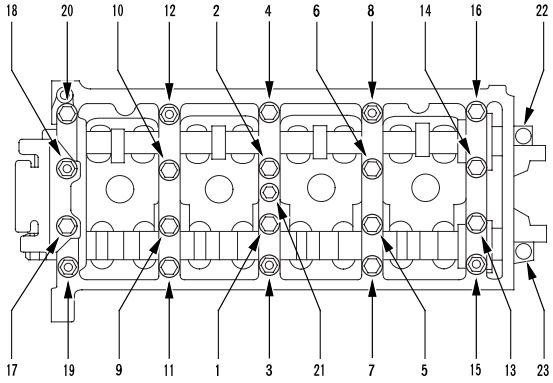


Camshaft Inspection

NOTE: Do not rotate the camshaft during inspection.

1. Remove the rocker arm assembly (see page 06-27).
2. Put the rocker shaft holders, camshaft and camshaft holders on the cylinder head, then tighten the bolts to the specified torque.

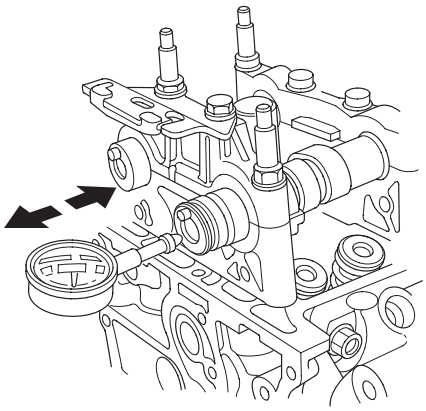
   Specified torque:
   8 mm bolts:
   22 N·m (2.2 kgf·m, 16 lbf·ft)
   6 mm bolts:
   12 N·m (1.2 kgf·m, 8.7 lbf·ft)
   6 mm bolts: 21, 22, 23



3. Seat the camshaft by pushing it away from the camshaft pulley end of the cylinder head.
4. Zero the dial indicator against the end of the camshaft, then push the camshaft back and forth and read the end play. If the end play is beyond the service limit, replace the cylinder head and recheck. If it is still beyond the service limit, replace the camshaft.

Camshaft End Play:

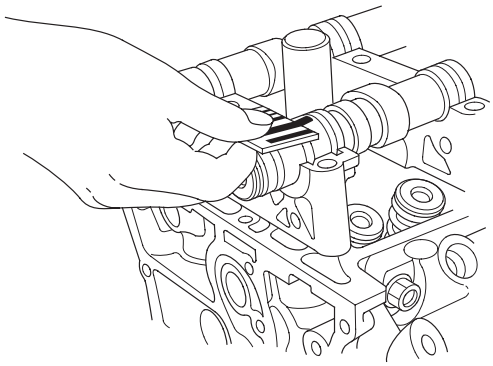
Standard (New):	**0.05 - 0.20 mm (0.002 - 0.008 in.)**
Service Limit:	**0.4 mm (0.02 in.)**



5. Unscrew the camshaft holder bolts two turns at a time, in a crisscross pattern. Then remove the camshaft holders from the cylinder head.
6. Lift the camshafts out of the cylinder head, wipe them clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored, or excessively worn.
7. Clean the camshaft journal surfaces in the cylinder head, then set the camshafts back in place. Place a plastigage strip across each journal.
8. Install the camshaft holders, then tighten the bolts to the specified torque as shown in step 2.
9. Remove the camshaft holders. Measure the widest portion of plastigage on each journal.
   - If the camshaft-to-holder clearance is within limits, go to step 11.
   - If the camshaft-to-holder clearance is beyond the service limit and the camshaft has been replaced, replace the cylinder head.
   - If the camshaft-to-holder clearance is beyond the service limit and the camshaft has not been replaced, go to step 10.

Camshaft-to-Holder Oil Clearance:

Standard (New):	
No. 1 Journal:	**0.030 - 0.069 mm (0.001 - 0.003 in.)**
No. 2, 3, 4, 5 Journals:	**0.060 - 0.099 mm (0.002 - 0.004 in.)**
Service Limit:	**0.15 mm (0.006 in.)**



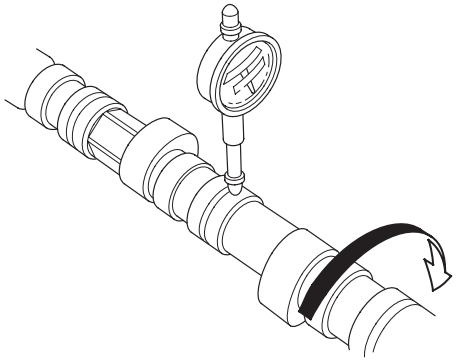
(cont'd)

Camshaft Inspection (cont'd)

10. Check the total runout with the camshaft supported on V-blocks.

- If the total runout of the camshaft is within the service limit, replace the cylinder head.
- If the total runout is beyond the service limit, replace the camshaft and recheck the camshaft-to-holder oil clearance. If the oil clearance is still beyond the service limit, replace the cylinder head.

Camshaft Total Runout:
Standard (New): 0.03 mm (0.001 in.) max.
Service Limit: 0.04 mm (0.002 in.)

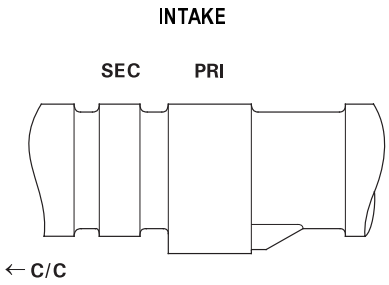


11. Measure cam lobe height.

Cam Lobe Height Standard (New):

	INTAKE	EXHAUST
PRI	33.925 mm (1.3356 in.)	34.092 mm (1.3422 in.)
SEC	29.638 mm (1.1668 in.)	

PRI: Primary SEC: Secondary
C/C: Cam Chain



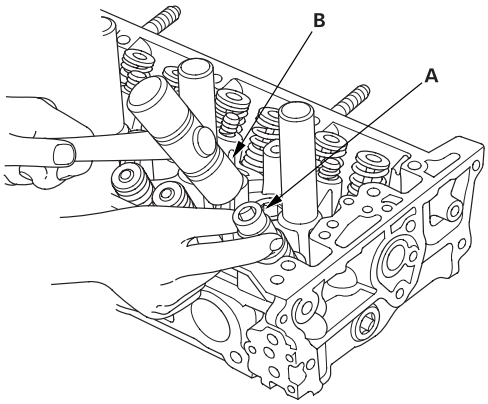
Valves, Springs and Valve Seals Removal

Special Tools Required
- Valve spring compressor attachment 07757-PJ10100
- Valve spring compressor 07757-0010000

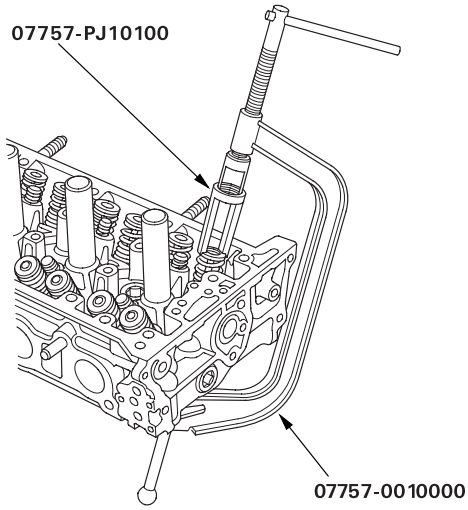
Identify the valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Remove the cylinder head (see page 06-24).

2. Using an appropriate-sized socket (A) and plastic mallet (B), lightly tap the valve retainer to loosen the valve keepers.



3. Install the spring compressor. Compress the spring, and remove the valve keepers.



Valve Inspection

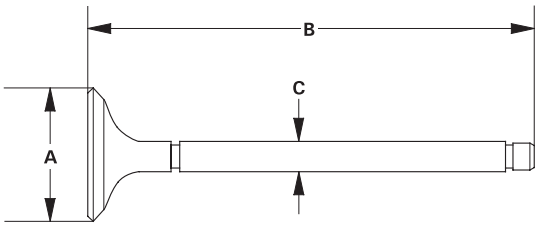
1. Remove the valves (see page 06-32).
2. Measure the valve in these areas.

Intake Valve Dimensions:

A Standard (New):	34.85 - 35.15 mm (1.372 - 1.384 in.)
B Standard (New):	108.7 - 109.5 mm (4.280 - 4.311 in.)
C Standard (New):	5.475 - 5.485 mm (0.2156 - 0.2159 in.)
C Service Limit:	5.445 mm (0.214 in.)

Exhaust Valve Dimensions:

A Standard (New):	29.85 - 30.15 mm (1.175 - 1.187 in.)
B Standard (New):	108.3 - 109.1 mm (4.264 - 4.295 in.)
C Standard (New):	5.450 - 5.460 mm (0.2146 - 0.2150 in.)
C Service Limit:	5.42 mm (0.213 in.)



Valve Stem-to-Guide Clearance Inspection

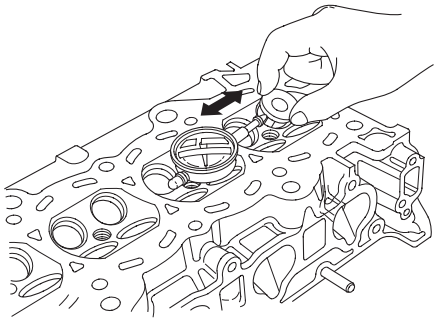
1. Remove the valves (see page 06-32).
2. Slide the valve out of its guide about 10 mm, then measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).
   - If the measurement exceeds the service limit, recheck it using a new valve.
   - If the measurement is now within the service limit, reassemble using a new valve.
   - If the measurement with a new valve still exceeds the service limit, go to step 3.

Intake Valve Stem-to-Guide Clearance:

Standard (New):	0.06 - 0.11 mm (0.002 - 0.004 in.)
Service Limit:	0.16 mm (0.006 in.)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New):	0.11 - 0.16 mm (0.004 - 0.006 in.)
Service Limit:	0.22 mm (0.009 in.)



3. Subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge. Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance:

Standard (New):	0.030 - 0.055 mm (0.0012 - 0.0022 in.)
Service Limit:	0.08 mm (0.003 in.)

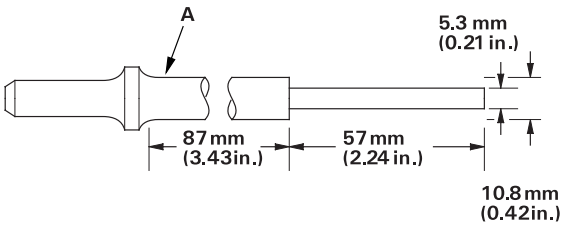
Exhaust Valve Stem-to-Guide Clearance:

Standard (New):	0.055 - 0.080 mm (0.0022 - 0.0031 in.)
Service Limit:	0.11 mm (0.004 in.)

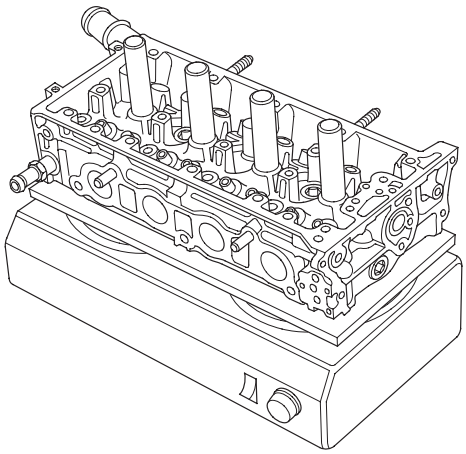
Valve Guide Replacement

Special Tools Required
- Valve guide driver, 5.5 mm 07742-0010100
- Valve guide reamer, 5.525 mm 07HAH-PJ70100

1. Inspect valve stem-to-guide clearance (see page 06-33).
2. As illustrated below, use a commercially available air-impact valve guide driver (A) modified to fit the diameter of the valve guides. In most cases, the same procedure can be done using the special tool and a conventional hammer.

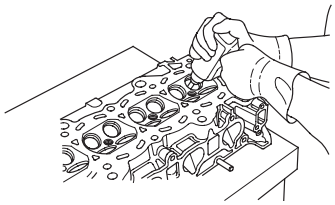


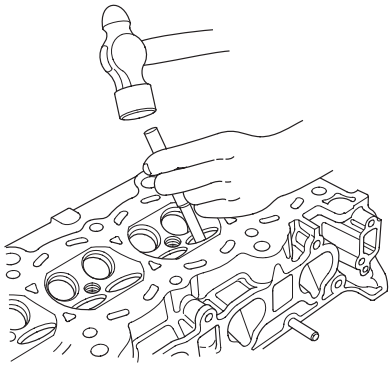
3. Select the proper replacement guides, and chill them in the freezer section of a refrigerator for about an hour.
4. Use a hot plate or oven to evenly heat the cylinder head to 150°C (300°F). Monitor the temperature with a cooking thermometer. Do not get the head hotter than 150°C (300°F); excessive heat may loosen the valve seats.



5. Working from the camshaft side, use the driver and an air hammer to drive the guide about 2 mm (0.1 in.) towards the combustion chamber. This will knock off some of the carbon and make removal easier. Hold the air hammer directly in line with the valve guide to prevent damaging the driver.
6. Turn the head over, and drive the guide out toward the camshaft side of the head.



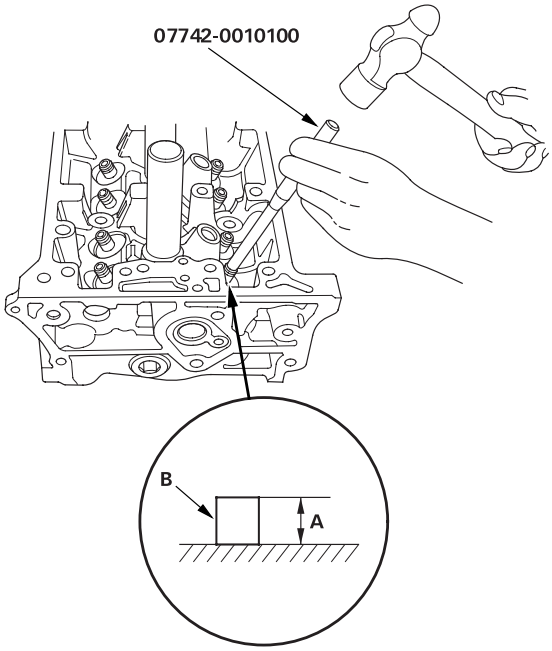




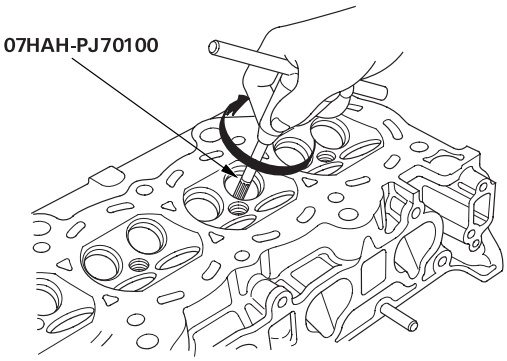
7. If a valve guide won't move, drill it out with a 8 mm (5/16 inch) bit, then try again. Drill guides only in extreme cases; you could damage the cylinder head if the guide breaks.
8. Remove the new guide(s) from the freezer, one at a time, as you need them.

9. Apply a thin coat of clean engine oil to the outside of the new valve guide. Install the guide from the camshaft side of the head; use the special tool to drive the guide in to the specified installed height (A) of the guide (B). If you have all 16 guides to do, you may have to reheat the head.

Valve Guide Installed Height:
Intake: 15.2 - 16.2 mm (0.598 - 0.638 in.)
Exhaust: 15.5 - 16.5 mm (0.610 - 0.650 in.)



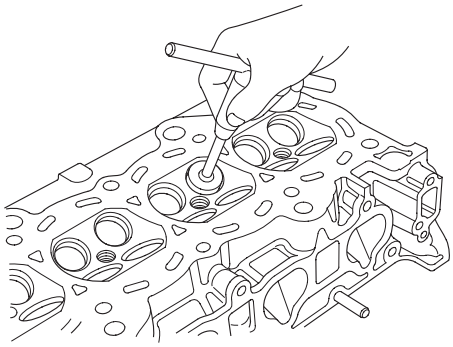
10. Coat both reamer and valve guide with cutting oil.
11. Rotate the reamer clockwise the full length of the valve guide bore.



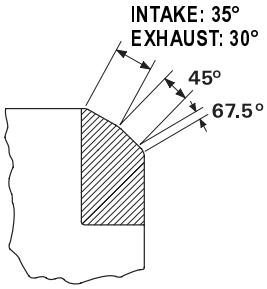
12. Continue to rotate the reamer clockwise while removing it from the bore.
13. Thoroughly wash the guide in detergent and water to remove any cutting residue.
14. Check the clearances with a valve (see page 06-33). Verify that a valve slides in the intake and exhaust valve guides without exerting pressure.

Valve Seat Reconditioning

1. Inspect valve stem-to-guide clearance (see page 06-33). If the valve guides are worn, replace them (see page 06-34) before cutting the valve seats.
2. Renew the valve seats in the cylinder head using a valve seat cutter.



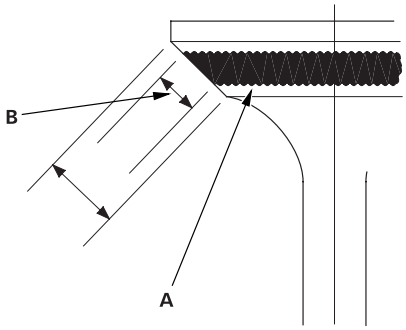
3. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
4. Bevel the upper and lower edges at the angles shown in the illustration.
   Check the width of the seat and adjust accordingly.



5. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutters.

   Valve Seat Width:
   Standard (New): 1.25 - 1.55 mm (0.049 - 0.061 in.)
   Service Limit: 2.00 mm (0.079 in.)

6. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound (A) to the valve face. Insert the valve in its original location in the head, then lift it and snap it closed against the seat several times.

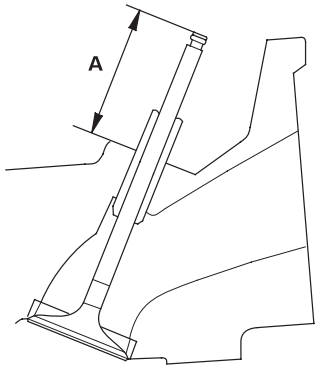


7. The actual valve seating surface (B), as shown by the blue compound, should be centered on the seat.
   - If it is too high (closer to the valve stem), you must make a second cut with the 67.5° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (close to the valve edge), you must make a second cut with the 35° cutter (intake side) or the 30° cutter (exhaust side) to move it up, then make one more cut with the 45° cutter to restore seat width.

   NOTE: The final cut should always be made with the 45° cutter.

8. Insert the intake and exhaust valves in the head, and measure valve stem installed height (A).

Intake Valve Stem Installed Height:
Standard (New): 40.8 - 41.0 mm (1.606 - 1.614 in.)
Exhaust Valve Stem Installed Height:
Standard (New): 54.6 - 54.8 mm (2.150 - 2.157 in.)



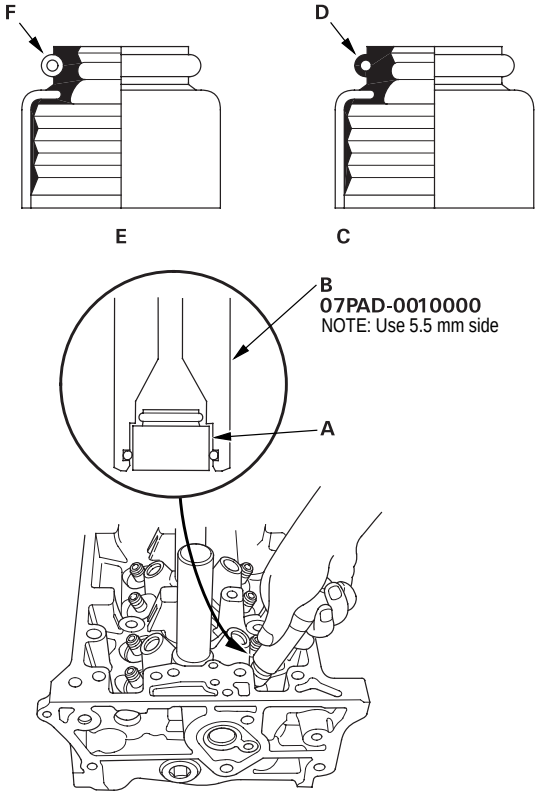
9. If valve stem installed height is over the standard, replace the valve and recheck. If it is still over the standard, replace the cylinder head; the valve seat in the head is too deep.

Valves, Springs and Valve Seals Installation

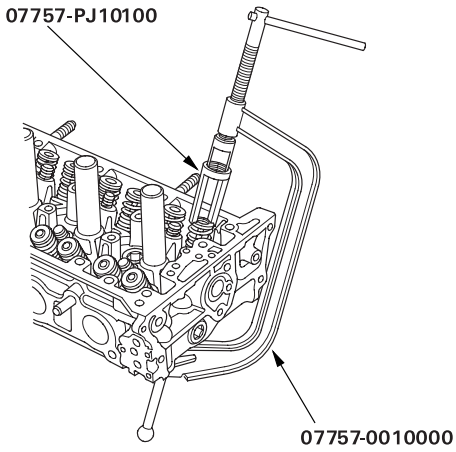
Special Tools Required
- Stem seal driver 07PAD-0010000
- Valve spring compressor attachment 07757-PJ10100
- Valve spring compressor 07757-0010000

1. Coat the valve stems with engine oil. Install the valves in the valve guides.
2. Check that the valves move up and down smoothly.
3. Install the spring seats on the cylinder head.
4. Install the new valve seals (A) using the valve guide seal installer (B).

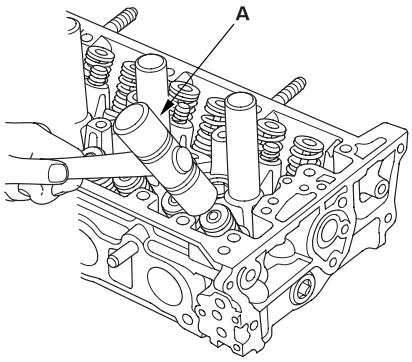
   NOTE: The exhaust valve seal (C) has a black spring (D), and the intake valve seal (E) has a white spring (F). They are not interchangeable.



5. Install the valve spring. Place the end of the valve spring with closely wound coils toward the cylinder head.
6. Install the valve retainer.
7. Install the valve spring compressor. Compress the spring, and install the valve keepers.



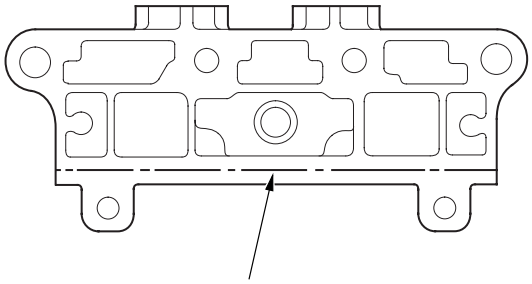
8. Lightly tap the end of each valve stem two or three times with a plastic mallet (A) to ensure proper seating of the valve and valve keepers. Tap the valve stem only along its axis so you do not bend the stem.



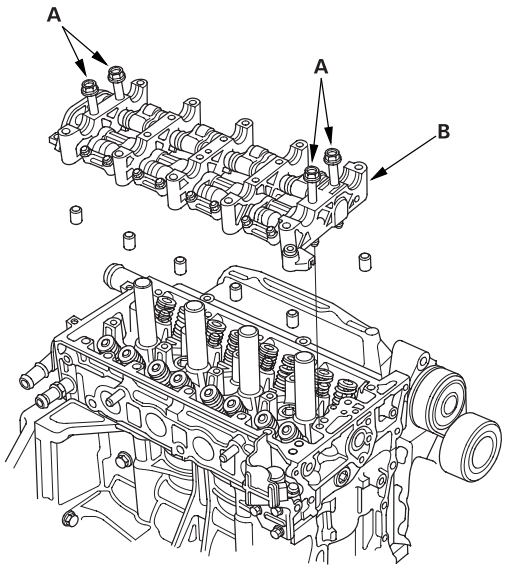
Rocker Arm Assembly Installation

1. Clean and dry the No. 5 rocker shaft holder mating surface.
2. Apply liquid gasket, P/N 08C70-K0234M, 08C70-K0334M or 08C70-X0331S, evenly to the cylinder head mating surface of the No. 5 rocker shaft holder.

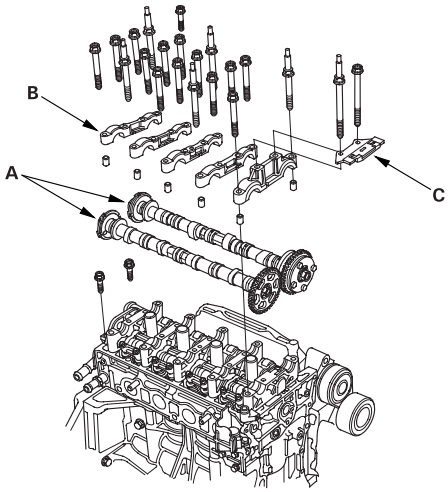
   NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.



3. Reassembly the rocker arm assembly (see page 06-28).
4. Insert the bolts (A) into the rocker shaft holder, then install the rocker arm assembly (B) on the cylinder head.

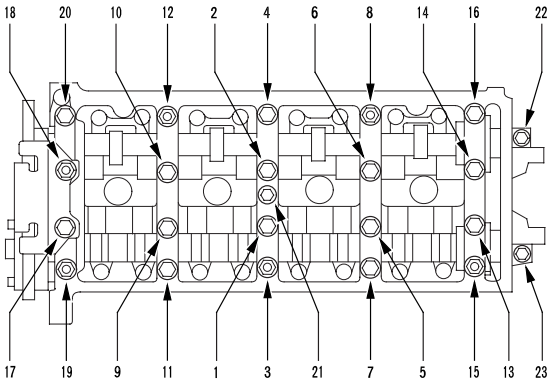


5. Remove the bolts from the rocker shaft holder.
6. Punch marks on the Variable Valve Timing Control (VTC) actuator and exhaust camshaft sprocket are facing up, then set the camshafts (A) in the holder.



7. Set the camshaft holders (B) and cam chain guide B (C) in place.
8. Tighten the bolts to the specified torque.

   Specified torque:
   8 mm bolts: 22 N·m (2.2 kgf·m, 16 lbf·ft)
   6 mm bolts: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)
   6 mm bolts: 21, 22, 23

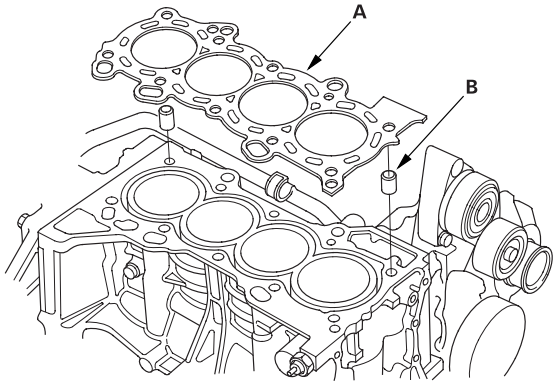


9. Install the cam chain (see page 06-15), and adjust the valve clearance (see page 06-9).

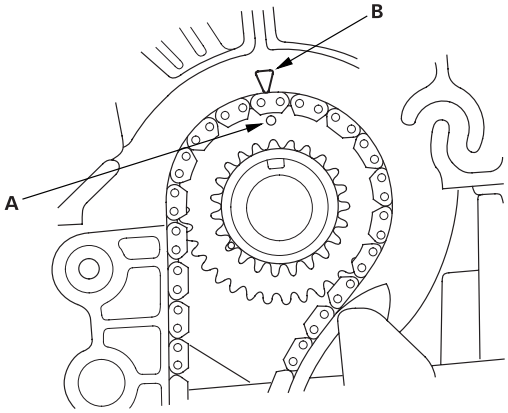
Cylinder Head Installation

Install the cylinder head in the reverse order of removal:

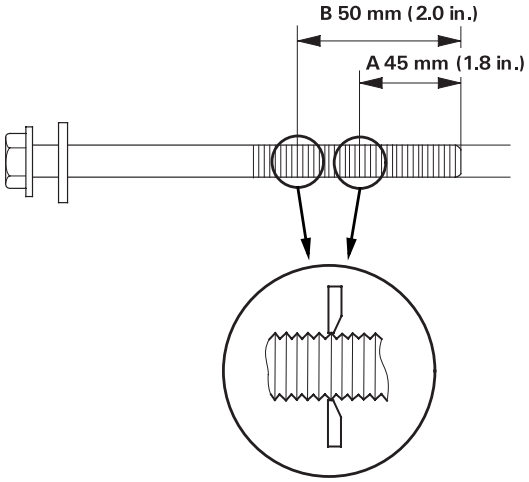
1. Clean the cylinder head and block surface.
2. Install the new cylinder head gasket (A) and dowel pins (B) on the cylinder block. Always use a new cylinder head gasket.



3. Set the crankshaft to Top Dead Center (TDC). Align the TDC mark (A) on the crankshaft sprocket with the pointer (B) on the cylinder block.

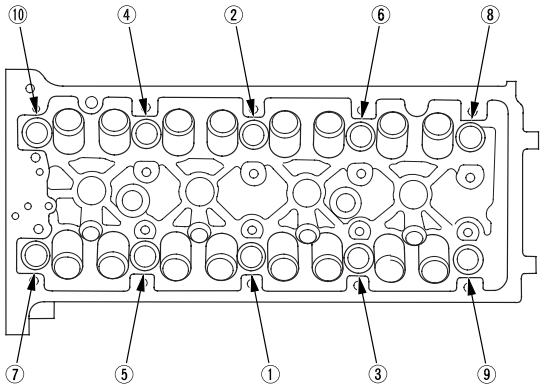


4. Install the cylinder head on the block.
5. Measure the diameter of each cylinder head bolt at point A and point B.

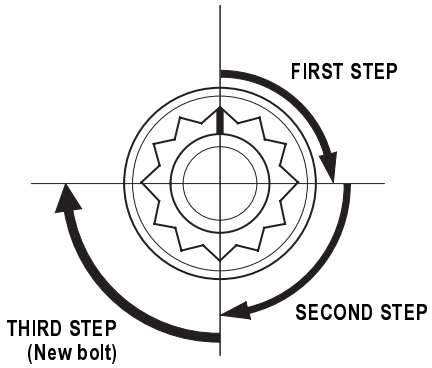


6. If either diameter is less than 10.6 mm (0.42 in.), replace the cylinder head bolt.

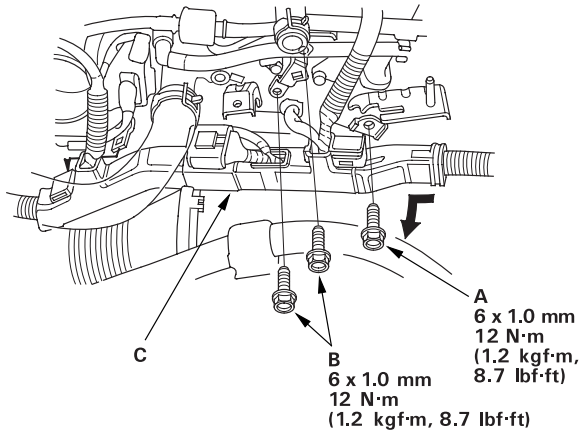
7. Apply engine oil to the bolt threads and under the bolt heads of all the cylinder head bolts.
8. Tighten the cylinder head bolts in sequence to 39 N·m (4.0 kgf·m, 29 lbf·ft). Use a beam-type torque wrench, be sure to tighten slowly and do not overtighten. If a bolt makes any noise while you are torquing it, loosen the bolt and retighten it from the first step.



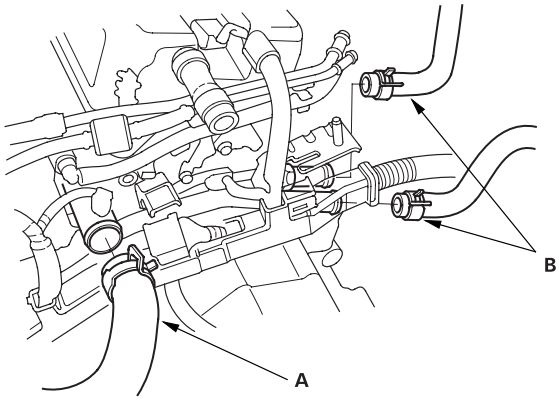
9. After torquing, tighten all cylinder head bolts in two steps (90° per step). If you are using a new cylinder head bolt, tighten the bolt an extra 90°.



10. Install the rocker arm assembly (see page 06-39).
11. Tighten the connecting pipe mounting bolt (A) and brake booster vacuum line mounting bolts (B), then install the harness holder (C) on the bracket.



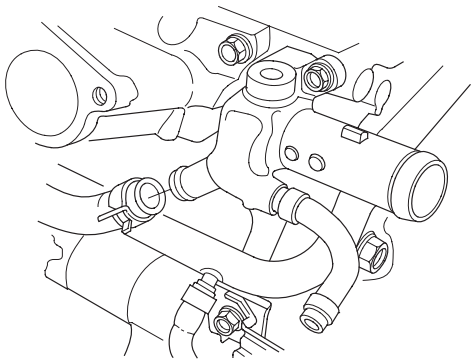
12. Install the upper radiator hose (A) and heater hose (B).



(cont'd)

Cylinder Head Installation (cont'd)

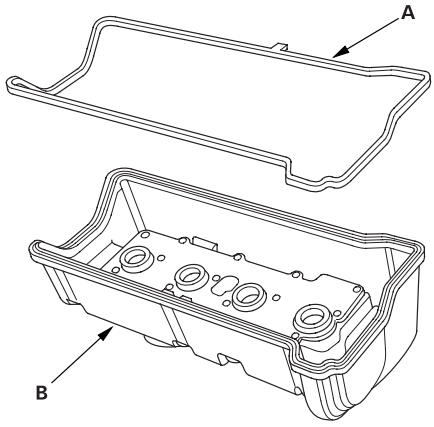
13. Install the water bypass hose.



14. Install the intake manifold (see page 09-5).
15. Install the exhaust manifold (see page 09-8).
16. Install the cam chain (see page 06-15).
17. Connect the fuel feed hose (see page 11-156).
18. Adjust the valve clearance (see page 06-9).
19. Install the drive belt (see page 04-30).
20. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.
21. After installation, check that all tubes, hoses and connectors are installed correctly.
22. Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so that the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.
23. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-6).
24. Inspect the idle speed (see page 11-148).
25. Inspect the ignition timing (see page 04-20).

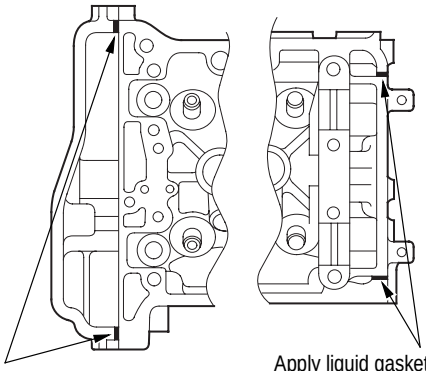
Cylinder Head Cover Installation

1. Thoroughly clean the head cover gasket and the groove.
2. Install the head cover gasket (A) in the groove of the cylinder head cover (B).



3. Check that the mating surfaces are clean and dry.
4. Apply liquid gasket, P/N 08C70-K0234M, 08C70-K0334M or 08C70-X0331S on the chain case and the No. 5 rocker shaft holder mating areas.

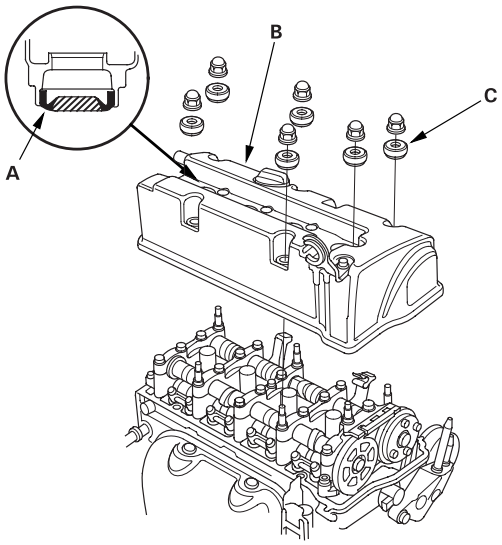
   NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.



Apply liquid gasket to these points.

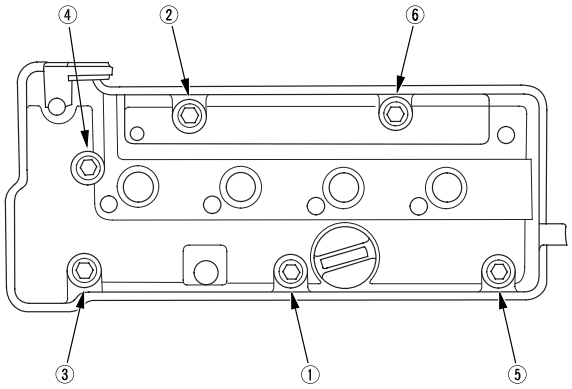
Apply liquid gasket to these points.

5. Set the spark plug seals (A) on the spark plug tubes. Once the cylinder head cover (B) is on the cylinder head, slide the cover slightly back and forth to seat the head cover gasket.

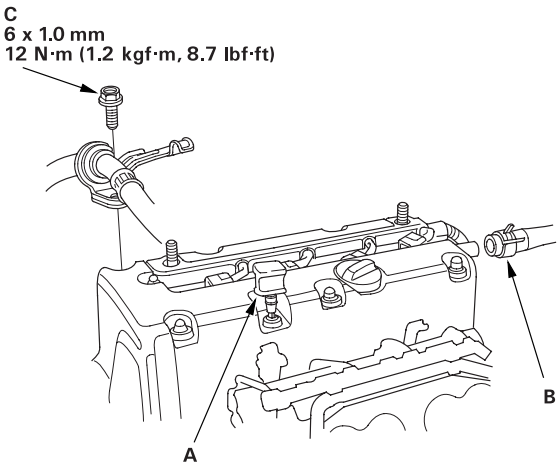


6. Inspect the cover washers (C). Replace any washer that is damaged or deteriorated.

7. Tighten the bolts in two or three steps. In the final step, tighten all bolts, in sequence, to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



8. Install the dipstick (A) and breather hose (B).



9. Tighten the bolt (C) securing the power steering hose bracket.

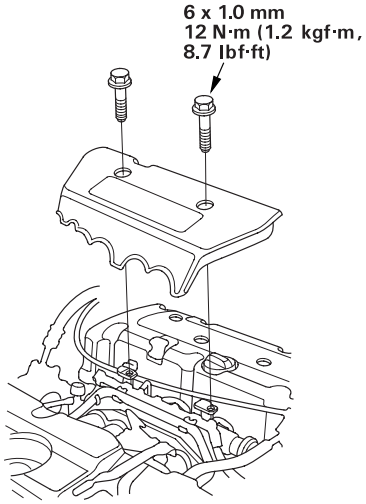
(cont'd)

Cylinder Head Cover Installation (cont'd)

10. Install the four ignition coils (see page 04-21).

11. Check that all tubes, hoses, and connectors are installed correctly.

12. Install the intake manifold cover.



13. After assembly, wait at least 30 minutes before filling the engine with oil.

07

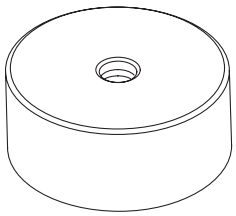
Engine Mechanical

Engine Block **07-2**
- Special Tools 07-2
- Component Location Index 07-3
- Connecting Rod and Crankshaft End Play Inspection 07-5
- Crankshaft Main Bearing Replacement 07-6
- Connecting Rod Bearing Replacement 07-8
- Oil Pan Removal 07-11
- Crankshaft and Piston Removal 07-12
- Crankshaft Inspection 07-14
- Block and Piston Inspection 07-15
- Cylinder Honing 07-17
- Piston, Pin and Connecting Rod Replacement 07-18
- Piston Ring Replacement 07-21
- Piston Installation 07-23
- Connecting Rod Bolt Inspection 07-24
- Crankshaft Installation 07-24
- Oil Pan Installation 07-27

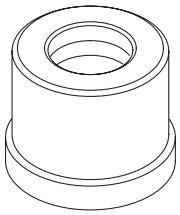
Engine Block

Special Tools

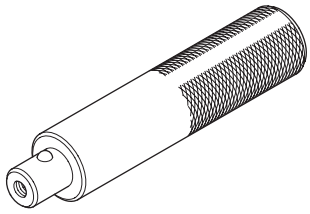
Ref. No.	Tool Number	Description	Qty
1	07ZAD-PNA0100	Oil Seal Driver Attachment 96	1
2	07746-0010700	Driver Attachment, 24 x 26 mm	1
3	07749-0010000	Handle Driver	1



1

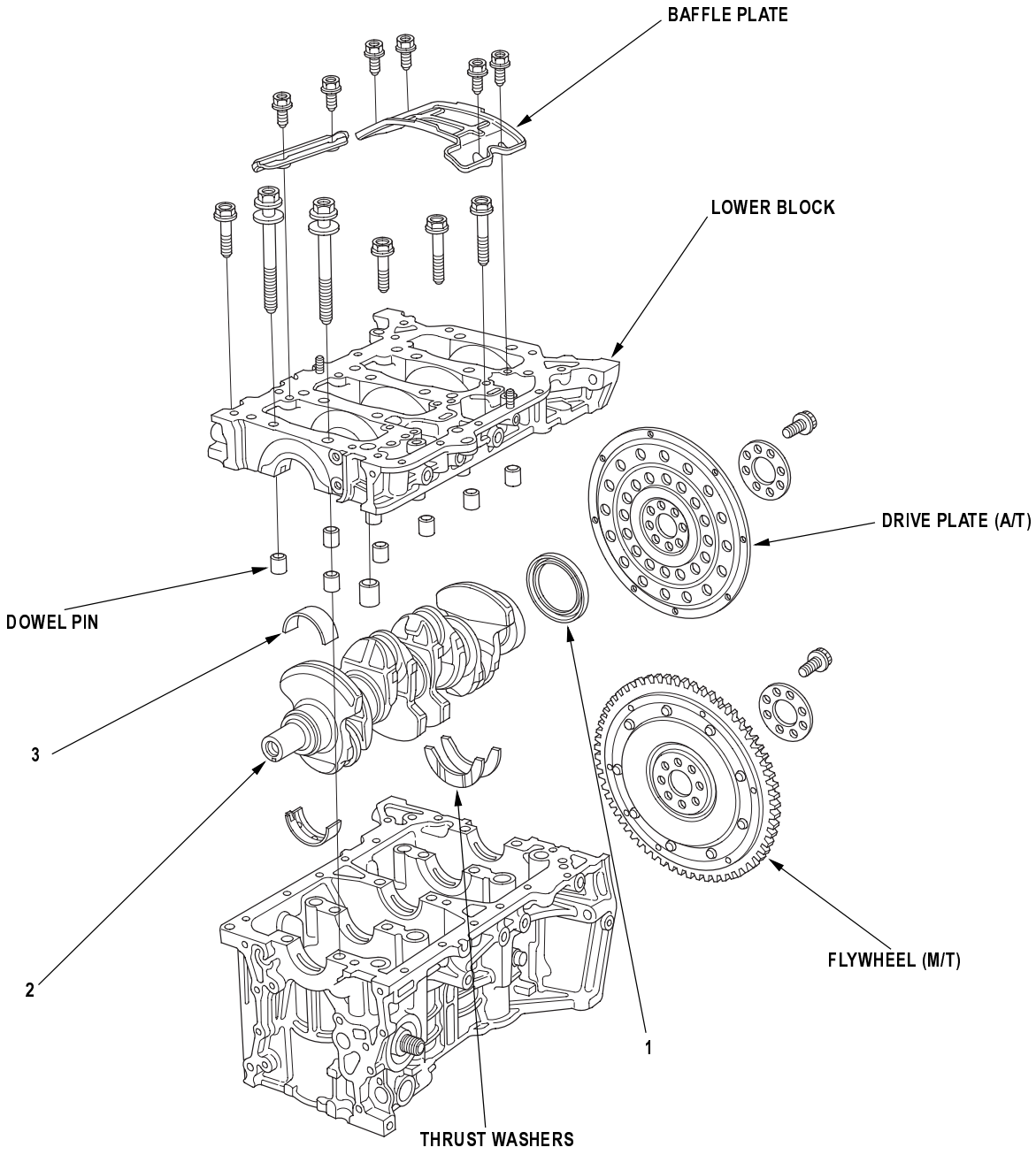


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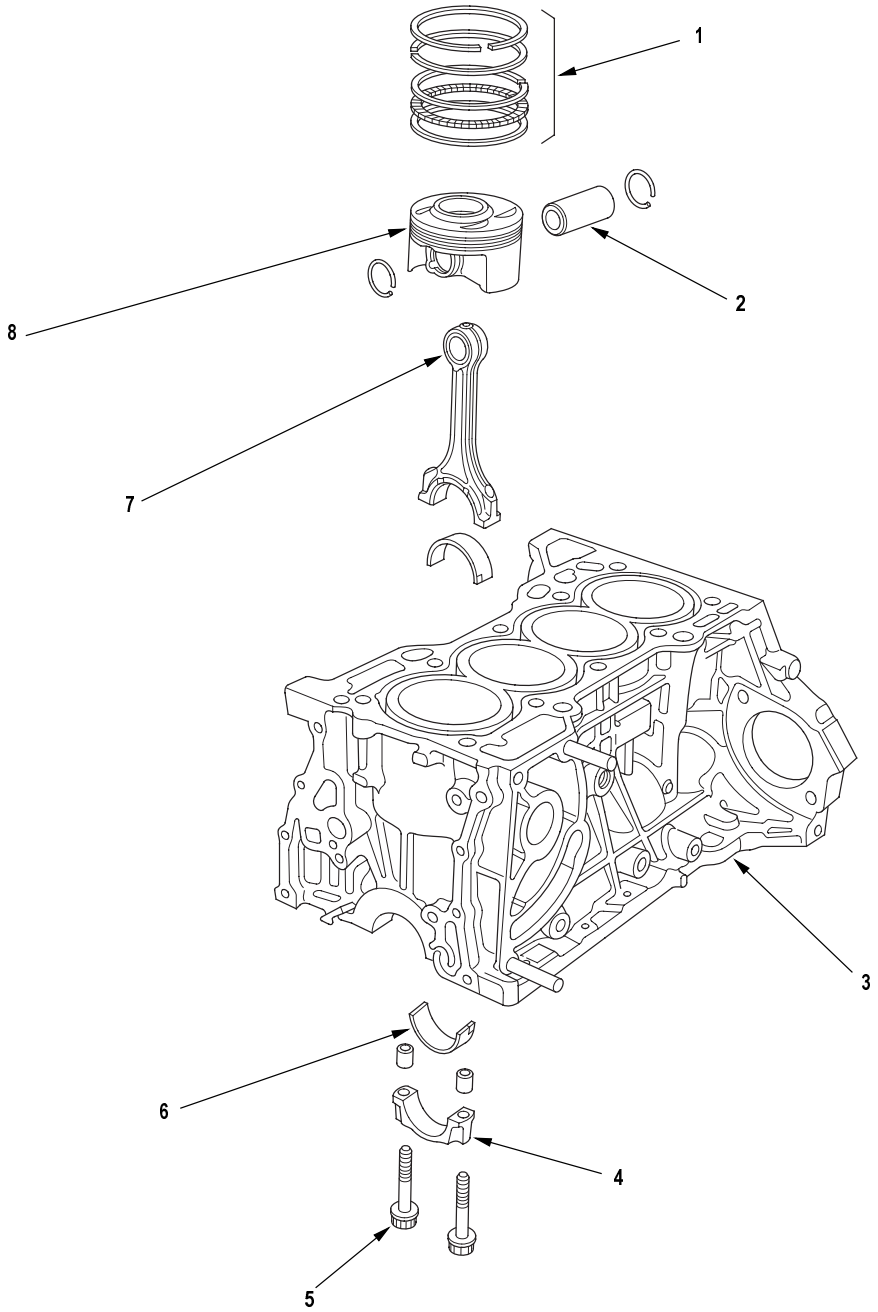
Component Location Index



1	CRANKSHAFT OIL SEAL, TRANSMISSION END	Installation, step 21 on page 07-26
2	CRANKSHAFT	End play, page 07-5; Runout, page 07-14; Out-of-Round, page 07-14; Removal, page 07-12; Installation, page 07-24
3	MAIN BEARINGS	Oil clearance, page 07-6; Selection, page 07-6

(cont'd)

Component Location Index (cont'd)

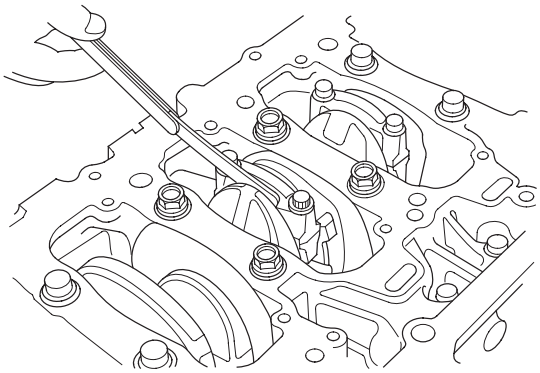


1	PISTON RINGS	Replacement, page 07-21
2	PISTON PIN	Removal, page 07-18; Inspection, page 07-19; Installation, page 07-20
3	ENGINE BLOCK	Cylinder bore inspection, page 07-15; Warpage inspection, page 07-15; Cylinder bore honing, page 07-17; Ridge removal, step 13 on page 07-13
4	CONNECTING ROD BEARING CAP	
5	CONNECTING ROD BOLT	Inspection, page 07-24
6	CONNECTING ROD BEARINGS	Oil clearance, page 07-8; Selection, page 07-9
7	CONNECTING ROD	End play, page 07-5; Small end measurement, page 07-19
8	PISTON	Removal, page 07-12; Measurement, page 07-15

Connecting Rod and Crankshaft End Play Inspection

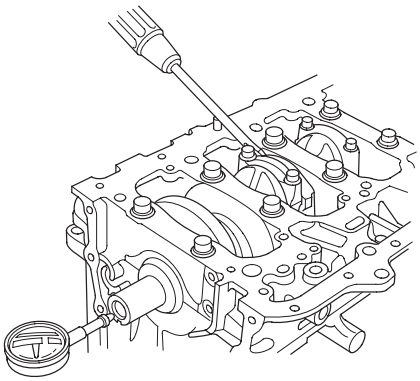
1. Remove the oil pump (see page 08-11).
2. Remove the baffle plate (see step 6 on page 07-12).
3. Measure the connecting rod end play with a feeler gauge between the connecting rod and crankshaft.

   Connecting Rod End Play:
   Standard (New): 0.15 - 0.30 mm (0.006 - 0.012 in.)
   Service Limit: 0.40 mm (0.016 in.)



4. If the connecting rod end play is out-of-tolerance, install a new connecting rod, and recheck. If it is still out-of-tolerance; replace the crankshaft (see page 07-12).
5. Push the crankshaft firmly away from the dial indicator, and zero the dial against the end of the crankshaft. Then pull the crankshaft firmly back toward the indicator; the dial reading should not exceed the service limit.

   Crankshaft End Play:
   Standard (New): 0.10 - 0.35 mm (0.004 - 0.014 in.)
   Service Limit: 0.45 mm (0.018 in.)



6. If the end play is out-of-tolerance, replace the thrust washers and recheck, if it is still out-of-tolerance, replace the crankshaft.

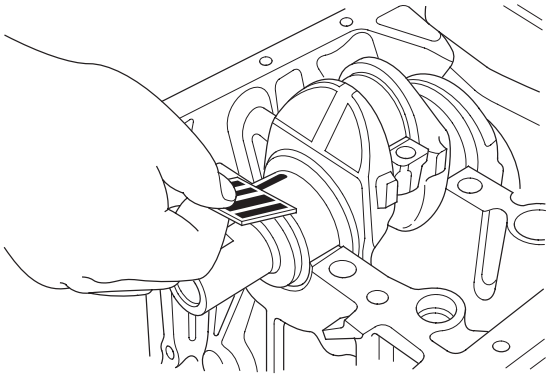
Crankshaft Main Bearing Replacement

Main Bearing Clearance Inspection

1. To check main bearing-to-journal oil clearance, remove the lower block and bearing halves (see page 07-12).
2. Clean each main journal and bearing half with a clean shop towel.
3. Place one strip of plastigage across each main journal.
4. Reinstall the bearings and lower block, then torque the bolts to 29 N·m (3.0 kgf·m, 22 lbf·ft) + 56°.

   NOTE: Do not rotate the crankshaft during inspection.
5. Remove the lower block and bearings again, and measure the widest part of the plastigage.

   Main Bearing-to-Journal Oil Clearance:
   No. 1, 2, 4, 5 Journals:
   Standard (New): 0.017 - 0.041 mm (0.0007 - 0.0016 in.)
   Service Limit: 0.050 mm (0.0020 in.)
   No. 3 Journal:
   Standard (New): 0.025 - 0.049 mm (0.0010 - 0.0019 in.)
   Service Limit: 0.055 mm (0.0022 in.)

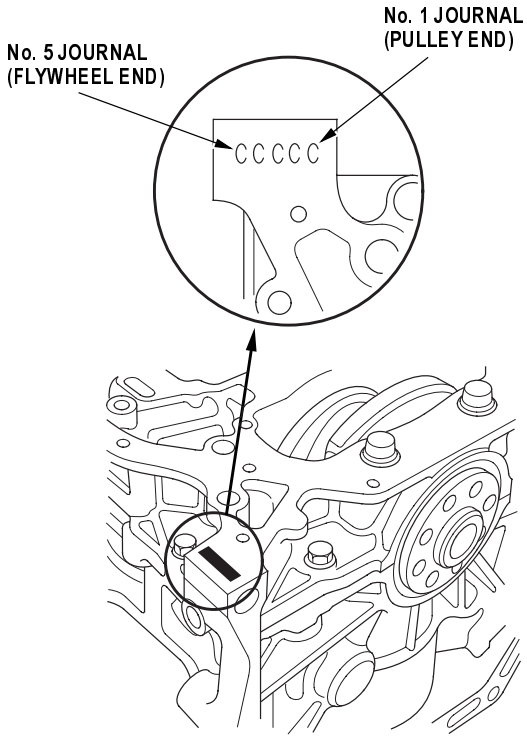


6. If the plastigage measures too wide or too narrow, remove the crankshaft, and remove the upper half of the bearing. Install a new, complete bearing with the same color code(s), and recheck the clearance. Do not file, shim, or scrape the bearings or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again. If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

Main Bearing Selection

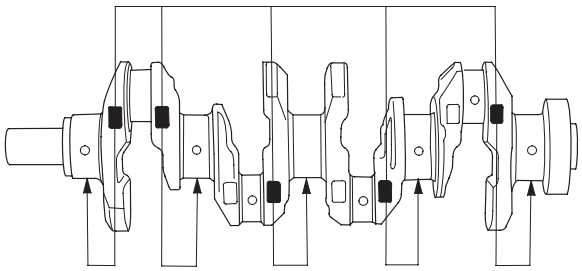
Crankshaft Bore Code Location

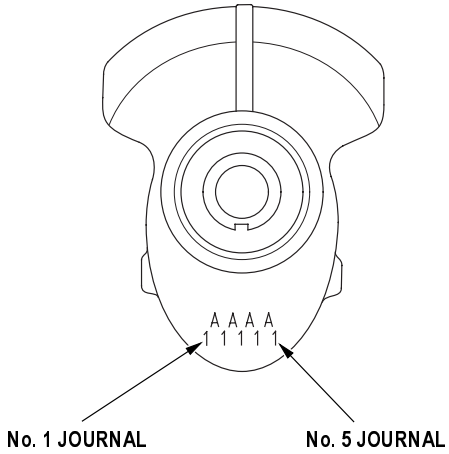
1. Numbers or letters or bars have been stamped on the end of the block as a code for the size of each of the five main journal bores. Write down the crank bore codes.
   If you can't read the codes because of accumulated dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.



Main Journal Code Location

2. The main journal codes are stamped on the crankshaft.





(cont'd)

Crankshaft Main Bearing Replacement (cont'd)

Main Bearing Selection (cont'd)

3. Use the crank bore codes and crank journal codes to select the appropriate replacement bearings from the following table.

   NOTE:
   - Color code is on the edge of the bearing.
   - When using bearing halves of different colors, it does not matter which color is used in the top or bottom.

Larger crank bore →

Main journal code	Crank bore code: 1 or A or I	2 or B or II	3 or C or III	4 or D or IIII
1	Pink	Pink/ Yellow	Yellow	Green
2	Pink/ Yellow	Yellow	Green	Green/ Brown
3	Yellow	Green	Green/ Brown	Brown
4	Green	Green/ Brown	Brown	Black
5	Green/ Brown	Brown	Black	Black/ Blue
6	Brown	Black	Black/ Blue	Blue

↓ Smaller main jounal

→ Smaller bearing (Thicker)

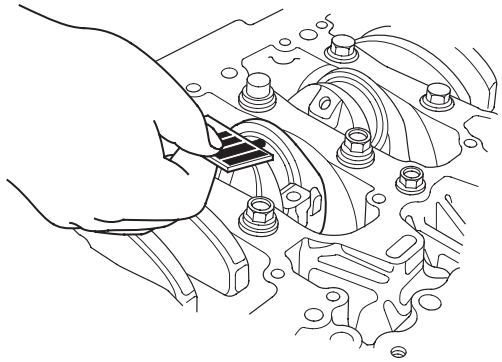
Connecting Rod Bearing Replacement

Rod Bearing Clearance Inspection

1. Remove the oil pump (see page 08-11).
2. Remove the baffle plate (see step 6 on page 07-12).
3. Remove the connecting rod cap and bearing half.
4. Clean the crankshaft rod journal and bearing half with a clean shop towel.
5. Place plastigage across the rod journal.
6. Reinstall the bearing half and cap, and torque the bolts to 20 N·m (2.0 kgf·m, 14 lbf·ft) + 90°.

   NOTE: Do not rotate the crankshaft during inspection.
7. Remove the rod cap and bearing half, and measure the widest part of the plastigage.

Connecting Rod Bearing-to-Journal Oil Clearance:
Standard (New): 0.021 - 0.049 mm (0.0008 - 0.0019 in.)
Service Limit: 0.060 mm (0.0024 in.)



8. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code(s), and recheck the clearance. Do not file, shim, or scrape the bearings or the caps to adjust clearance.
9. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check clearance again. If the proper clearance cannot be obtained by using the appropriate larger or smaller bearing, replace the crankshaft and start over.

Rod Bearing Selection

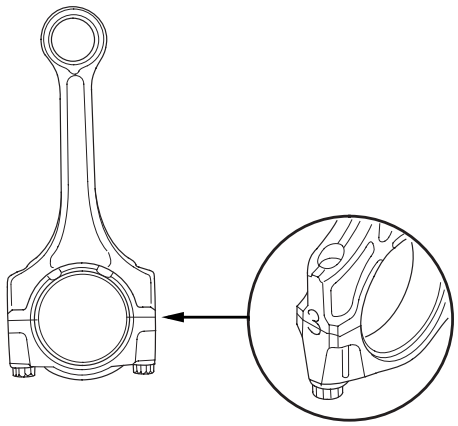
1. Inspect each connecting rod for cracks and heat damage.

Connecting Rod Big End Bore Code Locations

2. Each rod has a tolerance range from 0 to 0.024 mm (0.0009 in.), in 0.006 mm (0.0002 in.) increments, depending on the size of its big end bore. It's then stamped with a number or bar (1, 2, 3 or 4/I, II, III, or IIII) indicating the range. You may find any combination of numbers and bars in any engine, (Half the number or bar is stamped on the bearing cap, the other half on the rod.).

   If you can't read the code because of an accumulation of oil and varnish, do not scrub it with a wire brush or scraper. Clean it only with solvent or detergent.

Normal Bore Size:	
K20A4, K20A5 engines:	48.0 mm (1.89 in.)
K24A1 engine:	51.0 mm (2.01 in.)



(cont'd)

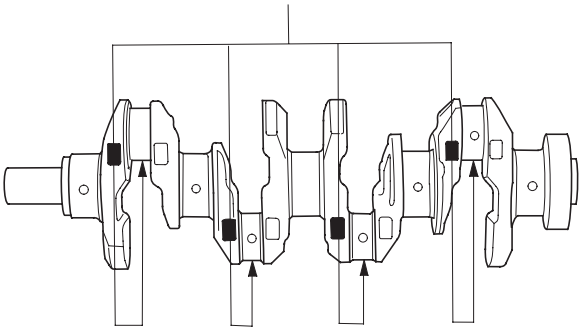
Connecting Rod Bearing Replacement (cont'd)

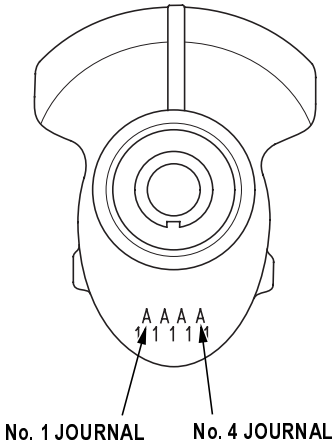
Rod Bearing Selection (cont'd)

Connecting Rod Journal Code Location

3. The connecting rod journal codes are stamped on the crankshaft.

Connecting Rod Journal Code Location (Letters or Bars)





4. Use the big end bore codes and rod journal codes to select appropriate replacement bearings from the following table.

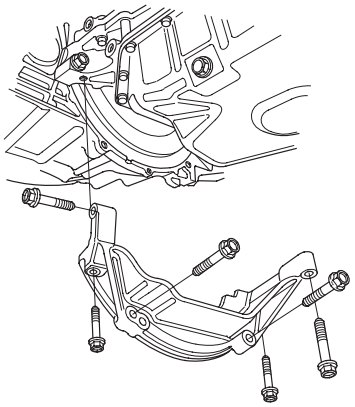
NOTE: Color code is on the edge of the bearing.

Rod journal code	Big end bore code: 1 or I	2 or II	3 or III	4 or IIII
	Larger big end bore → / Smaller bearing (Thicker) ↓			
A	Red	Pink	Yellow	Green
B	Pink	Yellow	Green	Brown
C	Yellow	Green	Brown	Black
D	Green	Brown	Black	Blue

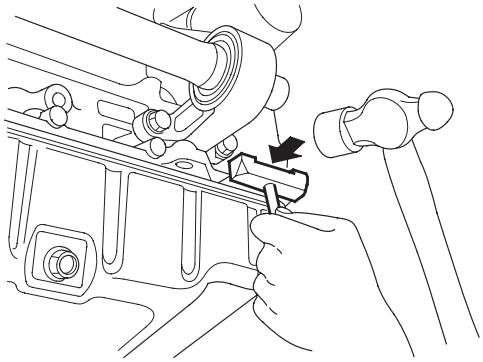
Smaller rod journal ↓ / Smaller bearing (Thicker) ↓

Oil Pan Removal

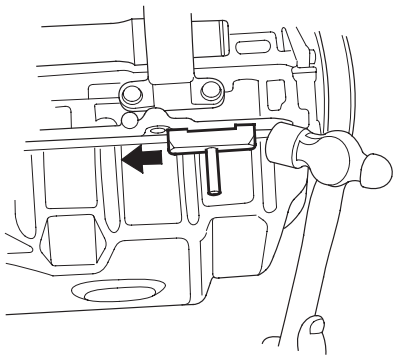
1. If the engine is still in the vehicle, remove the sub-frame.
   1 Drain the engine oil (see page 08-5).
   2 Attach the chain hoist to the engine (see step 38 on page 05-7).
   3 Disconnect the suspension lower arm ball joints (see page 18-20).
   4 Remove the rear mount mounting bolts (see step 42 on page 05-8).
   5 Remove the front mount mounting bolt (see step 43 on page 05-9).
   6 Remove the ATF filter mounting bolt (A/T) (see step 34 on page 05-7).
   7 Use a marker to make alignment marks on the reference lines that align with the centers of the rear sub-frame mounting bolts. Remove the front sub-frame (see step 44 on page 05-9).
2. Remove the stiffener (K24A1 engine M/T).



3. Remove the bolts/nuts securing the oil pan.
4. Drive an oil pan seal cutter between the oil pan and cylinder block.



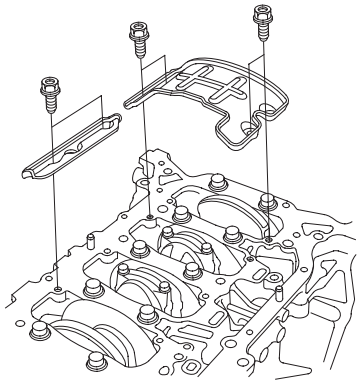
5. Cut the oil pan seal by striking the side of the cutter to slide the cutter along the oil pan.



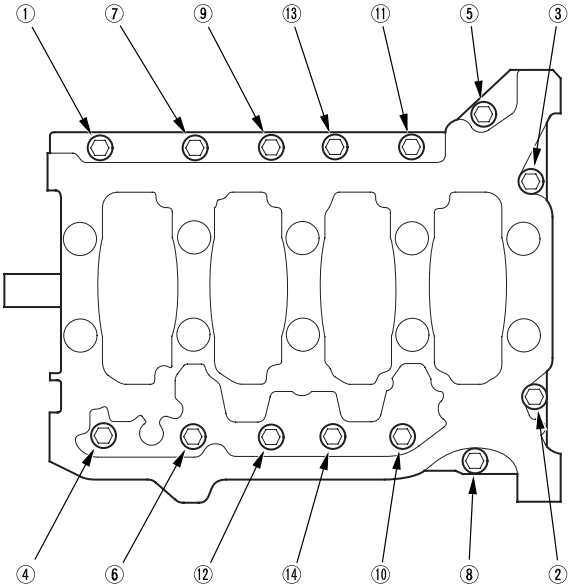
6. Remove the oil pan.

Crankshaft and Piston Removal

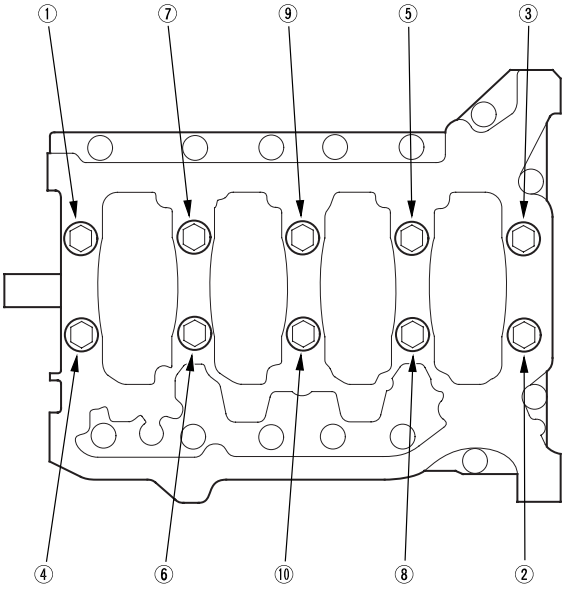
1. Remove the engine assembly (see page 05-3).
2. Remove the transmission:
   - Manual transmission (see page 13-5).
   - Automatic transmission (see page 14-135).
3. Remove the oil pan (see page 07-11).
4. Remove the oil pump (see page 08-11).
5. Remove the cylinder head (see page 06-24).
6. Remove the baffle plates.



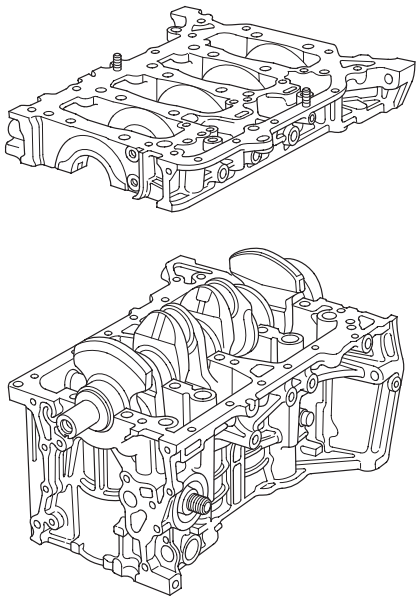
7. Remove the 8 mm bolts.



8. Remove the bearing cap bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time: repeat the sequence until all bolts are loosened.

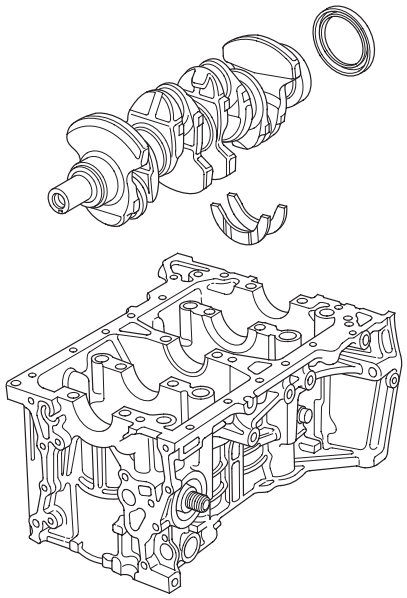


9. Remove the lower block and bearings. Keep all bearings in order.



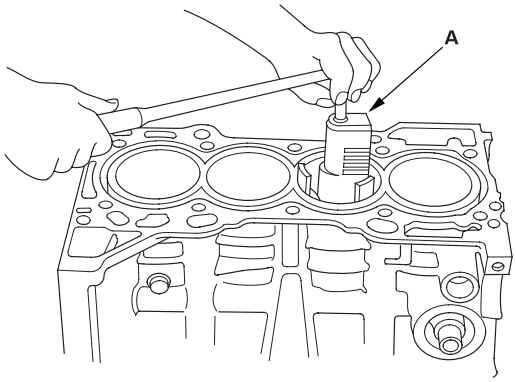
10. Remove the rod caps/bearings. Keep all caps/bearings in order.

11. Lift the crankshaft out of the engine, being careful not to damage the journals.

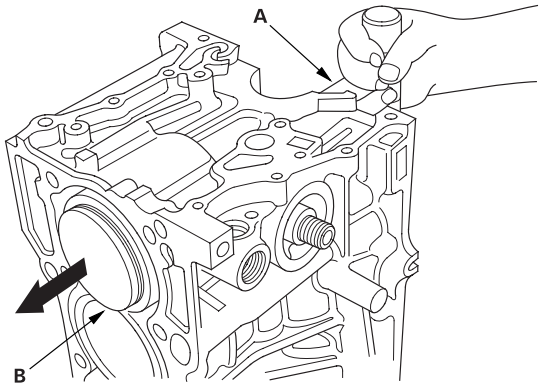


12. Remove the upper bearing halves from the connecting rods, and set them aside with their respective caps.

13. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer (A). Follow the reamer manufacturer's instructions. If the ridge is not removed, it may damage the pistons as they are pushed out.



14. Use the wooden handle of a hammer (A) to drive out the pistons (B).



15. Reinstall the lower block and bearings on the engine in the proper order.

16. Reinstall the connecting rod bearings and caps after removing each piston/connecting rod assembly.

17. To avoid mixup on reassembly, mark each piston/connecting rod assembly with its cylinder number.

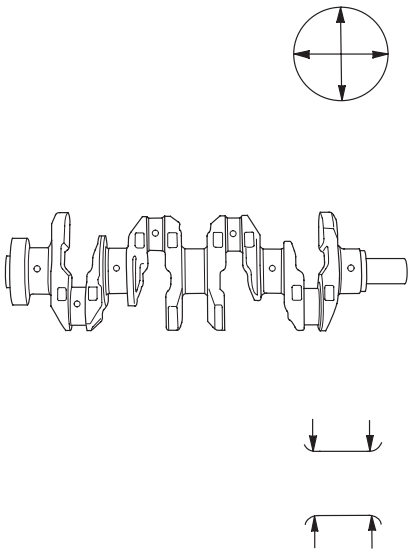
NOTE: The existing number on the connecting rod does not indicate its position in the engine, it indicates the rod bore size.

Crankshaft Inspection

Out-of-Round and Taper

1. Remove the crankshaft from the cylinder block (see page 07-12).
2. Clean the crankshaft oil passages with pipe cleaners or suitable brush.
3. Clean the keyway and threads.
4. Measure out-of-round at the middle of each rod and main journal in two places. The difference between measurements on each journal must not be more than the service limit.

   Journal Out-of-Round:
   Standard (New): 0.005 mm (0.0002 in.) max.
   Service Limit: 0.010 mm (0.0004 in.)



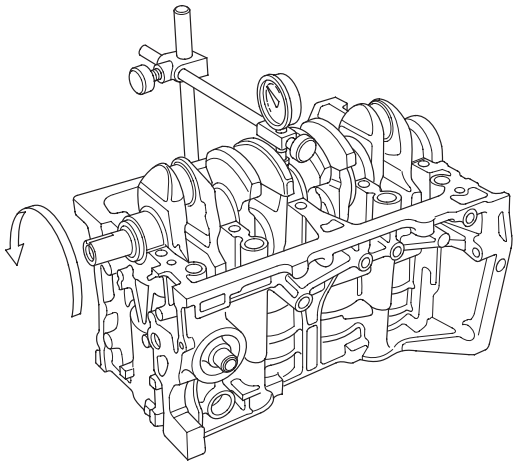
5. Measure taper at the edges of each rod and main journal. The difference between measurement on each journal must not be more than the service limit.

   Journal Taper:
   Standard (New): 0.005 mm (0.0002 in.) max.
   Service Limit: 0.010 mm (0.0004 in.)

Straightness

6. Place the cylinder block on the surface plate.
7. Clean and install the bearings on the No. 1 and No. 5 journal of the cylinder block.
8. Lower the crankshaft into the block.
9. Measure runout on all main journals. Rotate the crankshaft two complete revolutions. The difference between measurements on each journal must not be more than the service limit.

   Crankshaft Total Runout:
   Standard (New): 0.03 mm (0.0012 in.) max.
   Service Limit: 0.04 mm (0.0016 in.)



Block and Piston Inspection

1. Remove the crankshaft and pistons (see page 07-12).
2. Check the piston for distortion or cracks.
3. Measure the piston diameter at a point A from the bottom of the skirt. There are two standard-size pistons (No Letter or A, and B). The letter is stamped on the top of the piston. Letters are also stamped on the block as cylinder bore sizes.

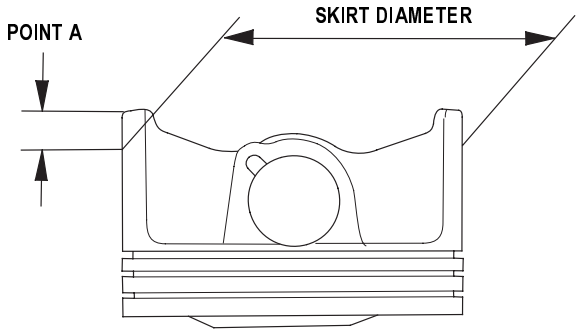
Point A:
K20A4, K20A5 engines: 11 mm (0.4 in.)
K24A1 engine: 13 mm (0.5 in.)

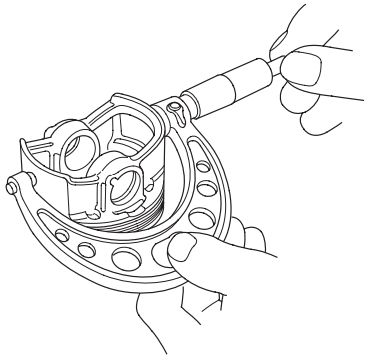
Piston Diameter:
Standard (New):
K20A4, K20A5 engines:
No Letter (or A): 85.980 - 85.990 mm (3.3850 - 3.3854 in.)
B: 85.970 - 85.980 mm (3.3846 - 3.3850 in.)

K24A1, engine:
No Letter (or A): 86.980 - 86.990 mm (3.4244 - 3.4248 in.)
B: 86.970 - 86.980 mm (3.4240 - 3.4244 in.)

Service Limit:
K20A4, K20A5 engines:
No Letter (or A): 85.930 mm (3.3831 in.)
B: 85.920 mm (3.3827 in.)

K24A1 engine:
No Letter (or A): 86.930 mm (3.4224 in.)
B: 86.920 mm (3.4220 in.)





Oversize Piston Diameter:
K20A4, K20A5 engines:
0.25: 86.230 - 86.240 mm (3.3949 - 3.3953 in.)

K24A1 engine:
0.25: 87.230 - 87.240 mm (3.4342 - 3.4346 in.)

(cont'd)

Block and Piston Inspection (cont'd)

4. Measure wear and taper in direction X and Y at three levels in each cylinder as shown. If measurements in any cylinder are beyond the Oversize Bore Service Limit, replace the block. If the block is to be rebored, refer to step 7 after reboring.

Cylinder Bore Size:
K20A4, K20A5 engines:
Standard (New):

A or I:	**86.010 - 86.020 mm (3.3862 - 3.3866 in.)**
B or II:	**86.000 - 86.010 mm (3.3858 - 3.3862 in.)**
Service Limit:	**86.070 mm (3.3886 in.)**

K24A1 engine:
Standard (New):

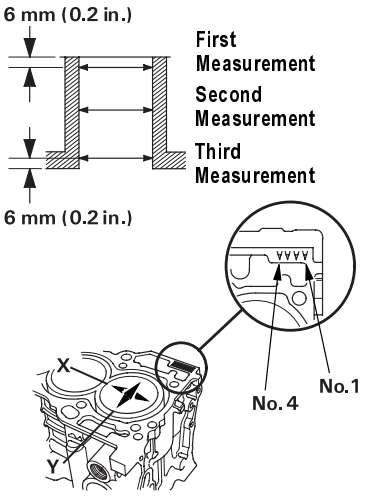
A or I:	**87.010-87.020 mm (3.4256-3.4260 in.)**
B or II:	**87.000-87.010 mm (3.4252-3.4256 in.)**
Service Limit:	**87.070 mm (3.4279 in.)**

Oversize:
K20A4, K20A5 engines:
0.25: 86.250 - 86.260 mm (3.3957 - 3.3961 in.)

K24A1 engine:
0.25: 87.250-87.260 mm (3.4350-3.4354 in.)

Reboring limit: 0.25 mm (0.01 in.) max.

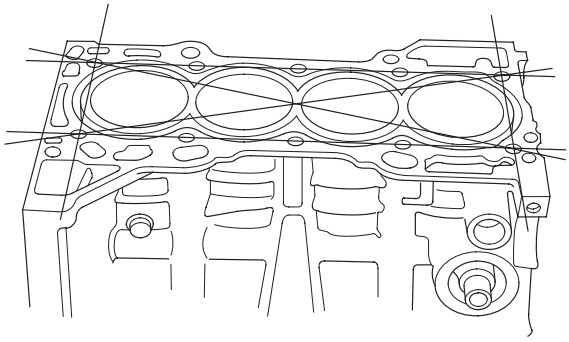
Bore Taper:
Limit: (Difference between first and third measurement) 0.05 mm (0.002 in.)

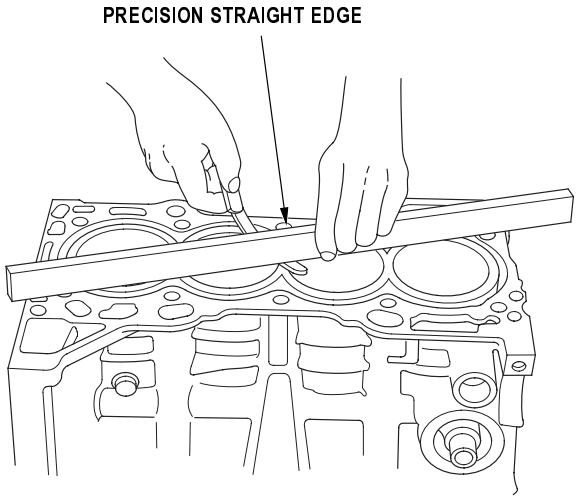


5. Scored or scratched cylinder bores must be honed.

6. Check the top of the block for warpage. Measure along the edges and across the center as shown.

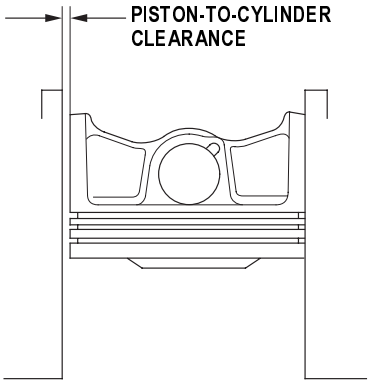
Engine Block Warpage:
Standard (New): 0.07 mm (0.003 in.) max.
Service Limit: 0.10 mm (0.004 in.)





7. Calculate the difference between the cylinder bore diameter and the piston diameter. If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.

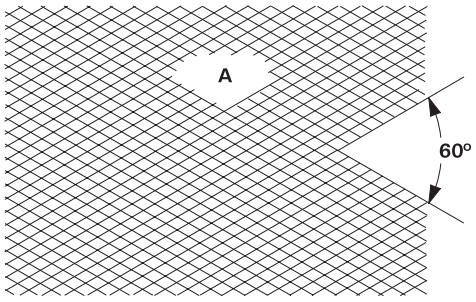
Piston-to-Cylinder Clearance:
Standard (New): 0.020 - 0.040 mm (0.0008 - 0.0016 in.)
Service Limit: 0.05 mm (0.002 in.)



Cylinder Honing

Only a scored or scratched cylinder bore must be honed.

1. Measure the cylinder bores (see step 4 on page 07-16).
   If the block is to be reused, hone the cylinders and remeasure the bores.
2. Hone the cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree cross-hatch pattern (A). Use only a rigid hone with 400 grit or finer stone such as Sunnen, Ammco, or equivalent. Do not use stones that are worn or broken.



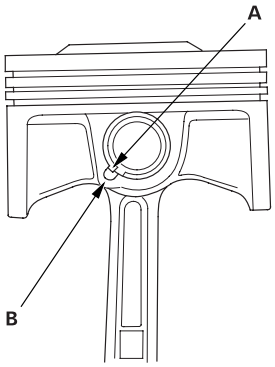
3. When honing is complete, thoroughly clean the engine block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil them immediately to prevent rusting. Never use solvent, it will only redistribute the grit on the cylinder walls.
4. If scoring or scratches are still present in the cylinder bores after honing to the service limit, rebore the cylinder block. Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.

Piston, Pin and Connecting Rod Replacement

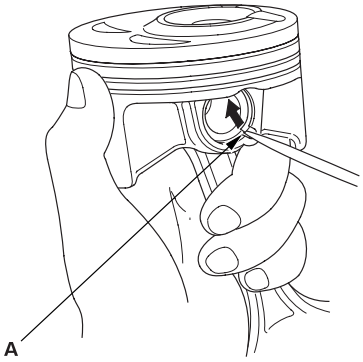
Disassembly

1. Remove the piston from the cylinder block (see page 07-12).
2. Apply engine oil to the piston pin snap rings (A), and turn them in the ring grooves until the end gaps are lined up with the cutouts in the piston pin bores (B).

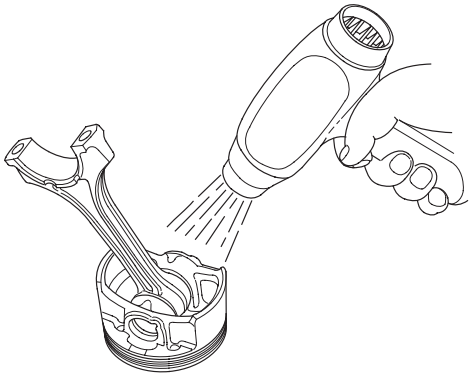
   NOTE: Take care not to damage the ring grooves.



3. Remove both snap rings (A). Start at the cutout in the piston pin bore. Remove the snap rings carefully so they do not go flying or get lost. Wear eye protection.



4. Heat the piston and connecting rod assembly to about 70°C (158°F), then remove the piston pin.

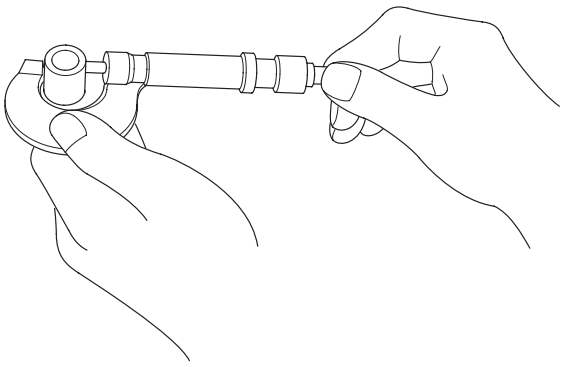


Inspection

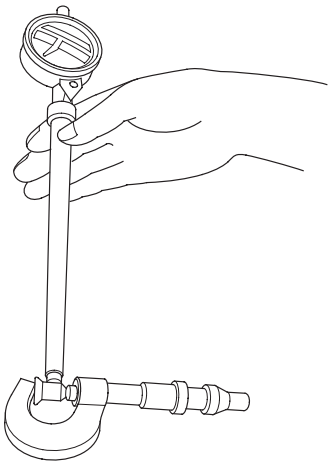
NOTE: Inspect the piston, piston pin, and connecting rod when they are at room temperature.

1. Measure the diameter of the piston pin.

Piston Pin Diameter:
Standard (New): 21.961 - 21.965 mm (0.8646 - 0.8648 in.)
Service Limit: 21.953 mm (0.8643 in.)

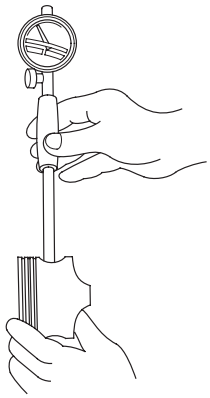


2. Zero the dial indicator to the piston pin diameter.



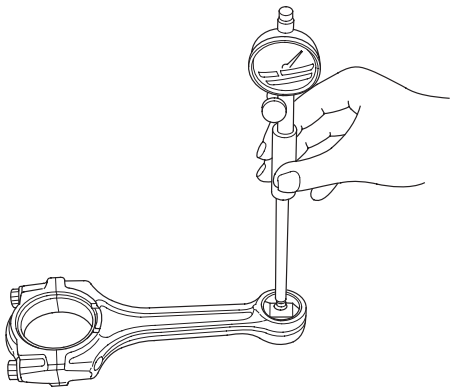
3. Check the difference between the piston pin diameter and piston pin hole diameter in the piston.

Piston Pin-to-Piston Clearance:
Standard (New): - 0.005 to +0.002 mm (- 0.00020 to +0.00008 in.)
Service Limit: 0.005 mm (0.0002 in.)



4. Measure the piston pin-to-connecting rod clearance.

Piston Pin-to-Connecting Rod Clearance:
Standard (New): 0.005 - 0.015 mm (0.0002 - 0.0006 in.)
Service Limit: 0.02 mm (0.0008 in.)

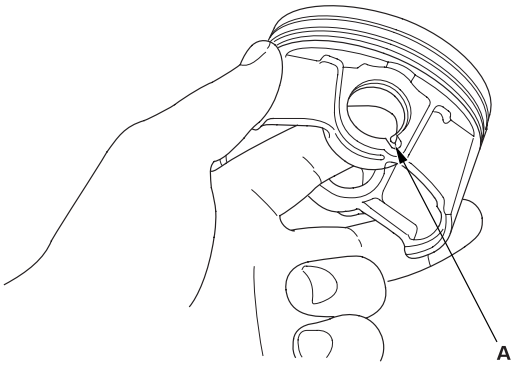


(cont'd)

Piston, Pin and Connecting Rod Replacement (cont'd)

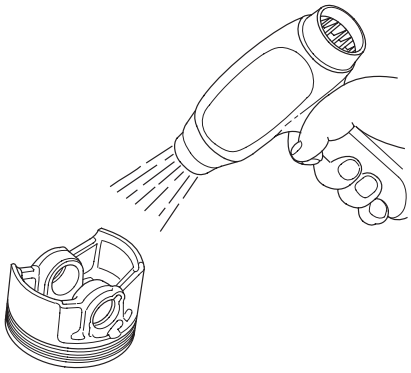
Reassembly

1. Install a piston pin snap ring (A).

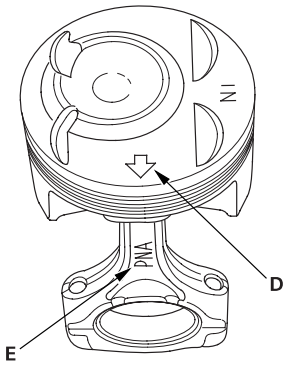


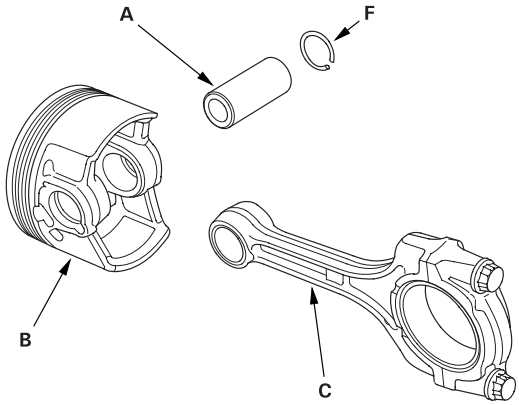
2. Coat the piston pin bore in the piston, the bore in the connecting rod, and the piston pin with engine oil.

3. Heat the piston to about 70°C (158°F).



4. Install the piston pin (A). Assemble the piston (B) and connecting rod (C) with the arrow (D) and the embossed mark (E) on the same side.



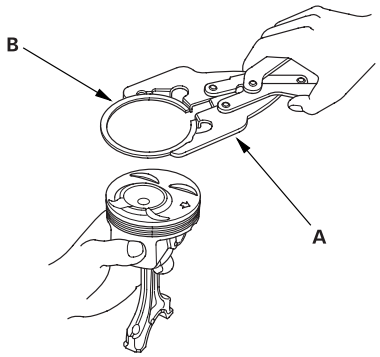


5. Install the remaining snap ring (F).

6. Turn the snap rings in the ring grooves until the end gaps are positioned at the bottom of the piston.

Piston Ring Replacement

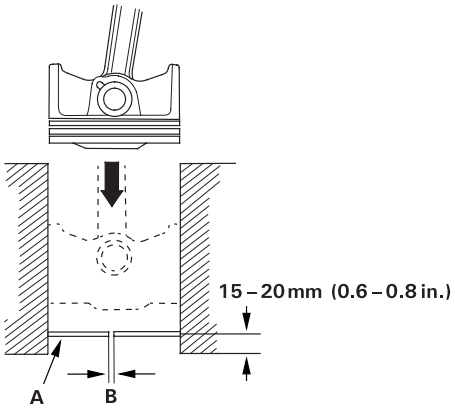
1. Remove the piston from the cylinder block (see page 07-12).
2. Using a ring expander (A), remove the old piston rings (B).



3. Clean all ring grooves thoroughly with a squared-off broken ring or ring groove cleaner with a blade to fit the piston grooves.
   The top and 2nd ring grooves are 1.2 mm (0.05 in.) wide. The oil ring groove is 2.0 mm (0.08 in.) wide (K20A4, K24A1 engines) or 2.8 mm (0.11 in.) wide (K20A5 engine).
   File down a blade if necessary.
   Do not use a wire brush to clean the ring grooves, or cut the ring grooves deeper with the cleaning tools.

   NOTE: If the piston is to be separated from the connecting rod, do not install new rings yet.

4. Using a piston, push a new ring (A) into the cylinder bore 15 - 20 mm (0.6 - 0.8 in.) from the bottom.



5. Measure the piston ring end-gap (B) with a feeler gauge:
   - If the gap is too small, check to see if you have the proper rings for your engine.
   - If the gap is too large, recheck the cylinder bore diameter against the wear limits (see step 4 on page 07-16).
     If the bore is over the service limit, the cylinder block must be rebored.

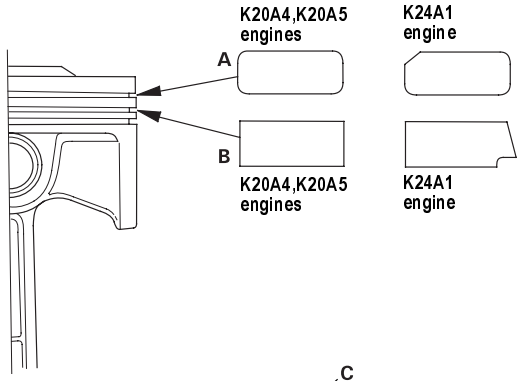
Piston Ring End-Gap:

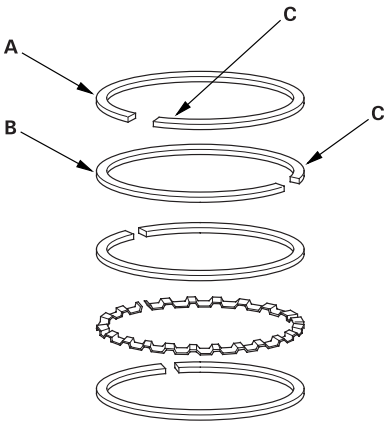
Top Ring	
Standard (New):	**0.20 - 0.35 mm (0.008 - 0.014 in.)**
Service Limit:	**0.60 mm (0.024 in.)**
Second Ring	
Standard (New):	**0.40 - 0.55 mm (0.016 - 0.022 in.)**
Service Limit:	**0.70 mm (0.028 in.)**
Oil Ring	
K20A4 (Except KY models) engine	
Standard (New):	**0.25 - 0.65 mm (0.010 - 0.026 in.)**
Service Limit:	**0.75 mm (0.030 in.)**
K20A4 (KY models), K20A5, K24A1 engines	
Standard (New):	**0.20 - 0.70 mm (0.008 - 0.028 in.)**
Service Limit:	**0.80 mm (0.031 in.)**

(cont'd)

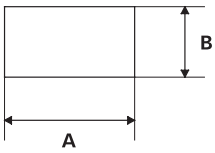
Piston Ring Replacement (cont'd)

6. Install the top ring and second ring as shown.The top ring (A) has a T or 1R mark and the second ring (B) has a 2T or 2R mark. The manufacturing marks (C) must be facing upward.





Piston ring dimensions

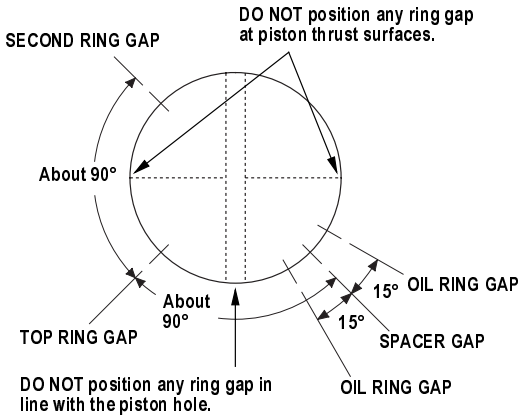


Top Ring (Standard):
A: 3.1 mm (0.12 in.)
B: 1.2 mm (0.05 in.)

Second Ring (Standard):
A: 3.4 mm (0.13 in.)
B: 1.2 mm (0.05 in.)

7. Rotate the rings in their grooves to make sure they do not bind.

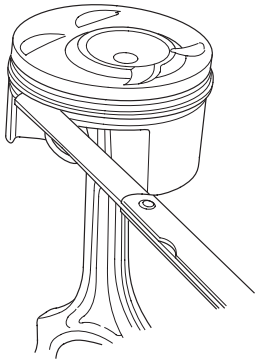
8. Position the ring end gaps as shown:



9. After installing a new set of rings, measure the ring-to-groove clearances:

Top Ring Clearance
Standard (New):
K20A4 engine:
0.035-0.060 mm (0.0014-0.0024 in.)
K20A5 engine:
0.030-0.055 mm (0.0012-0.0022 in.)
K24A1 engine:
0.045-0.070 mm (0.0018-0.0028 in.)
Service Limit:0.13 mm (0.005 in.)

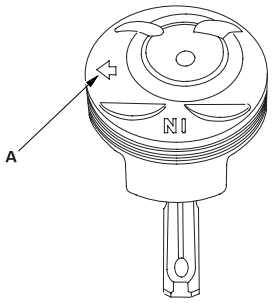
Second Ring Clearance
Standard (New):
K20A4, K20A5 engine:
0.030-0.055 mm (0.0012-0.0022 in.)
K24A1 engine:
0.050-0.075 mm (0.0020-0.0030 in.)
Service Limit: 0.13 mm (0.005 in.)



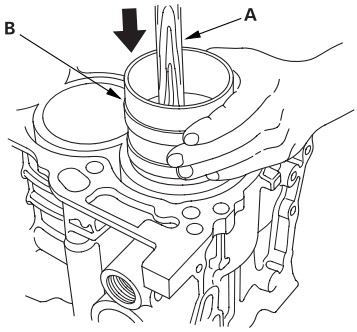
Piston Installation

If the crankshaft is already installed

1. Set the crankshaft to Bottom Dead Center (BDC) for each cylinder.
2. Remove the connecting rod caps, then install the ring compressor, and check that the bearing is securely in place.
3. Position the arrow (A) facing the timing chain side of the engine.



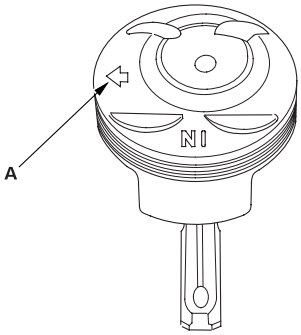
4. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer (A). Maintain downward force on the ring compressor (B) to prevent the rings from expanding before entering the cylinder bore.



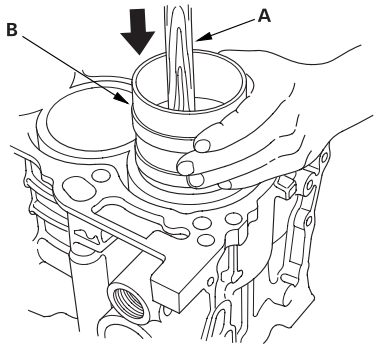
5. Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing the piston into place.
6. Check the connecting rod bearing clearance with plastigage (see page 07-8).
7. Inspect the connecting rod bolts (see page 07-24).
8. Apply engine oil to the bolt threads, then install the rod caps with bearings. Torque the bolts to 20 N·m (2.0 kg·m, 14 lbf·ft) + 90°.

If the crankshaft is not installed

1. Remove the connecting rod caps, then install the ring compressor, and check that the bearing is securely in place.
2. Position the arrow (A) facing the timing chain side of the engine.



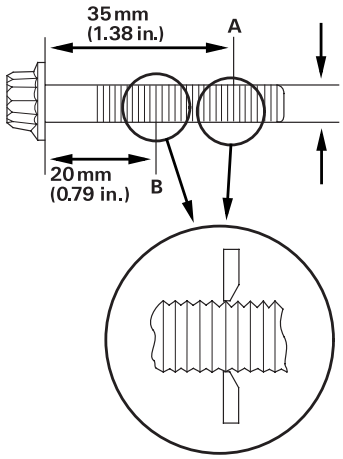
3. Position the piston in the cylinder, and tap it in using the wooden handle of a hammer (A). Maintain downward force on the ring compressor (B) to prevent the rings from expanding before entering the cylinder bore.



4. Position all pistons at top dead center.

Connecting Rod Bolt Inspection

1. Measure the diameter of each connecting rod bolt at point A and point B.



2. Calculate the difference in diameter between point A and point B.

   Point A - Point B = Difference in Diameter

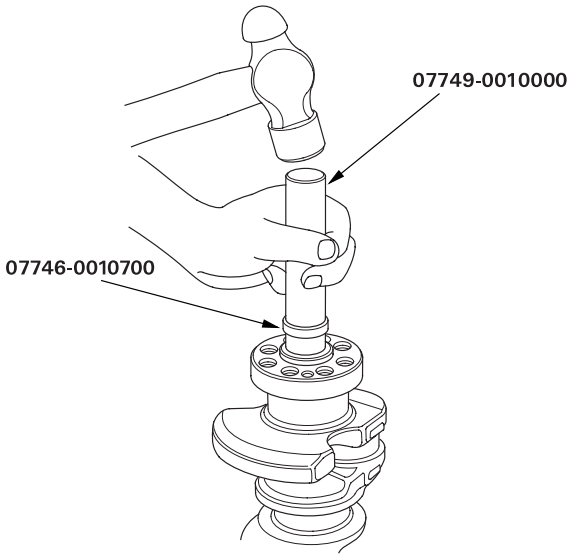
   Difference in Diameter:
   Specification: 0 - 0.1 mm (0 - 0.004 in.)

3. If the difference in diameter is out of tolerance, replace the connecting rod bolt.

Crankshaft Installation

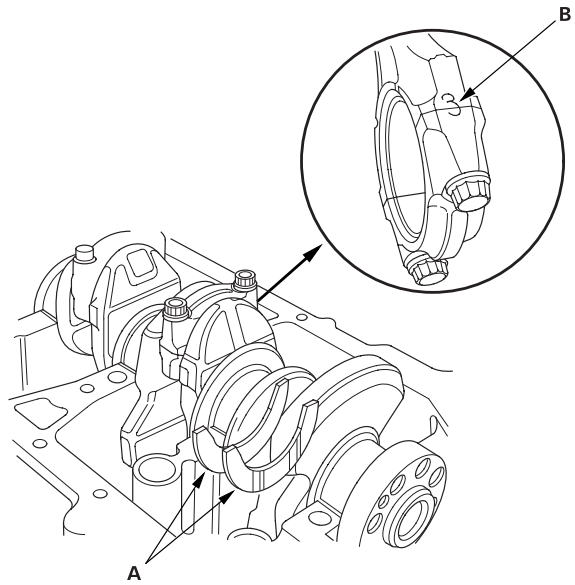
Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 24 x 26 mm 07746-0010700
- Oil seal driver attachment 96 07ZAD-PNA0100

1. With a manual transmission, install the crankshaft end bushing when replacing the crankshaft.
   1 Using the special tools, drive in the crankshaft end bushing until the special tools bottom against the crankshaft.



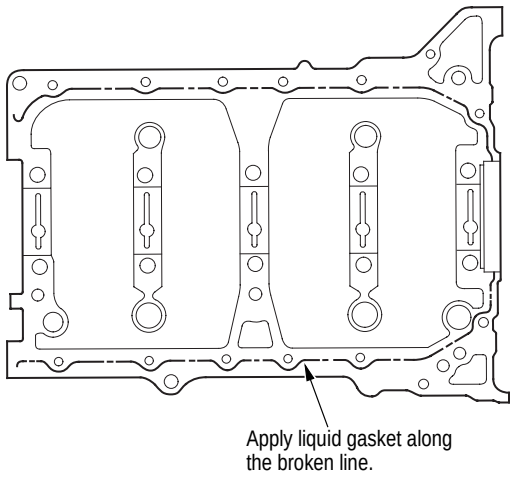
2. Check the connecting rod bearing clearance with plastigage (see page 07-8).
3. Check the main bearing clearance with plastigage (see page 07-6).
4. Inspect the connecting rod bolts (see page 07-24).

5. Install the bearing halves in the cylinder block and connecting rods.
6. Apply a coat of engine oil to the main bearings and rod bearings.
7. Hold the crankshaft so rod journal No. 2 and rod journal No. 3 are straight up, and lower the crankshaft into the block.
8. Install the thrust washers (A) in the No. 4 journal of the cylinder block.



9. Apply engine oil to the threads of the connecting rod bolts.
10. Seat the rod journals into connecting rod No. 1 and connecting rod No. 4. Line up the mark (B) on the connecting rod and cap, then install the caps and bolts finger-tight.
11. Rotate the crankshaft clockwise, and seat the journals into connecting rod No. 2 and connecting rod No. 3. Line up the mark on the connecting rod and cap, then install the caps and bolts finger-tight.
12. Tighten the connecting rod bolts to 20 N·m (2.0 kgf·m, 14 lbf·ft).
13. Tighten the connecting rod bolts an additional 90°.
14. Remove old liquid gasket from the lower block mating surfaces, bolts and bolt holes.
15. Clean and dry the lower block mating surfaces.
16. Apply liquid gasket, P/N 08C70-K0234M, 08C70-K0334M or 08C70-X0331S, evenly to the cylinder block mating surface of the lower block and to the inner threads of the bolt holes.

    NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.

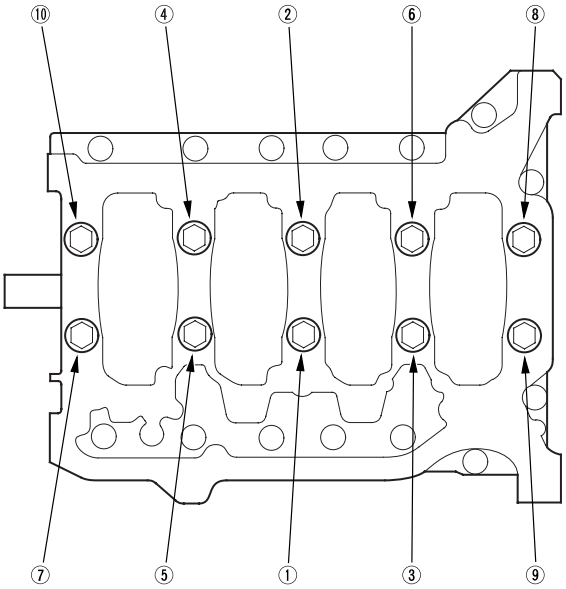


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Crankshaft Installation (cont'd)

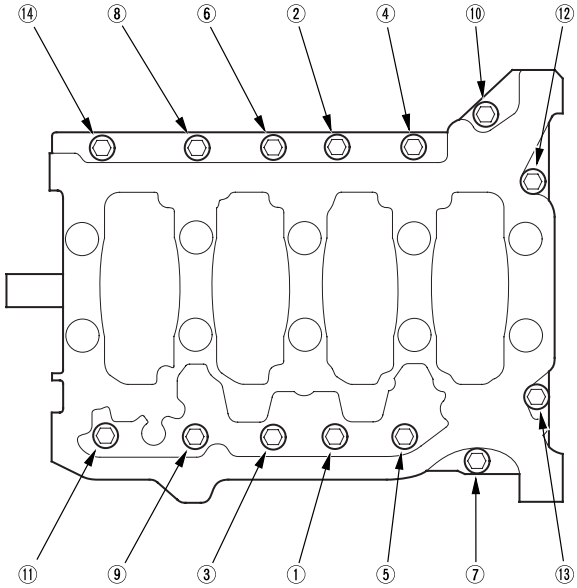
17. Put the lower block on the cylinder block.

18. Tighten the bearing cap bolts in sequence to 29 N·m (3.0 kgf·m, 22 lbf·ft).

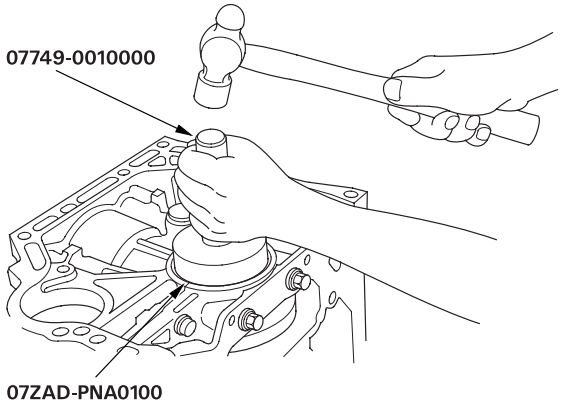


19. Tighten the bearing cap bolts an additional 56°.

20. Tighten the 8 mm bolts in sequence to 22 N·m (2.2 kgf·m, 16 lbf·ft).

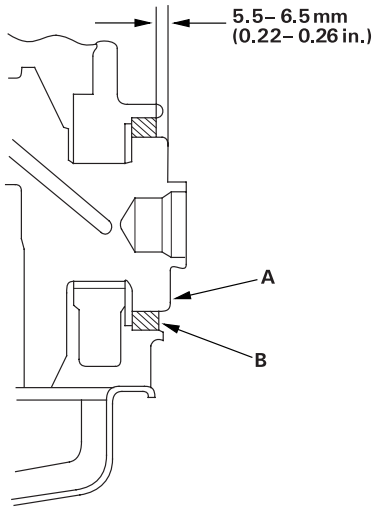


21. Use the special tools to drive a new oil seal squarely into the block to the specified installed height.

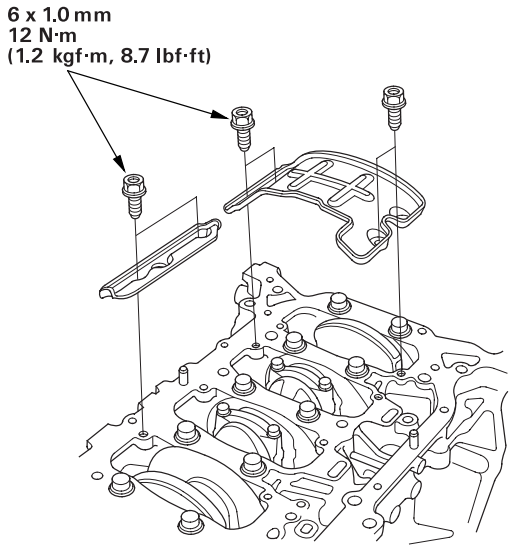


22. Measure the distance between the crankshaft (A) and oil seal (B).

Oil Seal Installed Height: 5.5 - 6.5 mm (0.22 - 0.26 in.)



23. Install the baffle plates.



24. Install the oil pump (see page 08-16).

25. Install the oil pan (see page 07-27).

26. Install the cylinder head (see page 06-40).

27. Install the transmission:

- Manual transmission (see page 13-10).
- Automatic transmission (see page 14-143).

28. Install the engine assembly (see page 05-10).

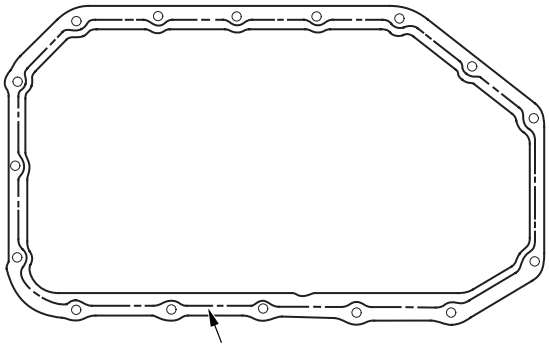
Oil Pan Installation

1. Remove old liquid gasket from the oil pan mating surfaces, bolts, and bolt holes.

2. Clean and dry the oil pan mating surfaces.

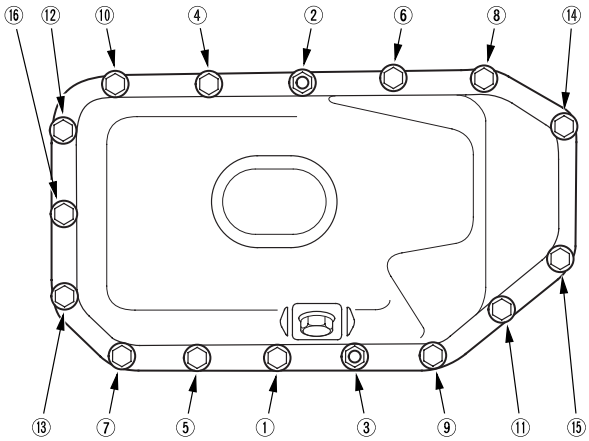
3. Apply liquid gasket, P/N 08C70-K0334M or 08C70-X0331S, evenly to the cylinder block mating surface of the oil pan and to the inner threads of the bolt holes.

NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.



4. Install the oil pan.

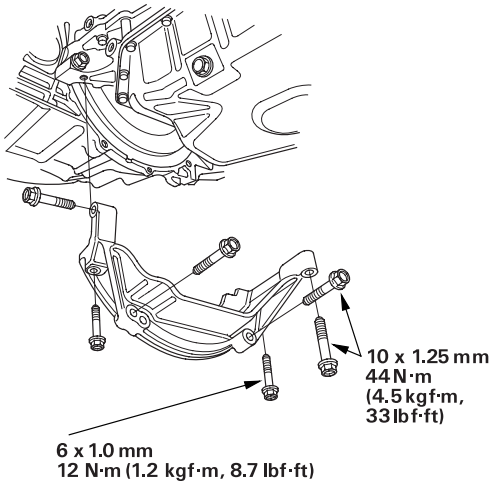
5. Tighten the bolts in two or three steps. In the final step, tighten all bolts, in sequence, to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



(cont'd)

Oil Pan Installation (cont'd)

6. Install the stiffener (K24A1 engine M/T).



7. If the engine is still in the vehicle, install the sub-frame.

1 Install the sub-frame. Align the reference lines on the sub-frame with the bolt head center, then tighten the bolts (see step 4 on page 05-11).

2 Install the ATF filter mounting bolt (see step 21 on page 05-13).

3 Tighten the front mounting bolt (see step 5 on page 05-11).

4 Tighten the rear mount mounting bolts (see step 6 on page 05-12).

5 Connect the suspension lower arm ball joints (see page 18-20).

8. After assembly, wait at least 30 minutes before filling the engine with oil.

08

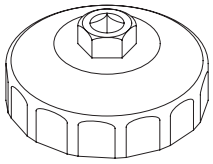
Engine Mechanical

Engine Lubrication 08-2
- Special Tools 08-2
- Component Location Index 08-3
- Oil Pressure Switch Test 08-4
- Oil Pressure Test 08-4
- Engine Oil Replacement 08-5
- Engine Oil Filter Replacement 08-6
- Oil Filter Holder Replacement 08-9
- Oil Pump Overhaul 08-10
- Oil Pressure Switch Replacement 08-18

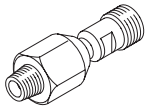
Engine Lubrication

Special Tools

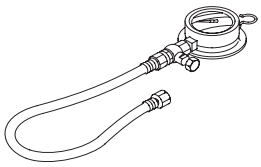
Ref. No.	Tool Number	Description	Qty
1	07HAA-PJ70100	Oil Filter Wrench	1
2	07406-0030000	Oil Pressure Gauge Attachment	1
3	07506-3000001	Oil Pressure Gauge	1
4	07744-0010500	Pin Driver, 6.0 mm	1
5	07912-6110001	Oil Filter Wrench	1



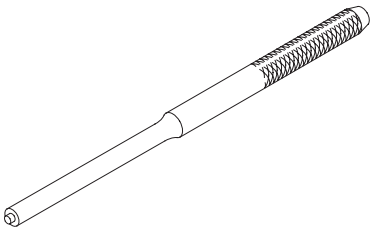
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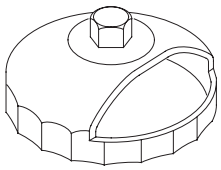
2



3

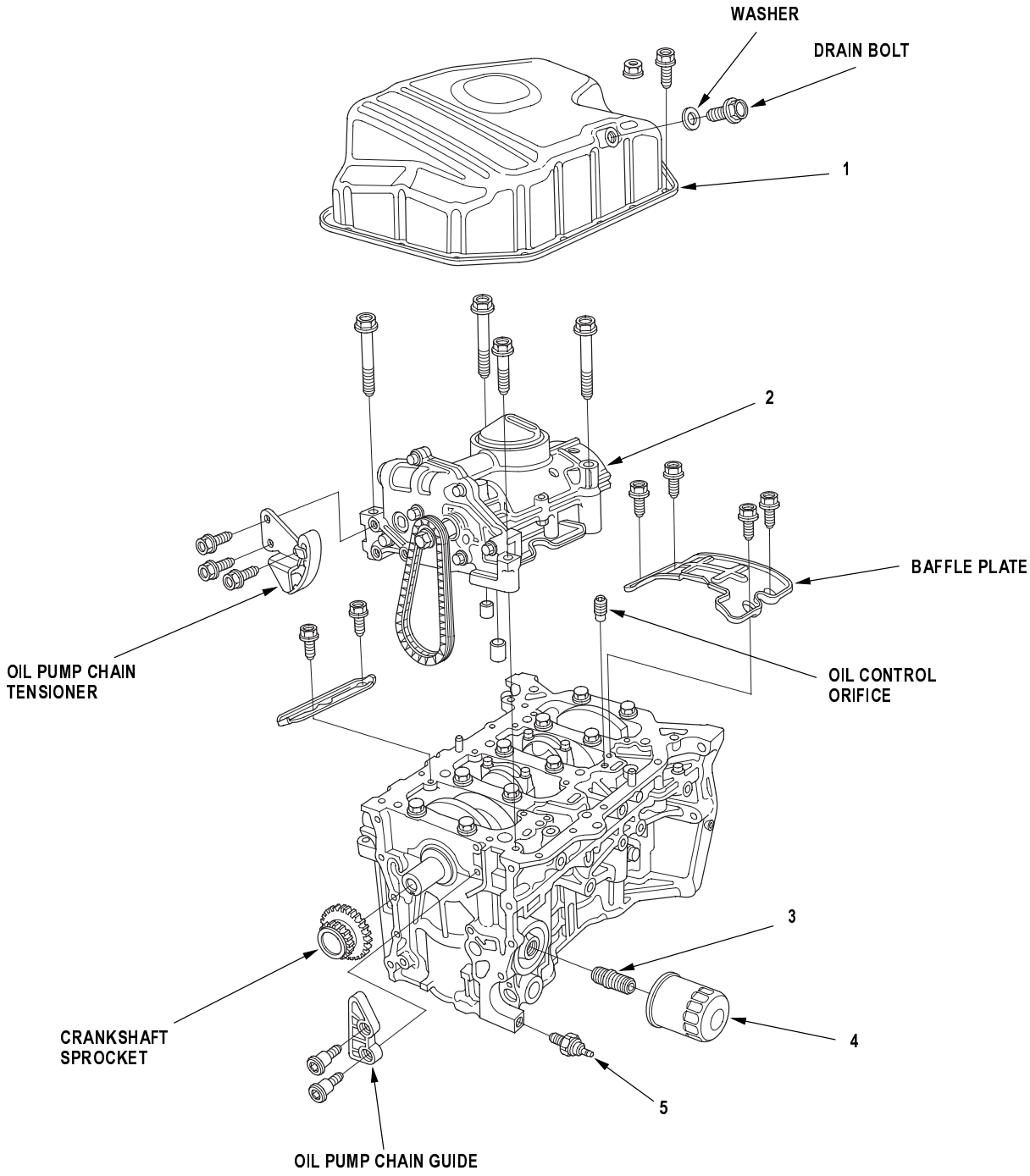


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5

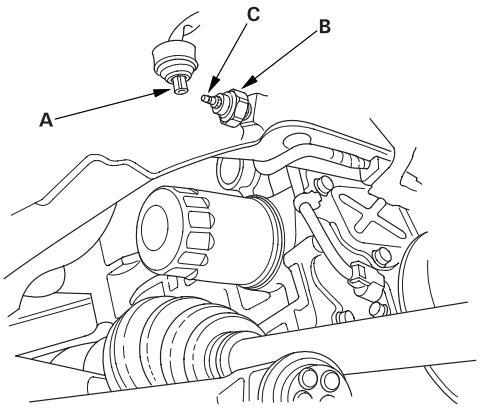
Component Location Index



1	OIL PAN	Removal, page 07-11; Installation, page 07-27
2	OIL PUMP	Overhaul, page 08-10
3	OIL FILTER HOLDER	Replacement, page 08-9
4	OIL FILTER	Replacement, page 08-6
5	OIL PRESSURE SWITCH	Circuit Diagram, page 22A-68; Switch Test, page 08-4; Oil Pressure test, page 08-4; Replacement, page 08-18

Oil Pressure Switch Test

1. Remove the YEL/RED wire (A) from the engine oil pressure switch (B).



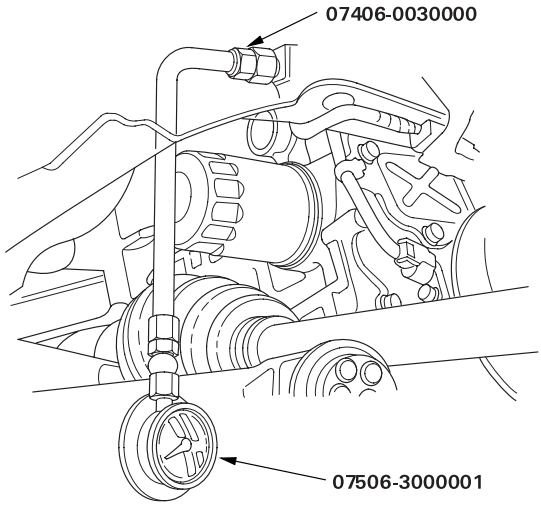
2. Check for continuity between the positive terminal (C) and the engine (ground). There should be continuity with the engine stopped. There should be no continuity with the engine running.
3. If the switch fails to operate, check the engine oil level. If the engine oil level is OK, check the engine oil pressure. If the oil pressure is OK, replace the oil pressure switch.

Oil Pressure Test

Special Tools Required
- Oil pressure gauge attachment 07406-0030000
- Oil pressure gauge 07506-3000001

If the oil pressure warning light stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Connect a tachometer or a Honda PGM Tester.
2. Remove the engine oil pressure switch, and install an the special tools.



3. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.
4. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

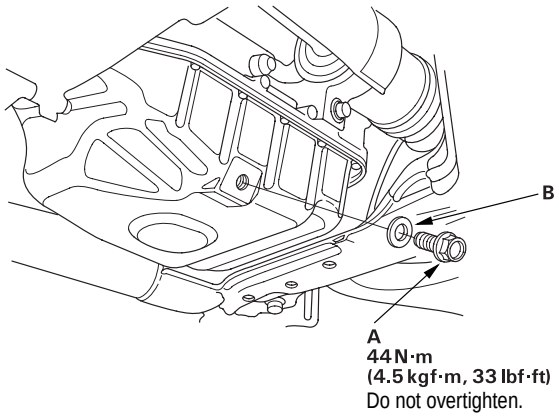
Engine Oil Temperature: 80°C (176°F)
Engine Oil Pressure:

At Idle:	**70 kPa (0.7 kgf/cm^2, 10 psi) minimum**
At 3,000 rpm (min^{-1}):	**340 kPa (3.5 kgf/cm^2, 50 psi) minimum**

5. If the oil pressure is NOT within specifications, inspect these items.
   - Check the oil screen for clogging.
   - Check the oil pump (see page 08-12).

Engine Oil Replacement

1. Warm up the engine.
2. Remove the drain bolt (A), and drain the engine oil.



3. Reinstall the drain bolt with a new washer (B).
4. Refill with the recommended oil (see page 03-2).

Capacity

4.0 l (4.2 US qt, 3.5 Imp qt) at oil change.
4.2 l (4.4 US qt, 3.7 Imp qt) at oil change including filter.
5.3 l (5.6 US qt, 4.7 Imp qt) after engine overhaul.

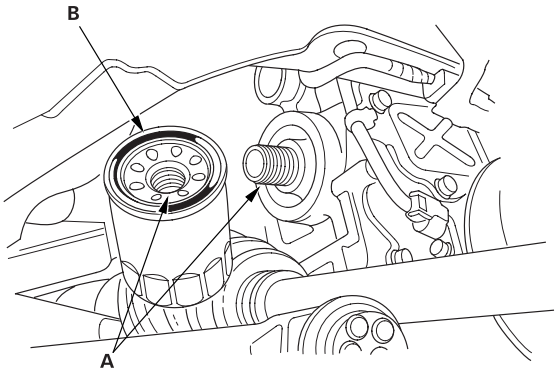
5. Run the engine for more than 3 minutes, then check for oil leakage.

Engine Oil Filter Replacement

Special Tools Required
- Oil filter wrench 07HAA-PJ70100
- Oil filter wrench 07912-6110001

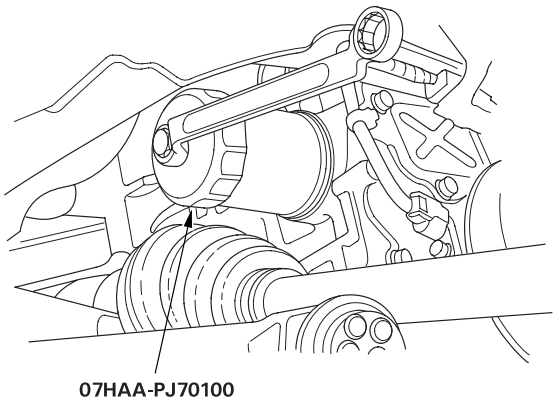
JAPAN-MADE Engine Oil Filter
(3/4 - turn type)

1. Remove the oil filter with the special oil filter wrench.
2. Inspect the threads (A) and rubber seal (B) on the new filter. Wipe off the seat on the engine block, then apply a light coat of oil to the filter rubber seal. Use only filters with a built-in bypass system.

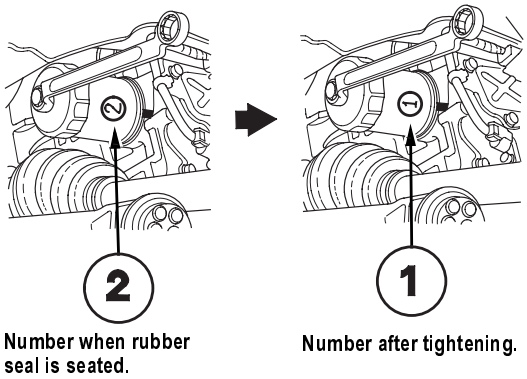


3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

Tighten: **3/4 turn clockwise.**
Tightening torque: **12 N·m (1.2 kgf·m, 8.7 lbf·ft)**



5. If 4 numbers or marks (1 to 4 or ▼ to ▼▼▼▼) are printed around the outside of the filter, use the following procedure to tighten the filter.
   - Spin the filter on until its seal lightly seats against the block, and note which number or mark is at the bottom.
   - Tighten the filter by turning it clockwise 3 numbers or marks from the one you noted. For example, if number 2 is at the bottom when the seal is seated, tighten the filter until the number 1 comes around the bottom.

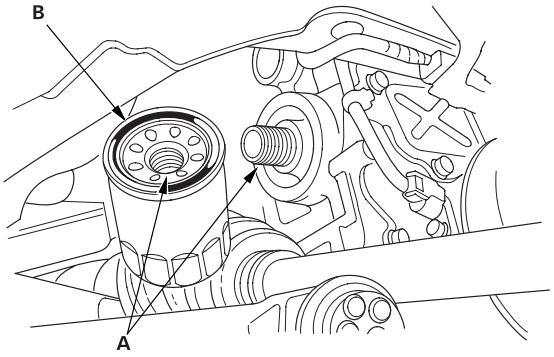


Number or Mark when rubber seal is seated	1 or ▼	2 or ▼▼	3 or ▼▼▼	4 or ▼▼▼▼
Number or Mark after tightening	4 or ▼▼▼▼	1 or ▼	2 or ▼▼	3 or ▼▼▼

6. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

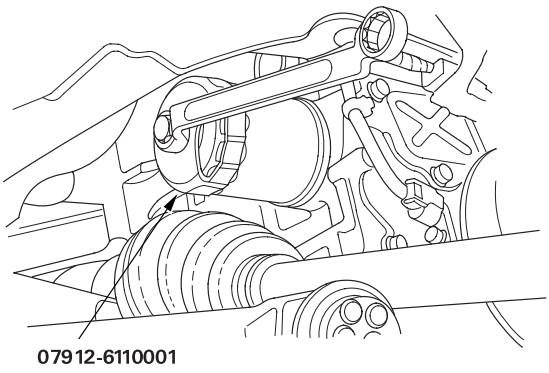
JAPAN-MADE Engine Oil Filter (7/8 - turn type)

1. Remove the oil filter with the special oil filter wrench.
2. Inspect the threads (A) and rubber seal (B) on the new filter. Wipe off the seat on the engine block, then apply a light coat of oil to the filter rubber seal. Use only filters with a built-in bypass system.

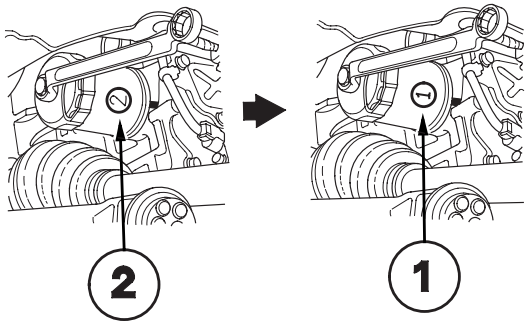


3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

Tighten: **7/8 turn clockwise.**
Tightening torque: **22 N·m (2.2 kgf·m, 16 lbf·ft)**



5. If 8 numbers (1 to 8) are printed around the outside of the filter, use the following procedure to tighten the filter.
   - Spin the filter on until its seal lightly seats against the block, and note which number is at the bottom.
   - Tighten the filter by turning it clockwise 7 numbers from the one you noted. For example, if number 2 is at the bottom when the seal is seated, tighten the filter until the number 1 comes around the bottom.



Number when rubber seal is seated	1	2	3	4	5	6	7	8
Number after tightening	8	1	2	3	4	5	6	7

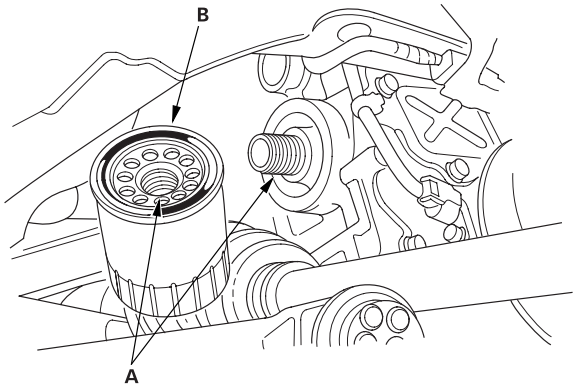
6. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

(cont'd)

Engine Oil Filter Replacement (cont'd)

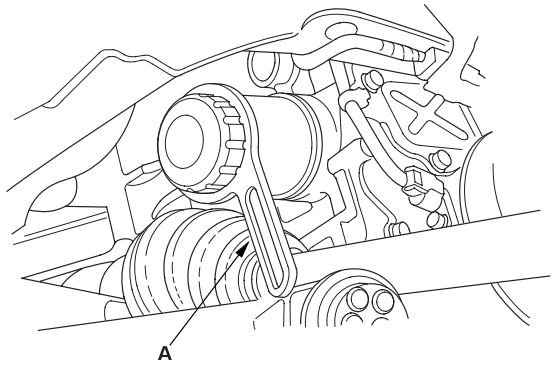
FRANCE-MADE Engine Oil Filter (3/4 - turn type)

1. Remove the oil filter with the commercially available oil filter wrench (LABINAL-Purflux 76).
2. Inspect the threads (A) and rubber seal (B) on the new filter. Wipe off the seat on the engine block, then apply a light coat of oil to the filter rubber seal. Use only filters with a built-in bypass system.

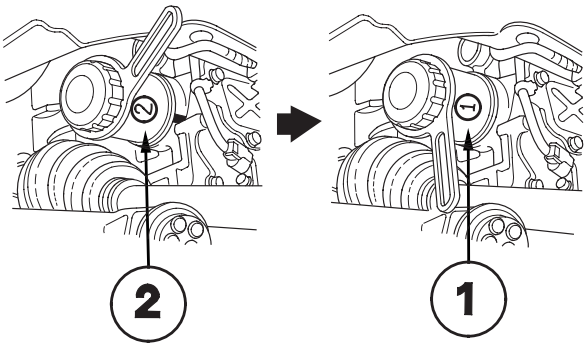


3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the commercially available oil filter wrench (LABINAL-Purflux 76)(A).

Tighten: **3/4 turn clockwise.**
Tightening torque: **22 N·m (2.2 kgf·m, 16 lbf·ft)**



5. If 4 numbers (1 to 4) are printed around the outside of the filter, use the following procedure to tighten the filter.
   - Spin the filter on until its seal lightly seats against the block, and note which number is at the bottom.
   - Tighten the filter by turning it clockwise 3 numbers from the one you noted. For example, if number 2 is at the bottom when the seal is seated, tighten the filter until the number 1 comes around the bottom.



Number when rubber seal is seated.

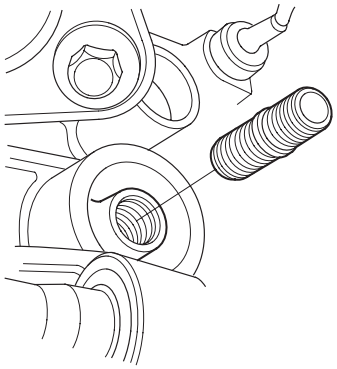
Number after tightening.

Number or Mark when rubber seal is seated	1	2	3	4
Number or Mark after tightening	4	1	2	3

6. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

Oil Filter Holder Replacement

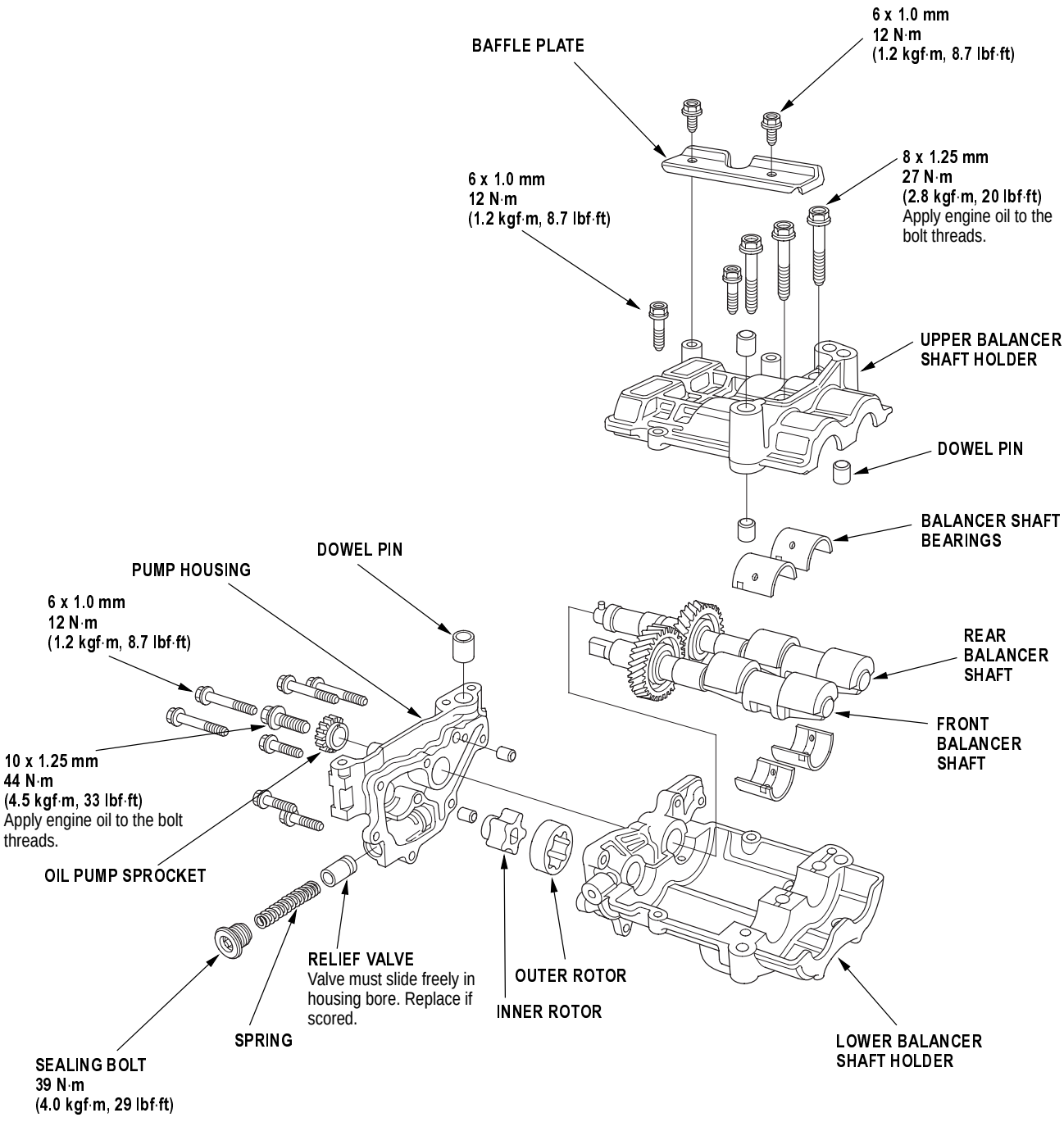
1. Remove the oil filter (see page 08-6).
2. Remove the oil filter holder.



3. Tighten the new oil filter holder to 49 N·m (5.0 kgf·m, 36 lbf·ft)

Oil Pump Overhaul

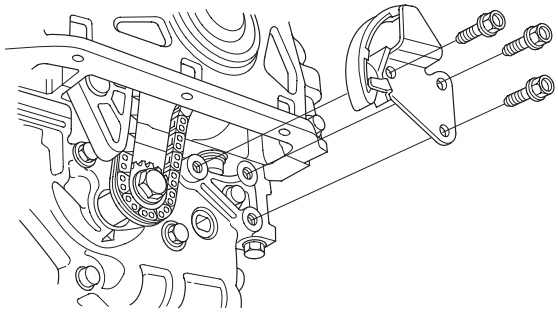
Exploded View



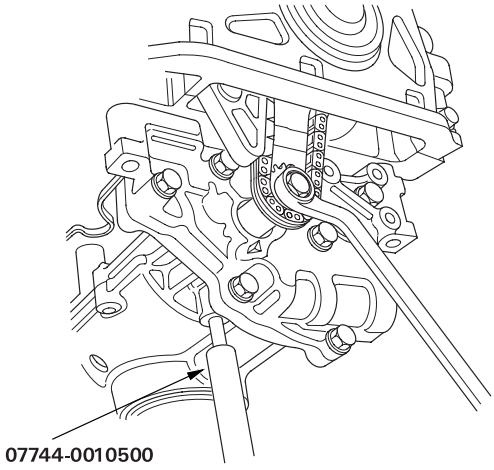
Special Tools Required
Pin driver, 6.0 mm 07744-0010500

Oil Pump Removal

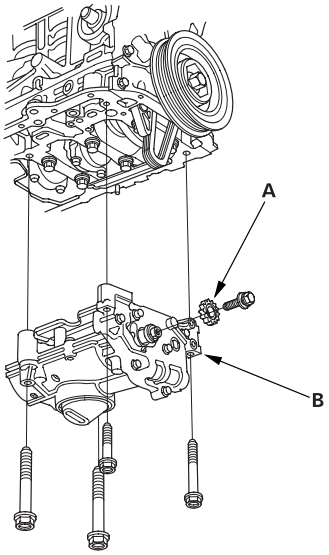
1. Set the No. 1 piston at Top Dead Center (TDC) (see step 1 on page 06-12).
2. Remove the oil pan (see page 07-11).
3. Remove the oil pump chain tensioner.



4. To hold the rear balancer shaft, insert a pin driver into the hole in the rear balancer shaft, through the maintenance hole on the lower balancer shaft holder.



5. Loosen the oil pump sprocket mounting bolt.
6. Remove the oil pump sprocket (A), then remove the oil pump (B).

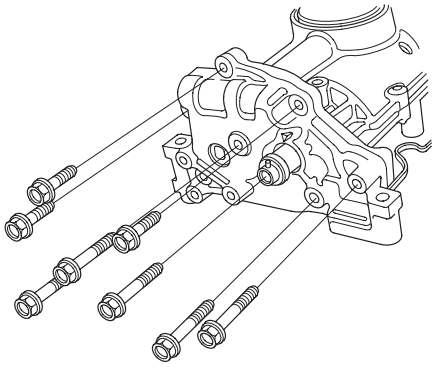


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Oil Pump Overhaul (cont'd)

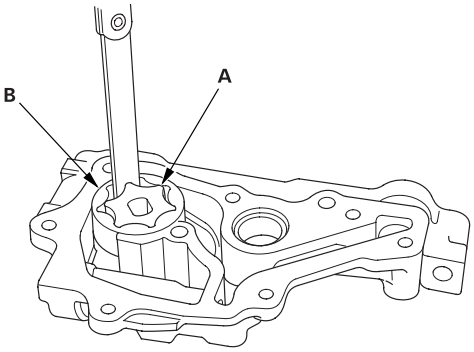
Oil Pump Inspection

1. Remove the pump housing.



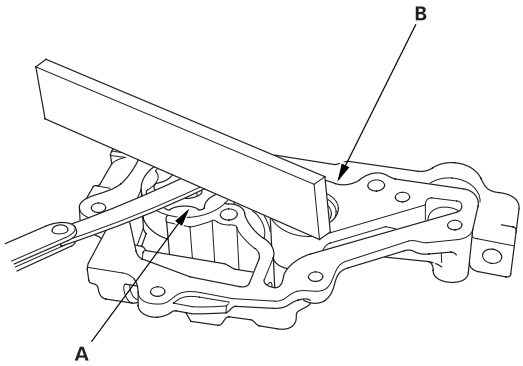
2. Check the inner-to-outer rotor radial clearance between the inner rotor (A) and outer rotor (B). If the inner-to-outer rotor radial clearance exceeds the service limit, replace the oil pump.

Inner Rotor-to-Outer Rotor Radial Clearance
Standard (New): 0.02 - 0.16 mm (0.001 - 0.006 in.)
Service Limit: 0.20 mm (0.008 in.)



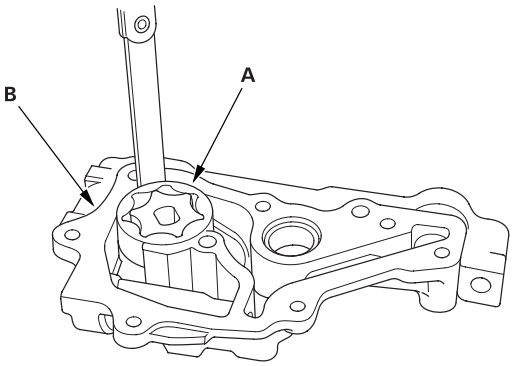
3. Check the housing-to-rotor axial clearance between the rotor (A) and pump housing (B). If the housing-to-rotor axial clearance exceeds the service limit, replace the oil pump.

Housing-to-Rotor Axial Clearance
Standard (New): 0.02 - 0.07 mm (0.001 - 0.003 in.)
Service Limit: 0.12 mm (0.005 in.)



4. Check the housing-to-outer rotor radial clearance between the outer rotor (A) and pump housing (B). If the housing-to-outer rotor radial clearance exceeds the service limit, replace the oil pump.

Housing-to-Outer Rotor Radial Clearance
Standard (New): 0.15 - 0.21 mm (0.006 - 0.008 in.)
Service Limit: 0.23 mm (0.009 in.)

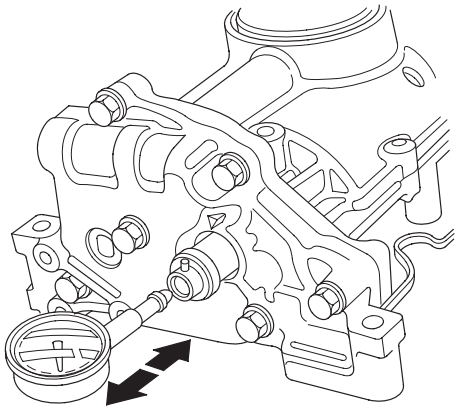


5. Inspect both rotors and the pump housing for scoring or other damage. Replace parts if necessary.

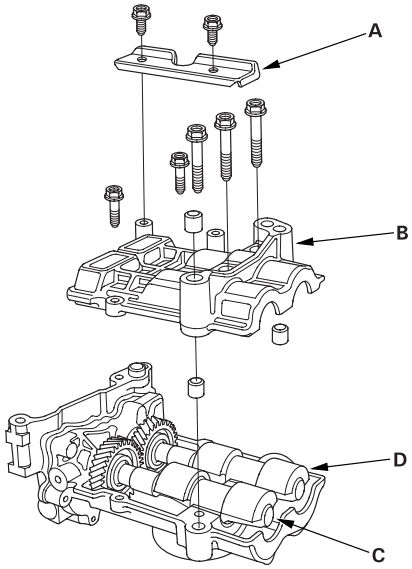
Balancer Shaft Inspection

1. Seat the balancer shaft by pushing it away from the oil pump sprocket end of the oil pump.
2. Zero the dial indicator against the end of the balancer shaft, then push the balancer shaft back and forth and read the end play.

Balancer Shaft End Play:
Front Balancer Shaft:
Standard (New): 0.070 - 0.135 mm (0.0028 - 0.0053 in.)
Service Limit: 0.15 mm (0.006 in.)
Rear Balancer Shaft:
Standard (New): 0.070 - 0.135 mm (0.0028 - 0.0053 in.)
Service Limit: 0.15 mm (0.006 in.)



3. Remove the baffle plate (A) and upper balancer shaft holder (B), then remove the front balancer shaft (C) and rear balancer shaft (D).



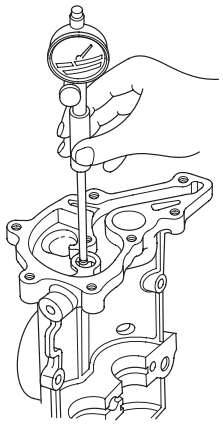
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Oil Pump Overhaul (cont'd)

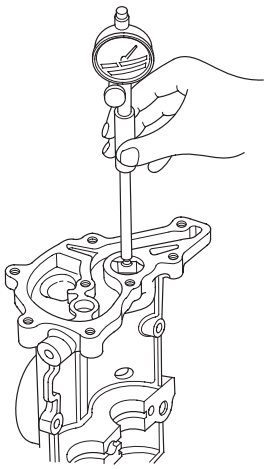
4. Measure the inner diameter of the No. 1 bearing for the front balancer shaft hole and the rear balancer shaft hole.

Bearing Inner Diameter:
Front:
Standard (New): **20.000 - 20.020 mm (0.7874 - 0.7882 in.)**
Service Limit: **20.03 mm (0.789 in.)**
Rear:
Standard (New): **24.000 - 24.020 mm (0.9449 - 0.9457 in.)**
Service Limit: **24.03 mm (0.946 in.)**

Front:



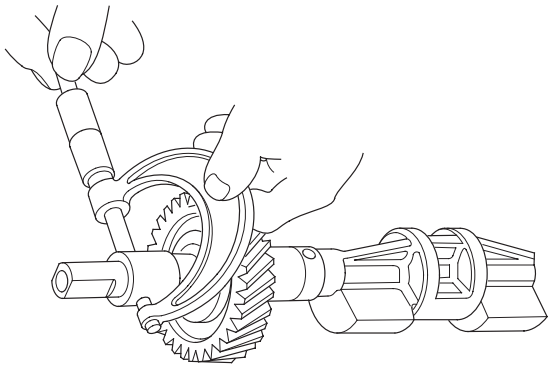
Rear:



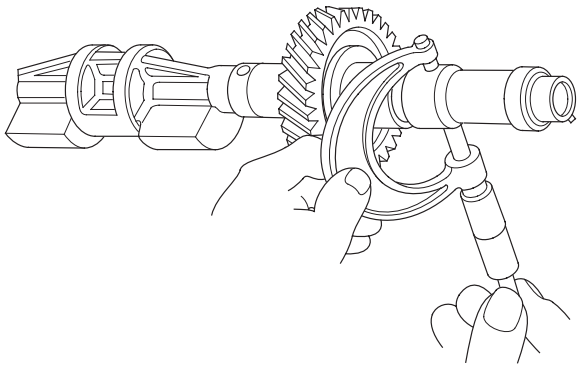
5. Measure the diameters of the No. 1 journals on the front balancer shaft and rear balancer shaft.

Journal Diameter:
Front:
Standard (New): **19.938 - 19.950 mm (0.7850 - 0.7854 in.)**
Service Limit: **19.92 mm (0.784 in.)**
Rear:
Standard (New): **23.938 - 23.950 mm (0.9424 - 0.9429 in.)**
Service Limit: **23.92 mm (0.942 in.)**

Front:



Rear:



6. Clean each balancer shaft No. 2 journals and bearings half with a clean shop towel.

7. Place one strip of plastigage across each journal.

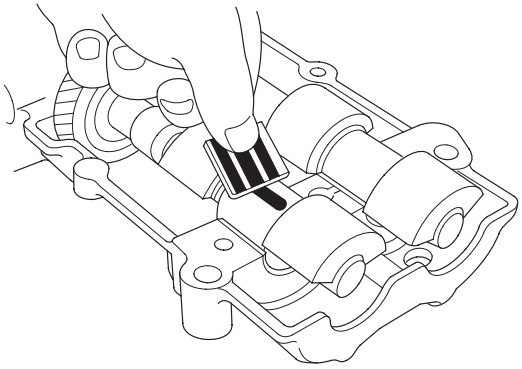
8. Reinstall the bearings and upper balancer shaft holder, the torque the bolts.

NOTE: Do not rotate the balancer shaft during inspection.

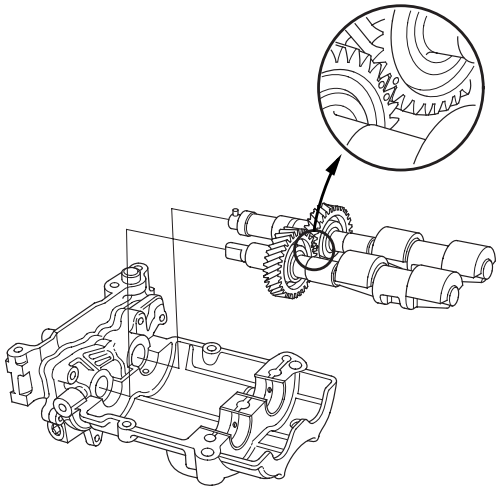
9. Remove the upper balancer shaft holder and bearings again, and measure the widest part of the plastigage.
If the balancer shaft No. 2 journal oil clearance is out-of-tolerance, install the new bearings, and recheck. If it is still out-of-tolerance; replace the balancer shafts.

No. 2 Journal Oil Clearance:

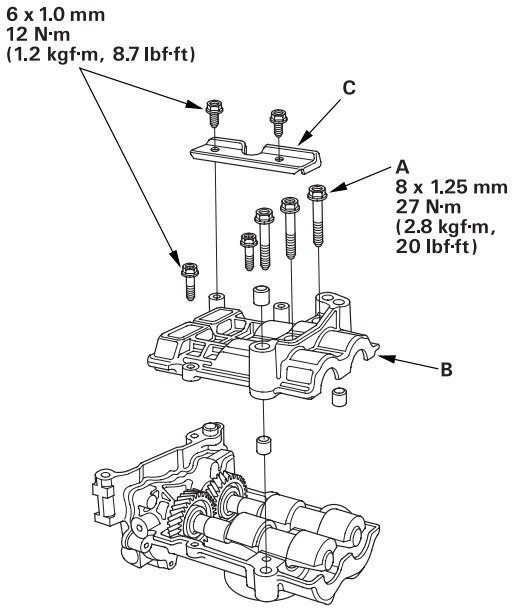
Standard (New):	**0.060 - 0.120 mm (0.0024 - 0.0047 in.)**
Service Limit:	**0.15 mm (0.006 in.)**



10. Align the punch mark on the rear balancer shaft with the center of the two punch marks on the front balancer shaft, then install the balancer shafts on the lower balancer shaft holder.



11. Apply engine oil to the threads of the 8 mm bolts (A).

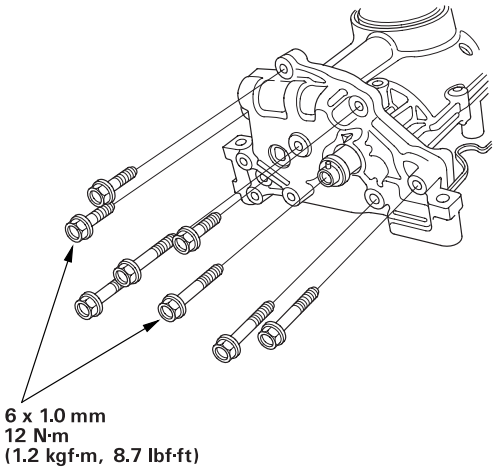


12. Install the upper balancer shaft holder (B) and baffle plate (C).

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Oil Pump Overhaul (cont'd)

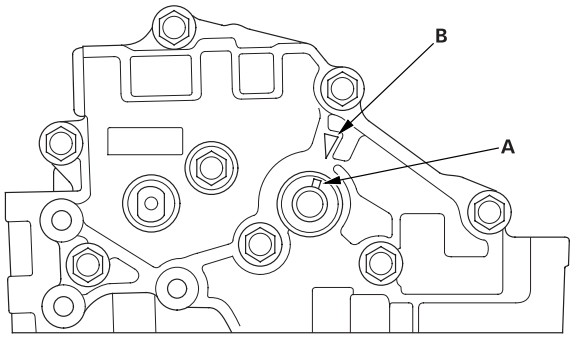
13. Install the pump housing.



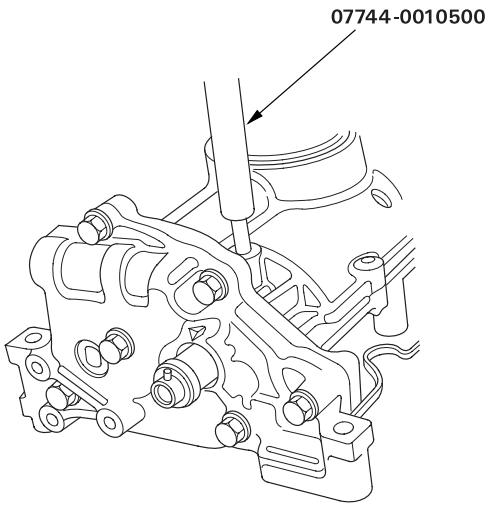
Oil Pump Installation

1. Check the No. 1 piston at TDC (see step 1 on page 06-12).

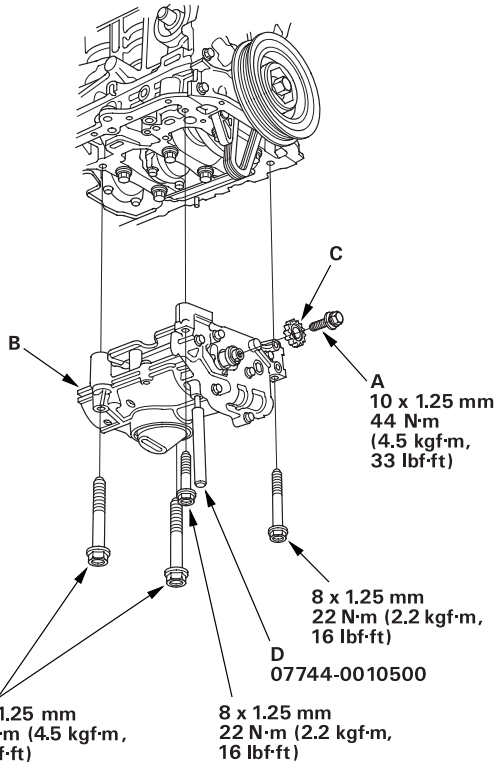
2. Align the dowel pin (A) on the rear balancer shaft with the mark (B) on the oil pump.



3. To hold the rear balancer shaft, insert a pin driver into the hole in the rear balancer shaft, through the maintenance hole on the lower balancer shaft holder.



4. Apply engine oil to the threads of the oil pump sprocket mounting bolt (A).



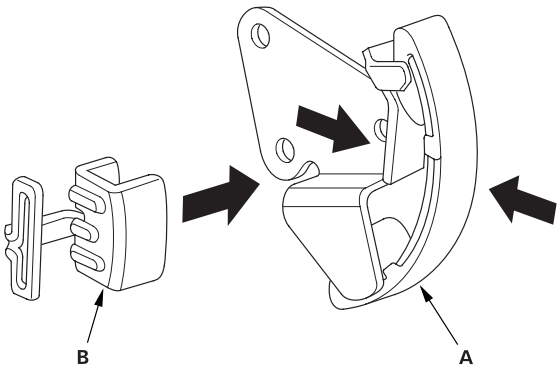
5. Loosely install the oil pump (B), then install the oil pump sprocket (C).

6. Remove the pin driver (D).

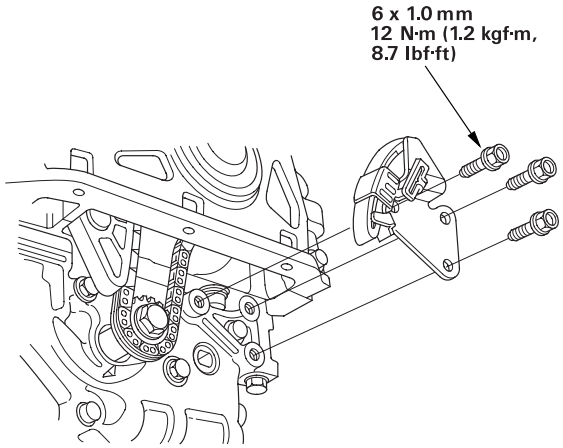
7. Tighten the oil pump mounting bolts.

8. Squeeze the new oil pump chain tensioner (A), then install the set clip (B) on it as shown.

NOTE: The set clip is supplied with the oil pump chain tensioner.



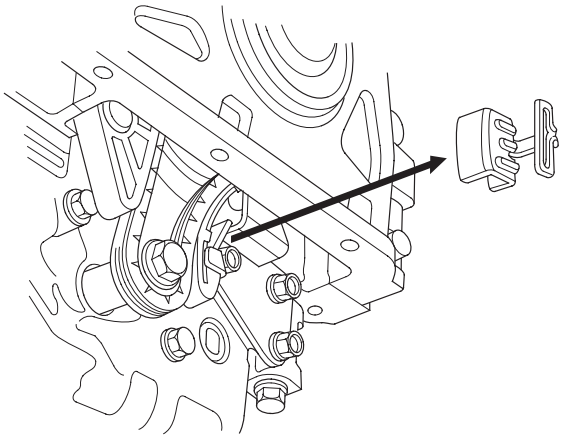
9. Install the oil pump chain tensioner.



(cont'd)

Oil Pump Overhaul (cont'd)

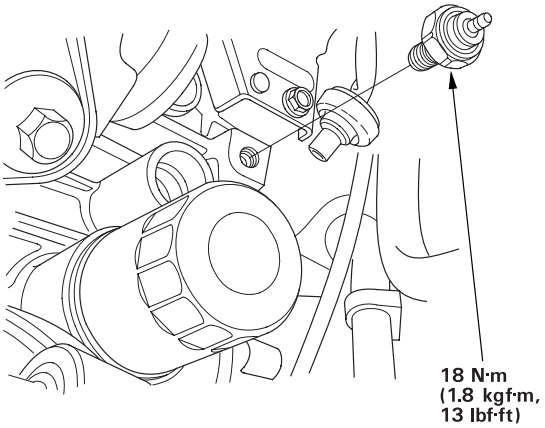
10. Remove the set clip from the oil pump chain tensioner.



11. Install the oil pan (see page 07-27).

Oil Pressure Switch Replacement

1. Disconnect the oil pressure switch connector, then remove the oil pressure switch.



2. Apply liquid gasket to the oil pressure switch threads, then install the oil pressure switch.

09

Engine Mechanical

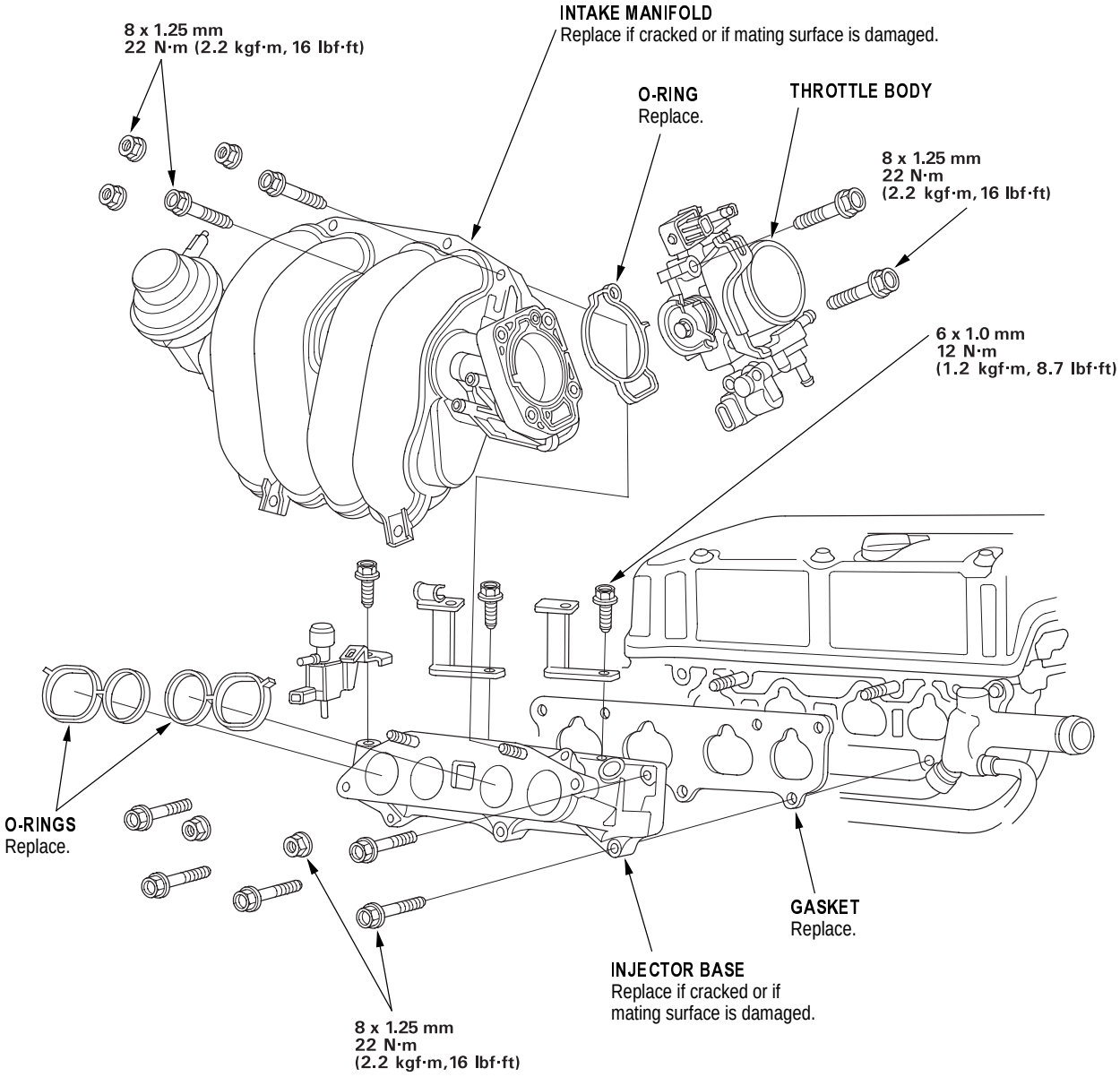


Intake Manifold and Exhaust System **09-2**
Intake Manifold Removal and Installation 09-2
Exhaust Manifold Removal and Installation 09-8
Exhaust Pipe and Muffler Replacement 09-9

Intake Manifold and Exhaust System

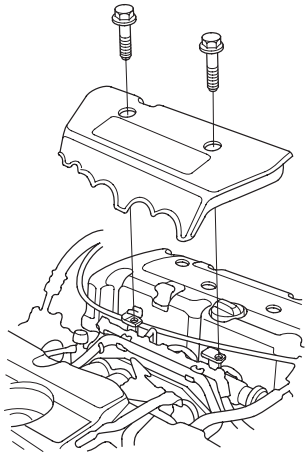
Intake Manifold Removal and Installation

Exploded View

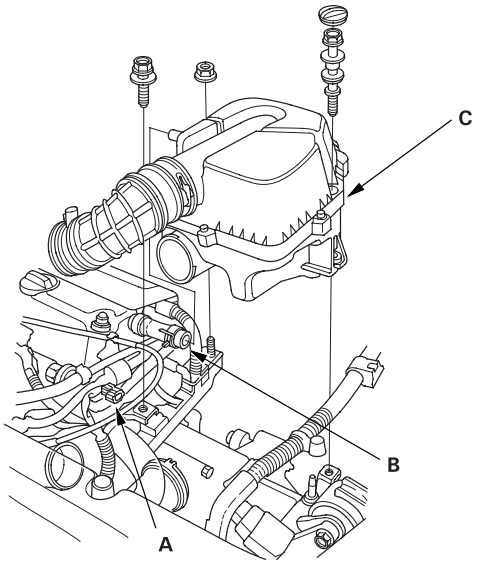


Removal:

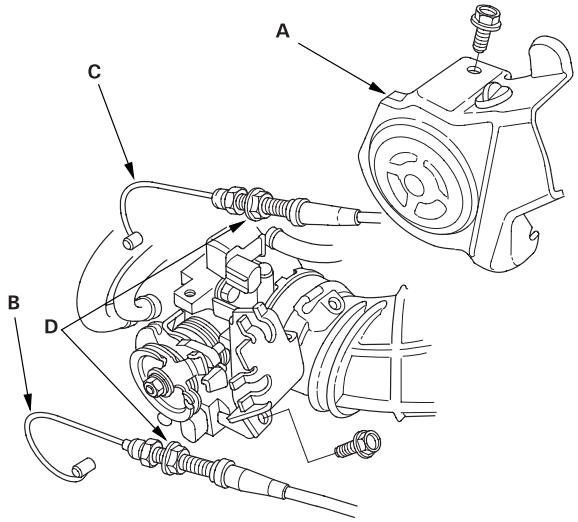
1. Remove the intake manifold cover.



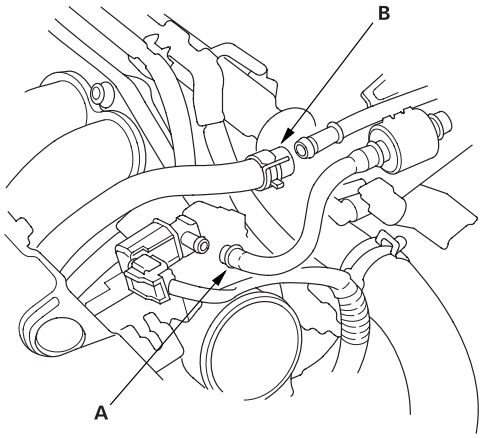
2. Disconnect the Intake Air Temperature (IAT) sensor connector (A), and remove the breather hose (B), then remove the air cleaner housing (C).



3. Remove the throttle cover (A). Fully open the throttle link and cruise control link by hand, then remove the throttle cable (B) and cruise control cable (C) from the links. Loosen the locknuts (D), and remove the cables from the bracket.



4. Remove the Evaporative Emission (EVAP) canister hose (A) and brake booster vacuum hose (B).

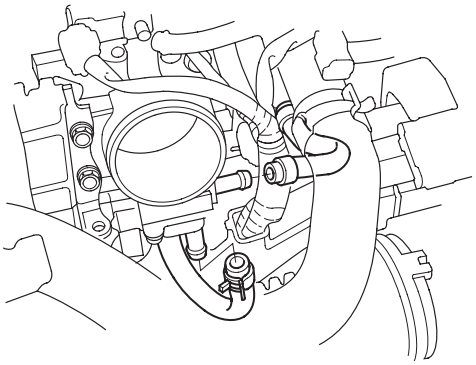


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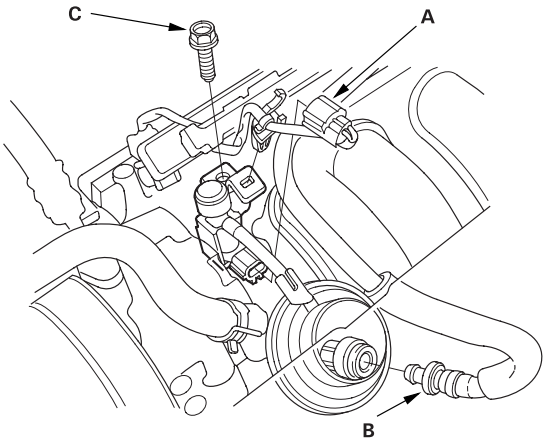
Intake Manifold Removal and Installation (cont'd)

Removal: (cont'd)

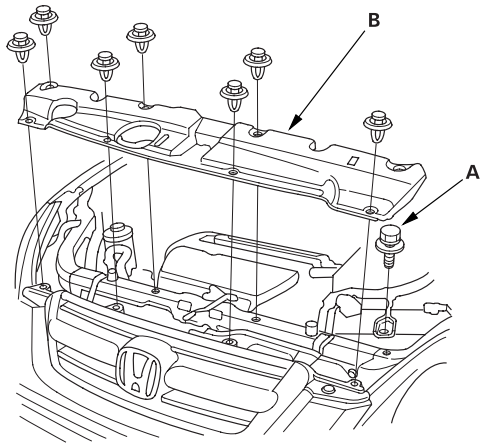
5. Remove the water bypass hoses, then plug the water bypass hoses.



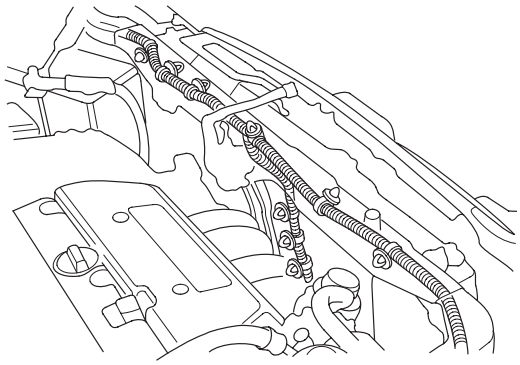
6. Disconnect the Intake Manifold Runner Control (IMRC) valve actuator control solenoid valve connector (A), then remove the Positive Crankcase Ventilation (PCV) hose (B) and IMRC valve control solenoid valve mounting bolt (C).



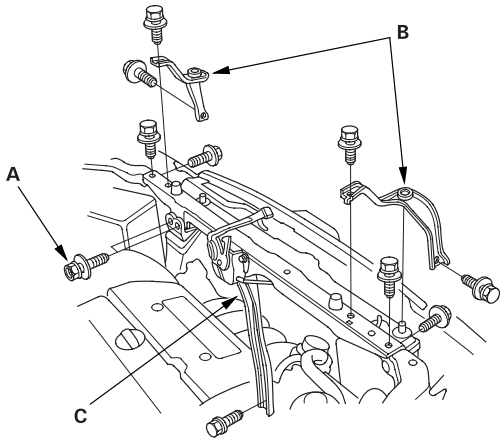
7. Remove the bolt (A) securing the battery clamp, then remove the bulkhead cover (B).



8. Remove the harness clamps.

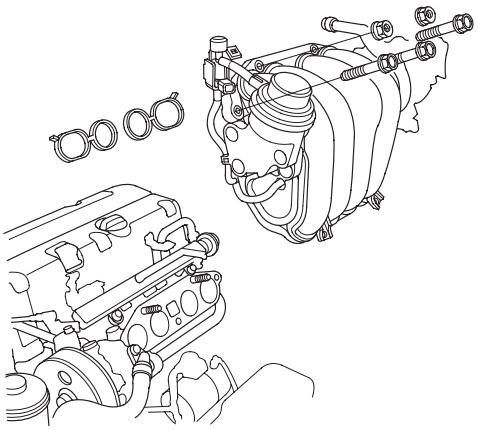


9. Remove the intake air duct mounting bolts (A) and upper bracket and cushion (B), then remove the bulkhead (C).



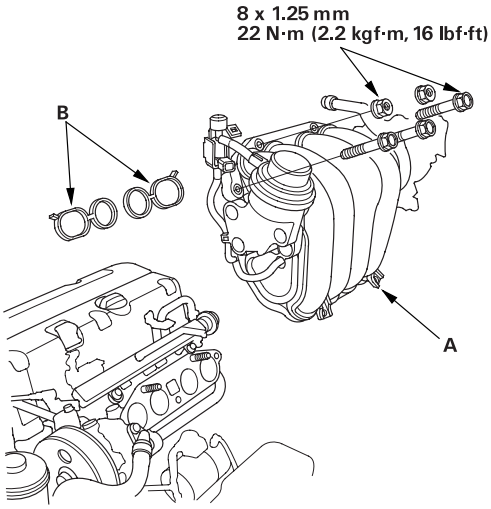
10. Remove the engine wire harness connectors and wire harness clamps from the intake manifold.
- Idle Air Control (IAC) valve connector
- Throttle Position (TP) sensor connector
- Manifold Absolute Pressure (MAP) sensor connector
- Evaporative Emission (EVAP) canister purge valve connector

11. Remove the intake manifold.

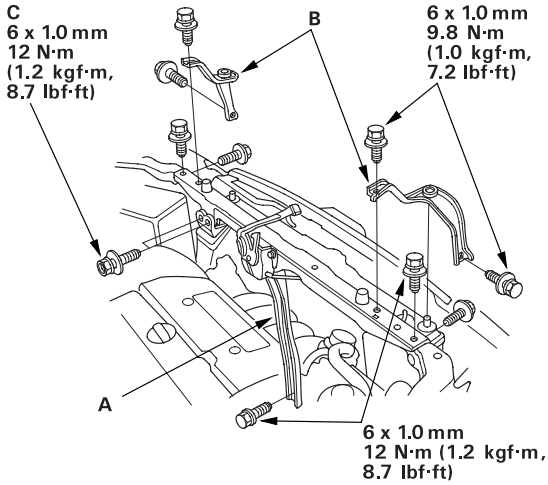


Installation:

1. Install the intake manifold (A) and tighten the bolts/nuts in a crisscross pattern in two or three steps, beginning with the inner bolt. Using the new O-rings (B).



2. Install the bulkhead (A), then install the upper bracket and cushion (B) and intake air duct mounting bolts (C). Apply body paint to the bulkhead mounting bolts.

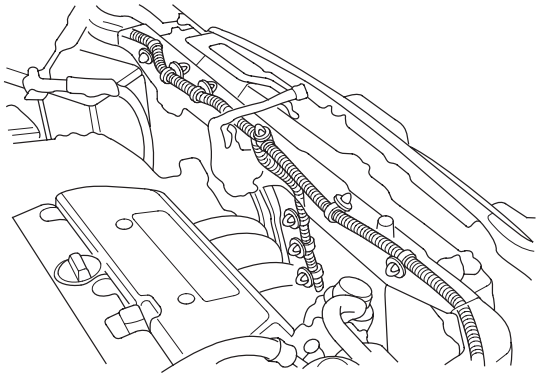


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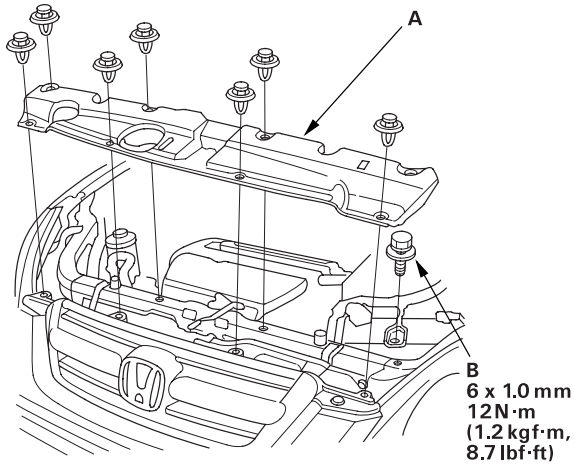
Intake Manifold Removal and Installation (cond't)

Installation: (cont'd)

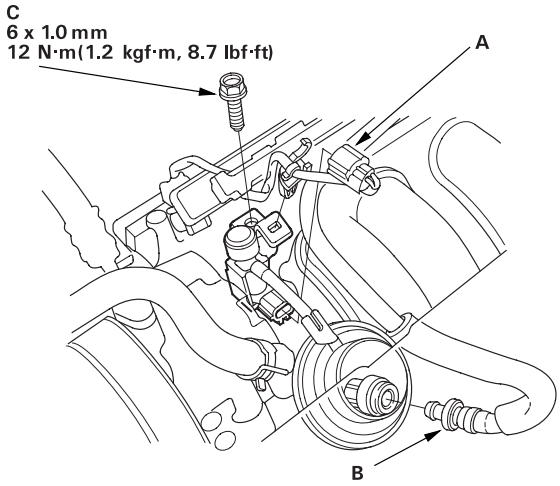
3. Connect the harness clamps.



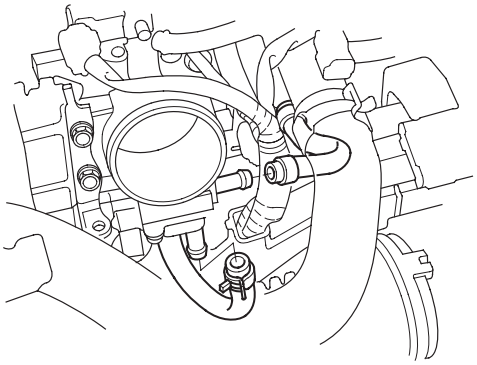
4. Install the bulkhead cover (A), then install the battery clamp bolt (B).



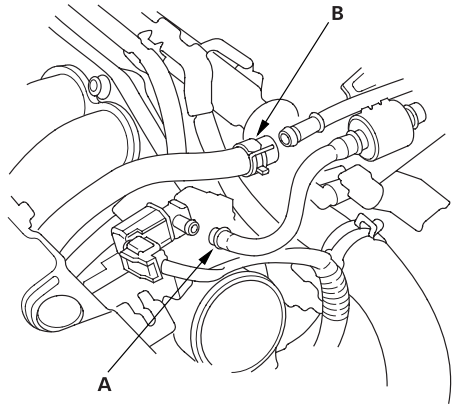
5. Connect the Intake Manifold Runner Control (IMRC) valve actuator control solenoid valve connector (A), then install the Positive Crankcase Ventilation (PCV) hose (B) and IMRC valve actuator control solenoid valve mounting bolt (C).



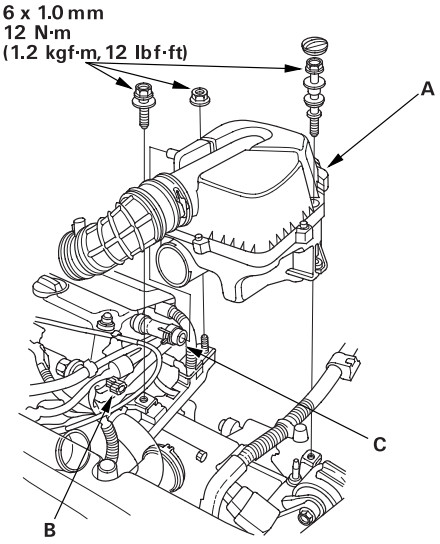
6. Install the water bypass hoses.



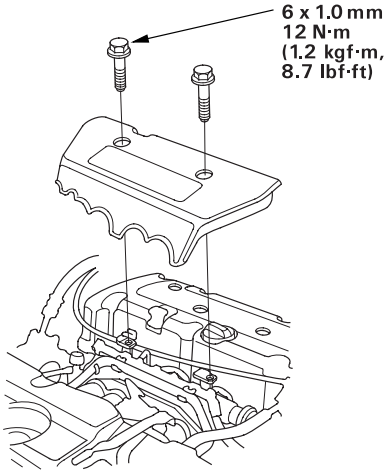
7. Install the Evaporative Emission (EVAP) canister hose (A) and brake booster vacuum hose (B).



8. Install the throttle cable (see page 11-184), then adjust the cable (see page 11-183).
9. Install the cruise control cable, then adjust the cable (see page 04-49)
10. Install the air cleaner housing (A) and connect the Intake Air Temperature (IAT) sensor connector (B).



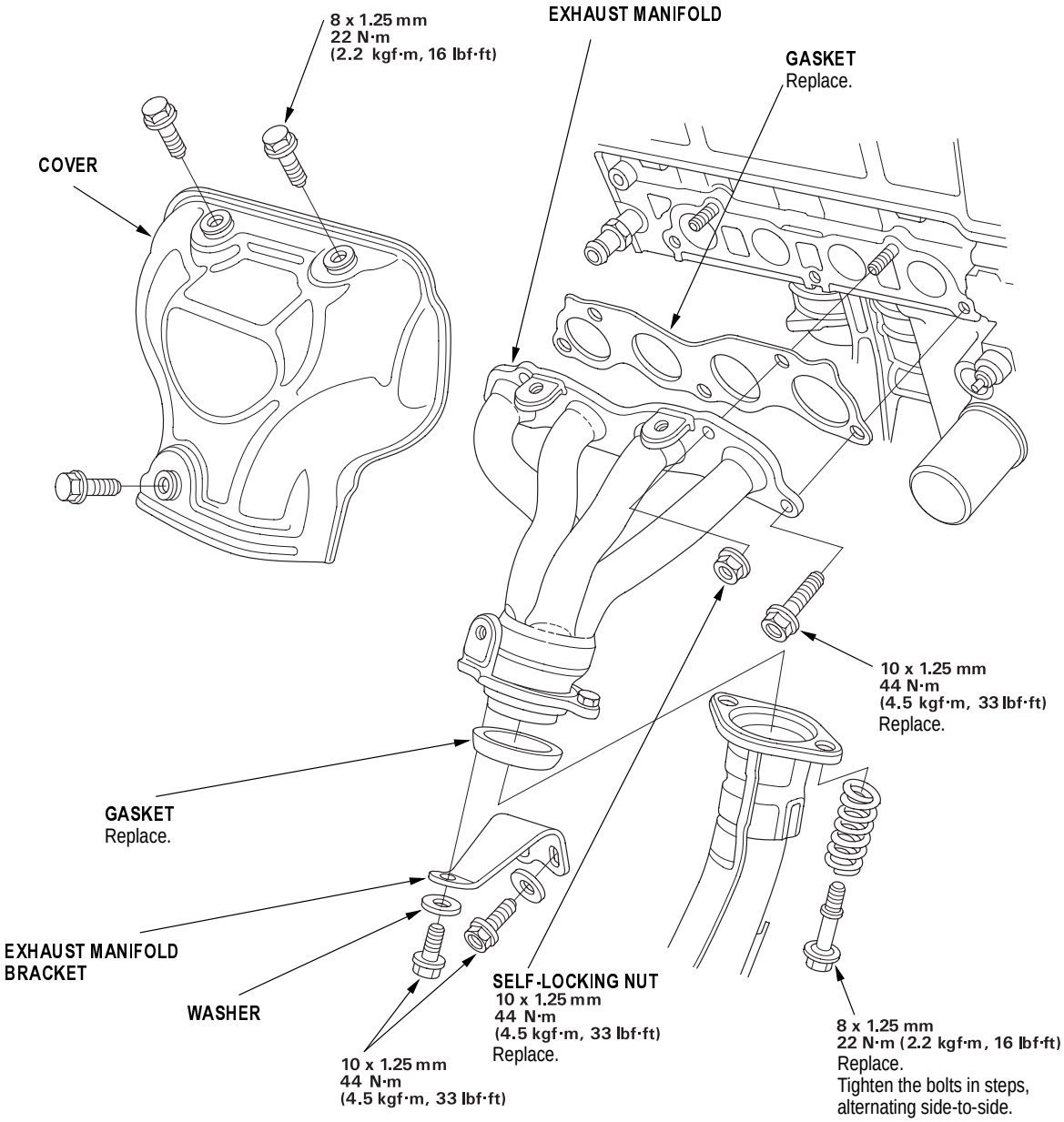
11. Install the breather hose (C).
12. Install the intake manifold cover.



13. Clean up any spilled engine coolant.
14. After installation, check that all tubes, hoses and connectors are installed correctly.
15. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-6).

Exhaust Manifold Removal and Installation

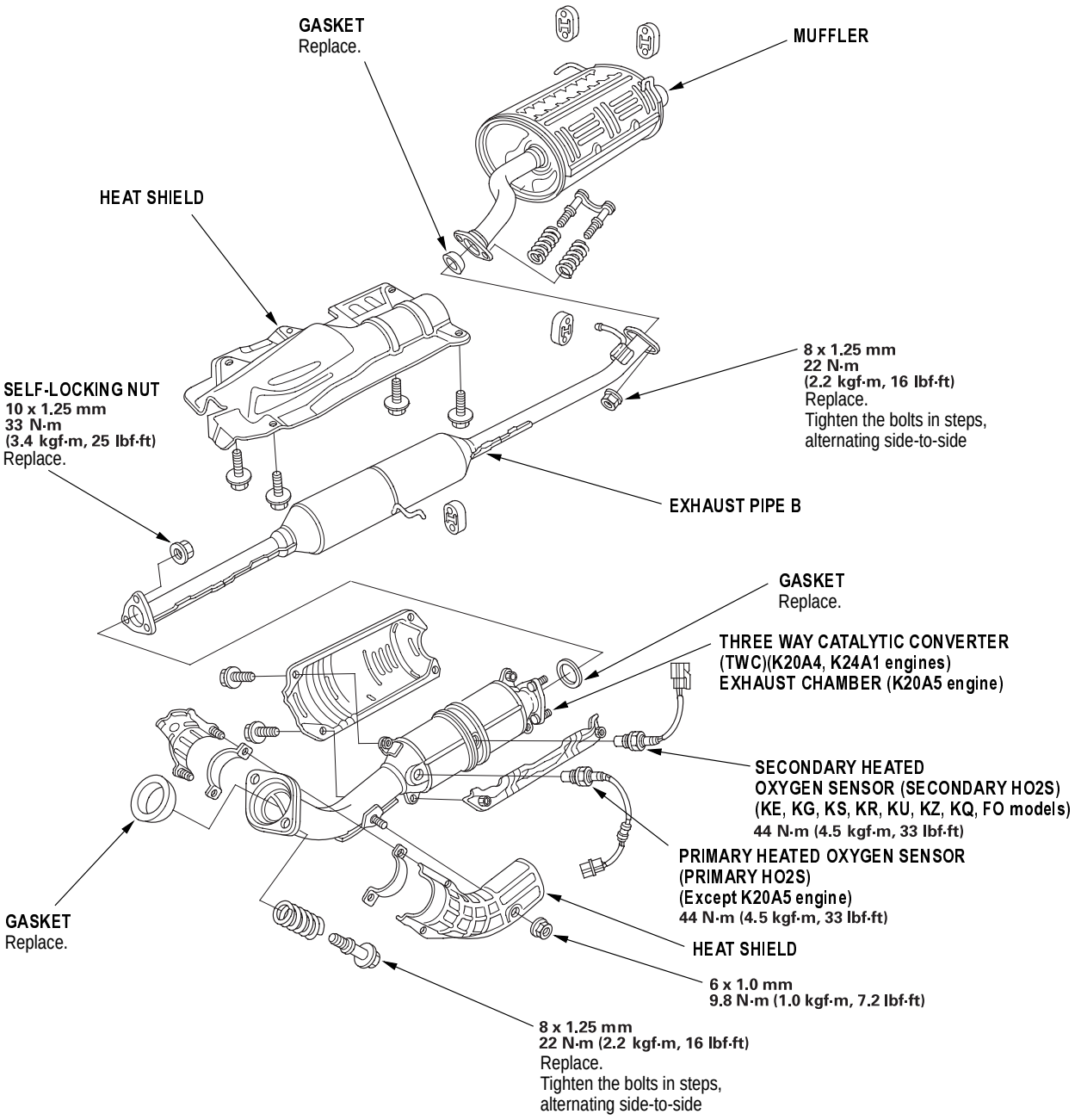
1. Remove the VTEC solenoid valve (see page 11-138).
2. Remove the driveshaft heat cover (see page 16-19).
3. Remove the cover and exhaust manifold bracket, then remove the exhaust manifold.



4. Install the exhaust manifold and tighten the bolts/nuts in a crisscross pattern in two or three steps, beginning with the inner bolt.
5. Install the other parts in the reverse order of removal.

Exhaust Pipe and Muffler Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.



10

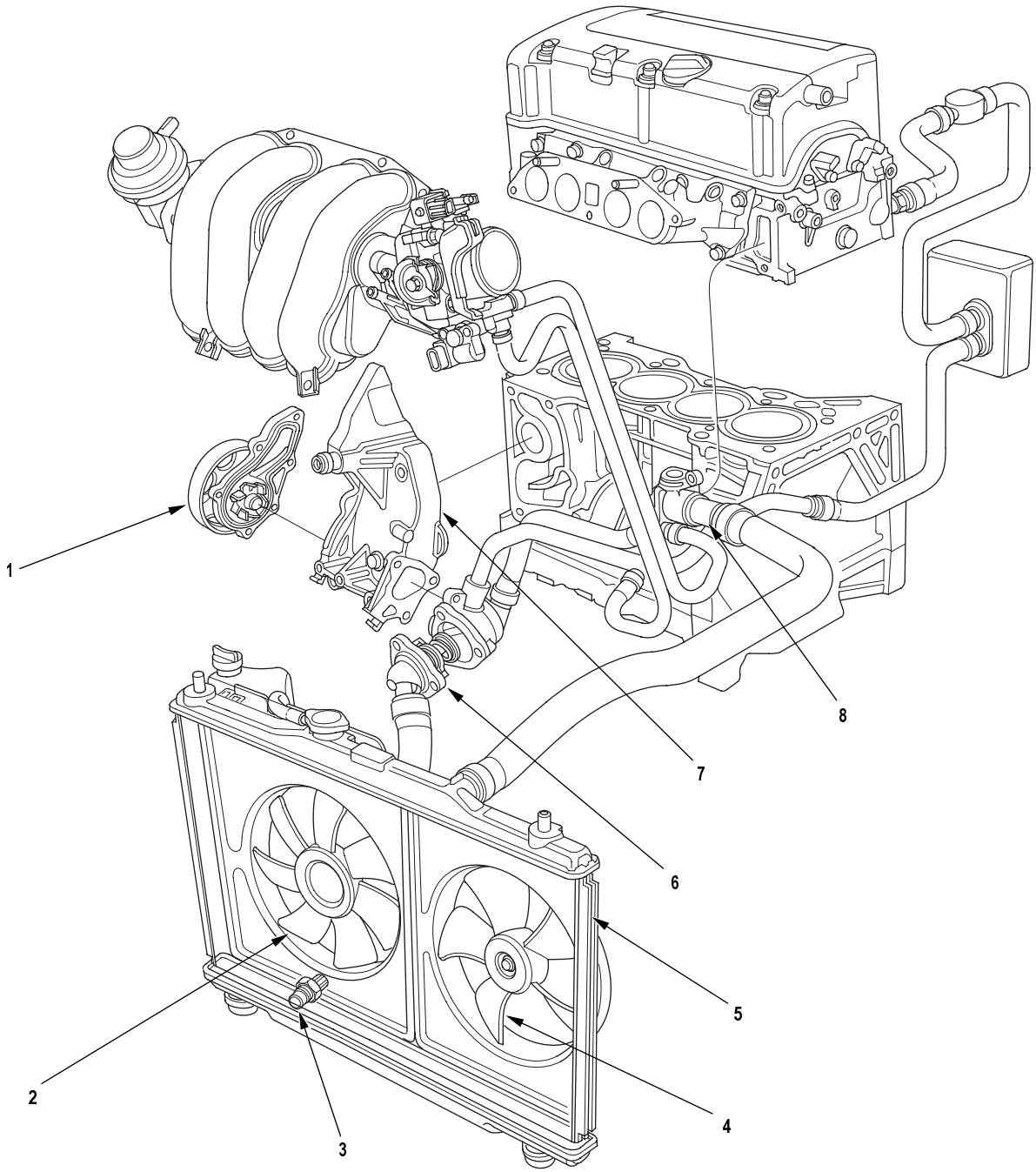
Engine Cooling

Cooling System **10-2**
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- Radiator Test 10-3
- Fan Motor Test 10-4
- Thermostat Test 10-4
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- Coolant Replacement 10-6
- Thermostat Replacement 10-8
- Water Passage Installation 10-9
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Fan Controls **10-11**
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- Symptom Troubleshooting Index 10-12
- Circuit Diagram 10-13
- Radiator Fan Circuit Troubleshooting 10-14
- Radiator Fan Switch Circuit Troubleshooting (Open) 10-16
- Radiator Fan Switch Circuit Troubleshooting (Short) 10-16
- Radiator Fan Switch Test 10-17
- Radiator Fan Switch Replacement 10-17

Cooling System

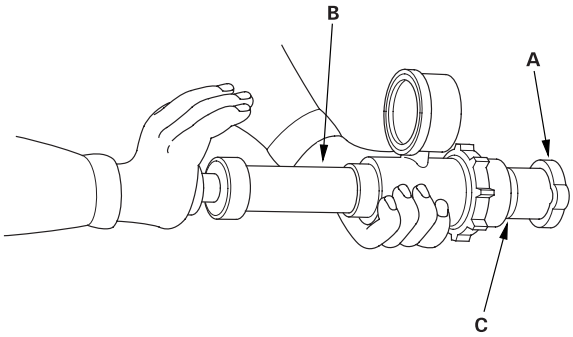
Component Location Index



1	WATER PUMP	Inspection, page 10-5; Replacement, page 10-5
2	A/C CONDENSER FAN ASSEMBLY	Replacement, page 10-10; Fan Motor Test, page 10-4
3	RADIATOR FAN SWITCH	Test, page 10-17; Replacement, page 10-17
4	RADIATOR FAN ASSEMBLY	Replacement, page 10-10; Fan Motor Test, page 10-4
5	RADIATOR	Replacement page 10-10
6	THERMOSTAT	Test, page 10-4; Replacement, page 10-8
7	WATER PASSAGE	Installation, page 10-9
8	WATER OUTLET	Installation, page 10-9

Radiator Cap Test

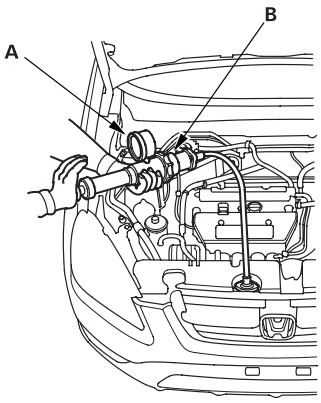
1. Remove the radiator cap (A), wet its seal with engine coolant, then install it on the pressure tester (B) (commercially available). Use a small adapter H-901122-09 (C) (commercially available) to install the radiator cap.



2. Apply a pressure of 93 - 123 kPa (0.95 - 1.25 kgf/cm², 14 - 18 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.

Radiator Test

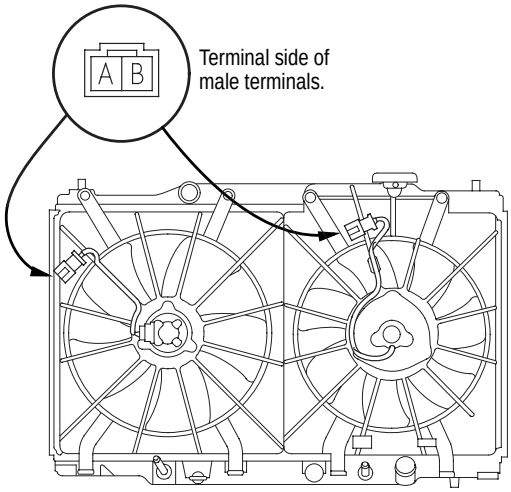
1. Wait until the engine is cool, then carefully remove the radiator cap and fill the radiator with engine coolant to the top of the filler neck.
2. Attach the pressure tester (A) (commercially available) to the radiator. Use a small adapter H-901122-09 (B) (commercially available) to attach the pressure tester.



3. Apply a pressure of 93 - 123 kPa (0.95 - 1.25 kgf/cm², 14 - 18 psi).
4. Inspect for engine coolant leaks and a drop in pressure.
5. Remove the tester, and reinstall the radiator cap.
6. Check for engine oil in the coolant and/or coolant in the engine oil.

Fan Motor Test

1. Disconnect the 2P connectors from the radiator fan motor and condenser fan motor.



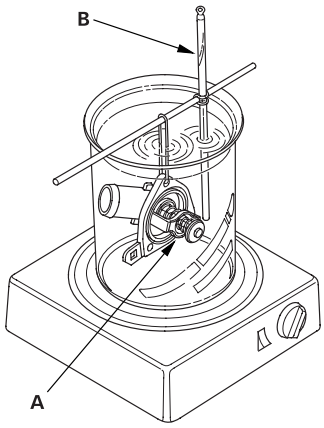
2. Test the motor by connecting battery power to the B terminal and ground to the A terminal.
3. If the motor fails to run or does not run smoothly, replace it.

Thermostat Test

Replace the thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat (A) in a container of water. Do not let the thermometer (B) touch the bottom of the hot container.



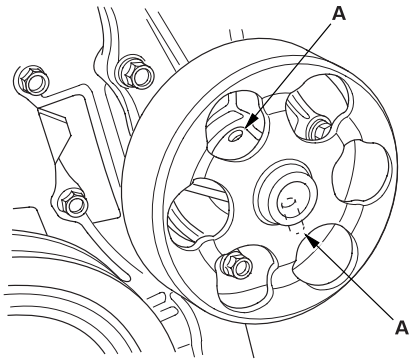
2. Heat the water, and check the temperature with a thermometer. Check the temperature at which the thermostat first opens, and at which it is fully open.
3. Measure the lift height of the thermostat when it is fully open.

STANDARD THERMOSTAT

Lift height:	**above 8.0 mm (0.31 in.)**
Starts opening:	**76 - 80°C (169 - 176°F)**
Fully open:	**90°C (194°F)**

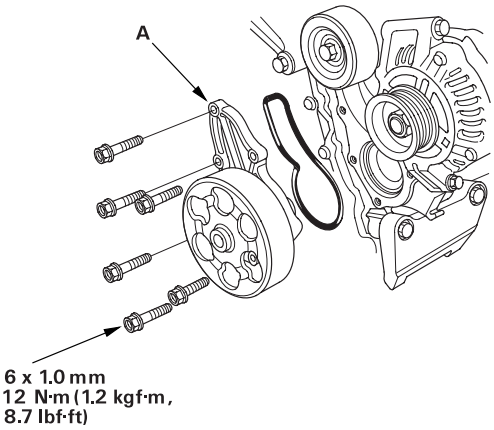
Water Pump Inspection

1. Remove the drive belt (see page 04-30).
2. Turn the water pump pulley counterclockwise. Check that it turns freely.
3. Check for signs of seal leakage. A small amount of ”weeping” from the bleed hole (A) is normal.



Water Pump Replacement

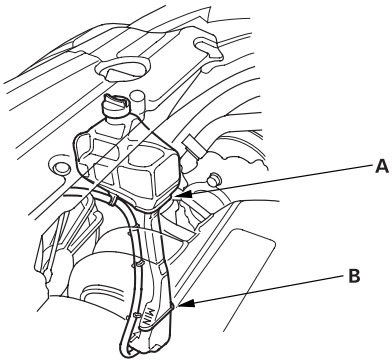
1. Remove the drive belt (see page 04-30).
2. Drain the engine coolant (see page 10-6).
3. Remove the crankshaft pulley (see page 06-11).
4. Remove the six bolts securing the water pump, then remove the water pump (A).



5. Inspect and clean the O-ring groove and mating surface with the water passage.
6. Install the water pump with new O-rings in the reverse order of removal.
7. Clean up any spilled engine coolant.
8. Install the crankshaft pulley (see page 06-12).
9. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-6).

Coolant Check

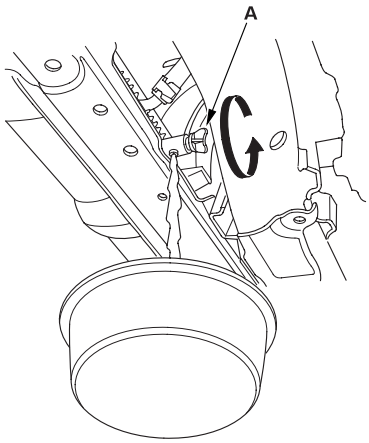
1. Look at the coolant level in the reserve tank. Make sure it is between the MAX mark (A) and MIN mark (B).



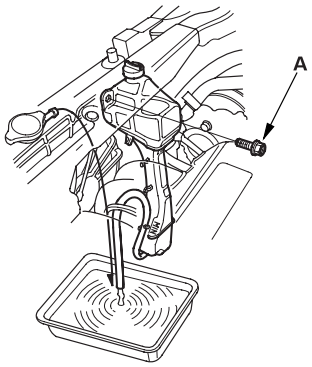
2. If the coolant level in the reserve tank is at or below the MIN mark, add coolant to bring it up to the MAX mark, and inspect the cooling system for leaks.

Coolant Replacement

1. Start the engine. Set the heater temperature control dial to maximum heat, then turn off the ignition switch. Make sure the engine and radiator are cool to the touch.
2. Remove the bulkhead cover (see step 7 on page 09-4).
3. Remove the splash shield (see step 21 on page 05-6).
4. Remove the radiator cap.
5. Loosen the drain plug (A), and drain the coolant.

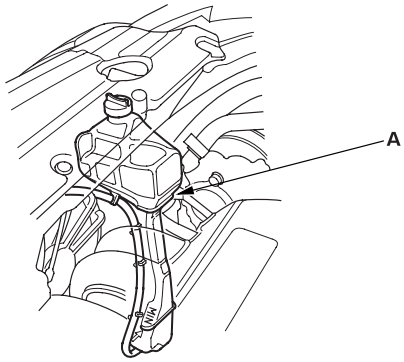


6. Remove the reserve tank mounting bolt (A), and remove the reserve tank.



7. Remove the coolant tube from the radiator, then put the end of the coolant tube lower the reserve tank and drain the coolant in the tank.

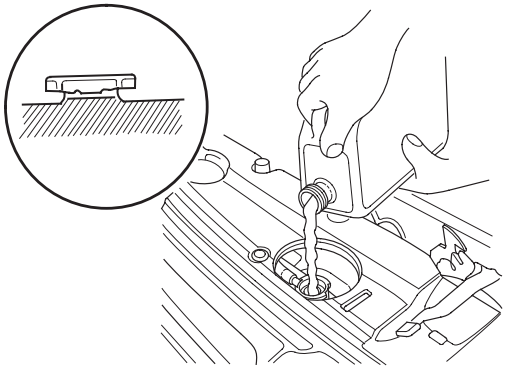
8. After the coolant has drained, tighten the radiator drain plug, and reinstall the coolant tube and reserve tank.
9. Install the splash shield (see step 22 on page 05-14).
10. Install the bulkhead cover (see step 4 on page 09-6).
11. Fill the reserve tank to the MAX mark (A) with genuine Honda All Season Antifreeze/Coolant Type 2.



12. Pour genuine Honda All Season Antifreeze/Coolant Type 2 into the radiator up to the base of the filler neck.

    NOTE:
    - Always use genuine Honda All Season Antifreeze/Coolant Type 2. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
    - Genuine Honda All Season Antifreeze/Coolant Type 2 is a mixture of 50% antifreeze and 50% water. Pre-mixing is not required.

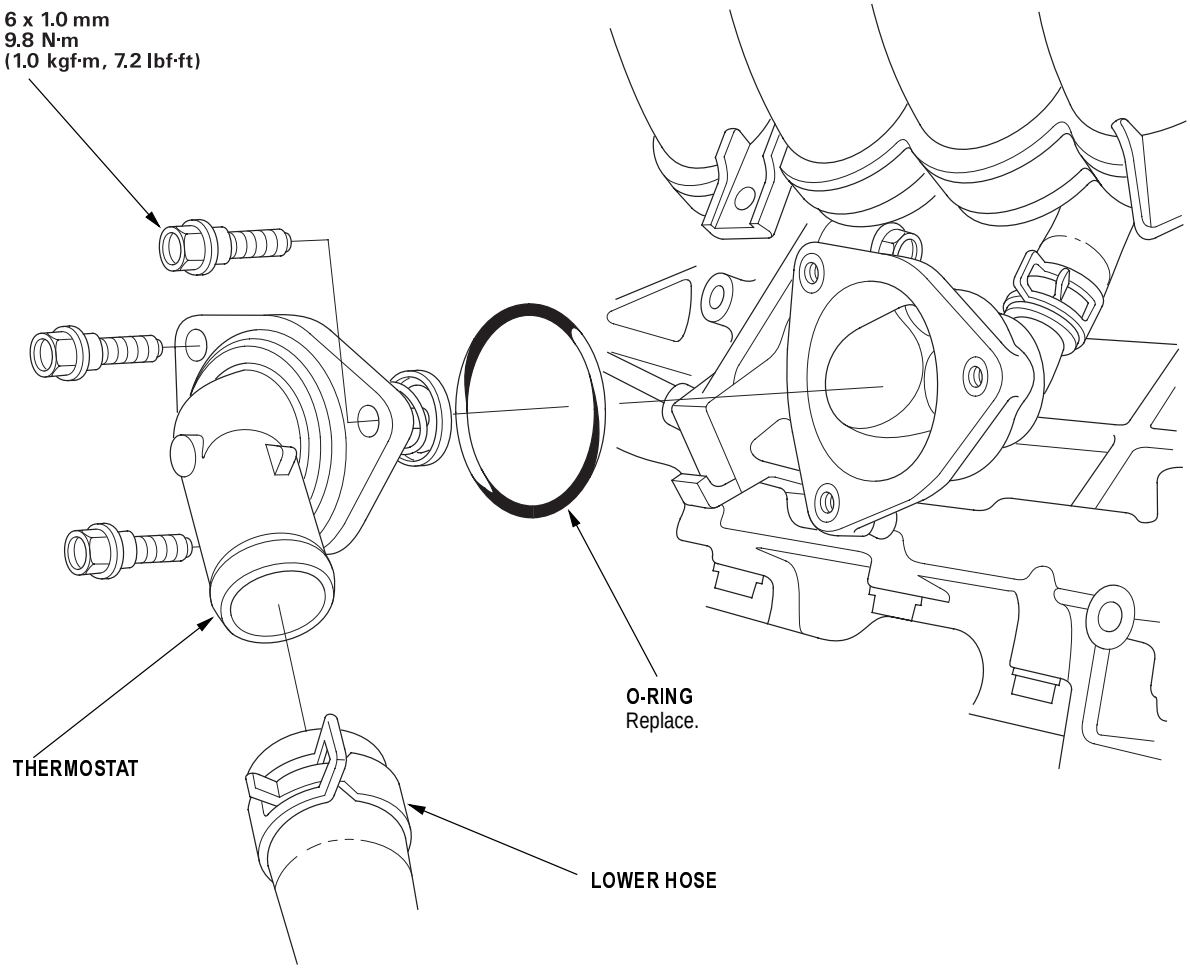
    Engine Coolant Refill Capacity [including the reserve tank capacity of 0.55 l (0.58 US qt, 0.48 Imp qt)]:
    K20A4, K20A5 engines:
    M/T: 5.4 l (5.7 US qt, 4.8 Imp qt)
    A/T: 5.3 l (5.6 US qt, 4.7 Imp qt)
    K24A1 engine:
    M/T: 5.5 l (5.8 US qt, 4.8 Imp qt)
    A/T: 5.4 l (5.7 US qt, 4.8 Imp qt)



13. Install the radiator cap loosely.
14. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
15. Turn off the engine. Check the level in the radiator and add genuine Honda All Season Antifreeze/Coolant Type 2 if needed.
16. Put the radiator cap on tightly, then run the engine again and check for leaks.

Thermostat Replacement

1. Drain the engine coolant (see page 10-6).
2. Remove the splash shield (see step 21 on page 05-6).
3. Remove the lower hose, then remove the thermostat.

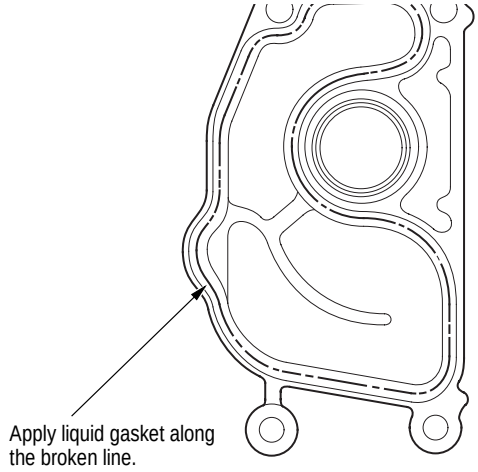


4. Install the thermostat with a new O-ring, then install the lower hose.
5. Install the splash shield (see step 22 on page 05-14).
6. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-6).

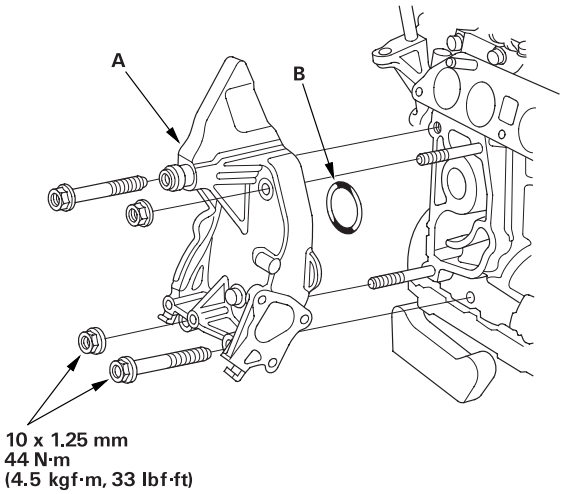
Water Passage Installation

1. Clean and dry the water passage mating surfaces.
2. Apply liquid gasket, 08C70-K0234M, 08C70-K0334M or 08C70-X0331S, evenly to the cylinder block mating surface of the water passage and to the inner threads of the bolt holes.

   NOTE: Do not install the parts if 5 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.



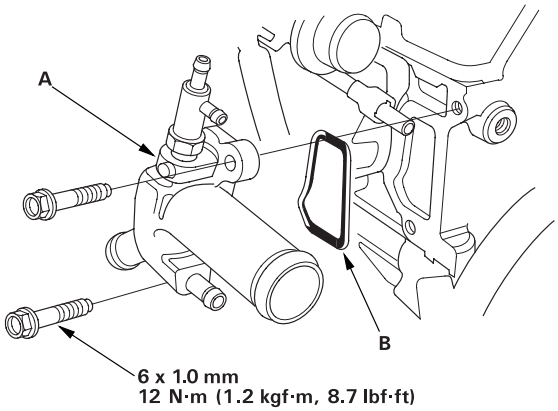
3. Install the water passage (A) with a new O-ring (B).



4. After assembly, wait at least 30 minutes before filling the engine with oil.

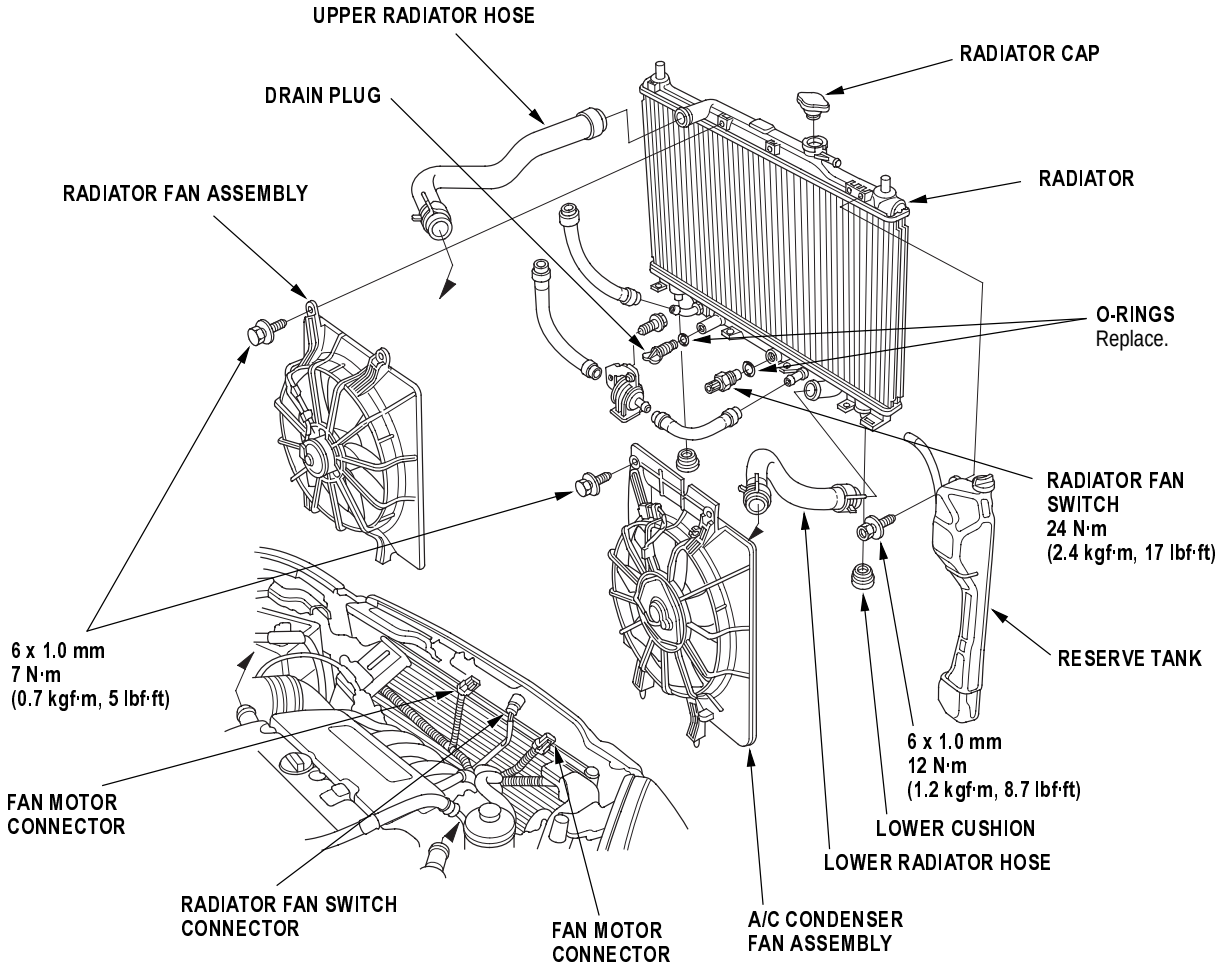
Water Outlet Installation

Install the water outlet (A) with a new O-ring (B).



Radiator and Fans Replacement

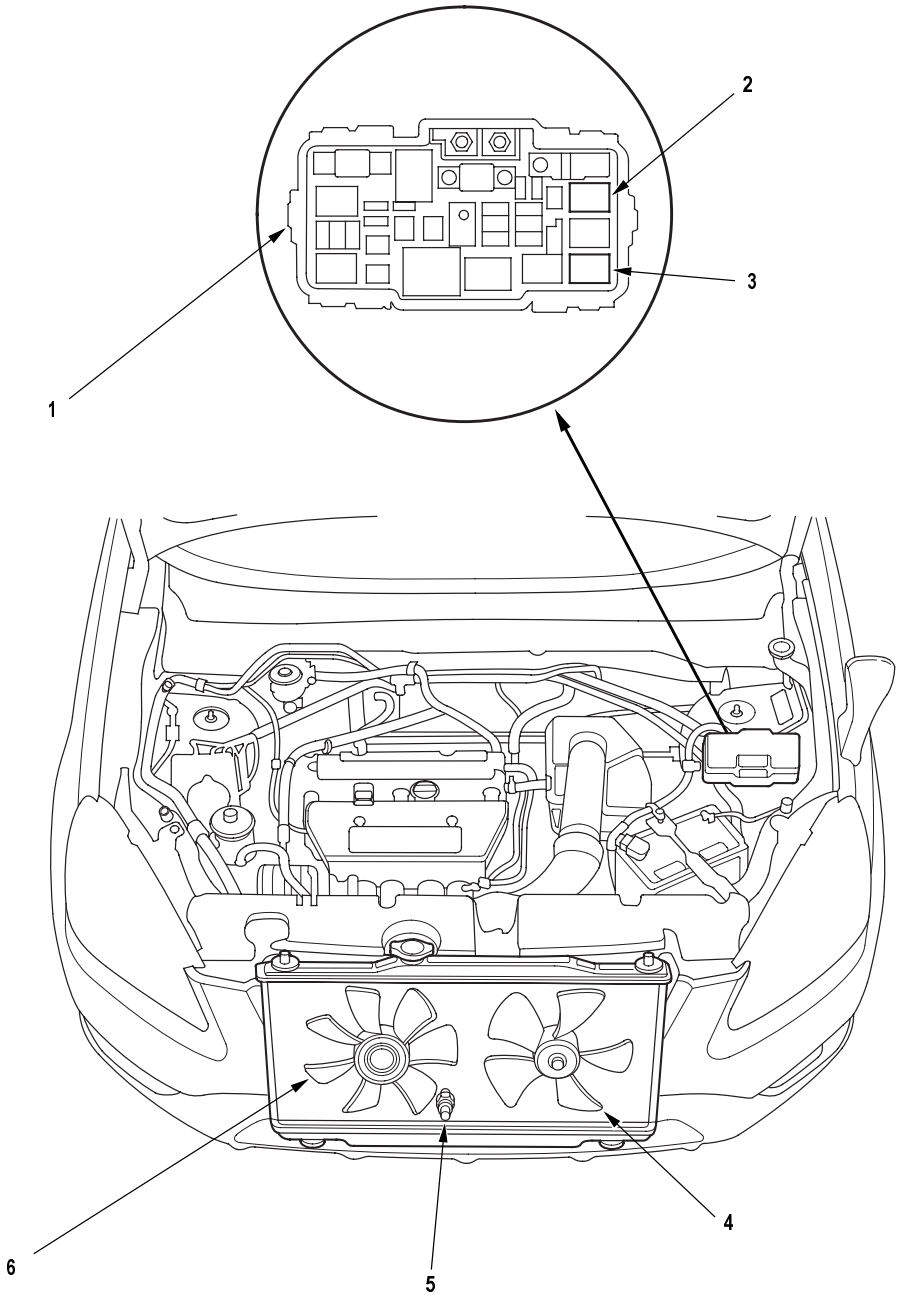
1. Drain the engine coolant (see page 10-6).
2. Remove the bulkhead cover (see step 7 on page 09-4).
3. Remove the upper bracket cushion, then remove the bulkhead (see step 9 on page 09-5).
4. Remove the upper radiator hose and lower radiator hose.



5. Disconnect the fan motor connectors and radiator fan switch connector, then pull up the radiator.
6. Remove the fan shroud assemblies and other parts from the radiator.
7. Install the radiator in the reverse order of removal. Make sure the upper and lower cushions are set securely.
8. Install the bulkhead in the reverse order of removal. Apply body paint to the bulkhead mounting bolts.
9. Fill the radiator with engine coolant and bleed the air (see page 10-6).

Fan Controls

Component Location Index



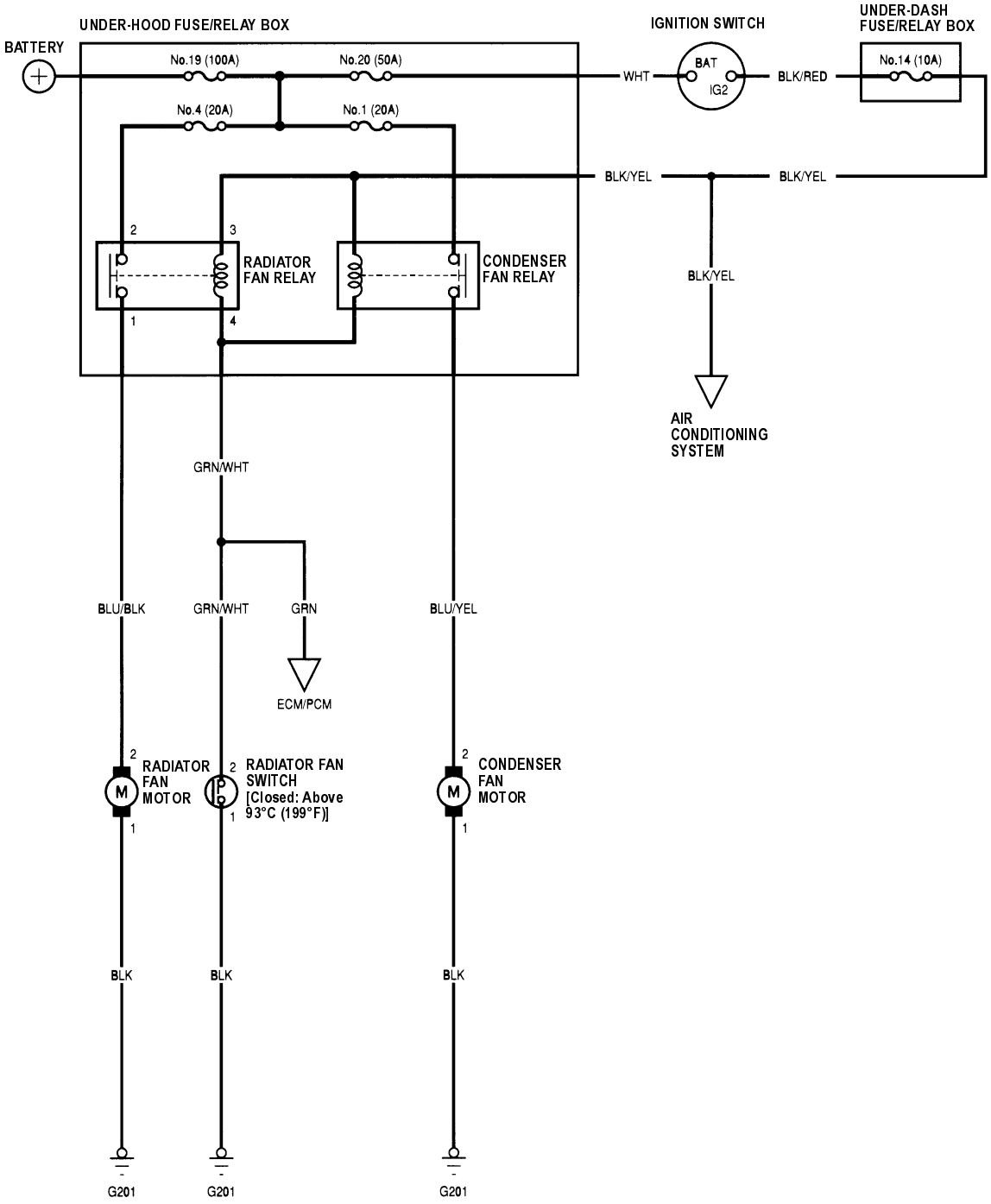
1	UNDER-HOOD FUSE/RELAY BOX	
2	CONDENSER FAN RELAY	Test, page 21-38
3	RADIATOR FAN RELAY	Test, page 10-14
4	CONDENSER FAN ASSEMBLY	Motor Test, page 10-4
5	RADIATOR FAN SWITCH	Test, page 10-17; Replacement, page 10-17
6	RADIATOR FAN ASSEMBLY	Motor Test, page 10-4

Symptom Troubleshooting Index

Before performing any troubleshooting procedures check:
- Fuses
- Grounds
- Cleanliness and tightness of all connectors

SYMPTOM	PROCEDURE
Radiator fan does not run at all	Radiator Fan Circuit Troubleshooting (see page 10-14).
Radiator fan does not run for engine cooling, but it runs with A/C on	Radiator Fan Switch Circuit Troubleshooting (Open) (see page 10-16).
Radiator fan runs with ignition switch ON (II), A/C off, and engine temperature below 93°C (199°F)	Radiator Fan Switch Circuit Troubleshooting (Short) (see page 10-16).

Circuit Diagram



Radiator Fan Circuit Troubleshooting

1. Check the No. 4 (20A) fuse in the under-hood fuse/relay box, and the No. 14 (10A) fuse in the under-dash fuse/relay box.

Is the fuse (s) OK?

Yes Go to step 2.

No Replace the fuse (s) and recheck.■

2. Remove the radiator fan relay from the under-hood fuse/relay box, and test it (see page 10-17).

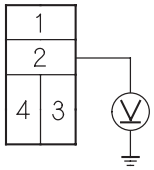
Is the relay OK?

Yes Go to step 3.

No Replace the radiator fan relay.■

3. Measure the voltage between the No. 2 terminal of the radiator fan relay 4P socket and body ground.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

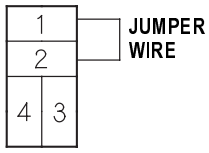
Is there battery voltage?

Yes Go to step 4.

No Replace the under-hood fuse/relay box.■

4. Connect the No. 1 and No. 2 terminals of the radiator fan relay 4P socket with a jumper wire.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

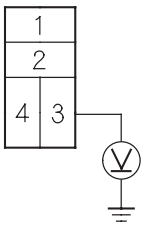
Does the radiator fan run?

Yes Go to step 5.

No Go to step 6.

5. Disconnect the jumper, and turn the ignition switch ON (II). Check for voltage between the No. 3 terminal of the radiator fan relay 4P socket and body ground.

RADIATOR FAN RELAY 4P SOCKET



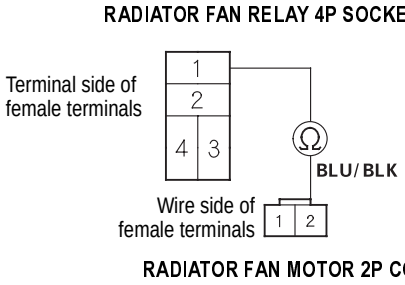
Terminal side of female terminals

Is there battery voltage?

Yes Go to step 9.

No Check for an open in the wire between the under-hood fuse/relay box and under-dash fuse/relay box.■

6. Disconnect the radiator fan motor 2P connector.
7. Check for continuity between the No. 1 terminal of the radiator fan relay 4P socket and the No. 2 terminal of the radiator fan motor 2P connector.

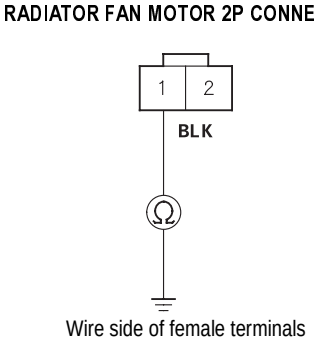


Is there continuity?

Yes Go to step 8.

No Repair open in the wire between the under-hood fuse/relay box and the radiator fan motor 2P connector terminal No. 2.■

8. Check for continuity between the No. 1 terminal of the radiator fan motor 2P connector and body ground.

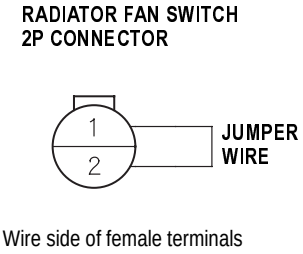


Is there continuity?

Yes Replace the radiator fan motor.■

No Check for an open in the wire between radiator fan motor 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G201.■

9. Reinstall the radiator fan relay.
10. Disconnect the radiator fan switch 2P connector.
11. Connect the No. 1 and No. 2 terminals, of the radiater fan switch 2P connector with a jumper wire.

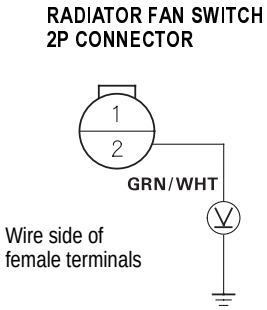


Does the radiator fan run?

Yes Replace the radiator fan switch.■

No Go to step 12.

12. Remove the jumper wire, and measure the voltage between the No. 2 terminal of the radiator fan switch connector and body ground.



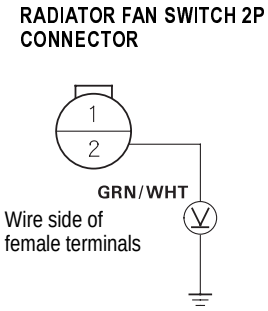
Is there battery voltage?

Yes Check for an open in the wire between radiator fan switch 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G201.■

No Repair open in the wire between the radiator fan switch terminal No. 2 and the under-hood fuse/relay box.■

Radiator Fan Switch Circuit Troubleshooting (Open)

1. Disconnect the radiator fan switch 2P connector.
2. Turn the ignition switch ON (II).
3. Measure voltage between the No. 2 terminal of the radiator fan switch 2P connector and body ground.

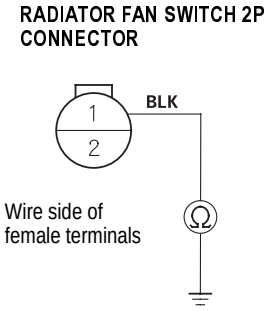


Is there battery voltage?

Yes Go to step 4.

No Repair open in the wire between the radiator fan switch 2P connector terminal No. 2 and under-hood fuse/relay box.■

4. Turn the ignition switch OFF, and check for continuity between the No. 1 terminal of the radiator fan switch 2P connector and body ground.



Is there continuity?

Yes Replace the radiator fan switch.■

No Check for an open in the wire between the radiator fan switch 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G201.■

Radiator Fan Switch Circuit Troubleshooting (Short)

1. Remove the radiator fan relay from the under-hood fuse/relay box, and test it (see page 10-17).

   Is the relay OK?

   Yes Go to step 2.

   No Replace the radiator fan relay.■

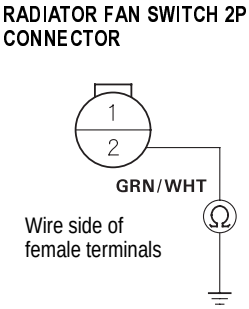
2. Remove the radiator fan switch, and test it (see page 10-17).

   Is the radiator fan switch OK?

   Yes Go to step 3.

   No Replace the radiator fan switch.■

3. Disconnect the negative cable from the battery.
4. Disconnect Engine Control Module (ECM)/ Powertrain Control Module (PCM) connector B (24P) and the under-hood fuse relay box 14P connector.
5. Check for continuity between the No. 2 terminal of the radiator fan switch 2P connector and body ground.



Is there continuity?

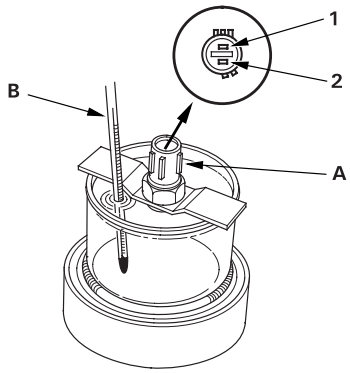
Yes Repair short in the wire between the radiator fan switch 2P connector terminal No. 2 and under-hood fuse/relay box.■

No Replace the under-hood fuse/relay box.■

Radiator Fan Switch Test

NOTE: Bleed air from the cooling system after installing the radiator fan switch (see page 10-6).

1. Remove the radiator fan switch from the radiator (see page 10-17).
2. Suspend the radiator fan switch (A) in a container of water as shown.

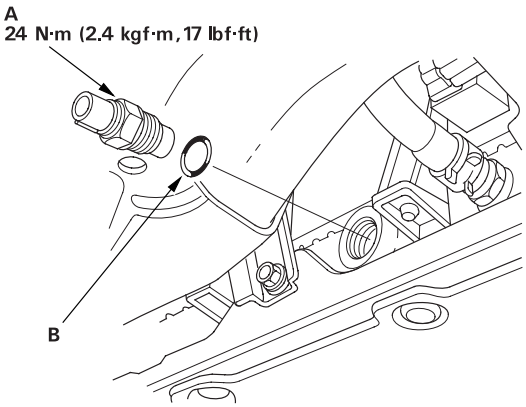


3. Heat the water, and check the temperature with a thermometer. Do not let the thermometer (B) touch the bottom of the hot container.
4. Measure the continuity between terminal No. 1 and terminal No. 2 according to the table.

Operation		Temperature	Terminal 1	Terminal 2
SWITCH	ON	91 - 95°C (196 - 203°F	○	○
	OFF	3 - 8°C (5 - 15°F) lower than the temperature when it goes on		

Radiator Fan Switch Replacement

5. Disconnect the radiator fan switch connector, then remove the radiator fan switch (A).



6. Install the radiator fan switch with a new O-ring (B).

11

Fuel and Emissions

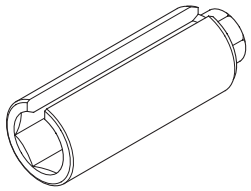
Fuel and Emissions Systems 11-2
PGM-FI System 11-59
VTEC/VTC 11-123
Idle Control System 11-139
Fuel Supply System 11-149
Intake Air System 11-176
Catalytic Converter System 11-188
PCV System 11-190
Evaporative Emission Control System 11-191



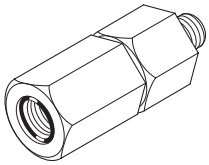
Fuel and Emissions Systems

Special Tools

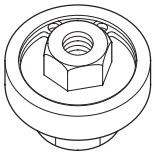
Ref. No.	Tool Number	Description	Qty
1	07LAA-PT50101	O_2 Sensor Socket Wrench	1
2	07NAJ-P070100	Oil Pressure Gauge Attachment	1
3	07VAJ-0040100	Fuel Pressure Gauge Attachment	1
4	07WAA-0010100	Adjustable Ring Wrench	1
5	07ZAJ-S5A0100	Fuel Pressure Gauge Set	1
6	07ZAJ-S7C0100	Fuel Hose Attachment	1
7	07ZAJ-S7C0200	Fuel Joint Attachment	1
8	07ZAJ-S5A0200	Hose, Oil Pressure	1
9	07406-0070001	Low Pressure Gauge	1
10	07406-0040002	Fuel Pressure Gauge	1



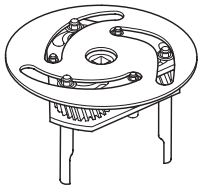
1



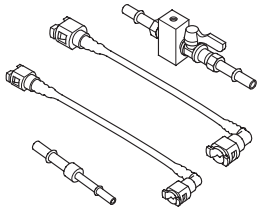
2



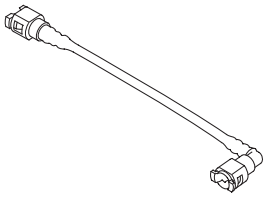
3



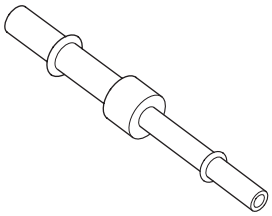
4



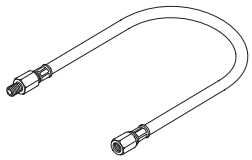
5



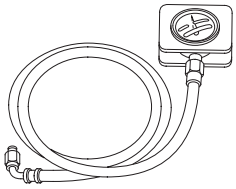
6



7



8



9



10

General Troubleshooting Information

Intermittent Failures

The term ”intermittent failure” means a system may have had a failure, but it checks OK now. If the Malfunction Indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting.

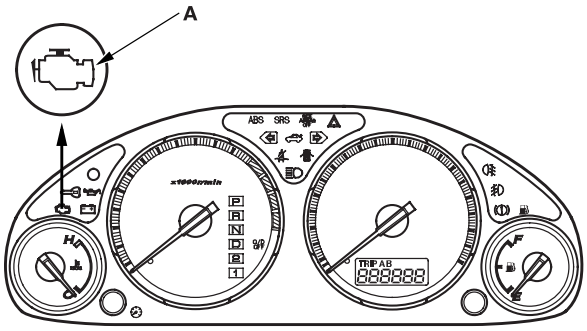
Opens and Shorts

”Open” and ”Short” are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something won’t work at all. In complex electronics (like ECM’s/PCM’s) this can sometimes mean something works, but not the way it’s supposed to.

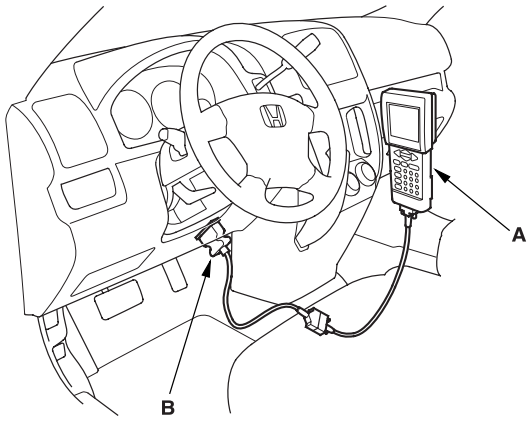
How to Use the Honda PGM Tester or a Scan Tool

If the MIL has come on

1. Start the engine and check the MIL.



2. If the MIL stays on, connect the Honda PGM Tester (A) or a scan tool to the Data Link Connector (DLC) (B) located under the driver’s side of the dashboard.



*: The illustration shows LHD model.

3. Turn the ignition switch ON (II).
4. Check the Diagnostic Trouble Code (DTC) and note it. Also check the freeze frame data. Refer to the DTC Troubleshooting Index and begin the appropriate troubleshooting procedure.

NOTE:
- Freeze frame data indicates the engine conditions when the first malfunction, misfire or fuel trim malfunction was detected.
- The scan tool and the Honda PGM Tester can read the DTC, freeze frame data, current data, and other Engine Control Module (ECM)/Powertrain Control Module (PCM) data.
- For specific operations, refer to the user’s manual that came with the scan tool or Honda PGM Tester.

If the MIL did not come on

If the MIL did not come on but there is a driveability problem, refer to the Symptom Troubleshooting Index in this section (see page 11-8).

If you can't duplicate the DTC

Some of the troubleshooting in this section requires you to reset the ECM/PCM and try to duplicate the DTC. If the problem is intermittent and you can’t duplicate the code, do not continue through the procedure. To do so will only result in confusion and, possibly, a needlessly replaced ECM/PCM.

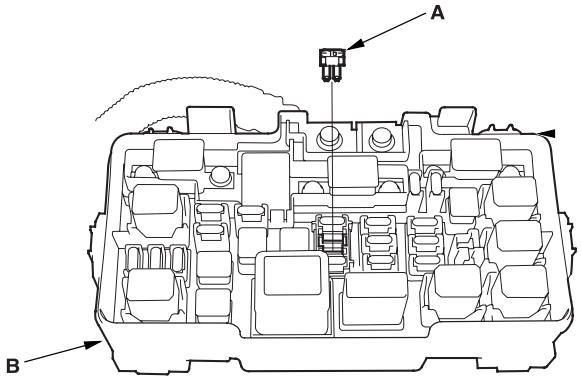
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General Troubleshooting Information (cont'd)

How to Reset the ECM/PCM

You can reset the ECM/PCM in either of 2 ways:

- Use the scan tool or Honda PGM Tester to clear the ECM's/PCM's memory.
  See the scan tool or Honda PGM Tester user's manuals for specific instructions.
- Turn the ignition switch OFF, and remove the No. 6 ECU (ECM/PCM) (15A) fuse (A) from the under-hood fuse/relay box (B) for 10 seconds.



How to End a Troubleshooting Session (required after any troubleshooting)

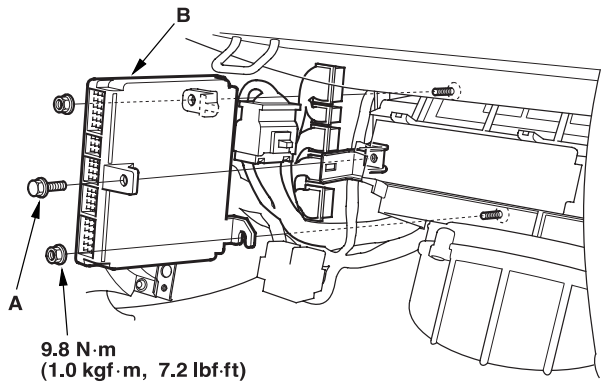
1. Reset the ECM/PCM as described above.
2. Turn the ignition switch OFF.
3. Disconnect the scan tool or Honda PGM Tester from the DLC.

   NOTE: The ECM/PCM is part of the immobilizer system. If you replace the ECM/PCM, it will have a different immobilizer code. In order for the engine to start, you must rewrite the immobilizer code with the Honda PGM Tester.

How to Remove the ECM/PCM for Testing

If the inspection for a trouble code requires voltage or resistance checks at the ECM/PCM connectors, remove the ECM/PCM and test it:

1. Make sure you have the anti-theft code for the radio, then write down the radio station presets.
2. Disconnect the negative cable from the battery.
3. Remove the glove box (see page 20-95).
4. Remove the gray 20P ECM/PCM wire harness connector from the ECM/PCM mounting bracket. Remove the ECM/PCM mounting bolt (A) and the bracket.

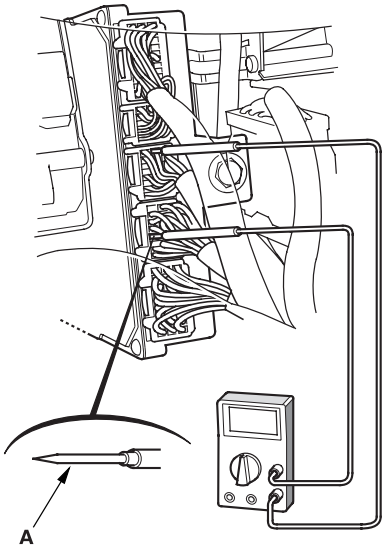


*: The illustration shows LHD model.

5. Remove the nuts, then remove the ECM/PCM (B).
6. Install the ECM/PCM in the reverse order of removal.
7. Reconnect the negative cable to the battery.
8. Enter the radio anti-theft code and the radio station preset then set the clock.

How to Troubleshoot Circuits at the ECM/PCM

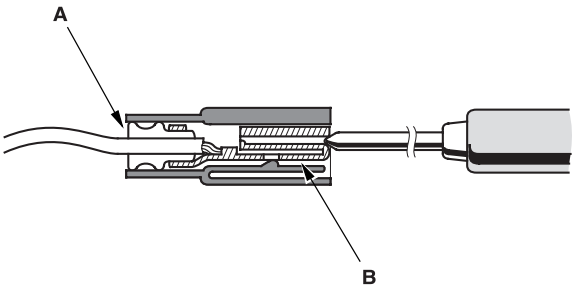
1. Gently slide the sharp tester probe (A) into the connector from wire side until it touches the end of the wire terminal.



2. If you cannot get to the wire side of the connector or the wire side is sealed (A), disconnect the connector and probe the terminals (B) from the terminal side. Do not force the probe into the connector.

NOTICE

Do not puncture the insulation on a wire.Punctures can cause poor or intermittent electrical connections.



How to Substitute the ECM/PCM

1. Disconnect the negative cable from the battery.
2. Remove the ECM/PCM from the vehicle.
3. Install a known-good ECM/PCM in the vehicle.
4. Reconnect the negative cable to the battery.
5. Rewrite the immobilizer code with the ECM/PCM replacement procedure on the Honda PGM Tester. It allows you to start the engine.
6. After completing your tests, reinstall the original ECM/PCM and rewrite the immobilizer code with the ECM/PCM replacement procedure on the Honda PGM Tester again.

DTC Troubleshooting Index

Scan tool DTC (Honda DTC)	Detection Item	Page
P0010 (56-1)	VTC Oil Control Solenoid Valve Malfunction	(see page 11-124)
P0011 (56-2)	VTC System Malfunction	(see page 11-126)
P0107 (3-1)	Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	(see page 11-62))
P0108 (3-2)	Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	(see page 11-63)
P0112 (10-1)	Intake Air Temperature (IAT) Sensor Circuit Low Voltage	(see page 11-64)
P0113 (10-2)	Intake Air Temperature (IAT) Sensor Circuit High Voltage	(see page 11-65)
P0117 (6-1)	Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage	(see page 11-66)
P0118 (6-2)	Engine Coolant Temperature (ECT) Sensor Circuit High Voltage	(see page 11-67)
P0122 (7-1)	Throttle Position (TP) Sensor Circuit Low Voltage	(see page 11-68)
P0123 (7-2)	Throttle Position (TP) Sensor Circuit High Voltage	(see page 11-70)
P0131 (1-1)* [4]	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit Low Voltage	(see page 11-71)
P0132 (1-2)* [4]	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Circuit High Voltage	(see page 11-72)
P0133 (61-1)* [3] *	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Slow Response	(see page 11-73)
P0135 (41-2)* [4]	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Heater Circuit Malfunction	(see page 11-74)
P0137 (63-1)* [5] *	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Circuit Low Voltage	(see page 11-76)
P0138 (63-2)* [5] *	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Circuit High Voltage	(see page 11-77)
P0141 (65-2)* [5]	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Heater Circuit Malfunction	(see page 11-78)
P0171 (45-2)* [3] *	Fuel system Too Lean	(see page 11-80)
P0172 (45-1)* [3] *	Fuel system Too Rich	(see page 11-80)
P0300 (7x-1)* [3] *	Random Misfire	(see page 11-81)
P0301 (71-1)* [3] *	No. 1 Cylinder Misfire	(see page 11-81)
P0302 (72-1)* [3] *	No. 2 Cylinder Misfire	(see page 11-81)
P0303 (73-1)* [3] *	No. 3 Cylinder Misfire	(see page 11-81)
P0304 (74-1)* [3] *	No. 4 Cylinder Misfire	(see page 11-81)

* :These DTCs have Temporary DTC code.
*1: A/T
*2: M/T
*3: KG, KS, KE, KR, KU (Hong Kong) models
*4: with TWC model
*5: KG, KS, KE, KR, KU, KZ, FO, KQ models
*6: KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models
*7: except KG, KS, KE, KR, KU (Hong Kong) models
*8: without TWC model

Scan tool DTC (Honda DTC)	Detection Item	Page
P0325 (23-1)	Knock Sensor Circuit Malfunction	(see page 11-87)
P0335 (4-1)	Crankshaft Position (CKP) Sensor No Signal	(see page 11-88)
P0336 (4-2)	Crankshaft Position (CKP) Sensor Intermittent Interruption	(see page 11-88)
P0340 (57-1)	Camshaft Position (CMP) Sensor No Signal	(see page 11-128)
P0341 (57-3)	VTC Phase Gap	(see page 11-129)
P0344 (57-2)	Camshaft Position (CMP) Sensor Intermittent Interruption	(see page 11-128)
P0420 (67-1)* [3] *	Catalyst System Efficiency Below Threshold	(see page 11-188)
P0443 (92-4)* [3]	Evaporative Emission (EVAP) Canister Purge Valve Circuit Malfunction	(see page 11-193)
P0500 (17-1)* [2]	Vehicle Speed Sensor (VSS) Circuit Malfunction	(see page 11-90)
P0563 (34-2)	Engine Control Module (ECM)/Powertrain Control Module (PCM) Power Source Circuit Unexpected Voltage	(see page 11-91)
P0600 (39-1)	Serial Communication Link Malfunction	Refer to the Multiplex Control System Troubleshooting (see page 22A-231)
P07xx, P08xx* [1] (70-2, 70-3)* [1] *	Automatic Transaxle System Malfunction	Refer to the Automatic Transmission DTC Troubleshooting Index (see page 14-7)
P1107 (13-1)	Barometric Pressure (BARO) Sensor Circuit Low Voltage	(see page 11-93)
P1108 (13-2)	Barometric Pressure (BARO) Sensor Circuit High Voltage	(see page 11-93)
P1213 (11-1)* [8]	Idle Mixture Adjuster (IMA) Circuit Low Voltage	(see page 11-94)
P1214 (11-2)* [8]	Idle Mixture Adjuster (IMA) Circuit High Voltage	(see page 11-95)
P1253 (21-1)* [7]	VTEC System Malfunction	(see page 11-130)
P1259 (22-4)* [3]	VTEC System Malfunction	(see page 11-133)
P1297 (20-1)* [6]	Electrical Load Detector (ELD) Circuit Low Voltage	(see page 11-97)
P1298 (20-2)* [6]	Electrical Load Detector (ELD) Circuit High Voltage	(see page 11-98)
P1361 (8-2)	Top Dead Center (TDC) Sensor Intermittent Interruption	(see page 11-100)
P1362 (8-1)	Top Dead Center (TDC) Sensor No Signal	(see page 11-100)
P1519 (14-3)	Idle Air Control (IAC) Valve Circuit Malfunction	(see page 11-140)
P1607 (0-2)	Engine Control Module (ECM)/Powertrain Control Module (PCM) Internal Circuit Malfunction	(see page 11-101)
P17xx (70-2, 70-3)* [1] *	Automatic Transaxle System Malfunction	Refer to the Automatic Transmission DTC Troubleshooting Index (see page 14-7)

* : These DTCs have Temporary DTC code.
*1: A/T
*2: M/T
*3: KG, KS, KE, KR, KU (Hong Kong) models
*4: with TWC model
*5: KG, KS, KE, KR, KU, KZ, FO, KQ models
*6: KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models
*7: except KG, KS, KE, KR, KU (Hong Kong) models
*8: without TWC model

Symptom Troubleshooting Index

When the vehicle has one of these symptoms, check the Diagnostic Trouble Code (DTC) with the scan tool. If there is no DTC, do the diagnostic procedure for the symptom, in the sequence listed, until you find the cause.

Symptom	Diagnostic procedure	Also check for
Engine will not start (MIL works OK, no DTCs set)	1. Test the battery (see page 22A-59). 2. Test the starter (see page 04-5). 3. Troubleshoot the fuel pump circuit (see page 11-151).	• Low compression • No ignition spark • Intake air leaks • Locked up engine • Slipped/ broken timing belt • Contaminated fuel
Engine will not start (MIL comes on and stays on, or never comes on at all, no DTCs set)	Troubleshoot the MIL circuit (see page 11-102).	
Engine will not start (immobilizer indicator light stays on or flashes)	Troubleshoot the immobilizer system (see page 22A-190).	
Hard starting (MIL works OK, no DTCs set)	1. Test the battery (see page 22A-59). 2. Check the fuel pressure (see page 11-154).	• Low compression • Intake air leaks • Contaminated fuel • Weak spark
Cold fast idle too low (MIL works OK, no DTCs set)	Check the idle speed (see page 11-148).	
Cold fast idle too high (MIL works OK, no DTCs set)	1. Check the idle speed (see page 11-148). 2. Inspect/adjust the throttle cable (see page 11-183). 3. Inspect and test the throttle body (see page 11-180).	
Idle speed fluctuates (MIL works OK, no DTCs set)	1. Check the idle speed (see page 11-148). 2. Inspect/adjust the throttle cable (see page 11-183). 3. Inspect and test the throttle body (see page 11-180).	Intake air leaks
After warming up idle speed is below specifications with no load (MIL works OK, no DTCs set)	1. Troubleshoot the ALT FR signal circuit (see page 11-143).* 1 2. Inspect and test the throttle body (see page 11-180).	Vacuum hose clogged/ cracked/poor connection
After warming up idle speed is above specifications with no load*1 (MIL works OK, no DTCs set)	Troubleshoot the ALT FR signal circuit (see page 11-143).	
After warming up idle speed drops when steering wheel is turning (MIL works OK, no DTCs set)	1. Troubleshoot the PSP switch signal circuit (see page 11-145). 2. Inspect and test the throttle body (see page 11-180).	Power steering system
Idle speed fluctuates (MIL works OK, no DTCs set)	1. Test the fuel pressure (see page 11-154). 2. Test the injectors (see page 11-116).* 2 3. Troubleshoot the ALT FR signal circuit (see page 11-143). 4. Inspect and test the PCV valve (see page 11-190).	Contaminated fuel

Symptom	Diagnostic procedure	Also check for
Misfire or rough running (MIL works OK, no DTCs set)	1. Check the spark plugs (see page 04-23).* 2 2. Test the fuel pressure (see page 11-154). 3. Test the injectors (see page 11-116).* 2 4. Troubleshoot the fuel pump circuit (see page 11-151).	• Low compression • Valve clearance • Contaminated fuel
Fails emission test* 2 (MIL works OK, no DTCs set)	1. Inspect the three way catalytic converter (TWC) (see page 11-188). 2. Check the spark plugs (see page 04-23). 3. Test the fuel pressure (see page 11-154). 4. Test the injectors (see page 11-116). 5. Check the EVAP emission control system (see page 11-195).	• Contaminated fuel • Low compression • Slipped/broken timing belt
Low power (MIL works OK, no DTCs set)	1. Test the fuel pressure (see page 11-154). 2. Check the air cleaner element (see page 11-182). 3. Inspect/adjust the throttle cable (see page 11-183). 4. Inspect and the test the throttle body (see page 11-180). 5. Inspect the three way catalytic converter (TWC) (see page 11-188).* 2 6. Test the injectors (see page 11-116).* 2	• Contaminated fuel • Low compression • Camshaft timing • Engine oil level
Engine stalls (MIL works OK, no DTCs)	1. Test the fuel pressure (see page 11-154). 2. Check the idle speed (see page 11-148). 3. Troubleshoot the brake pedal position switch signal circuit (see page 11-146). 4. Check the spark plugs (see page 04-23).* 2	• Intake air leaks • Faulty harness and sensor connections

*1: except KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models
*2: except KG, KS, KE, KR, KU (Hong Kong) models

System Descriptions

Electronic Control System

The functions of the fuel and emission control systems are managed by the Engine Control Module (ECM) on vehicles with manual transmissions or the Powertrain Control Module (PCM) on vehicles with automatic transmissions.

Fail-safe Function
When an abnormality occurs in a signal from a sensor, the ECM/PCM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.

Back-up Function
When an abnormality occurs in the ECM/PCM, the injectors are controlled by a back-up circuit independent of the system to permit minimal driving.

Self-diagnosis
When an abnormality occurs in the signal from a sensor, the ECM/PCM supplies ground for the Malfunction Indicator Lamp (MIL) and stores the Diagnostic Trouble Code (DTC) in erasable memory. When the ignition is first turned on, the ECM/PCM supplies ground for the MIL for 2 seconds to check the MIL bulb condition.

Two Driving Cycle Detection Method
To prevent false indications, the ”two driving cycle detection method” is used for some self-diagnostic functions. When an abnormality occurs, the ECM/PCM stores it in its memory. When the same abnormality recurs after the ignition switch is turned OFF and ON (II) again, the ECM/PCM informs the driver by turning on the MIL.

ECM/PCM Data

You can retrieve data from the ECM/PCM by connecting the scan tool or the Honda PGM Tester to the Data Link Connector (DLC). The items listed in the table below conform to SAE recommended practice. The Honda PGM Tester also reads data beyond that recommended by SAE so that this data may help you find the causes of intermittent problems.

NOTE:
- The ''operating values'' listed are approximate and may vary depending on the environment and the individual vehicle.
- Unless noted otherwise, ''at idle speed'' means idling with the engine completely warmed up, A/T in Park or neutral, M/T in neutral position, and the A/C and all accessories turned off.

Data	Description	Operating Value	Freeze Data
Diagnostic Trouble Code (DTC)	If the ECM/PCM detects a problem, it will store it as a code consisting of one letter and four numbers. Depending on the problem, an SAE-defined code (P0xxx) or a Honda-defined code (P1xxx) will be output to the tester.	If no problem is detected, there is no output.	YES
Engine Speed	The ECM/PCM computes engine speed from the signals sent from the Crankshaft Position (CKP) sensor. This data is used for determining the time and amount of injected fuel.	Nearly the same as tachometer indication At idle speed: 650±50 rpm (min^{-1})	YES
Vehicle Speed	The ECM/PCM converts pulse signals from the Vehicle Speed Sensor (VSS).	Nearly the same as speedometer indication	YES
Manifold Absolute Pressure (MAP)	The absolute pressure caused in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure At idle speed: about 20 - 34 kPa (150 - 260 mmHg, 6 - 10 in.Hg), 0.7 - 1.1 V	YES
Engine Coolant Temperature (ECT)	The ECT sensor converts coolant temperature into voltage and signals the ECM/PCM. The sensor is a thermistor whose internal resistance changes with coolant temperature. The ECM/PCM uses the voltage signals from the ECT sensor to determine the amount of injected fuel.	With cold engine: Same as ambient temperature and IAT With engine warmed up: about 80 - 100°C (176 - 212°F), 0.5 - 0.8 V	YES
Heated Oxygen Sensor (HO2S), Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2)	The HO2S detects the oxygen content in the exhaust gas and sends voltage signals to the ECM/PCM. Based on these signals, the ECM/PCM controls the air fuel ratio. When the oxygen content is high (that is, when the ratio is leaner than the stoichiometric ratio), the voltage signal is lower. When the oxygen content is low (that is, when the radio is richer than the stoichiometric ratio), the voltage signal is higher.	0.0 - 1.25 V At idle speed: about 0.1 - 0.9 V	NO

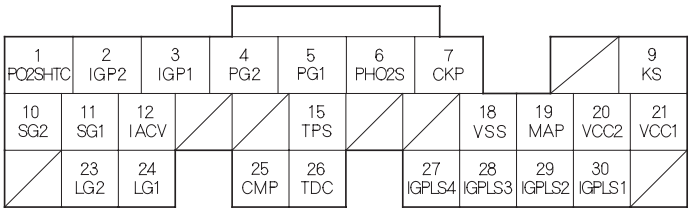
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System Descriptions (cont'd)

ECM/PCM Data (cont'd)

Data	Description	Operating Value	Freeze Data
Fuel System Status	Fuel system status is indicated as "open" or "closed". Closed: Based on the HO2S output, the ECM/PCM determines the air/fuel ratio and controls the amount of injected fuel. Open: ignoring the HO2S output, the ECM/PCM refers to signals from the Throttle Position (TP), Manifold Absolute Pressure (MAP), Intake Air Temperature (IAT), Barometric Pressure (BARO) and Engine Coolant Temperature (ECT) sensors to control the amount of injected fuel.	At idle speed: closed	YES
Short Term Fuel Trim	The air/fuel ratio correction coefficient for correcting the amount of injected fuel when the Fuel System Status is "closed." When the ratio is leaner than the stoichiometric ratio, the ECM/PCM increases short term fuel trim gradually, and the amount of injected fuel increases. The air/fuel ratio gradually gets richer, causing a lower oxygen content in the exhaust gas. Consequently, the short term fuel trim is lowered, and the ECM/PCM reduces the amount of injected fuel. This cycle keeps the air/fuel ratio close to the stoichiometric ratio when in closed loop status.	0.73 - 1.47	YES
Long Term Fuel Trim	Long term fuel trim is computed from short term fuel trim and indicates changes occurring in the fuel supply system over a long period. If long term fuel trim is higher than 1.00, the amount of injected fuel must be increased. If it is lower than 1.00, the amount of injected fuel must be reduced.	0.82 - 1.47	YES
Intake Air Temperature (IAT)	The IAT sensor converts intake air temperature into voltage and signals the ECM/PCM. When intake air temperature is low, the internal resistance of the sensor increases, and the voltage signal is higher.	With cold engine: Same as ambient temperature and ECT	YES
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle speed: about 10 %, 0.5 V	YES
Ignition Timing	Ignition timing is the ignition advance angle set by the ECM/PCM. The ECM/PCM matches ignition timing to the driving conditions.	At idle speed: 8° ± 2° BTDC when the SCS service signal line is jumped with the Honda PGM tester	NO

ECM/PCM Inputs and Outputs at Connector A (31P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

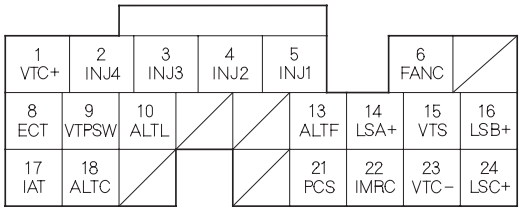
Terminal number	Wire color	Terminal name	Description	Signal
1* [3]	BLK/WHT	PO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives Primary HO2S heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
2	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the ECM/ PCM circuit	With the ignition switch ON (II): battery voltage With the ignition switch OFF: about 0 V
3	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the ECM/ PCM circuit	With the ignition switch ON (II): battery voltage With the ignition switch OFF: about 0 V
4	BLK	PG2 (POWER GROUND)	Ground for the ECM/PCM circuit	Less than 1.0 V at all times
5	BLK	PG1 (POWER GROUND)	Ground for the ECM/PCM circuit	Less than 1.0 V at all times
6* [3]	RED	PHO2S (PRIMARY HEATED OXYGEN SENSOR, Sensor 1)	Detects Primary HO2S sensor (Sensor 1) signal	With throttle fully opened from idle with fully warmed up engine: about 0.6 V With throttle quickly closed: below 0.4 V
7	BLU	CKP (CRANKSHAFT POSITION SENSOR)	Detects CKP sensor signal	With engine running: pulses
9	RED/BLU	KS (KNOCK SENSOR)	Detects knock sensor signal	With ignition ON (II): about 0 V With engine knocking: pulses
10	GRN/YEL	SG2 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
11	GRN/WHT	SG1 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
12	BLK/RED	IACV (IDLE AIR CONTROL (IAC) VALVE)	Drives IAC valve	With engine running: duty controlled
15	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
18* [2]	WHT/GRN	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal	With ignition switch ON (II) and front wheels rotating: cycles about 0 V-about 5 V or battery voltage
19	GRN/RED	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
20	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
21	YEL/RED	VCC1 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
23	BRN/YEL	LG2 (LOGIC GROUND)	Ground for the ECM/PCM circuit	Less than 1.0 V at all times
24	BRN/YEL	LG1 (LOGIC GROUND)	Ground for the ECM/PCM circuit	Less than 1.0 V at all times
25	BLU/WHT	CMP (CAMSHAFT POSITION SENSOR)	Detects CMP sensor signal	With engine running: pulses
26	GRN	TDC (TOP DEAD CENTER SENSOR)	Detects TDC sensor	With engine running: pulses
27	BRN	IGPLS4 (No.4 IGNITION COIL PULSE)	Drives No.4 ignition coil	With ignition switch ON (II): about 0 V With engine running: pulses
28	WHT/BLU	IGPLS3 (No.3 IGNITION COIL PULSE)	Drives No.3 ignition coil	
29	BLU/RED	IGPLS2 (No.2 IGNITION COIL PULSE)	Drives No.2 ignition coil	
30	YEL/GRN	IGPLS1 (No.1 IGNITION COIL PULSE)	Drives No.1 ignition coil	

*1: A/T
*2: M/T
*3: with TWC model
*4: KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models
*5: KG, KS, KE, KR, KU (Hong Kong) models
*6: KG, KS, KE, KR, KU, KZ, FO, KQ models
*7: KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*8: except KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*9: except TWC model
*10: with cruise control

(cont'd)

System Descriptions (cont'd)

ECM/PCM Inputs and Outputs at Connector B (24P)



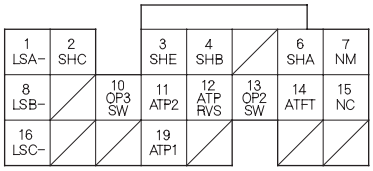
Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLU/WHT	VTC+ (VTC OIL CONTROL SOLENOID VALVE +SIDE)	Drives VTC oil control solenoid valve	With ignition switch ON (II): 0 V
2	YEL	INJ4 (No. 4 INJECTOR)	Drives No. 4 injector	At idle: duty controlled With ignition switch ON (II): battery voltage
3	BLU	INJ3 (No. 3 INJECTOR)	Drives No. 3 injector	
4	RED	INJ2 (No. 2 INJECTOR)	Drives No. 2 injector	
5	BRN	INJ1 (No. 1 INJECTOR)	Drives No. 1 injector	
6	GRN	FANC (RADIATOR FAN CONTROL)	Drives radiator fan relay	With radiator fan running: about 0 V With radiator fan stopped: battery voltage
8	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal	With the ignition switch ON (II): about 0.1 - 4.8 V (depending on engine coolant temperature)
9* [5]	BLU/BLK	VTPSW (VTEC OIL PRESSURE SWITCH)	Detects VTEC oil pressure switch signal	At idle: about 0 V
10	WHT/BLU	ALTL (ALTERNATOR L SIGNAL)	Detects alternator L signal	With ignition switch ON (II): about 0 V With engine running: battery voltage
13	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal	With engine running: about 0 V - 5 V (depending on electrical load)
14* [1]	RED/BLK	LSA+ (A/T PRESSURE CONTROL SOLENOID VALVE A +SIDE)	Drives A/T pressure control solenoid valve A	With the ignition switch ON (II): duty controlled
15	GRN/YEL	VTS (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve	At idle: about 0 V
16* [1]	BRN/WHT	LSB+ (A/T PRESSURE CONTROL SOLENOID VALVE B +SIDE)	Drives A/T pressure control solenoid valve B	With the ignition switch ON (II): duty controlled
17	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal	With ignition switch ON (II): about 0.1 V - 4.8 V (depending on intake air temperature)
18* [4]	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal	With engine running: about 0 V - 5 V (depending on electrical load)
21	YEL/BLU	PCS (EVAPORATIVE EMISSION CANISTER PURGE VALVE)	Drives EVAP canister purge valve	With engine running, engine coolant below 65°C (149°F): about 0 V With engine running, engine coolant above 65°C (149°F): duty controlled
22	RED/BLU	IMRC (INTAKE MANIFOLD RUNNER CONTROL SOLENOID VALVE)	Drives IMRC solenoid valve	With engine speed below 4,700 rpm (min^{-1}) (K24A1 engine: 4,300 rpm (min^{-1})): battery voltage With engine speed above 4,700 rpm (min^{-1}) (K24A1 engine: 4,300 rpm (min^{-1})): 0 V
23	BLK/WHT	VTC- (VTC OIL CONTROL SOLENOID VALVE -SIDE)	Drives VTC oil control solenoid valve	With the ignition switch ON (II): 0 V
24* [1]	BLU/YEL	LSC+ (A/T PRESSURE CONTROL SOLENOID VALVE C +SIDE)	Drives A/T pressure control solenoid valve C	With the ignition switch ON (II): duty controlled

*1: A/T
*2: M/T
*3: with TWC model
*4: KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models
*5: KG, KS, KE, KR, KU (Hong Kong) models
*6: KG, KS, KE, KR, KU, KZ, FO, KQ models
*7: KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*8: except KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*9: except TWC model
*10: with cruise control

PCM Inputs and Outputs at Connector C (22P)* [1]



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

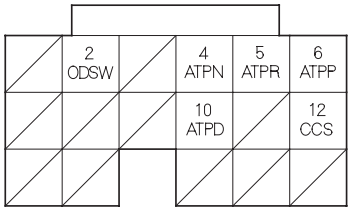
Terminal number	Wire color	Terminal name	Description	Signal
1	WHT/BLK	LSA- (A/T PRESSURE CONTROL SOLENOID VALVE A -SIDE)	Ground for A/T pressure control solenoid valve A	
2	GRN	SHC (SHIFT SOLENOID VALVE C)	Drives shift solenoid valve C	With engine running in Neutral position, or in D, M position (in 1st, 3rd, 5th gears): battery voltage With engine running in Park, R position, or in D, M position (in 2nd, 4th gears): about 0 V
3	YEL	SHE (SHIFT SOLENOID VALVE E)	Drives shift solenoid valve E	With engine running in Park, R position: battery voltage With engine running in Neutral position, or in D, M position (in 1st, 2nd, 3rd, 4th, 5th gears): about 0 V
4	GRN/WHT	SHB (SHIFT SOLENOID VALVE B)	Drives shift solenoid valve B	With engine running in Park, R, Neutral position, or D, M position (in 1st, 2nd gears): battery voltage With engine running in D, M position (in 3rd, 4th, 5th gears): about 0 V
6	BLU/BLK	SHA (SHIFT SOLENOID VALVE A)	Drives shift solenoid valve A	With engine running in R position, or D, M position (in 1st, 4th, 5th gears): battery voltage With engine running in Park, Neutral position, or D, M position (in 2nd, 3rd gears): about 0V
7	WHT/RED	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signals	With engine running: pulses
8	BLK/RED	LSB- (A/T PRESSURE CONTROL SOLENOID VALVE B -SIDE)	Ground for A/T pressure control solenoid valve B	
10	BLU/WHT	OP3SW (3RD OIL PRESSURE SWITCH)	Detects 3rd oil pressure switch	With the ignition switch ON (II): about 5 V With engine running in 3rd gear: about 0 V
11	GRN/RED	ATP2 (TRANSMISSION RANGE SWITCH 2ND POSITION)	Detects transmission range switch 2nd position signal	In 2nd position: about 0 V In any other position: battery voltage
12	RED/WHT	ATPRVS (TRANSMISSION RANGE SWITCH R POSITION)	Detects transmission range switch R position signal	In R position: about 0 V In any other position: about 5 V or battery voltage
13	BLU/RED	OP2SW (2ND OIL PRESSURE SWITCH)	Detects 2nd oil pressure switch	With the ignition switch ON (II): about 5 V With engine running in 2nd gear: about 0 V
14	RED/YEL	ATFT (ATF TEMPERATURE SENSOR)	Detects ATF temperature sensor signal	With the ignition switch ON (II): about 0.1 V - 4.2 V (depending on ATF temperature)
15	BLU	NC (COUNTERSHAFT SPEED SENSOR)	Detects countershaft speed sensor signals	With ignition switch ON (II), and front wheels rotating: pulses
16	WHT/BLU	LSC- (A/T PRESSURE CONTROL SOLENOID VALVE C -SIDE)	Ground for A/T pressure control solenoid valve C	With the ignition switch ON (II): duty controlled
19	BRN	ATP1 (TRANSMISSION RANGE SWITCH 1ST POSITION)	Detects transmission range switch 1st position signal	In 1st position: about 0 V In any other position: battery voltage

*1: A/T
*2: M/T
*3: with TWC model
*4: KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models
*5: KG, KS, KE, KR, KU (Hong Kong) models
*6: KG, KS, KE, KR, KU, KZ, FO, KQ models
*7: KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*8: except KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*9: except TWC model
*10: with cruise control

(cont'd)

System Descriptions (cont'd)

PCM Inputs and Outputs at Connector D (17P)



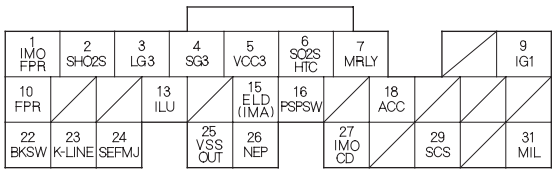
Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
2	GRN	ODSW (OVER-DRIVE SWITCH)	Detects over-drive switch signal	With Over-Drive OFF (O/D OFF indicator light turned ON): about 0 V With Over-Drive ON (O/D OFF indicator light turned OFF): about 5 V
4	BLK/RED	ATPN (TRANSMISSION RANGE SWITCH NEUTRAL POSITION)	Detects transmission range switch Neutral position signal	In Neutral position: about 0 V In any other position: about 5 V or battery voltage
5	WHT	ATPR (TRANSMISSION RANGE SWITCH R POSITION)	Detects transmission range switch R position signal	In R position: about 0 V In any other position: about 5 V or battery voltage
6	BLU/BLK	ATPP (TRANSMISSION RANGE SWITCH PARK POSITION)	Detects transmission range switch Park position signal	In Park position: about 0 V In any other position: about 5 V or battery voltage
10	LT BLU	ATPD (TRANSMISSION RANGE SWITCH D POSITION)	Detects transmission range switch D position signal	In D position: about 0 V In any other position: about 5 V or battery voltage
12* [10]	BLU/ORN	CCS (CRUISE CONTROL SIGNAL	Detects cruise control signal	With ignition switch ON (II): pulses

*1: A/T
*2: M/T
*3: with TWC model
*4: KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models
*5: KG, KS, KE, KR, KU (Hong Kong) models
*6: KG, KS, KE, KR, KU, KZ, FO, KQ models
*7: KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*8: except KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*9: except TWC model
*10: with cruise control

ECM/PCM Inputs and Outputs at Connector E (31P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1* [7]	GRN/YEL	IMO FPR (IMMOBILIZER FUEL PUMP RELAY)	Drives PGM-FI main ralay 2	0 V for 2 seconds after turning ignition switch ON (II), then battery voltage
2* [6]	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2)	Detects Secondary HO2S (sensor 2) signal	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
3	BRN/YEL	LG3 (LOGIC GROUND)	Ground for the ECM/PCM control circuit	Less than 1.0 V at all times
4	PNK	SG3 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
5	YEL/BLU	VCC3 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
6* [6]	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives Secondary HO2S heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
7	RED/YEL	MRLY (PGM-FI MAIN RELAY)	Drives PGM-FI main relay 1 Power source for the DTC memory	With ignition switch ON (II): battery voltage With ignition switch OFF: about 0 V
9	YEL/BLK	IG1 (IGNITION SIGNAL)	Detects ignition signal	With ignition switch ON (II): battery voltage With ignition switch OFF: about 0 V
10* [8]	GRN/YEL	FPR (FUEL PUMP RELAY)	Drives PGM-FI main relay 2	0 V for 2 seconds after turning ignition switch ON (II), then battery voltage
13* [1]	WHT/BLU	ILU (INTERLOCK CONTROL UNIT)	Drives interlock control unit	With ignition switch ON (II) and brake pedal depressed: about 8.5 V
15* [4]	GRN/RED	ELD (ELECTRICAL LOAD DETECTOR)	Drives ELD signal	With ignition switch ON (II): about 0.1 V - 4.8 V (depending on electrical load)
15* [9]	ORN	IMA (IDLE MIXTURE ADJUSTER (IMA))	Detects IMA signal	With ignition switch ON (II): about 0.5-4.5 V (depending on idle mixture)
16	LT GRN/BLK	PSPSW (POWER STEERING PRESSURE SWITCH SIGNAL)	Detects PSP switch signal	At idle steering wheel in straight ahead position: about 0 V At idle with steering wheel at full lock: battery voltage
18	RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay	With compressor ON: about 0 V With compressor OFF: battery voltage
22	WHT/BLK	BKSW (BRAKE PEDAL POSITION SWITCH)	Detects BPP switch signal	With brake pedal released: about 0 V With brake pedal pressed: battery voltage
23	LT BLU	K-LINE	Sends and receives scan tool signal	With ignition switch ON (II): pulses or battery voltage
24	YEL	SEFMJ	Communicates with multiplex control unit	With ignition switch ON (II): about 5 V With engine running with load: pulses
25* [1]	BLU/WHT	VSSOUT (VEHICLE SPEED SENSOR OUTPUT SIGNAL)	Sends vehicle speed sensor signal	Depending on vehicle speed: pulses
26	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse	With engine running: pulses
27* [7]	RED/BLU	IMOCD (IMMOBILIZER CODE)	Detects immobilizer signal	
29	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check signal	With the service check signal shorted with the PGM Tester: about 0 V With the service check signal opened: about 5 V battery voltage
31	GRN/WHT	MIL (MALFUNCTION INDICATOR LAMP)	Drives MIL	With MIL turned ON: about 0 V With MIL turned OFF: battery voltage

1: A/T
*2: M/T
*3: with TWC model
*4: KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models

*5: KG, KS, KE, KR, KU (Hong Kong) model

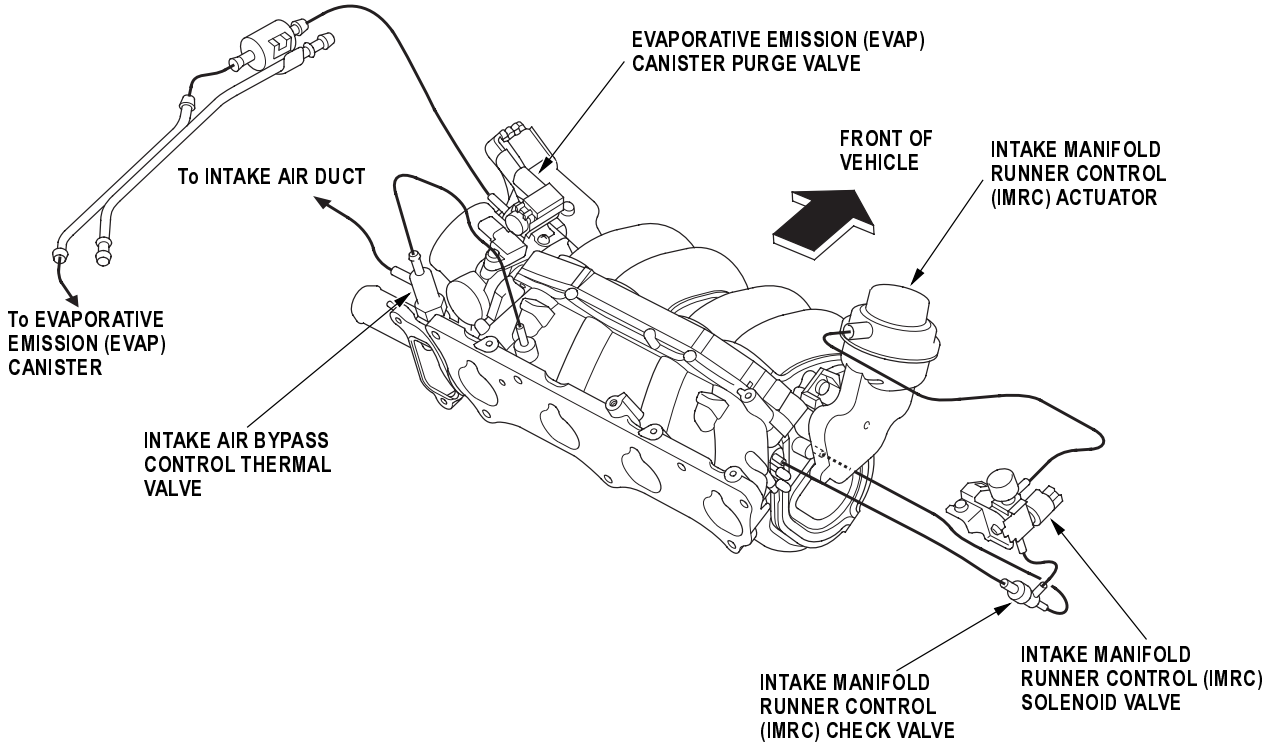
*6: KG, KS, KE, KR, KU, KZ, FO, KQ models
*7: KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*8: except KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models
*9: except TWC model

*10: with cruise control

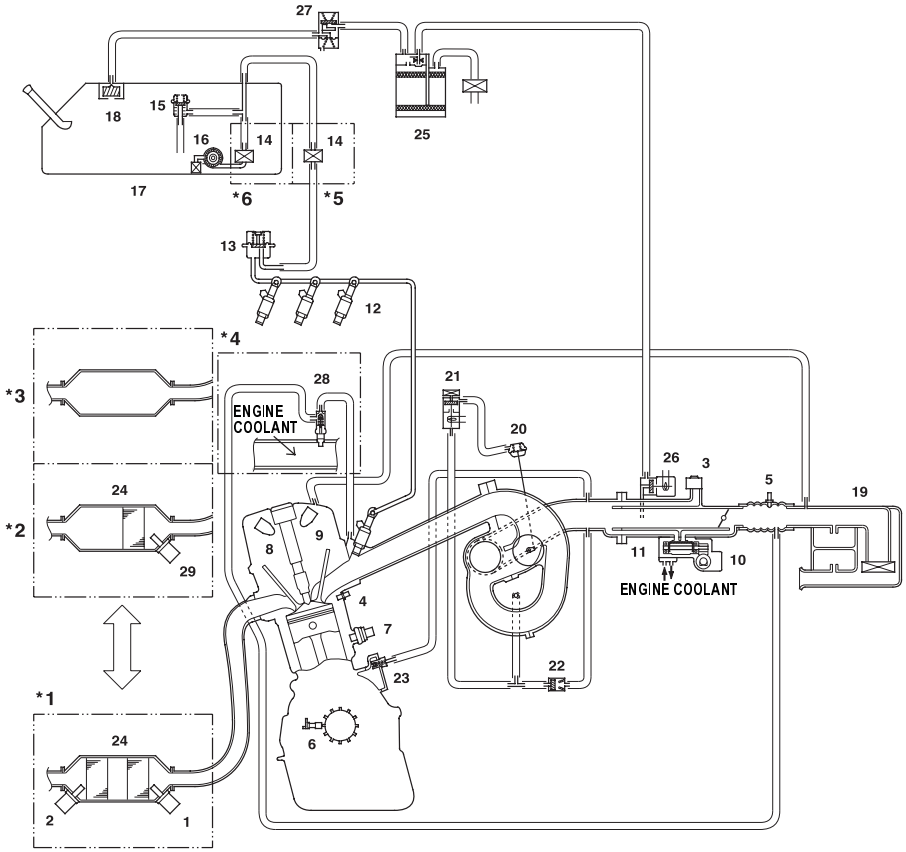
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System Descriptions (cont'd)

Vacuum Hose Routing



Vacuum Distribution



*1: KG, Ks, KE, KR, KU, KZ, FO, KQ models
*2: KN, KM, KY, MA, PH, IN, KK models
*3: without TWC model
*4: with TWC model
*5: except KZ, PH, FO, IN, MA models
*6: KZ, PH, FO, IN, MA models

1 PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)
2 SECONDARY HEATED OXYGEN SENSOR SECONDARY HO2S) (SENSOR 2)
3 MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
4 ENGINE COOLANT TEMPERATURE (ECT) SENSOR
5 INTAKE AIR TEMPERATURE (IAT) SENSOR
6 CRANKSHAFT POSITION (CKP) SENSOR
7 KNOCK SENSOR
8 TOP DEAD CENTER (TDC) SENSOR
9 CAMSHAFT POSITION (CMP) SENSOR
10 IDLE AIR CONTROL (IAC) VALVE
11 THROTTLE BODY
12 INJECTOR
13 FUEL PULSATION DAMPER
14 FUEL FILTER
15 FUEL PRESSURE REGULATOR
16 FUEL PUMP
17 FUEL TANK
18 FUEL TANK VAPOR/LIQUID SEPARATION VALVE
19 AIR CLEANER
20 INTAKE MANIFOLD RUNER CONTROL (IMRC) CONTROL VALVE
21 INTAKE MANIFOLD RUNNER CONTROL (IMRC) SOLENOID VALVE
22 INTAKE MANIFOLD RUNNER CONTROL (IMRC) CHECK VALVE
23 POSITIVE CRANKCASE VENTILATION (PCV) VALVE
24 THREE WAY CATALYTIC CONVERTER
25 EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
26 EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE
27 EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
28 INTAKE AIR BYPASS CONTROL THERMAL VALVE
29 HEATED OXYGEN SENSOR (HO2S)

(cont'd)

System Descriptions (cont'd)

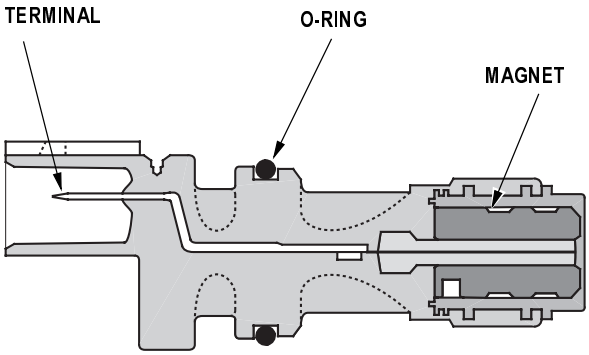
PGM-FI System
The Programmed Fuel Injection (PGM-FI) system is a sequential multiport fuel injection system.

Air Conditioning (A/C) Compressor Clutch Relay
When the ECM/PCM receives a demand for cooling from the A/C system, it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.

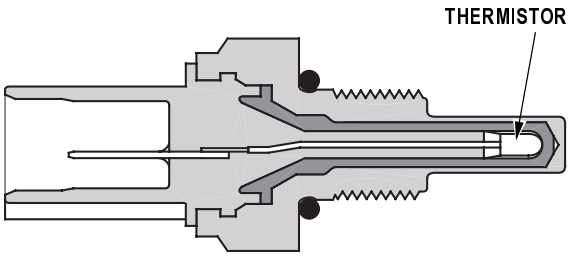
Alternator Control
The alternator signals the Engine Control Module (ECM)/ Powertrain Control Module (PCM) during charging.

Barometric Pressure (BARO) Sensor
The BARO sensor is inside the ECM/PCM. It converts atmospheric pressure into a voltage signal that modifies the basic duration of the fuel injection discharge.

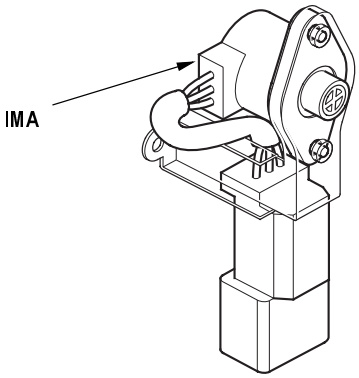
Crankshaft Position (CKP) Sensor
The CKP sensor detects crankshaft speed and determines ignition timing and timing for fuel injection of each cylinder, as well as detecting engine misfire.



Engine Coolant Temperature (ECT) Sensor
The ECT sensor is a temperature dependent resistor (thermistor). The resistor of the thermistor decreases as the engine coolant temperature increases.



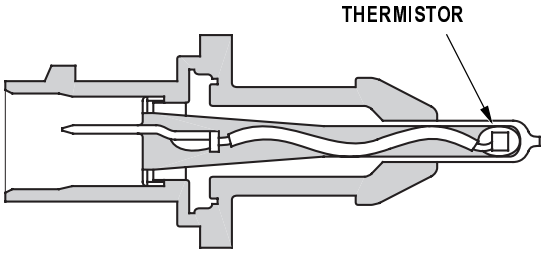
Idle Mixture Adjuster (IMA) (without TWA model)
The idle mixture adjuster (IMA) is selected resistance device used to control idle mixture.



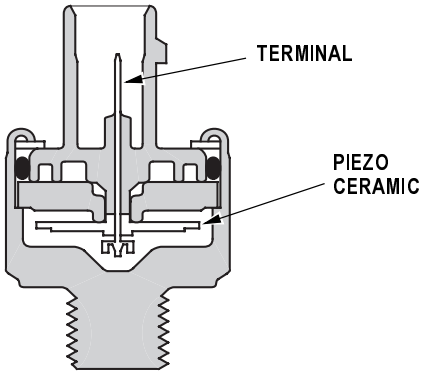
Ignition Timing Control
The ECM/PCM contains the memory for basic ignition timing at various engine speeds and manifold absolute pressure. It also adjusts the timing according to engine coolant temperature.

Injector Timing and Duration
The ECM/PCM contains the memory for basic discharge duration at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.
By monitoring long term fuel trim, the ECM/PCM detects long term malfunctions in the fuel system, and will set a Diagnostic Trouble Code (DTC).

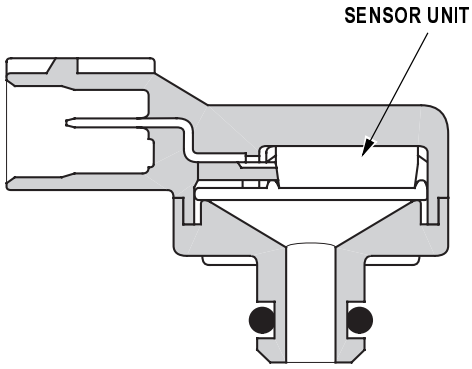
Intake Air Temperature (IAT) Sensor
The IAT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases.



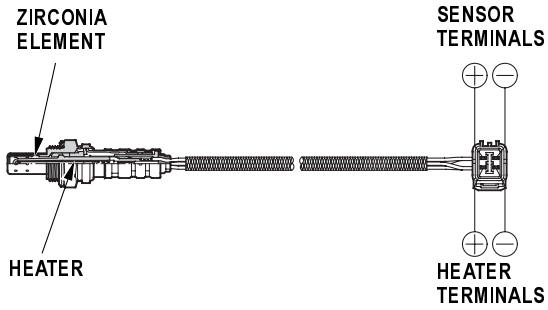
Knock Sensor
The knock control system adjusts the ignition timing to minimize knock.



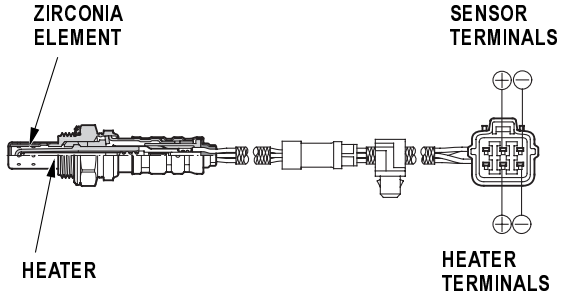
Manifold Absolute Pressure (MAP) Sensor
The MAP sensor converts manifold absolute pressure into electrical signals to the ECM/PCM.



Primary Heated Oxygen Sensor (Primary HO2S)
The primary HO2S detects the oxygen content in the exhaust gas and sends signals to the ECM/PCM which varies the duration of fuel injection accordingly. To stabilize its output, the sensor has an internal heater. The primary HO2S is installed in the Three Way Catalytic Converter (TWC). By controlling the air fuel ratio with primary HO2S and secondary HO2S, the deterioration of the primary HO2S can be evaluated by its feedback period. When the feedback period exceeds a certain value during stable driving conditions, the sensor is considered deteriorated and the ECM/PCM sets a DTC.



Secondary Heated Oxygen Sensor (Secondary HO2S)
The secondary HO2S detects the oxygen content in the exhaust gas downstream of the Three Way Catalytic Converter (TWC) and sends signals to the ECM/PCM which varies the duration of fuel injection accordingly. To stabilize its output, the sensor has an internal heater. The secondary HO2S is installed in the TWC.



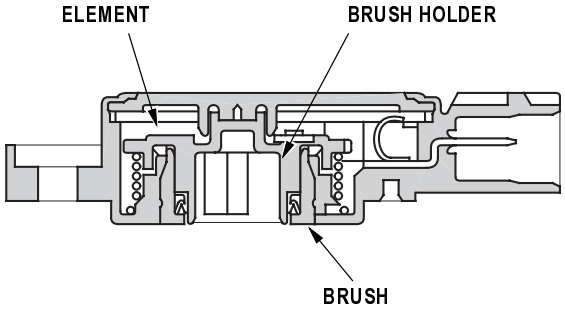
Starting Control
When the engine is started, the ECM/PCM provides a rich mixture by increasing injector duration.

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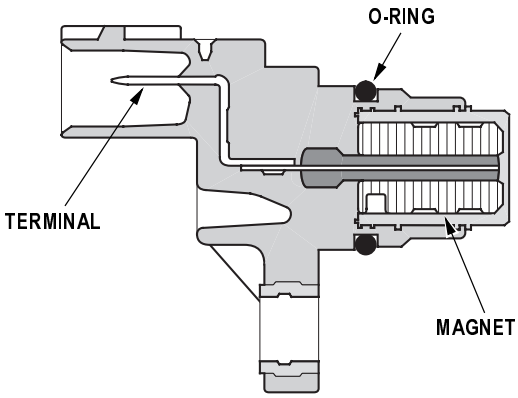
System Descriptions (cont'd)

PGM-FI System (cont'd)

Throttle Position (TP) Sensor
The TP sensor is a potentiometer connected to the throttle valve shaft. As the throttle position changes, the sensor varies the signal voltage to the ECM/PCM. The TP sensor is not replaceable apart from the throttle body.



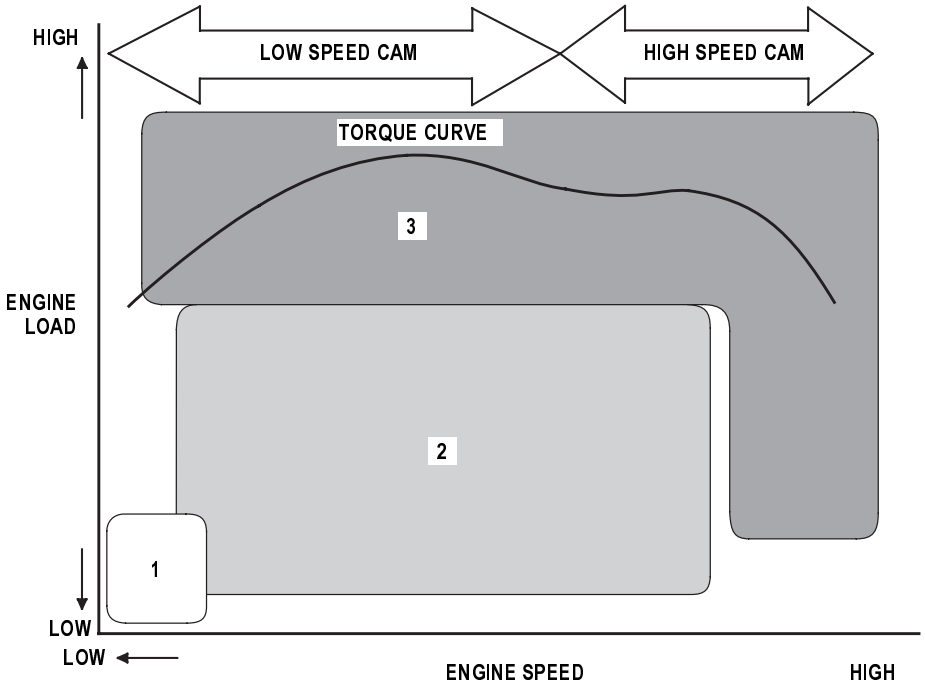
Top Dead Center (TDC) Sensor
The TDC sensor detects the position of the No. 1 cylinder as a reference for sequential fuel injection to each cylinder.



Vehicle Speed Sensor (VSS)
The VSS is driven by the differential. It generates a pulsed signal from an input of 5 volts. The number of pulses per minute increases/decreases with the speed of the vehicle.

VTEC/VTC

- The i-VTEC has a VTC (Variable Valve Timing Control) mechanism on the intake camshaft in addition to the usual VTEC. This mechanism improves fuel efficiency and reduces exhaust emissions at all levels of engine speed, vehicle speed, and engine load.
- The VTEC mechanism changes the valve lift and timing by using more than one cam profile.
- The VTC changes the phase of the intake camshaft via oil pressure. It changes the intake valve timing continuously.



Driving Condition	VTC Control	Description
1 light-load	Base Position	Cam angle is retarded to reduce the entry of exhaust gas into the intake port and to achieve stable fuel consumption during lean burn.
2 medium/high-load	Advance Control	Cam angle is advanced for EGR effect and to reduce this pumping loss. The intake valve is closed quickly to help reduce the entry of air/fuel mixture into the intake port and improve the charging effect.
3 high speed	Advance-Base Position	Cam phase angle is controlled for optimum valve timing and maximum engine power.

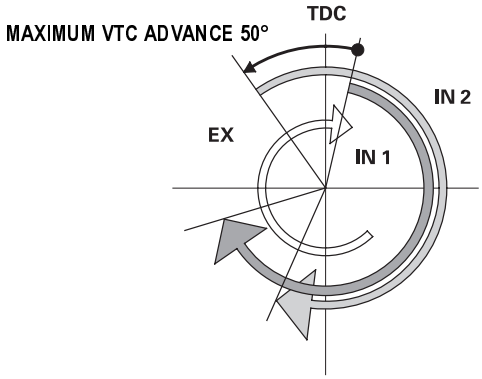
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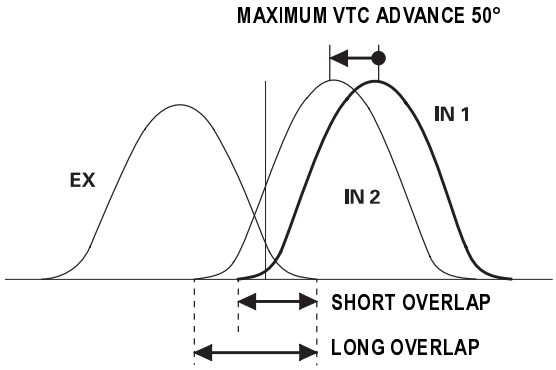
System Descriptions (cont'd)

VTEC/VTC

VTC system

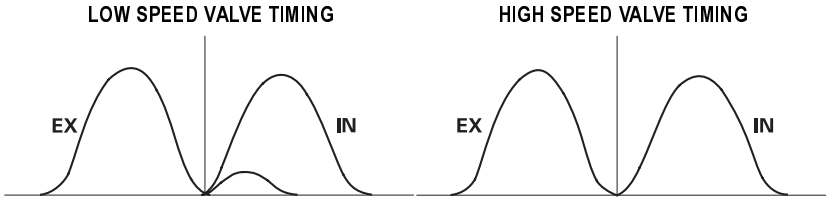
- The VTC system makes continuous intake valve timing changes based on operating conditions.
- Intake valve timing to allow the engine to produce maximum power.
- Cam angle is advanced to obtain the EGR effect and reduce the pumping loss. The intake valve is closed quickly to reduce the entry of the air/fuel mixture into the intake port and improve the charging effect.
- Reduces the cam advance at idle, stabilizes combustion, and reduces engine speed.
- If a malfunction occurs, the VTC system control is disabled and the valve timing is fixed at the fully retarded position.



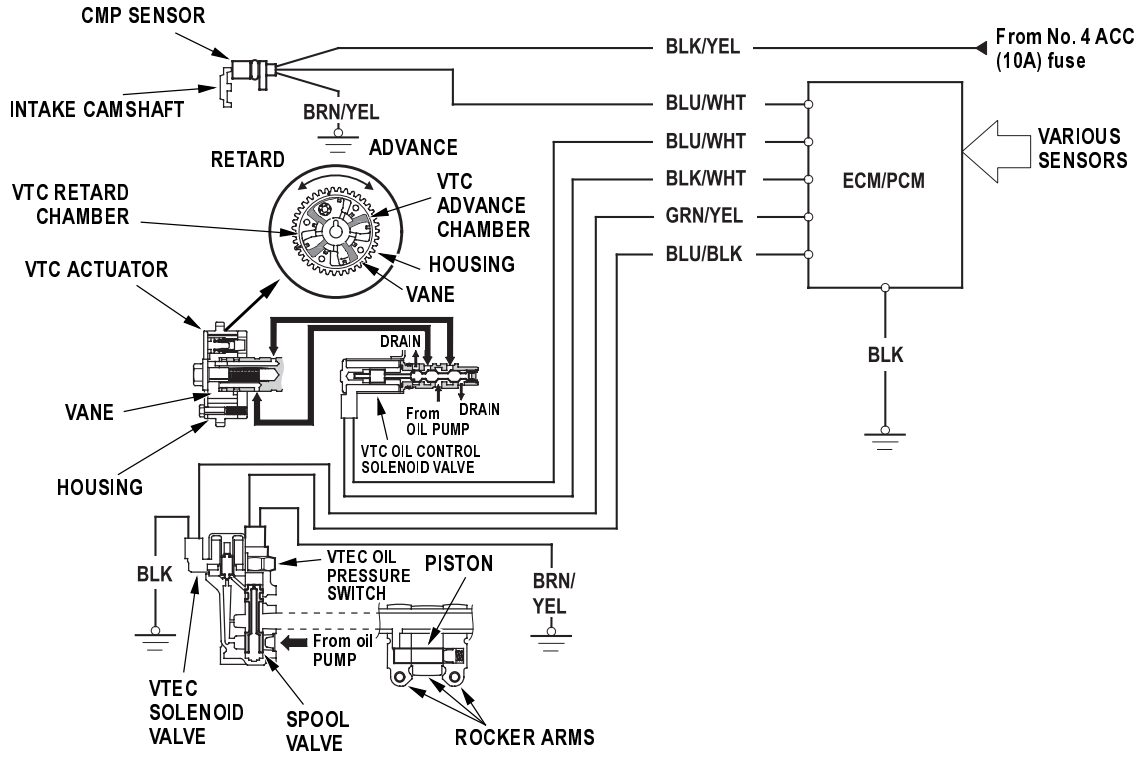


VTEC system

- The VTEC system changes the cam profile to correspond to the engine speed. It maximizes torque at low engine speed and output at high engine speed.
- The low lift cam is used at low engine speeds, and the high lift cam is used at high engine speeds.

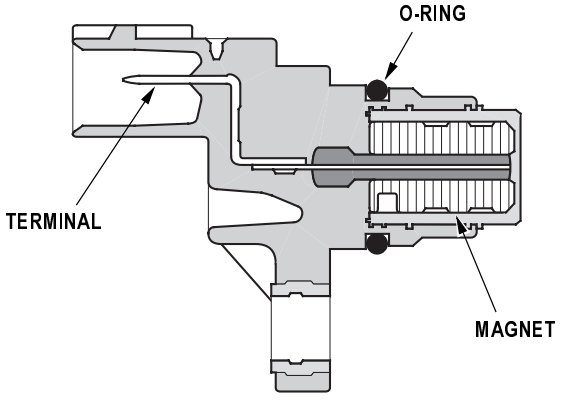


System Diagram



Camshaft Position (CMP) Sensor

The CMP sensor detects camshaft angle position for the VTC system.



(cont'd)

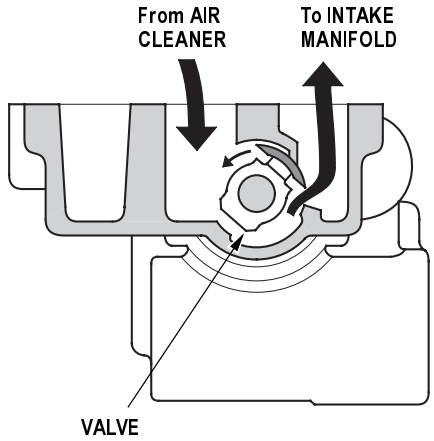
System Descriptions (cont'd)

Idle Control System

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is pressed, the power steering load is high, or the alternator is charging, the ECM/PCM controls current to the Idle Air Control (IAC) valve to maintain the correct idle speed. Refer to the System Diagram to see the functional layout of the system.

Brake Pedal Position Switch
The brake pedal position switch signals the ECM/PCM when the brake pedal is pressed.

Idle Air Control (IAC) Valve
To maintain the proper idle speed, the IAC valve changes the amount of air bypassing the throttle body in response to an electrical signal from the ECM/PCM.



Power Steering Pressure (PSP) Switch
The PSP switch signals the ECM/PCM when the power steering load is high.

Fuel Supply System

Fuel Cut-off Control
During deceleration with the throttle valve closed, current to the injectors is cut off to improve fuel economy at speeds over 850 rpm (min^{-1}) (KY, KH, PH, KP, IN models: 900 rpm (min^{-1})). Fuel cut-off action also occurs when engine speed exceeds 6,900 rpm (min^{-1}) (K24A1 engine: 6,700 rpm (min^{-1})), regardless of the position of the throttle valve, to protect the engine from over-revving. When the vehicle is stopped, the ECM/PCM cuts the fuel at engine speeds over 6,500 rpm (min^{-1}) (A/T: 5,000 rpm (min^{-1})).

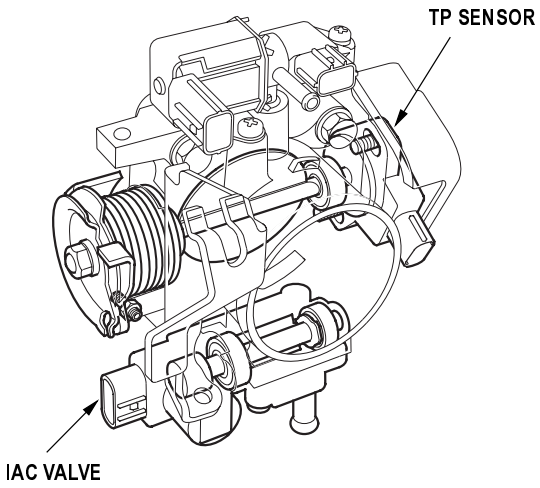
Fuel Pump Control
When the ignition is turned on, the ECM/PCM grounds the PGM-FI main relay which feeds current to the fuel pump for 2 seconds to pressurize the fuel system. With the engine running, the ECM/PCM grounds the PGM-FI main relay and feeds current to the fuel pump. When the engine is not running and the ignition is on, the ECM/PCM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.

PGM-FI Main Relay 1 and 2
The PGM-FI relay consists of two separate relays. PGM-FI main relay 1 is energized whenever the ignition switch is ON (II) which supplies battery voltage to the ECM/PCM, power to the injectors, and power for the PGM-FI main relay 2. PGM-FI main relay 2 is energized to supply power to the fuel pump for 2 seconds when the ignition switch is turned ON (II), and when the engine is running.

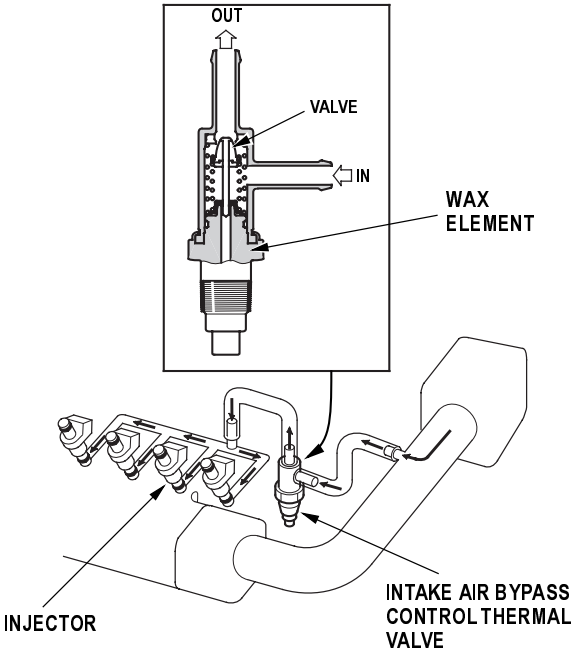
Intake Air System

Refer to the System Diagram to see the functional layout of the system.

Throttle Body
The throttle body is a single-barrel side draft type. The lower portion of the IAC valve is heated by engine coolant from the cylinder head.



Intake Air Bypass Control Thermal Valve
When the engine is running, the intake air bypass control thermal valve sends air to the injector.



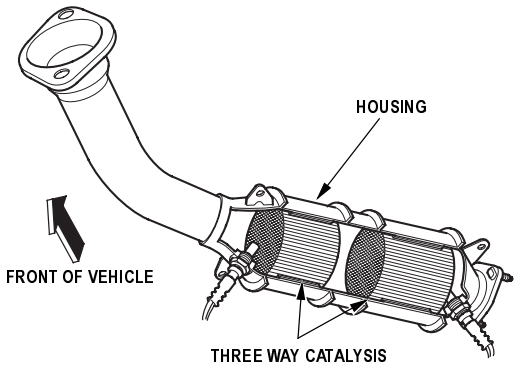
(cont'd)

System Descriptions (cont'd)

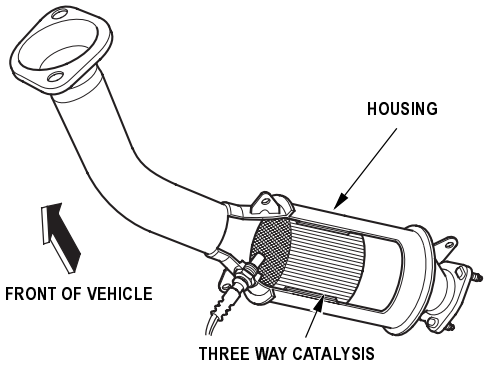
Catalytic Converter System

Three Way Catalytic Converter (TWC)
The TWC converts hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas to carbon dioxide (CO2), dinitrogen (N2), and water vapor.

KG, KS, KE, KR, KU, KZ, FO, KQ, models:

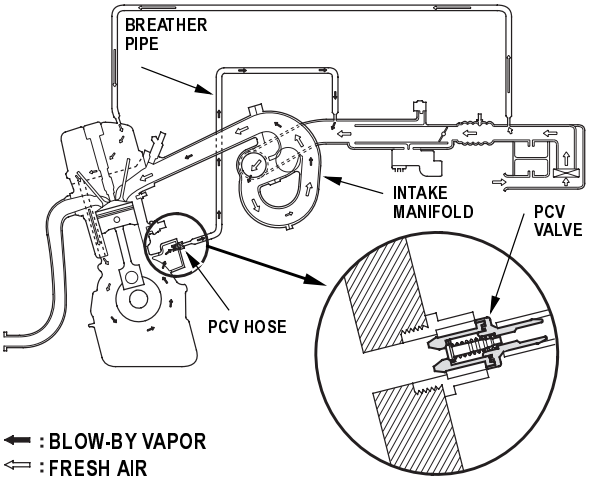


KN, KM, KY, MA, PH, IN, KK models:



Positive Crankcase Ventilation (PCV) System

The PCV valve prevents blow-by gasses from escaping into the atmosphere by venting them into the intake manifold.



Evaporative Emission (EVAP) Control System

Refer to the System Diagram to see the functional layout of the system.

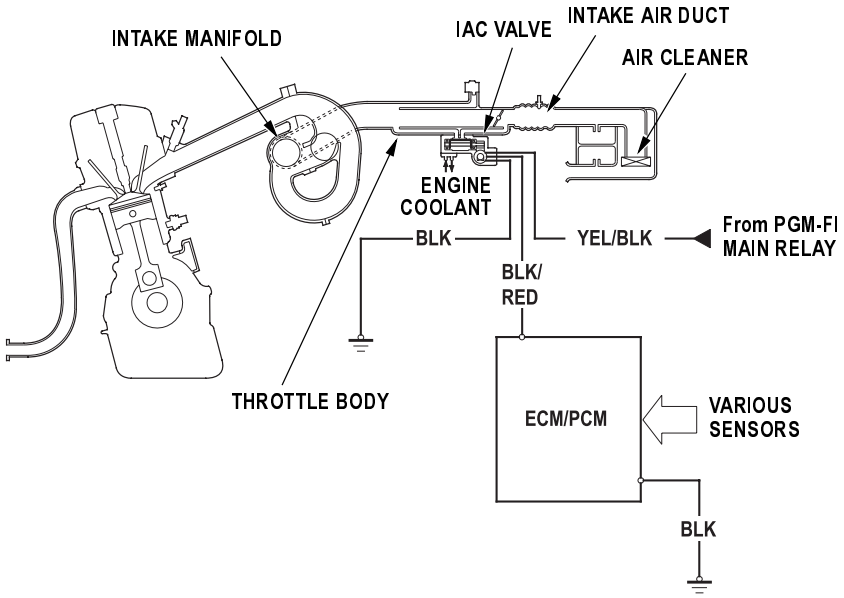
EVAP Canister
The EVAP canister temporarily stores fuel vapor from the fuel tank until it can be purged back into the engine and burned (refer to the System Diagram to see the functional layout of the system).

EVAP Canister Purge Valve
When the engine coolant temperature is below 65°C (149°F), the ECM/PCM turns off the EVAP canister purge valve which cuts vacuum to the EVAP canister.

Idle Control System Diagram

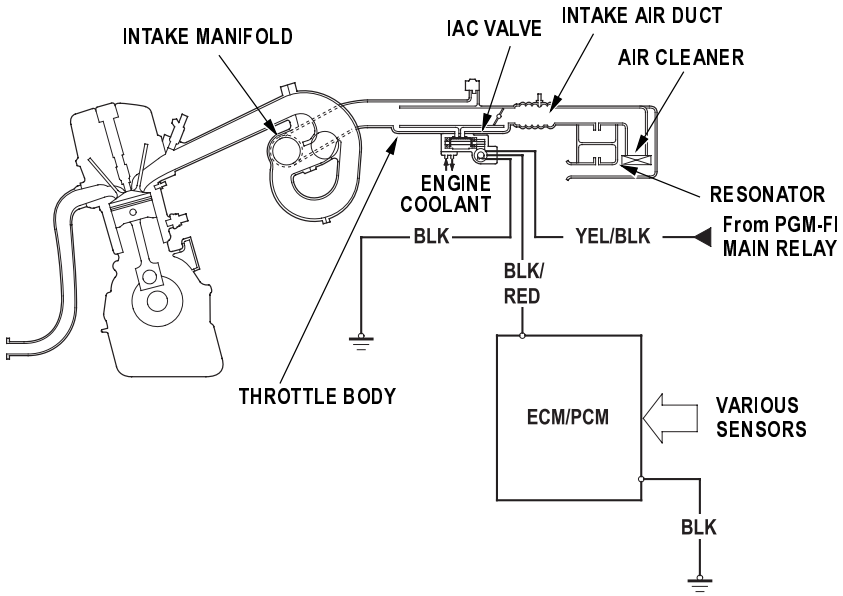
The idle speed of the engine is controlled by the Idle Air Control (IAC) valve:

- After the engine starts, the IAC valve opens for a certain amount of time. The amount of air is increased to raise the idle speed.
- When the engine coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to engine coolant temperature.



Intake Air System Diagram

This system supplies air for engine needs. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.

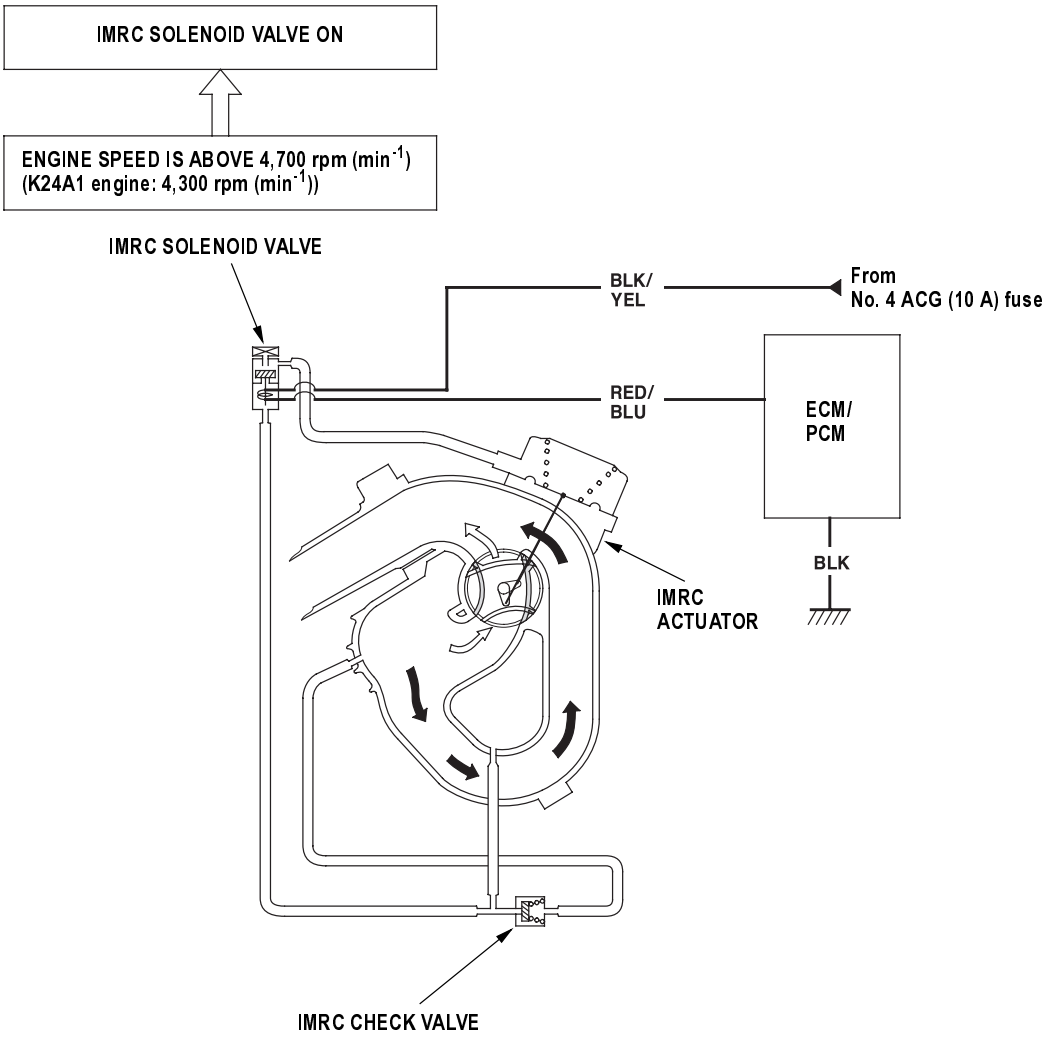


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System Descriptions (cont'd)

Intake Manifold Runner Control (IMRC) System

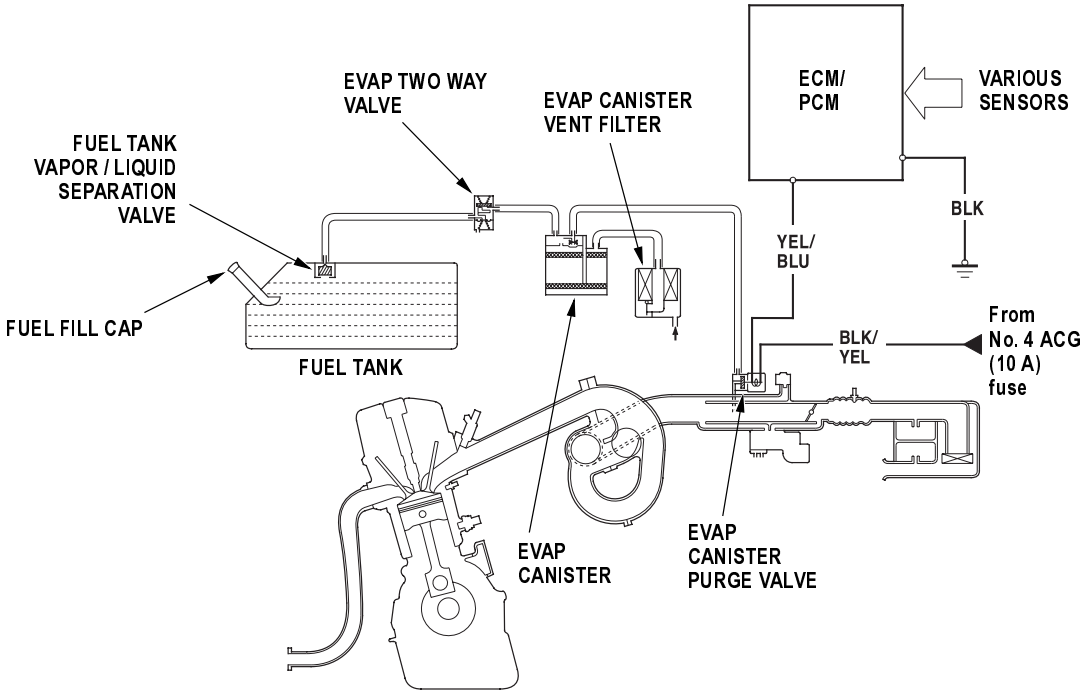
Satisfactory power performance is achieved by closing and opening the Intake Manifold Runner Control (IMRC) valve. High torque at low engine speed is achieved when the valve is closed, whereas high power at high engine is achieved when the valve is opened.



Evaporative Emission (EVAP) Control Diagram

The EVAP controls minimize the amount of fuel vapor escaping to the atmosphere. Vapor from the fuel tank is temporarily stored in the EVAP canister until it can be purged from the EVAP canister into the engine and burned.

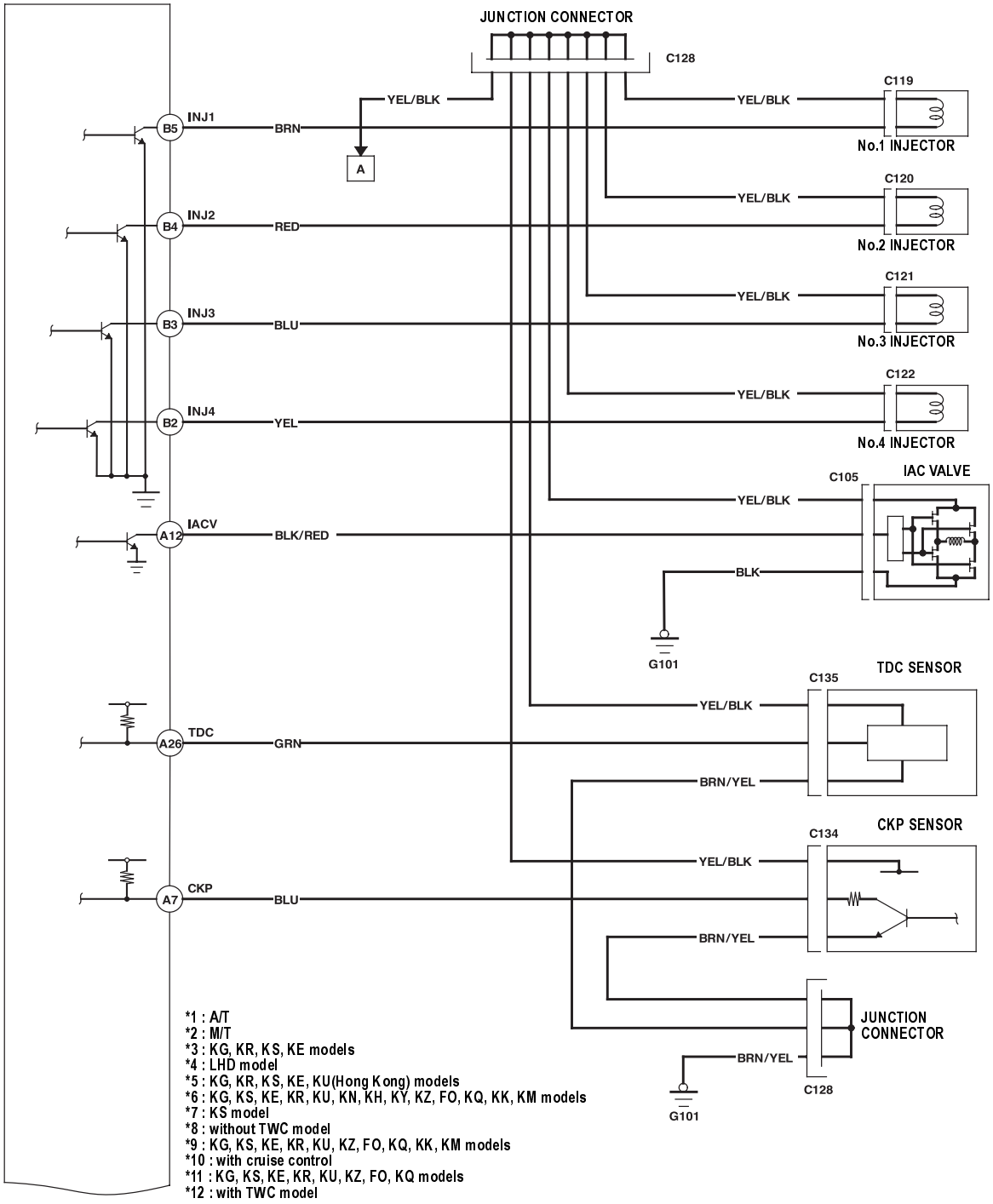
- The EVAP canister is purged by drawing fresh air through it and into a port on the intake manifold.
- The purging vacuum is controlled by the EVAP canister purge valve, which is open whenever engine coolant temperature is above 65°C (149°F).
- When vapor pressure in the fuel tank is higher than the set value of the EVAP two way valve, the valve opens and regulates the flow of fuel vapor to the EVAP canister.

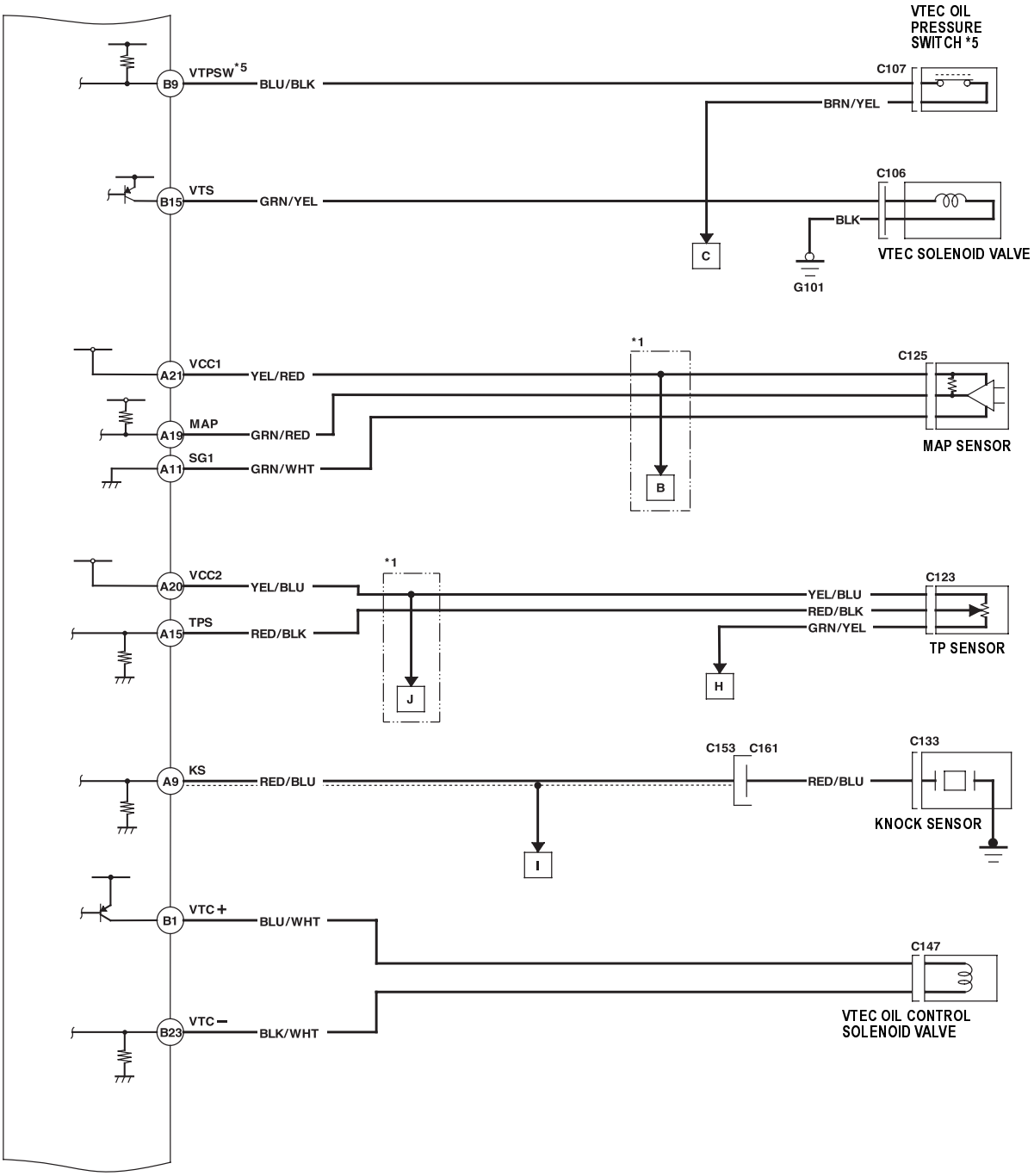


(cont'd)

System Descriptions (cont'd)

ECM/PCM Circuit Diagram

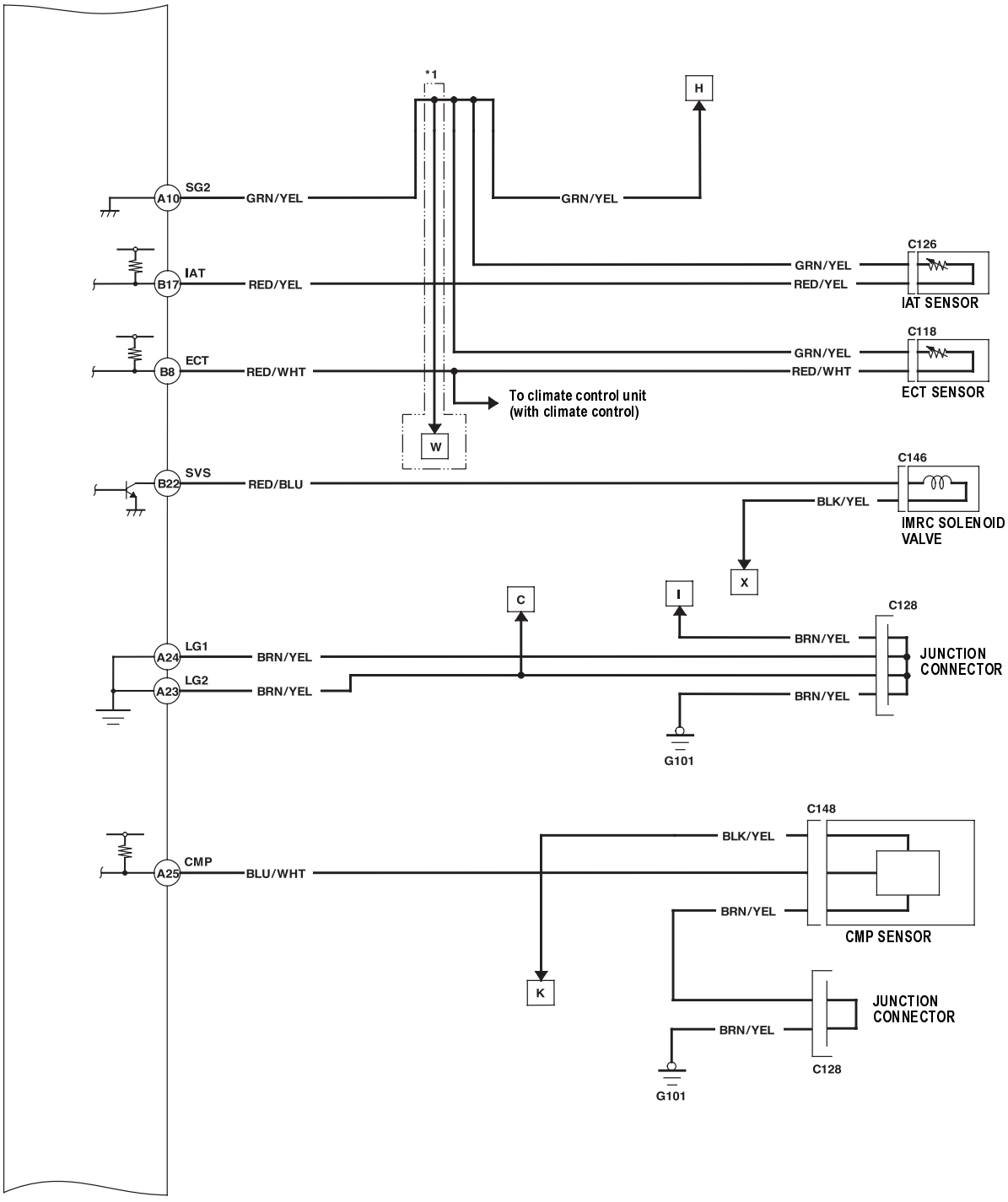


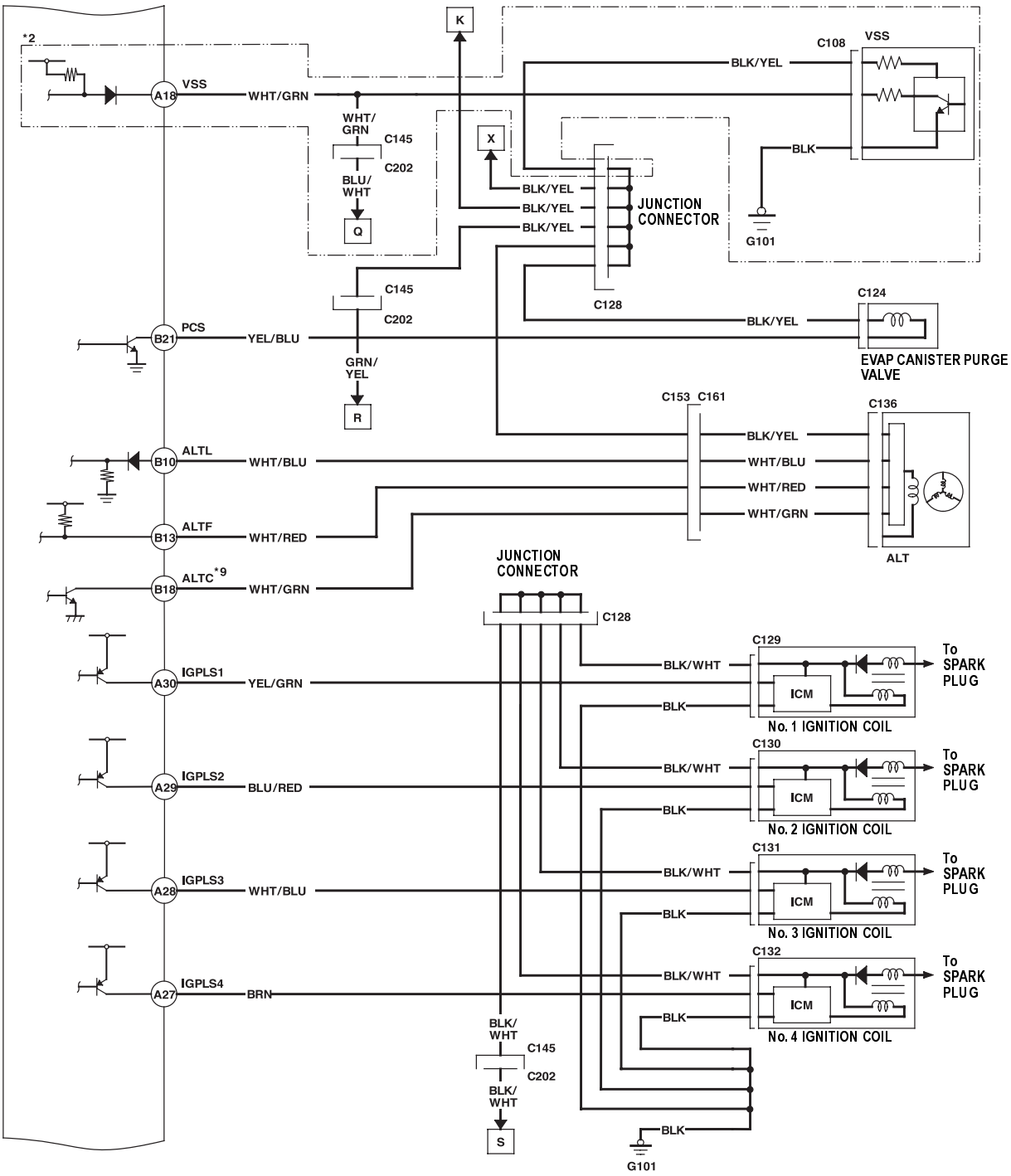

VTEC OIL PRESSURE SWITCH *5
C107
VTPSW*5
B9
BLU/BLK
BRN/YEL
C106
VTS
B15
GRN/YEL
BLK
C
G101
VTEC SOLENOID VALVE
*1
C125
VCC1
A21
YEL/RED
MAP
A19
GRN/RED
SG1
A11
GRN/WHT
B
MAP SENSOR
VCC2
A20
YEL/BLU
TPS
A15
RED/BLK
*1
C123
YEL/BLU
RED/BLK
GRN/YEL
J
H
TP SENSOR
C153
C161
C133
KS
A9
RED/BLU
RED/BLU
I
KNOCK SENSOR
VTC+
B1
BLU/WHT
C147
VTC−
B23
BLK/WHT
VTEC OIL CONTROL SOLENOID VALVE

(cont'd)

System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

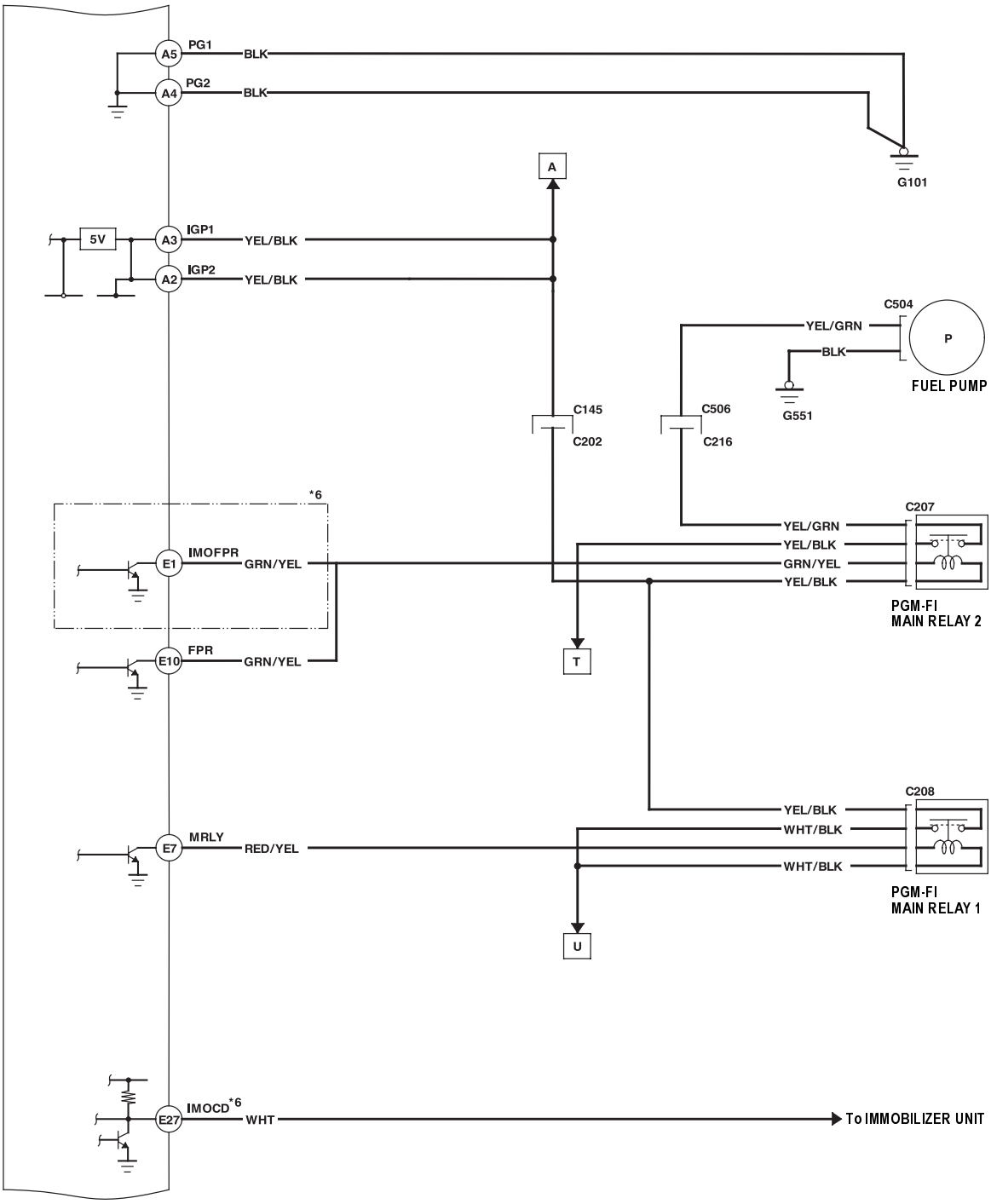


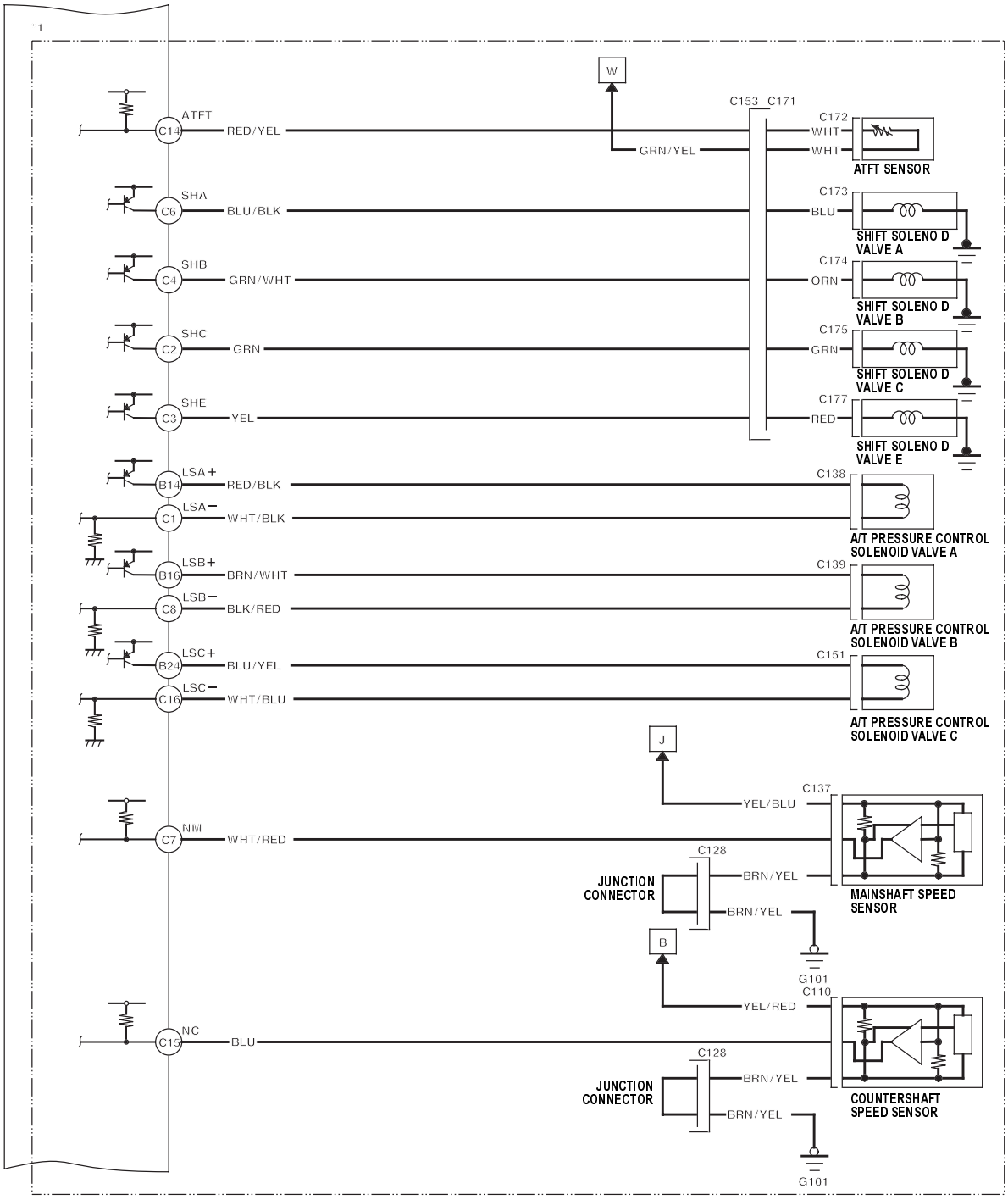

*2
A18
VSS
WHT/GRN
WHT/
GRN
C145
C202
BLU/
WHT
Q
K
X
C108
VSS
BLK/YEL
BLK
BLK/YEL
BLK/YEL
BLK/YEL
JUNCTION
CONNECTOR
C128
G101
C145
C202
GRN/
YEL
R
B21
PCS
YEL/BLU
C124
BLK/YEL
EVAP CANISTER PURGE
VALVE
C153_C161
C136
B10
ALTL
WHT/BLU
BLK/YEL
WHT/BLU
WHT/RED
WHT/GRN
B13
ALTF
WHT/RED
ALT
B18
ALTC*9
WHT/GRN
JUNCTION
CONNECTOR
C128
C129
A30
IGPLS1
YEL/GRN
BLK/WHT
BLK
ICM
No. 1 IGNITION COIL
To
SPARK
PLUG
C130
A29
IGPLS2
BLU/RED
BLK/WHT
BLK
ICM
No. 2 IGNITION COIL
To
SPARK
PLUG
C131
A28
IGPLS3
WHT/BLU
BLK/WHT
BLK
ICM
No. 3 IGNITION COIL
To
SPARK
PLUG
C132
A27
IGPLS4
BRN
BLK/WHT
BLK
ICM
No. 4 IGNITION COIL
To
SPARK
PLUG
BLK/
WHT
C145
C202
BLK/
WHT
S
BLK
G101

(cont'd)

System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

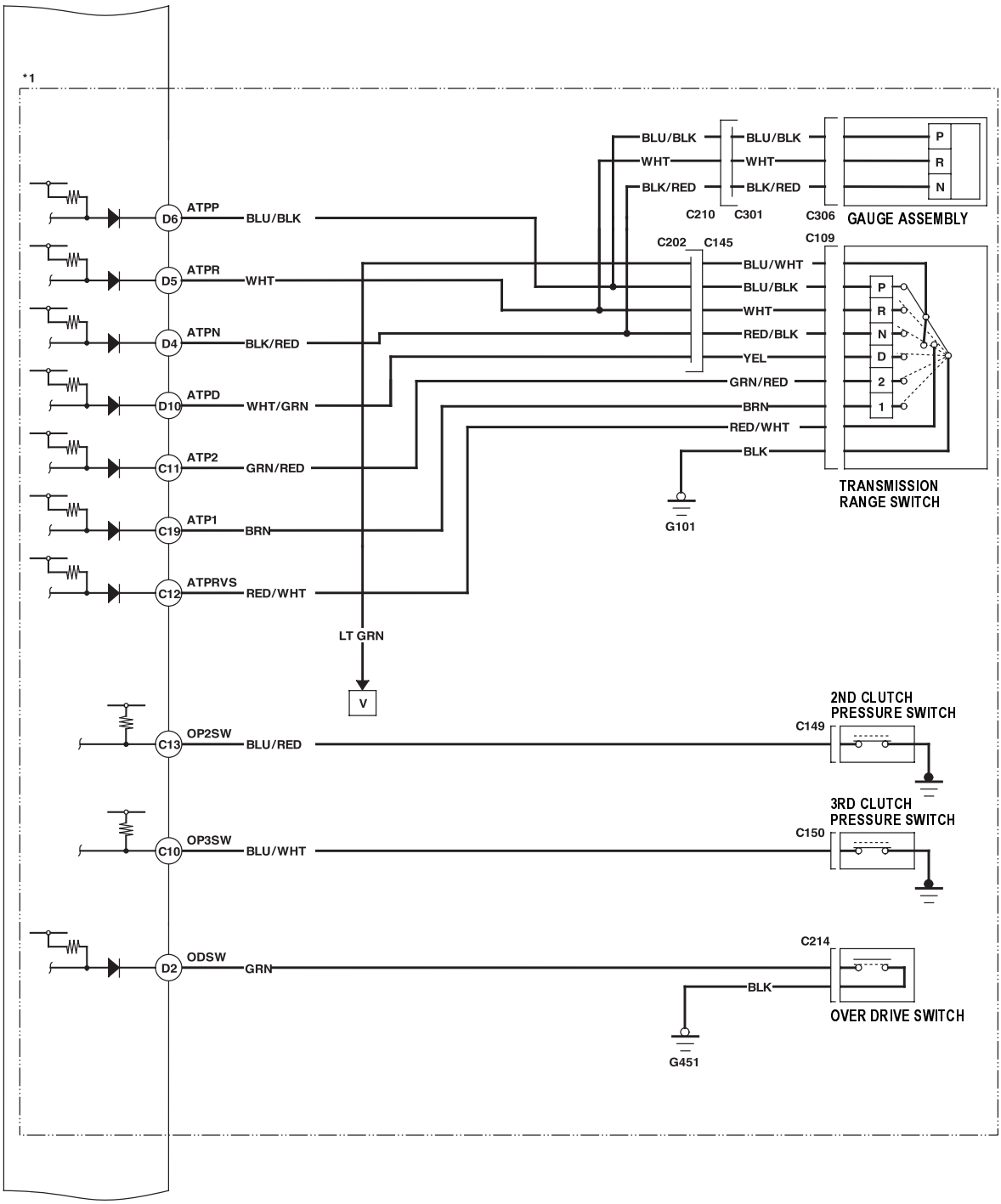


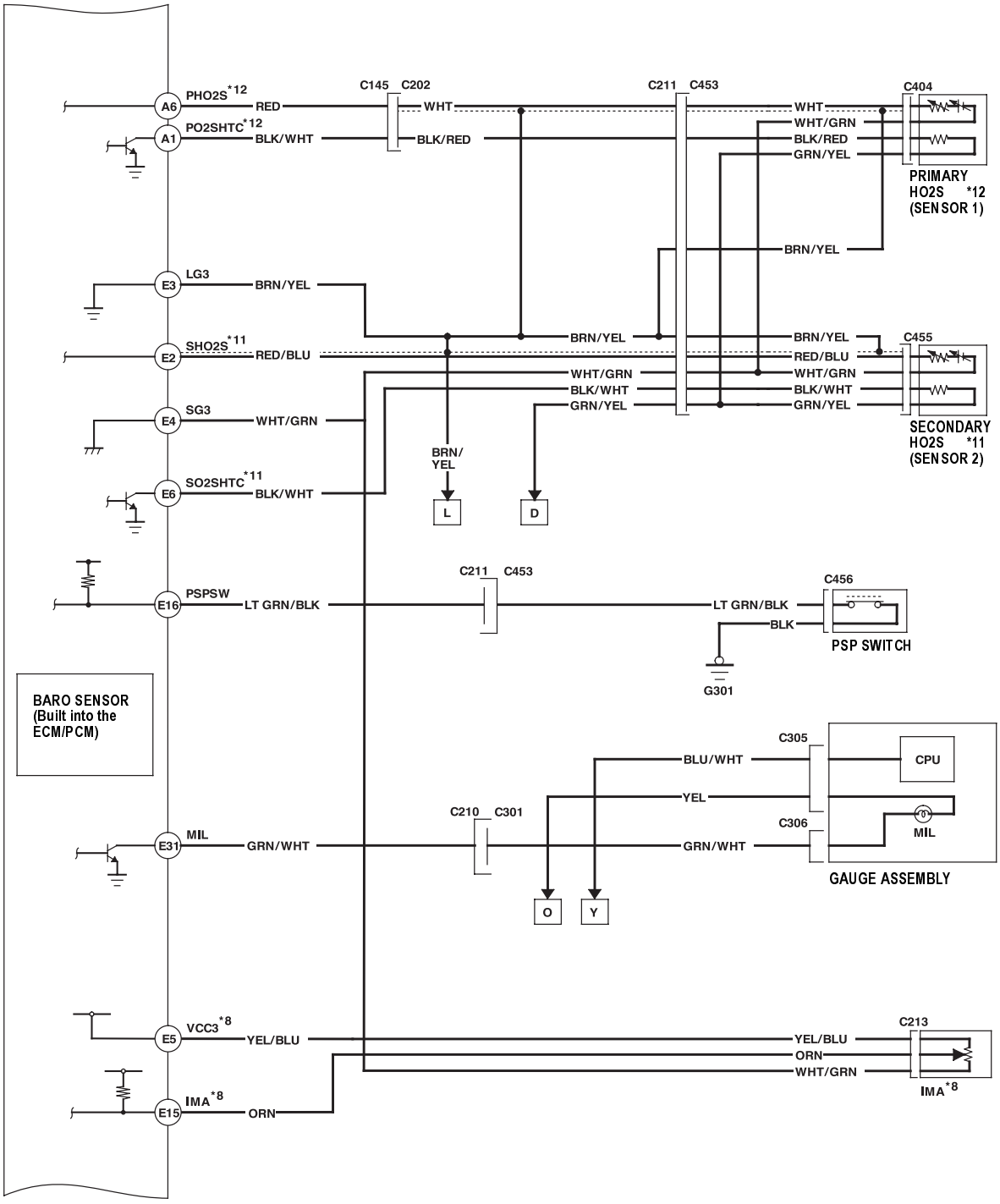

W
C153 C171
ATFT
C14
RED/YEL
GRN/YEL
C172
WHT
WHT
ATFT SENSOR
SHA
C6
BLU/BLK
C173
BLU
SHIFT SOLENOID VALVE A
SHB
C4
GRN/WHT
C174
ORN
SHIFT SOLENOID VALVE B
SHC
C2
GRN
C175
GRN
SHIFT SOLENOID VALVE C
SHE
C3
YEL
C177
RED
SHIFT SOLENOID VALVE E
LSA+
B14
RED/BLK
C138
LSA−
C1
WHT/BLK
A/T PRESSURE CONTROL SOLENOID VALVE A
LSB+
B16
BRN/WHT
C139
LSB−
C8
BLK/RED
A/T PRESSURE CONTROL SOLENOID VALVE B
LSC+
B24
BLU/YEL
C151
LSC−
C16
WHT/BLU
A/T PRESSURE CONTROL SOLENOID VALVE C
J
YEL/BLU
C137
NM
C7
WHT/RED
C128
JUNCTION CONNECTOR
BRN/YEL
BRN/YEL
MAINSHAFT SPEED SENSOR
B
G101
YEL/RED
C110
NC
C15
BLU
C128
JUNCTION CONNECTOR
BRN/YEL
BRN/YEL
COUNTERSHAFT SPEED SENSOR
G101

(cont'd)

System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

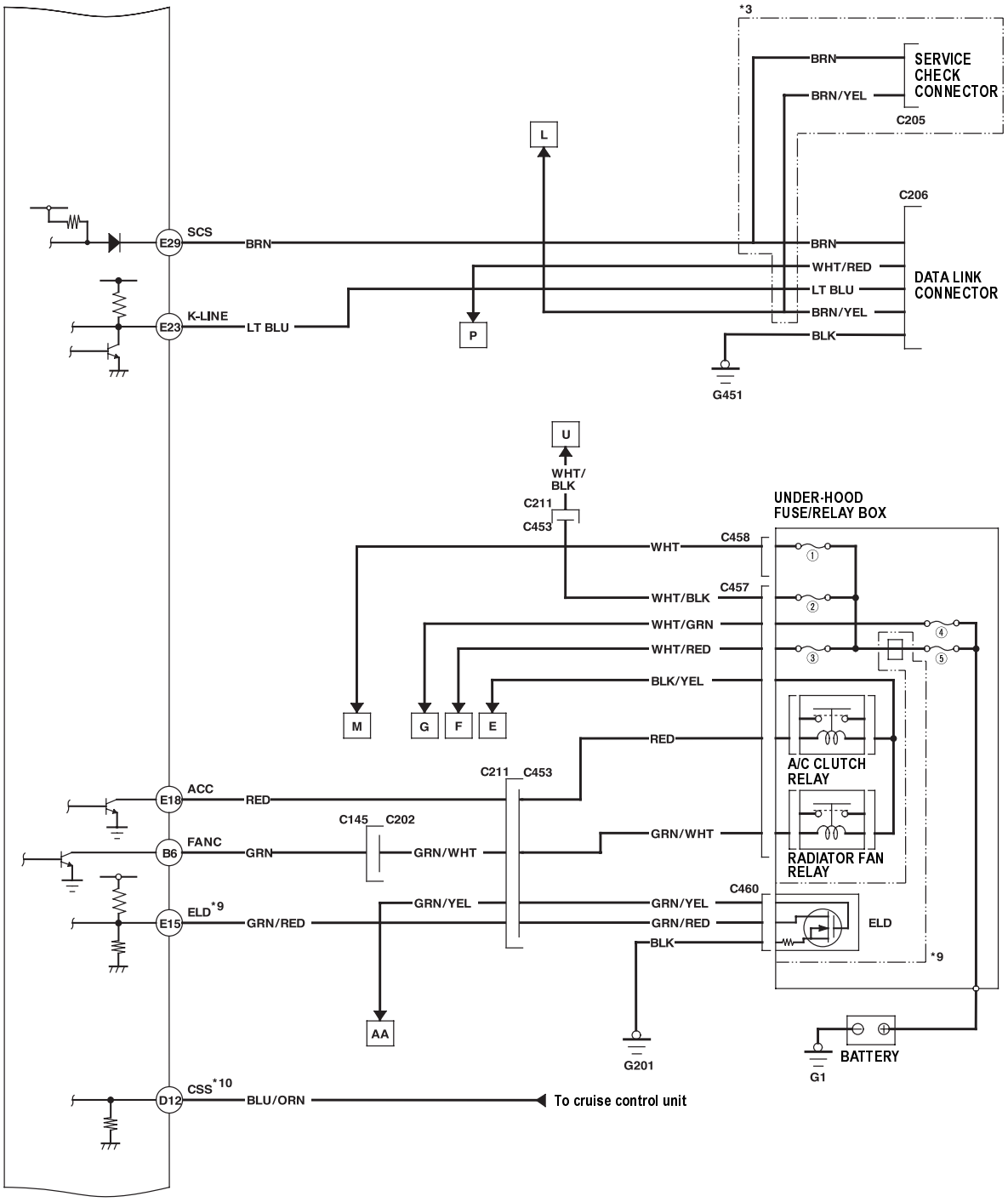


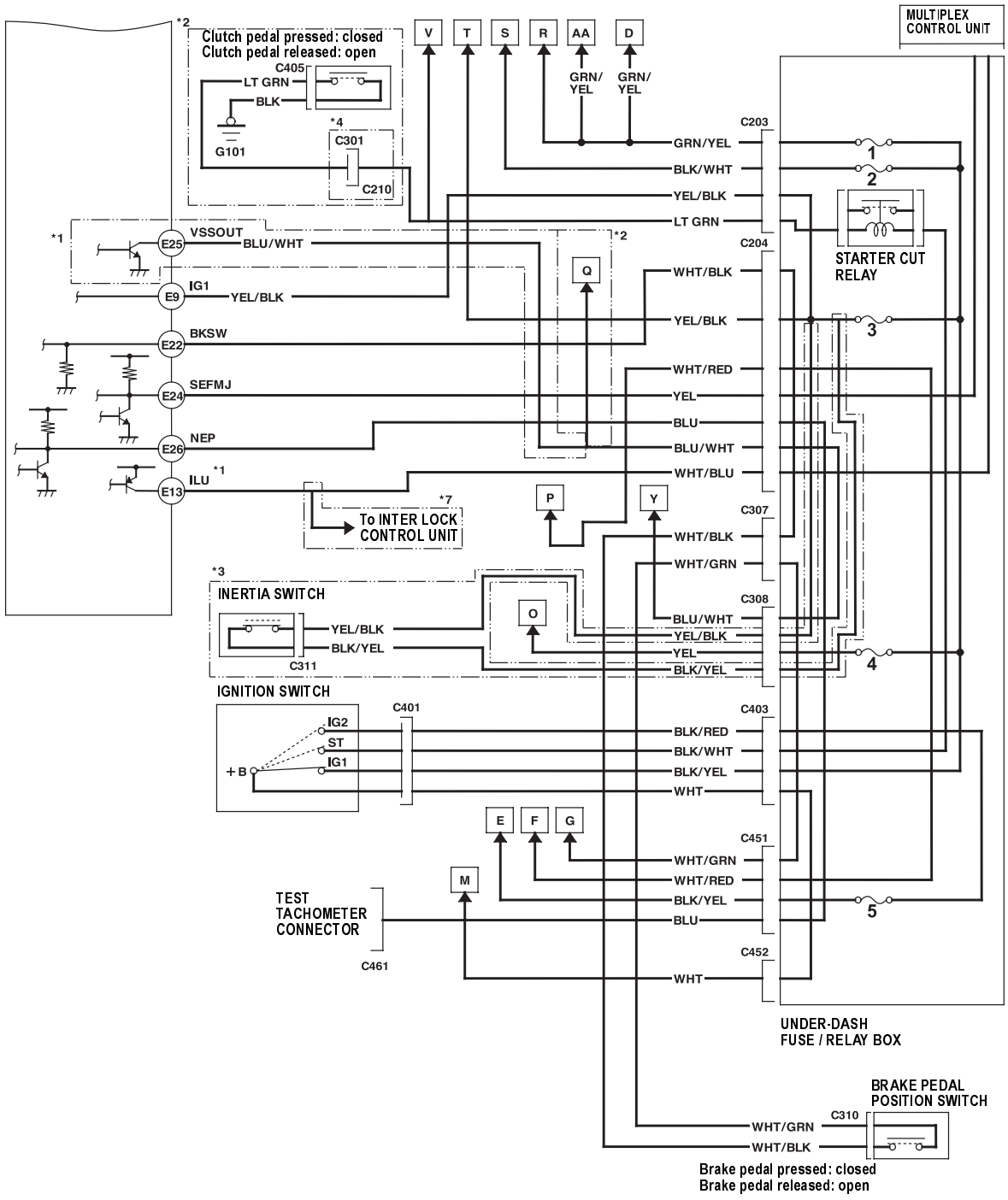

A6
PHO2S *12
RED
A1
PO2SHTC *12
BLK/WHT
C145 C202
WHT
BLK/RED
C211 C453
WHT
WHT/GRN
BLK/RED
GRN/YEL
C404
PRIMARY HO2S *12 (SENSOR 1)
BRN/YEL
E3
LG3
BRN/YEL
E2
SHO2S *11
RED/BLU
BRN/YEL
WHT/GRN
BLK/WHT
GRN/YEL
BRN/YEL
RED/BLU
WHT/GRN
BLK/WHT
GRN/YEL
C455
SECONDARY HO2S *11 (SENSOR 2)
E4
SG3
WHT/GRN
BRN/ YEL
L
D
E6
SO2SHTC *11
BLK/WHT
C211 C453
E16
PSPSW
LT GRN/BLK
LT GRN/BLK
BLK
C456
PSP SWITCH
G301
BARO SENSOR (Built into the ECM/PCM)
C305
BLU/WHT
CPU
YEL
C210 C301
C306
MIL
E31
MIL
GRN/WHT
GRN/WHT
GAUGE ASSEMBLY
O
Y
E5
VCC3 *8
YEL/BLU
YEL/BLU
ORN
WHT/GRN
C213
IMA *8
E15
IMA *8
ORN

(cont'd)

System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)





UNDER-HOOD FUSE/RELAY BOX:

1 No. 20 IG (50A)
2 No. 6 ECU (ECM/PCM) (15A)
3 No. 9 BACK UP (10A)
4 No. 7 HORN, STOP (15A)
5 No. 19 BATTERY (100A)

UNDER-DASH FUSE/RELAY BOX:

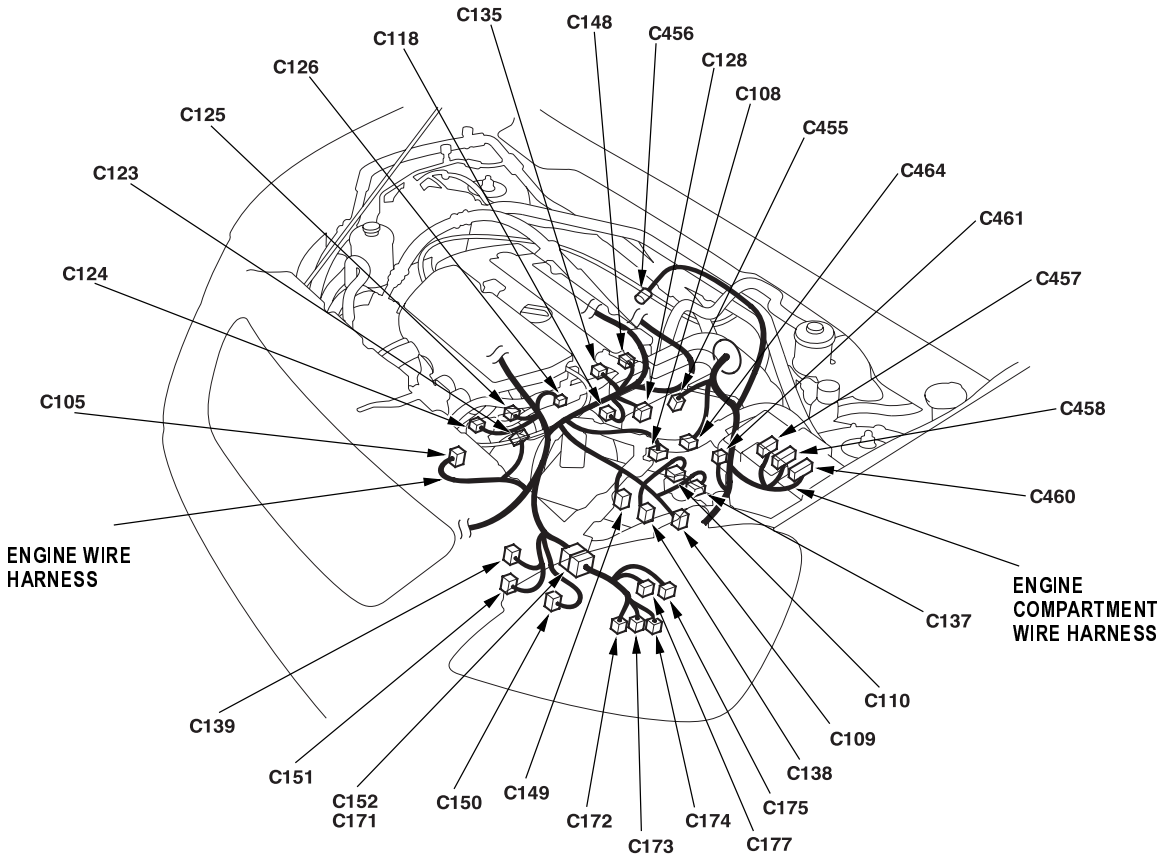
1 No. 4 ACG (10A)
2 No. 1 IGN COIL (15A)
3 No. 17 FUEL PUMP (15A)
4 No. 10 METER (7.5A)
5 No. 14 A/C CLUTCH RELAY (10A)

(cont'd)

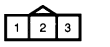
System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

LHD model:



C105



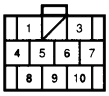
①	BLK
②	YEL/BLK
③	BLK/RED

C108 (M/T)



①	BLK
②	BLK/YEL
③	WHT/GRN

C109 (A/T)



①	BLU/WHT	⑥	RED/WHT
2	——	⑦	YEL
③	BLK	⑧	RED/BLK
④	BRN	⑨	WHT
⑤	GRN/RED	⑩	BLU/BLK

C110 (A/T)



①	YEL/RED
②	BLU
③	BRN/YEL

C118



①	RED/WHT
②	GRN/YEL

C123



①	YEL/BLU
②	RED/BLK
③	GRN/YEL

C124



①	BLK/YEL
②	YEL/BLU

C125



①	YEL/RED
②	GRN/RED
③	GRN/WHT

C126



①	GRN/YEL
②	RED/YEL

C128



①	BRN/YEL	⑨	BLK/YEL	⑰	BLK/WHT
②	BRN/YEL	⑩	BLK/YEL	⑱	YEL/BLK
③	BRN/YEL	⑪	BLK/YEL	⑲	YEL/BLK
④	BRN/YEL	⑫	BLK/YEL	⑳	YEL/BLK
⑤	BRN/YEL	⑬	BLK/WHT	㉑	YEL/BLK
⑥	BRN/YEL	⑭	BLK/WHT	㉒	YEL/BLK
⑦	BRN/YEL*	⑮	BLK/WHT	㉓	YEL/BLK
⑧	BLK/YEL	⑯	BLK/WHT	㉔	YEL/BLK
	BLK/YEL				

* : A/T

C135



①	GRN
②	BRN/YEL
③	YEL/BLK

C137 (A/T)



①	YEL/BLU
②	WHT/RED
③	BRN/YEL

C138 (A/T)



①	RED/BLK
②	WHT/BLK

C139 (A/T)



①	BRN/WHT
②	BLK/RED

C148



①	BLU/WHT
②	BRN/YEL
③	BLK/YEL

C149 (A/T)



①	BLU/RED

C150 (A/T)



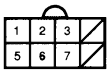
①	BLU/WHT

C151 (A/T)



①	BLU/YEL
②	WHT/BLU

C152 (A/T)



①	GRN	⑤	BLU/BLK
②	GRN/WHT	⑥	RED/YEL
③	YEL	⑦	GRN/YEL
4	——	8	——

C172 (A/T)



①	WHT
②	WHT

C173 (A/T)



①	BLU

C174 (A/T)



①	ORN

C175 (A/T)

①	GRN

C177 (A/T)



①	RED

C455
(KG, KS, KR, FO models)



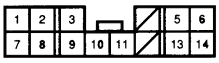
①	WHT/GRN
②	RED/BLU
③	BLK/WHT
④	GRN/YEL

C456



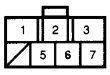
①	LT GRN/BLK
②	BLK

C457



1	ORN	⑧	BLK/YEL
2	BLU/RED	⑨	GRN/WHT
3	BLU/RED	⑩	RED
4	——	⑪	WHT/RED
5	WHT/BLU	12	——
⑥	WHT/BLK	13	BLK
⑦	WHT/GRN	14	WHT

C458



①	WHT
2	WHT/RED
3	BLU/WHT
4	——
5	BLK/YEL
6	WHT/BLK
7	YEL/BLK

C460
(KG, KS, KR, FO, KK, KM, models)



①	GRN/YEL
②	BLK
③	GRN/RED

C461



1	——
②	BLU

C464
(with TWC model)



①	WHT
②	WHT/GRN
③	GRN/YEL
④	BLK/RED

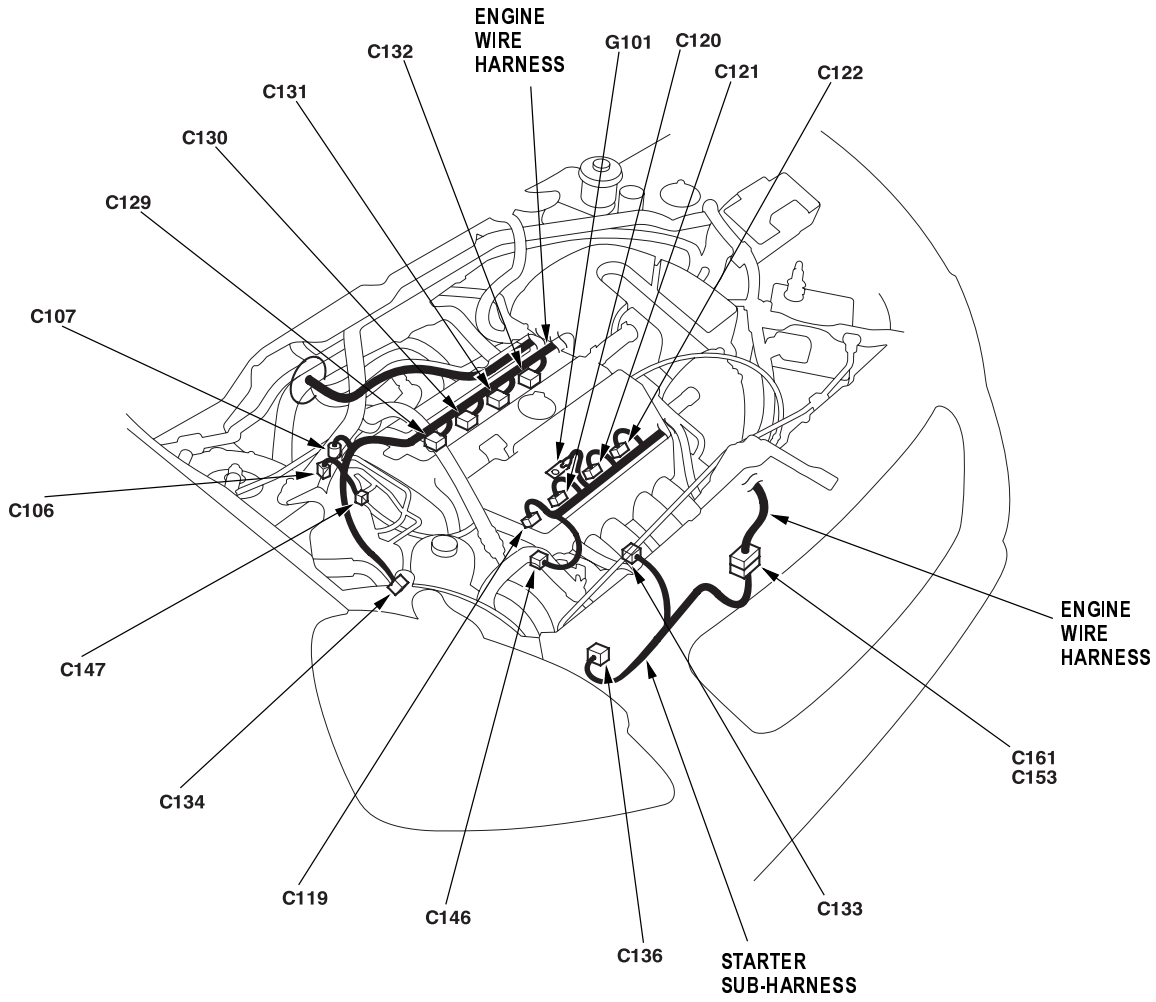
Note:
- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side
- O : Related to ECM/PCM control

(cont'd)

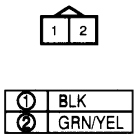
System Descriptions (cont’d)

ECM/PCM Circuit Diagram (cont'd)

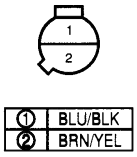
LHD model:



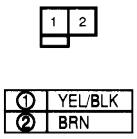
C106



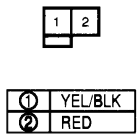
C107



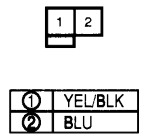
C119



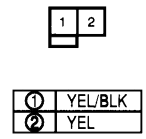
C120



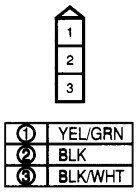
C121



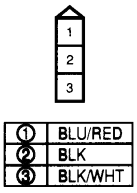
C122



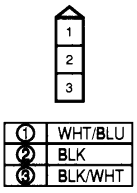
C129



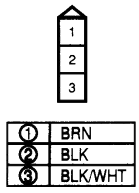
C130



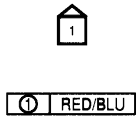
C131



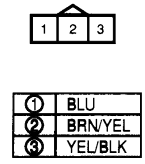
C132



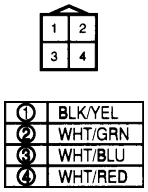
C133



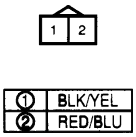
C134



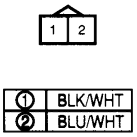
C136



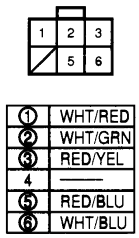
C146



C147



C153



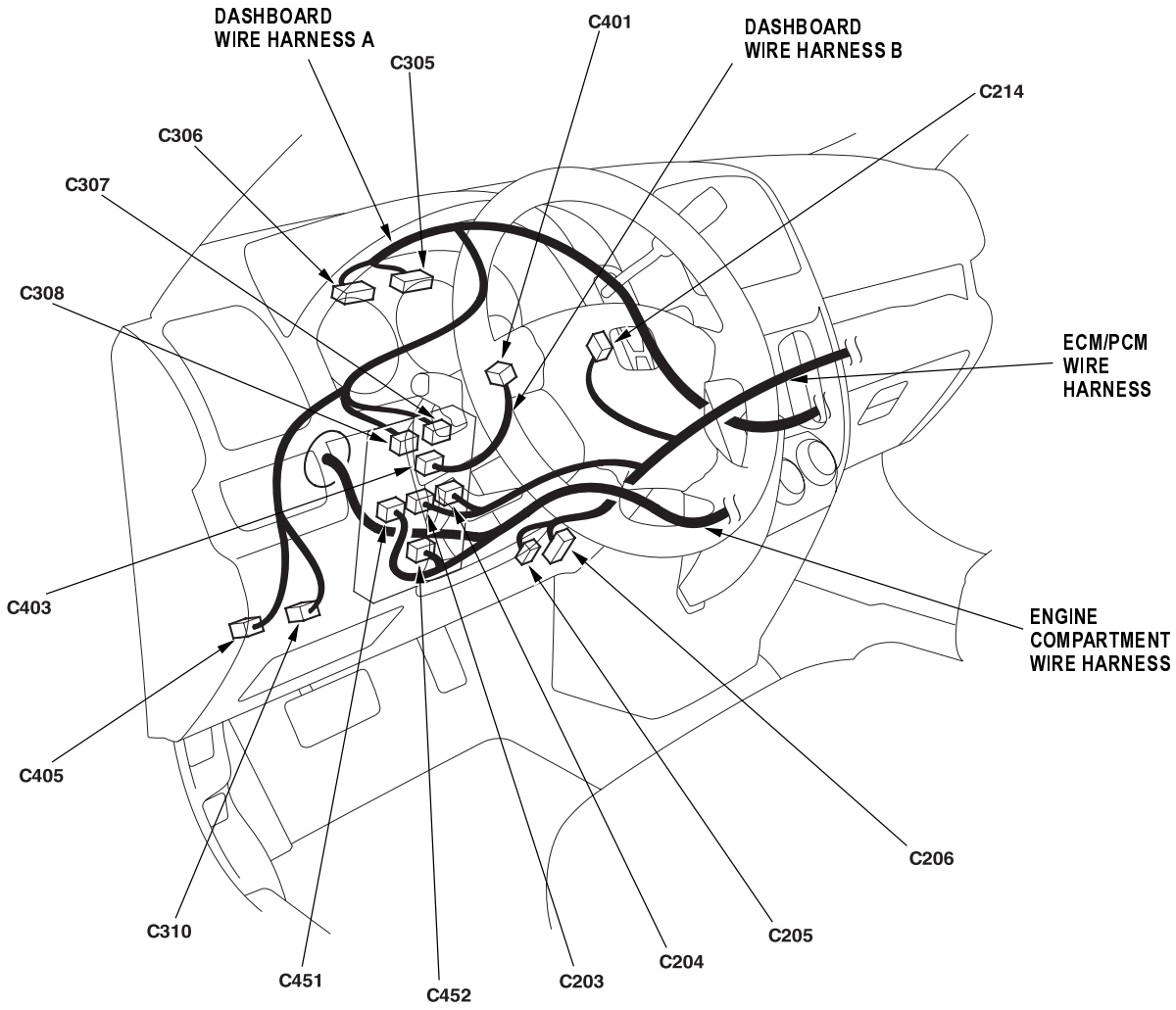
Note:
- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side
- O : Related to ECM/PCM control

(cont'd)

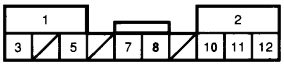
System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

LHD model:



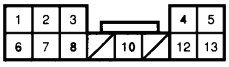
C203



1	BLK/WHT	⑦	LT GRN
2	GRN/WHT	8	GRN/BLK
③	GRN/YEL	9	——
4	——	10	BLU/BLK *1
⑤	BLK/WHT	11	YEL
6	——	⑫	YEL/BLK

*1: A/T

C204



1	GRY	8	WHT *2
2	YEL/RED *1	9	——
③	WHT/BLK	⑩	YEL
④	BLU/WHT	11	——
⑤	BLU	⑫	WHT/RED
⑥	YEL/BLK	⑬	WHT/BLU *1
7	BRN		

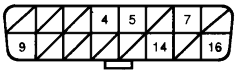
*1: A/T
*2: KG, KS, KR, KH, KY, FO, KK, KM models

C205
(KG, KR, KB, KS models)



①	BRN
②	BRN/YEL

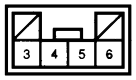
C206 *



1	——	⑨	BRN *1
2	——	10	——
3	——	11	——
④	BLK	12	——
⑤	BRN/YEL	13	——
6	——	14	GRY
⑦	LT BLU	15	——
8	——	⑯	WHT/RED

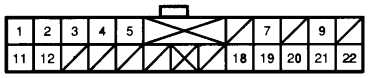
*1: execpt KG, KR, KS models

C214 (A/T)



1	——
2	——
3	YEL/BLK
4	YEL/RED
⑤	BLK
⑥	GRN

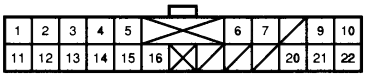
C305



1	GRY/RED	9	WHT*2	16	——
2	YEL/BLK	10	——	17	——
3	BLK	11	RED/WHT*2	⑱	YEL
④	BLU/WHT	11	BLU/YEL	19	WHT/RED
5	BLU	12	BLU/YEL	20	PNK/BLU
6	——	13	——	21	WHT/BLU *3
7	PNK *1	14	——	22	WHT/BLK *3
8	——	15	——		

*1: with outside air temperature sensor
*2: with rear fog fight
*3: KK, KM, KP models

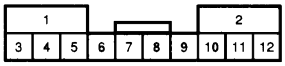
C306



1	RED/YEL	9	YEL/RED	17	——
②	BLU/BLK *1	10	WHT/RED	18	——
③	BLK/RED*1	11	GRN/RED	19	——
④	WHT *1	12	GRN/YEL	⑳	GRN/WHT
5	LT GRN/BLK*1	13	BLU/RED	21	BLK/YEL
6	RED	14	RED/BLU	22	BLU/ORN*2
7	RED/BLK	15	BLK		
8	——	16	PNK		

*1: A/T
*2: KG, KS, KR, KH, KY, FO, KK, KM models

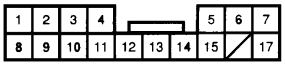
C307



1	RED/YEL*1	7	GRN/RED
2	GRN	8	RED/BLK
3	GRN/YEL*2	9	BLU/YEL *2
4	WHT/BLU	10	RED
⑤	WHT/BLK	11	BLU/WHT*2
6	YEL/GRN	⑫	WHT/GRN

*1: with headlight washer
*2: with cruise control

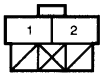
C308



1	BLU	10	GRY/RED
2	BLU/ORN	11	RED/BLK *2
3	WHT/RED	⑫	YEL/BLK *3
4	WHT/RED	13	WHT/RED
5	BLU/YEL *1	⑭	BLK/YEL *3
6	YEL	15	RED/WHT*4
⑦	YEL	16	——
⑧	BLU/WHT	17	RED*5
9	BLU/WHT		

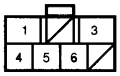
*1: with cruise control
*2: KG with NAVI
*3: KG, KR, KS models
*4: with rear fog light
*5: with seat heater

C310



①	WHT/GRN
②	WHT/BLK
3	——
4	——

C401



①	BLK/WHT
2	——
③	WHT
④	BLK/RED
5	WHT/RED
⑥	BLK/YEL
7	——

C403



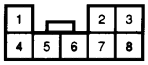
①	WHT
2	WHT/RED
③	BLK/WHT
④	BLK/RED
⑤	BLK/YEL

C405 (M/T)



①	LT GRN
②	BLK

C451



①	BLK/YEL
②	WHT/RED
③	WHT/GRN
4	BLK
⑤	BLU
6	ORN
7	WHT
8	WHT/BLU

C452



①	WHT
②	WHT/RED
3	WHT/BLK

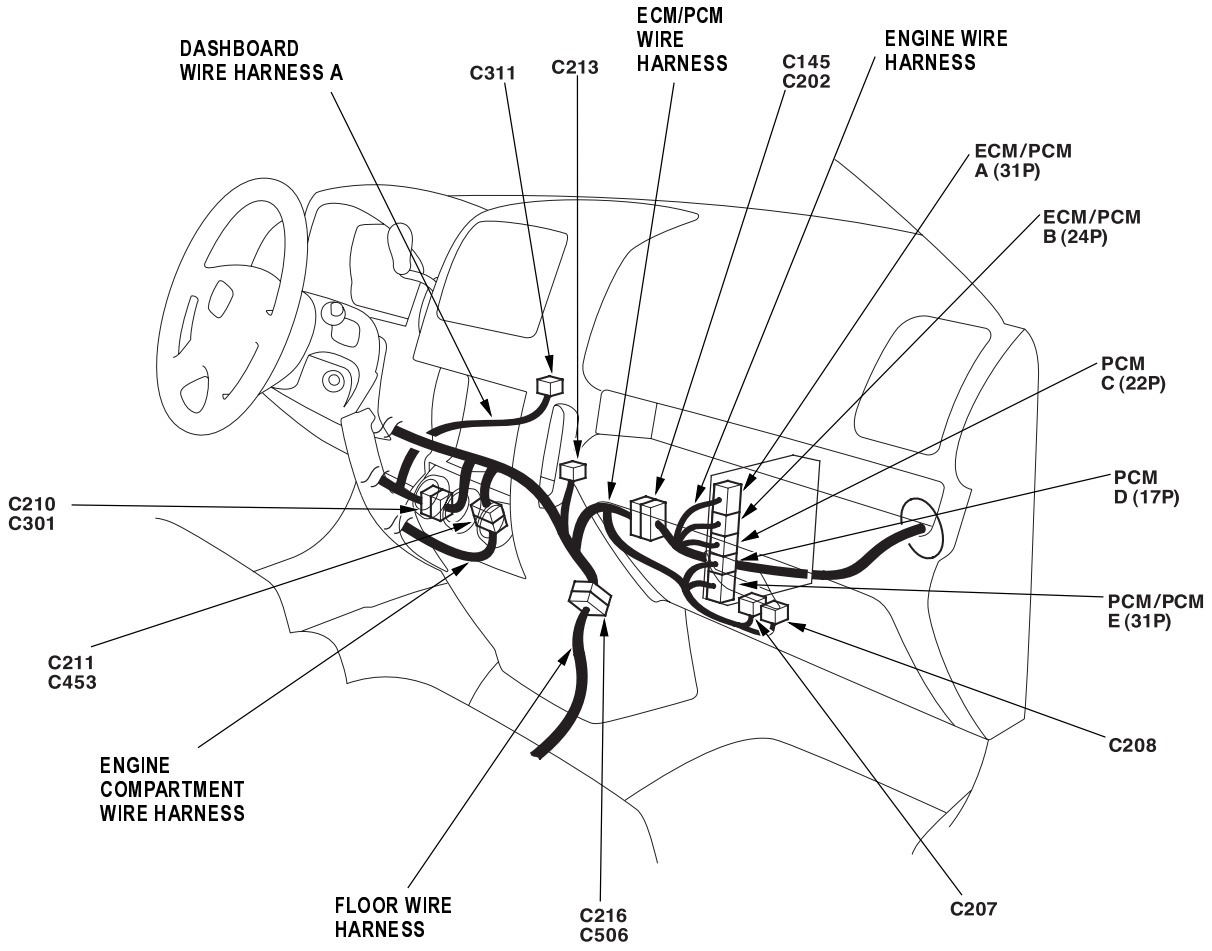
Note: · Connector with male terminals (double outline): View from terminal side
· Connector with female terminals (single outline): View from wire side
· O : Related to ECM/PCM control
· * : Terminal side of female terminals

(cont'd)

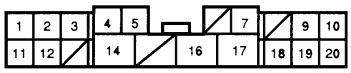
System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

LHD model:



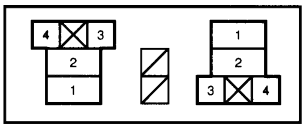
C145



①	BLU/BLK *1	④	GRN/RED *1	⑩	BLK/WHT	16	BLK/WHT
1	GRN/WHT *2	⑤	BRN *1	⑪	WHT *1	17	RED/WHT *3
②	RED/BLK *1	6	——	⑫	YEL *1	18	YEL/RED
2	YEL *2	⑦	GRN	13	——	⑲	WHT
③	BLU/WHT *1	8	——	⑭	YEL/BLK	⑳	BLK/WHT
④	WHT/GRN *2	⑨	BLK/YEL	15	——		

*1: A/T
*2: M/T
*3: with climate control

C207 **C208**



①	YEL/BLK
②	YEL/GRN
③	GRN/YEL
④	YEL/BLK

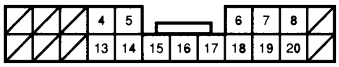
①	YEL/BLK
②	WHT/BLK
③	RED/YEL
④	WHT/BLK

C213
(without TWC model)



①	YEL/BLU
②	ORN
③	WHT/GRN

C301



1	——	8	RED/YEL *3	15	YEL/RED
2	——	9	——	⑯	GRN/WHT
3	——	10	——	⑰	BLU/BLK *4
4	WHT/GRN *1	11	——	18	LT GRN/BLK *4
5	BLU/ORN *1	12	——	⑲	LT GRN *4
6	BRN/YEL *2	⑬	BLK/RED *4	20	RED/WHT *5
7	YEL/BLK *2	⑭	WHT *4	21	——

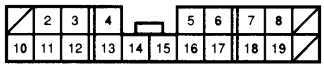
*1: with cruise control
*2: KG, KS, KR, KH, KY, FO, KK, KM models
*3: KH, PH models
*4: A/T
*5: with climate control

C311
(KG, KR, KS models)



①	BLK/YEL
2	——
③	YEL/BLK

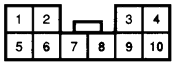
C453



1	——	⑧	GRN/RED *4	⑮	WHT/GRN *5
②	WHT *1	9	——	⑯	GRN/YEL *5
③	BRN/YEL *1	10	BLK/RED	⑰	RED/BLU *5
4	BLK/YEL *2	⑪	BLK/RED *1	⑱	BRN/YEL *5
5	YEL *3	⑫	WHT/BLK	⑲	BLK/WHT *5
⑥	LT GRN/BLK	⑬	RED	20	——
⑦	GRN/YEL *4	⑭	GRN/WHT		

*1: with TWC model
*2: with seat heater
*3: with ABS
*4: KG, KS, KR, FO, KK, KM models
*5: KG, KS, KR, FO models

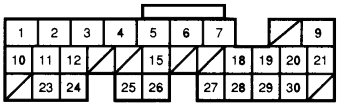
C506



1	GRN/YEL	6	YEL/BLK
②	YEL/GRN	7	YEL
3	GRY *1	8	YEL/BLU
4	BLK/YEL	9	YEL/RED
5	GRN/RED	10	RED/BLK *1

*1: with seat heater

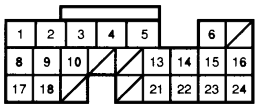
ECM/PCM A (31P)



①	BLK/WHT	⑨	RED/BLU	17	——	㉕	BLU/WHT
②	YEL/BLK	⑩	GRN/YEL	⑱	WHT/GRN *1	㉖	GRN
③	YEL/BLK	⑪	GRN/WHT	⑲	GRN/RED	㉗	BRN
④	BLK	⑫	BLK/RED	⑳	YEL/BLU	㉘	WHT/BLU
⑤	BLK	13	——	㉑	YEL/RED	㉙	BLU/RED
⑥	RED	14	——	22	——	㉚	YEL/GRN
⑦	BLU	⑮	RED/BLK	㉓	BRN/YEL	31	——
8	——	16	——	㉔	BRN/YEL		

*1: M/T

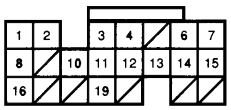
ECM/PCM B (24P)



①	BLU/WHT *2	⑨	BLU/BLK	⑰	RED/YEL
②	YEL	⑩	WHT/BLU	⑱	WHT/GRN
③	BLU	11	——	19	——
④	RED	12	——	20	——
⑤	BRN	⑬	WHT/RED	㉑	YEL/BLU
⑥	GRN	⑭	RED/BLK *1	㉒	RED/BLU
7	——	⑮	GRN/YEL	㉓	BLK/WHT
⑧	RED/WHT	⑯	BRN/WHT *1	㉔	BLU/YEL *1

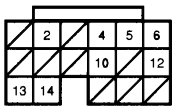
*1: A/T
*2: KG model

PCM C (22P) (A/T)



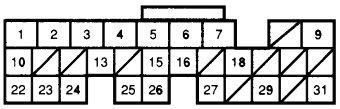
①	WHT/BLK	⑫	RED/WHT
②	GRN	⑬	BLU/RED
③	YEL	⑭	RED/YEL
④	GRN/WHT	⑮	BLU
5	——	⑯	WHT/BLU
⑥	BLU/BLK	17	——
⑦	WHT/RED	18	——
⑧	BLK/RED	⑲	BRN
9	——	20	——
⑩	BLU/WHT	21	——
⑪	GRN/RED	22	——

PCM D (17P) (A/T)



1	——	⑩	WHT/GRN
②	GRN	11	——
3	——	⑫	BLU/ORN
④	BLK/RED	⑬	BLU/WHT
⑤	WHT	⑭	BLU/YEL
⑥	BLU/BLK	15	——
7	——	16	——
8	——	17	——
9	——		

ECM/PCM E (31P)



①	GRN/YEL *1	⑨	YEL/BLK	⑯	LT GRN/BLK	㉔	YEL
②	RED/BLU *2	⑩	GRN/YEL *4	17	——	㉕	BLU/WHT *5
③	BRN/YEL	11	——	⑱	RED	㉖	BLU
④	WHT/GRN	12	——	19	——	㉗	WHT *1
⑤	YEL/BLU *3	⑬	WHT/BLU *5	20	——	28	——
⑥	BLK/WHT *2	14	——	21	——	㉙	BRN
⑦	RED/YEL	⑮	GRN/RED *6	㉒	WHT/BLK	30	——
8	——	⑮	ORN *3	㉓	LT BLU	㉛	GRN/WHT

*1: KG, KS, KR, KH, KY, FO, KK, KM models
*2: KG, KS, KR, FO models
*3: without TWC model
*4: except KG, KS, KR, KH, KY FO, KK, KM models
*5: A/T
*6: KG, KS, KR, FO, KK, KM models

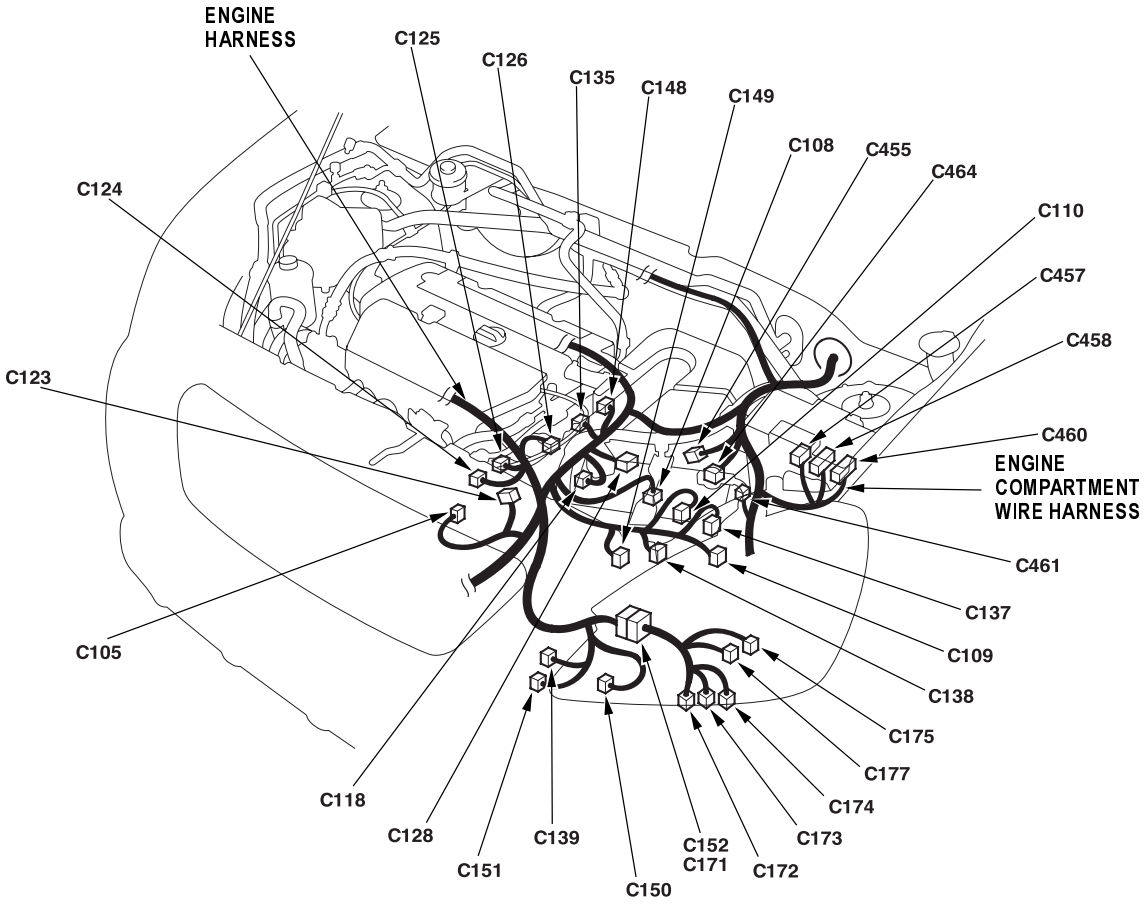
Note: · Connector with male terminals (double outline): View from terminal side
· Connector with female terminals (single outline): View from wire side
· O : Related to ECM/PCM control

(cont'd)

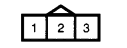
System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

RHD model:



C105



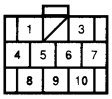
①	BLK
②	YEL/BLK
③	BLK/RED

C108 (M/T)



①	BLK
②	BLK/YEL
③	WHT/GRN

C109 (A/T)



①	BLU/WHT	⑥	RED/WHT
2	——	⑦	YEL
③	BLK	⑧	RED/BLK
④	BRN	⑨	WHT
⑤	GRN/RED	⑩	BLU/BLK

C110 (A/T)



①	YEL/RED
②	BLU
③	BRN/YEL

C118



①	RED/WHT
②	GRN/YEL

C123



①	YEL/BLU
②	RED/BLK
③	GRN/YEL

C124



①	BLK/YEL
②	YEL/BLU

C125



①	YEL/RED
②	GRN/RED
③	GRN/WHT

C126



①	GRN/YEL
②	RED/YEL

C128



①	BRN/YEL	⑨	BLK/YEL	⑰	BLK/WHT
②	BRN/YEL	⑩	BLK/YEL	⑱	YEL/BLK
③	BRN/YEL	⑪	BLK/YEL	⑲	YEL/BLK
④	BRN/YEL	⑫	BLK/YEL	⑳	YEL/BLK
⑤	BRN/YEL	⑬	BLK/WHT	㉑	YEL/BLK
⑥	BRN/YEL	⑭	BLK/WHT	㉒	YEL/BLK
⑦	BRN/YEL*	⑮	BLK/WHT	㉓	YEL/BLK
⑧	BLK/YEL	⑯	BLK/WHT	㉔	YEL/BLK
⑧	BLK/YEL				

* : A/T

C135



①	GRN
②	BRN/YEL
③	YEL/BLK

C137 (A/T)



①	YEL/BLU
②	WHT/RED
③	BRN/YEL

C138 (A/T)



①	RED/BLK
②	WHT/BLK

C139 (A/T)



①	BRN/WHT
②	BLK/RED

C148



①	BLU/WHT
②	BRN/YEL
③	BLK/YEL

C149 (A/T)



①	BLU/RED

C150 (A/T)



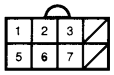
①	BLU/WHT

C151 (A/T)



①	BLU/YEL
②	WHT/BLU

C152 (A/T)



①	GRN	⑤	BLU/BLK
②	GRN/WHT	⑥	RED/YEL
③	YEL	⑦	GRN/YEL
4	——	8	——

C172 (A/T)



①	WHT
②	WHT

C173 (A/T)



①	BLU

C174 (A/T)



①	ORN

C175 (A/T)



①	GRN

C177 (A/T)



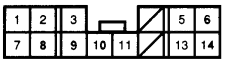
①	RED

C455
(KE, KU, KZ, KQ models)



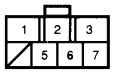
①	WHT/GRN
②	RED/BLU
③	BLK/WHT
④	GRN/YEL

C457



1	ORN	⑧	BLK/YEL
2	BLU/RED	⑨	GRN/WHT
3	BLU/RED	⑩	RED
4	——	⑪	WHT/RED
5	WHT/BLU	12	——
⑥	WHT/BLK	13	BLK
⑦	WHT/GRN	14	WHT

C458



①	WHT
2	WHT/RED
3	BLU/WHT
4	——
5	BLK
6	WHT/BLK
7	YEL/BLK

C460
(KE, KU, KZ, KQ models)



①	GRN/YEL
②	BLK
③	GRN/RED

C461



1	——
②	BLU

C464
(with TWC model)



①	WHT
②	WHT/GRN
③	GRN/YEL
④	BLK/RED

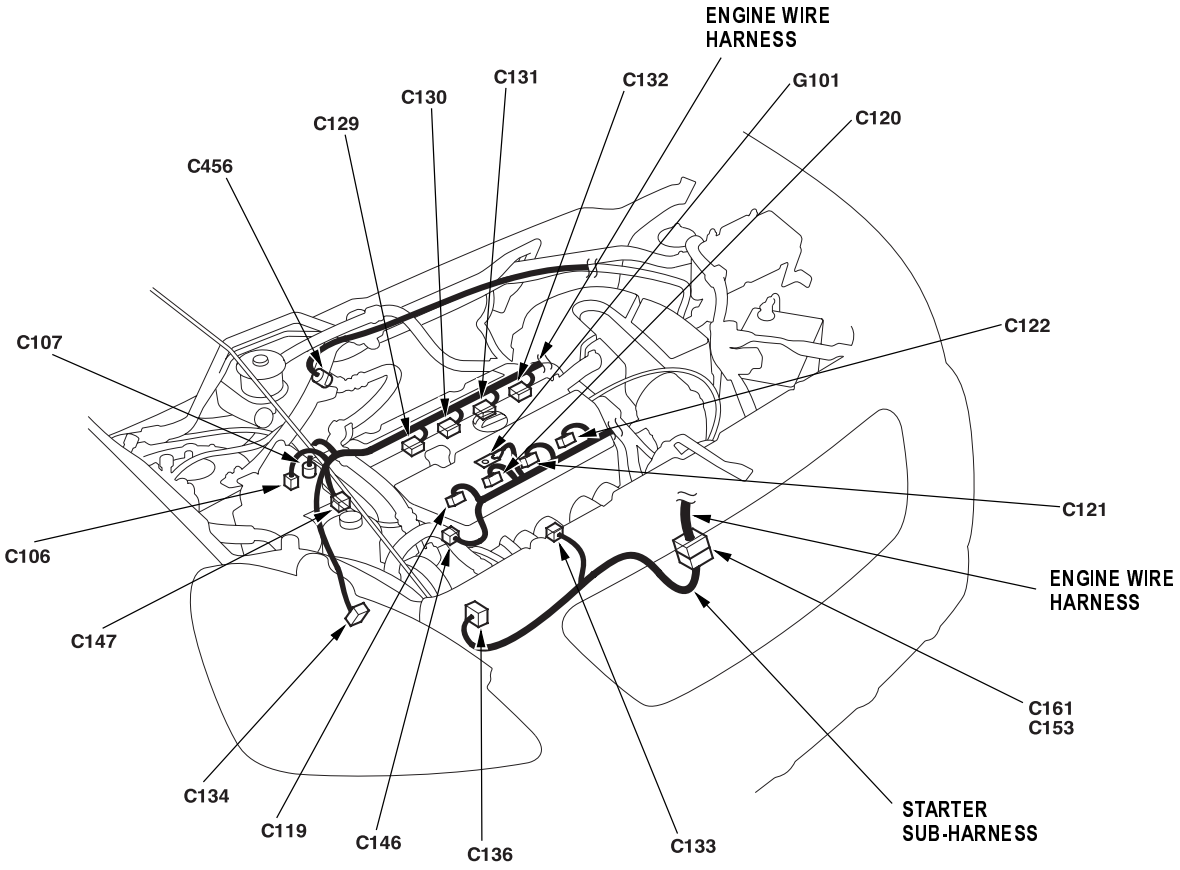
Note:
- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side
- O : Related to ECM/PCM control

(cont'd)

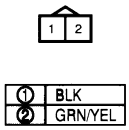
System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

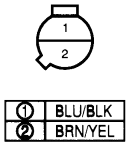
RHD model:



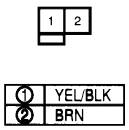
C106



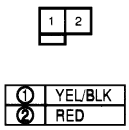
C107



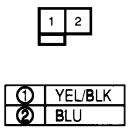
C119



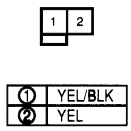
C120



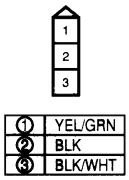
C121



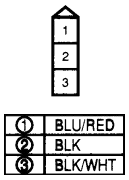
C122



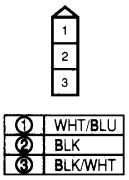
C129



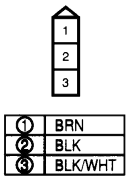
C130



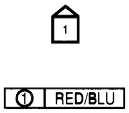
C131



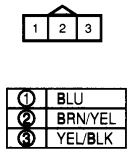
C132



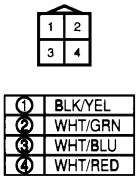
C133



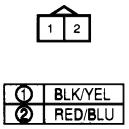
C134



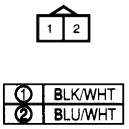
C136



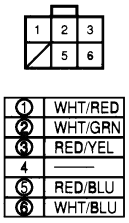
C146



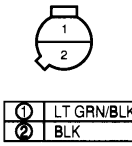
C147



C153



C456



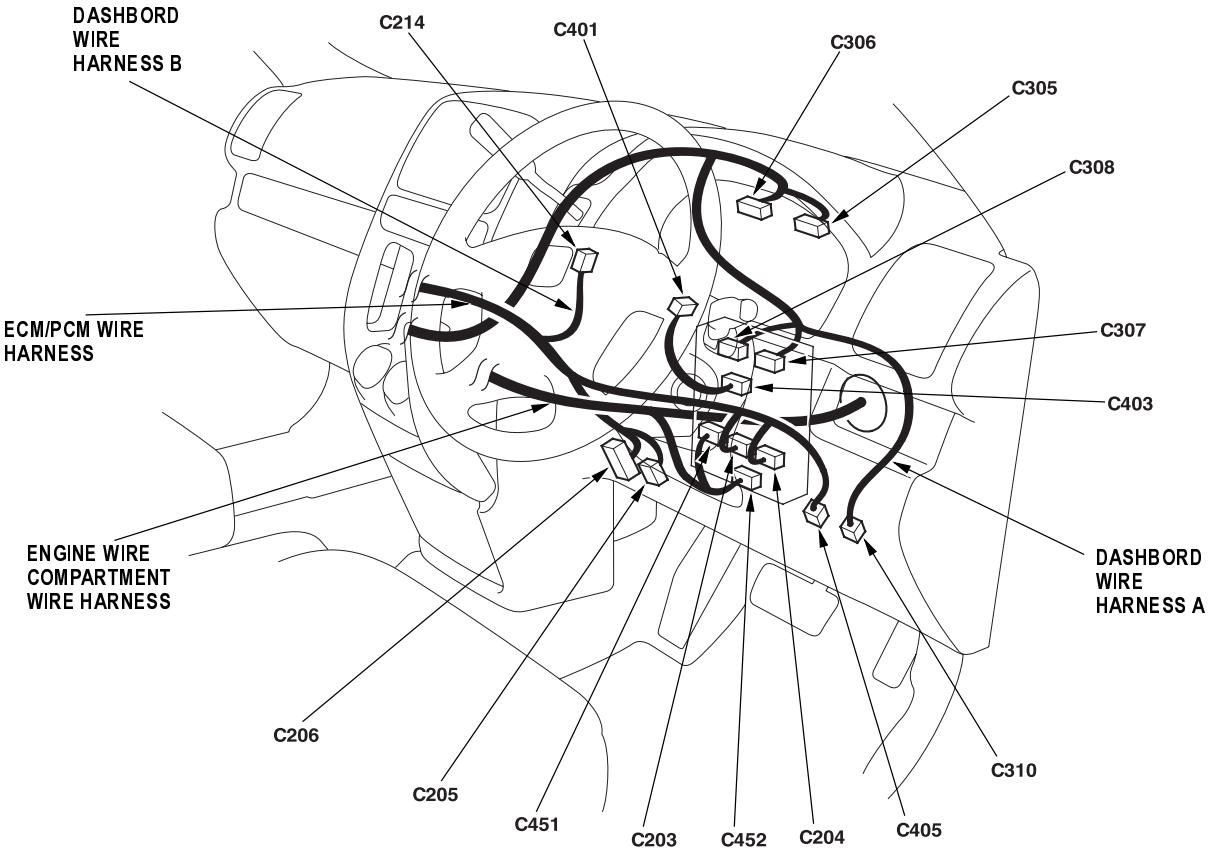
Note:
- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side
- O : Related to ECM/PCM control

(cont'd)

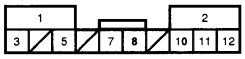
System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

RHD model:

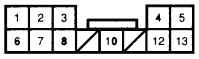


C203



1	BLK/WHT	⑦	LT GRN
2	GRN/WHT	8	GRN/BLK
③	GRN/YEL	9	——
4	——	10	BLU/BLK *1
⑤	BLK/WHT	11	YEL
6	——	⑫	YEL/BLK

C204



1	GRY	8	WHT *2
2	YEL/RED *1	9	——
③	WHT/BLK	⑩	YEL
④	BLU/WHT	11	——
⑤	BLU	⑫	WHT/RED
⑥	YEL/BLK	⑬	WHT/BLU *1
7	BRN		

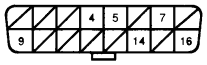
*1: A/T
*2: KE, KU, KN, KZ, KQ models

C205 (KE models)



①	BRN
②	BRN/YEL

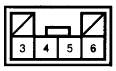
C206 *



1	——	⑨	BRN *1
2	——	10	——
3	——	11	——
④	BLK	12	——
⑤	BRN/YEL	13	——
6	——	14	GRY
⑦	LT BLU	15	——
8	——	⑯	WHT/RED

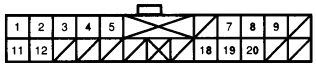
*1: except KE model

C214 (A/T)



1	——		
2	——		
3	YEL/BLK		
4	YEL/RED		
⑤	BLK		
⑥	GRN		

C305



1	GRY/RED	9	WHT*2	16	——
2	YEL/BLK	10	——	17	——
3	BLK	11	RED/WHT*2	⑱	YEL
④	BLU/WHT	11	BLU/YEL	19	WHT/RED
5	BLU	12	BLU/YEL	20	PNK/BLU
6	——	13	——	21	——
7	PNK *1	14	——	22	——
8	GRY *3	15	——		

*1: with outside air temperature sensor
*2: with rear fog light
*3: with climate control

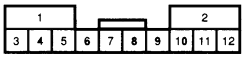
C306



1	RED/YEL	9	YEL/RED	17	——
②	BLU/BLK *1	10	WHT/RED	18	——
③	BLK/RED *1	11	GRN/RED	19	——
④	WHT *1	12	GRN/YEL	⑳	GRN/WHT
5	LT GRN/BLK *1	13	BLU/RED	21	BLK/YEL
6	RED	14	RED/BLU	22	BLU/ORN*2
7	RED/BLK	15	BLK		
8	——	16	PNK		

*1: A/T
*2: KE, KU, KN, KZ, KQ models

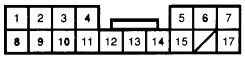
C307



1	RED/YEL *1	7	GRN/RED
2	GRN	8	RED/BLK
3	GRN/YEL *2	9	BLU/YEL *2
4	WHT/BLU	10	RED
⑤	WHT/BLK	11	BLU/WHT*2
6	YEL/GRN	⑫	WHT/GRN

*1: with headlight washer
*2: with cruise control

C308



1	BLU	10	GRY/RED
2	BLU/ORN	11	RED/BLK *2
3	WHT/RED	⑫	YEL/BLK *3
4	WHT/RED	13	WHT/RED
5	BLU/YEL *1	⑭	BLK/YEL *3
6	YEL	15	RED/WHT*4
⑦	YEL	16	——
⑧	BLU/WHT	17	RED *5
9	BLU/WHT		

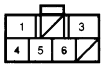
*1: with cruise control
*2: KE with NAVI
*3: KE models
*4: with rear fog light
*5: with seat heater

C310



①	WHT/GRN
②	WHT/BLK
3	——
4	——

C401



①	BLK/WHT
2	——
③	WHT
④	BLK/RED
5	WHT/RED
⑥	BLK/YEL
7	——

C403



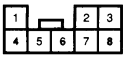
①	WHT
2	WHT/RED
③	BLK/WHT
④	BLK/RED
⑤	BLK/YEL

C405 (M/T)



①	LT GRN
②	BLK

C451



①	BLK/YEL
②	WHT/RED
③	WHT/GRN
4	BLK
⑤	BLU
6	ORN
7	WHT
8	WHT/BLU

C452



①	WHT
②	WHT/RED
3	WHT/BLK

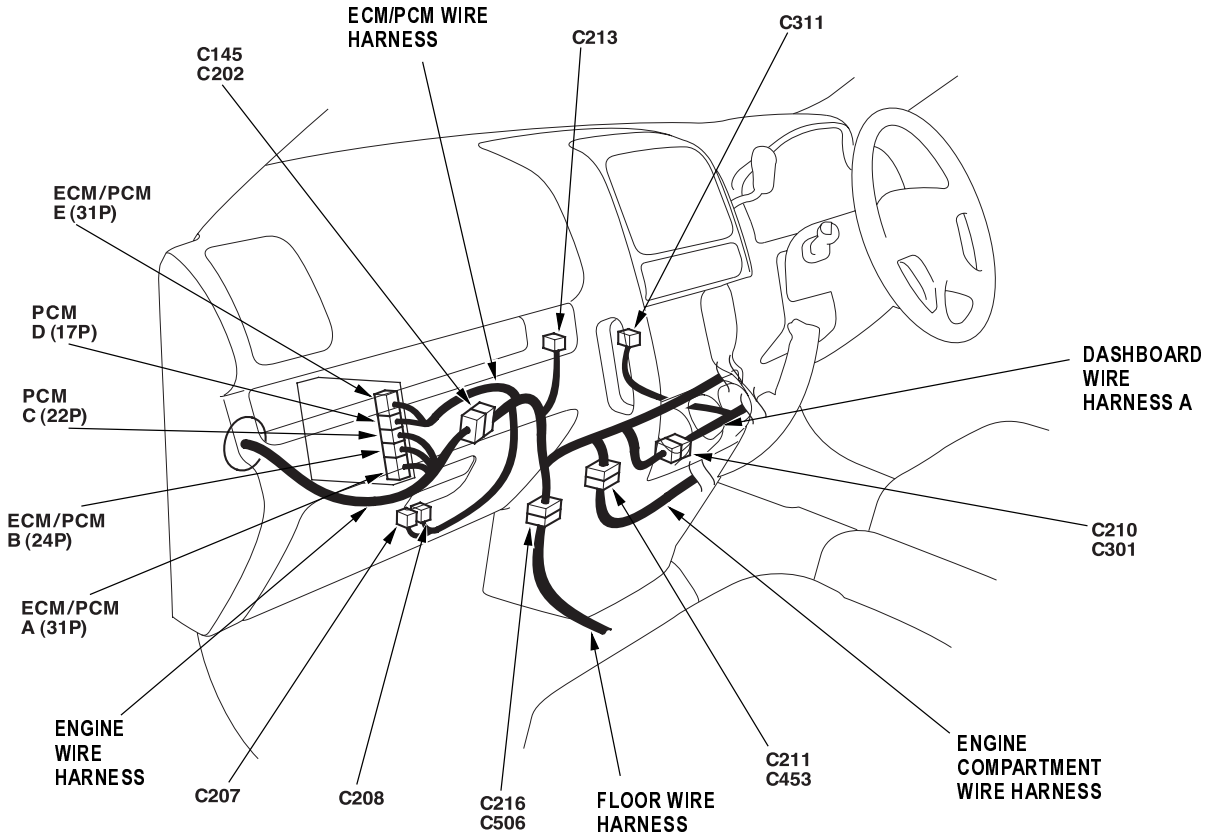
Note:
- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side
- O : Related to ECM/PCM control
- * : Terminal side of female terminals

(cont'd)

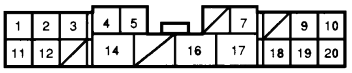
System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)

RHD model:



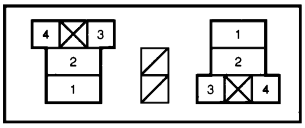
C145



①	BLU/BLK *1	④	GRN/RED *1	⑩	BLK/WHT	16	BLK/WHT
1	GRN/WHT *2	⑤	BRN *1	⑪	WHT *1	17	RED/WHT *3
②	RED/BLK *1	6	———	⑫	YEL *1	18	YEL/RED
2	YEL *2	⑦	GRN	13	———	⑲	WHT
③	BLU/WHT *1	8	———	⑭	YEL/BLK	⑳	BLK/WHT
④	WHT/GRN *2	⑨	BLK/YEL	15	———		

*1: A/T
*2: M/T
*3: with climate control

C207



①	YEL/BLK
②	YEL/GRN
③	GRN/YEL
④	YEL/BLK

C208

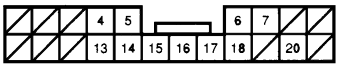
①	YEL/BLK
②	WHT/BLK
③	RED/YEL
④	WHT/BLK

C213 (without TWC model)



①	YEL/BLU
②	ORN
③	WHT/GRN

C301



1	———	8	———	15	YEL/RED
2	———	9	———	⑯	GRN/WHT
3	———	10	———	⑰	BLU/BLK *3
4	WHT/GRN *1	11	———	18	LT GRN/BLK *3
5	BLU/ORN *1	12	———	19	———
6	BRN/YEL *2	⑬	BLK/RED *3	20	RED/WHT *4
7	YEL/BLK *2	⑭	WHT *3	21	———

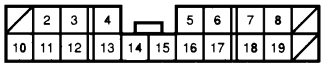
*1: with cruise control
*2: KE, KU, KN, KZ, KQ models
*3: A/T
*4: with climate control

C311 (KE model)



①	BLK/YEL
2	———
③	YEL/BLK

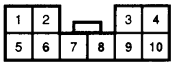
C453



1	———	⑧	GRN/RED *4	⑮	WHT/GRN *4
②	WHT *1	9	———	⑯	GRN/YEL *4
③	BRN/YEL *1	10	BLK/RED	⑰	RED/BLU *4
4	BLK/YEL *2	⑪	BLK/RED *1	⑱	BRN/YEL *4
5	YEL *3	⑫	WHT/BLK	⑲	BLK/WHT *4
⑥	LT GRN/BLK	⑬	RED	20	———
⑦	GRN/YEL *4	⑭	GRN/WHT		

*1: with TWC model
*2: with seat heater
*3: with ABS
*4: KE, KU, KZ, KQ models

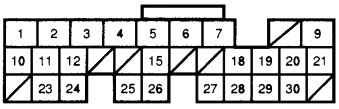
C506



1	GRN/YEL	6	YEL/BLK
②	YEL/GRN	7	YEL
3	GRY *1	8	YEL/BLU
4	BLK/YEL	9	YEL/RED
5	GRN/RED	10	RED/BLK *1

*1: with seat heater

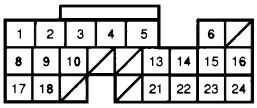
ECM/PCM A (31P)



①	BLK/WHT	⑨	RED/BLU	17	———	㉕	BLU/WHT
②	YEL/BLK	⑩	GRN/YEL	⑱	WHT/GRN *1	㉖	GRN
③	YEL/BLK	⑪	GRN/WHT	⑲	GRN/RED	㉗	BRN
④	BLK	⑫	BLK/RED	⑳	YEL/BLU	㉘	WHT/BLU
⑤	BLK	13	———	㉑	YEL/RED	㉙	BLU/RED
⑥	RED	14	———	22	———	㉚	YEL/GRN
⑦	BLU	⑮	RED/BLK	㉓	BRN/YEL	31	———
8	———	16	———	㉔	BRN/YEL		

*1: M/T

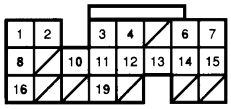
ECM/PCM B (24P)



①	BLU/WHT *2	⑨	BLU/BLK	⑰	RED/YEL
②	YEL	⑩	WHT/BLU	⑱	WHT/GRN
③	BLU	11	———	19	———
④	RED	12	———	20	———
⑤	BRN	⑬	WHT/RED	㉑	YEL/BLU
⑥	GRN	⑭	RED/BLK *1	㉒	RED/BLU
7	———	⑮	GRN/YEL	㉓	BLK/WHT
⑧	RED/WHT	⑯	BRN/WHT *1	㉔	BLU/YEL *1

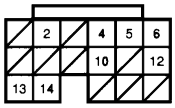
*1: A/T
*1: KE model

PCM C (22P) (A/T)



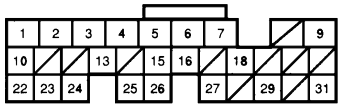
①	WHT/BLK	⑫	RED/WHT
②	GRN	⑬	BLU/RED
③	YEL	⑭	RED/YEL
④	GRN/WHT	⑮	BLU
5	———	⑯	WHT/BLU
⑥	BLU/BLK	17	———
⑦	WHT/RED	18	———
⑧	BLK/RED	⑲	BRN
9	———	20	———
⑩	BLU/WHT	21	———
⑪	GRN/RED	22	———

PCM D (17P) (A/T)



1	———	⑩	WHT/GRN
②	GRN	11	———
3	———	⑫	BLU/ORN
④	BLK/RED	⑬	BLU/WHT
⑤	WHT	⑭	BLU/YEL
⑥	BLU/BLK	15	———
7	———	16	———
8	———	17	———
9	———		

ECM/PCM E (31P)



①	GRN/YEL *1	⑨	YEL/BLK	⑯	LT GRN/BLK	㉔	YEL
②	RED/BLU *2	⑩	GRN/YEL *4	17	———	㉕	BLU/WHT *5
③	BRN/YEL	11	———	⑱	RED	㉖	BLU
④	WHT/GRN	12	———	19	———	㉗	WHT *1
⑤	YEL/BLU *3	⑬	WHT/BLU *5	20	———	28	———
⑥	BLK/WHT *2	14	———	21	———	㉙	BRN
⑦	RED/YEL	⑮	GRN/RED *2	㉒	WHT/BLK	30	———
8	———	⑮	ORN *3	㉓	LT BLU	㉛	GRN/WHT

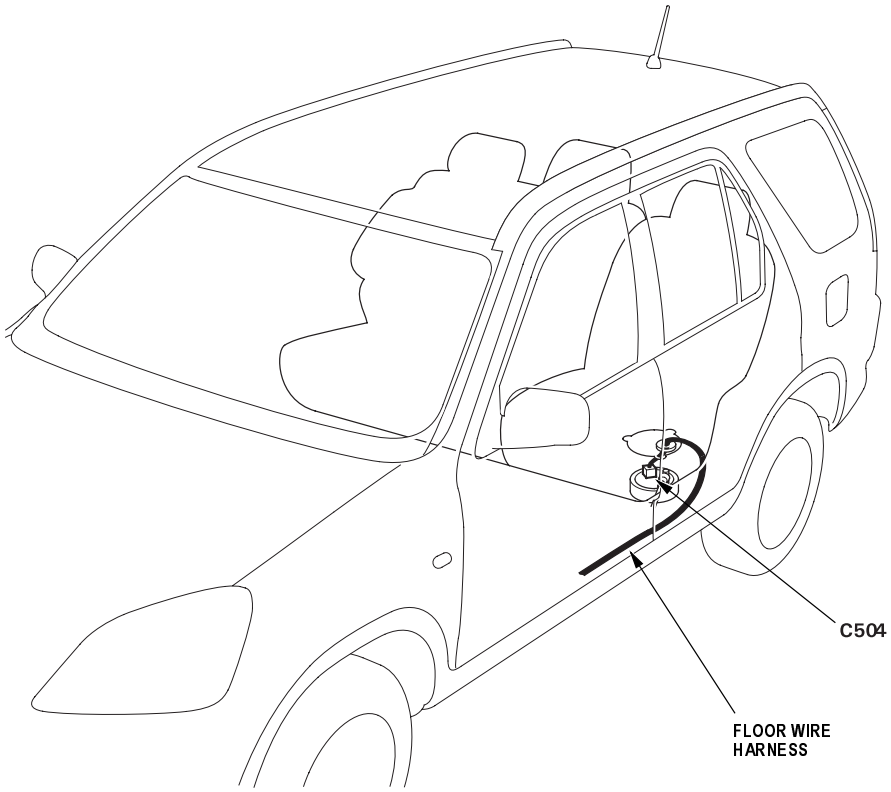
*1: KE, KU, KN, KZ, KQ models
*2: KE, KU, KZ, KQ models
*3: without TWC model
*4: except KE, KU, KN, KZ, KQ models
*5: A/T

Note: · Connector with male terminals (double outline): View from terminal side
· Connector with female terminals (single outline): View from wire side
· O : Related to ECM/PCM control

(cont'd)

System Descriptions (cont'd)

ECM/PCM Circuit Diagram (cont'd)



C504

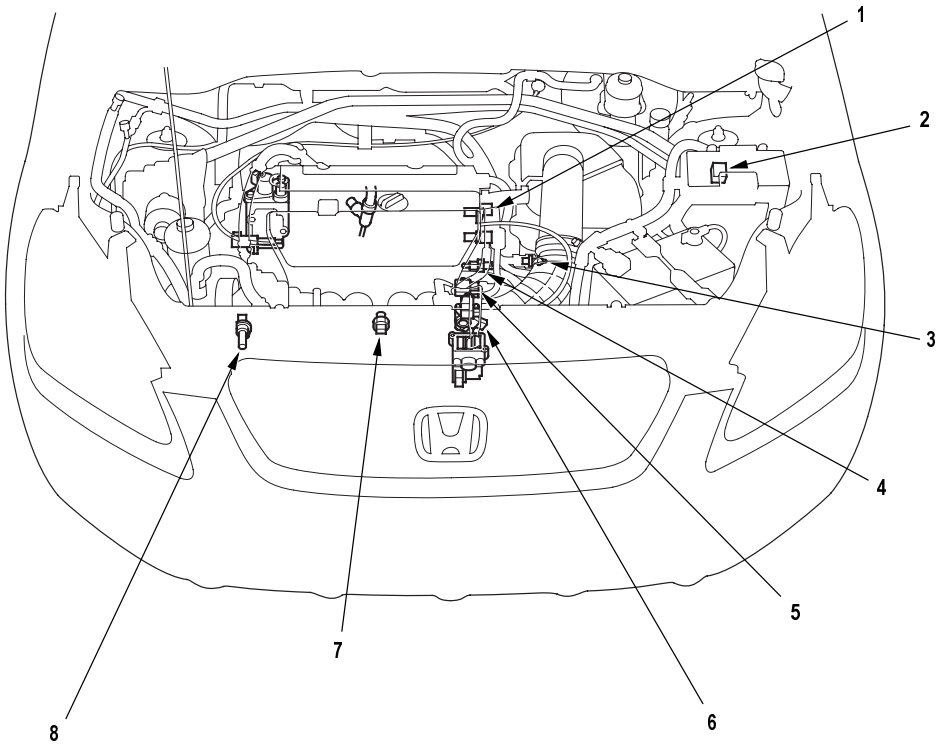


1	BLK
2	YEL/BLK
3	——
④	BLK
⑤	YEL/GRN

Note: · Connector with male terminals (double outline): View from terminal side
· Connector with female terminals (single outline): View from wire side
· O : Related to ECM/PCM control

PGM-FI System

Component Location Index



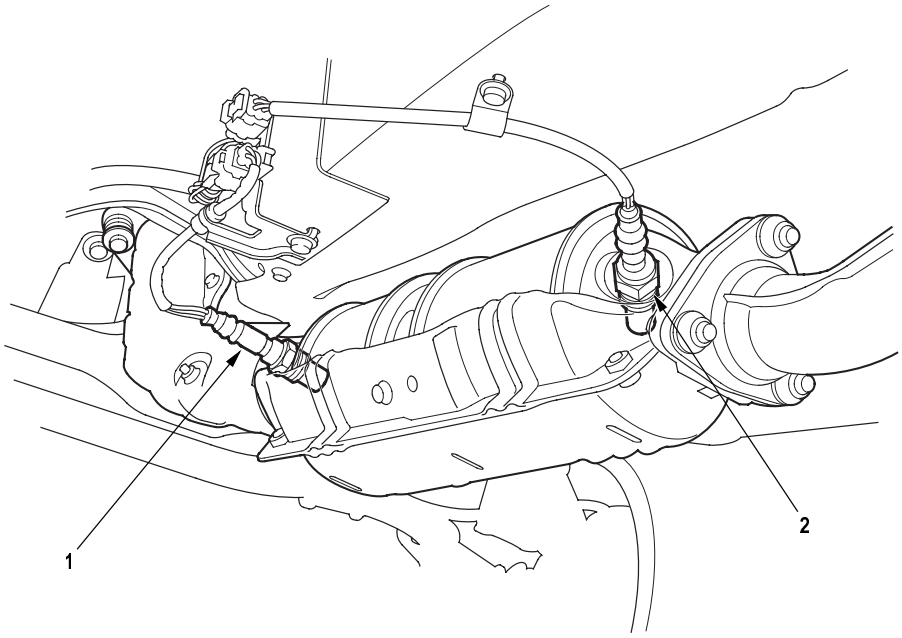
*: The illustration shows LHD model

1	TOP DEAD CENTER (TDC) SENSOR	Troubleshooting, page 11-100; Replacement, page 11-120
2	ELECTRICAL LOAD DETECTOR (ELD)	Troubleshooting, page 11-97
3	INTAKE AIR TEMPERATURE (IAT) SENSOR	Troubleshooting, page 11-64; Replacement, page 11-121
4	ENGINE COOLANT TEMPERATURE (ECT) SENSOR	Troubleshooting, page 11-66; Replacement, page 11-120
5	MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR	Troubleshooting, page 11-62
6	THROTTLE POSITION (TP) SENSOR	Troubleshooting, page 11-68
7	KNOCK SENSOR	Troubleshooting, page 11-87; Replacement, page 11-121
8	CRANKSHAFT POSITION (CKP) SENSOR	Troubleshooting, page 11-88; Replacement, page 11-119

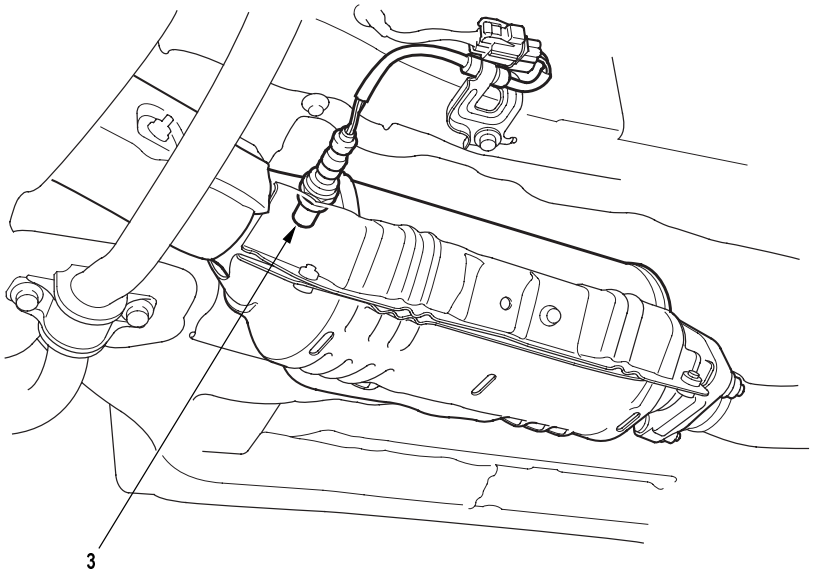
(cont'd)

Component Location Index (cont'd)

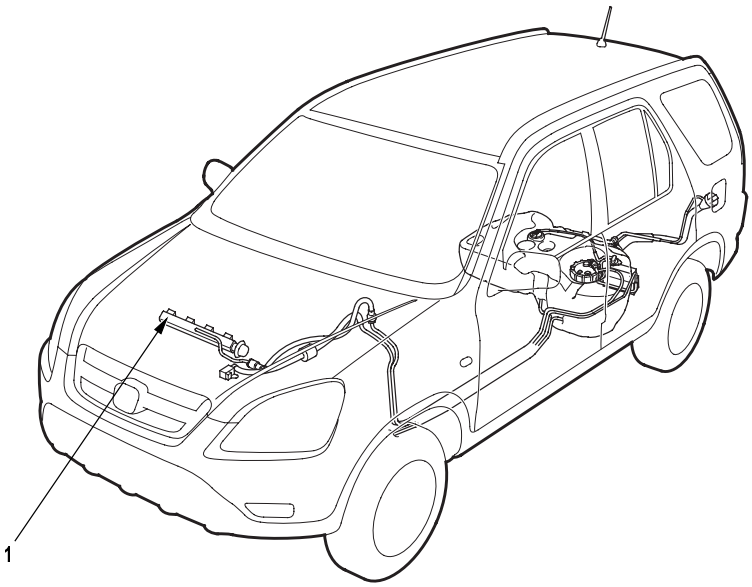
KG, KS, KE, KR, KU, KZ, FO, KQ models:



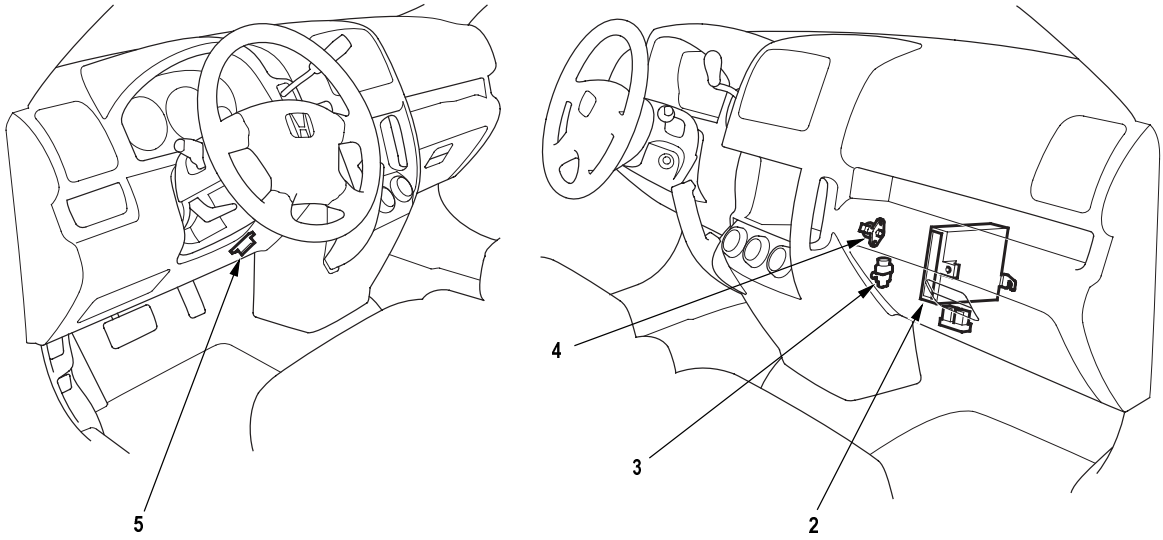
KN, KM, KY, MA, PH, IN, KK models:



1	PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S) (SENSOR 1)	Troubleshooting, page 11-71; Replacement, page 11-119
2	SECONDARY HEATED OXYGEN SENSOR (SECONDARY H2OS) (SENSOR 2)	Troubleshooting, page 11-76; Replacement, page 11-122
3	HEATED OXYGEN SENSOR (HO2S)	Troubleshooting, page 11-71; Replacement, page 11-119



*: The illustration shows KG, KS, KE, KR models.



*: The illustration shows LHD model

1	INJECTORS	Test, page 11-116; Replacement, page 11-117
2	ENGINE CONTROL MODULE / POWERTRAIN CONTROL MODULE (ECM/PCM)	General Troubleshooting Information, page 11-3; Troubleshooting, page 11-101
3	INERTIA SWITCH	Troubleshooting, page 11-102
4	IDLE MIXTURE ADJUSTER (IMA)	Troubleshooting, page 11-94
5	DATA LINK CONNECTOR (DLC)	General Troubleshooting Information, page 11-3

DTC Troubleshooting

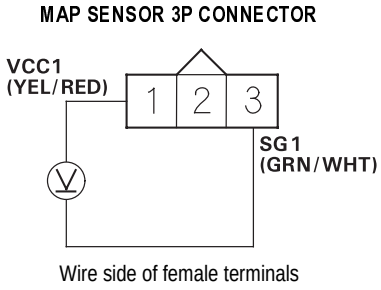
DTC P0107(3-1): MAP Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the MAP with the scan tool.

   Is about 101 kPa (760 mmHg, 30 in.Hg) or 2.9 V indicated?

   Yes Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the MAP sensor and at the ECM/PCM.■

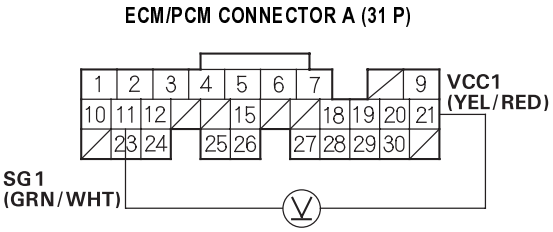
   No Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 3.



   Is there about 5 V?

   Yes Go to step 8.

   No Go to step 7.
7. Measure voltage between ECM/PCM connector terminals A11 and A21.



   Is there about 5 V?

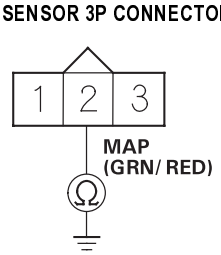
   Yes Repair open in the wire between ECM/PCM (A21) and the MAP sensor.■

   No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■
8. Check the MAP with the scan tool.

   Is 2 kPa (15 mmHg, 0.6 in.Hg) or less or 0 V indicated?

   Yes Go to step 9.

   No Replace the MAP sensor.■
9. Disconnect the negative cable from the battery.
10. Turn the ignition switch OFF.
11. Disconnect ECM/PCM connector A (31P).
12. Check for continuity between MAP sensor connector terminal No. 2 and body ground.



   Is there continuity?

   Yes Repair short in the wire between the ECM/PCM (A19) and the MAP sensor.■

   No Substitute a known-good ECM/PCM and recheck (see page 11-5) If the symptom/indication goes away, replace the original ECM/PCM.■

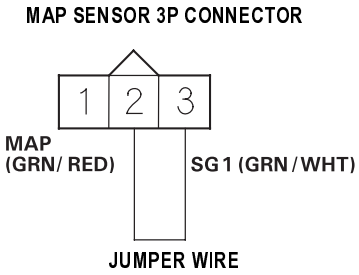
DTC P0108 (3-2): MAP Sensor Circuit High Voltage

1. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle with no load.
2. Check the MAP with the scan tool.

   Is about 101 kPa (760 mmHg, 30 in.Hg) or higher, or about 2.9 V or higher indicated?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the MAP sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor 3P connector.
5. Connect MAP sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.



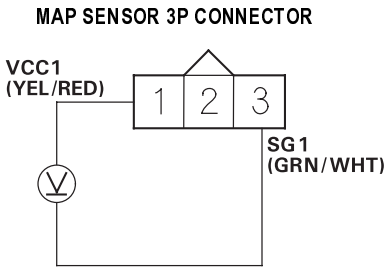
Wire side of female terminals

6. Turn the ignition switch ON (II).
7. Check the MAP with the scan tool.

   Is about 101 kPa (760 mmHg, 30 in.Hg) or higher, or about 2.9 V or higher indicated?

   Yes Go to step 8.

   No Replace the MAP sensor.■
8. Remove the jumper wire.
9. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 3.

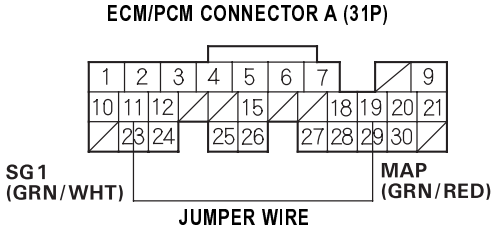


Wire side of female terminals

   Is there about 5 V?

   Yes Go to step 10.

   No Repair open in the wire between the ECM/PCM (A11) and the MAP sensor.■
10. Turn the ignition switch OFF.
11. Connect ECM/PCM connector terminals A11 and A19 with a jumper wire.



Wire side of female terminals

12. Turn the ignition switch ON (II).
13. Check the MAP with the scan tool.

    Is about 101 kPa (760 mmHg, 30 in.Hg) or higher, or about 2.9 V or higher indicated?

    Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

    No Repair open in the wire between the ECM/PCM (A19) and the MAP sensor.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0112 (10-1): IAT Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

   Is 150°C (302°F) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

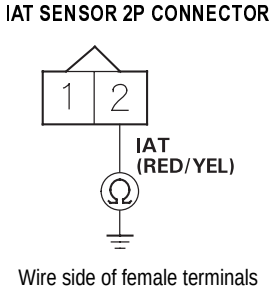
   Yes Go to step 3.

   No Go to step 9.
3. Disconnect the IAT sensor 2P connector.
4. Check the IAT with the scan tool.

   Is 150°C (302°F) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

   Yes Go to step 5.

   No Replace the IAT sensor.■
5. Turn the ignition switch OFF.
6. Disconnect the negative cable from the battery.
7. Disconnect ECM/PCM connector B (24P).
8. Check for continuity between IAT sensor 2P connector terminal No. 2 and body ground.



Wire side of female terminals

   Is there continuity?

   Yes Repair short in the wire between the ECM/PCM (B17) and the IAT sensor.■

   No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■
9. Check the temperature reading on the scan tool. Be aware that if the engine is warm, the reading will be higher than ambient temperature. If the engine is cold, the IAT and ECT will have the same value.

   Is the correct ambient temperature indicated?

   Yes Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IAT sensor and at the ECM/PCM.■

   No Replace the IAT sensor.■

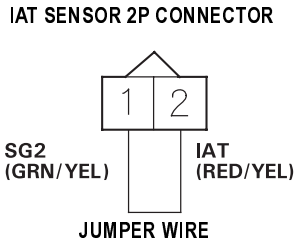
DTC P0113 (10-2): IAT Sensor Circuit High Voltage

1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

   Is -20°C (-4°F) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   Yes Go to step 3.

   No Intermitent failure, system is OK at this time. Check for poor connections or loose wires at the IAT sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the IAT sensor 2P connector.
5. Connect IAT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.

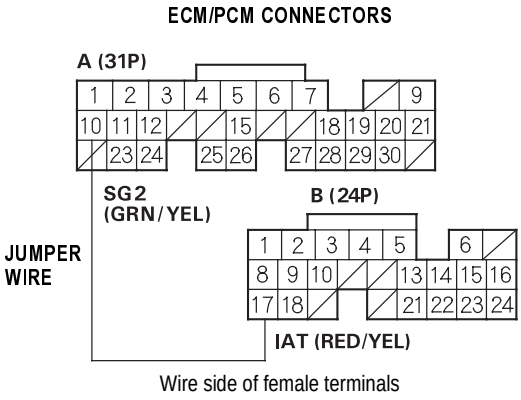


6. Turn the ignition switch ON (II).
7. Check the IAT with the scan tool.

   Is -20°C (-4°F) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   Yes Go to step 8.

   No Replace the IAT sensor.■
8. Turn the ignition switch OFF.
9. Remove the jumper wire.
10. Connect ECM/PCM connector terminals A10 and B17 with a jumper wire.



11. Turn the ignition switch ON (II).
12. Check the IAT with the scan tool.

    Is -20°C (-4°F) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

    Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

    No Repair open in the wire between the ECM/PCM (A10, B17) and the IAT sensor.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0117 (6-1): ECT Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the ECT with the scan tool.

   Is 150°C (302°F) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

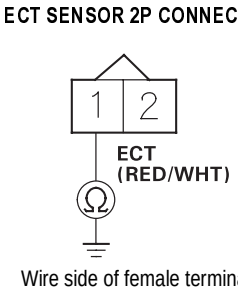
   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ECT sensor and at the ECM/PCM.■
3. Disconnect the ECT sensor 2P connector.
4. Check the ECT with the scan tool.

   Is 150°C (302°F) or higher (or H-Limit in Honda mode of PGM Tester) or 0 V indicated?

   Yes Go to step 5.

   No Replace the ECT sensor.■
5. Turn the ignition switch OFF.
6. Disconnect the negative cable from the battery.
7. Disconnect ECM/PCM connector B (24P).
8. Check for continuity between ECT sensor 2P connector terminal No. 1 and body ground.



   Is there continuity?

   Yes Repair short in the wire between the ECM/PCM (B8) and the ECT sensor.■

   No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

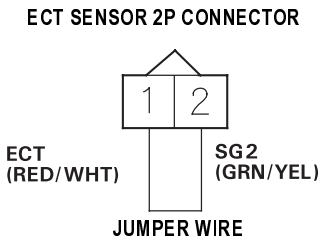
DTC P0118 (6-2): ECT Sensor Circuit High Voltage

1. Turn the ignition switch ON (II).
2. Check the ECT with the scan tool.

   Is -20°C (-4°F) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ECT sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the ECT sensor 2P connector.
5. Connect ECT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.



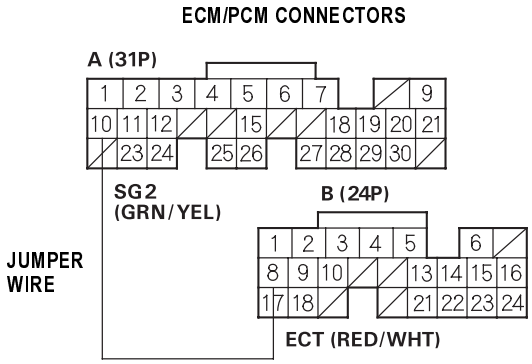
Wire side of female terminals

6. Turn the ignition switch ON (II).
7. Check the ECT with the scan tool.

   Is -20°C (-4°F) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

   Yes Go to step 8.

   No Replace the ECT sensor.■
8. Turn the ignition switch OFF.
9. Remove the jumper wire.
10. Connect ECM/PCM connector terminals A10 and B8 with a jumper wire.



Wire side of female terminals

11. Turn the ignition switch ON (II).
12. Check the ECT with the scan tool.

    Is -20°C (-4°F) or less (or L-Limit in Honda mode of PGM Tester) or 5 V indicated?

    Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

    No Repair open in the wire between the ECM/PCM (A10, B8) and the ECT sensor.■

(cont'd)

DTC Troubleshooting (cont'd)

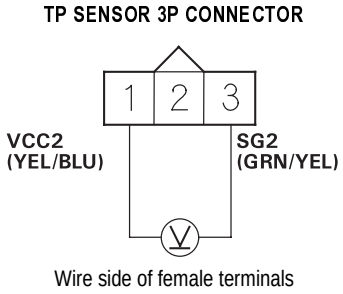
DTC P0122 (7-1): TP Sensor Circuit Low Voltage

1. Turn the ignition switch ON(II).
2. Check the throttle position with the scan tool.

   Is there about 10% or 0.5 V when the throttle is fully closed and about 90% or 4.5 V when the throttle is fully opened?

   Yes Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TP sensor and at the ECM/PCM.■

   No Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the TP sensor 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.

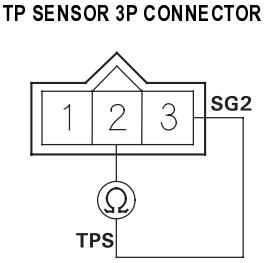


Wire side of female terminals

   Is there about 5 V?

   Yes Go to step 7.

   No Go to step 15.
7. Turn the ignition switch OFF.
8. At the sensor side, measure resistance between TP sensor 3P connector terminals No. 1 and No. 3 with the throttle fully closed.

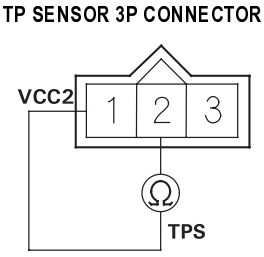


Trerminal side of male terminals

   Is there about 0.5 - 0.9 kΩ?

   Yes Go to step 9.

   No Replace the throttle body.■
9. Measure resistance between TP sensor 3P connector terminals No. 1 and No. 2 with the throttle fully closed.



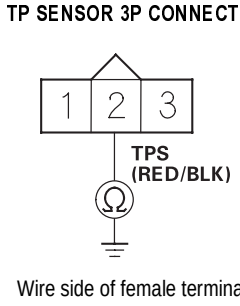
Terminal side of male terminals

   Is there about 4.5 kΩ?

   Yes Go to step 10.

   No Replace the throttle body (the TP sensor is not available separately).■
10. Disconnect the negative cable from the battery.
11. Disconnect ECM/PCM connector A (31P).

12. At the wire harness side, check for continuity between TP sensor 3P connector terminal No. 2 and body ground.

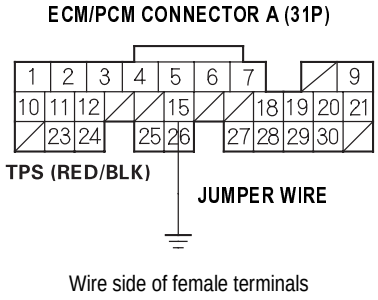


Is there continuity?

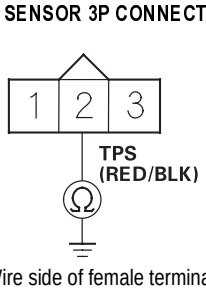
Yes Repair short in the wire between the ECM/PCM (A15) and the TP sensor.■

No Go to step 13.

13. Connect ECM/PCM connector terminal A15 and body ground with a jumper wire.



14. At the wire harness side, check for continuity between TP sensor 3P connector terminals No. 2 and body ground.

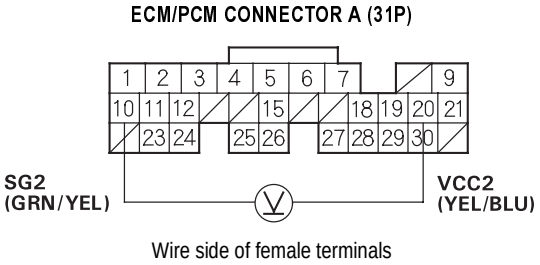


Is there continuity?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between the ECM/PCM (A15) and the TP sensor.■

15. Measure voltage between ECM/PCM connector terminals A10 and A20.



Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (A20) and the TP sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

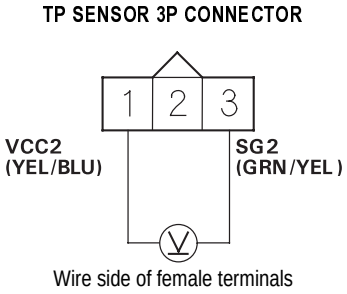
DTC P0123 (7-2): TP Sensor Circuit High Voltage

1. Turn the ignition switch ON (II).
2. Check the throttle position with the scan tool.

   Is there about 10% or 0.5 V when the throttle is fully closed and about 90% or 4.5 V when the throttle is fully opened?

   Yes Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TP sensor and at the ECM/PCM.■

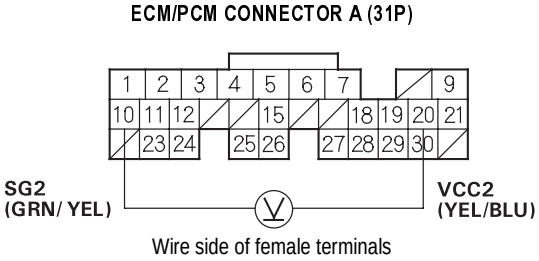
   No Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the TP sensor 3P connector.
5. Turn the ignition switch ON (II).
6. At the wire harness side, measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.



   Is there about 5 V?

   Yes Replace the throttle body (the TP sensor is not available separately).■

   No Go to step 7.
7. Measure voltage between ECM/PCM connector terminals A10 and A20.



   Is there about 5 V?

   Yes Repair open in the wire between the ECM/PCM (A10) and the TP sensor.■

   No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

DTC P0131 (1-1): Primary HO2S (Sensor 1) Circuit Low Voltage

1. Reset the ECM/PCM (see page 11-4)
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
3. Check the primary HO2S (Sensor 1) output voltage with the scan tool during acceleration using wide open throttle.

   Does the voltage stay at 0.5 V or less?

   Yes Go to step 4.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and at the ECM/PCM.■
4. Check the fuel pressure (see page 11-154).

   Is it normal?

   Yes Go to step 5.

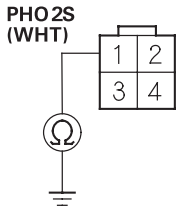
   No Repair the fuel supply system.■
5. Turn the ignition switch OFF.
6. Disconnect the primary HO2S (Sensor 1) 4P connector.
7. Turn the ignition switch ON (II).
8. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Does it stay at 0.5 V or less?

   Yes Go to step 9.

   No Replace the primary HO2S (Sensor 1).■
9. Turn the ignition switch OFF.
10. Disconnect the negative cable from the battery.
11. Disconnect ECM/PCM connector A (31P).
12. Check for continuity between primary HO2S (Sensor 1) 4P connector terminal No. 1 and body ground.

PRIMARY HO2S (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A6) and the primary HO2S (Sensor 1).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

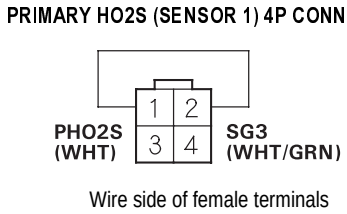
DTC P0132 (1-2): Primary HO2S (Sensor 1) Circuit High Voltage

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
3. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Does the voltage stay at 0.9 V or more?

   Yes Go to step 4.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and at the ECM/PCM.■
4. Turn the ignition switch OFF.
5. Disconnect the primary HO2S (Sensor 1) 4P connector.
6. Connect primary HO2S (Sensor 1) 4P connector terminals No. 1 and No. 2 with a jumper wire.

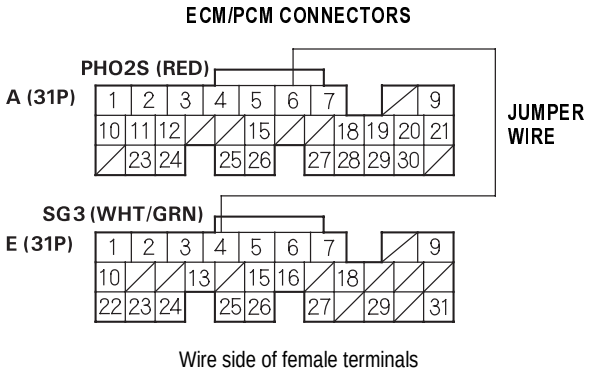


7. Turn the ignition switch ON (II).
8. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

   Is there 0.9 V or more?

   Yes Go to step 9.

   No Replace the primary HO2S (Sensor 1).■
9. Turn the ignition switch OFF.
10. Connect ECM/PCM connector terminals A6 and E4 with a jumper wire.



11. Turn the ignition switch ON (II).
12. Check the primary HO2S (Sensor 1) output voltage with the scan tool.

    Is there 0.9 V or more?

    Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

    No Repair open in the wire between the ECM/PCM (A6, E4) and the primary HO2S (Sensor 1).■

DTC P0133 (61-1): Primary HO2S (Sensor 1) Slow Response

NOTE: If DTC P0131, P0132 and/or P0135 are stored at the same time as DTC P0133, troubleshoot those DTCs first, then recheck for DTC P0133.

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
3. Test-drive under the following conditions:
   - 89 km/h (55 mph) steady speed
   - A/T in D position (M/T in 5th gear)
   - Until readiness code or Temporary DTC P0133 comes on
4. Check for a Temporary DTC with the scan tool.

   Is Temporary DTC P0133 indicated?

   Yes Replace the primary HO2S (Sensor 1).■

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and the ECM/PCM.■

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DTC Troubleshooting (cont'd)

DTC P0135 (41-2): Primary HO2S (Sensor 1) Heater Circuit Malfunction

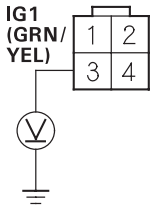
1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.

   Is DTC P0135 indicated?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the primary HO2S (Sensor 1) 4P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between primary HO2S (Sensor 1) 4P connector terminal No. 3 and body ground.

PRIMARY HO2S (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

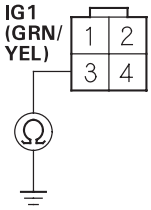
Is there battery voltage?

Yes Go to step 8.

No Go to step 7.

7. Check for continuity between body ground and primary HO2S (Sensor 1) 4P connector terminals No. 3.

PRIMARY HO2S (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

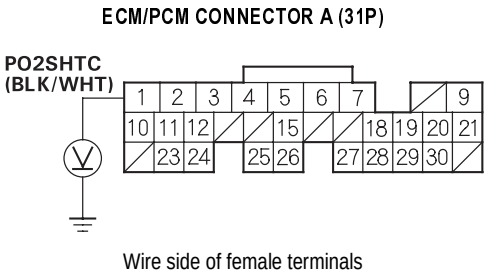
Is there continuity?

Yes Repair short in the wire between the primary HO2S (Sensor 1) and the No. 4 ACG (10A) fuse.■

No Check the No. 4 ACG (10A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the primary HO2S (Sensor 1) and the No. 4 ACG (10A) fuse.■

8. Turn the ignition switch OFF.
9. Reconnect the primary HO2S (Sensor 1) 4P connector.
10. Disconnect the negative cable from the battery.
11. Disconnect ECM/PCM connector A (31P).
12. Reconnect the negative cable to the battery.
13. Turn the ignition switch ON (II).

14. Measure voltage between between body ground and ECM/PCM connector terminal A1.



Wire side of female terminals

Is there battery voltage?

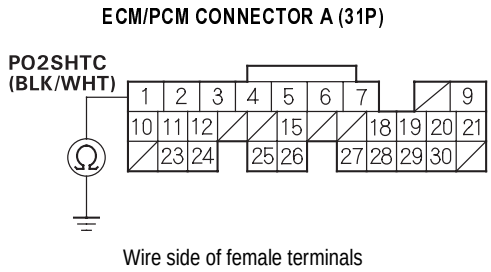
Yes Go to step 15.

No Repair open in the wire between ECM/PCM (A1) and primary HO2S (Sensor 1).■

15. Turn the ignition switch OFF.

16. Disconnect the primary HO2S (Sensor 1) 4P connector.

17. Check for continuity between body ground and ECM/PCM connector terminal A1.



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A1) and primary HO2S (Sensor 1).■

No Go to step 18.

18. Substitute a known-good primary HO2S (Sensor 1) and recheck.

Is DTC P0135 indicated?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

No Replace the primary HO2S (Sensor 1).■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0137 (63-1): Secondary HO2S (Sensor 2) Circuit Low Voltage

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm (min^{-1}) with the scan tool.

   Does the voltage stay at 0.3 V or less?

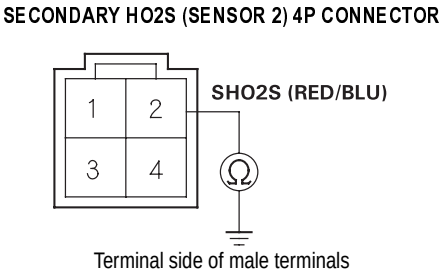
   Yes Go to step 4.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2) and at the ECM/PCM.■
4. Turn the ignition switch OFF.
5. Disconnect the secondary HO2S (Sensor 2) 4P connector.
6. Turn the ignition switch ON (II).
7. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

   Does the voltage stay at 0.3 V or less?

   Yes Go to step 8.

   No Replace the secondary HO2S (Sensor 2).■
8. Turn the ignition switch OFF.
9. Disconnect the negative cable from the battery.
10. Disconnect ECM/PCM connector E (31P).
11. Check for continuity between secondary HO2S (Sensor 2) 4P connector terminal No. 2 and body ground.



Is there continuity?

Yes Repair short in the wire between the ECM/PCM (E2) and the secondary HO2S (Sensor 2).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

DTC P0138 (63-2): Secondary HO2S (Sensor 2) Circuit High Voltage

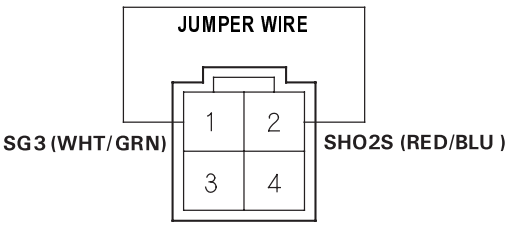
1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
3. Check the secondary HO2S (Sensor 2) output voltage at 3,000 rpm (min^{-1}) with the scan tool.

   Does the voltage stay at 1.0 V or more?

   Yes Go to step 4.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2) and the at ECM/PCM.■
4. Turn the ignition switch OFF.
5. Disconnect the secondary HO2S (Sensor 2) 6P connector.
6. Connect secondary HO2S (Sensor 2) 6P connector terminals No. 1 and No. 2 with a jumper wire.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

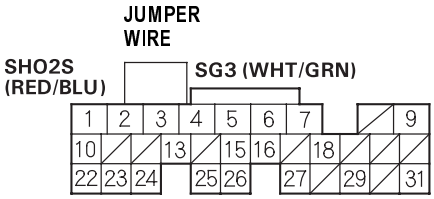
7. Turn the ignition switch ON (II).
8. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

   Is there 1.0 V or more?

   Yes Go to step 9.

   No Replace the secondary HO2S (Sensor 2).■
9. Turn the ignition switch OFF.
10. Connect ECM/PCM connector terminals E2 and E4 with a jumper wire.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

11. Turn the ignition switch ON (II).
12. Check the secondary HO2S (Sensor 2) output voltage with the scan tool.

    Is there 1.0 V or more?

    Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

    No Repair open in the wire between the ECM/ PCM (E2, E4) and the secondary HO2S (Sensor 2).■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0141 (65-2): Secondary HO2S (Sensor 2) Heater Circuit Malfunction

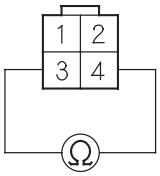
1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.

   Is DTC P0141 indicated?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2) and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the secondary HO2S (Sensor 2) 4P connector.
5. At the secondary HO2S (Sensor 2) side, measure resistance between the HO2S 4P connector terminals No. 3 and No. 4.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

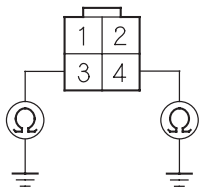
Is there about 3.3 Ω?

Yes Go to step 6.

No Replace the secondary HO2S (Sensor 2).■

6. Check continuity between body ground and secondary HO2S (Sensor 2) 4P connector terminals No. 3 and No. 4 individually.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

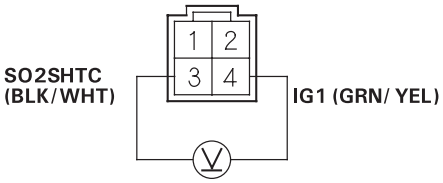
Is there continuity?

Yes Replace the secondary HO2S (Sensor 2).■

No Go to step 7.

7. Turn the ignition switch ON (II).
8. Measure voltage between secondary HO2S 4P connector terminals No. 3 and No. 4.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

Is there battery voltage?

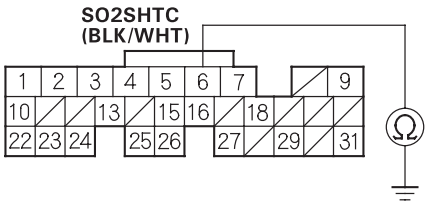
Yes Go to step 9.

No Go to step 14.

9. Turn the ignition switch OFF.
10. Disconnect the negative cable from the battery.
11. Disconnect ECM/PCM connector E (31P).
12. Reconnect the negative cable to the battery.

13. Check for continuity between ECM/PCM connector terminal E6 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

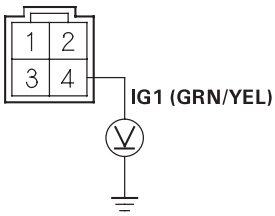
Is there continuity?

Yes Repair short in the wire between the ECM/PCM (E6) and the secondary HO2S (Sensor 2).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

14. Measure voltage between secondary HO2S (Sensor 2) 4P connector terminal No. 4 and body ground.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

Is there battery voltage?

Yes Go to step 15.

No Check the No. 4 ACG (10A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the secondary HO2S (Sensor 2) and No. 4 ACG (10A) fuse.■

15. Turn the ignition switch OFF.

16. Reconnect the secondary HO2S (Sensor 2) 4P connector.

17. Disconnect the negative cable from the battery.

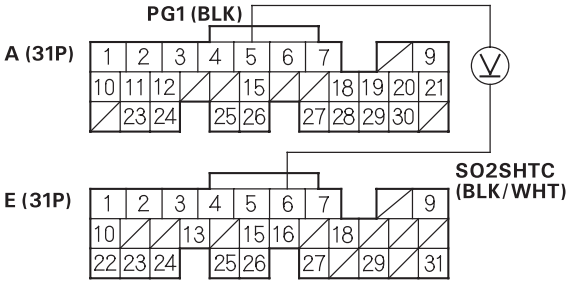
18. Disconnect ECM/PCM connector E (31P).

19. Reconnect the negative cable to the battery.

20. Turn the ignition switch ON (II).

21. Measure voltage between ECM/PCM connector terminal E6 and A5.

ECM/PCM CONNECTORS



Wire side of female terminals

Is there 0.1 V or less?

Yes Repair open in the wire between the ECM/PCM (E6) and the secondary HO2S (Sensor 2).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0171 (45-2): Fuel System Too Lean

DTC P0172 (45-1): Fuel System Too Rich

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0171 and/or P0172, troubleshoot those DTCs first, then recheck for P0171 and/or P0172.

P0010, P0011: VTC System
P0107, P0108: Manifold Absolute Pressure (MAP) sensor
P0135: Primary Heated Oxygen Sensor (primary HO2S) (Sensor 1) heater
P0137, P0138: Secondary Heated Oxygen Sensor (secondary HO2S) (sensor 1)
P0141: Secondary Heated Oxygen Sensor (secondary HO2S) (sensor 2) heater
P0340, P0344: CMP Sensor
P1259: VTEC System

1. Check the fuel pressure (see page 11-154).

   Is fuel pressure OK?

   Yes Go to step 2.

   No Check these items:
   - If the pressure is too high, replace the fuel pressure regulator (see page 11-165).■
   - If the pressure is too low, check the fuel pump, the fuel feed pipe, the fuel filter, and replace the fuel pressure regulator (see page 11-165).■

2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.

3. Check the primary HO2S (Sensor 1) output with the scan tool.

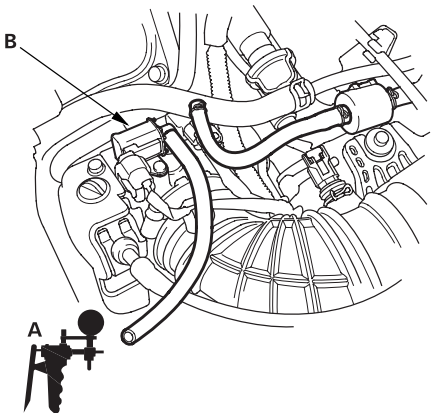
   Does it stay at less than 0.3 V or more than 0.6 V?

   Yes Replace the primary HO2S (Sensor 1).■

   No Go to step 4.

4. Turn the ignition switch OFF.

5. With a vacuum pump (A), apply vacuum to the evaporative emission (EVAP) canister purge valve (B) from the evaporative emission (EVAP) canister side.



   Does it hold vacuum?

   Yes Go to step 6.

   No Replace the EVAP canister purge valve.■

6. Turn the ignition switch ON (II).

7. Check the manifold pressure with the scan tool.

   Does it indicate atmospheric pressure?

   Yes Go to step 8.

   No Replace the MAP sensor.■

8. Start the engine.

9. Check the MAP sensor with the scan tool.

   Is a MAP of 40.0 kPa (300 mmHg, 12.0 in.Hg) or less indicated within 1 second after starting the engine?

   Yes Check the valve clearance and adjust if necessary. If the valve clearance are OK, replace the injector.■

   No Replace the MAP sensor.■

(cont'd)

DTC P0300 (7x-1): Random misfire and any Combination of the Following:

DTC P0301 (71-1): No. 1 Cylinder Misfire

DTC P0302 (72-1): No. 2 Cylinder Misfire

DTC P0303 (73-1): No. 3 Cylinder Misfire

DTC P0304 (74-1): No. 4 Cylinder Misfire

NOTE:
- If the misfiring is frequent enough to trigger detection of increased emissions during two consecutive driving cycles, the MIL will come on, and DTC P0300 (and some combination of P0301 through P0304) will be stored.
- If the misfiring is frequent enough to damage the catalyst, the MIL will blink whenever the misfiring occurs, and DTC P0300 (and some combination of P0301 through P0304) will be stored. When the misfiring stops, the MIL will remain on.

1. Troubleshoot the following DTCs first if any of them were stored along with the random misfire DTC(s):
   P0107, P0108: Manifold Absolute Pressure (MAP) sensor
   P0131, P0132: Primary Heated Oxygen Sensor (primary HO2S) (Sensor 1)
   P0171, P0172: Fuel system
   P0335, P0336: Crankshaft Position (CKP) sensor
   P1253: VTEC system
   P1361, P1362: Top Dead Center (TDC) sensor
   P1519: Idle Air Control (IAC) valve
2. Test-drive the vehicle to verify the symptom.
3. Find the symptom in the chart below, and do the related procedures in the order listed until you find the cause.

Symptom	Procedure(s)	Also check for:
Random misfire only at low engine speed and under load	Check fuel pressure (see page 11-154).	• Low compression • Contaminated fuel • Manifold vacuum problem
Random misfire only during acceleration	Check fuel pressure (see page 11-154).	Malfunction in the VTEC system (see page 11-130)
Random misfire at high engine speed, under load, or under random conditions	Check fuel pressure (see page 11-154).	Correct valve clearance (see page 06-9)

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0301 (71-1): No. 1 Cylinder Misfire

DTC P0302 (72-1): No. 2 Cylinder Misfire

DTC P0303 (73-1): No. 3 Cylinder Misfire

DTC P0304 (74-1): No. 4 Cylinder Misfire

1. After checking and recording the freeze data, reset the ECM/PCM (see page 11-4). If there is no freeze data of the misfire, just clear the DTC.
2. Start the engine, and listen for a clicking sound at the injector at the problem cylinder.

   Does it click?

   Yes Go to step 3.

   No Go to step 32.
3. Turn the ignition switch OFF, and reset the ECM/PCM.
4. Exchange the ignition coil from the problem cylinder with one from another cylinder.
5. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.
6. Check the DTC or the Temporary DTC with the scan tool.

   Is DTC or Temporary DTC P0301, P0302, P0303 or P0304 indicated?

   Yes Go to step 7.

   No Intermittent misfire due to poor contact at the ignition coil connector (no misfire at this time).■
7. Determine which cylinder(s) had the misfire.

   Does the misfire occur in the other cylinder whose ignition coil was exchanged?

   Yes Replace the faulty ignition coil.■

   No Go to step 8.
8. Turn the ignition switch OFF, and reset the ECM/PCM.
9. Exchange the spark plug from the problem cylinder with one from another cylinder.
10. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.
11. Check the DTC or the Temporary DTC with the scan Tool.

    Is DTC or Temporary DTC P0301, P0302, P0303 or P0304 indicated?

    Yes Go to step 12.

    No Intermittent misfire due to spark plug fouling, etc. (no misfire at this time).■
12. Determine which cylinder(s) had the misfire.

    Does the misfire occur in the other cylinder whose spark plug was exchanged?

    Yes Replace the faulty spark plug.■

    No Go to step 13.
13. Turn the ignition switch OFF, and reset the ECM/PCM.
14. Exchange the injector from the problem cylinder with one from the another cylinder.
15. Let the engine idle for 2 minutes.

16. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.

17. Check for a DTC or Temporary DTC with the scan Tool.

Is DTC or Temporary DTC P0301, P0302, P0303 or P0304 indicated?

Yes Go to step 18.

No Intermittent misfire due to bad contact at the injector connector (no misfire at this time).■

18. Determine which cylinder(s) had the misfire.

Does the misfire occur in the other cylinder whose injector was exchanged?

Yes Replace the faulty injector.■

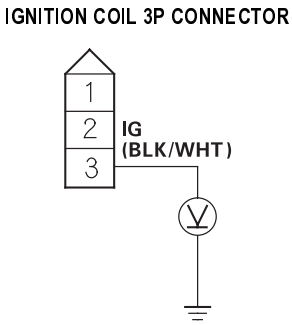
No Go to step 19.

19. Turn the ignition switch OFF.

20. Disconnect the ignition coil 3P connector from the problem cylinder.

21. Turn the ignition switch ON (II).

22. Measure voltage between ignition coil 3P connector terminal No. 3 and body ground.



Wire side of female terminals

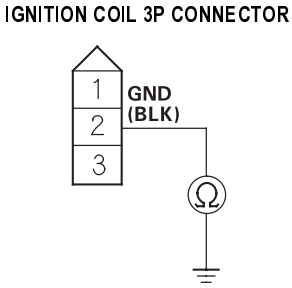
Is there battery voltage?

Yes Go to step 23.

No Repair open or short in the wire between the No. 1 IGN COIL (15A) fuse and the ignition coil.■

23. Turn the ignition switch OFF.

24. Check for continuity between ignition coil 3P connector terminal No. 2 and body ground.



Wire side of female terminals

Is there continuity?

Yes Go to step 25.

No Repair open in the wire between the ignition coil and G101.■

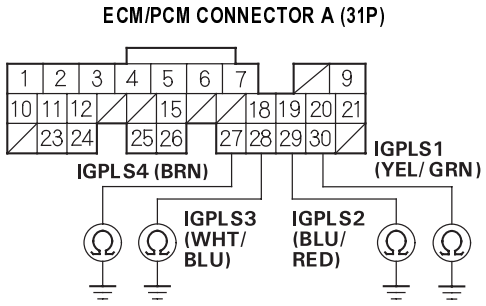
25. Disconnect the negative cable from the battery.

26. Disconnect ECM/PCM connector A (31P).

(cont'd)

DTC Troubleshooting (cont'd)

27. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).



Wire side of female terminals

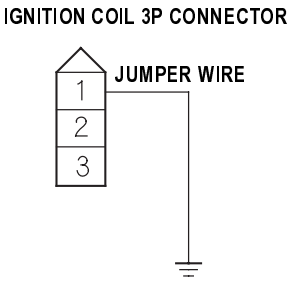
PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	A30	YEL/GRN
No. 2	P0302	A29	BLU/RED
No. 3	P0303	A28	WHT/BLU
No. 4	P0304	A27	BRN

Is there continuity?

Yes Repair short in the wire between the ECM/PCM and the ignition coil.■

No Go to step 28.

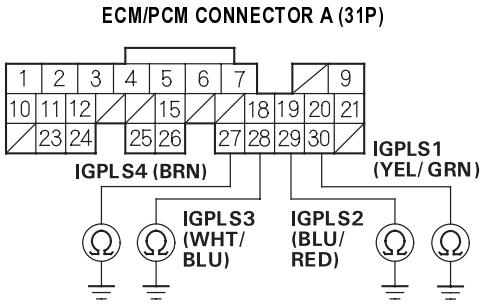
28. Connect the appropriate ignition coil 3P connector terminal No. 1 and body ground with a jumper wire (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	P0301	YEL/GRN
No. 2	P0302	BLU/RED
No. 3	P0303	WHT/BLU
No. 4	P0304	BRN

29. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	A30	YEL/GRN
No. 2	P0302	A29	BLU/RED
No. 3	P0303	A28	WHT/BLU
No. 4	P0304	A27	BRN

Is there continuity?

Yes Go to step 30.

No Repair open in the wire between the ECM/PCM and the ignition coil.■

30. Reconnect the negative cable to the battery.

31. Check the compression.

Is the engine compression OK?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

No Repair the engine.■

32. Disconnect the negative cable from the battery.

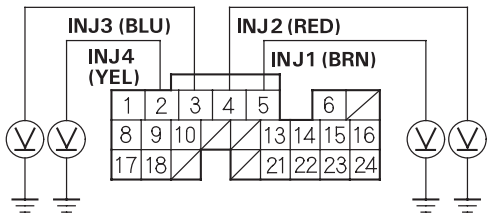
33. Disconnect ECM/PCM connector B (24P).

34. Reconnect the negative cable to the battery.

35. Turn the ignition switch ON (II).

36. Measure voltage between body ground and the appropriate ECM/PCM connector terminal (see table).

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	B5	BRN
No. 2	P0302	B4	RED
No. 3	P0303	B3	BLU
No. 4	P0304	B2	YEL

Is there battery voltage?

Yes Go to step 37.

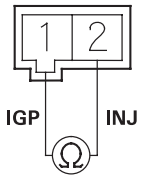
No Go to step 45.

37. Turn the ignition switch OFF, and remove the engine cover.

38. Disconnect the injector 2P connector on the problem cylinder.

39. Measure the resistance between injector 2P connector terminals No. 1 and No. 2.

INJECTOR 2P CONNECTOR



Terminal side of male terminals

Is there 10 Ω - 13 Ω?

Yes Go to step 40.

No Replace the injector (see page 11-117).■

40. Exchange the injector from the problem cylinder with one from another cylinder.

41. Let the engine idle for 2 minutes.

42. Test-drive the vehicle several times in the range of the freeze data or under various conditions if there was no freeze data.

43. Check for a DTC or Temporary DTC with a scan tool.

Is DTC or Temporary DTC P0301, P0302, P0303, or P0304 indicated?

Yes Go to step 44.

No Intermittent misfire due to injector malfunction etc.■

44. Determine which cylinder(s) had the misfire.

Does the misfire occur in the other cylinder whose injector was exchanged?

Yes Replace the faulty injector.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

45. Turn the ignition switch OFF and remove the engine cover.

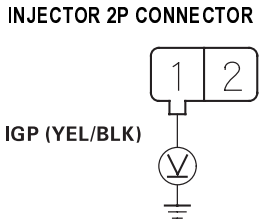
46. Disconnect the injector 2P connector on the problem cylinder.

47. Turn the ignition switch ON (II).

(cont'd)

DTC Troubleshooting (cont'd)

48. Measure voltage between injector 2P connector terminal No. 1 and body ground.



Wire side of female terminals

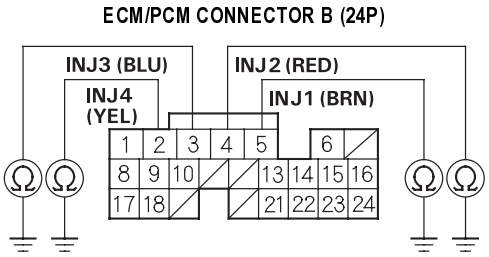
Is there battery voltage?

Yes Go to step 49.

No Repair open in the wire between the injector and the PGM-FI main relay.■

49. Turn the ignition switch OFF.

50. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).



Wire side of female terminals

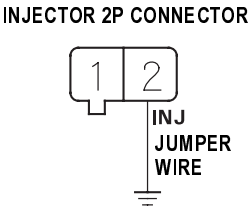
PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	B5	BRN
No. 2	P0302	B4	RED
No. 3	P0303	B3	BLU
No. 4	P0304	B2	YEL

Is there continuity?

Yes Repair short in the wire between the ECM/PCM and the injector.■

No Go to step 51.

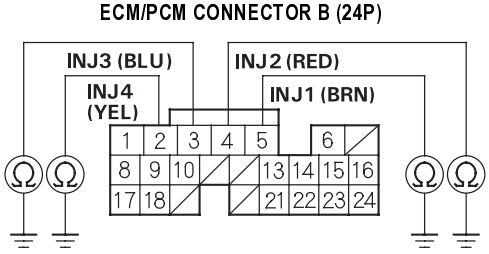
51. Connect the appropriate injector 2P connector terminal No. 2 to body ground with a jumper wire (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	P0301	BRN
No. 2	P0302	RED
No. 3	P0303	BLU
No. 4	P0304	YEL

52. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	B5	BRN
No. 2	P0302	B4	RED
No. 3	P0303	B3	BLU
No. 4	P0304	B2	YEL

Is there continuity?

Yes Replace the injector, then recheck.■

No Repair open in the wire between the ECM/PCM and the injector.■

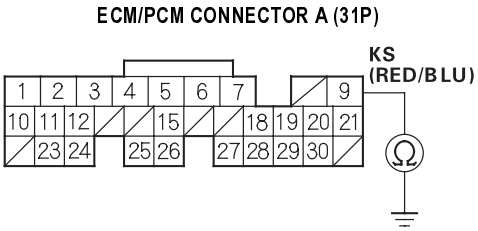
DTC P0325 (23-1): Malfunction in Knock Sensor Circuit

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Hold the engine at 3,000 - 4,000 rpm (min^{-1}) for at least 60 seconds.

   Is DTC P0325 indicated?

   Yes Go to step 4.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the knock sensor and at the ECM/PCM.
4. Turn the ignition switch OFF.
5. Disconnect the starter sub-harness 6P connector.
6. Check for continuity between ECM/PCM connector terminal A9 and body ground.



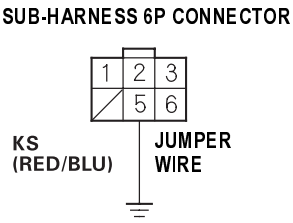
Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A9) and the starter sub-harness 6P connector.■

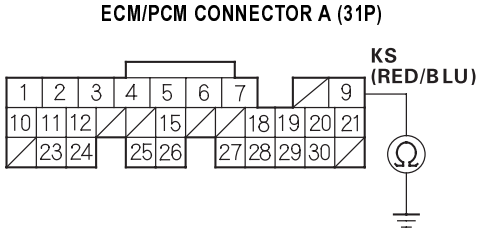
No Go to step 7.

7. Connect starter sub-harness 6P connector terminal No. 5 to body ground with a jumper wire.



Wire side of female terminals

8. Check for continuity between body ground and ECM/PCM connector terminal A9.



Wire side of female terminals

Is there continuity?

Yes Go to step 9.

No Repair open in the wire between the ECM/PCM (A9) and the starter sub-harness 6P connector.■

9. Check the starter sub-harness between 6P connector and the knock sensor for an open or short. If it's OK, substitute a known-good knock sensor and recheck.

   Is DTC P0325 indicated?

   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

   No Replace the original knock sensor and/or starter sub-harness.■

(cont'd)

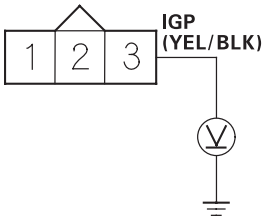
DTC Troubleshooting (cont'd)

DTC P0335 (4-1): CKP Sensor No Signal

DTC P0336 (4-2): CKP Sensor Intermittent Interruption

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.
   Is DTC P0335 and/or P0336 indicated?
   Yes Go to step 3.
   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the CKP sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the CKP sensor 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between CKP sensor 3P connector terminal No. 3 and body ground.

CKP SENSOR 3P CONNECTOR



Wire side of female terminals

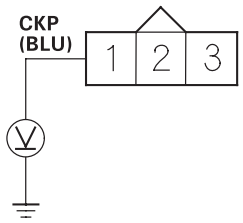
Is there battery voltage?

Yes Go to step 7.

No Repair open in the wire between the PGM-FI main relay 1 and the CKP sensor.■

7. Measure voltage between CKP sensor 3P connector terminal No. 1 and body ground.

CKP SENSOR 3P CONNECTOR



Wire side of female terminals

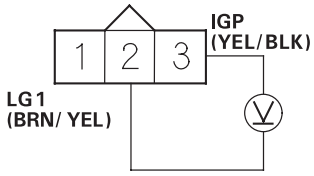
Is there about 5 V?

Yes Go to step 8.

No Go to step 10.

8. Measure voltage between CKP sensor 3P connector terminals No. 2 and No. 3.

CKP SENSOR 3P CONNECTOR



Wire side of female terminals

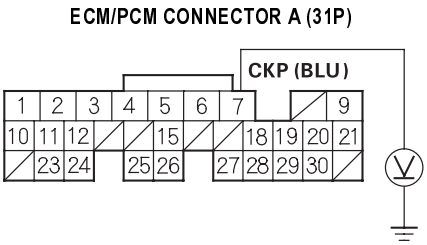
Is there battery voltage?

Yes Go to step 9.

No Repair open in the BRN/YEL wire between the CKP sensor and G101.■

9. Substitute a known-good CKP sensor and recheck.
   Is DTC P0335 and/or P0336 indicated?
   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■
   No Replace the original CKP sensor.■

10. Measure voltage between ECM/PCM connector terminal A7 and body ground.



Wire side of female terminals

Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (A7) and the CKP sensor.■

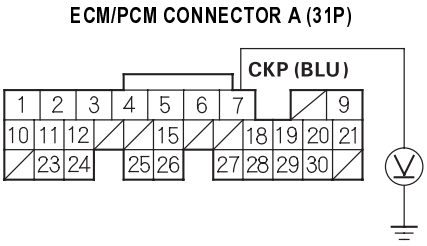
No Go to step 11.

11. Turn the ignition switch OFF.

12. Disconnect the negative cable from the battery.

13. Disconnect ECM/PCM connector A (31P).

14. Check for continuity between ECM/PCM connector terminal A7 and body ground.



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A7) and the CKP sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0500 (17-1): VSS Circuit Malfunction

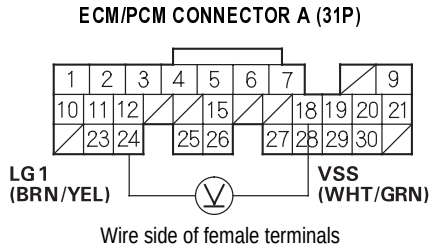
DTC P0501 (17-2): VSS Range/Performance Problem

1. Test-drive the vehicle.
2. Check the vehicle speed with the scan tool.

   Is the correct speed indicated?

   Yes Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the VSS and at the ECM.■

   No Go to step 3.
3. Turn the ignition switch OFF.
4. Block the rear wheels and set the parking brake.
5. Raise the front of the vehicle, and make sure it is securely supported.
6. Turn the ignition switch ON (II).
7. Block the right front wheel, and slowly rotate the left front wheel.
8. Measure voltage between ECM/PCM connector terminals A18 and A24.

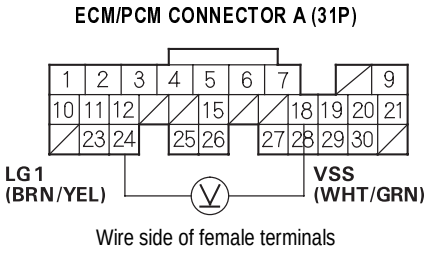


Does the voltage pulse between 0 V and 5 V or battery voltage?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

No Go to step 9.

9. Turn the ignition switch OFF.
10. Disconnect the negative cable from the battery.
11. Disconnect ECM/PCM connector A (31P).
12. Reconnect the negative cable to the battery.
13. Turn the ignition switch ON (II).
14. Block the right front wheel, and slowly rotate the left front wheel.
15. Measure voltage between ECM/PCM connector terminals A18 and A24.



Does the voltage pulse between 0 V and 5 V or battery voltage?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

No Check these items:

- A short or an open in the wire between the ECM/ PCM (A18) and the VSS.
- If the wire is OK, test the VSS (see page 22A-75).

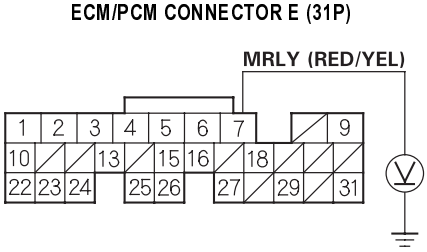
DTC P0563 (34-2): ECM/PCM Power Source Circuit Unexpected Voltage

1. Reset the ECM/PCM (see page 11-4).
2. Turn the ignition switch OFF.
3. Wait 5 seconds.
4. Turn the ignition switch ON (II).

   Is DTC P0563 indicated?

   Yes Go to step 5.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the No. 6 ECU (ECM/PCM) (15A) fuse in the under-hood fuse/relay box and at the ECM/PCM.■
5. Turn the ignition switch OFF.
6. Disconnect the negative cable from the battery.
7. Disconnect ECM/PCM connector E (31P).
8. Reconnect the negative cable to the battery.
9. Measure voltage between ECM/PCM connector terminal E7 and body ground.



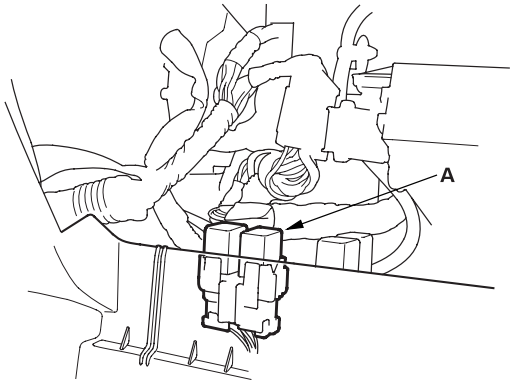
Wire side of female terminals

Is there battery voltage?

Yes Go to step 13.

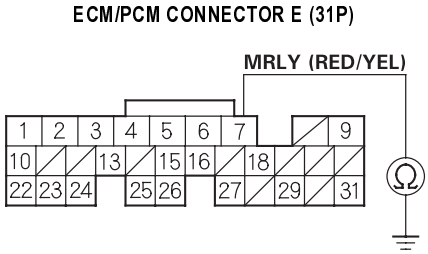
No Go to step 10.

10. Remove the glove box (see page 20-95).
11. Remove the PGM-FI main relay 1 (A).



*: The illustration shows LHD model.

12. Check for continuity between ECM/PCM connector terminal E7 and body ground.



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (E7) and the PGM-FI main relay 1.■

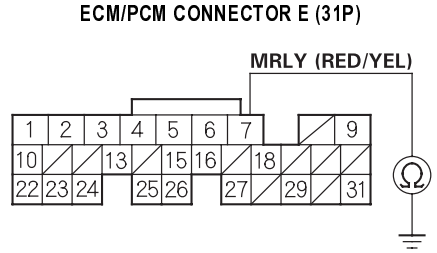
No Replace the PGM-FI main relay 1.

13. Disconnect the negative cable from the battery.
14. Reconnect ECM/PCM connector E (31P).
15. Reconnect the negative cable to the battery.

(cont'd)

DTC Troubleshooting (cont'd)

16. Measure voltage between ECM/PCM connector terminal E7 and body ground.



Wire side of female terminals

Is there battery voltage?

Yes Go to step 18.

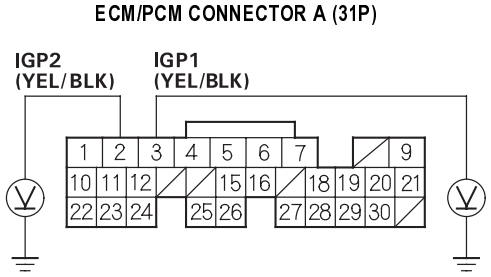
No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

17. Disconnect the negative cable from the battery.

18. Disconnect ECM/PCM connector A (31P).

19. Reconnect the negative cable to the battery.

20. Measure voltage between body ground and ECM/PCM connector terminals A3 and A2 individually.



Wire side of female terminals

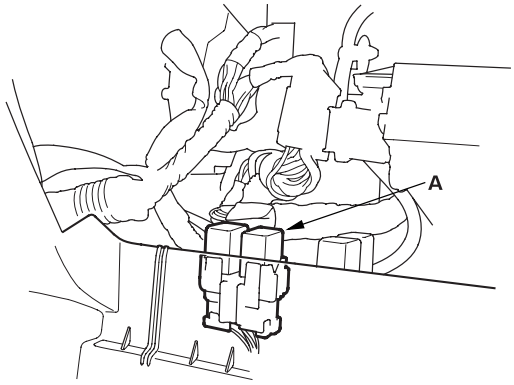
Is there battery voltage?

Yes Go to step 21.

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

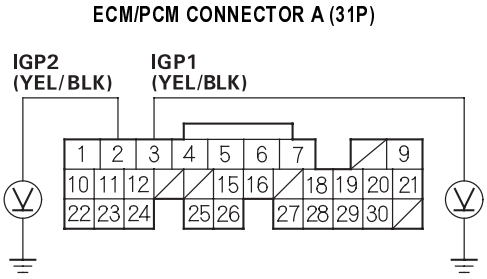
21. Remove the glove box (see page 20-95).

22. Remove the PGM-FI main relay 1 (A).



*: The illustration shows LHD model.

23. Measure voltage between body ground and ECM/PCM connector terminals A3 and A2 individually.



Wire side of female terminals

Is there battery voltage?

Yes Repair short to power in the wire between the ECM/PCM (A2, A3) and the PGM-FI main relay 1.■

No Replace the PGM-FI main relay 1.■

DTC P1107 (13-1): BARO Sensor Circuit Low Voltage

DTC P1108 (13-2): BARO Sensor Circuit High Voltage

1. Reset the ECM/PCM (see page 11-4).
2. Turn the ignition switch ON (II).

   Is DTC P1107 or P1108 indicated?

   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

   No Intermittent failure, system is OK at this time.■

(cont'd)

DTC Troubleshooting (cont'd)

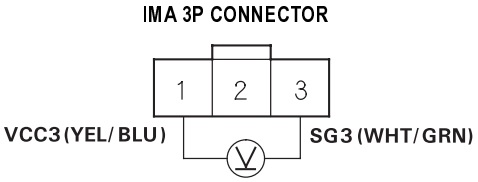
DTC P1213 (11-1): IMA Circuit Low Voltage

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine, then let it idle for more than 5 seconds.

   Is DTC P1213 indicated?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IMA and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the IMA 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between IMA 3P connector terminals No. 1 and No. 3.

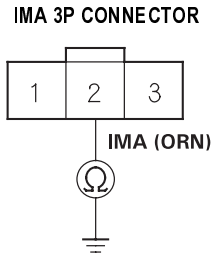


Wire side of female terminals

   Is there about 5 V?

   Yes Go to step 7.

   No Go to step 15.
7. Turn the ignition switch OFF.
8. Disconnect the negative cable from the battery.
9. Disconnect ECM/PCM connector E (31P).
10. At the wire harness side, check for continuity between IMA 3P connector terminal No. 2 and body ground.



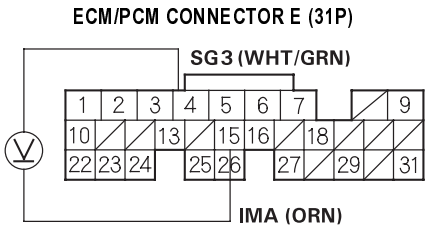
Wire side of female terminals

   Is there continuity?

   Yes Repair short in the wire between the ECM/PCM (E15) and the IMA.■

   No Go to step 11.
11. Reconnect the IMA 3P connector and ECM/PCM connector E (31P).
12. Reconnect the negative cable to the battery.
13. Turn the ignition switch ON (II).

14. Measure voltage between ECM/PCM connector terminals E4 and E15.



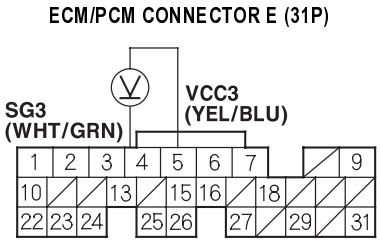
Wire side of female terminals

Is there about 0.5 - 4.5 V?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

No Replace the IMA.■

15. Measure voltage between ECM/PCM connector terminals E4 and E5.



Wire side of female terminals

Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (E5) and the IMA.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

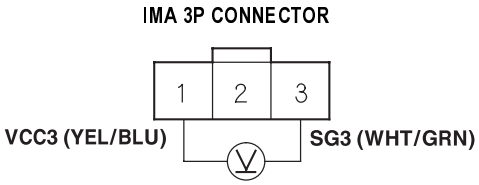
DTC P1214 (11-2): IMA Circuit High Voltage

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine, then let it idle for more than 5 seconds.

   Is DTC P1214 indicated?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IMA and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the IMA 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between IMA 3P connector terminals No. 1 and No. 3.



Wire side of female terminals

Is there about 5 V?

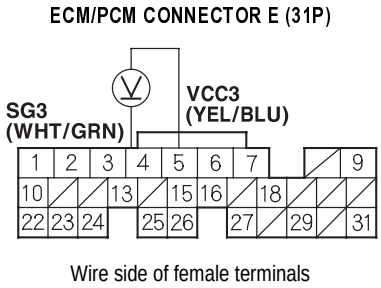
Yes Go to step 8.

No Go to step 7.

(cont'd)

DTC Troubleshooting (cont'd)

7. Measure voltage between ECM/PCM connector terminals E4 and E5.



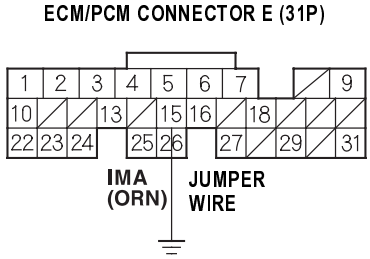
Wire side of female terminals

Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (E4) and the IMA.■

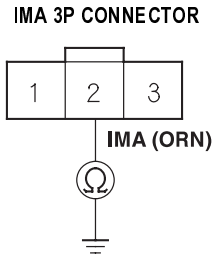
No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

8. Connect ECM/PCM connector terminal E15 and body ground with a jumper wire.



Wire side of female terminals

9. At the wire harness side, check for continuity between IMA 3P connector terminals No. 2 and body ground.



Wire side of female terminals

Is there continuity?

Yes Replace the IMA.■

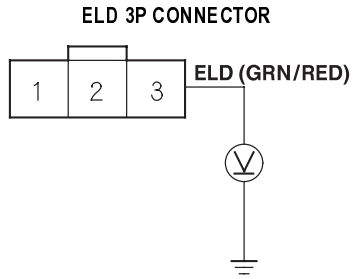
No Repair open in the wire between the ECM/PCM (E15) and the IMA.■

DTC P1297 (20-1): ELD Circuit Low Voltage

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.
3. Turn on the headlights.
   Is DTC P1297 indicated?

   Yes Go to step 4.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ELD and at the ECM/PCM.■
4. Turn the ignition switch and the headlights OFF.
5. Disconnect the ELD 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between body ground and ELD 3P connector terminal No. 3.



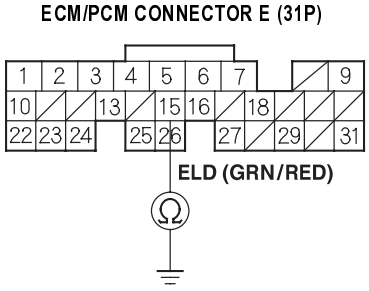
Wire side of female terminals

Is there about 5 V?

Yes Replace the ELD.■

No Go to step 8.

8. Turn the ignition switch OFF.
9. Disconnect the negative cable from the battery.
10. Disconnect ECM/PCM connector E (31P).
11. Check for continuity between body ground and ECM/PCM connector terminal E15.



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (E15) and the ELD.■

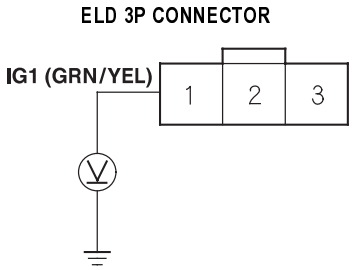
No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P1298 (20-2): ELD Circuit High Voltage

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.
3. Turn on the headlights.
   Is DTC P1298 indicated?
   Yes Go to step 4.
   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ELD and at the ECM/PCM.■
4. Turn the ignition switch and headlights OFF.
5. Disconnect the ELD 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between body ground and ELD 3P connector terminal No. 1.



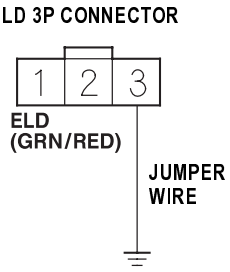
Wire side of female terminals

Is there battery voltage?

Yes Go to step 8.

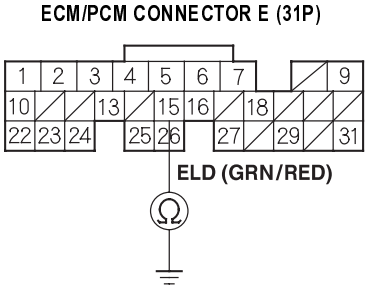
No Check the No. 4 ACG (10A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the No. 4 ACG (10A) fuse and the ELD.■

8. Turn the ignition switch OFF.
9. Connect ELD 3P connector terminal No. 3 to body ground with a jumper wire.



Wire side of female terminals

10. Disconnect ECM/PCM connector E (31P).
11. Disconnect the negative cable from the battery.
12. Check for continuity between body ground and ECM/PCM connector terminal E15.



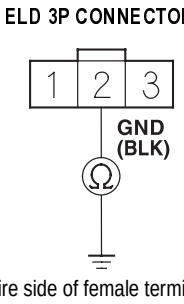
Wire side of female terminals

Is there continuity?

Yes Go to step 13.

No Repair open in the wire between the ECM/PCM (E15) and the ELD.

13. Check for continuity between ELD 3P connector terminal No. 2 and body ground.



Is there continuity?

Yes Go to step 14.

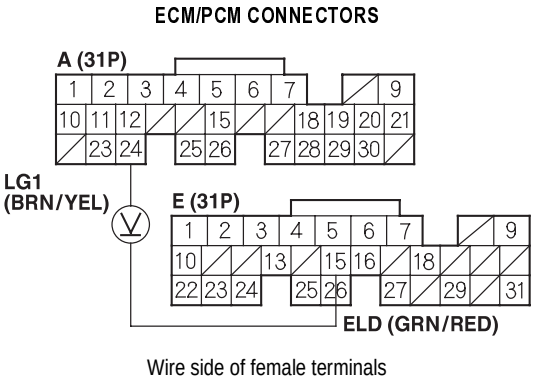
No Repair open in the wire between ELD and G201.■

14. Reconnect the ELD 3P connector and ECM/PCM connector E (31P).

15. Reconnect the negative cable to the battery.

16. Start the engine and let it idle.

17. While measuring voltage between ECM/PCM connector terminals A24 and E15, turn the headlights on (high).



Does the voltage drop?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

No Replace the ELD.■

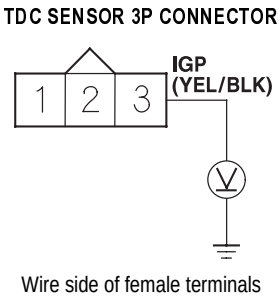
(cont'd)

DTC Troubleshooting (cont'd)

DTC P1361 (8-2): TDC Sensor Intermittent Interruption

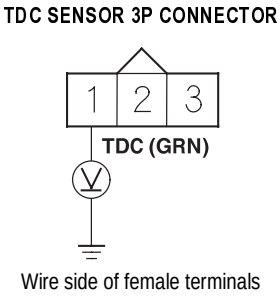
DTC P1362 (8-1): TDC Sensor No Signal

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.
   Is DTC P1361 and/or P1362 indicated?
   Yes Go to step 3.
   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TDC sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the TDC sensor 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between TDC sensor 3P connector terminal No. 3 and body ground.



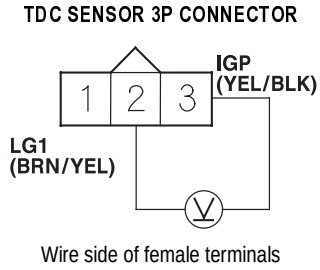
Is there battery voltage?
Yes Go to step 7.
No Repair open in the wire between the PGM-FI main relay 1 and the TDC sensor.■

7. Measure voltage between TDC sensor 3P connector terminal No. 1 and body ground.



Is there about 5 V?
Yes Go to step 8.
No Go to step 10.

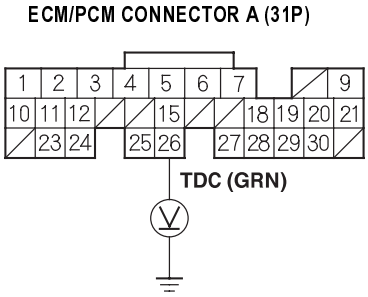
8. Measure voltage between TDC sensor 3P connector terminals No. 2 and No. 3.



Is there battery voltage?
Yes Go to step 9.
No Repair open in the BRN/YEL wire between the TDC sensor and G101.■

9. Substitute a known-good TDC sensor and recheck.
   Is DTC P1361 and/or P1362 indicated?
   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■
   No Replace the original TDC sensor.■

10. Measure voltage between ECM/PCM connector terminal A26 and body ground.

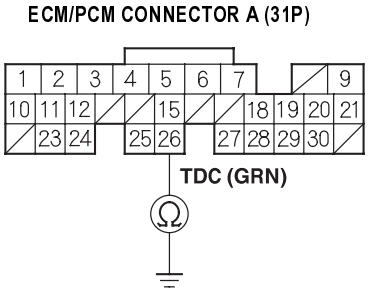


Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (A26) and TDC sensor.■

No Go to step 11.

11. Turn the ignition switch OFF.
12. Disconnect the negative cable from the battery.
13. Disconnect ECM/PCM connector A (31P).
14. Check for continuity between ECM/PCM connector terminal A26 and body ground.



Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A26) and the TDC sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

DTC P1607 (0-2): Malfunction in ECM/PCM Internal Circuit

1. Reset the ECM/PCM (see page 11-4).
2. Turn the ignition switch ON (II).
3. Wait 40 seconds.

Is DTC P1607 indicated?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

No Intermittent failure, system is OK at this time.■

MIL Circuit Troubleshooting

1. Connect a scan tool/Honda PGM Tester (see page 11-3).
2. Turn the ignition switch ON (II) and read the scan tool/Honda PGM Tester.

   Does the the scan tool/Honda PGM Tester communicate with the ECM/PCM?

   Yes Go to step 3.

   No Go to troubleshooting ”DLC circuit” (see page 11-114).
3. Check the scan tool/Honda PGM Tester for DTCs.

   Are any DTCs indicated?

   Yes Go to the DTC Troubleshooting Index.

   No Go to step 4.
4. Turn the ignition switch OFF.
5. Turn the ignition switch ON (II) and watch the Malfunction Indicator Lamp (MIL).

   Does the MIL come on and stay on?

   Yes If the MIL always come on and stays on, go to step 77. But if the MIL sometimes works normally, first check for these problems:

   - An intermittent short in the wire between the ECM/PCM (E29) and the Data Link Connector (DLC).
   - An intermittent short in the wire between the ECM/PCM (E31) and the gauge assembly.

   No If the MIL is always off, go to step 6. But if the MIL sometimes works normally, first check for these problems:

   - A loose No. 10 METER (7.5A) fuse in the under-dash fuse/relay box.
   - A loose No. 20 IG (50A) fuse in the under-hood fuse/relay box.
   - A loose No. 6 ECU (ECM/PCM) (15A) fuse in the under-hood fuse/relay box.
   - A loose No. 17 FUEL PUMP (15A) fuse in the under-dash fuse/relay box.
   - A poor connection at ECM/PCM terminal E31.
   - An intermittent open in the GRN/WHT wire between the ECM/PCM (E31) and the gauge assembly.
   - An intermittent short in the wire between the ECM/PCM (A21) and the manifold absolute pressure (MAP) sensor, countershaft speed sensor (A/T).
   - An intermittent short in the wire between the ECM/PCM (A20) and the throttle position (TP) sensor, mainshaft speed sensor (A/T).
   - An intermittent short in the wire between the ECM/PCM (E5) and the idle mixture adjuster (IMA) (without TWC).

6. KG, KS, KE, KR models:
Turn the ignition switch OFF and press the inertia switch button.

7. KG, KS, KE, KR models:
Turn the ignition switch ON (II).

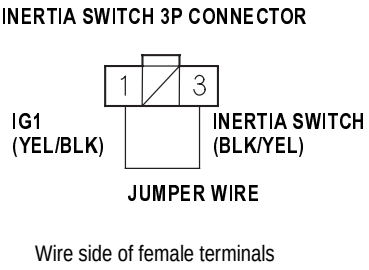
Does the MIL come on for 2 seconds after the ignition switch is turned ON (II)?

Yes Intermittent failure system is OK at this time.■

No Go to step 8.

8. KG, KS, KE, KR models:
Turn the ignition switch OFF and disconnect the inertia switch 3P connector.

9. KG, KS, KE, KR models:
Connect inertia switch 3P connector terminals No. 1 and No. 3 with a jumper wire.



10. KG, KS, KE, KR models:
Turn the ignition switch ON(II).

Does the MIL come on for 2 seconds after the ignition switch is turned ON (II)?

Yes Replace the inertia switch.■

No Go to step 11.

11. Turn the ignition switch OFF.

12. Turn the ignition switch ON(II).

Is the low oil pressure light on?

Yes Go to step 15.

No Go to step 13.

13. Inspect the No. 10 METER (7.5A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

Yes Go to step 14.

No Repair short in the wire between No. 10 METER (7.5A) fuse and the gauge assembly. Also replace the No. 10 METER (7.5A) fuse.■

14. Inspect the No. 20 IG1 (50A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

Yes Repair open in the wire between the No. 20 IG (50A) fuse and the gauge assembly. If the wires are OK, test the ignition switch (see page 22A-63).■

No Repair short in the wire between the No. 20 IG (50A) fuse and the under-hood fuse/relay box. Also replace the No. 20 IG (50A) fuse.■

15. Try to start the engine.

Does the engine start?

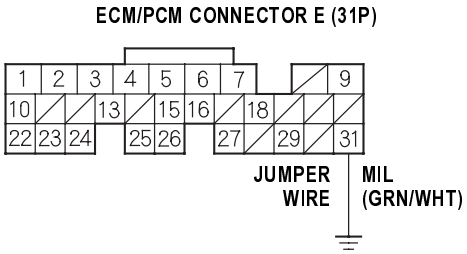
Yes Go to step 16.

No Go to step 18.

(cont'd)

MIL Circuit Troubleshooting (cont'd)

16. Turn the ignition switch OFF. Connect ECM/PCM connector terminal E31 to body ground with a jumper wire.



Wire side of female terminals

17. Turn the ignition switch ON (II).

Is the MIL on?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away, replace the original ECM/PCM.■

No Check for an open in the wires between the ECM/PCM (E31) and the gauge assembly. Also check for a blown MIL bulb. If the wires and the bulb are OK, replace the gauge assembly.■

18. Turn the ignition switch OFF.

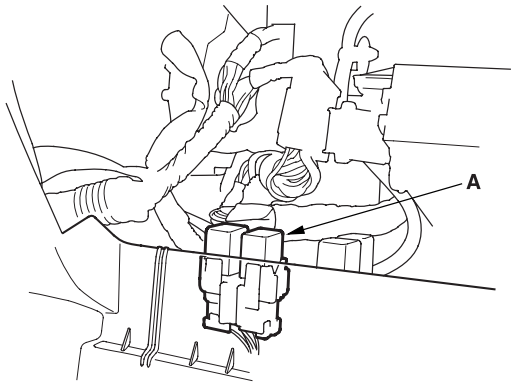
19. Remove and inspect the No. 6 ECU (ECM/PCM) (15A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

Yes Go to step 25.

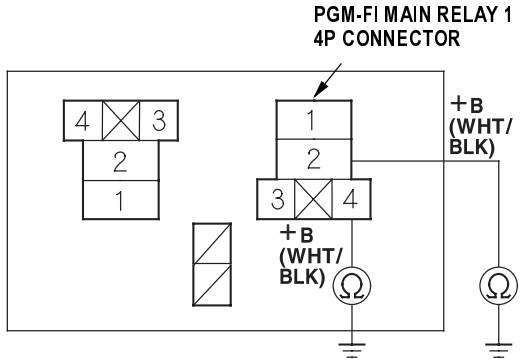
No Go to step 20.

20. Remove the glove box (see page 20-95), PGM-FI main relay 1 (A).



*: The illustration shows LHD model.

21. Check for continuity between body ground and PGM-FI main relay 1 4P connector terminals No. 2 and No. 4 individually.



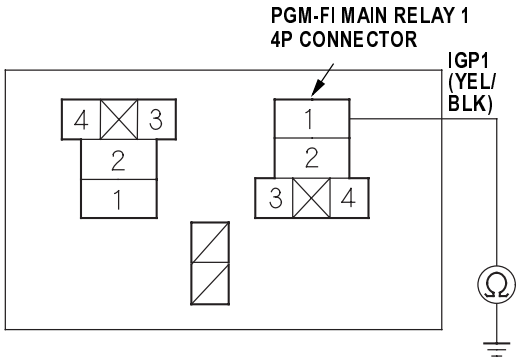
Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the No. 6 ECU (ECM/PCM) (15A) fuse and the PGM-FI main relay 1. Also replace the No. 6 ECU (ECM/PCM) (15A) fuse.■

No Go to step 22.

22. Disconnect each of the component or the connector sensors below, one at a time, and check for continuity between the PGM-FI main relay 1 4P connector terminal No. 1 and body ground.
- PGM-FI main relay 2
- ECM/PCM connector A (31P)
- Each injector 2P connector
- Idle air control (IAC) valve 3P connector
- Top dead center (TDC) sensor 2P connector
- Crankshaft position (CKP) sensor 3P connector



Wire side of female terminals

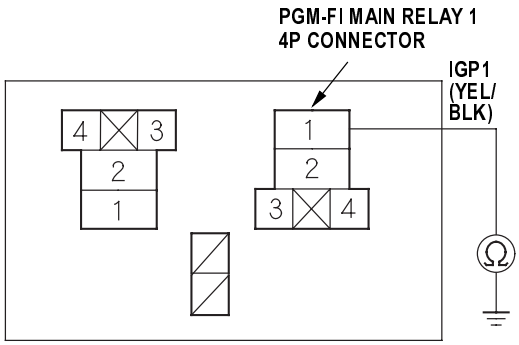
Is there continuity?

Yes Go to step 23.

No Replace the item that made continuity to body ground go away when disconnected. If the item is the ECM/PCM, substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM. Also replace the No. 6 ECU (ECM/PCM) (15A) fuse.■

23. Disconnected the connectors of all following items.
- PGM-FI main relay 2
- ECM/PCM connector A (31P)
- Injectors
- Idle air control (IAC) valve
- Top dead center (TDC) sensor
- Crankshaft position (CKP) sensor

24. Check for continuity between PGM-FI main relay 1 4P connector terminals No. 1 and body ground.



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between PGM-FI main relay 1 and each item. Also replace the No. 6 ECU (ECM/PCM) (15A) fuse.■

No Replace the PGM-FI main relay 1. Also replace the No. 6 ECU (ECM/PCM) (15A) fuse.■

25. Remove and inspect the No. 17 FUEL PUMP (15A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

Yes Go to step 36.

No Go to step 26.

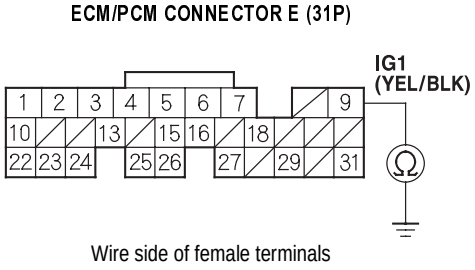
26. Disconnect the negative cable from the battery.

27. Disconnect ECM/PCM connector E (31P).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

28. Check for continuity between ECM/PCM connector terminal E9 and body ground.



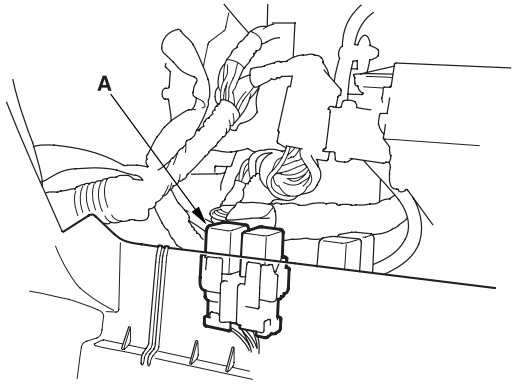
Wire side of female terminals

Is there continuity?

Yes Go to step 29.

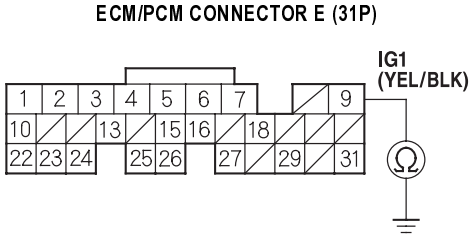
No Replace the No. 17 FUEL PUMP (15A) fuse, and substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away, replace the original ECM/PCM.■

29. Remove the glove box (see page 20-95), PGM-FI main relay 2 (A).



*: The illustration shows LHD model

30. Check for continuity between ECM/PCM connector terminal E9 and body ground.



Wire side of female terminals

Is there continuity?

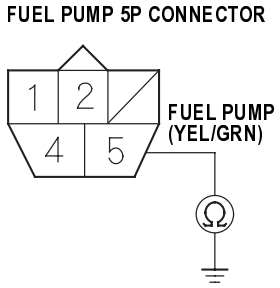
Yes Repair short in the wire between the No. 17 FUEL PUMP (15A) fuse and the ECM/PCM (E9), or the No. 17 FUEL PUMP (15A) fuse and the PGM-FI main relay 2. Also replace the No. 17 FUEL PUMP (15A) fuse.■

No Go to step 31.

31. Fold the rear seats forward, and pull back the carpet to expose the access panel.

32. Remove the access panel from the floor. Disconnect the fuel pump 5P connector.

33. Check for continuity between fuel pump 5P connector terminal No. 5 and body ground.



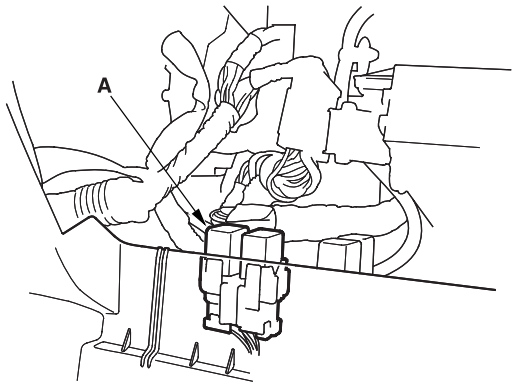
Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the fuel pump and the PGM-FI main relay 2. Also replace the No. 17 FUEL PUMP (15A) fuse.■

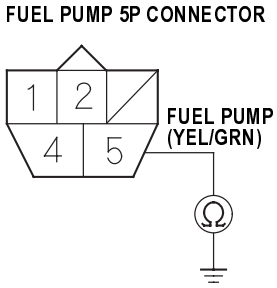
No Go to step 34.

34. Reinstall PGM-FI main relay 2 (A).



*: The illustration shows LHD model

35. Check for continuity between fuel pump 5P connector terminal No. 5 and body ground.



Wire side of female terminals

Is there continuity?

Yes Replace PGM-FI main relay 2. Also replace the No. 17 FUEL PUMP (15A) fuse.■

No Check the fuel pump, and replace it if necessary. Also replace the No. 17 FUEL PUMP (15A) fuse.■

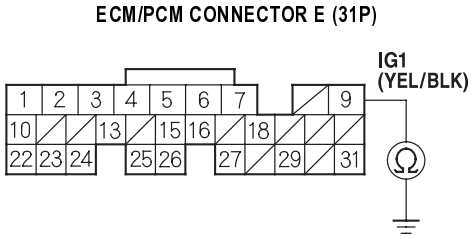
36. Disconnect the negative cable from the battery.

37. Disconnect ECM/PCM connector E (31P).

38. Reconnect the negative cable to the battery.

39. Turn the ignition switch ON (II).

40. Measure voltage between ECM/PCM connector terminals E9 and body ground.



Wire side of female terminals

Is there battery voltage?

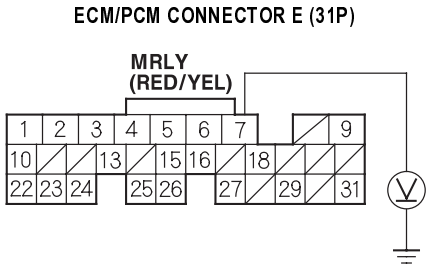
Yes Go to step 41.

No Repair open in the wire between the No. 17 FUEL PUMP (15A) fuse and the ECM/PCM (E9).■

(cont'd)

MIL Circuit Troubleshooting (cont'd)

41. Measure voltage between ECM/PCM connector terminal E7 and body ground.



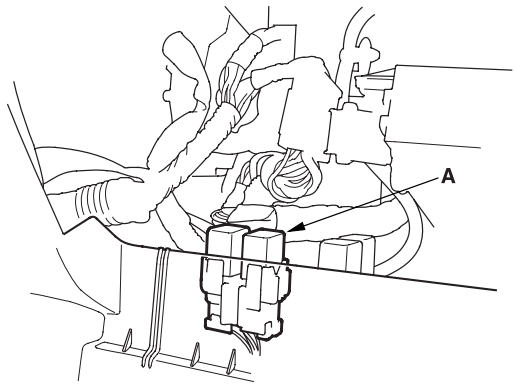
Wire side of female terminals

Is there battery voltage?

Yes Go to step 45.

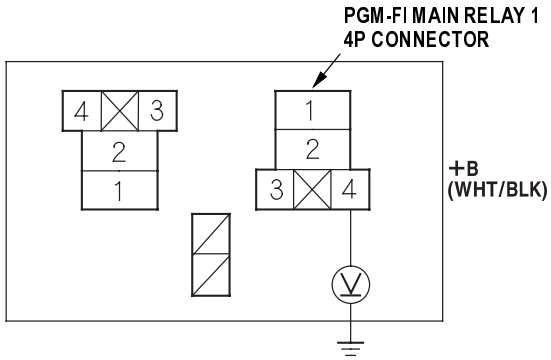
No Go to step 42.

42. Turn the ignition switch OFF and remove PGM-FI main relay 1 (A).



*: The illustration shows LHD model.

43. Measure voltage between PGM-FI main relay 1 4P connector terminal No. 4 and body ground.



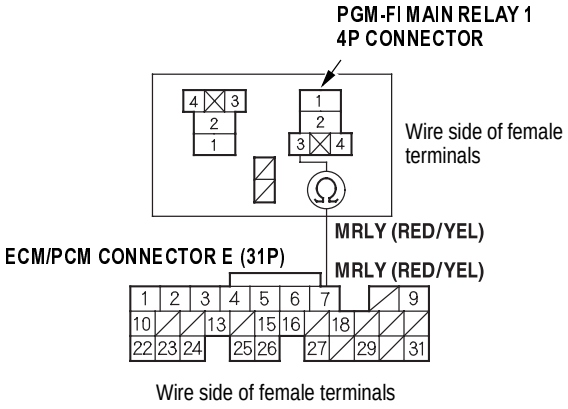
Wire side of female terminals

Is there battery voltage?

Yes Go to step 44.

No Repair open in the wire between the No. 6 ECU (ECM/PCM) (15A) fuse and PGM-FI main relay 1.■

44. Check for continuity between PGM-FI main relay 1 4P connector terminal No. 3 and ECM/PCM connector terminal E7.



Wire side of female terminals

Is there continuity?

Yes Test PGM-FI main relay 1 (see page 22A-60). If the relay is OK, substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between PGM-FI main relay 1 and the ECM/PCM (E7).■

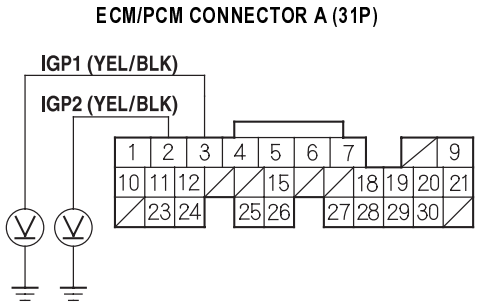
45. Disconnect the negative cable from the battery.

46. Reconnect ECM/PCM connector E (31P).

47. Reconnect the negative cable to the battery.

48. Turn the ignition switch ON (II).

49. Measure voltage between body ground and ECM/PCM connector terminals A2 and A3 individually.

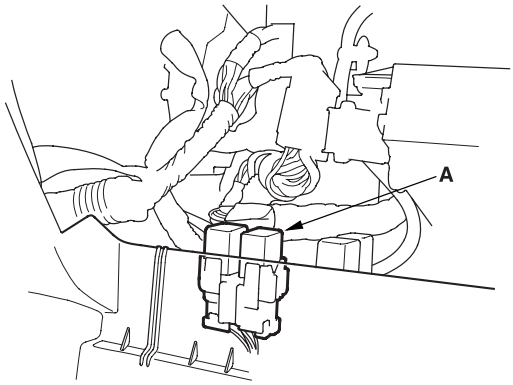


Is there battery voltage?

Yes Go to step 55.

No Go to step 50.

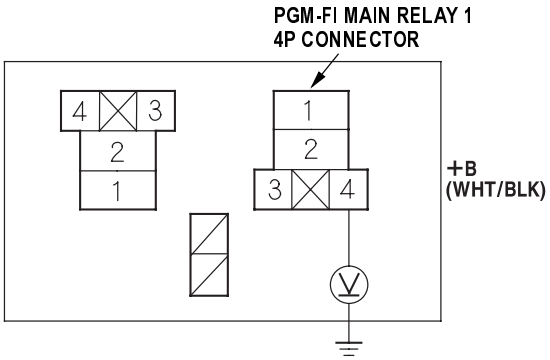
50. Turn the ignition switch OFF and remove PGM-FI main relay 1 (A).



*: The illustration shows LHD model

51. Turn the ignition switch ON (II).

52. Measure voltage between PGM-FI main relay 1 4P connector terminal No. 2 and body ground.



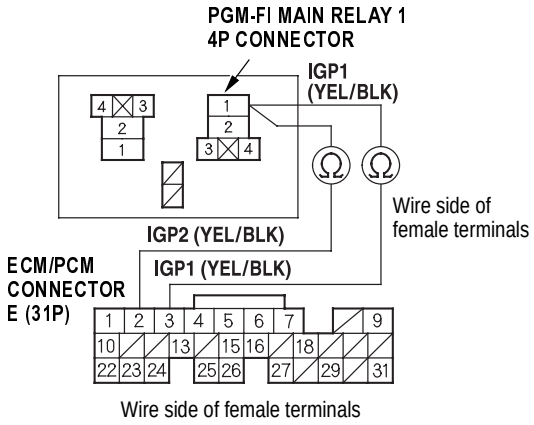
Is there battery voltage?

Yes Go to step 53.

No Repair open in the wire between the No. 6 ECU (ECM/PCM) (15A) fuse and PGM-FI main relay 1.■

53. Turn the ignition switch OFF.

54. Check for continuity between PGM-FI main relay 1 4P connector terminal No. 1 and ECM/PCM connector terminals A2 and A3 individually.



Is there continuity?

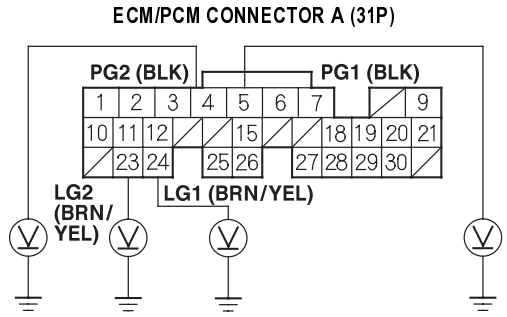
Yes Replace the PGM-FI main relay 1.■

No Repair open in the wire between PGM-FI main relay 1 and the ECM/PCM (A2, A3).■

(cont'd)

MIL Circuit Troubleshooting (cont'd)

55. Measure voltage between body ground and ECM/PCM connector terminals A4, A5, A23 and A24 individually.



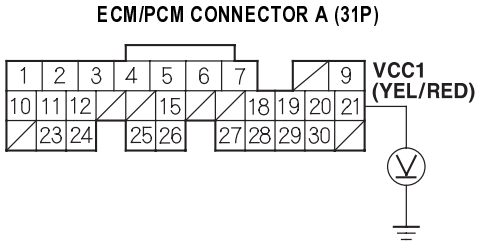
Wire side of female terminals

Is there less than 0.2 V?

Yes Repair open in the wire(s) that had more than 0.2 V between G101 and ECM/PCM (A4, A5, A23, A24).■

No Go to step 56.

56. Measure voltage between body ground and ECM/PCM connector terminals A21.



Wire side of female terminals

Is there about 5 V?

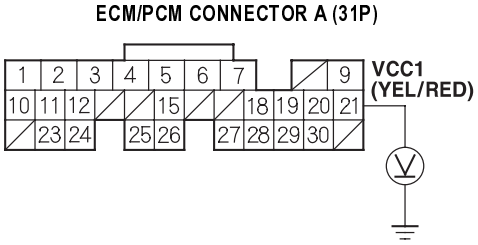
Yes Go to step 63.

No Go to step 57.

57. Turn the ignition switch OFF.

58. Disconnect the 3P connector from each of these sensors, one at a time, and measure voltage between body ground and ECM/PCM connector terminal A21 with the ignition switch ON (II).

- Manifold absolute pressure (MAP) sensor
- Countershaft speed sensor (A/T)



Wire side of female terminals

Is there about 5 V?

Yes Replace the sensor that restored 5 V when disconnected.■

No Go to step 59.

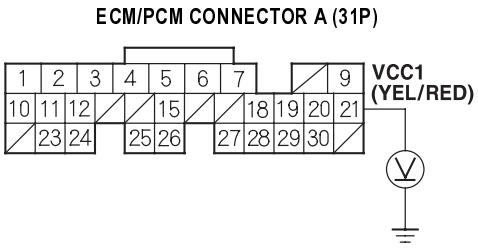
59. Turn the ignition switch OFF and disconnect the negative cable from the battery.

60. Disconnect the 3P connectors from the following sensors.

- Manifold absolute pressure (MAP) sensor
- Countershaft speed sensor (A/T)

61. Disconnect ECM/PCM connector A (31P).

62. Check for continuity between ECM/PCM connector terminal A21 and body ground.



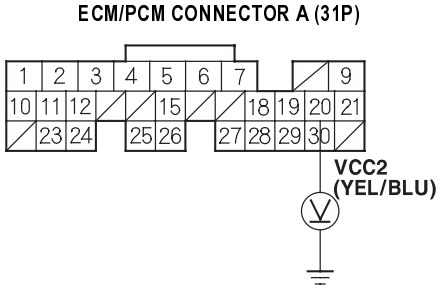
Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between ECM/PCM (A21) and the MAP sensor, countershaft speed sensor (A/T).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away, replace the original ECM/PCM.■

63. Measure voltage between body ground and ECM/ PCM connector terminals A20.



Wire side of female terminals

Is there about 5 V?

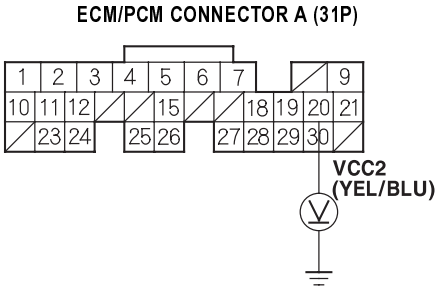
Yes Go to step 70.

No Go to step 64.

64. Turn the ignition switch OFF.

65. Disconnect the 3P connector from each of these sensors, one at a time, and measure voltage between body ground and ECM/PCM connector terminal A20 with the ignition switch ON (II).

- Throttle position (TP) sensor
- Mainshaft speed sensor (A/T)



Wire side of female terminals

Is there about 5 V?

Yes Replace the sensor that restored 5 V when disconnected.■

No Go to step 66.

66. Turn the ignition switch OFF and disconnect the negative cable from the battery.

67. Disconnect the 3P connector from the following sensors.

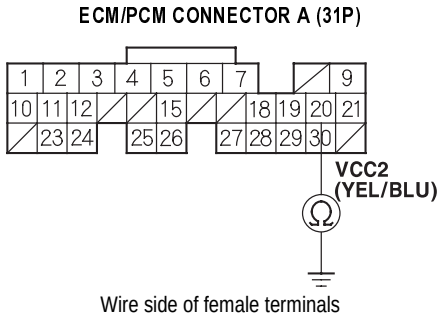
- Throttle position (TP) sensor
- Mainshaft speed sensor (A/T)

68. Disconnect ECM/PCM connector A (31P).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

69. Check for continuity between ECM/PCM connector terminal A20 and body ground.



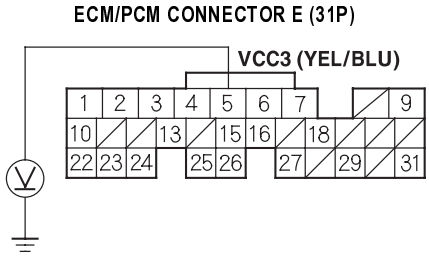
Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A20) and the TP sensor, mainshaft speed sensor (A/T).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

70. Measure voltage between body ground and ECM/PCM connector terminals E5.



Wire side of female terminals

Is there about 5 V?

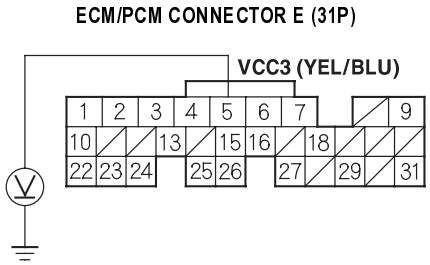
Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Go to step 71.

71. Turn the ignition switch OFF and disconnect the idle mixture adjuster (IMA) 3P connector.

72. Turn the ignition switch ON (II).

73. Measure voltage between body ground and ECM/PCM connector terminal E5.



Wire side of female terminals

Is there about 5 V?

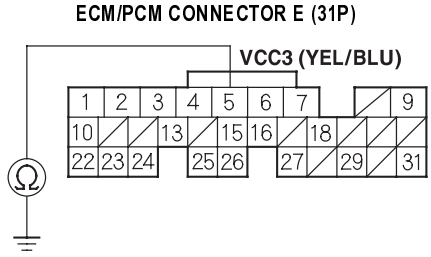
Yes Replace the IMA.■

No Go to step 74.

74. Turn the ignition switch OFF and disconnect the negative cable from the battery.

75. Disconnect ECM/PCM connector E (31P).

76. Check for continuity between ECM/PCM connector terminal E5 and body ground.



Wire side of female terminals

Is there continuity?

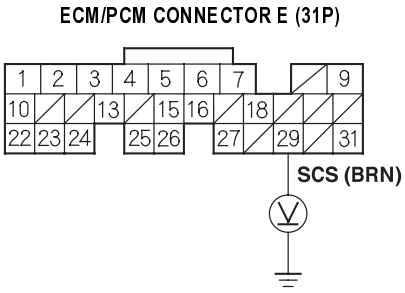
Yes Repair short in the wire between ECM/PCM (E5) and the IMA.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

77. Turn the ignition switch OFF.

78. Turn the ignition switch ON (II).

79. Measure voltage between ECM/PCM connector terminal E29 and body ground.



Is there about 5 V (or battery voltage)?

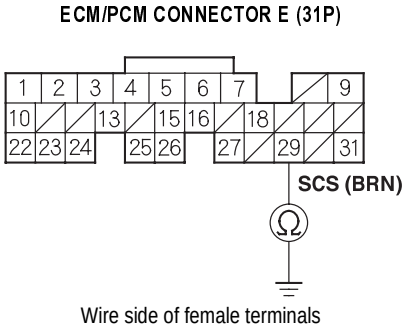
Yes Go to step 83.

No Go to step 80.

80. Turn the ignition switch OFF and disconnect the negative cable from the battery.

81. Disconnect the ECM/PCM connector E (31P).

82. Check for continuity between ECM/PCM connector terminal E29 and body ground.



Is there continuity?

Yes Repair short in the wire between the data link connector and the ECM/PCM (E29).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

83. Turn the ignition switch OFF and disconnect the negative cable from the battery.

84. Disconnect the ECM/PCM connector E (31P).

85. Reconnect the negative cable to the battery.

86. Turn the ignition ON (II).

Is the MIL ON?

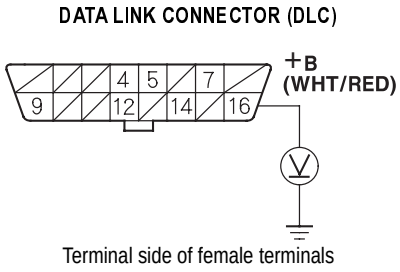
Yes Repair short in the wire between the gauge assembly and the ECM/PCM (E31). If the wires are OK, replace the gauge assembly.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

DLC Circuit Troubleshooting

1. Turn the ignition switch ON (II).

2. Measure voltage between data link connector (DLC) terminal No. 16 and body ground.

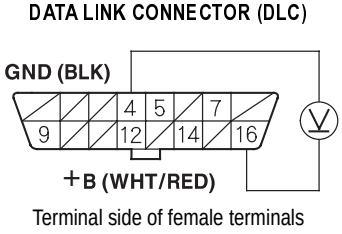


Is there battery voltage?

Yes Go to step 3.

No Repair open in the wire between DLC terminal No. 16 and the No. 9 BACK UP (10A) fuse in the under-hood fuse/relay box.■

3. Measure voltage between DLC terminals No. 4 and No. 16.

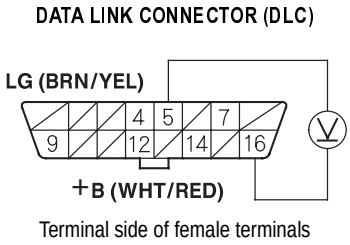


Is there battery voltage?

Yes Go to step 4.

No Repair open in the wire between DLC terminal No. 4 and body ground.■

4. Measure voltage between DLC terminals No. 5 and No. 16.

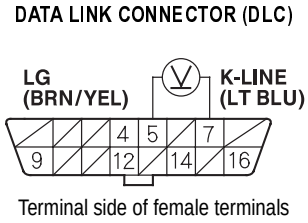


Is there battery voltage?

Yes Go to step 5.

No Repair open in the wire between DLC terminal No. 5 and the ECM/PCM (E3).■

5. Measure voltage between DLC terminals No. 5 and No. 7.



Is there 8.5 V or more?

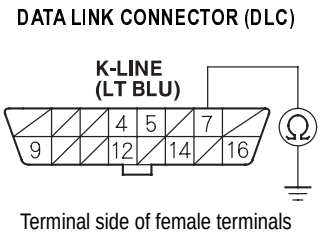
Yes Go to step 11.

No Go to step 6.

6. Turn the ignition switch OFF.

7. Disconnect the negative cable from the battery.

8. Disconnect ECM/PCM connector E (31P). Make sure the Honda PGM Tester is disconnected from the DLC.
9. Check for continuity between DLC terminal No. 7 and body ground.

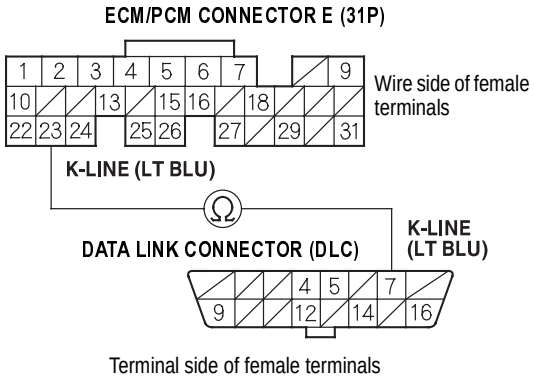


Is there continuity?

Yes Repair short to ground in the wire between DLC terminal No. 7 and the ECM/PCM (E23).■

No Go to step 10.

10. Check for continuity between DLC terminal No. 7 and ECM/PCM terminal E23.

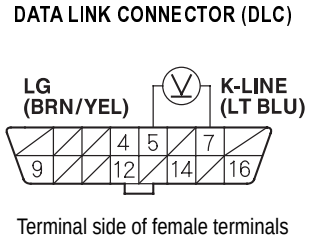


Is there continuity?

Yes Substitute a known-good ECM/PCM, and recheck (see page 11-5). If the symptom/ indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

No Repair open in the wire between DLC terminal No. 7 and the ECM/PCM (E23).■

11. Turn the ignition switch OFF.
12. Disconnect the negative cable from the battery.
13. Disconnect ECM/PCM connector E (31P). Make sure the Honda PGM Tester is disconnected from the DLC.
14. Reconnect the negative cable to the battery.
15. Turn the ignition switch ON (II).
16. Measure voltage between DLC terminals No. 5 and No. 7.



Is there 0 V?

Yes Substitute a known-good ECM/PCM, and recheck (see page 11-5). If the symptom/ indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

No Repair short to power in the wire between the DLC terminal No. 7 and the ECM/PCM (E23).■

Injector Test

NOTE: Check the following items before testing: idle speed, ignition timing and idle CO%.

1. Try to start the engine.

   Does the engine start?

   Yes Go to step 2.

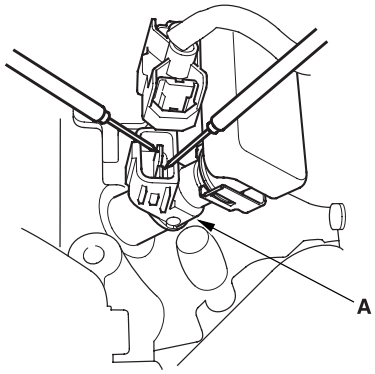
   No Go to step 6.

2. Turn the ignition switch OFF. Remove the engine cover.
3. Disconnect each injector connector individually.
4. Inspect the change in the idle speed.

   - If the idle speed drop is almost the same for each cylinder, the fuel injectors are normal.
   - If the idle speed or quality remains the same when you disconnect a particular injector, replace the injector and retest (see page 11-117).

5. Check the clicking sound of each injector by means of a stethoscope when the engine is idling.
   - If any fuel injector fails to make the typical clicking sound, check the sound again after replacing the injector (see page 11-117).
   - If clicking sound is still absent, check the following.
     – Whether there is wire breakage or poor connection in the YEL/BLK wire between the PGM-FI main relay and the junction connector.
     – Whether the junction connector is open or corroded.
     – Whether there is wire breakage or poor connection in the YEL/BLK wire between the junction connector and the injector.
     – Whether there is any short-circuiting, wire breakage or poor connection in the wire between the injector and the ECM/PCM.
   - If all is OK, the test is complete.

6. Turn the ignition switch OFF.
7. Remove the engine cover.
8. Remove the injector connector.
9. Measure the resistance between injector (A) terminals No. 1 and No. 2.



   Is there 10 - 13 Ω?

   Yes Go to step 10.

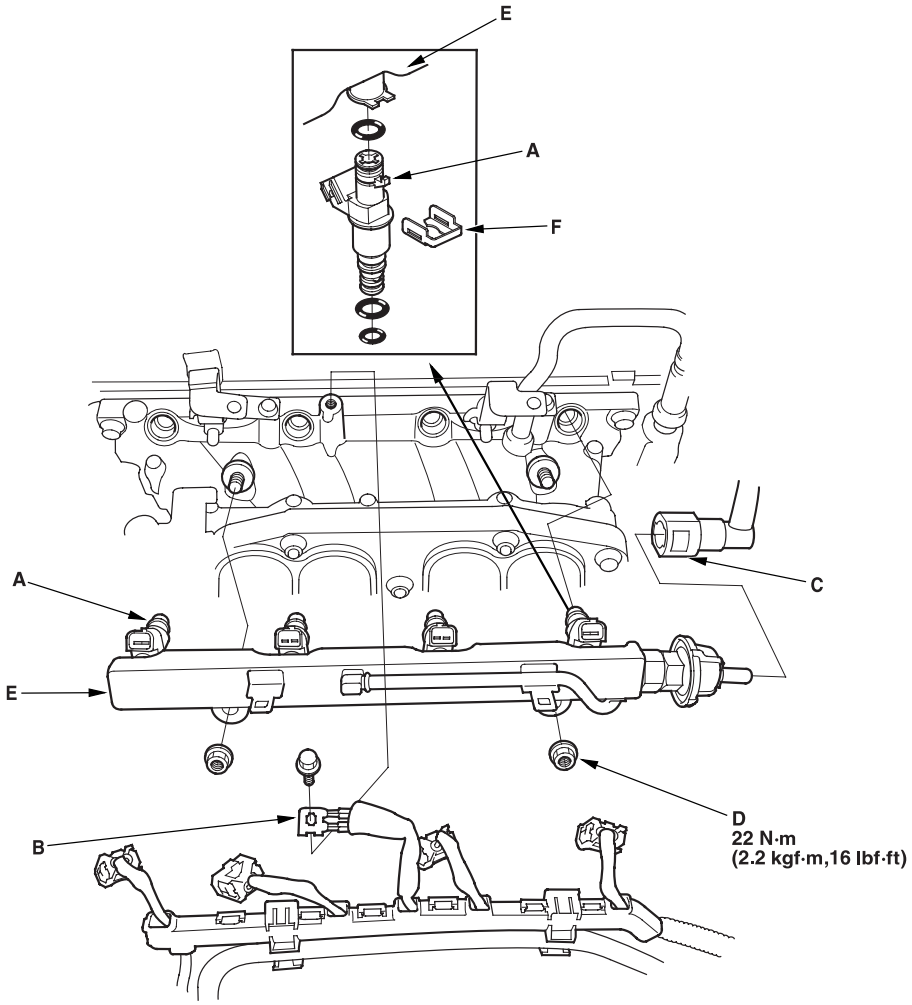
   No Replace the injector (see page 11-117).■

10. 10. Check the fuel pressure (see page 11-154).

- If the fuel pressure is as specified, check the following:
  – Whether there is wire breakage, or poor connection in the YEL/BLK wire between the PGM-FI main relay and the junction connector.
  – Whether the junction connector is open or corroded.
  – Whether there is wire breakage, or poor connection in the YEL/BLK wire between the junction connector and the injector.
  – Whether there is any short-circuiting, wire breakage or poor connection in the wire between the injector and the ECM/PCM.
- If the fuel pressure is not as specified, recheck the fuel pressure (see page 11-154).

Injector Replacement

1. Relieve fuel pressure (see page 11-154).
2. Disconnect the connectors from the injectors (A), ground cable (B).

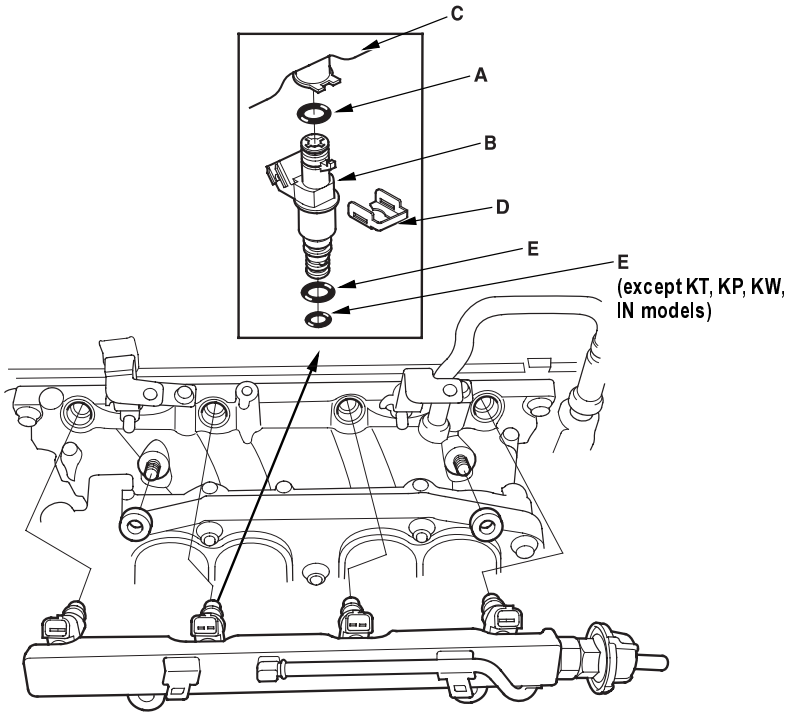


3. Disconnect the quick-connect fittings (C).
4. Remove the fuel rail mounting nuts (D) from the fuel rail (E).
5. Remove the injector clip (F) from the injector.
6. Remove the injector from the fuel rail.

(cont'd)

Injector Replacement (cont'd)

7. Coat the new O-rings (A) with clean engine oil, and insert the injectors (B) into the fuel rail (C).



8. Install the injector clip (D).

9. Coat the injector O-ring (E) with clean engine oil.

10. To prevent damage to the O-rings, install the injectors in the fuel rail first, then install them in the injector base (F).

11. Install the fuel rail mounting nuts and ground cable.

12. Connect the connectors on the injectors.

13. Connect the quick-connect fittings.

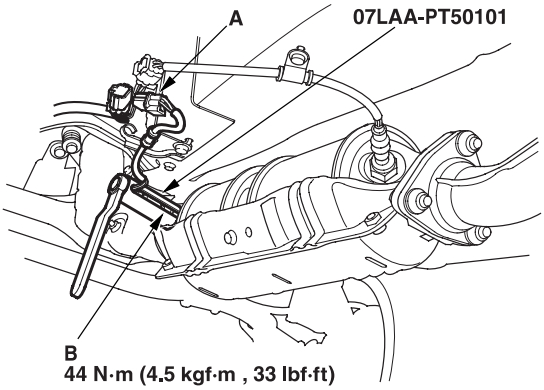
14. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for approximately 2 seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check for fuel leakage.

Primary HO2S Replacement

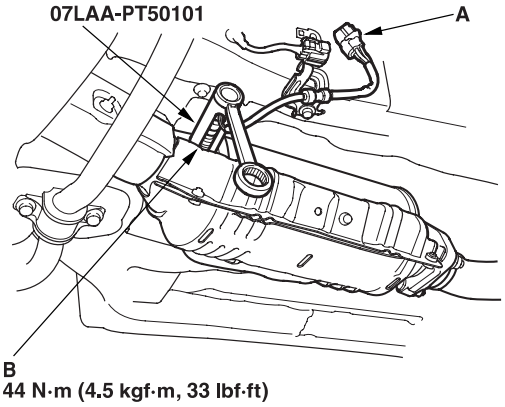
Special Tools Required
O2 sensor wrench 07LAA-PT50101

1. Disconnect the primary HO2S 4P connector (A), then remove the primary HO2S (B).

KG, KS, KE, KR, KU, KZ, FO, KQ models:



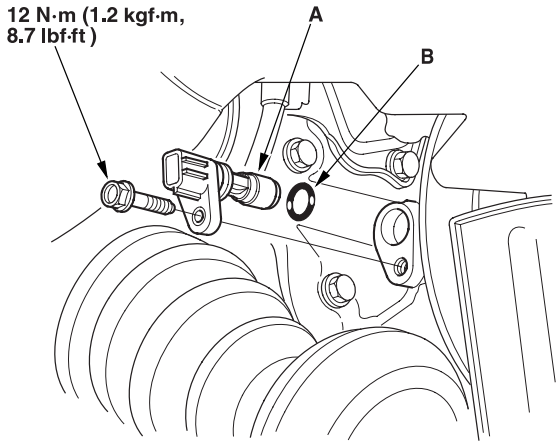
KN, KM, KY, MA, PH, IN, KK models.



2. Install the primary HO2S in the reverse order of removal.

CKP Sensor Replacement

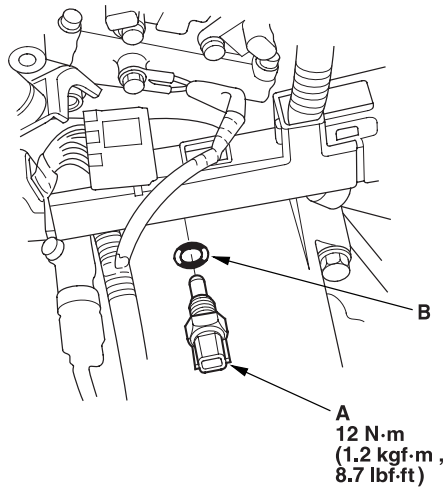
1. Disconnect the CKP 3P connector.
2. Remove the CKP sensor (A).



3. Install the part in the reverse order of removal with a new O-ring (B).

ECT Sensor Replacement

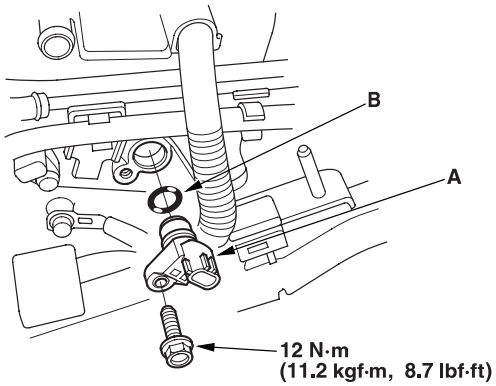
1. Remove the air cleaner (see page 11-182).
2. Disconnect the ECT sensor 2P connector.
3. Remove the ECT sensor (A).



4. Install the part in the reverse order of removal with a new O-ring (B).

TDC Sensor Replacement

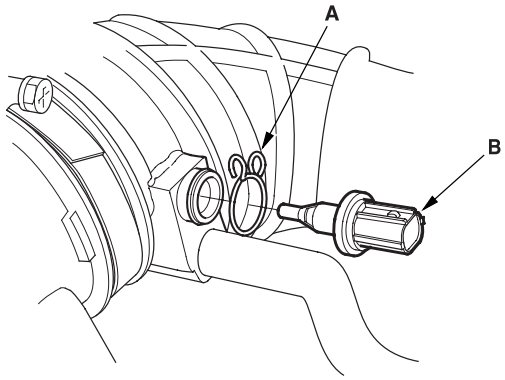
1. Remove the air cleaner (see page 11-182).
2. Disconnect the TDC sensor 3P connector.
3. Remove the TDC sensor (A).



4. Install the part in the reverse order of removal with a new O-ring (B).

IAT Sensor Replacement

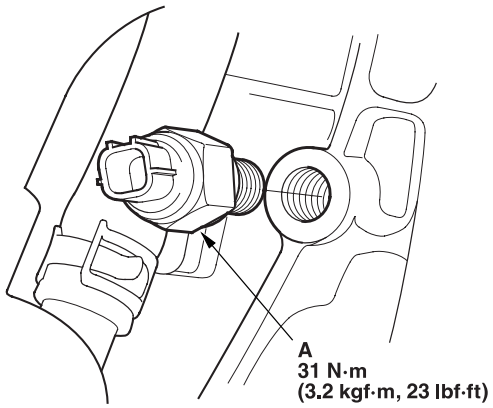
1. Disconnect the IAT sensor 2P connector.
2. Remove the clip (A) and the IAT sensor (B).



3. Install the part in the reverse order of removal.

Knock Sensor Replacement

1. Remove the splash shield.
2. Disconnect the knock sensor 1P connector.
3. Remove the knock sensor (A).

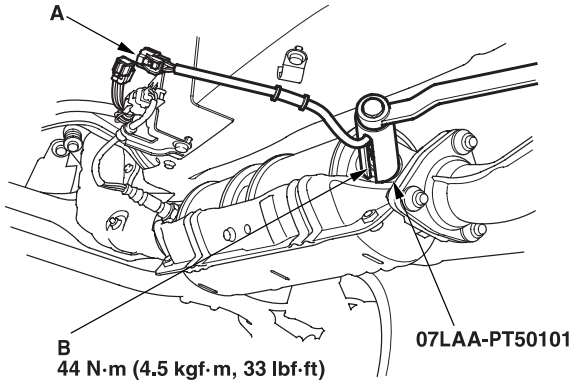


4. Install the part in the reverse order of removal.

Secondary HO2S Replacement

Special Tools Required
O2 sensor wrench 07LAA-PT50101

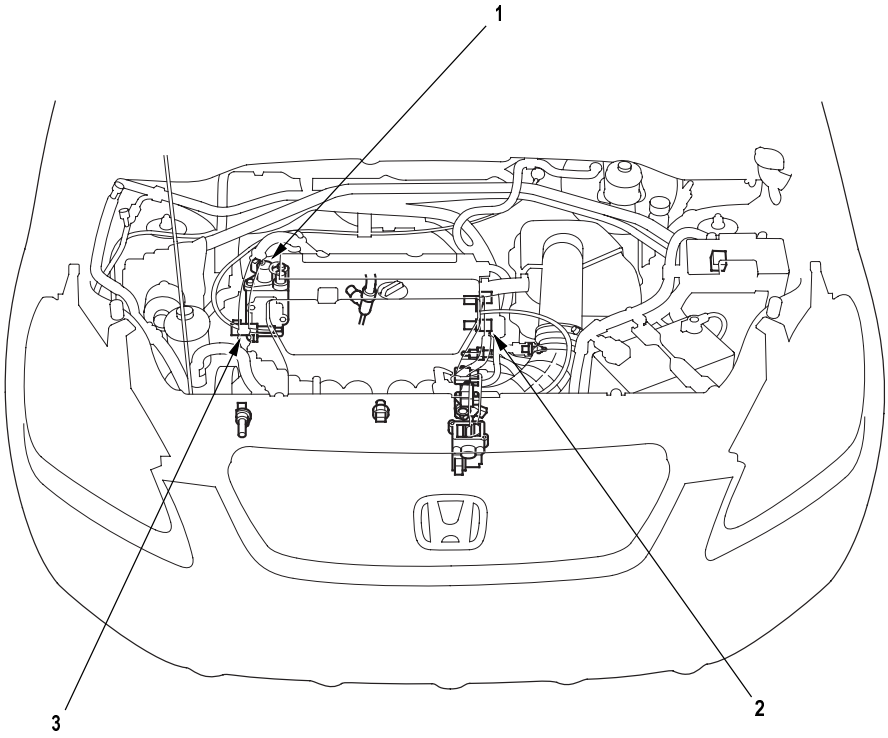
1. Disconnect the secondary HO2S 4P connector (A), then remove the secondary HO2S (B).



2. Install the secondary HO2S in the reverse order of removal.

VTEC/VTC

Component Location Index



1	VTEC SOLENOID VALVE	Troubleshooting, page 11-130; Removal/Inspection, page 11-138
2	CAMSHAFT POSITION (CMP) SENSOR	Troubleshooting, page 11-128; Replacement, page 11-138
3	VTC OIL CONTROL SOLENOID VALVE	Troubleshooting, page 11-124; Test, page 11-137

*: The illustration shows LHD model

DTC Troubleshooting

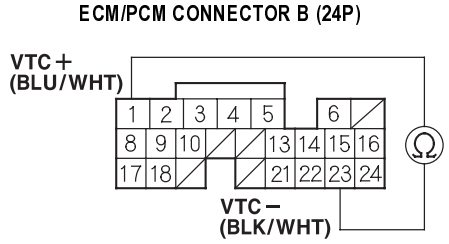
DTC P0010 (56-1): VTC Oil Control Solenoid Valve Malfunction

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on, then let it idle.
3. Test-drive at a steady speed between 30-60 km/h (20-40 mph) for 10 minutes.

   Is DTC P0010 indicated?

   Yes Go to step 4.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the VTC oil control solenoid valve and at the ECM/PCM.■
4. Turn the ignition switch OFF.
5. Disconnect the negative cable from the battery.
6. Disconnect the ECM/PCM connector B (24P).
7. Measure resistance between ECM/PCM connector terminal B1 and B23.

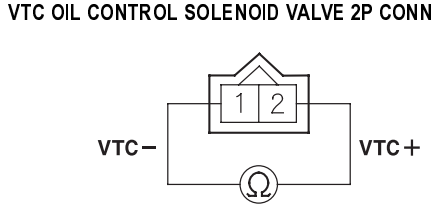


Wire side of female terminals

   Is there 6.75 - 8.25 Ω?

   Yes Go to step 12.

   No Go to step 8.
8. Disconnect the VTC oil control solenoid valve 2P connector.
9. Measure resistance between VTC oil control solenoid valve 2P terminal No. 1 and No. 2.

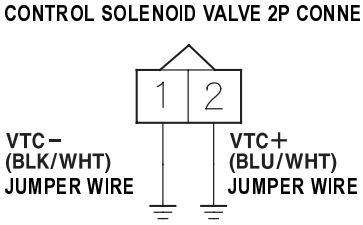


Terminal side of male terminals

   Is there 6.75 - 8.25 Ω?

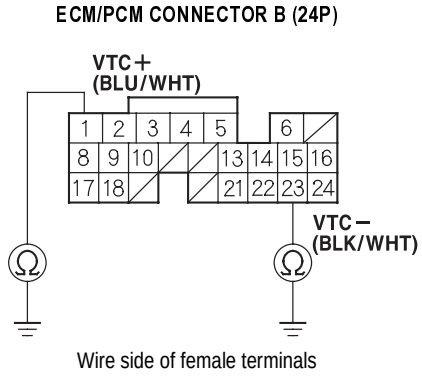
   Yes Go to step 10.

   No Replace the VTC oil control solenoid valve (see page 11-137).■
10. Connect VTC oil control solenoid valve 2P connector terminals No. 1 and No. 2 to body ground with a jumper wire individually.



Wire side of female terminals

11. Check for continuity between ECM/PCM connector terminals B1, B23, and body ground.

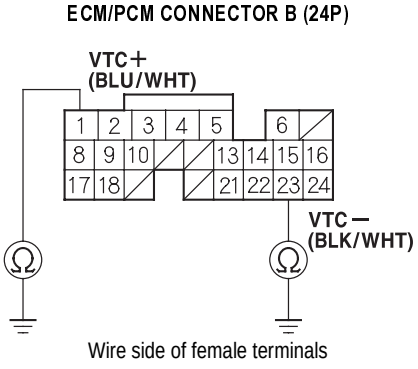


Is there continuity?

Yes Go to step 12.

No Repair open in the wire between the ECM/PCM (B1, B23) and the VTC oil control solenoid valve.■

12. Check for continuity between ECM/PCM connector terminals B1 and B23 and body ground individually.



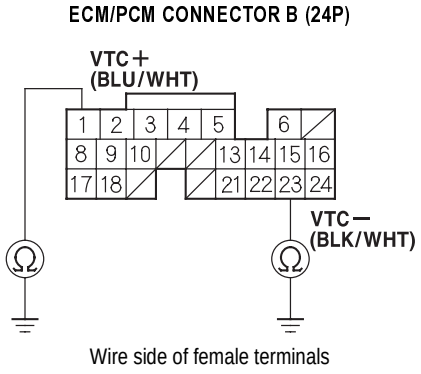
Is there continuity?

Yes Go to step 13.

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

13. Disconnect the VTC oil control solenoid valve 2P connector.

14. Check for continuity between ECM/PCM connector terminals B1 and B23 and body ground individually.



Is there continuity?

Yes Repair short in the wire between the ECM/PCM (B1, B23) and the VTC oil control solenoid valve.■

No Replace the VTC oil control solenoid valve (see page 11-137).■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0011 (56-2): VTC System Malfunction

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
3. Test-drive at a steady speed between 30 - 60 km/h (20 - 40 mph) for 10 minutes.
4. Check for Temporary DTC with the scan tool.

   Is Temporary DTC P0011 indicated?

   Yes Go to step 5.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the VTC oil control solenoid valve and at the ECM/PCM.■
5. Watch the low oil pressure light.

   Is the low oil pressure light on?

   Yes Check the oil pressure (see page 08-4).■

   No Go to step 6.
6. Turn the ignition switch OFF.
7. Remove the auto-tensioner (see page 04-31).
8. Remove the VTC strainer. Check the VTC strainer for clogging.

   Is the strainer OK?

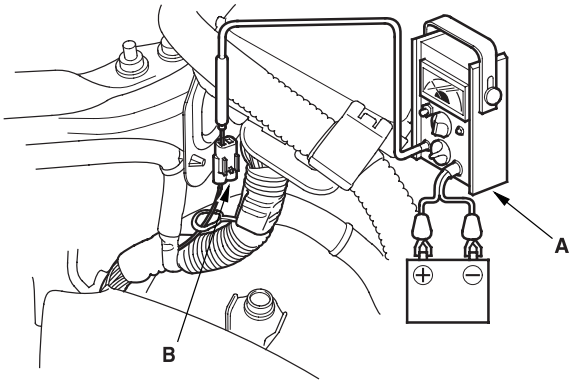
   Yes Go to step 9.

   No Clean the VTC strainer, then replace the engine oil filter and the engine oil.
9. Check the VTC oil control solenoid valve (see page 11-137).

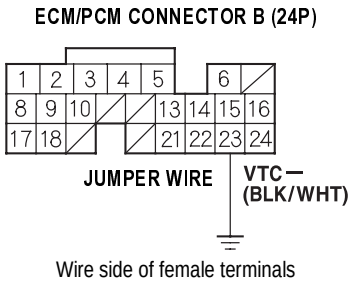
   Is the VTC oil control solenoid valve OK?

   Yes Go to step 10.

   No Clean the ports of the VTC oil control solenoid valve, or replace the VTC oil control solenoid valve.■
10. Install the VTC oil control solenoid valve.
11. Connect a tachometer (A) to the test tachometer connector (B).

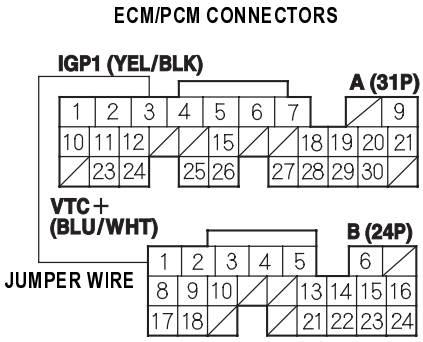


12. Start the engine. Hold the engine at 700 - 1,000 rpm (min^{-1}).
13. Connect the ECM/PCM connector terminal B23 to body ground with a jumper wire.



14. Connect the ECM/PCM connector terminal A3 and B1 with a jumper wire for below 1 minute.

NOTE: Do not jump for above 1 minute.



Wire side of female terminals

Did the engine stall or run rough?

Yes Test-drive at a steady speed between 30 - 60 km/h (19 - 37 mph) for 10 minutes. If temporary DTC P0011 is indicated, substitute a known-good ECM/PCM and recheck (see page 11-5), replace the original ECM/PCM.■

No Go to step 15.

15. Check the VTC actuator (see page 06-8).

Is the VTC actuator OK?

Yes Remove the auto-tensioner (see page 04-31) and replace the VTC oil filter. Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

No Replace the VTC actuator.■

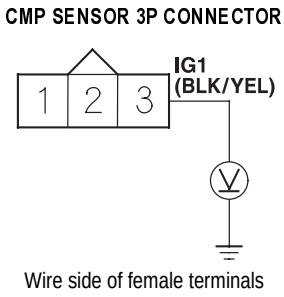
(cont'd)

DTC Troubleshooting (cont'd)

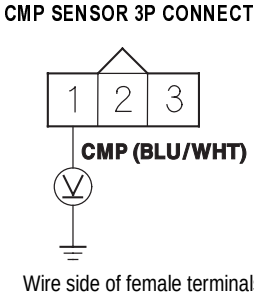
DTC P0340 (57-1): CMP Sensor No Signal

DTC P0344 (57-2): CMP Sensor Intermittent Interruption

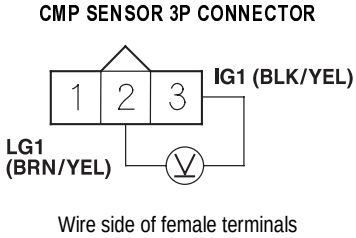
1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.
   Is DTC P0340 and/or P0344 indicated?
   Yes Go to step 3.
   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the CMP sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the CMP sensor 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between CMP sensor 3P connector terminal No. 3 and body ground.



   Is there battery voltage?
   Yes Go to step 7.
   No Check the No. 4 ACG (10A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the CMP sensor and No. 4 ACG (10A) fuse.
7. Measure voltage between CMP sensor 3P connector terminal No. 1 and body ground.

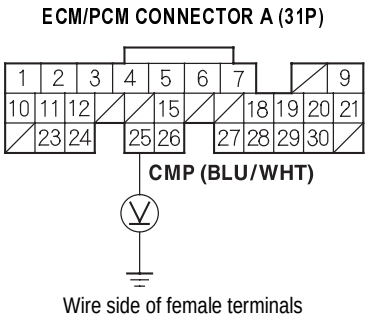


   Is there about 5 V?
   Yes Go to step 8.
   No Go to step 10.
8. Measure voltage between CMP sensor 3P connector terminals No. 2 and No. 3.



   Is there battery voltage?
   Yes Go to step 9.
   No Repair open in the wire between the CMP sensor and G101.■
9. Substitute a known-good CMP sensor and recheck.
   Is DTC P0340 and/or P0344 indicated?
   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■
   No Replace the original CMP sensor.■

10. Measure voltage between ECM/PCM connector terminal A25 and body ground.

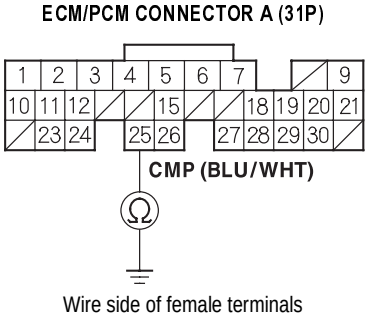


Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (A25) and CMP sensor.■

No Go to step 11.

11. Turn the ignition switch OFF.
12. Disconnect the negative cable from the battery.
13. Disconnect ECM/PCM connector A (31P).
14. Check for continuity between ECM/PCM connector terminal A25 and body ground.



Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A25) and the CMP sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

DTC P0341 (57-3): VTC Phase Gap

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.

   Is DTC P0341 indicated?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the CMP sensor and at the ECM/PCM.■
3. Check the VTC oil control solenoid valve (see page 11-137).

   Is the VTC oil control solenoid valve OK?

   Yes Go to step 4.

   No Clean the VTC oil control solenoid valve, or replace the VTC oil control solenoid valve.■
4. Remove the head cover and check the cam chain (see page 06-15).

   Is the cam chain OK?

   Yes Go to step 5.

   No Repair or replace the cam chain.■
5. Check the slack in the cam chain (see page 06-22).

   Is the cam chain OK?

   Yes Go to step 6.

   No Repair or replace the cam chain.
6. Check the VTC actuator (see page 06-8).

   Is the VTC actuator OK?

   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

   No Replace the VTC actuator.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P1253 (21-1): VTEC System Malfunction

Special Tools Required
- Oil Pressure gauge attachment 07NAJ-P070100
- Low pressure gauge 07406-0070001
- Hose oil pressure 07ZAJ-S5A0200

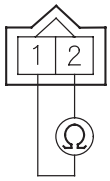
1. Reset the ECM/PCM (see page 11-4).
2. Check the engine oil level, and refill if necessary. Check for external damage to the oil pan.
3. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) unit the radiator fan comes on.
4. Road test the vehicle:
   Accelerate in MT, A/T: 2nd gear to an engine speed over 4,000 rpm (min^{-1}). Hold that engine speed for at least 2 seconds. If DTC P1253 is not repeated during the first road test, repeat this test 2 more times.

   Is DTC P1253 indicated?

   Yes Go to step 5.

   No Intermittent failure, system is OK at this time. Check the oil consumption if oil was added in step 2. Check for poor connections or loose wires at the VTEC solenoid valve and at the ECM/PCM.■
5. Turn the ignition switch OFF.
6. Turn the ignition switch OFF.
7. Disconnect the VTEC solenoid valve 2P connector.
8. Check for resistance between VTEC solenoid valve 2P connector terminals No. 1 and No. 2.

VTEC SOLENOID VALVE 2P CONNECTOR



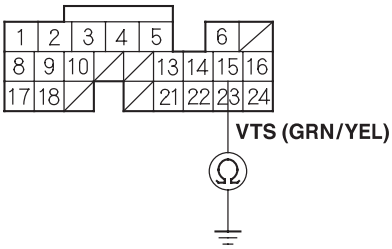
Terminal side of male terminals

Is there 14 - 30 Ω?

Yes Go to step 9.

No Replace the VTEC solenoid valve.■
9. Disconnect the negative cable from the battery.
10. Disconnect ECM/PCM connector B (24P).
11. Check for continuity between ECM/PCM connector terminal B15 and body ground.

ECM/PCM CONNECTOR B (24P)



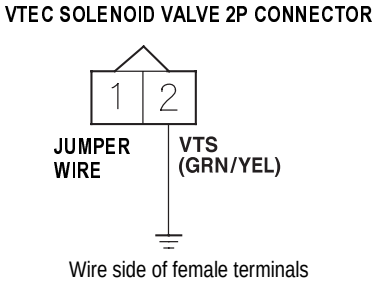
Wire side of female terminals

Is there continuity?

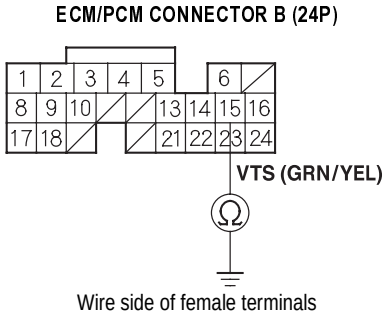
Yes Repair short in the wire between the VTEC solenoid valve and the ECM/PCM (B15).■

No Go to step 12.

12. Connect VTEC solenoid valve 2P connector terminal No. 2 to body ground with a jumper wire.



13. Check for continuity between ECM/PCM connector terminal B15 and body ground.

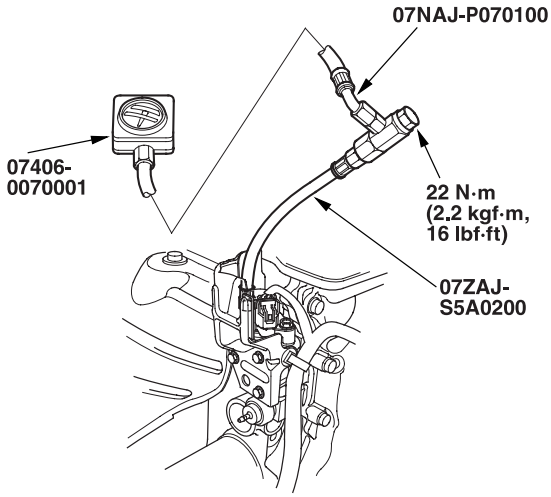


Is there continuity?

Yes Go to step 14.

No Repair open in the wire between the VTEC solenoid valve and the ECM/PCM (B15).■

14. Install the special tools as shown.



15. Reconnect ECM/PCM connector B (24P) and the VTEC solenoid valve connector.

16. Connect a tachometer.

17. Reconnect the negative cable to the battery.

18. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) unit the radiator fan comes on.

19. Check oil pressure at engine speeds of 1,000 and 2,000 rpm (min^{-1}). Keep measuring time as short as possible because the engine is running with no load (less than 1 minute).

Is pressure below 49 kPa (0.5 kgf/cm^2, 7 psi)?

Yes Go to step 20.

No Inspect the VTEC solenoid valve (see page 11-138).■

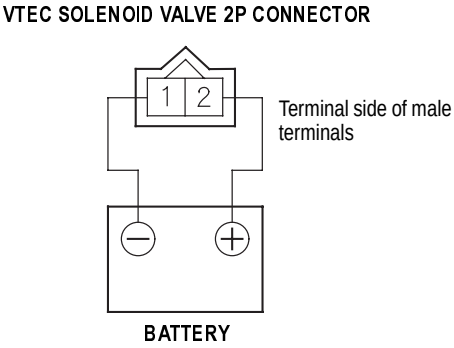
(cont'd)

DTC Troubleshooting (cont'd)

20. Turn the ignition switch OFF.

21. Disconnect the VTEC solenoid valve 2P connector.

22. Attach the battery positive terminal to VTEC solenoid valve 2P connector terminal No. 2.



23. Start the engine, then connect the battery negative to terminal No. 1 and check oil pressure at an engine speed of 3,000 rpm (min^{-1}).

Is pressure above 390 kPa (4.0 kgf/cm^2, 57 psi)?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Inspect the VTEC solenoid valve (see page 11-138).■

DTC P1259 (22-4): VTEC System Malfunction

Special Tools Required

- Oil Pressure gauge attachment 07NAJ-P070100
- Low pressure gauge 07406-0070001
- Hose oil pressure 07ZAJ-S5A0200

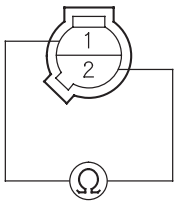
1. Reset the ECM/PCM (see page 11-4).
2. Check the engine oil level, and refill if necessary.
3. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
4. Road test the vehicle:
   Accelerate in 1st gear to an engine speed over 4,000 rpm (min^{-1}). Hold that engine speed for at least 2 seconds. If DTC P1259 is not repeated during the first road test, repeat this test 2 more times.

   Is DTC P1259 indicated?

   Yes Go to step 5.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the VTEC solenoid valve and at the ECM/PCM.■
5. Turn the ignition switch OFF.
6. Disconnect the VTEC oil pressure switch 2P connector.
7. Check for continuity on VTEC oil pressure switch between the VTEC oil pressure switch 2P connector terminals No. 1 and No. 2.

VTEC OIL PRESSURE SWITCH 2P CONNECTOR



Terminal side of male terminals

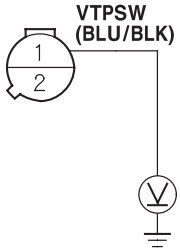
Is there continuity?

Yes Go to step 8.

No Replace the VTEC oil pressure switch.■

8. Turn the ignition switch ON (II).
9. Measure voltage between VTEC oil pressure switch 2P connector terminal No. 1 and body ground.

VTEC OIL PRESSURE SWITCH HARNESS 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Go to step 15.

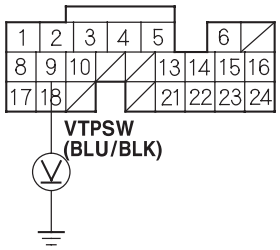
No Go to step 10.

(cont'd)

DTC Troubleshooting (cont'd)

10. Measure voltage between ECM/PCM connector terminal B9 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there battery voltage?

Yes Repair open in the wire between the VTEC oil pressure switch and the ECM/PCM (B9).■

No Go to step 11.

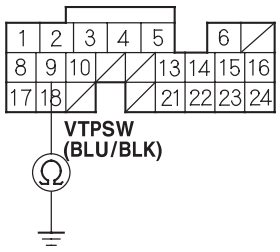
11. Turn the ignition switch OFF.

12. Disconnect the negative cable from the battery.

13. Disconnect ECM/PCM connector B (24P).

14. Check for continuity between ECM/PCM connector terminal B9 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

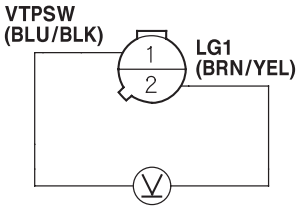
Is there continuity?

Yes Repair short in the wire between the VTEC oil pressure switch and the ECM/PCM (B9).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

15. Measure voltage between VTEC oil pressure switch 2P connector terminals No. 1 and No. 2.

VTEC OIL PRESSURE SWITCH HARNESS 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Go to step 16.

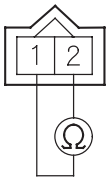
No Repair open in the wire between the VTEC oil pressure switch and G101.■

16. Turn the ignition switch OFF.

17. Disconnect the VTEC solenoid valve 1P connector.

18. Check for resistance between VTEC solenoid valve 2P connector terminals No. 1 and No. 2.

VTEC SOLENOID VALVE 2P CONNECTOR



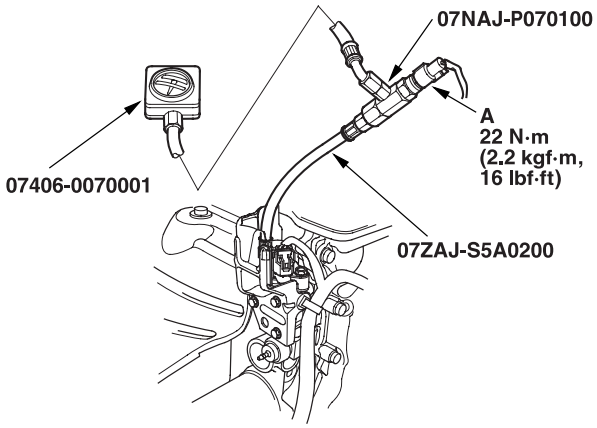
Terminal side of male terminals

Is there 14 - 30 Ω?

Yes Go to step 19.

No Replace the VTEC solenoid valve.■

19. Remove the VTEC oil pressure switch (A) and install the special tools as shown, then reinstall the VTEC oil pressure switch.



20. Reconnect the VTEC solenoid valve 2P connector and VTEC oil pressure switch 2P connector.

21. Connect a tachometer.

22. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.

23. Check oil pressure at engine speeds of 1,000 and 2,000 rpm (min^{-1}). Keep measuring time as short as possible because the engine is running with no load (less than 1 minute).

Is pressure below 49 kPa (0.5 kgf/cm^2, 7 psi)?

Yes Go to step 24.

No Inspect the VTEC solenoid valve (see page 11-138).■

24. Turn the ignition switch OFF.

25. Disconnect the VTEC solenoid valve 2P connector.

26. Attach the battery positive terminal to the VTEC solenoid valve 2P connector terminal No. 2.

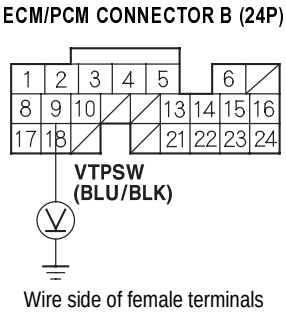
27. Start the engine, then connect the battery negative to terminal No. 1 and check oil pressure at an engine speed of 3,000 rpm (min^{-1}).

Is pressure above 390 kPa (4.0 kgf/cm^2, 57 psi)?

Yes Go to step 28.

No Inspect the VTEC solenoid valve (see page 11-138).■

28. With the battery terminal still connected to the VTEC solenoid valve, measure voltage between ECM/PCM connector terminal B9 and body ground.



Is there battery voltage above 4,000 rpm (min^{-1})?

Yes Go to step 29.

No Replace the VTEC oil pressure switch.■

29. Turn the ignition switch OFF.

30. Disconnect the battery terminal from the VTEC solenoid valve terminal.

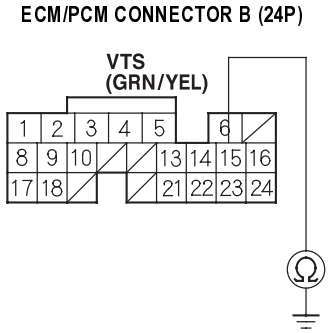
(cont'd)

DTC Troubleshooting (cont'd)

31. Reconnect the negative cable to the battery.

32. Disconnect ECM/PCM connector B (24P).

33. Check for continuity between ECM/PCM connector terminal B15 and body ground.



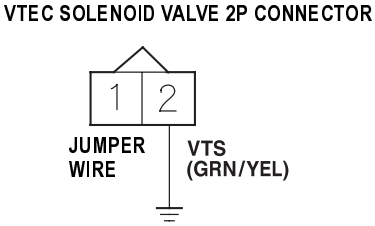
Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the VTEC solenoid valve and the ECM/PCM (B15).■

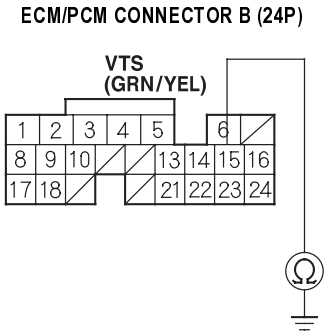
No Go to step 34.

34. Connect VTEC solenoid valve 2P connector terminal No. 2 to body ground with a jumper wire.



Wire side of female terminals

35. Check for continuity between ECM/PCM connector terminal B15 and body ground.



Wire side of female terminals

Is there continuity?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

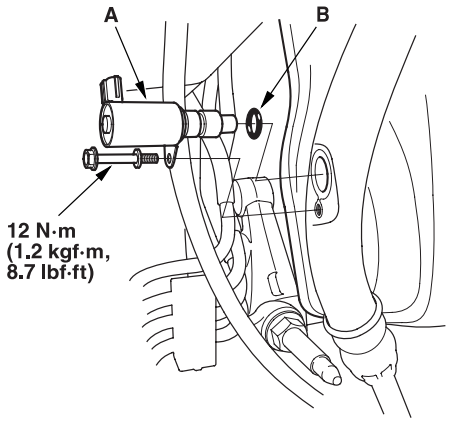
No Repair short in the wire between the VTEC solenoid valve and the ECM/PCM (B15).■

VTC Oil Control Solenoid Valve Test

1. Remove the VTC oil control solenoid valve (A).

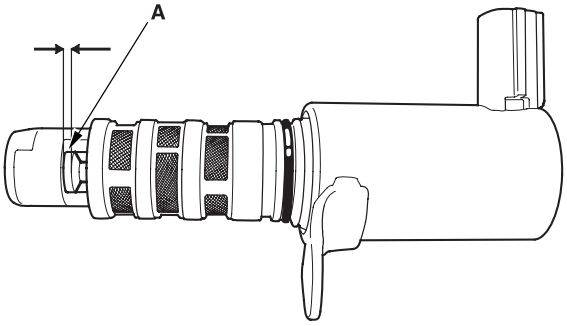
NOTE: Install the part in the reverse order of removal with a new O-ring (B), then check these items:

- Clean and dry the VTC oil control solenoid valve mating surface.
- Coat O-ring with engine oil.
- Do not install the VTC oil control solenoid valve while wearing fibrous gloves.
- Be careful not to contaminate the cylinder head opening.



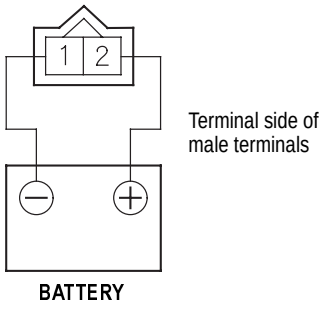
2. Check the VTC oil control solenoid valve filter for clogging. If it is clogged, replace the VTC oil control solenoid valve.

3. Check the clearance between the port (advance side) and the valve. Clearance (A) should be above 2.8 mm (1/8 in.).

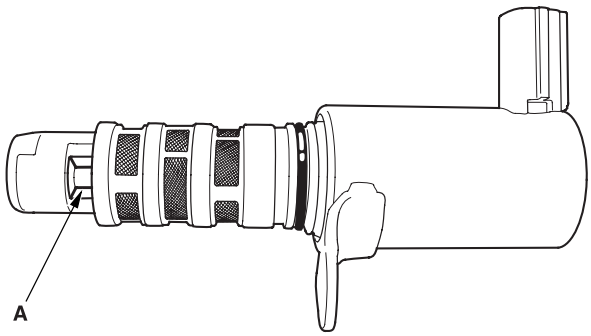


4. Connect the battery positive terminal to the VTC oil control solenoid valve 2P connector terminal No. 2.

VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR

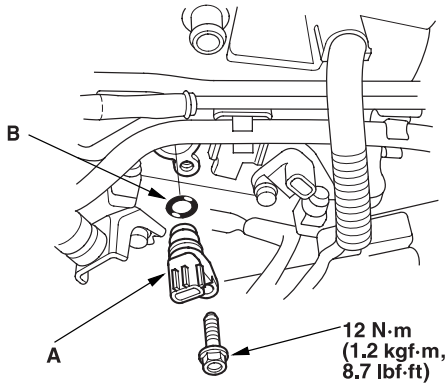


5. Connect the battery negative terminal to the VTC oil control solenoid valve 2P connector terminal No. 1, then make sure the valve (A) opens fully.



CMP Sensor Replacement

1. Remove the air cleaner (see page 11-182).
2. Disconnect the CMP sensor 3P connector.
3. Remove the CMP sensor (A).

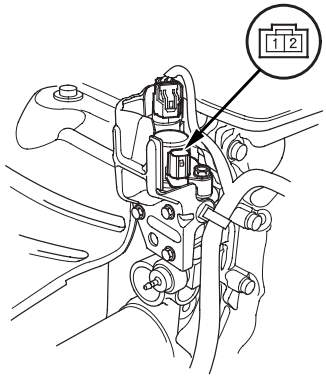


4. Install the part in the reverse order of removal with a new O-ring (B).

VTEC Solenoid Valve Removal/Inspection

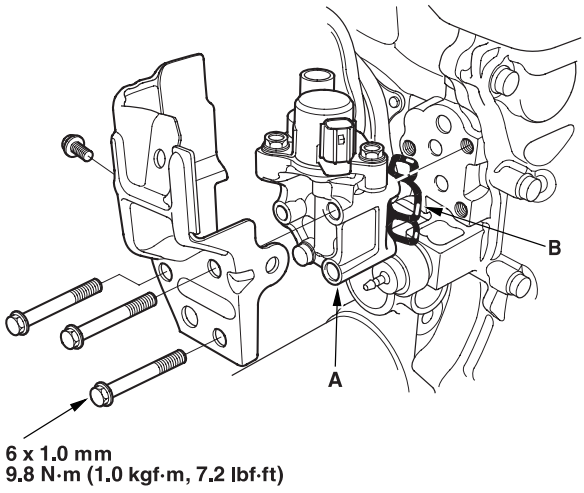
1. Disconnect the VTEC solenoid valve 2P connector.
2. KG, KS, KE, KR, KU (Hong Kong) models: Disconnect the VTEC oil pressure switch 2P connector.
3. Measure resistance between the VTEC solenoid valve connector terminals No. 1 and No. 2.

Resistance: 14 - 30 Ω



*: The illustration shows KG, KS, KE, KR, KU (Hong Kong) models.

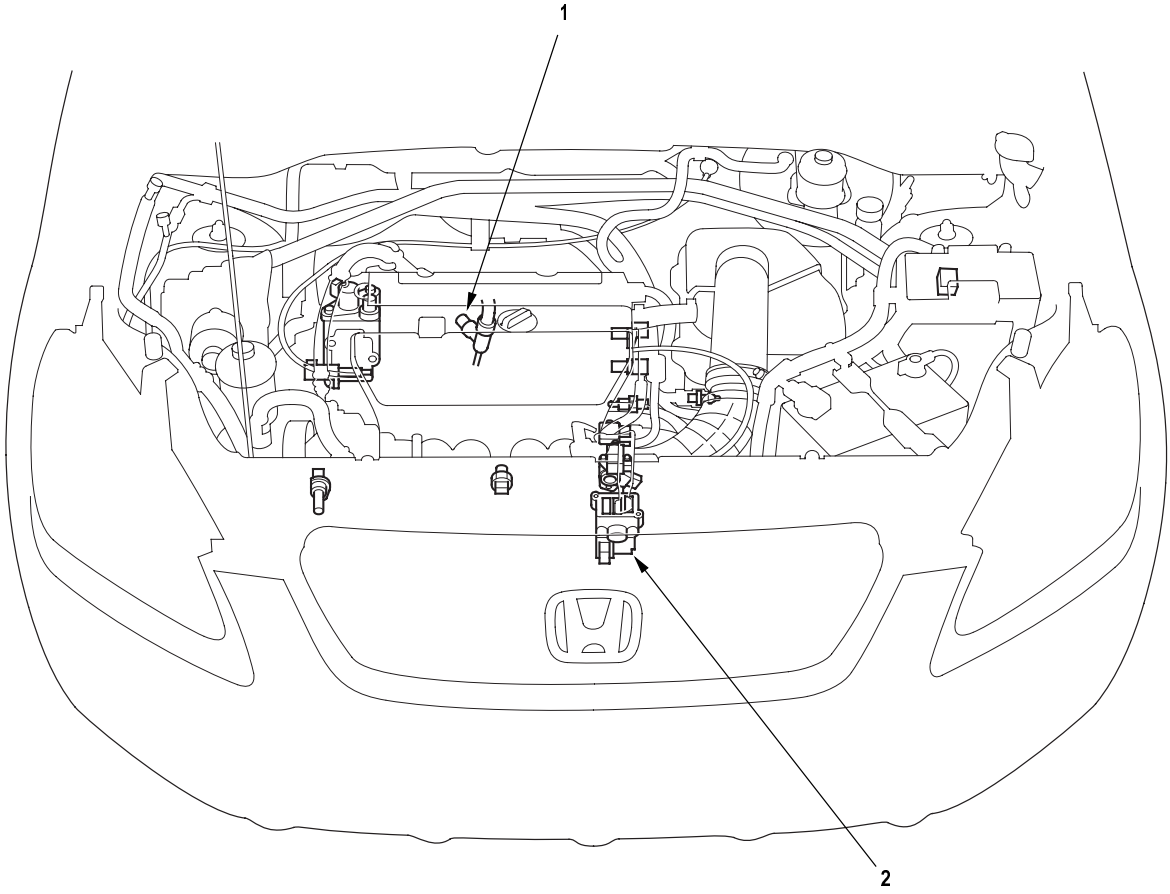
4. If the resistance is within specifications, remove the VTEC solenoid valve assembly (A) from the cylinder head, and check the VTEC solenoid valve filter (B) for clogging. If it is clogged, replace the solenoid valve filter, the engine oil filter, and the engine oil.



*: The illustration shows KG, KS, KE, KR, KU (Hong Kong) models

Idle Control System

Component Location Index



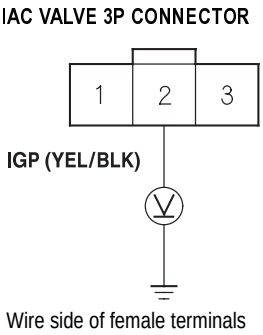
*: The illustration shows LHD model.

1	POWER STEERING PRESSURE (PSP) SWITCH	Troubleshooting, page 11-145
2	IDLE AIR CONTROL (IAC) VALVE	Troubleshooting, page 11-140

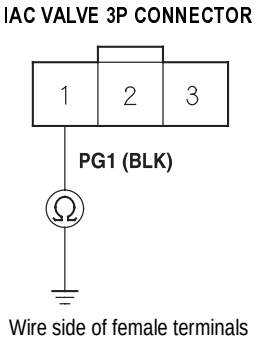
DTC Troubleshooting

DTC P1519 (14-3): IAC Valve Circuit Malfunction

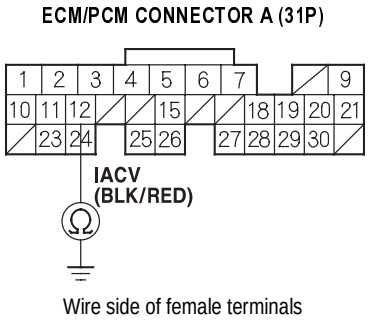
1. Reset the ECM/PCM (see page 11-4).
2. Turn the ignition switch ON (II).
   Is DTC P1519 indicated?
   Yes Go to step 3.
   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IAC valve and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the IAC valve 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between IAC valve 3P connector terminal No. 2 and body ground.



   Is there battery voltage?
   Yes Go to step 7.
   No Repair open in the wire between the IAC valve and the PGM-FI main relay.■
7. Turn the ignition switch OFF.
8. Check for continuity between body ground and IAC valve 3P connector terminal No. 1.

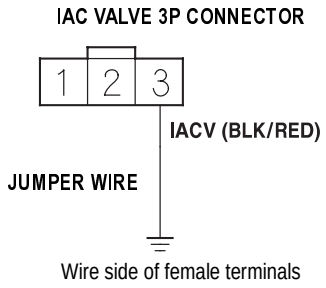


   Is there continuity?
   Yes Go to step 9.
   No Repair open in the wire between the IAC valve and G101.■
9. Disconnect the negative cable from the battery.
10. Disconnect ECM/PCM connector A (31P).
11. Check for continuity between body ground and ECM/PCM connector terminal A12.

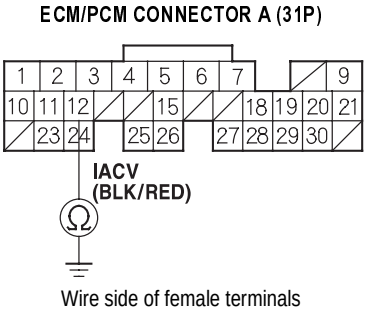


   Is there continuity?
   Yes Repair short in the wire between the IAC valve and the ECM/PCM (A12).■
   No Go to step 12.

12. Connect IAC valve 3P connector terminal No. 3 and body ground with a jumper wire.



13. Check for continuity between ECM/PCM connector terminal A12 and body ground.



Is there continuity?

Yes Go to step 14.

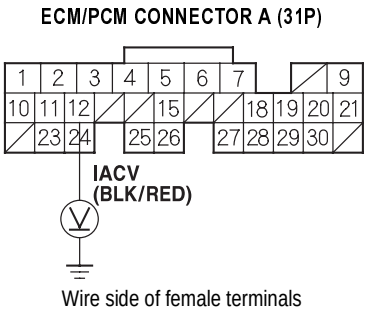
No Repair open in the wire between the IAC valve and the ECM/PCM (A12).■

14. Reconnect the IAC valve 3P connector.

15. Reconnect the negative cable to the battery.

16. Turn the ignition switch ON (II).

17. Measure voltage between body ground and ECM/PCM connector terminal A12.



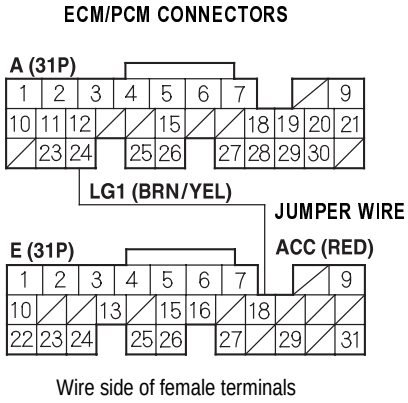
Is there battery voltage?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

No Replace the IAC valve.■

A/C Signal Circuit Troubleshooting

1. Turn the ignition switch ON (II).
2. Momentarily connect ECM/PCM connector terminals A24 and E18 with a jumper wire several times.



Is there a clicking noise from the A/C compressor clutch?

Yes Go to step 3.

No Go to step 6.

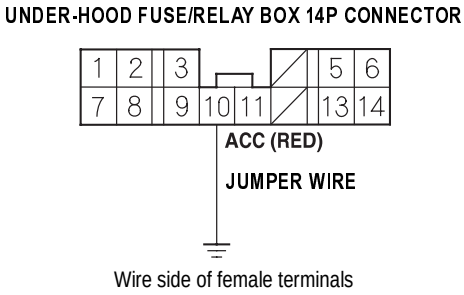
3. Start the engine.
4. Turn the blower switch ON.
5. Turn the A/C switch ON.

   Does the A/C operate?

   Yes The air conditioning signal is OK.■

   No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

6. Momentarily connect the under-hood fuse/relay box 14P connector terminal No. 10 to body ground with a jumper wire several times.



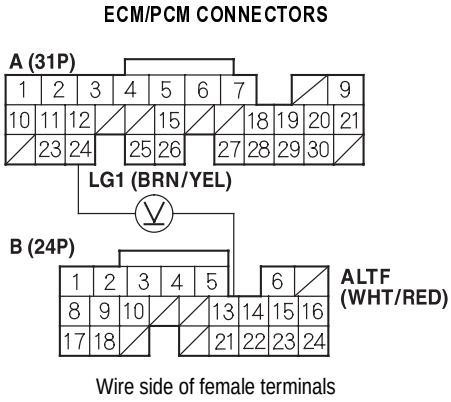
Is there clicking noise from the A/C compressor clutch?

Yes Repair open in the wire between the ECM/PCM (E18) and the A/C clutch relay.■

No Check the A/C system for other symptoms.■

Alternator FR Signal Circuit Troubleshooting

1. Disconnect the alternator 4P connector.
2. Turn the ignition switch ON (II).
3. Measure voltage between ECM/PCM connector terminals A24 and B13.



Is there about 5 V?

Yes Go to step 4.

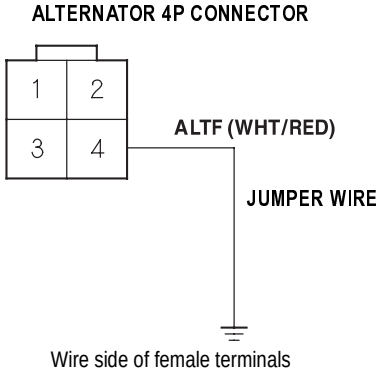
No Go to step 14.

4. Turn the ignition switch OFF.
5. Reconnect the alternator 4P connector.
6. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
7. Measure voltage between ECM/PCM connector terminals A24 and B13.

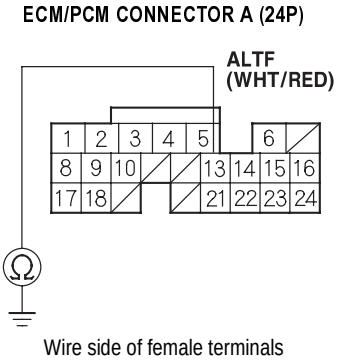
   Does the voltage decrease when the headlights and rear window defogger are turned on?

   Yes The alternator FR signal is OK.■

   No Go to step 8.
8. Turn the ignition switch OFF.
9. Disconnect the negative cable from the battery.
10. Disconnect ECM/PCM connector B (24P).
11. Disconnect the alternator 4P connector.
12. Connect alternator 4P connector terminal No. 4 and body ground with a jumper wire.



13. Check for continuity between body ground and ECM/PCM connector terminal B13.



Is there continuity?

Yes Test the alternator (see page 04-27).■

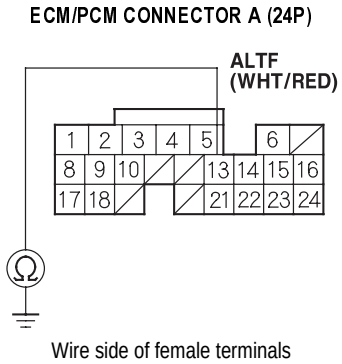
No Repair open in the wire between the ECM/PCM (B13) and the alternator.■

14. Turn the ignition switch OFF.
15. Disconnect the negative cable from the battery.
16. Disconnect ECM/PCM connector B (24P).

(cont'd)

Alternator FR Signal Circuit Troubleshooting (cont'd)

17. Check for continuity between body ground and ECM/PCM connector terminal B13.



Wire side of female terminals

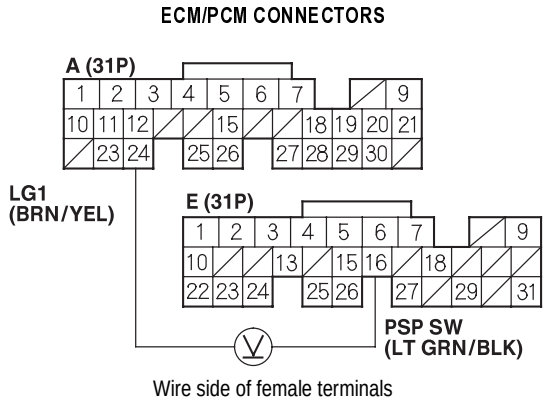
Is there continuity?

Yes Repair short in the wire between the ECM/PCM (B13) and the alternator.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

PSP Switch Signal Circuit Troubleshooting

1. Turn the ignition switch ON (II).
2. Measure voltage between ECM/PCM connector terminals A24 and E16.



Is there less than 1.0 V?

Yes Go to step 3.

No Go to step 6.

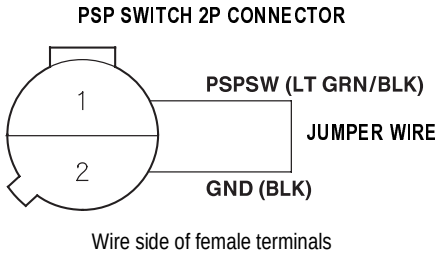
3. Start the engine.
4. Turn the steering wheel to the full lock position.
5. Measure voltage between ECM/PCM connector terminals A24 and E16.

Is there battery voltage?

Yes The PSP switch signal is OK.■

No Go to step 13.

6. Turn the ignition switch OFF.
7. Disconnect the PSP switch 2P connector.
8. Turn the ignition switch ON (II).
9. At the harness side, connect PSP switch 2P connector terminals No. 1 and No. 2 with a jumper wire.



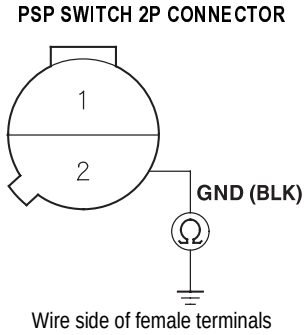
10. Measure voltage between ECM/PCM connector terminals A24 and E16.

Is there less than 1.0 V?

Yes Replace the PSP switch.■

No Go to step 11.

11. Turn the ignition switch OFF.
12. Check for continuity between PSP switch 2P connector terminal No. 2 and body ground.



Is there continuity?

Yes Repair open in the wire between the PSP switch and ECM/PCM (E16).■

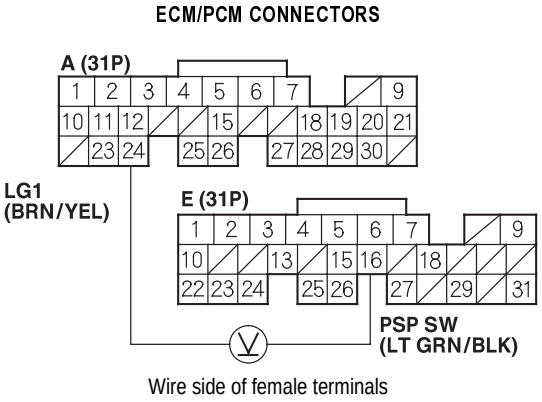
No Repair open in the wire between the PSP switch and G301.■

13. Turn the ignition switch OFF.
14. Disconnect the PSP switch 2P connector.
15. Turn the ignition switch ON (II).

(cont'd)

PSP Switch Signal Circuit Troubleshooting (cont'd)

16. Measure voltage between ECM/PCM connector terminals A24 and E16.



Is there battery voltage?

Yes Replace the PSP switch.■

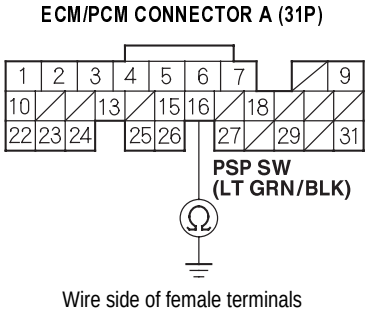
No Go to step 17.

17. Turn the ignition switch OFF.

18. Disconnect the negative cable from the battery.

19. Disconnect ECM/PCM connector E (31P).

20. Check for continuity between body ground and ECM/PCM connector terminal E16.



Is there continuity?

Yes Repair short in the wire between ECM/PCM (E16) and the PSP switch.

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

Brake Pedal Position Switch Signal Circuit Troubleshooting

1. Check the brake lights.

Are the brake lights on without pressing the brake pedal?

Yes Inspect the brake pedal position switch (see page 19A-5).■

No Go to step 2.

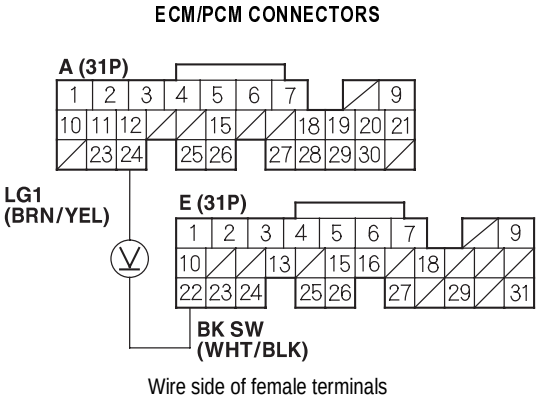
2. Press the brake pedal.

Do the brake lights come on?

Yes Go to step 3.

No Go to step 4.

3. Measure voltage between ECM/PCM connector terminals A24 and E22 with the brake pedal pressed.



Is there battery voltage?

Yes The brake pedal position switch signal is OK.■

No Repair open in the wire between the ECM/PCM (E22) and the brake pedal position switch.■

4. Inspect the No. 7 HORN, STOP (15A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

Yes Repair open in the wire between the brake pedal position switch and the No. 7 HORN, STOP (15A) fuse. Inspect the brake pedal position switch (see page 19A-5).■

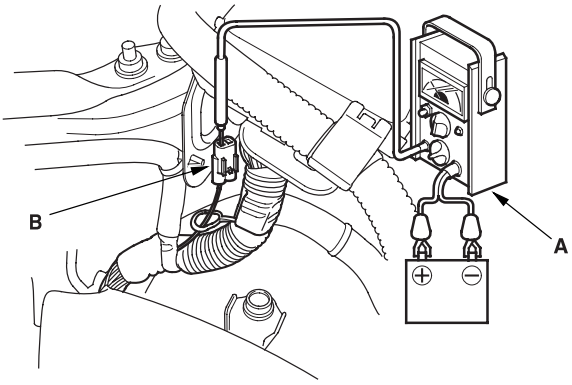
No Repair short in the wire between the ECM/PCM (E22) and the No. 7 HORN, STOP (15A) fuse. Replace the No. 7 HORN, STOP (15A) fuse.■

Idle Speed Inspection

NOTE:
- Leave the Idle Air Control (IAC) valve connected.
- Before checking the idle speed, check these items:
  - The Malfunction Indicator Lamp (MIL) has not been reported on.
  - Ignition timing
  - Spark plugs
  - Air cleaner
  - PCV system

1. Disconnect the Evaporative Emission (EVAP) canister purge valve 2P connector.

2. Connect a tachometer (A) to the test tachometer connector (B).



3. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.

4. Check the idle speed with no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.

Idle speed should be:

M/T	650 ± 50 rpm (min^{-1})
A/T	650 ± 50 rpm (min^{-1}) (in Park or neutral)

5. Idle the engine for 1 minute with heater fan switch on HI and air conditioner on, then check the idle speed.

Idle speed should be:

M/T	700 ± 50 rpm (min^{-1})
A/T	700 ± 50 rpm (min^{-1}) (in Park or neutral)

NOTE: If the idle speed is not within specification, go to the Symptom Troubleshooting Index.

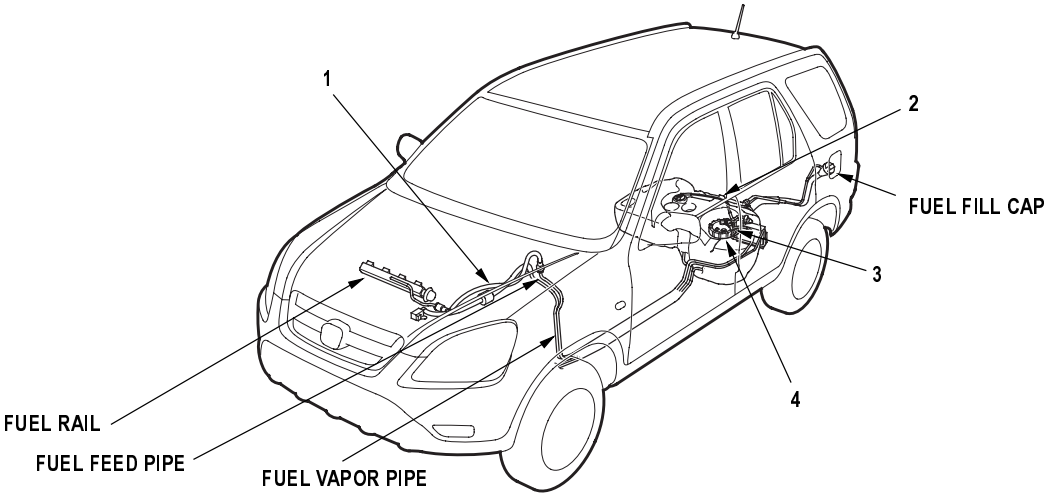
6. Reconnect the EVAP canister purge valve 2P connector.

NOTE: You can use the scan tool or Honda PGM Tester to inspect idle speed.

Fuel Supply System

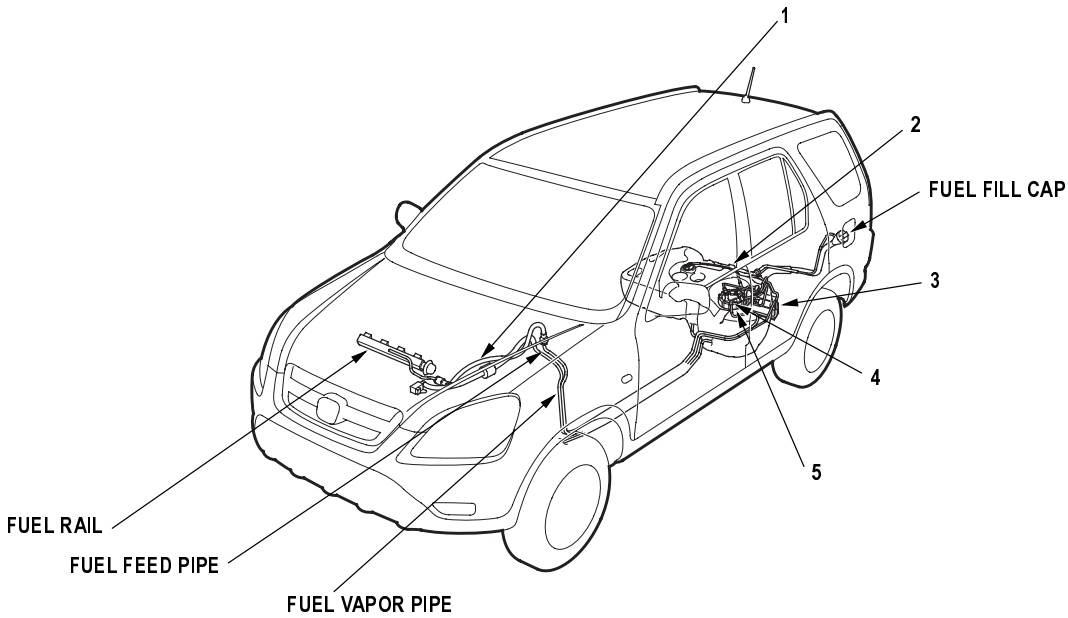
Component Location Index

KG, KS, KE, KR models:



1	FUEL TUBE/QUICK-CONNECT FITTINGS	Precautions, page 11-160; Removal, page 11-161; Installation, page 11-162
2	FUEL TANK	Replacement, page 11-169
3	FUEL TUBE/QUICK-CONNECT FITTINGS	Precautions, page 11-160; Removal, page 11-161; Installation, page 11-162
4	FUEL PUMP	Troubleshooting, page 11-151; Replacement, page 11-167
	FUEL FILTER	Replacement, page 11-166
	FUEL GAUGE SENDING UNIT	Test, page 11-173
	FUEL PRESSURE REGULATOR	Replacement, page 11-165

Except KG, KS, KE, KR, KZ models:

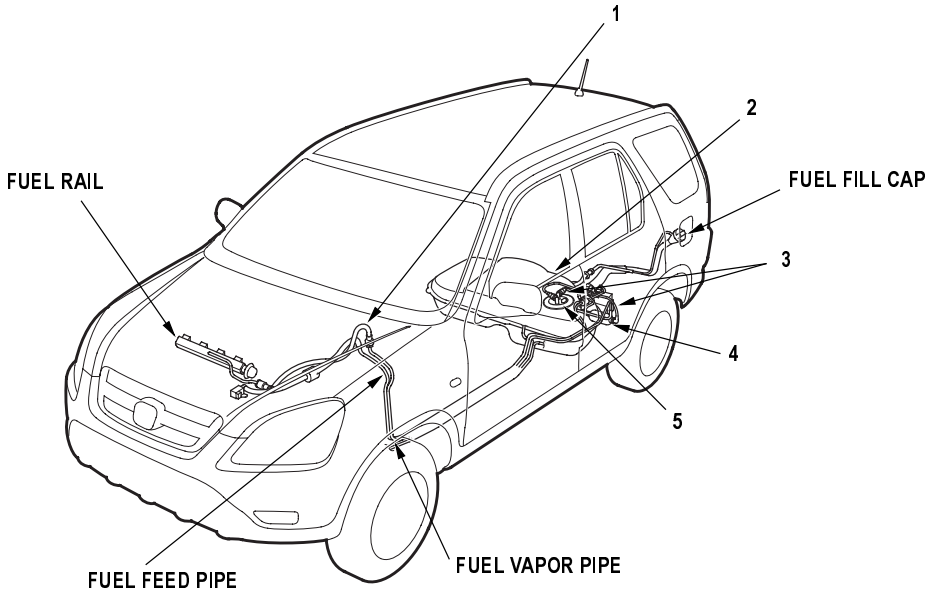


1	FUEL TUBE/QUICK-CONNECT FITTINGS	Precautions, page 11-160; Removal, page 11-161; Installation, page 11-162
2	FUEL TANK	Replacement, page 11-169
3	FUEL FILTER	Replacement, page 11-166
4	FUEL TUBE/QUICK-CONNECT FITTINGS	Precautions, page 11-160; Removal, page 11-161; Installation, page 11-162
5	FUEL PUMP	Troubleshooting, page 11-151; Replacement, page 11-167
	FUEL GAUGE SENDING UNIT	Test, page 11-173
	FUEL PRESSURE REGULATOR	Replacement, page 11-165

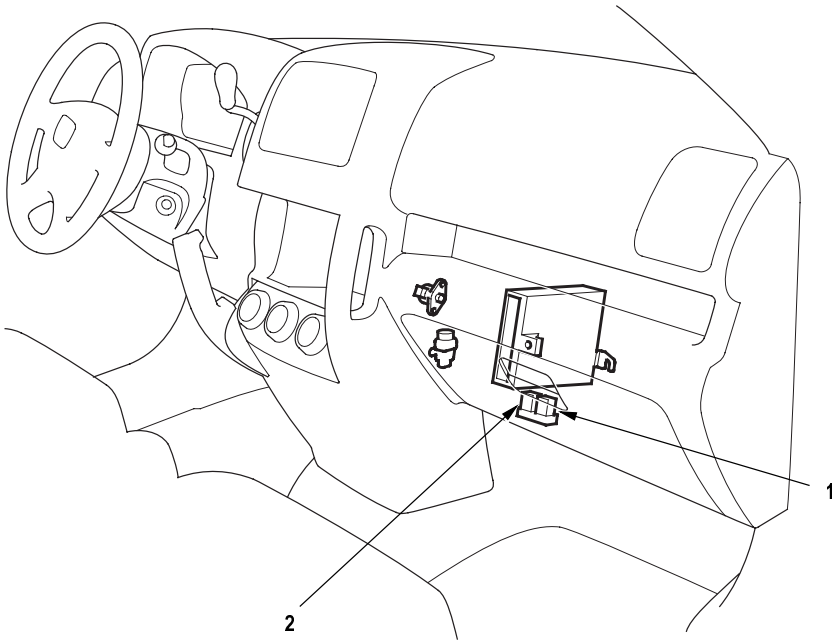
(cont'd)

Component Location Index (cont'd)

KZ model:



1	FUEL TUBE/QUICK-CONNECT FITTINGS	Precautions, page 11-160; Removal, page 11-161; Installation, page 11-162
2	FUEL TANK	Replacement, page 11-169
3	FUEL TUBE/QUICK-CONNECT FITTINGS	Precautions, page 11-160; Removal, page 11-161; Installation, page 11-162
4	FUEL FILTER	Replacement, page 11-166
5	FUEL PUMP	Troubleshooting, page 11-151; Replacement, page 11-167
	FUEL GAUGE SENDING UNIT	Test, page 11-173
	FUEL PRESSURE REGULATOR	Replacement, page 11-165



*: The illustration shows LHD model.

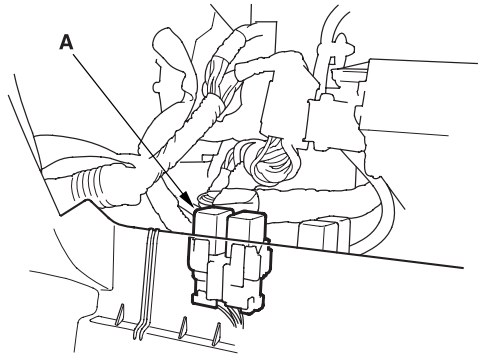
1	PGM-FI MAIN RELAY 1	Troubleshooting, page 11-102
2	PGM-FI MAIN RELAY 2	Troubleshooting, page 11-151

Fuel Pump Circuit Troubleshooting

If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is on, you will hear some noise if you listen to the fuel fill port with the fuel fill cap removed. The fuel pump should run for 2 seconds when the ignition switch is first turned on. If the fuel pump does not make noise, check as follows:

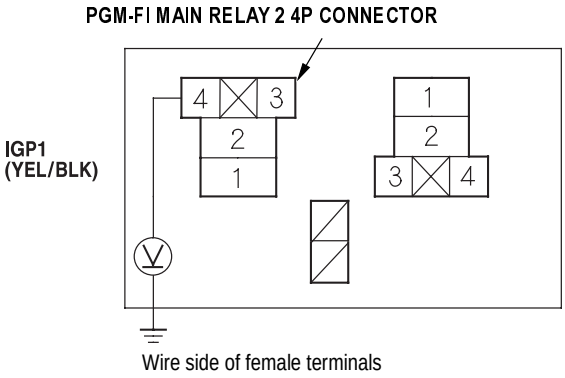
NOTE: Information marked with an asterisk (*) applies to except KG, KS, KE, KR, KU, KN, KH, KY, KZ, FO, KQ, KK, KM models.

1. Turn the ignition switch OFF.
2. Remove the glove box (see page 20-95), PGM-FI main relay 2 (A).



*: The illustration shows LHD model.

3. Turn the ignition switch ON (II).
4. Measure voltage between PGM-FI main relay 2 4P connector terminal No. 4 and body ground.

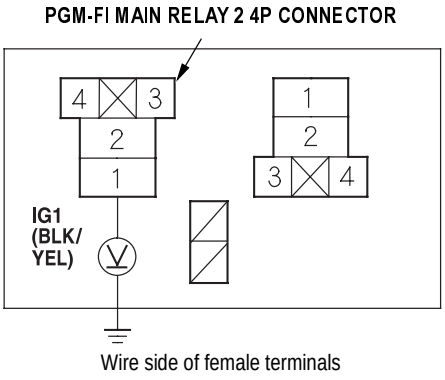


Is there battery voltage?

Yes Go to step 5.

No Repair open in the wire between the PGM-FI main relay 1 and the PGM-FI main relay 2.■

5. Measure voltage between PGM-FI main relay 2 4P connector terminal No. 1 and body ground.

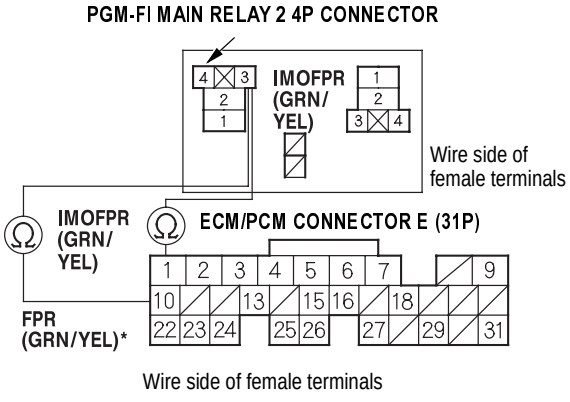


Is there battery voltage?

Yes Go to step 6.

No Repair open in the wire between the under-dash fuse/relay box and PGM-FI main relay 2.■

6. Turn the ignition switch OFF.
7. Disconnect the negative cable from the battery.
8. Disconnect ECM/PCM connector E (31P).
9. Check for continuity between PGM-FI main relay 2 4P connector terminal No. 3 and ECM/PCM connector terminal E1 (E10)*.



Is there continuity?

Yes Go to step 10.

No Repair open in the wire between the PGM-FI main relay 2 and the ECM/PCM (E1, E10*).■

(cont'd)

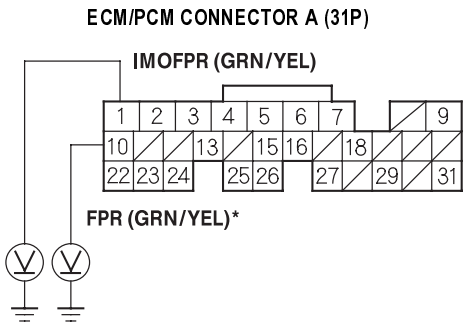
Fuel Pump Circuit Troubleshooting (cont'd)

10. Reinstall the PGM-FI main relay 2.

11. Reconnect the negative cable to the battery.

12. Turn the ignition switch ON (II).

13. Measure voltage between ECM/PCM connector terminal E1 (E10)* and body ground.



Is there battery voltage?

Yes Go to step 14.

No Replace the PGM-FI main relay 2.■

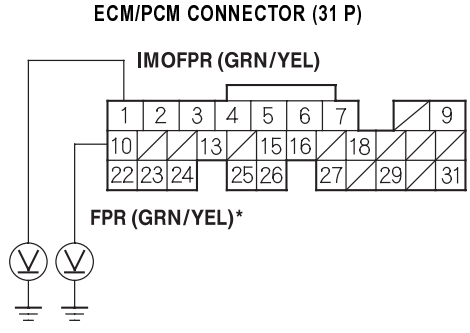
14. Turn the ignition switch OFF.

15. Disconnect the negative cable from the battery.

16. Reconnect ECM/PCM connector E (31P).

17. Reconnect the negative cable to the battery.

18. Turn the ignition switch ON (II), and measure voltage between ECM/PCM connector terminal E1 (E10)* and body ground within the first 2 seconds after the ignition switch was turned ON (II).



Is there battery voltage?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

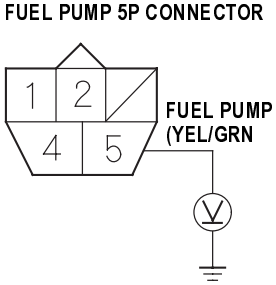
No Go to step 19.

19. Turn the ignition switch OFF.

20. Fold the rear seats forward, and pull back the carpet to expose the access panel.

21. Remove the access panel from the floor.

22. Measure voltage between fuel pump 5P connector terminal No. 5 and body ground within the first 2 seconds after the ignition switch was turned ON (II).



Is there battery voltage?

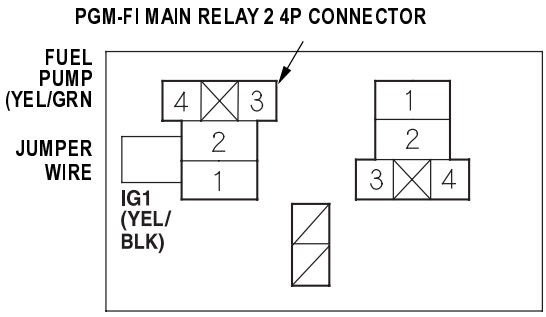
Yes Go to step 28.

No Go to step 23.

23. Turn the ignition switch OFF.

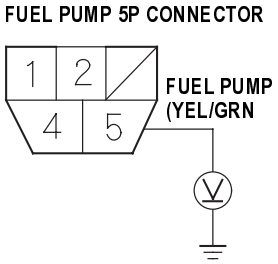
24. Remove the PGM-FI main relay 2.

25. Connect PGM-FI main relay 2 4P connector terminals No. 1 and No. 2 with a jumper wire.



26. Turn the ignition switch ON (II).

27. Measure voltage between fuel pump 5P connector terminal No. 5 and body ground within the first 2 seconds after the ignition switch was turned ON (II).



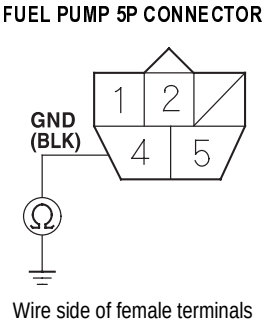
Is there battery voltage?

Yes Replace the PGM-FI main relay 2.■

No Repair open in the wire between the PGM-FI main relay 2 and the fuel pump 5P connector.■

28. Turn the ignition switch OFF.

29. Check for continuity between fuel pump 5P connector terminal No. 4 and body ground.



Is there continuity?

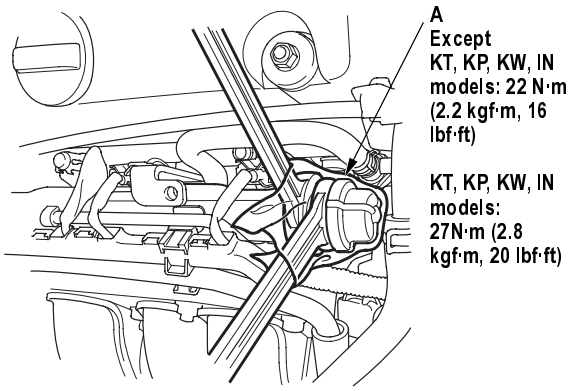
Yes Replace the fuel pump.■

No Repair open in the wire between the fuel pump 5P connector and G551.■

Fuel Pressure Relieving

Before disconnecting fuel lines or hoses, release pressure from the system by loosening the fuel pulsation damper on top of the fuel rail.

1. Make sure you have the anti-theft code for the radio,then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the fuel fill cap and the engine cover.
4. Use a wrench on the fuel pulsation damper (A).



5. Place a rag or shop towel (B) over the fuel pulsation damper.
6. Slowly loosen the fuel pulsation damper one complete turn.

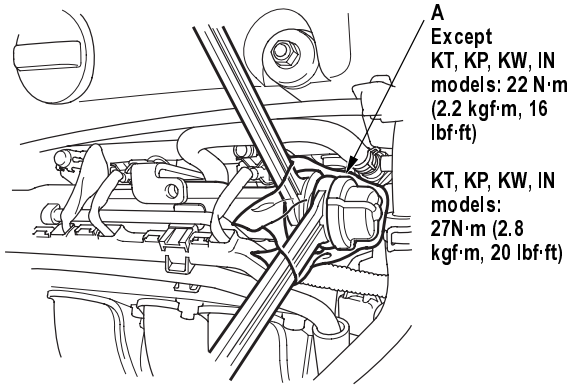
   NOTE: Replace all washers whenever the fuel pulsation damper is loosened or removed.

Fuel Pressure Test

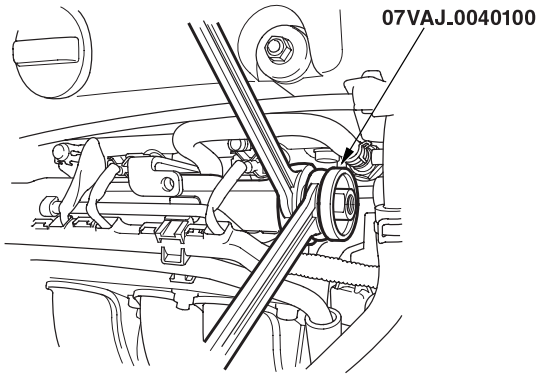
Special Tools Required

- Fuel pressure gauge 07406-0040002
- Fuel pressure gauge attachment 07VAJ-0040100
- Fuel pressure gauge set 07ZAJ-S5A0100

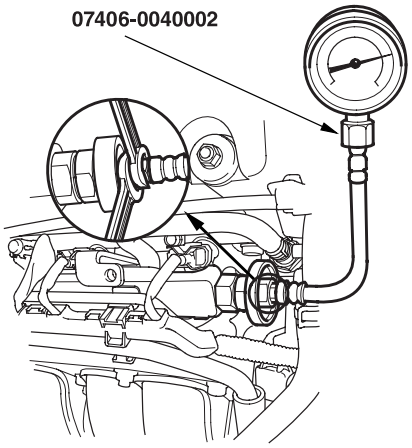
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. Remove the fuel fill cap and the engine cover.
4. Use a wrench on the fuel pulsation damper (A) at the fuel rail.



5. Place a rag or shop towel (B) over the fuel pulsation damper.
6. Slowly loosen the fuel pulsation damper one complete turn.
7. Remove the fuel pulsation damper from its fitting, and attach the fuel pressure gauge attachment.



8. Attach the fuel pressure gauge.



9. Start the engine and let it idle.
   - If the engine starts, go to step 11.
   - If the engine does not start, go to step 10.

10. Check to see if the fuel pump is running: listen to the fuel fill port with the fuel fill cap removed. The fuel pump should run for 2 seconds when the ignition switch is first turned ON (II).
    - If the pump runs, go to step 11.
    - If the pump does not run, perform the fuel pump circuit troubleshooting (see page 11-151)

11. Read the pressure gauge. The pressure should be 330 - 380 kpa (3.4 - 3.9 kgf/cm^2, 48 - 55 psi) (KZ model: 320 - 370 kpa (3.3 - 3.8 kgf/cm^2, 47 - 54 psi)).
    - If the pressure is OK, the test is complete.
    - If the pressure is out of specification, replace the fuel pressure regulator (see page 11-165) and the fuel filter (see page 11-166), then repeat the test.

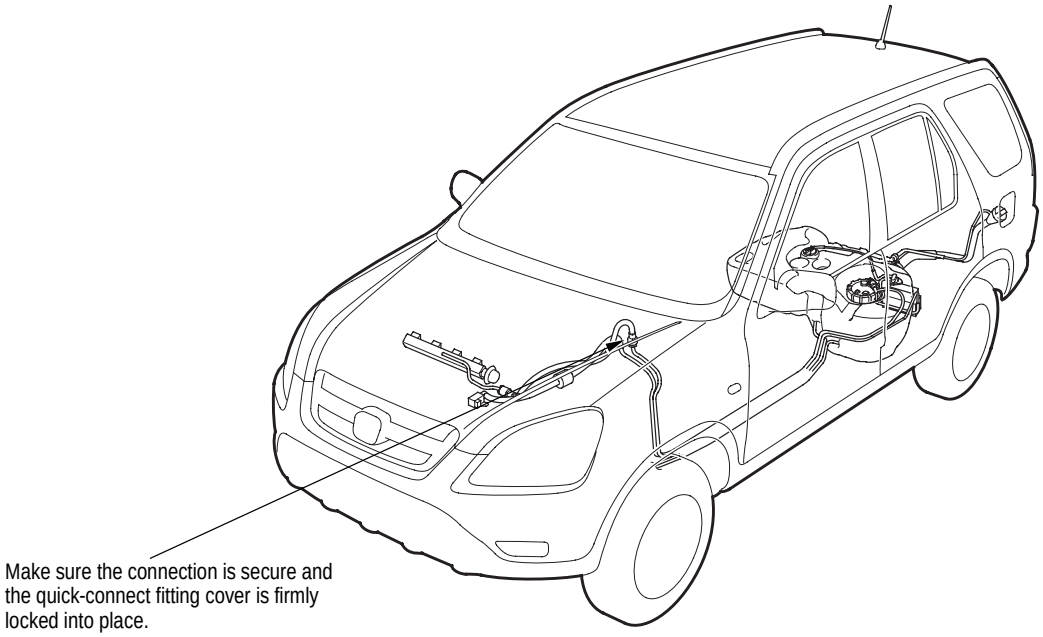
12. Remove the pressure gauge, and reinstall the fuel pulsation damper with a new washer. Tighten the fuel pulsation damper to 22 N·m (2.2kgf·m, 16 lbf·ft) [KT, KP, KW, IN models: 27 N·m (2.8 kgf·m, 20 lbf·ft)].

    NOTE: Disassemble and clean the fuel pressure gauge attachment thoroughly after use.

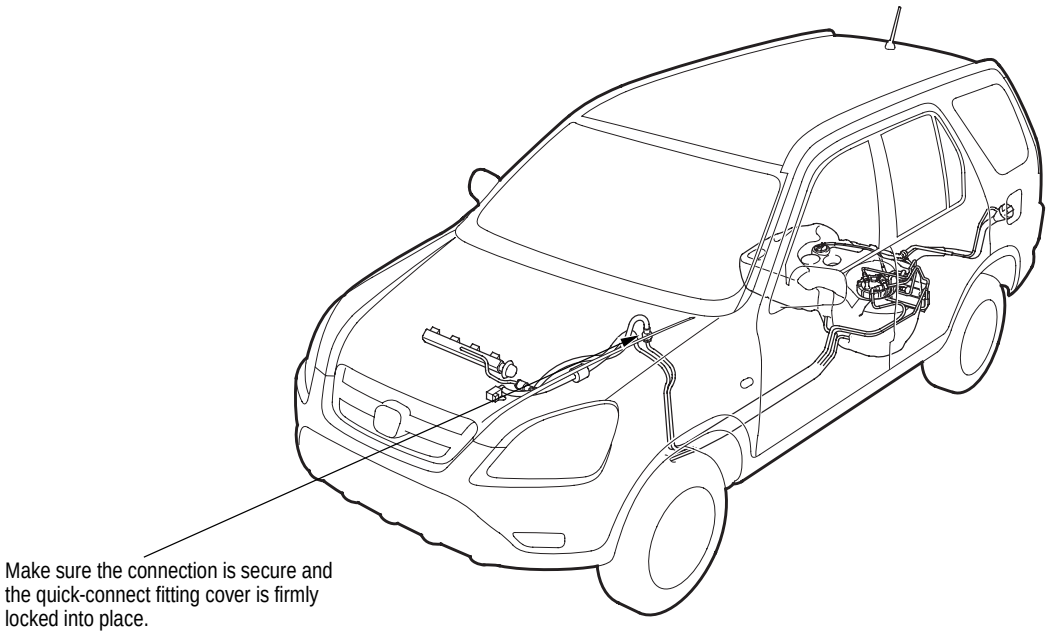
Fuel Line Inspection

Check the fuel system lines, hoses, and fuel filter for damage, leaks, and deterioration. Replace any damaged parts.

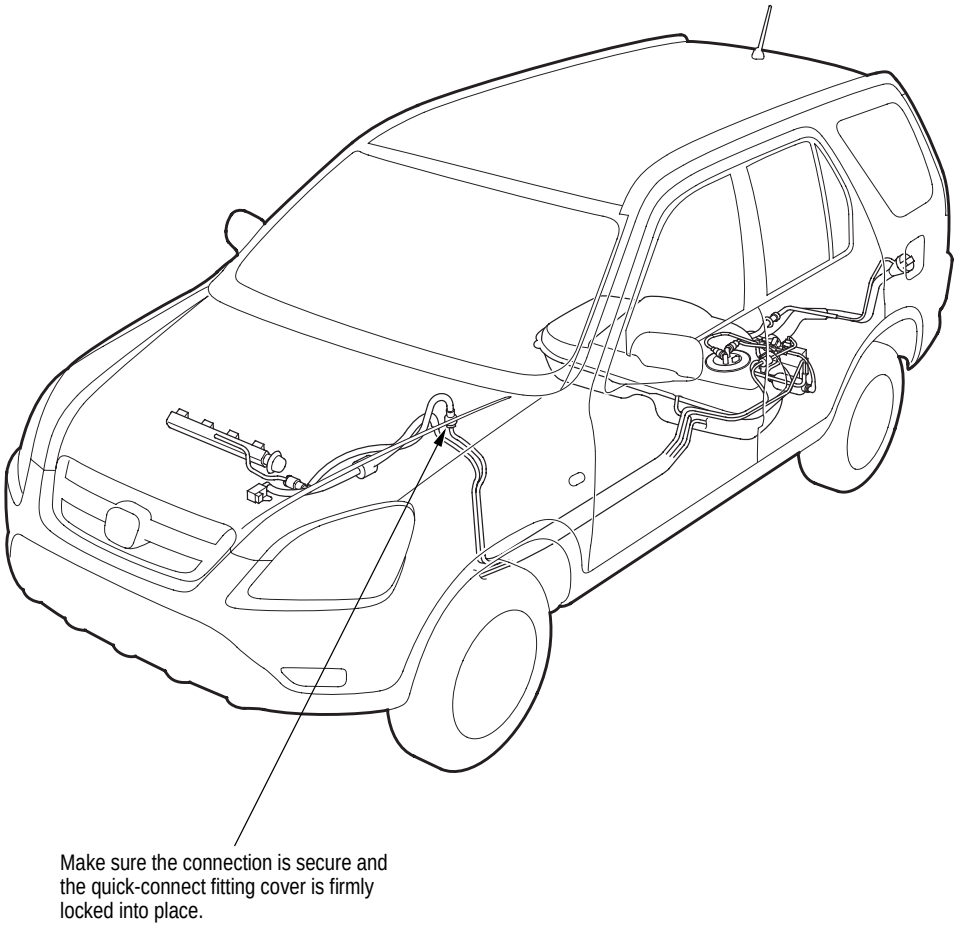
KG, KS, KE, KR models:



Except KG, KS, KE, KR, KZ models:



KZ model:

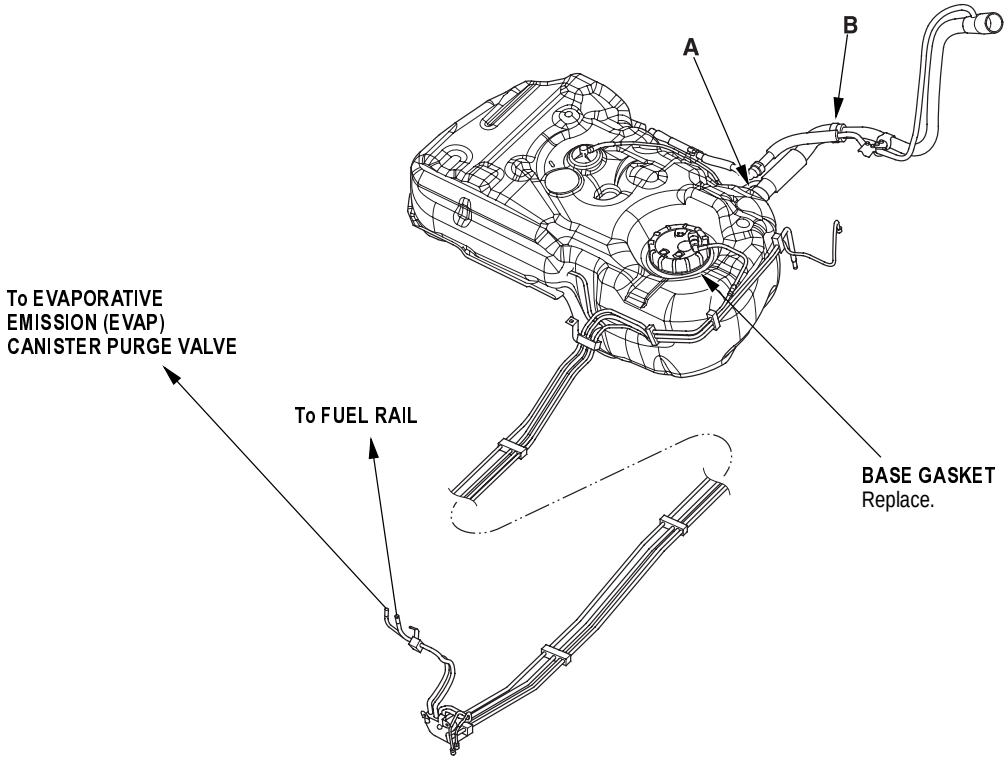


(cont'd)

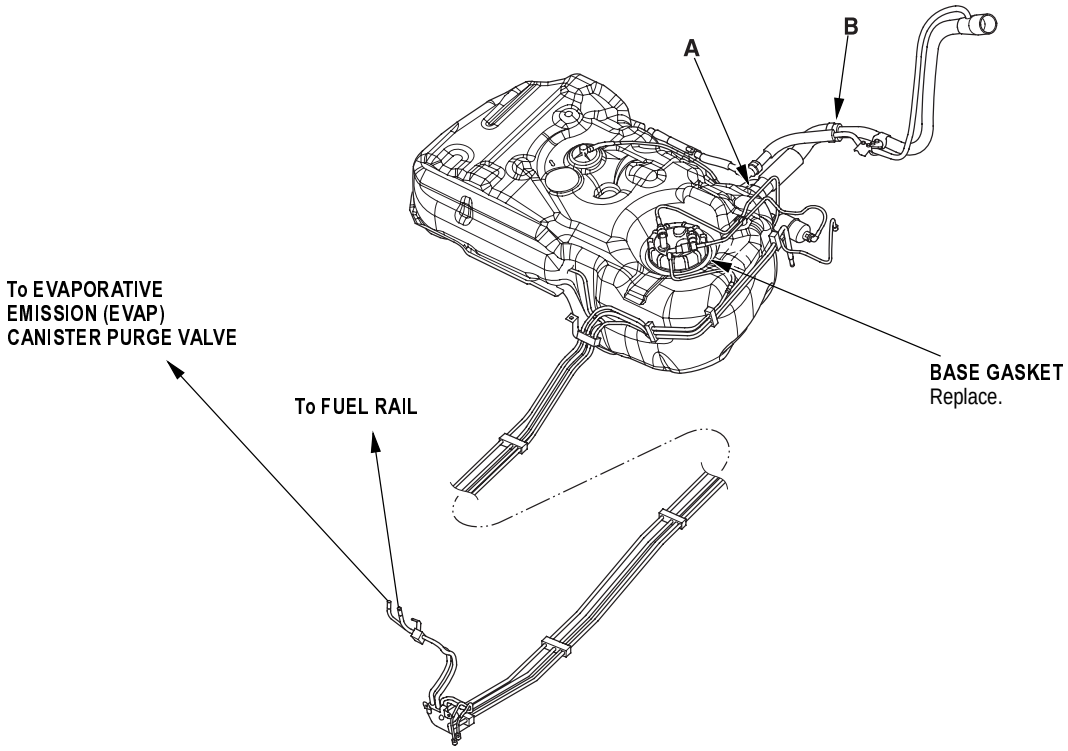
Fuel Line Inspection (cont'd)

Check all clamps and retighten if necessary.
▲: Do not disconnect the hose from the pipe at these joints.

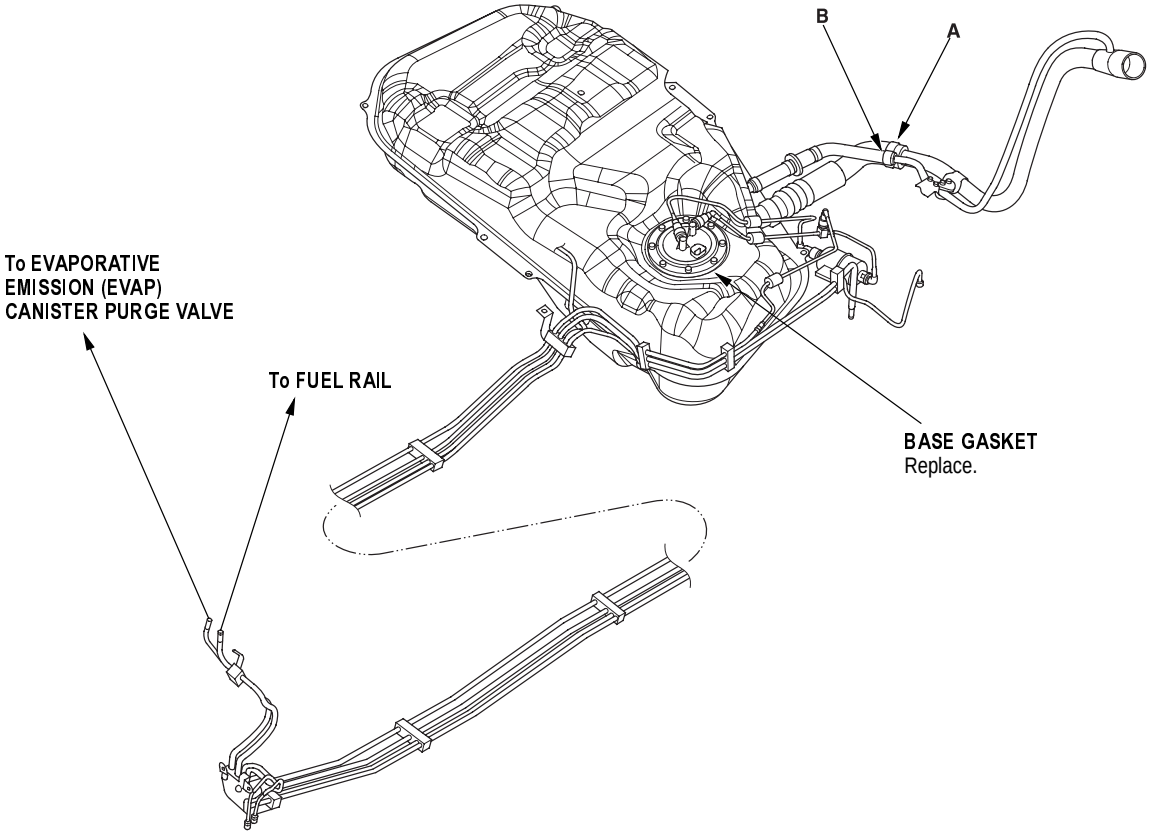
KG, KS, KE, KR models:

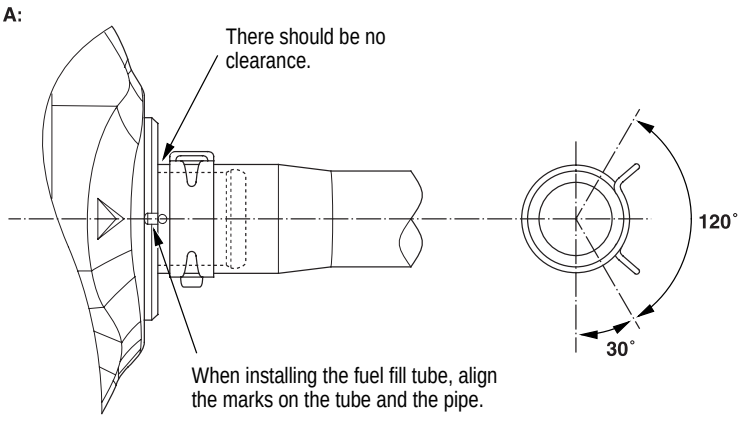


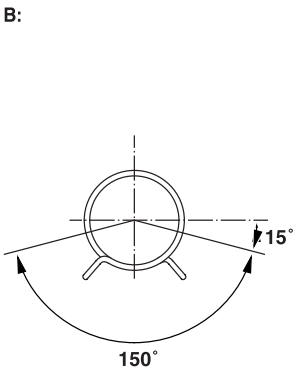
Except KG, KS, KE, KR, KZ models:



KZ model:


B
A
To EVAPORATIVE
EMISSION (EVAP)
CANISTER PURGE VALVE
To FUEL RAIL
BASE GASKET
Replace.

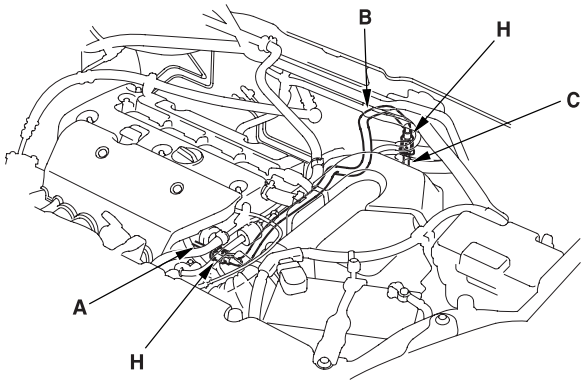

A:
There should be no
clearance.
120˚
30˚
When installing the fuel fill tube, align
the marks on the tube and the pipe.


B:
15˚
150˚

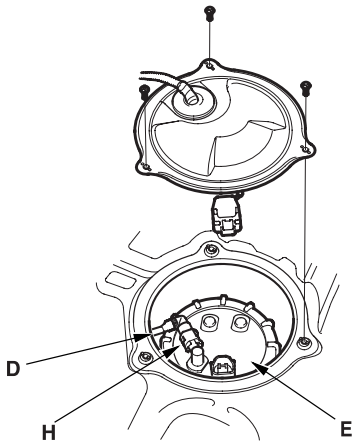
Fuel Tube/Quick-Connect Fittings Precaution

The fuel tube/quick-connect fittings connect the fuel rail (A) to fuel feed hose (B), the fuel feed hose (B) to the fuel line (C), and the fuel tube (D) to the fuel tank unit (E) and fuel tube (F) to the fuel filter (G). When removing or installing the fuel feed hose, fuel tank unit, or fuel tank, it is necessary to disconnect or connect the quick-connect fittings.
Pay attention to the following:

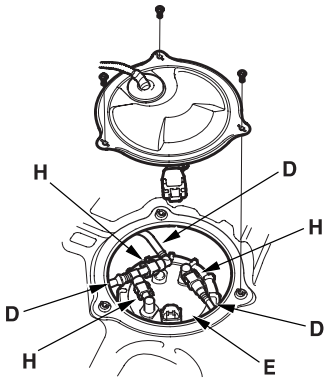
- The fuel feed hose (B), fuel tube (D) and quick-connect fittings (H) are not heat-resistant; be careful not to damage them during welding or other heat-generating procedures.
- The fuel feed hose (B), fuel tube (D) and quick-connect fittings (H) are not acid-proof; do not touch them with a shop towel which was used for wiping battery electrolyte. Replace them if they came into contact with electrolyte or something similar.
- When connecting or disconnecting the fuel feed hose (B), fuel tube (D), and quick-connect fittings (H), be careful not to bend or twist them excessively. Replace them it damaged.



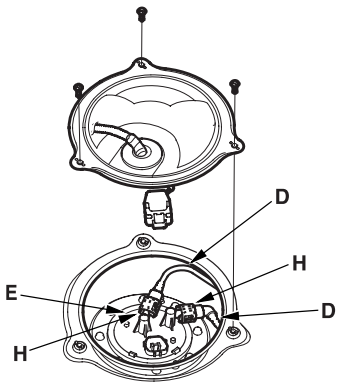
KG, KS, KE, KR models:



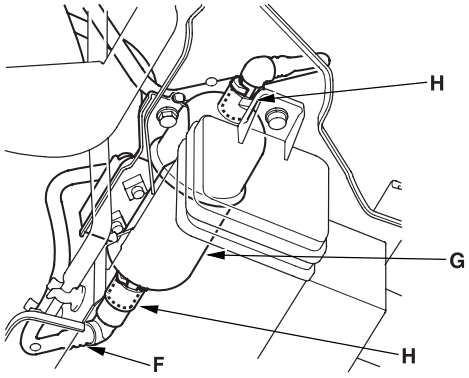
Except KG, KS, KE, KR, KZ models:



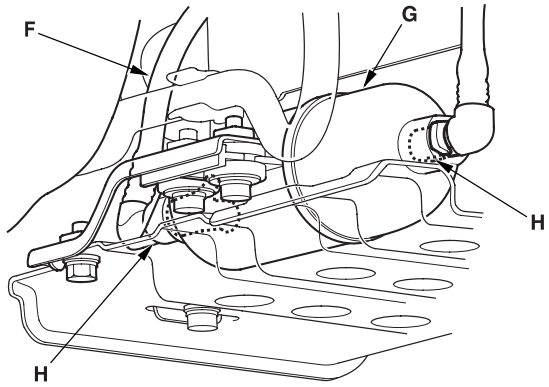
KZ model:



PH, FO, IN, MA models:



KZ model:



A disconnected quick-connect fitting can be reconnected, but the retainer on the mating pipe cannot be reused once it has been removed from the pipe. Replace the retainer when

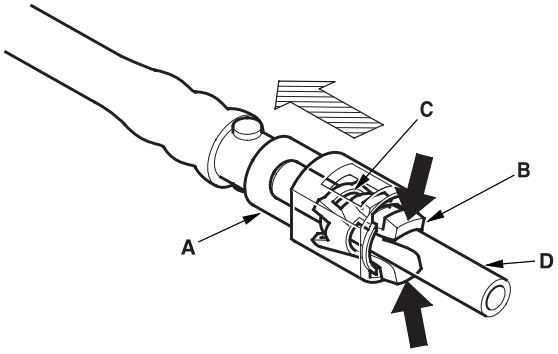
- replacing the fuel rail.
- replacing the fuel pipe.
- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel gauge sending unit.
- it has been removed from the pipe.
- it is damaged.

PART	MANUFACTURER	RETAINER COLOR
ENGINE COMPARTMENT (FUEL FEED HOSE: FUEL RAIL SIDE)	TOKAI	BLU
ENGINE COMPARTMENT (FUEL FEED HOSE: FUEL FEED PIPE SIDE)	TOKAI	GREEN
FUEL TANK UNIT FUEL FILTER	SANOH	WHITE
FUEL FILTER (FLOW SIDE)	MOD SIGNAL	NATURAL

Fuel Tube/Quick-Connect Fittings Removal

1. Relieve the fuel pressure (see page 11-154).
2. Check the fuel quick-connect fitting for dirt, and clean if necessary.
3. Hold the connector (A) with one hand and squeeze the retainer tabs (B) with the other hand to release them from the locking pawls (C). Pull the connector off.

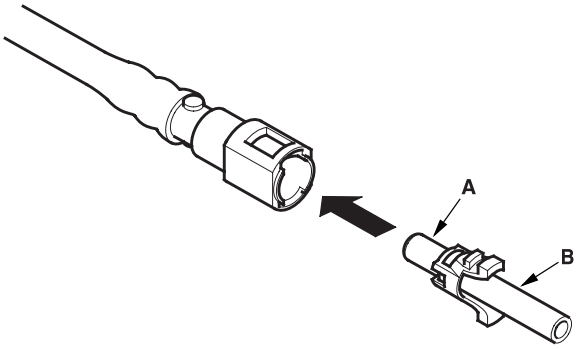
   NOTE:
   - Be careful not to damage the pipe (D) or other parts. Do not use tools.
   - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
   - Do not remove the retainer from the pipe; once removed, the retainer must be replaced with a new one.



(cont'd)

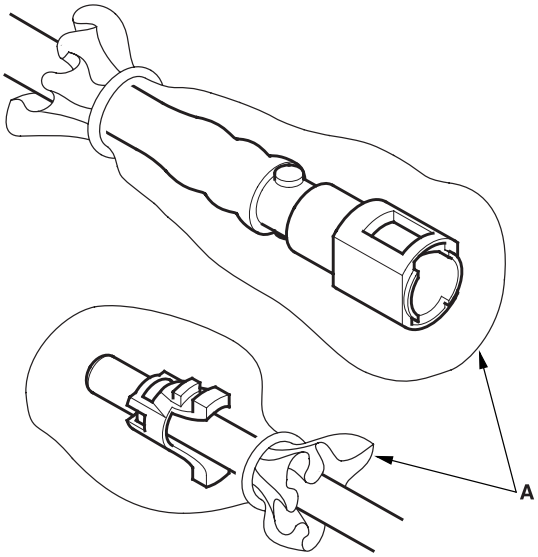
Fuel Tube/Quick-Connect Fittings Removal (cont'd)

4. Check the contact area (A) of the pipe (B) for dirt and damage.
- If the surface is dirty, clean it.
- If the surface is rusty or damaged, replace the fuel pump, fuel filter, or fuel feed pipe.



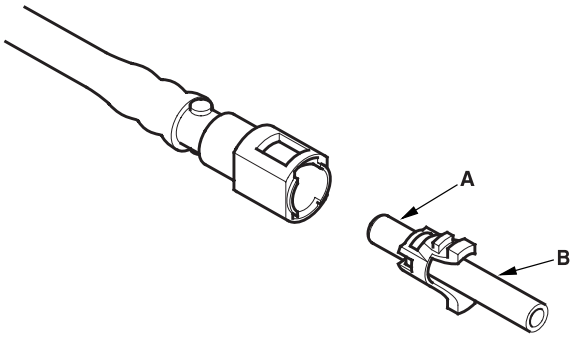
5. To prevent damage and keep foreign matter out, cover the disconnected connector and pipe end with plastic bags (A).

NOTE:
- The retainer cannot be reused once it has been removed from the pipe.
  Replace the retainer when
  – replacing the fuel rail.
  – replacing the fuel feed pipe.
  – replacing the fuel pump.
  – replacing the fuel filter.
  – replacing the fuel gauge sending unit.
  – it has been removed from the pipe.
  – it is damaged.

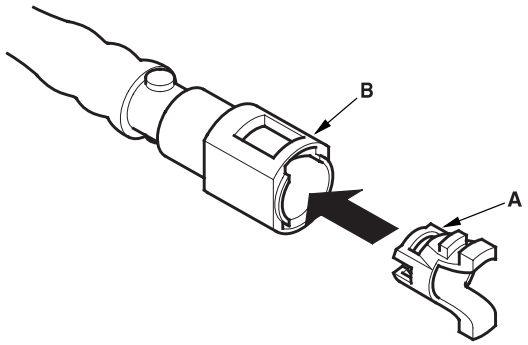


Fuel Tube/Quick-Connect Fittings Installation

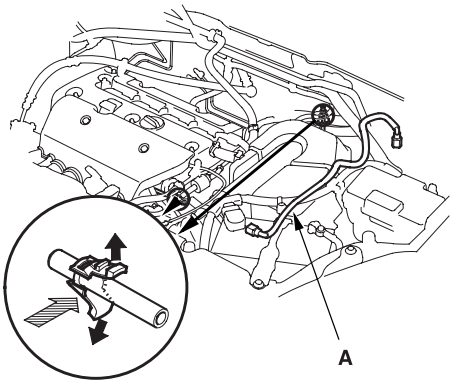
1. Check the contact area (A) of the pipe (B) for dirt and damage, and clean if necessary.



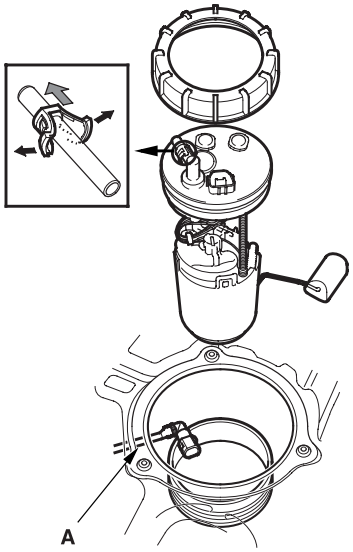
2. Insert a new retainer (A) into the connector (B) if the retainer is damaged, or after
- replacing the fuel rail.
- replacing the fuel feed pipe.
- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel gauge sending unit.
- removing the retainer from the pipe.



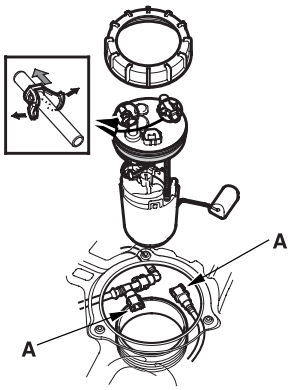
3. Before connecting a new fuel tube/quick-connect fitting assembly (A), remove the old retainer (B) from the mating pipe.



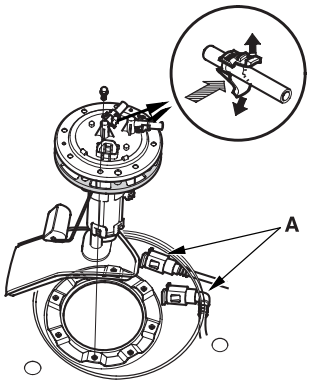
KG, KS, KE, KR models:



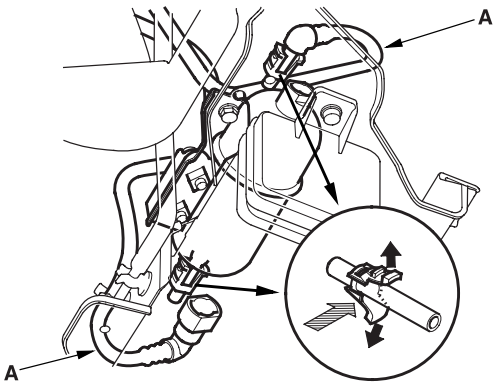
Except KG, KS, KE, KR KZ models:



KZ model:



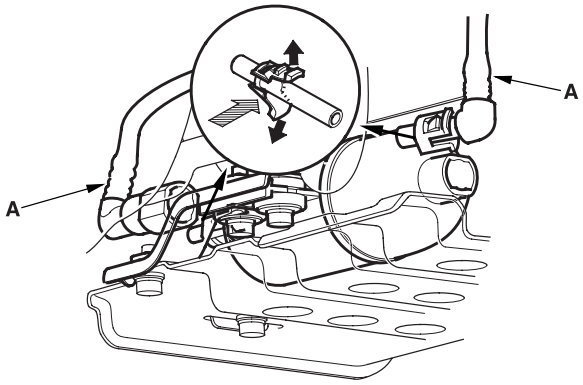
PH, FO, IN, MA models:



(cont'd)

Fuel Tube/Quick-Connect Fittings Installation (cont'd)

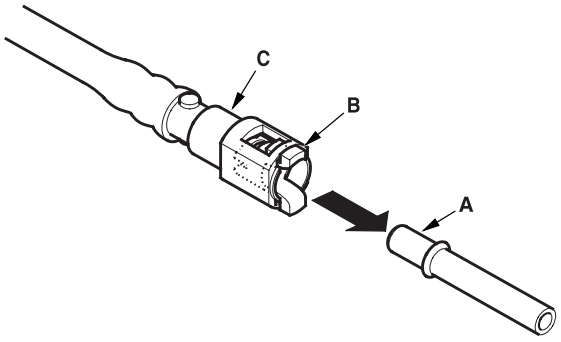
KZ model:



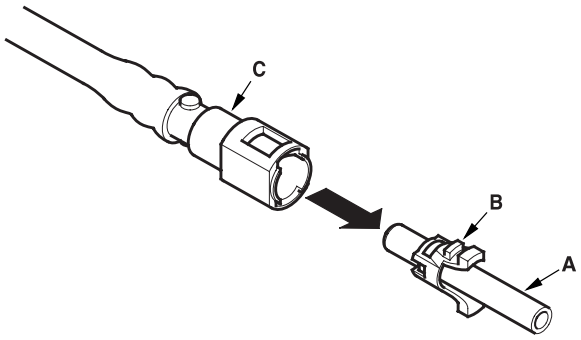
4. Align the quick-connect fittings with the pipe (A), and align the retainer (B) locking pawls with the connector (C) grooves. Then press the quick-connect fittings onto the pipe until both retainer pawls lock with a clicking sound.

NOTE: If it is hard to connect, put a small amount of new engine oil on the pipe end.

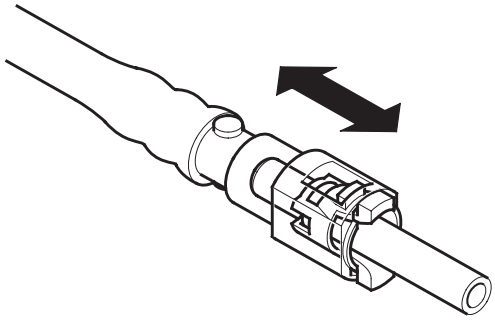
Connection with new retainer:



Reconnection to existing retainer:



5. Make sure the connection is secure and that the pawls are firmly locked into place; check visually and by pulling the connector.

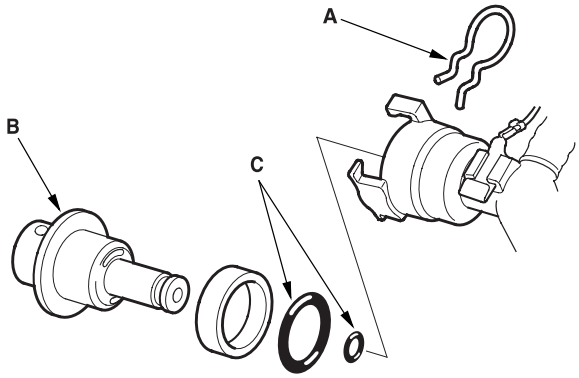


6. Reconnect the negative cable to the battery, and turn the ignition switch ON (II). The fuel pump will run for about 2 seconds, and fuel pressure will rise. Repeat two or three times, and check that there is no leakage in the fuel supply system.

Fuel Pressure Regulator Replacement

Except KZ model:

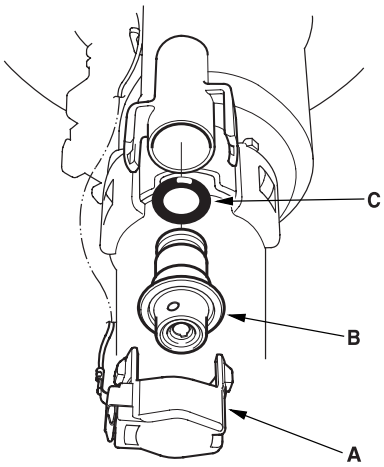
1. Remove the fuel pump (see page 11-167).
2. Remove the clip (A).



3. Remove the fuel pressure regulator (B).
4. Install the part in the reverse order of removal with new O-rings (C).

KZ model:

1. Remove the fuel pump (see page 11-167).
2. Remove the bracket (A).



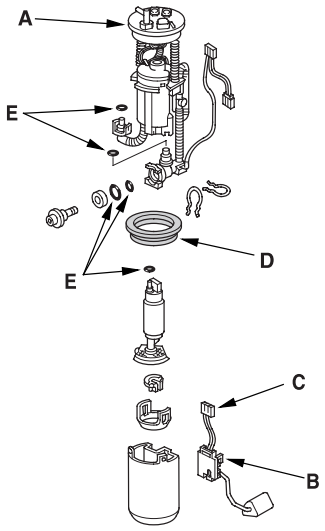
3. Remove the fuel pressure regulator (B).
4. Install the part in the reverse order of removal with a new O-ring (C).

Fuel Filter Replacement

The fuel filter should be replaced whenever the fuel pressure drops below the specified value (330 - 380 kPa (3.4 - 3.9 kgf/cm^2, 48 - 55 psi), KZ model: 320 - 370 kPa, (3.3 - 3.8 kgf/cm^2, 47 - 54 psi)) after making sure that the fuel pump and the fuel pressure regulator are OK.

KG, KS, KE, KR models:

1. Remove the fuel pump (see page 11-167).
2. Remove the fuel filter (A).

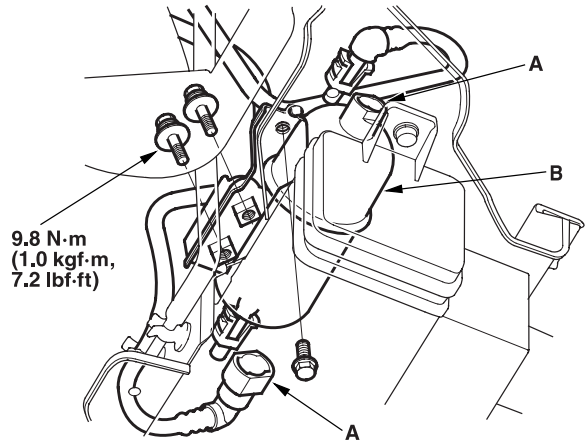


3. Install the part in the reverse order of removal with a new base gasket (D) and new O-rings (E), then check these items:
   - When connecting the wire harness, make sure the connection is secure and the terminal (B) is firmly locked into place.
   - When installing the fuel gauge sending unit (C), make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.

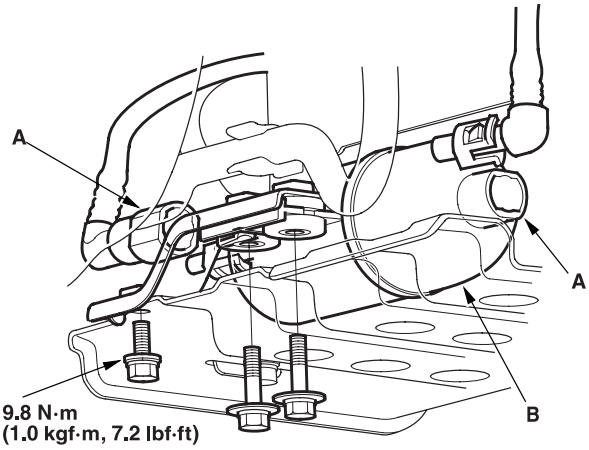
Except KG, KS, KE, KR models:

1. Relieve fuel pressure (see page 11-154).
2. Disconnect the hose and quick-connect fittings (A) (see page 11-161).

Except KZ model:



KZ model:



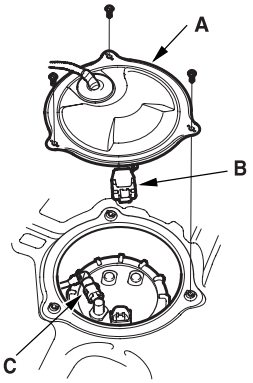
3. Remove the fuel filter (B).
4. Install the part in the reveres order of removal.

Fuel Pump/Fuel Gauge Sending Unit Replacement

Special Tools Required
Adjustable ring wrench 07WAA-0010100

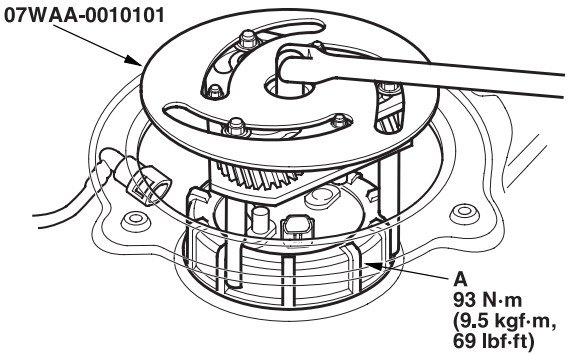
Except KZ model:

1. Relieve the fuel pressure (see page 11-154).
2. Remove the fuel fill cap.
3. Fold the rear seats forward, and pull back the carpet to expose the access panel.
4. Remove the access panel (A) from the floor.



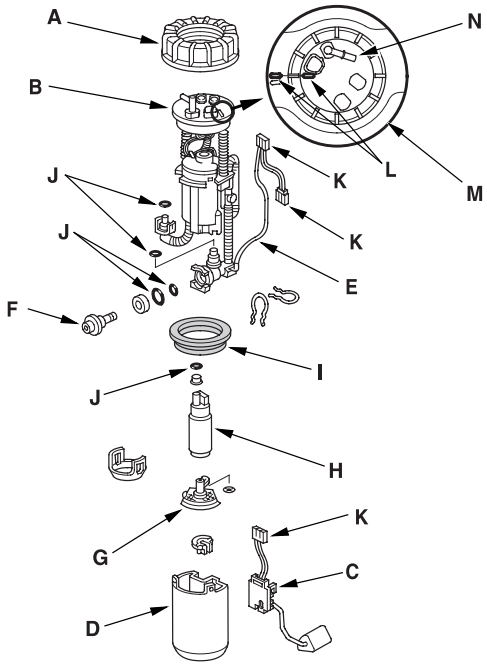
*: The illustration shows KG, KS, KE, KR models.

5. Disconnect the fuel pump 5P connector (B).
6. Disconnect the quick-connect fitting (C) from the fuel tank unit.
7. Using the tool, loosen the fuel tank unit locknut (A).



*: The illustration shows KG, KS, KE, KR models.

8. Remove the locknut (A) and the fuel pump assembly.



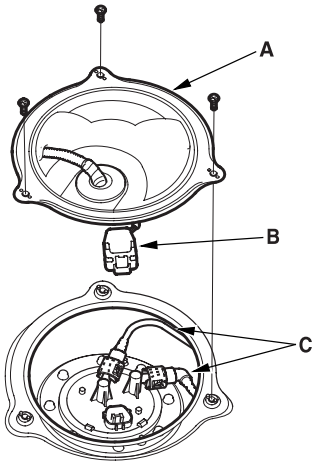
9. Remove the strainer case (B), the fuel gauge sending unit (C), the case (D), the wire harness (E), and the fuel pressure regulator (F).
10. When connecting the fuel pump assembly, make sure the connection is secure and the suction filter (G) is firmly connected to the fuel pump (H).
11. Install the fuel pump assembly in the reverse order of removal with a new base gasket (I) and new O-rings (J), then check these items:
    - When connecting the wire harness, make sure the connection is secure and the connector (K) is firmly locked into the place.
    - When installing the fuel gauge sending unit, make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.
    - When installing the fuel pump assembly align, the marks (L) on the fuel tank (M) and the fuel pump assembly (N).

(cont'd)

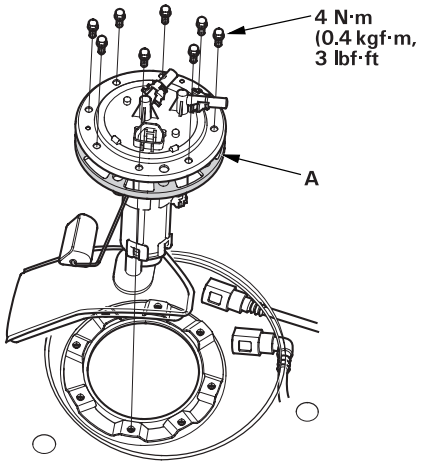
Fuel Pump/Fuel Gauge Sending Unit Replacement (cont'd)

KZ model:

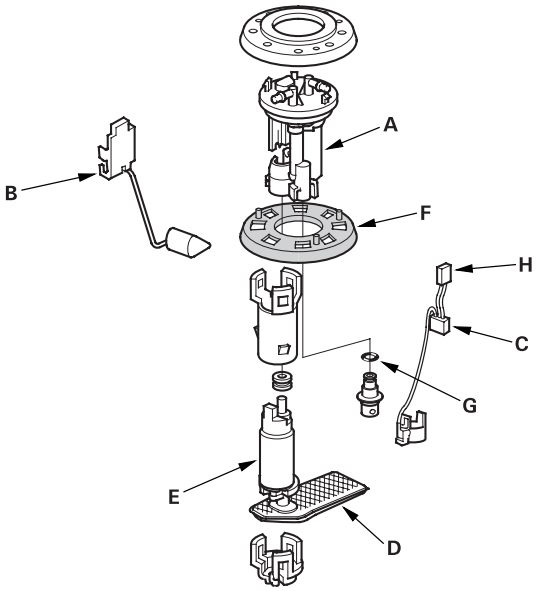
1. Relieve the fuel pressure (see page 11-154).
2. Remove the fuel fill cap.
3. Fold the rear seats forward, and pull back the carpet to expose the access panel.
4. Remove the access panel (A) from the floor.



5. Disconnect the fuel pump 5P connector (B).
6. Disconnect the quick-connect fittings (C) from the fuel tank unit.
7. Remove the fuel tank unit (A).



8. Remove the strainer case (A), the fuel gauge sending unit (B), the wire harness (C).



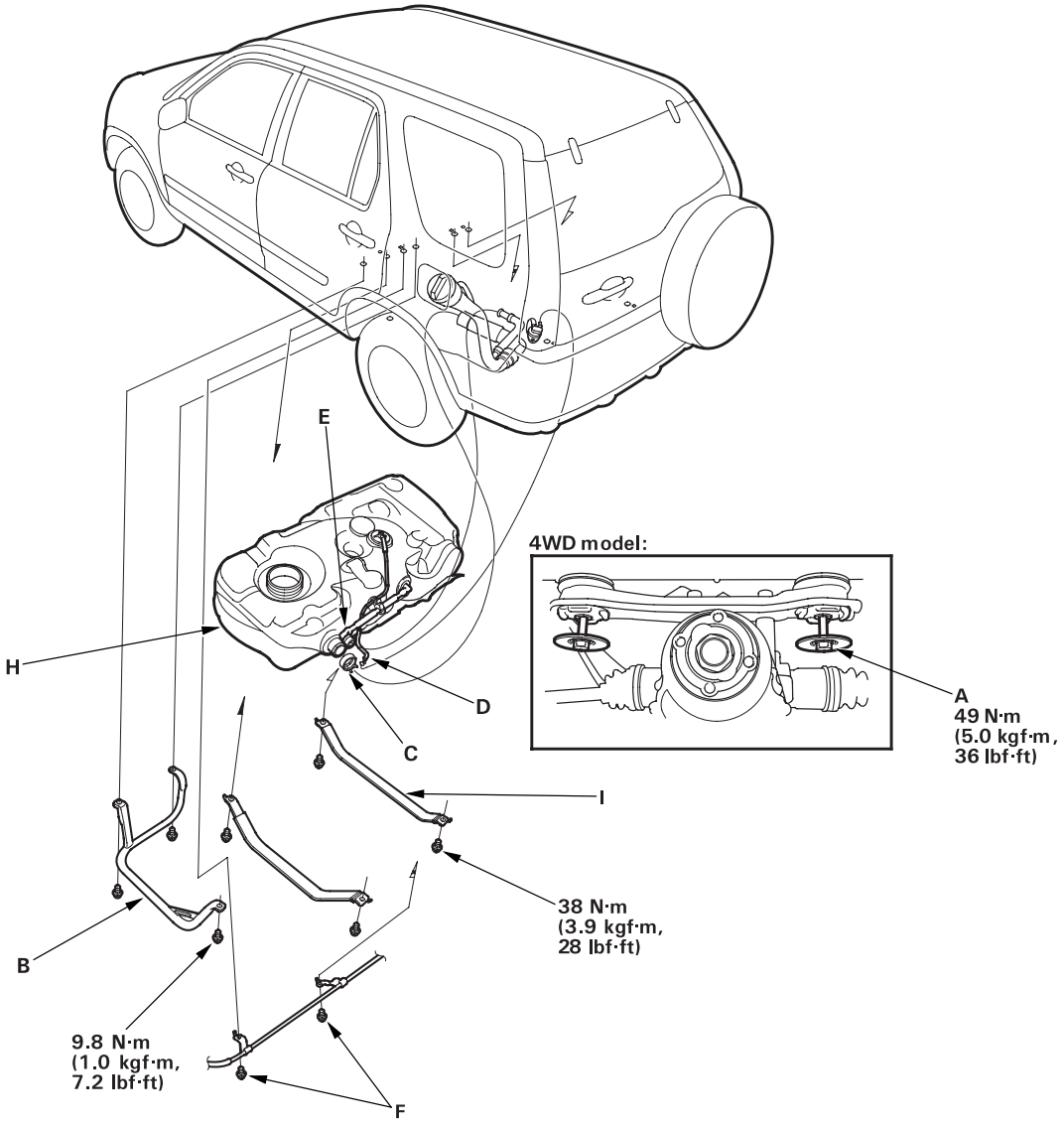
9. When connecting the fuel tank unit, make sure the connection is secure and the suction filter (D) is firmly connected to the fuel pump (E).
10. Install the part in the reverse order of removal with a new base gasket (F) and new O-rings (G), then check these items:
    - When connecting the wire harness, make sure the connection is secure and the connector (H) is firmly locked into the place.
    - When installing the fuel gauge sending unit, make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.

Fuel Tank Replacement

Except KZ model:

1. Drain the fuel tank: Remove the fuel pump assembly (see page 11-167). Using a hand pump, hose and container suitable for gasoline, draw the fuel from the fuel tank.
2. Jack up the vehicle, and support it with jackstands.
3. 4WD model:
   Remove the propeller shaft (see page 16-33). Remove the rear differential mounting bolt (A), then support it with jackstands.

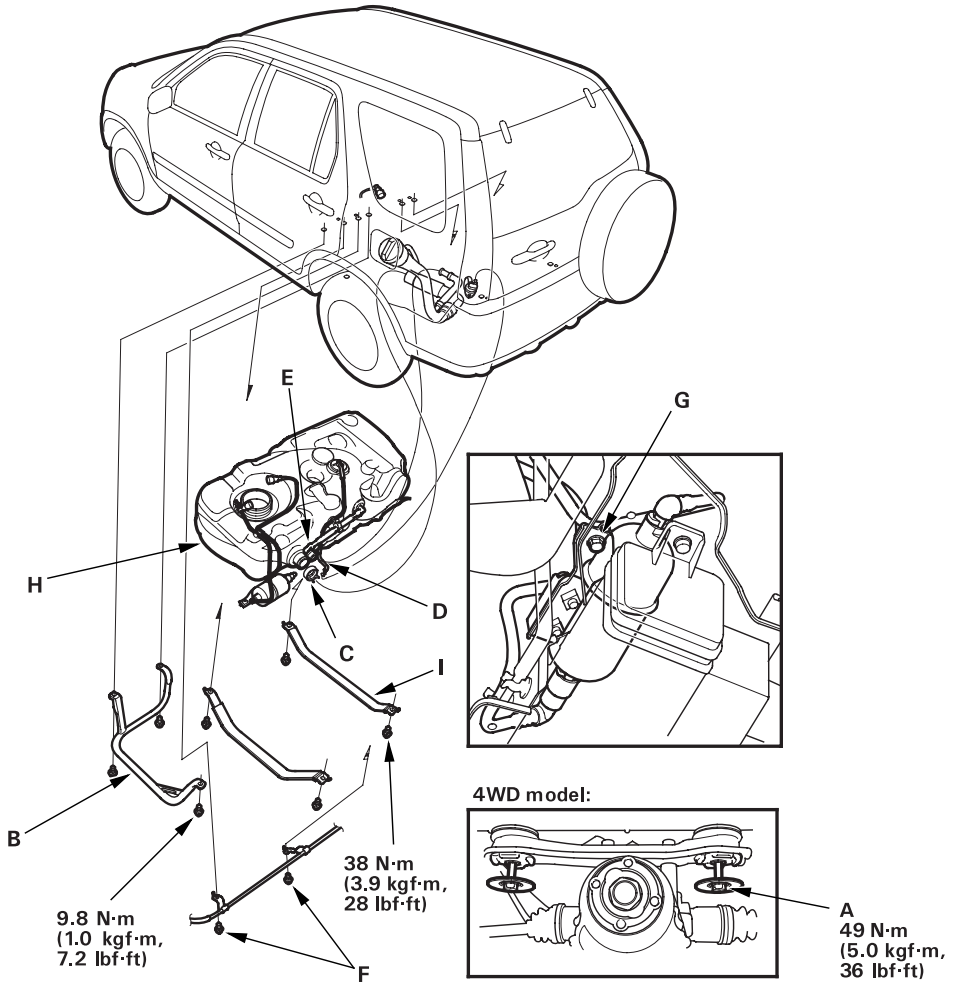
KG, KS, KE, KR models:



(cont'd)

Fuel Tank Replacement (cont'd)

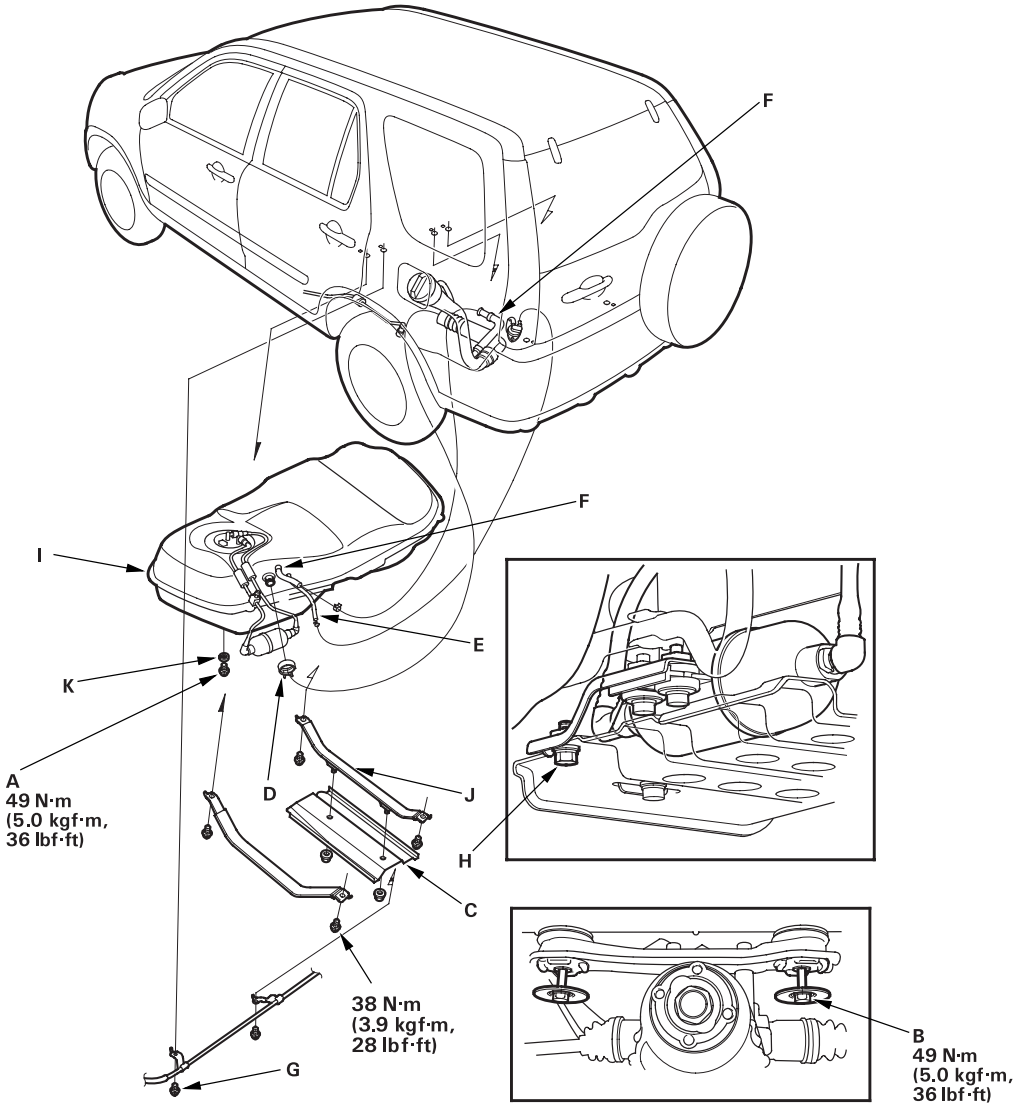
Except KG, KS, KE, KR models:



4. Loosen the Evaporative Emission (EVAP) canister bracket bolt.
5. Remove the fuel tank guard (B).
6. Loosen the clamp (C).
7. Disconnect the fuel vapor hose (D), hoses (E) and wire stay bolts (F). Slide back the clamps, then twist the hoses as you pull to avoid damaging them.
8. Except KG, KS, KE, KR models:
   Remove the fuel filter bracket bolt (G).
9. Place a jack, or other support, under the fuel tank (H).
10. Remove the strap bolts, and the strap (I).
11. Remove the fuel tank.
12. Install the remaining parts in the reverse order of removal.

KZ model:

1. Relieve the fuel pressure (see page 11-154).
2. Fold the rear seats forward, and pull back the carpet to expose the access panel.
3. Remove the access panel, disconnect the quick connect fittings from the fuel pump.
4. Jack up the vehicle, and support it with jackstands.
5. Remove the drain bolt (A), and drain the fuel into an approved container.
6. Remove the propeller shaft (see page 16-33). Remove the rear differential mounting bolt (B), then support it with jackstands.



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Fuel Tank Replacement (cont'd)

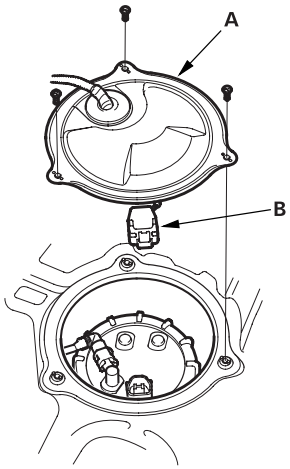
7. Loosen the Evaporative Emission (EVAP) canister bracket bolt.
8. Remove the fuel tank guard (C).
9. Loosen the clamp (D).
10. Disconnect the fuel vapor hose (E) and hoses (F) and wire stay bolts (G). Slide back the clamps, then twist the hoses as you pull to avoid damaging them.
11. Remove the fuel filter bracket (H).
12. Place a jack, or other support, under the fuel tank (I).
13. Remove the strap bolts, and the strap (J).
14. Remove the fuel tank.
15. Install the drain bolt with a new washer (K), then coat the drain bolt with Noxrust 124B or equivalent. Allow the Noxrust or equivalent to dry for 20 minutes.
16. Install the remaining parts in the reverse order of removal.

Fuel Gauge Sending Unit Test

Special Tools Required
Adjustable ring wrench 07WAA-0010100

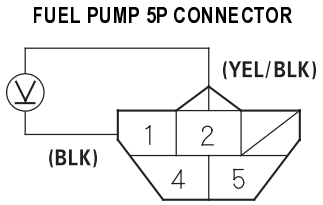
NOTE: For the fuel gauge system circuit diagram, refer to the Gauges Circuit Diagram (see page 22A-68).

1. Check the No. 10 METER (7.5A) fuse in the under-dash fuse/relay box before testing.
2. Do the gauge drive circuit check (see page 22A-67).
   - If the fuel gauge needle sweeps from the minimum to maximum position and then returns to the minimum position, the gauge is OK. Go to step 3.
   - If the fuel gauge needle does not sweep correctly, replace the gauge assembly and retest.
3. Turn the ignition switch OFF.
4. Remove the rear seat cushion (see page 20-114).
5. Remove the access panel (A) from the floor.



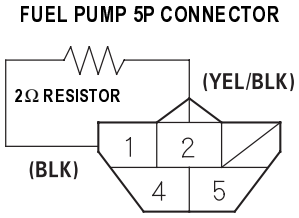
*: The illustration shows KG, KS, KE, KR, KZ models.

6. Disconnect the fuel pump 5P connector (B).
7. Measure voltage between the fuel pump 5P connector terminals No. 1 and No. 2 with the ignition switch ON (II). There should be battery voltage.
   - If the voltage is OK, go to step 8.
   - If the voltage is not as specified, check for:
     – a short YEL/BLK to ground.
     – an open in the YEL/BLK or BLK wire.
     – poor ground (G551).



Wire side of female terminals

8. Turn the ignition switch OFF. Remove the No. 9 BACK UP (10A) fuse from the under-hood fuse/relay box for at least 30 seconds, then reinstall it.
9. Install a 12 Ω resistor between the fuel pump 5P connector terminals No. 1 and No. 2, then turn the ignition switch ON (II).



Wire side of female terminals

(cont'd)

Fuel Gauge Sending Unit Test (cont'd)

10. Check that the pointer of the fuel gauge indicates "F".
- If the pointer of the fuel gauge does not indicate "F", replace the gauge.
- If the gauge is OK, inspect the fuel gauge sending unit.

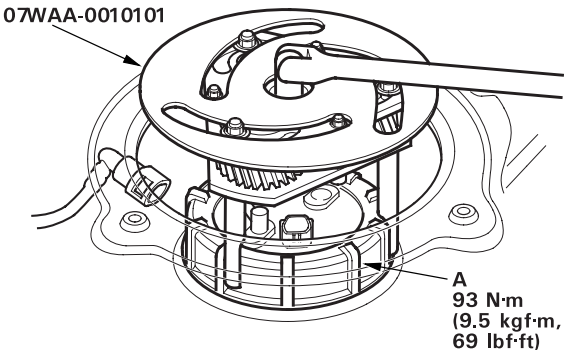
NOTE: The pointer of the fuel gauge returns to the bottom of the gauge dial when the ignition switch is OFF, regardless of the fuel level.

11. Relieve the fuel pressure (see page 11-154).

12. Remove the fuel fill cap.

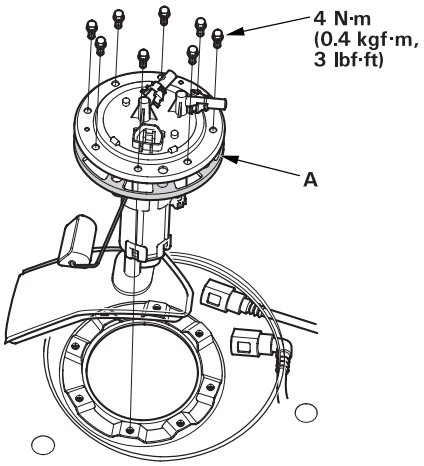
13. Disconnect the quick-connect fittings from the fuel pump.

14. Except KZ model:
Using the tool, loosen the locknut (A), and remove the fuel pump assembly from the fuel tank.



*: The illustration shows KG, KS, KE, KR model.

15. KZ model:
Remove the fuel pump assembly.



16. Measure the resistance between the No. 1 and No. 2 terminals with the float at E (EMPTY), 1/2 (HALF FULL), and F (FULL) positions.
If you do not get the following readings, replace the fuel gauge sending unit (see page 11-167).

Except KZ model:

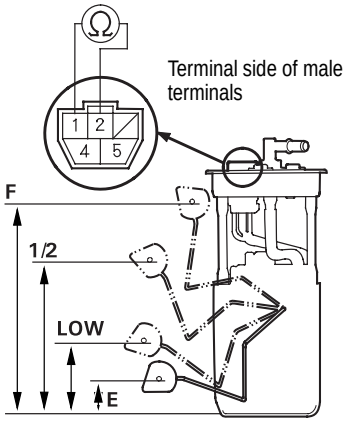
Float Position	F	1/2	LOW	E
Resistance (Ω)	11 -13	67.6 -73.6	113.5 -121.2	130 -132

KZ model:

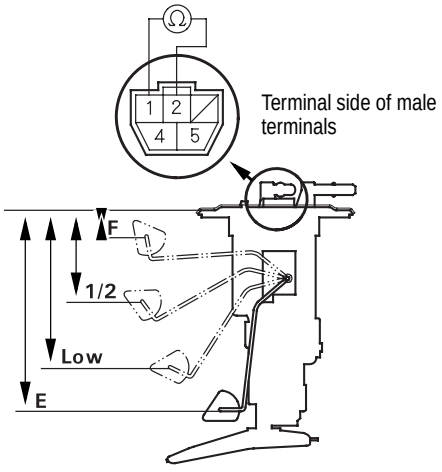
Float Position	F	1/2	LOW	E
Resistance (Ω)	11 -13	67.6 -73.6	110.8 -116.8	130 -132

NOTE: Remove the No. 9 BACK UP (10A) fuse from the under-hood fuse/relay box for at least 10 seconds after completing troubleshooting otherwise it may take up to 20 minutes for the fuel gauge to indicate the correct fuel level.

Except KZ model:



KZ model:

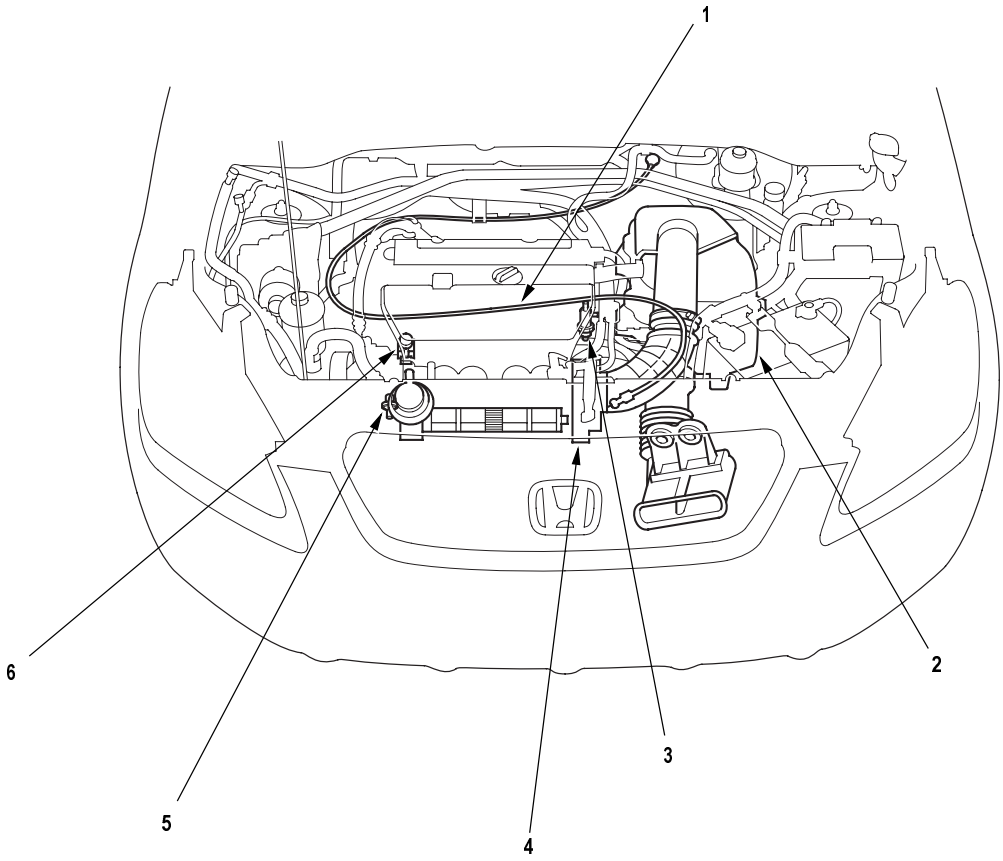


Low Fuel Indicator Light Test

1. Do the fuel gauge sending unit test (see page 11-173).
   - If the system is OK, go to step 2.
   - If the system has any malfunction, repair it.
2. Turn the ignition switch OFF. Remove the No. 9 BACK UP (10A) fuse from the under-hood fuse/relay box for at least 30 seconds, then reinstall it.
3. Turn the ignition switch ON (II) with the float at the E (EMPTY) position.
   - If the low fuel indicator light is on, go to step 3.
   - If the low fuel indicator light is not on, refer to the low fuel indicator Circuit Diagram (see page 22A-69) and check the circuit.
4. Turn the ignition switch OFF. Remove the No. 9 BACK UP (10A) fuse from the under-hood fuse/relay box for at least 30 seconds, then reinstall it.
5. Lift the float above the 1/2 position.
   - If the low fuel indicator light goes off, the system is OK.
   - If the low fuel indicator light is still on, refer to the low fuel indicator Circuit Diagram (see page 22A-69) and check the circuit.

Intake Air System

Component Location Index

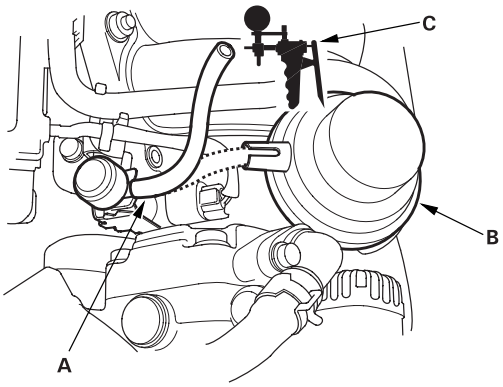


*: The illustration shows LHD model.

1	THROTTLE CABLE	Adjustment, page 11-183; Removal/Installation, page 11-184
2	AIR CLEANER	Replacement, page 11-182
	AIR CLEANER ELEMENT	Replacement, page 11-182
3	INTAKE AIR BYPASS CONTROL THERMAL VALVE	Test, page 11-181
4	THROTTLE BODY	Test, page 11-180; Removal/Installation, page 11-185; Disassembly/Reassembly, page 11-186
5	INTAKE MANIFOLD RUNNER CONTROL (IMRC) ACTUATOR	Troubleshooting, page 11-177; Replacement, page 11-187
6	INTAKE MANIFOLD RUNNER CONTROL (IMRC) SOLENOID VALVE	Troubleshooting, page 11-177

IMRC System Troubleshooting

1. Start the engine and allow it to idle.
2. Disconnect the vacuum hose (A) from Intake Manifold Runner Control (IMRC) actuator (B), and connect the vacuum pump/gauge (C) to the hose.



Is there vacuum?

Yes Go to step 10.

No Go to step 3.

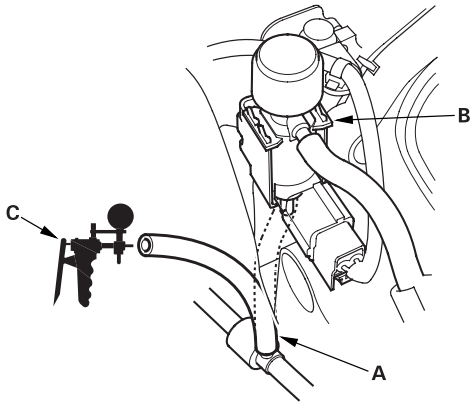
3. Check the vacuum hose between IMRC actuator and IMRC solenoid valve.

Is there vacuum hose OK?

Yes Go to step 4.

No Repair the blockage or vacuum leak between the IMRC actuator and IMRC solenoid valve.■

4. Disconnect the lower vacuum hose (A) from IMRC solenoid valve (B), and connect the vacuum pump/gauge (C) to the hose.



Is there vacuum?

Yes Go to step 5.

No Repair the blockage or vacuum leak between the intake manifold and IMRC solenoid valve.■

5. Reconnect the lower vacuum hose to the IMRC solenoid valve, and connect the vacuum pump/gauge to the vacuum hose (actuator side).
6. Disconnect the IMRC solenoid valve 2P connector.

Is there vacuum?

Yes Go to step 7.

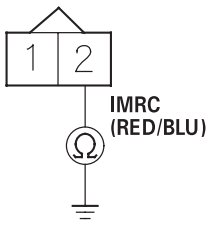
No Replace the IMRC solenoid valve.■

(cont'd)

IMRC System Troubleshooting (cont'd)

7. Turn the ignition switch OFF.
8. Disconnect the negative cable from the battery.
9. Disconnect ECM/PCM connector B (24P).
10. Check for continuity between IMRC solenoid valve 2P connector terminal No. 2 and body ground.

IMRC SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (B22) and the IMRC solenoid valve.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

11. Raise engine speed to 5,000 rpm (min^{-1}).
12. Check for vacuum.

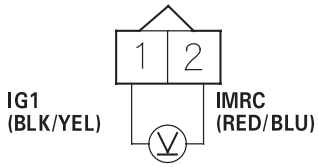
Is there vacuum?

Yes Go to step 13.

No Go to step 23.

13. Turn the ignition switch OFF.
14. Disconnect the IMRC solenoid valve 2P connector.
15. Start the engine.
16. Raise engie speed to 5,000 rpm (min^{-1}), then measure voltage between IMRC solenoid valve 2P connector terminal No. 1 and No. 2.

IMRC SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

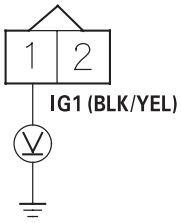
Is there battery voltage?

Yes Replace the IMRC solenoid valve.■

No Go to step 17.

17. Measure voltage between IMRC solenoid valve 2P connector terminal No. 1 and body ground.

IMRC SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Go to step 18.

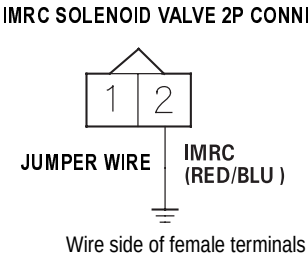
No Check the No. 4 ACG (10A) fuse in the under-dash fuse/relay box. If the fuse OK, repair open in the wire between the IMRC solenoid valve and No. 4 ACG (10A) fuse.

18. Turn the ignition switch OFF.

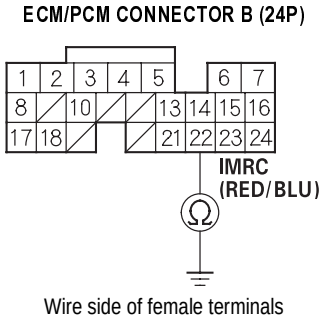
19. Disconnect the negative cable from the battery.

20. Disconnect ECM/PCM connector B (24P).

21. Connect IMRC solenoid valve 2P connector terminal No. 2 to body ground with a jumper wire.



22. Check for continuity between ECM/PCM connector terminal B22 and body ground.

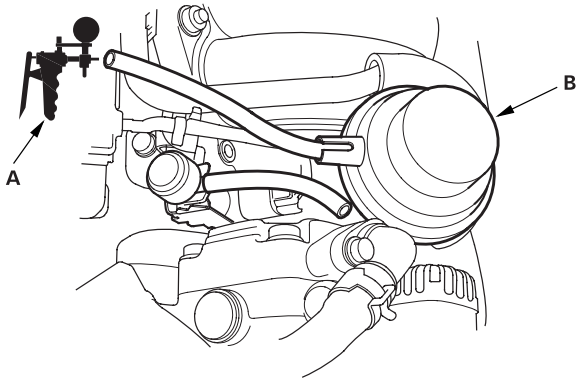


Is there continuity?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between the ECM/PCM (B22) and the IMRC solenoid valve.■

23. Connect the vacuum pump/gauge (A) to the IMRC actuator (B), then apply vacuum.

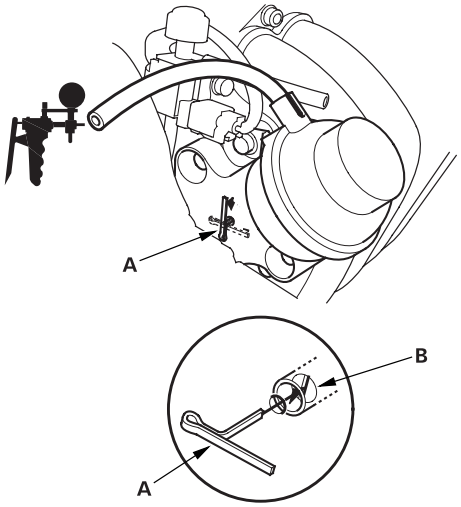


Does the IMRC actuator hold vacuum?

Yes Go to step 24.

No Replace the IMRC valve assembly.■

24. Install the cotter pin (A) to the IMRC actuator shaft (B).



25. Apply vacuum to the IMRC actuator, then check the cotter pin movement.

Does the cotter pin move?

Yes IMRC system is OK.■

No Replace the IMRC valve assembly.■

Throttle Body Test

With using a scan tool/Honda PGM Tester:

NOTE:
- Do not adjust the throttle stop screw. It is preset at the factory.
- If the Malfunction Indicator Lamp (MIL) has been reported on, check for Diagnostic Trouble Codes (DLC) (see page 11-3).

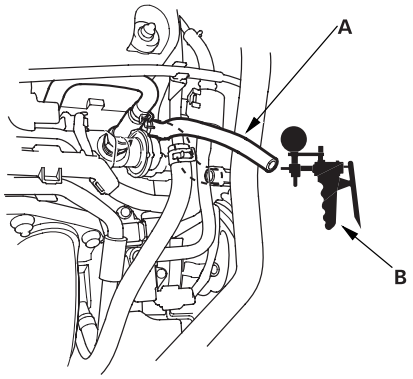
1. With the engine off, check the throttle cable operation. The cable should operate without binding or sticking.
   - If the cable operates OK, go to step 2.
   - If the cable binds or sticks, check it and its routing. If the cable is faulty, reroute it or replace it, and adjust it (see page 11-183), then go to step 2.
2. Operate the throttle lever by hand to see if the throttle valve and/or shaft are too loose or too tight.
   - If there is excessive play in the throttle valve shaft, or any binding in the throttle valve at the fully closed position or fully open, replace the throttle body.
   - If the throttle valve and shaft are OK, go to step 3.
3. Connect the scan tool/Honda PGM Tester to the Data Link Connector (DLC).
4. Turn the ignition switch ON (II).
5. Check the throttle position with the scan tool. The reading should be about 10% when the throttle is fully closed and about 90% when the throttle is fully opened.
   - If the throttle position is correct, the throttle body is OK.
   - If the throttle position is not correct, replace the throttle body.

Intake Air Bypass Control Thermal Valve Test

1. Start the engine. Then let it idle.

   NOTE: The engine coolant temperature must be below 65°C (149°F).

2. Remove the vacuum hose (A) from the intake air duct, and connect a vacuum pump/gauge (B) to the hose.



3. Raise and lower the engine speed, and make sure the vacuum gauge reading changes as the engine speed changes.

   If the vacuum reading does not change, check for these problems:

   - Misrouted, leaking, broken, or clogged intake air bypass control system vacuum lines.
   - A cracked or damage intake air bypass control thermal valve.

4. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.

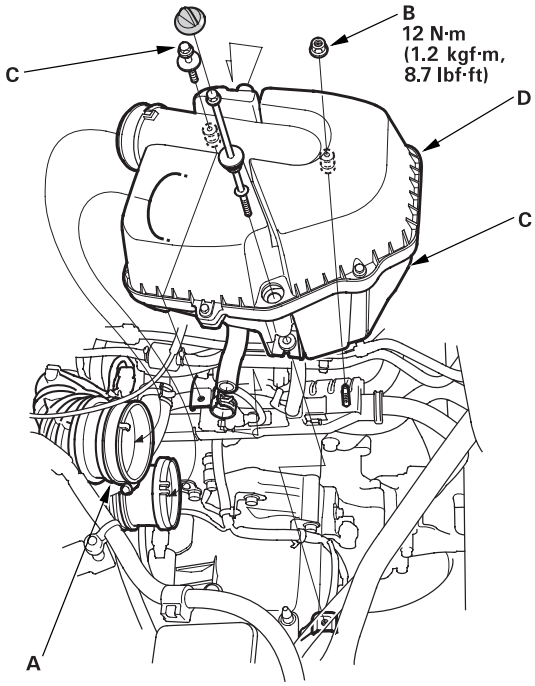
5. Raise and lower the engine speed, and make sure the vacuum gauge reading does not change as the rpm changes.

   If the vacuum reading changes, check for these problems:

   - Misrouted, leaking, broken, or clogged intake air bypass control system vacuum lines.
   - A cracked or damaged intake air bypass control thermal valve.

Air Cleaner Replacement

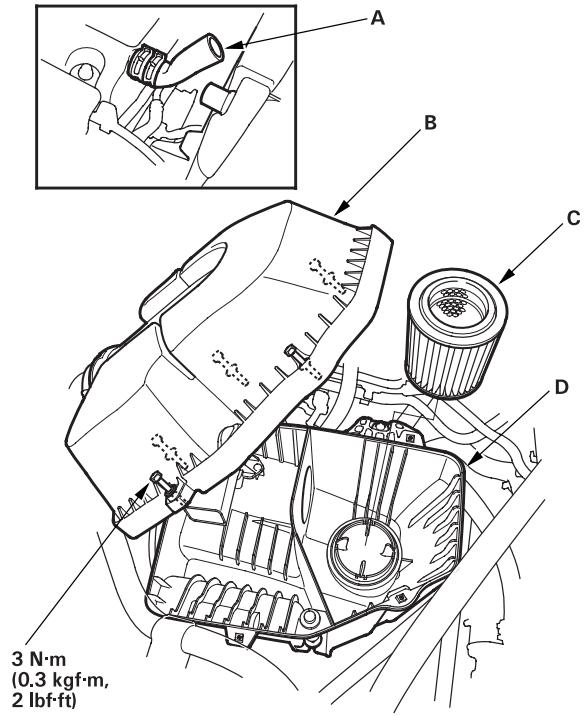
1. Remove the clamp (A), the nuts (B), and the bolts (C).



2. Remove the air cleaner (D).
3. Install the parts in the reverse order of removal.

Air Cleaner Element Replacement

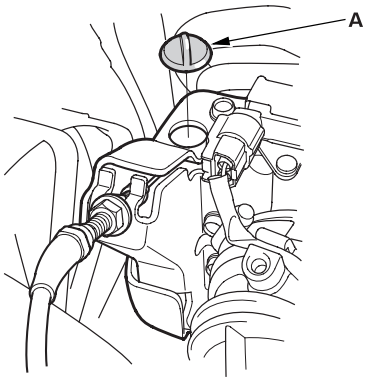
1. Disconnect the PCV hose (A). Open the air cleaner housing cover (B).



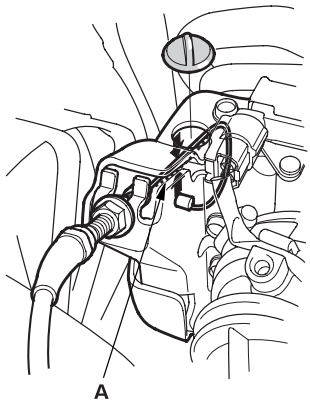
2. Remove the air cleaner (C) from the air clenaer housing (D).
3. Install the parts in the reverse order of removal.

Throttle Cable Adjustment

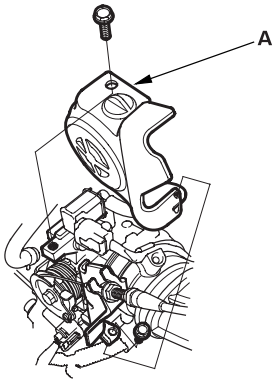
1. Remove the throttle linkage cover grommet (A).



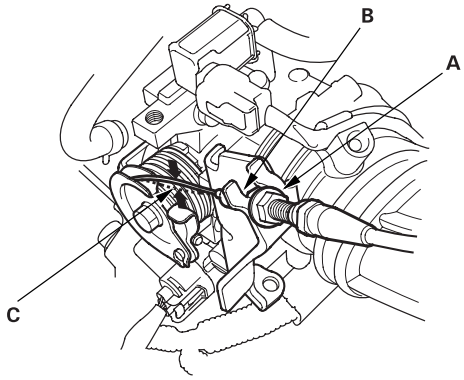
2. Check cable free play at the throttle linkage. Cable deflection (A) should be 10 - 12 mm (3/8 - 1/2 in.).



3. If the deflection is not within spec (10 - 12 mm, 3/8 - 1/2 in.), remove the throttle linkage cover (A).



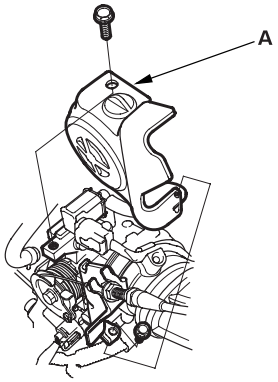
4. Loosen the locknut (A), turn the adjusting nut (B) until the deflection (C) is as specified, then retighten the locknut.



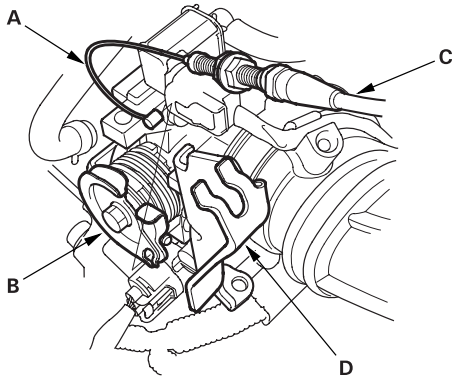
5. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Throttle Cable Removal/Installation

1. Remove the throttle linkage cover (A).

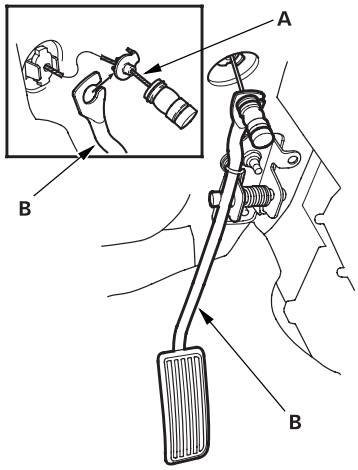


2. Fully open the throttle valve, then remove the throttle cable (A) from the throttle link (B).



3. Remove the cable housing (C) from the cable bracket (D).

4. Remove the throttle cable (A) from the accelerator pedal (B).

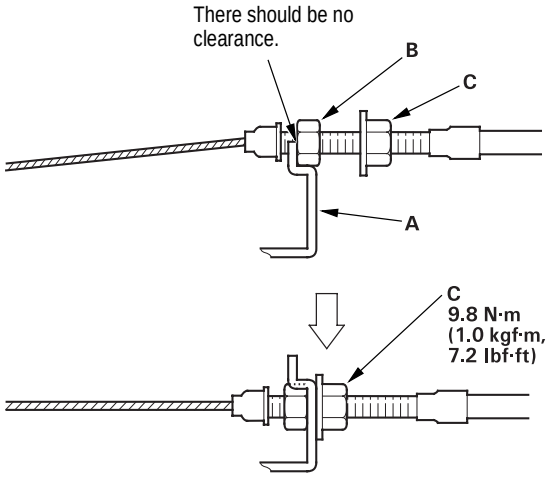


5. Install in the reverse order of removal.

6. After installing, start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.

7. Hold the cable, removing all slack from it.

8. Set the locknut on the cable bracket (A). Adjust the adjusting nut (B) so that its free play is 0 mm.

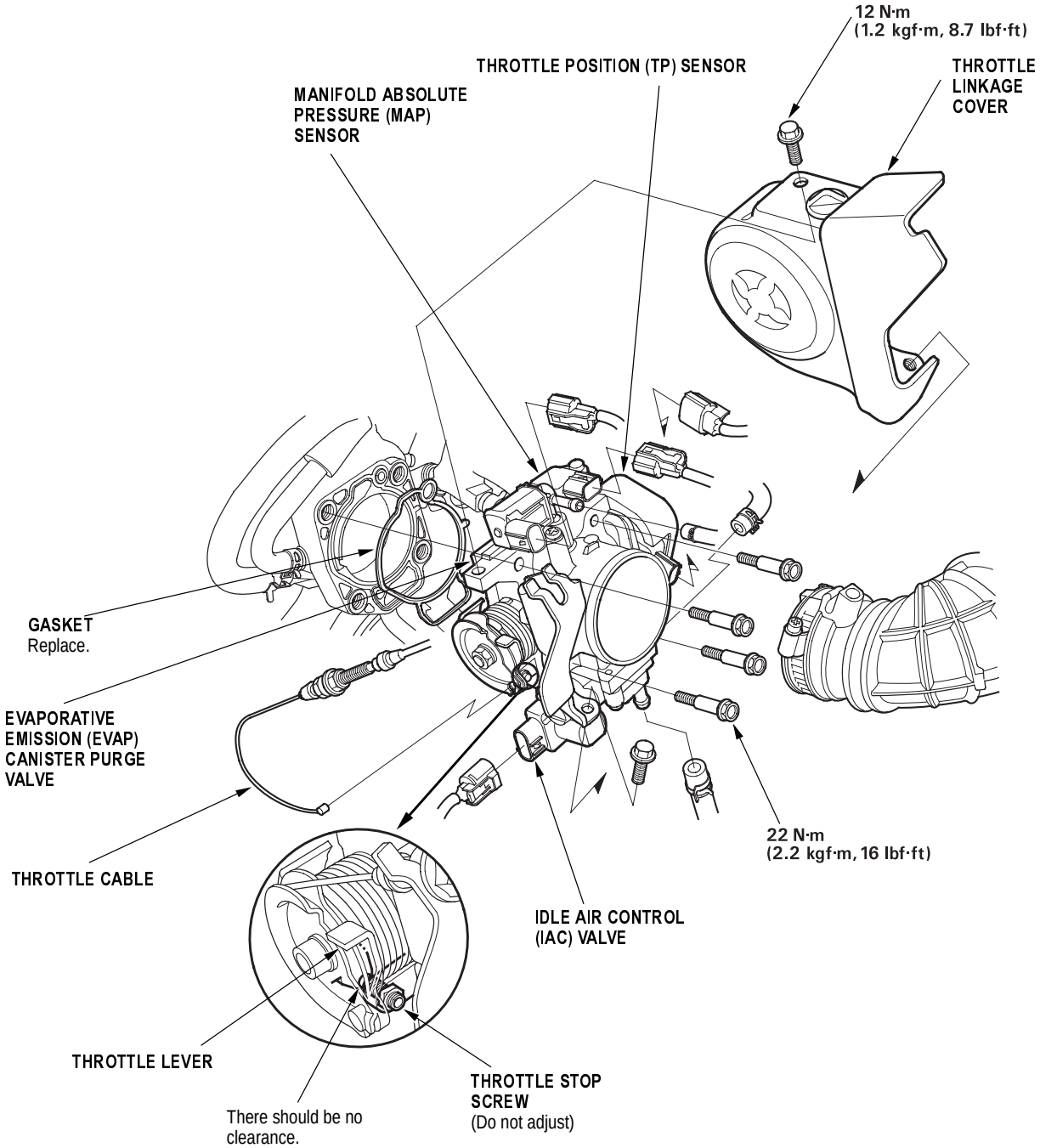


9. Remove the cable from the throttle bracket (A). Reset the adjusting nut (B) and tighten the locknut (C).

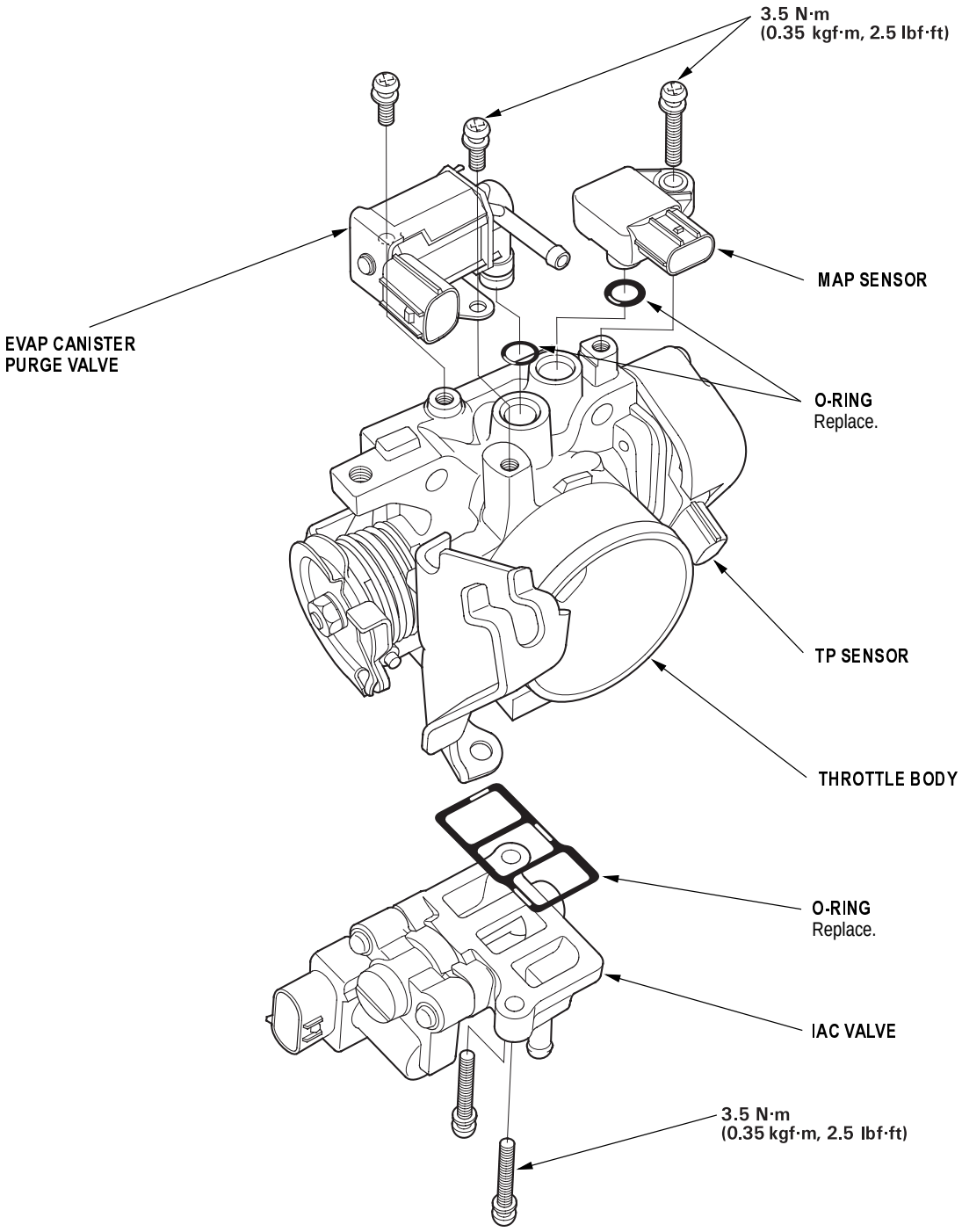
10. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Throttle Body Removal/Installation

NOTE:
- Do not adjust the throttle stop screw.
- After reassembly, adjust the throttle cable (see page 11-183).
- The Throttle Position (TP) sensor is not removable.

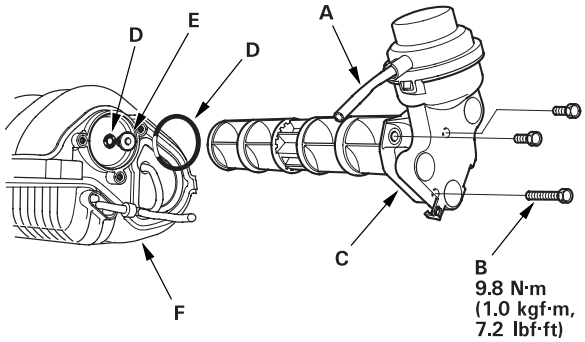


Throttle Body Disassembly/Reassembly



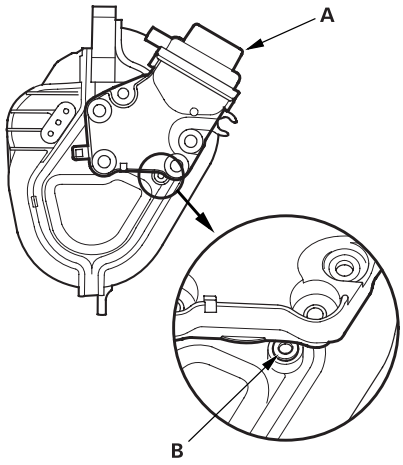
IMRC Valve Replacement

1. Remove the intake manifold (see page 09-2).
2. Disconnect the vacuum hose (A).



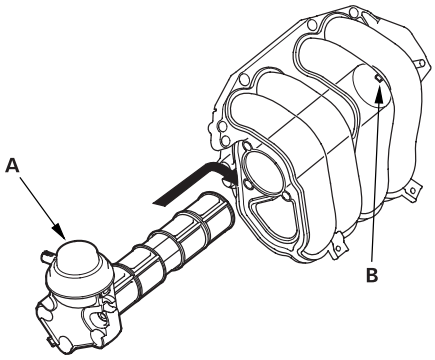
3. Remove the bolts (B).
4. Remove the IMRC actuator assembly (C).

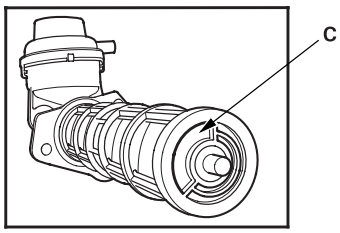
   NOTE:
   - When installing the IMRC actuator, make sure the bearing (E) is firmly secure into place if necessary.
   - Do not the IMRC assembly interfere with the intake manifold (F).
   - When installing the IMRC actuator, replace the new O-rings (D).
5. Install the IMRC actuator assembly (A), then check the hole (B) appears.



6. Turn the IMRC actuator assembly (A), and set the bolt holes.

   NOTE: When turning the IMRC actuator assembly, make sure the stopper (B) and groove (C) are fit.





Catalytic Converter System

DTC Troubleshooting

DTC P0420 (67-1): Catalytic System Efficiency Below Threshold

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0420, troubleshoot those DTCs first, then recheck for DTC P0420.

P0137, P0138: Secondary Heated Oxygen Sensor (secondary HO2S) (Sensor 2)
P0141: Secondary HO2S (Sensor 2) heater

1. Reset the ECM/PCM (see page 11-4), then continue to step 2 through 5 to reset the readiness code.
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
3. Drive for about 10 minutes without stopping on a highway or freeway. Your speed can vary.
4. With the A/T in D position, M/T in 5th gear, drive at a steady speed between 80 - 100 km/h (50 - 62 mph) for 30 seconds.
5. Repeat step 4 three times. Between each repetition, close the throttle completely for 1 - 2 seconds. If the engine is stopped during this part of the procedure, go to step 3 and do the procedure again.
6. Check for a Temporary DTC with the scan tool.

   Does the scan tool indicate Temporary DTC P0420?

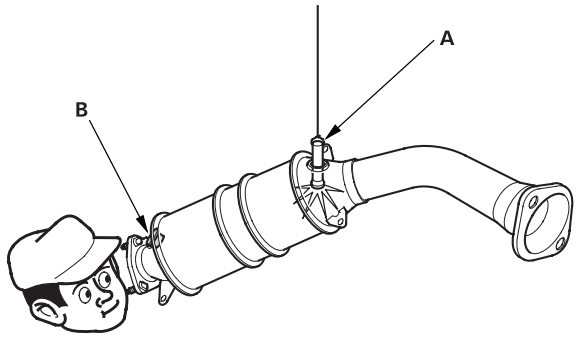
   Yes Check the TWC. If necessary, replace the TWC.■

   No Check for readiness code completion. If the readiness is complete, it was a intermittent failure, system is OK at this time. If the readiness is incomplete, repeat steps 2 through 5.■

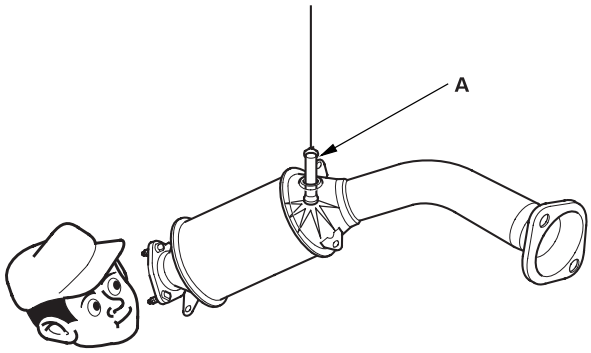
Catalytic Converter Inspection

If excessive exhaust system back-pressure is suspected, remove the TWC from the vehicle.
Using a flashlight (A) and plug (B) (KG, KS, KE, KR, KU, KZ, FO, KQ models) make a visual check for plugging, melting or cracking of the catalyst.
Replace the TWC if any of the visible area is damaged or plugged.

KG, KS, KE, KR, KU, KZ, FO, KQ models:



KN, KM, KY, MA, PH, IN, KK models:

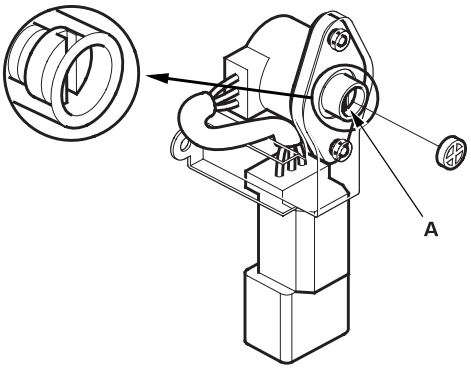


Tailpipe Emissions Test

1. Connect a tachometer.
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Check the idle speed (see page 11-148).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

   Specified CO%:
   For cars with TWC model: 0.1 % maximum
   For cars without TWC model: 1.0 ± 1.0 %

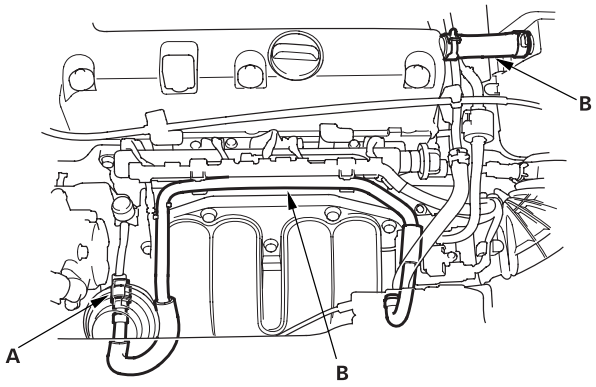
   - If unable to obtain this reading:
     Without TWC model, adjust by turning the adjusting screw (A) of the IMA.
     With TWC model, see DTC troubleshooting index.
   - If unable to obtain a CO reading of specified % by this procedure, check the tune-up condition.



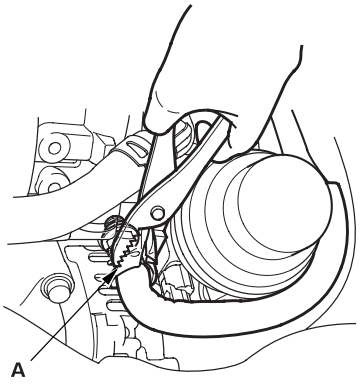
PCV System

PCV Valve Inspection and Test

1. Check the PCV valve (A), hoses (B) and connections for leaks or restrictions.

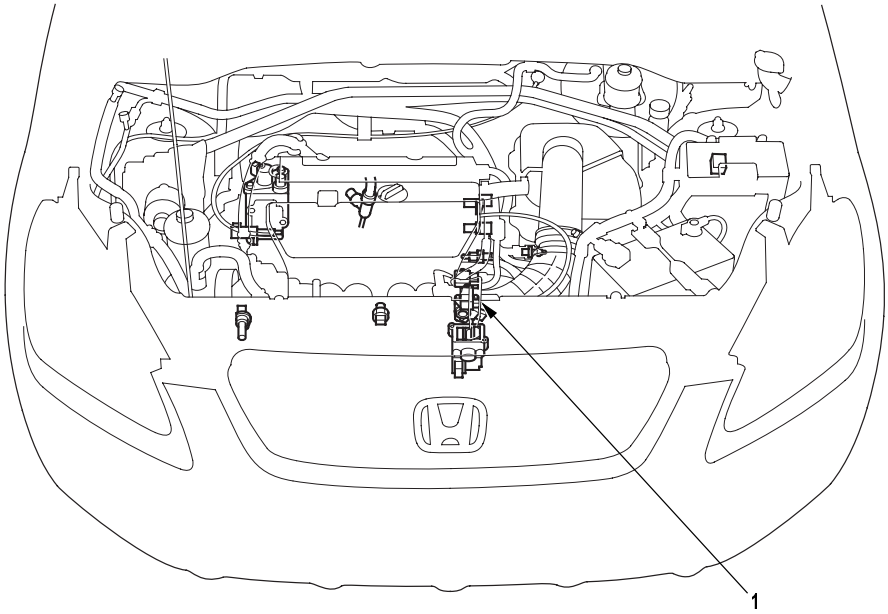


2. At idle, make sure there is a clicking sound from the PCV valve when the hose between the PCV valve and intake manifold is lightly pinched (A) with your fingers or pliers.
If there is no clicking sound, check the PCV valve grommet for cracks or damage. If the grommet is OK, replace the PCV valve and recheck.



Evaporative Emission Control System

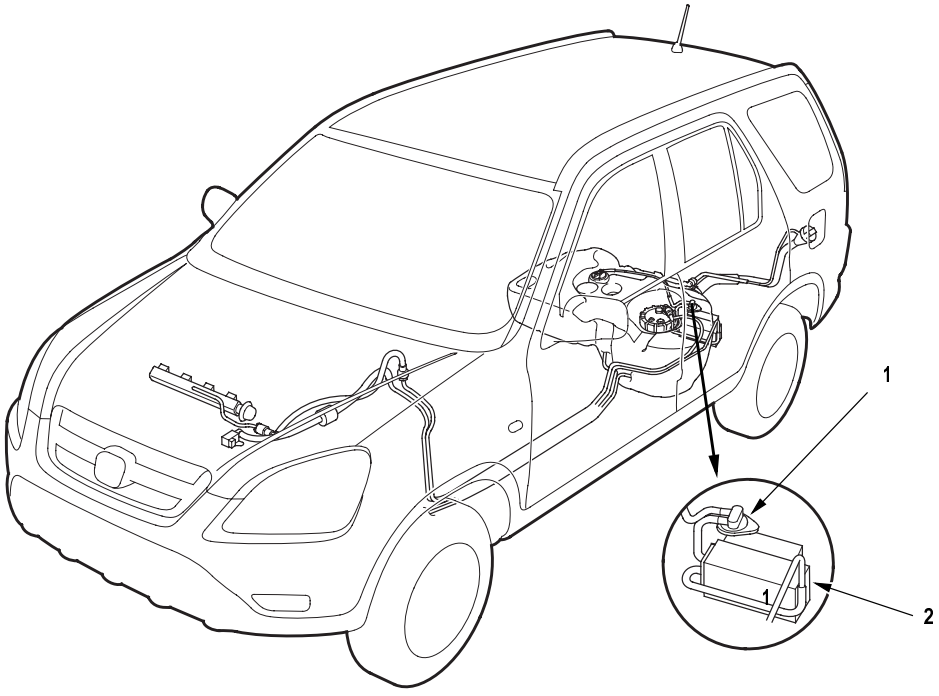
Component Location Index



*: The illustration shows LHD model.

1 EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE Troubleshooting, (see page 11-193)

KG, KS, KE, KR models:



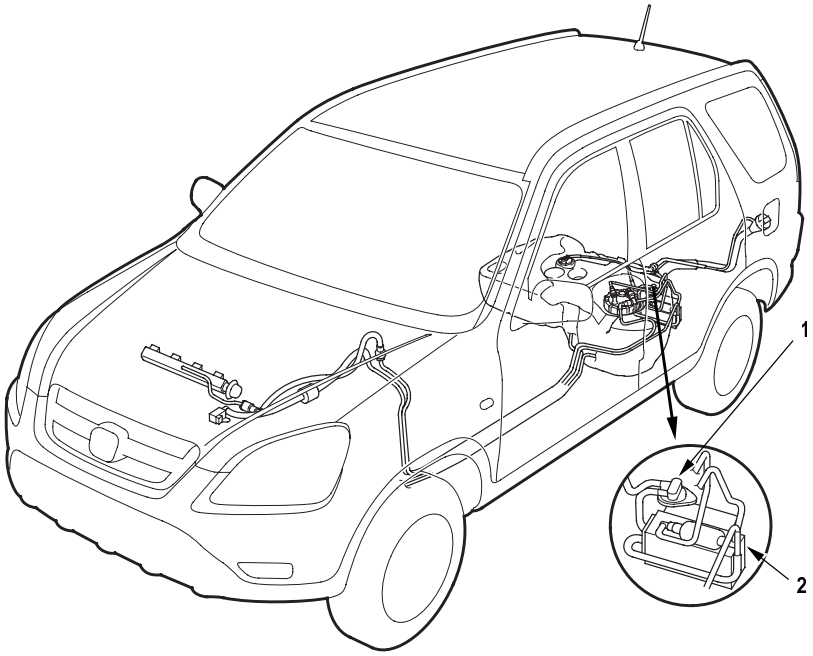
1 EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE Test, page 11-198

2 EVAPORATIVE EMISSION (EVAP) CANISTER Troubleshooting, page 11-195; Replacement, page 11-199

(cont'd)

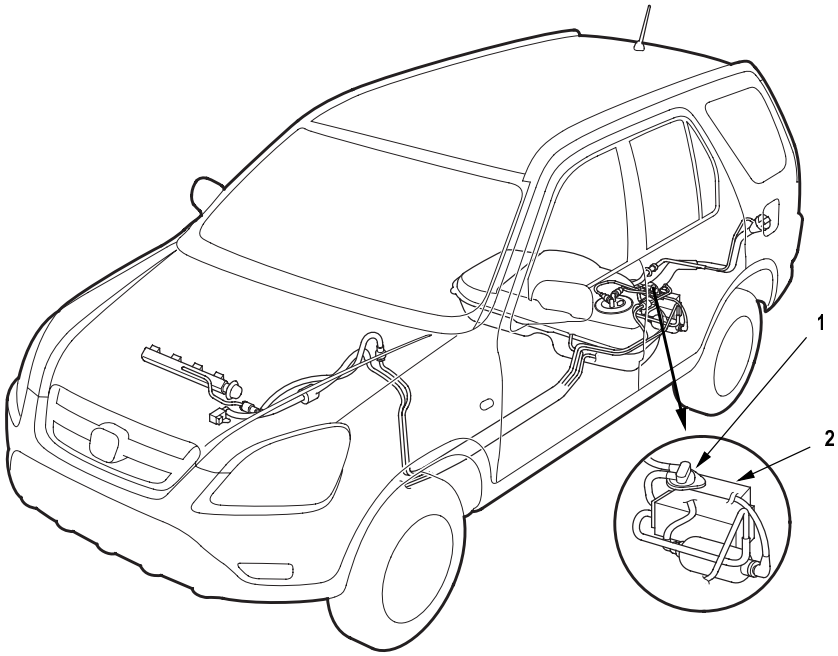
Component Location Index (cont'd)

Except KG, KS, KE, KR, KZ models:



1	EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE	Test, page 11-198
2	EVAPORATIVE EMISSION (EVAP) CANISTER	Troubleshooting, page 11-195; Replacement, page 11-199

KZ model:



1	EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE	Test, page 11-198
2	EVAPORATIVE EMISSION (EVAP) CANISTER	Troubleshooting, page 11-195; Replacement, page 11-199

DTC Troubleshooting

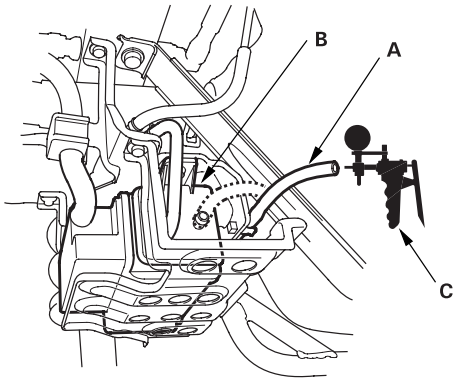
DTC P0443 (92-4): A electrical problem in the EVAP Canister Purge Valve circuit

1. Reset the ECM/PCM (see page 11-4).
2. Turn the ignition switch ON (II).

   Is the DTC P0443 indicated?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires between the EVAP canister purge valve and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the vacuum hose (A) from the EVAP canister (B) and connect a vacuum pump/gauge (C) to the hose.



*: The illustration shows KG, KS, KE, KR models.

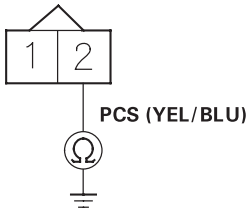
5. Start the engine end let it idle.

   Is there vacuum?

   Yes Go to step 6.

   No Go to step 11.
6. Turn the ignition switch OFF.
7. Disconnect the EVAP canister purge valve 2P connector.
8. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

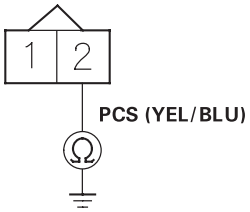
Is there continuity?

Yes Go to step 9.

No Replace the EVAP canister purge valve.■

9. Disconnect the negative cable from the battery.
10. Disconnect ECM/PCM connector B (24P).
11. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the EVAP canister purge valve and the ECM/PCM (B21).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

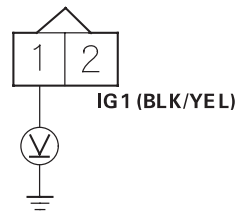
12. Turn the ignition switch OFF.

13. Disconnect the EVAP canister purge valve 2P connector.

14. Turn the ignition switch ON (II).

15. At the hamess side, measure voltage between EVAP canister purge valve 2P connector terminal No. 1 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Go to step 16.

No Repair open in the wire between No. 4 ACG (10 A) fuse in the under-dash fuse/relay box and the EVAP canister purge valve.■

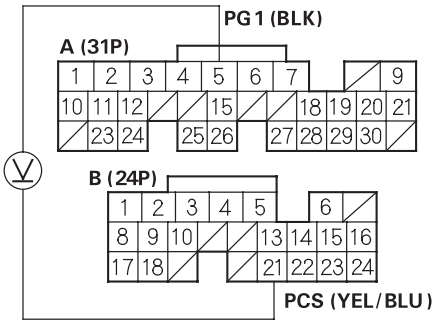
16. Turn the ignition switch OFF.

17. Reconnect the EVAP canister purge valve 2P connector.

18. Turn the ignition switch ON (II).

19. Measure voltage between ECM/PCM connector terminals A5 and B21.

ECM/PCM CONNECTORS



Wire side of female terminals

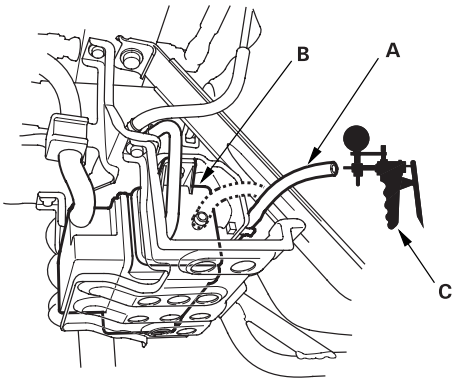
Is there battery voltage?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between the EVAP canister purge valve and the ECM/PCM (B21). If wire is OK, replace the EVAP canister purge valve.■

Evaporative Emission (EVAP) System Troubleshooting

1. Disconnect the vacuum hose (A) from the EVAP canister (B) and connect a vacuum pump/gauge (C) to the hose.



*: The illustration shows KG, KS, KE, KR models

2. Start the engine and let it idle.

NOTE: Engine coolant temperature must be below 65°C (149°F).

Is there vacuum?

Yes Inspect vacuum hose routing. If OK, replace the EVAP canister purge valve.■

No Go to step 3.

3. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then raise the engine speed to 3,000 rpm (min^{-1}).

Is there vacuum?

Yes Go to step 4.

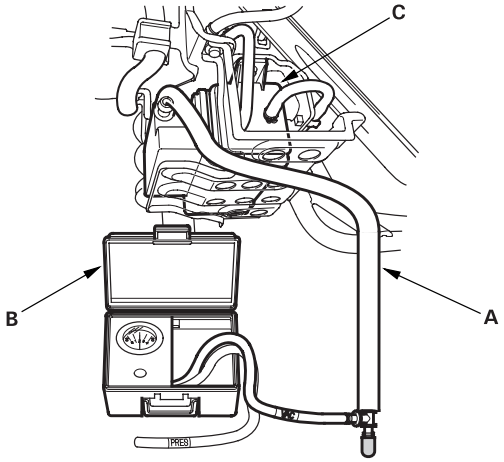
No Inspect vacuum hose routing. If OK, replace the EVAP canister purge valve.■

4. Turn the ignition switch OFF.

5. Reconnect the vacuum hose to the EVAP canister.

6. Remove the fuel fill cap.

7. Disconnect the purge air hose (A) from the EVAP canister and connect a vacuum pressure gauge 0 - 100 mmHg (0 - 4 in.Hg) (B) to EVAP canister (C).



*: The illustration shows KG, KS, KE, KR models.

8. Start the engine and raise speed to 3,000 rpm (min^{-1}).

Does vacuum appear on gauge within 1 minute?

Yes See EVAP two way valve test to complete. Evaporative emission controls are OK.■

No Replace the EVAP canister.■

(cont'd)

Evaporative Emission (EVAP) System Troubleshooting (cont'd)

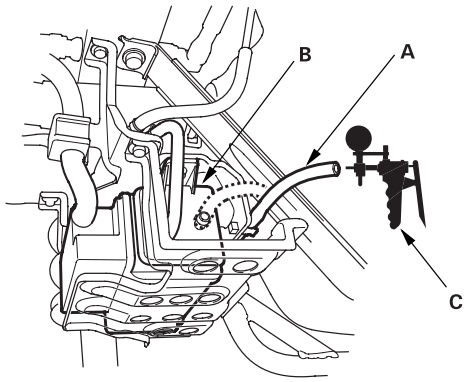
1. Inspect the No. 4 ACG (10A) fuse in the under-dash fuse/relay box.

   Is fuse OK?

   Yes Go to step 2.

   No Replace the fuse, and recheck.■

2. Disconnect the vacuum hose (A) from the EVAP canister (B) and connect a vacuum pump/gauge (C) to the hose.



3. Start the engine and let it idle.

   NOTE: Engine coolant temperature must be below 65°C (149°F).

4. Quickly raise the engine speed to 3,000 rpm (min^{-1}).

   Is there vacuum?

   Yes Go to step 5.

   No Go to step 11.

5. Disconnect the EVAP canister purge valve 2P connector.

6. Quickly raise the engine speed to 3,000 rpm (min^{-1}).

   Is there vacuum?

   Yes Inspect vacuum hose routing. If OK, replace the EVAP canister purge valve.■

   No Go to step 7.

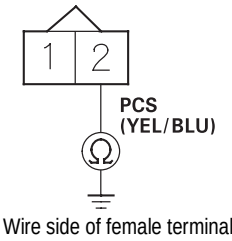
7. Turn the ignition switch OFF.

8. Disconnect the negative cable from the battery.

9. Disconnect ECM/PCM connector B (24P).

10. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



   Is there continuity?

   Yes Repair short in the wire between the EVAP cansiter purge valve and the ECM/PCM (B21).■

   No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away, replace the original ECM/PCM.■

11. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.

12. Check for vacuum at the vacuum hose after the starting the engine.

13. Quickly raise the engine speed to 3,000 rpm (min^{-1}).

    Is there vacuum?

    Yes Go to step 24.

    No Go to step 14.

14. Turn the ignition switch OFF.

15. Inspect the vacuum hose rooting.

    Is the vacuum hose OK?

    Yes Go to step 16.

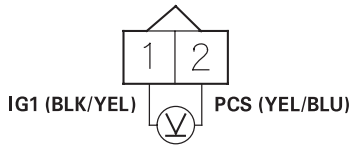
    No Repair the vacuum hose.■

16. Disconnect the EVAP canister purge valve 2P connector.

17. Turn the ignition switch ON (II).

18. At the harness side, measure voltage between EVAP canister purge valve 2P connector terminals No. 1 and No. 2.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

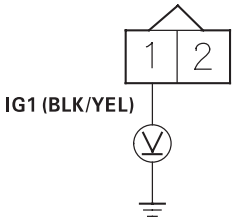
Is there any voltage?

Yes Replace the EVAP canister purge valve.■

No Go to step 19.

19. At the harness side, measure voltage between EVAP canister purge valve 2P connector terminal No. 1 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Go to step 20.

No Repair open in the wire between No. 4 ACG (10A) fuse in the under-dash fuse/relay box and the EVAP canister purge valve.■

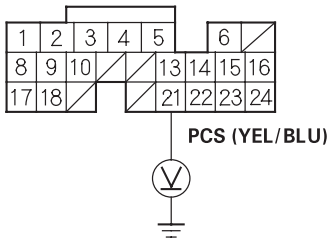
20. Turn the ignition switch OFF.

21. Reconnect the EVAP canister purge valve 2P connector.

22. Turn the ignition switch ON (II).

23. Measure voltage between ECM/PCM connector terminal B21 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there battery voltage?

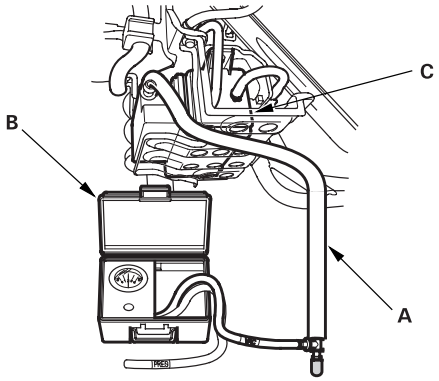
Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between the EVAP canister purge valve and the ECM/PCM (B21).■

24. Reconnect the vacuum hose to the EVAP control canister.

25. Remove the fuel fill cap.

26. Disconnect the purge air hose (A) from the EVAP canister and connect a vacuum/pressure gauge 0 - 100 mm Hg (0 - 4 in. Hg) (B) to EVAP canister (C).



27. Start the engine and raise speed to 3,000 rpm (min^{-1}).

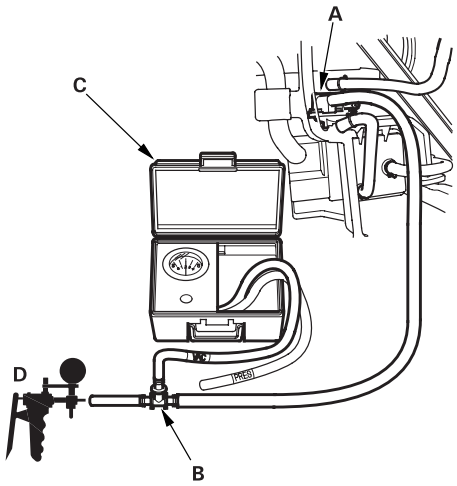
Does vacuum appear on gauge within 2 minute?

Yes When vacuum is appear, evaporative emission controls are OK. Check the EVAP two way valve test (see page 11-198).■

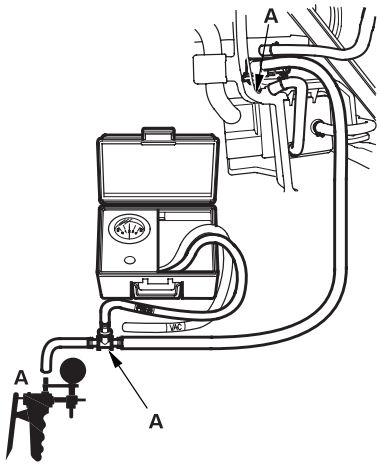
No Replace the EVAP canister.■

EVAP Two Way Valve Test

1. Remove the fuel cap.
2. Disconnect the vapor line from the EVAP two way valve (A). Connect it to a T-fitting (B) from the vacuum gauge (C) and the vacuum pump (D) as shown.



3. Apply vacuum slowly and continuously while watching the gauge.
   The vacuum should stabilize momentarily at 0.8 - 2.1 kPa (6 - 16 mmHg, 0.2 - 0.6 in.Hg).
   If the vacuum stabilizes (valve opens) below 0.8 kPa (6 in.Hg), or above 2.1 kPa (16 mmHg, 0.6 in.Hg), install a new valve and retest.
4. Move the vacuum pump hose from the vacuum fitting to the pressure fitting, and move the vacuum gauge hose from the vacuum side to the pressure side (A) as shown.

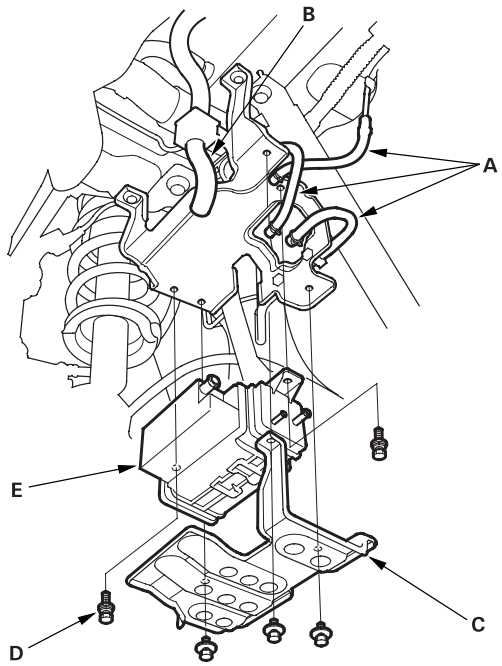


5. Slowly pressurize the vapor line while watching the gauge. The pressure should stabilize momentarily above 1.0 kPa (8 mmHg, 0.3 in.Hg).
   - If the pressure momentarily stabilizes (valve opens) above 1.0 kPa (8 mmHg, 0.3 in.Hg), the valve is OK.
   - If the pressure stabilizes below 1.0 kPa (8 mmHg, 0.3 in.Hg), install a new valve and retest.

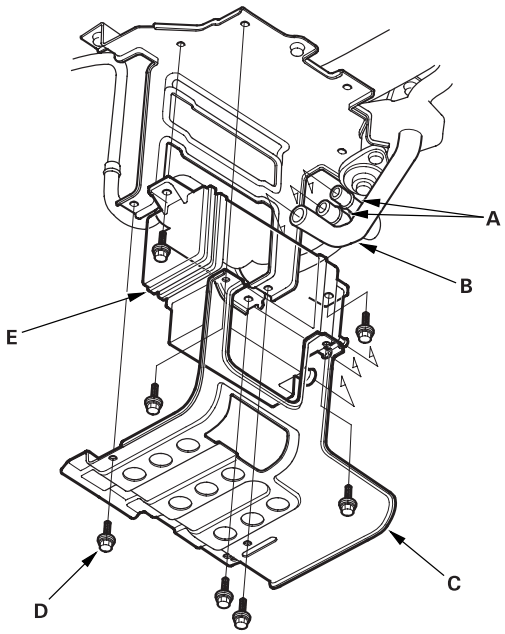
EVAP Canister Replacement

1. Remove the vacuum hoses (A) and drain hose (B).
2. Remove the cover (C).
3. Remove the bolt (D).
4. Remove the EVAP canister (E).
5. Install the parts in the reverse order of removal.

Except KZ model:



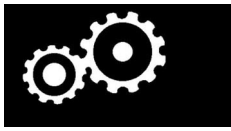
KZ model:



12

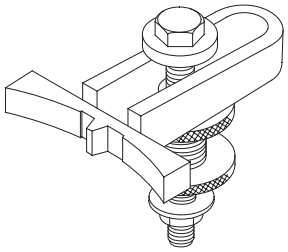
Clutch

Special Tools 12-2
Component Location Index 12-3
Clutch Pedal and Clutch Pedal Position Switch Adjustment 12-4
Clutch Master Cylinder Replacement 12-5
Clutch Master Cylinder Overhaul 12-6
Slave Cylinder Replacement 12-8
Slave Cylinder Overhaul 12-10
Clutch Replacement 12-11

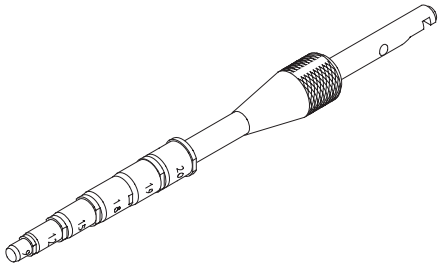


Special Tools

Ref. No.	Tool Number	Description	Qty
1	07LAB-PV00100 or 07924-PD20003	Ring Gear Holder	1
2	07PAF-0020000	Clutch Alignment Tool Set	1

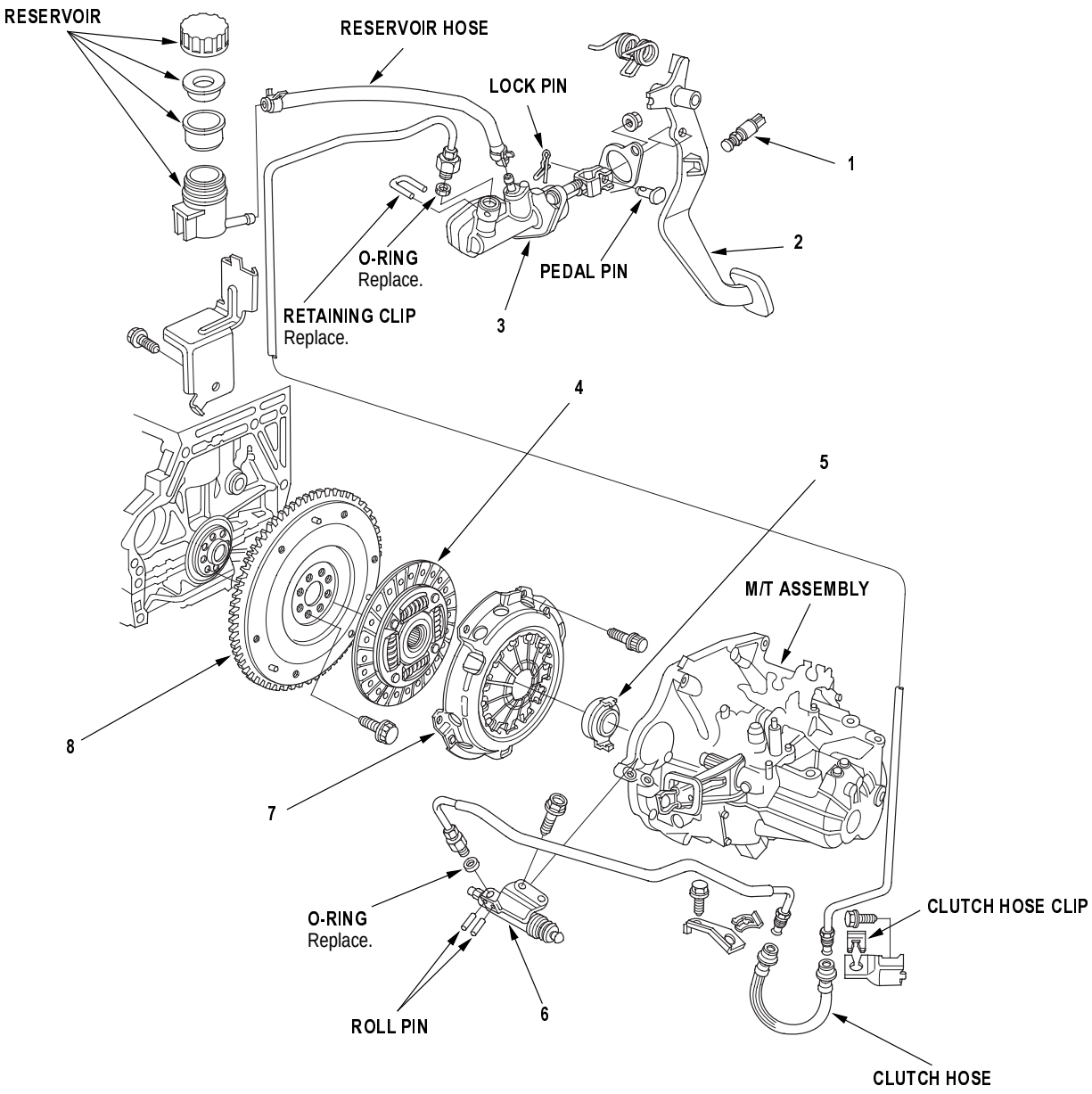


1



2

Component Location Index

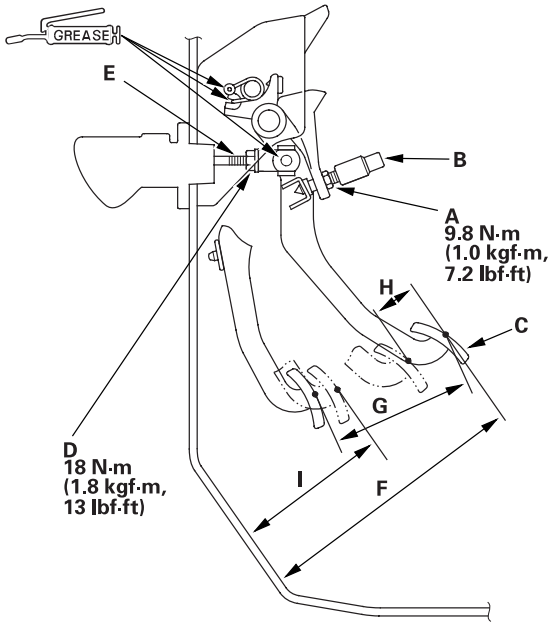


1	CLUTCH PEDAL POSITION SWITCH	Adjustment, page 12-4
2	CLUTCH PEDAL	Adjustment, page 12-4
3	CLUTCH MASTER CYLINDER	Replacement, page 12-5; Overhaul, page 12-6
4	CLUTCH DISC	Removal, page 12-11; Installation, page 12-14
5	RELEASE BEARING	Replacement, page 12-15
6	SLAVE CYLINDER	Replacement, page 12-8; Overhaul, page 12-10
7	PRESSURE PLATE	Removal, page 12-11; Installation, page 12-14
8	FLYWHEEL	Inspection, page 12-13; Replacement, page 12-13

Clutch Pedal and Clutch Pedal Position Switch Adjustment

NOTE:
- To check the clutch pedal position switch (see page 04-49).
- Remove the driver's side floor mat before adjusting the clutch pedal.
- The clutch is self-adjusting to compensate for wear.
- If there is no clearance between the master cylinder piston and push rod, the release bearing will be held against the diaphragm spring, which can result in clutch slippage or other clutch problems.

1. Loosen locknut (A), and back off the clutch pedal position switch or clutch pedal adjusting bolt (B) until it no longer touches the clutch pedal (C).



2. Loosen locknut (D), and turn the push rod (E) in or out to get the specified height (F), stroke (G), free play (H) and disengagement height (I) at the clutch pedal.

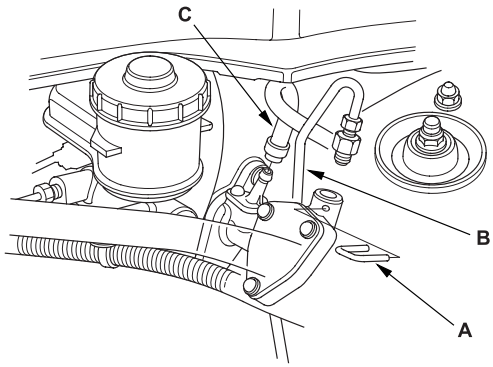
Clutch Pedal Stroke:	**125 - 135 mm (4.92 - 5.31 in.)**
Clutch Pedal Free Play:	**6 - 17 mm (0.24 - 0.67 in.)**
Clutch pedal Height:	**200 mm (7.87 in.)**
Clutch pedal Disengagement Height:	**112 mm (4.41 in.)**

3. Tighten locknut (D).
4. With the clutch pedal released, turn the clutch pedal position switch or clutch pedal adjusting bolt (B) in until it contacts the clutch pedal (C).
5. Turn the clutch pedal position switch or clutch pedal adjusting bolt (B) in an additional 3/4 to 1 turn.
6. Tighten locknut (A).
7. Press the clutch pedal to the floor.
8. Release the clutch pedal 10 - 16 mm (0.39 - 0.63 in.) from the fully depressed position, and hold it there. Adjust the position of the clutch interlock switch (K) so that the engine will start with the clutch pedal in this position.
9. Tighten locknut (J).

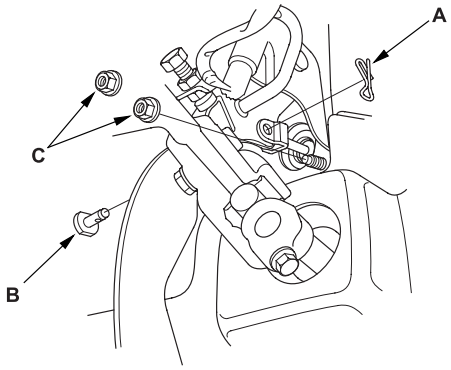
Clutch Master Cylinder Replacement

NOTE: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

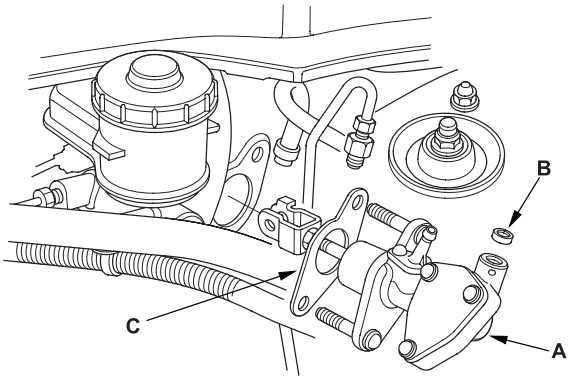
1. Remove the brake fluid from the clutch master cylinder reservoir with a syringe.
2. Remove the retaining clip (A). Disconnect the clutch line (B). Plug the end of the clutch line with a shop towel to prevent brake fluid from coming out.



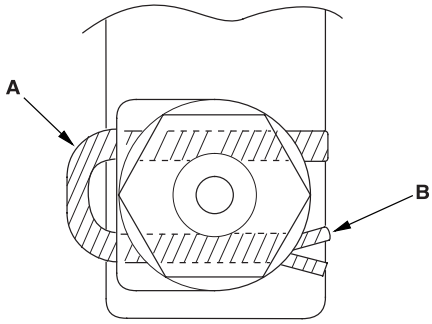
3. Disconnect the reservoir hose (C) from the clutch master cylinder reservoir. Plug the end of the reservoir hose with a shop towel to prevent brake fluid from coming out.
4. Pry out the lock pin (A), and pull the pedal pin (B) out of the yoke. Remove the master cylinder mounting nuts (C).



5. Remove the clutch master cylinder (A).



6. Remove the O-ring (B) and the clutch master cylinder seal (C) from the master cylinder.
7. Install the clutch master cylinder in the reverse order of removal. Install a new O-ring. Tighten the master cylinder mounting nuts to 13 N•m (1.3 kgf•m, 9.4 lbf•ft). Make sure the tabs on the master cylinder hose clamps are pointed in the directions shown.
8. To prevent the retaining clip (A) from coming off, pry to open the tip of the retaining clip (B) with a screwdriver.



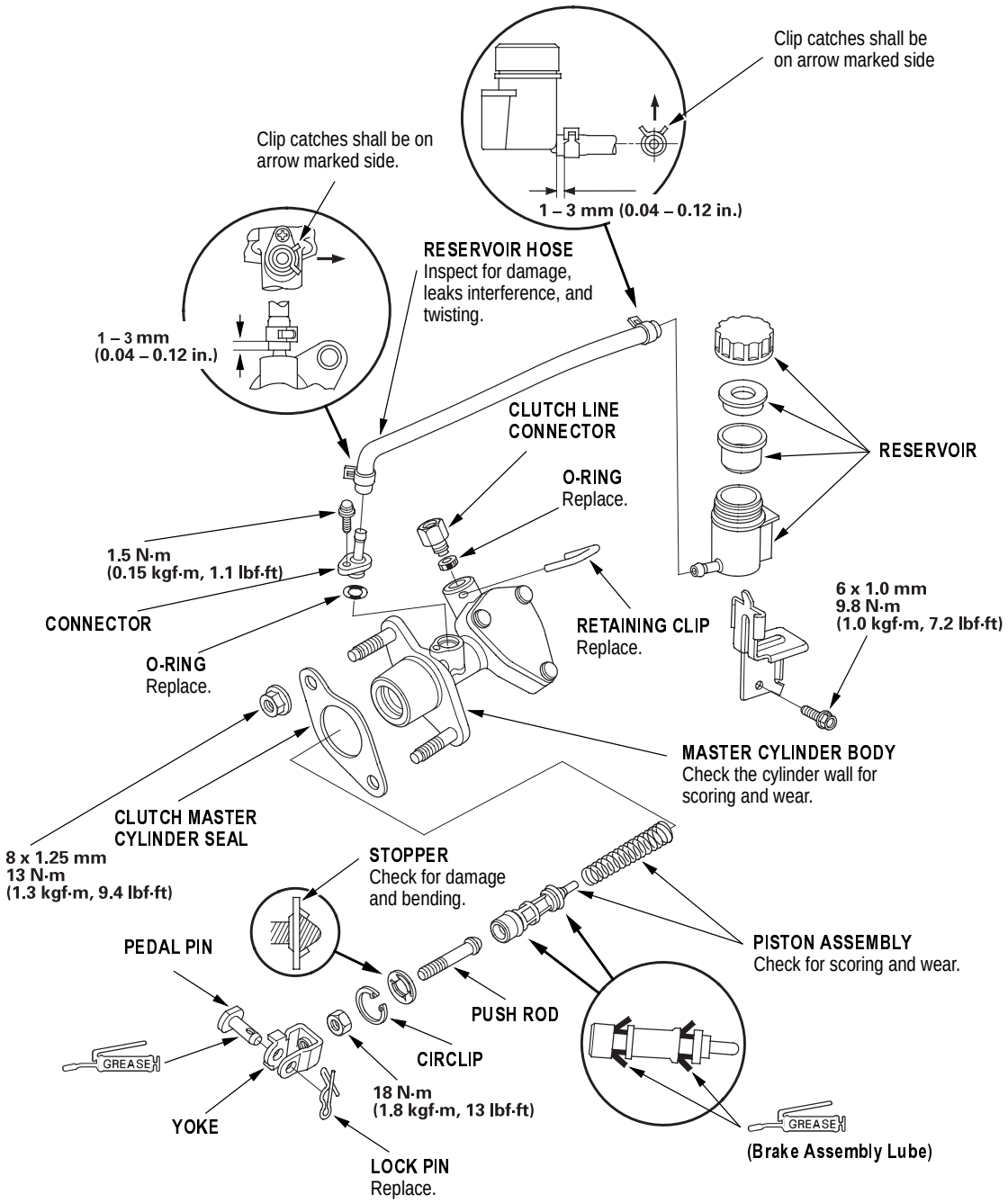
9. Bleed the clutch master hydraulic system (see step 11 on page 12-9).

   NOTE: The reservoir filling is covered in the bleeding procedure.

Clutch Master Cylinder Overhaul

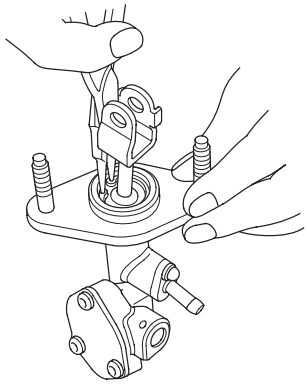
Exploded view

NOTE:
- When attaching the reservoir hose, align the yellow mark on the hose to the rib on reservoir connection area.
- When attaching the reservoir hose, align the blue mark on the hose to rip on the clutch master cylinder connection area.

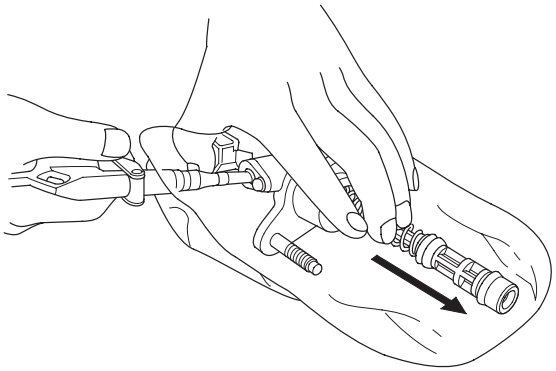


NOTE:
- Refer to the Exploded View, as needed during this procedure.
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all part are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

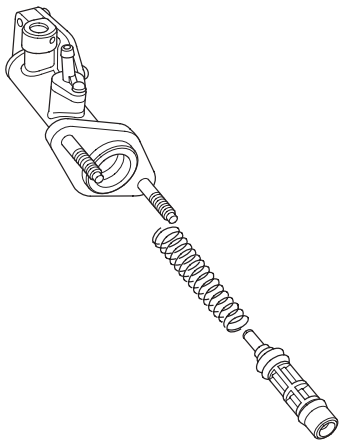
1. Pry the circlip off the clutch master cylinder.



2. Carefully remove the piston by applying air pressure through the clutch line hole.



3. Slide the piston assembly into the clutch master cylinder.

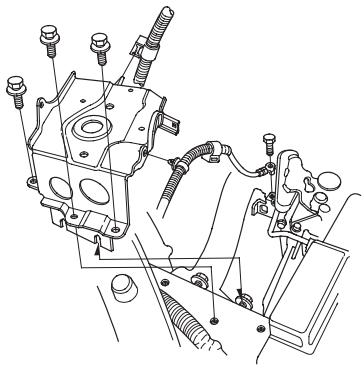


4. Install the circlip in the groove of the clutch master cylinder.

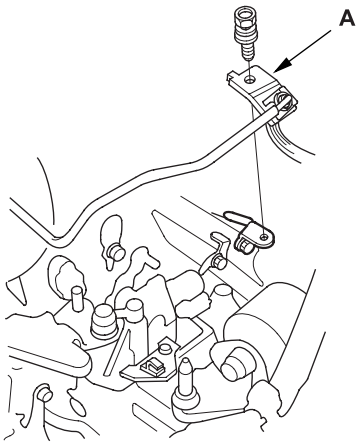
Slave Cylinder Replacement

NOTE:
- Use fender covers to avoid damaging painted surfaces.
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

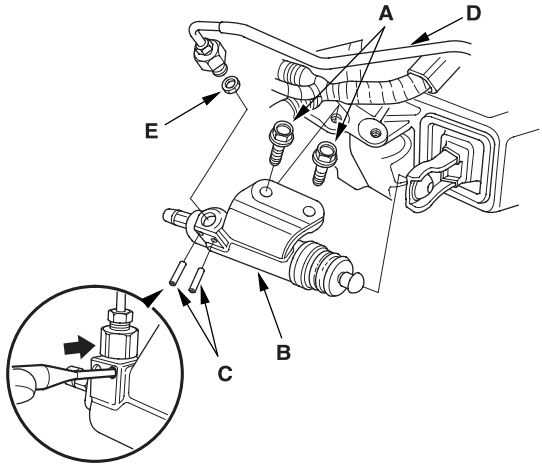
1. Write down the frequencies for the radio's preset buttons. Disconnect the negative (-) cable first, then the positive (+) cable from the battery. Remove the battery.
2. Remove the air cleaner housing (see step 5 on page 05-3).
3. Remove the intake air duct (see step 6 on page 05-3).
4. Remove the battery tray.



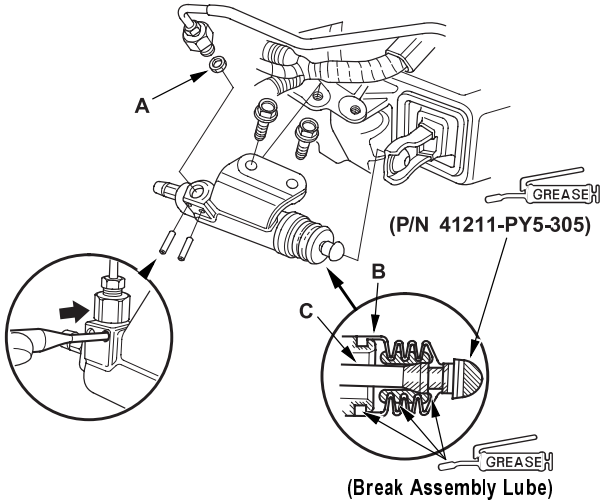
5. Remove the clutch line bracket (A).



6. Remove the mounting bolts (A) and the slave cylinder (B).



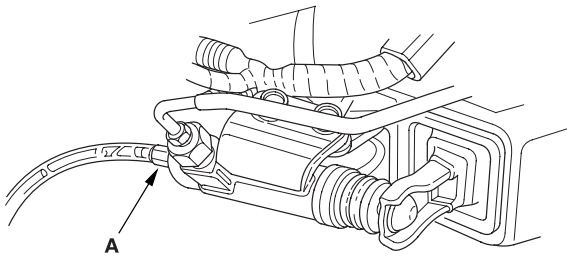
7. Remove the roll pins (C). Disconnect the clutch line (D), and remove the O-ring (E). Plug the end of the clutch line with a shop towel to prevent brake fluid from coming out.
8. Install the slave cylinder in the reverse order of removal. Install a new O-ring (A).



9. Pull the boot (B) back, and apply brake assembly lube to the boot and slave cylinder rod (C). Reinstall the boot.
10. Apply Urea Grease UM264 (P/N 41211-PY5-305) to the push rod of the slave cylinder. Tighten the slave cylinder mounting bolts to 22 N•m (2.2 kgf•m, 16 lbf•ft).

11. Bleed the clutch hydraulic system.

- Attach a hose to the bleeder screw (A), and suspended the hose in a container of brake fluid.
- Make sure there is an adequate supply of fluid at the clutch master cylinder, then slowly pump the clutch pedal until no more bubbles appear at the bleeder hose.
- Tighten the bleed screw to 8 N•m (0.8 kgf•m, 6 lbf•ft); do not overtighten it.
- Refill the clutch master cylinder with fluid when done.
- Always use only Genuine Honda DOT 3 or 4 brake fluid.

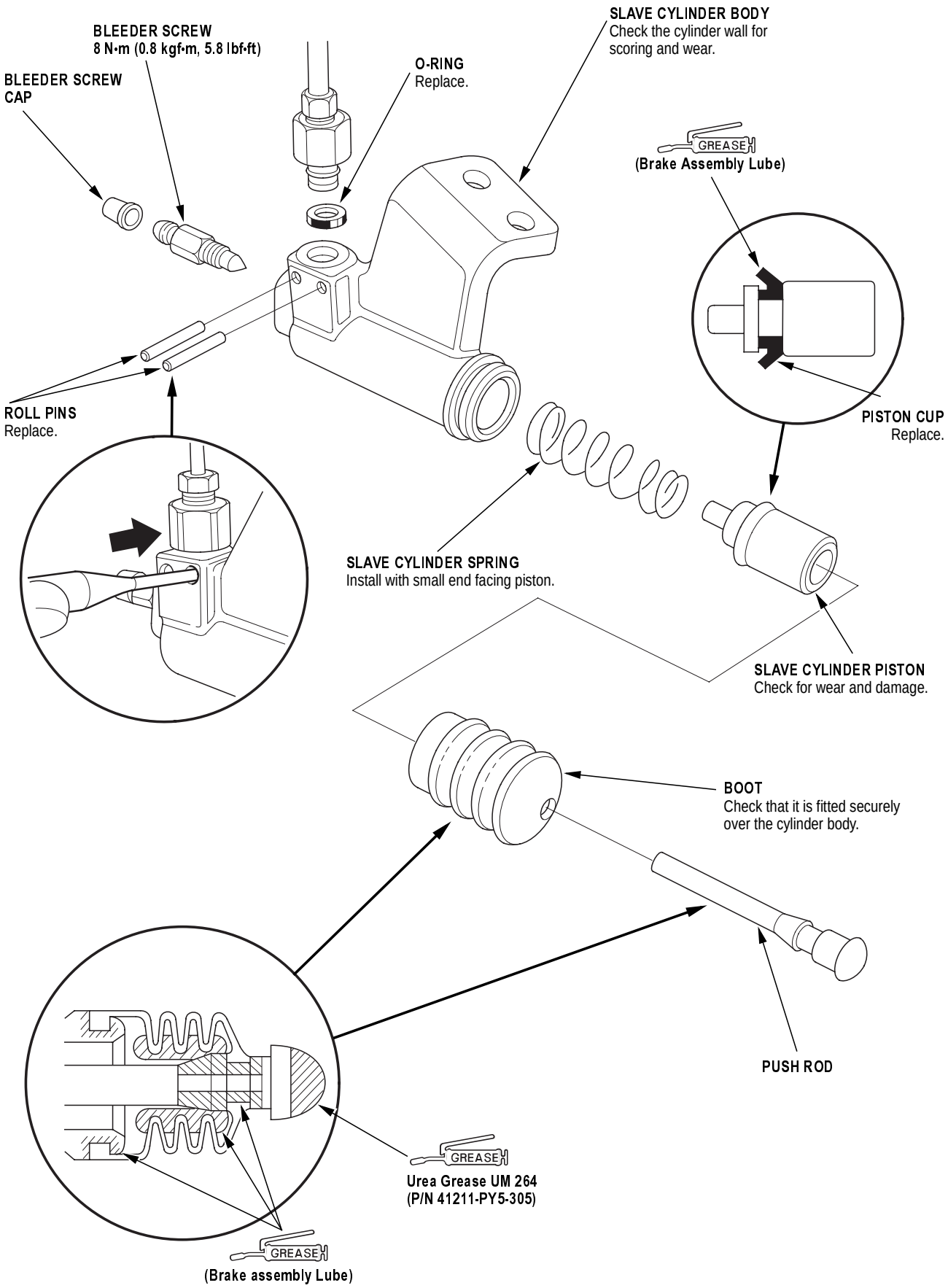


12. Install the clutch line bracket and battery tray.

13. Install the intake air duct (see step 38 on page 05-16).

14. Install the air cleaner housing (see step 39 on page 05-17).

Slave Cylinder Overhaul



Clutch Replacement

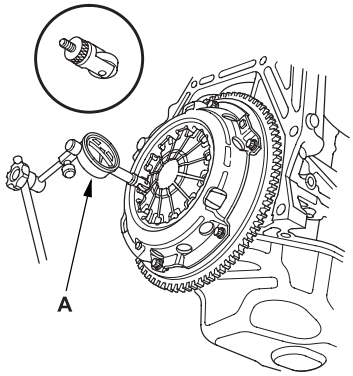
Special Tools Required
- Clutch alignment tool set 07PAF-0020000
- Ring gear holder 07LAB-PV00100 or 07924-PD20003

Pressure Plate and Clutch Disc Removal

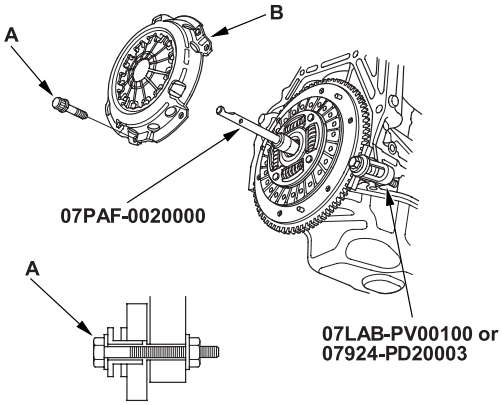
1. Check the diaphragm spring fingers for height using the dial indicater (A). If the height is more than the service limit, replace the pressure plate.

Standard (New): 0.6 mm (0.02 in.) max.

Service Limit: 0.8 mm (0.03 in.)

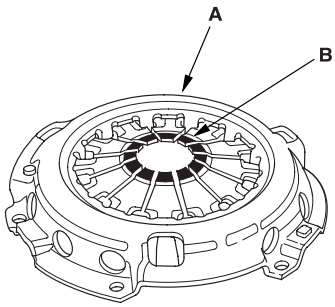


2. Install the special tools.



3. To prevent warping, unscrew the pressure plate mounting bolts (A) in a crisscross pattern in several steps, then remove the pressure plate (B).

4. Inspect the pressure plate (A) surface for wear, cracks, and burning.



5. Inspect the fingers of the diaphragm spring (B) for wear at the release bearing contact area.

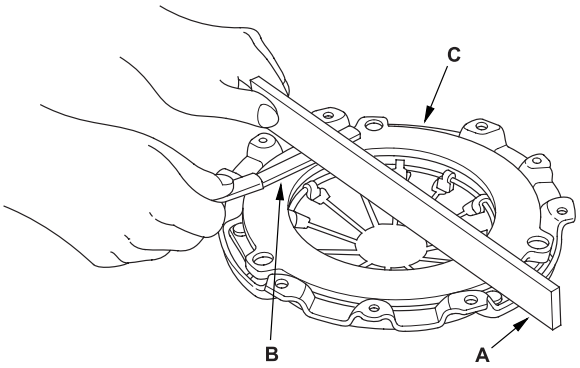
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Clutch Replacement (cont'd)

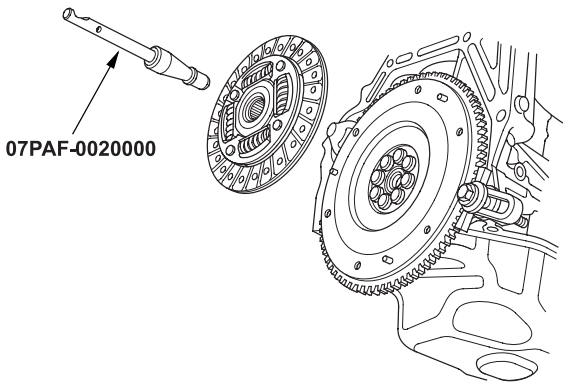
Pressure Plate and Clutch Disc Removal (cont'd)

6. Inspect for warpage using a straight edge (A) and feeler gauge (B). Measure across the pressure plate (C). If the warpage is more than the service limit, replace the pressure plate.

Standard (New): 0.03 mm (0.001 in.) max.
Service Limit: 0.15 mm (0.006 in.)



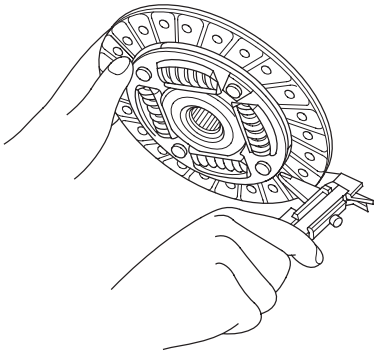
7. Remove the clutch disc and special tools.



8. Inspect the lining of the clutch disc for signs of slipping or oil. If the clutch disc is burned black or oil soaked, replace it.

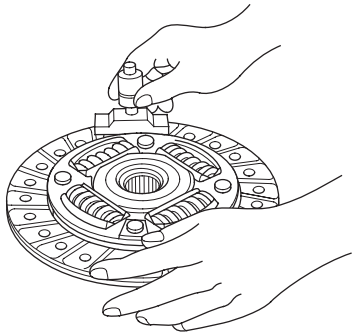
9. Measure the clutch disc thickness. If the thickness is less than the service limit, replace the clutch disc.

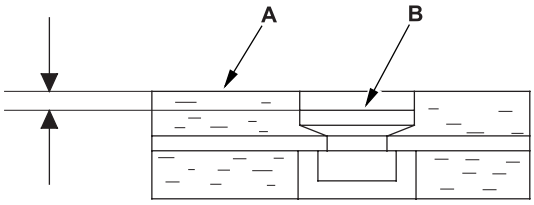
Standard (New): 8.7 - 9.3 mm (0.343 - 0.366 in.) max.
Service Limit: 6.0 mm (0.24 in.)



10. Measure the rivet depth from the clutch disc lining surface (A) to the rivets (B) on both sides. If the rivet depth is less than the service limit, replace the clutch disc.

Standard (New): 1.65 - 2.25 mm (0.065 - 0.089 in.) max.
Service Limit: 0.7 mm (0.03 in.)

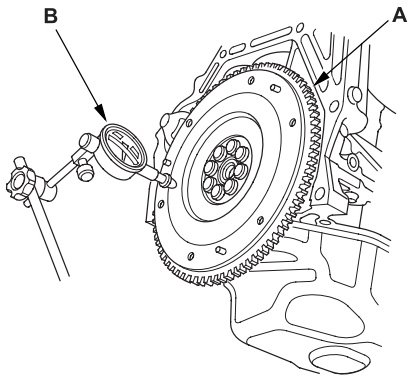




Flywheel Inspection

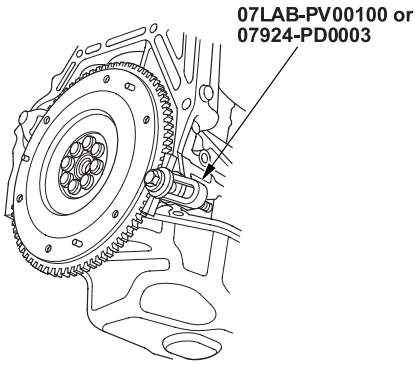
1. Inspect the ring gear teeth for wear and damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks and burning.
3. Measure the flywheel (A) runout using a dial indicator (B) through at least two full turns with the engine installed. Push against the flywheel each time you turn it to take up the crankshaft thrust washer clearance. If the runout is more than the service limit, replace the flywheel and recheck the runout. Resurfacing the flywheel is not recommended.

Standard (New): **0.05 mm (0.002 in.) max.**
Service Limit: **0.15 mm (0.006 in.)**

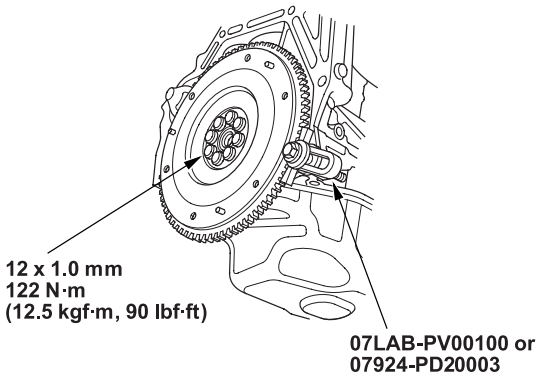


Flywheel Replacement

1. Install the special tool.



2. Remove the flywheel mounting bolts in a crisscross pattern in several steps, then remove the flywheel.
3. Install the flywheel on the crankshaft, and install the mounting bolts finger-tight.
4. Install the special tool, then torque the flywheel mounting bolts in a crisscross pattern in several steps.

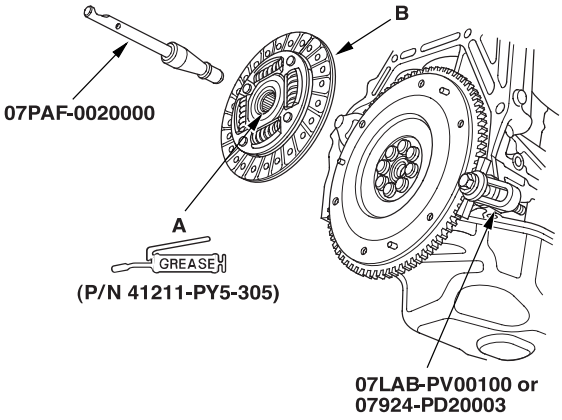


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Clutch Replacement (cont'd)

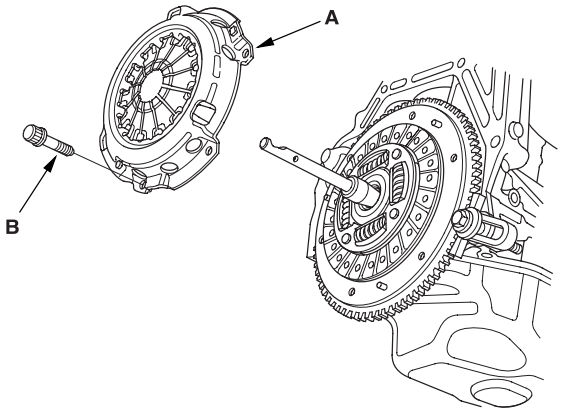
Clutch Disc and Pressure Plate Installation

1. Install the ring gear holder.



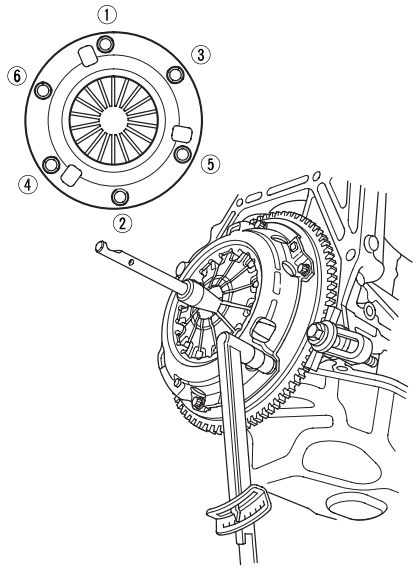
2. Apply Urea Grease UM264 (P/N 41211-PY5-305) to the splines (A) of the clutch disc (B), then install the clutch disc using the special tools.

3. Install the pressure plate (A) and the mounting bolts (B) finger-tight.



4. Torque the mounting bolts in a crisscross pattern. Tighten the bolts in several steps to prevent warping the diaphragm spring.

PRESSURE PLATE MOUNTING BOLT TORQUE:
25 N•m (2.6 kgf•m, 19 lbf•ft)

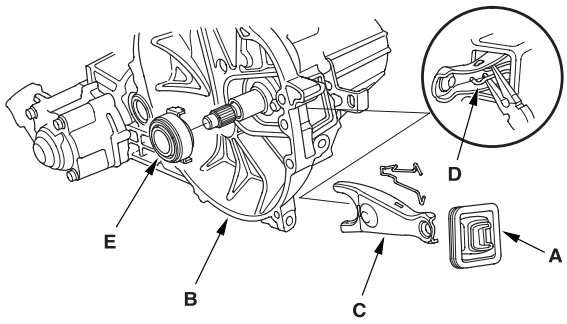


5. Remove the special tools.

6. Make sure the diaphragm spring fingers are all the same height.

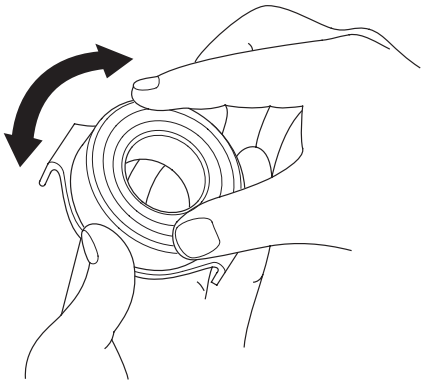
Release Bearing Replacement

1. Remove the release fork boot (A) from the clutch housing (B).

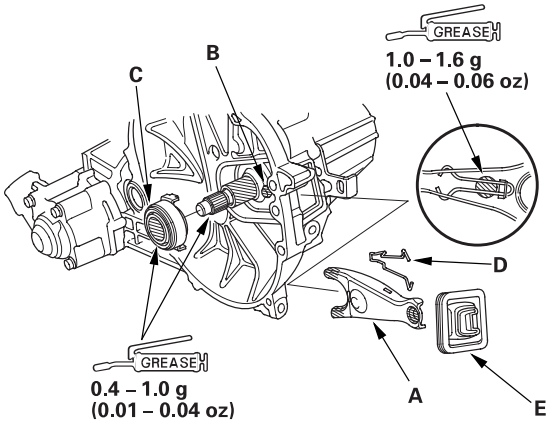


2. Remove the release fork (C) from the clutch housing (B) by squeezing the release fork set spring (D) with pliers. Remove the release bearing (E).
3. Check the release bearing for play by spinning it by hand. If there is excessive play, replace the release bearing with a new one.

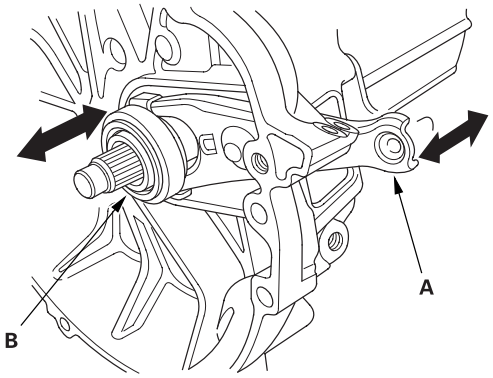
   NOTE: The release bearing is packed with grease. Do not wash it in solvent.



4. Apply Urea Grease UM264 (P/N 41211-PY5-305) to the release fork (A), the release fork bolt (B), the release bearing (C), and the release bearing guide (D) in the shaded areas.



5. With the release fork slid between the release bearing pawls, install the release bearing on the mainshaft while inserting the release fork through the hole in the clutch housing.
6. Align the detent of the release fork with the release fork bolt, then press the release fork over the release fork bolt squarely.
7. Install the release fork boot (E), make sure the boot seals around the release fork and clutch housing.
8. Move the release fork (A) right and left to make sure that it fits properly against the release bearing (B), and that the release bearing slides smoothly.



13

M/T - M/T Differential

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Manual Transmission

4WD (Four-wheel Drive) Model Precautions

This 4WD model does not have the feature that mechanically switches between 4WD and 2WD (front-wheel drive). Therefore, speedometer testing should be conducted using simplified free rollers under the rear wheels.

Precautions on using free rollers:

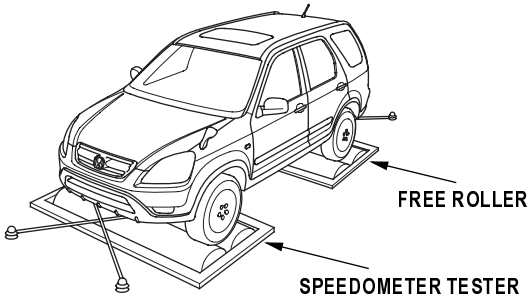
- Inspecting and testing using a chassis dynamometer is not feasible.
- Do not operate the accelerator pedal, brake pedal or steering wheel abruptly. It may cause the vehicle to roll and create a hazardous condition.
- The maximum testing speed should be 50 km/h (31 mph).
- The maximum continuous operating time should be three minutes.
- Make sure to tie down the vehicle securely with the side anchor wires and center tie down wire. The free rollers are to be set under the rear wheels.

CAUTION

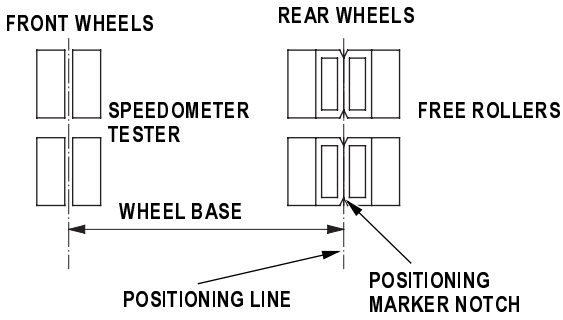
- Make sure to place the free rollers parallel to the roller of each speedometer tester.
- Putting the front and rear wheels on the speedometer testers and free rollers inappropriately may cause the vehicle to roll off or over the free rollers and create a hazardous condition.
- The side anchor wires and certain tie-down wire must be appropriately tensioned. If the wires have too much slack, the expected tie-down efficiency cannot be obtained.
- When attaching the side anchor wires and center tie-down wire, make sure they are not interfering with the bumper and other parts of the vehicle body.
- Do not attach the wires to any place other than the designed areas.
- Do not a operate the speedometer testers at a speed more than 50 km/h (31 mph) or for more than three minutes.

Testing Procedures

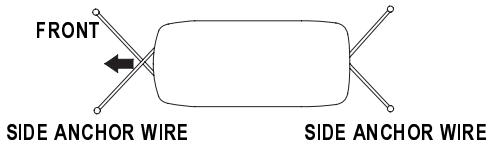
1. Set the free rollers according to the wheel base and tread of the vehicle.



NOTE: Align the position marker notch to the positioning line.



2. Move the vehicle to position the front wheels on the speedometer testers and the rear wheels on the free rollers. Make sure to align the center of the wheels to the center of the speedometer testers and the free rollers.

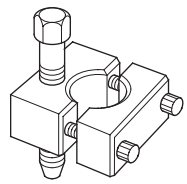


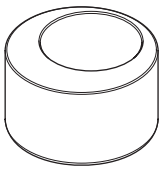
3. Tie down the vehicle securely using the towing hook and the rear tie-down hook bracket to prevent the vehicle from rolling off or over the free rollers.
4. Start the engine, shift the transmission to 3rd gear, accelerate the vehicle gradually, and measure the vehicle speed.
5. After measurement, use the brake pedal to gradually decelerate and stop the vehicle.

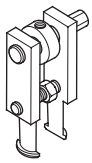
Special Tools

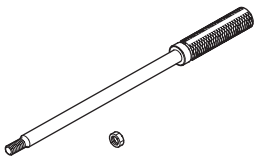
Ref. No.	Tool Number	Description	Qty
*1	07GAJ-PG20110	Mainshaft Holder	1
*2	07GAJ-PG20130	Mainshaft Base	1
3	07JAC-PH80100	Adjustable Bearing Puller, 20 - 40 mm	1
4	07JAC-PH80200	Bearing Remover Shaft	1
5	07JAD-PH80101	Oil Seal Driver Attachment	1
6	07JAD-PL90100	Oil Seal Driver	1
7	07JAF-SJ80110	Installer Shaft 14 x 165 mm	1
8	07JAF-SJ80120	Installer Nut 14 mm	1
9	07KAF-PS30120	Bearing Installer Attachment	1
10	07LAF-PZ70110	Bearing Installer Attachment	1
11	07NAD-P200100	Oil Seal Driver Attachment	1
12	07PAB-0020000	Companion Flange Holder	1
13	07741-0010201	Slide Hammer	1
14	07746-0010200	Attachment, 37 x 40 mm	1
15	07746-0010300	Attachment, 42 x 47 mm	1
16	07746-0010400	Attachment, 52 x 55 mm	1
17	07746-0010600	Attachment, 72 x 75 mm	1
18	07746-0030100	Driver, 40 mm I.D.	1
19	07746-0030300	Driver, 30 mm I.D.	1
20	07746-0030400	Attachment, 35 mm I.D.	1
21	07749-0010000	Driver	1

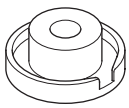
* Part of Mainshaft Inspection Tool Set, 07GAJ-PG20102.

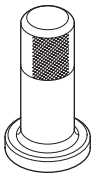

1

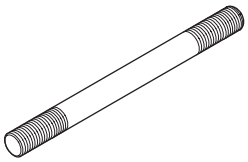

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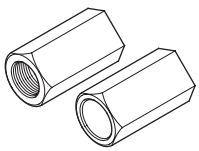

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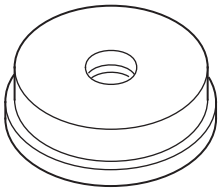

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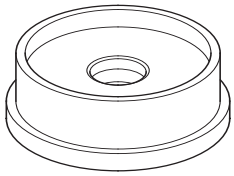

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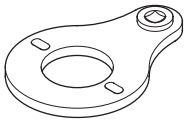

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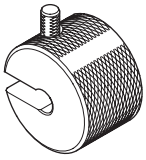

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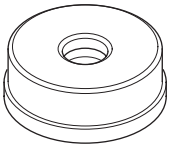

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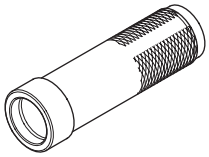

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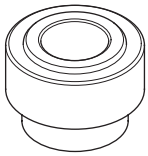

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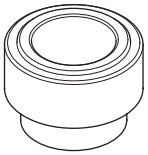

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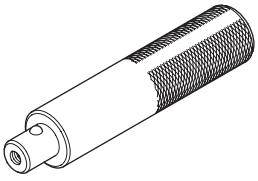

14, 15, 17


16


18

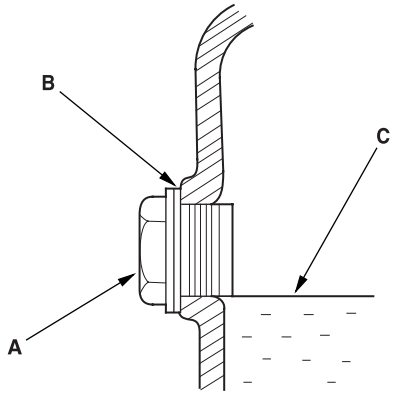

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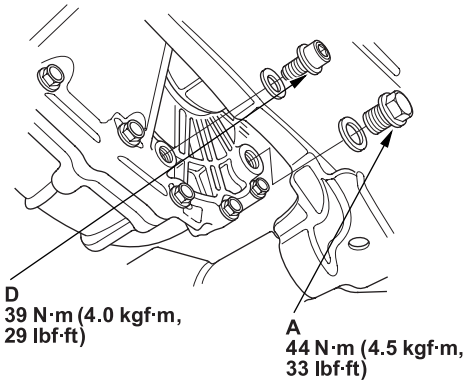

21

Transmission Fluid Inspection and Replacement

1. Park the vehicle on level ground, and turn the engine OFF.
2. Remove the oil filler plug (A) and washer (B), check the condition of the fluid, and make sure the fluid is at the proper level (C).



3. If the transmission fluid is dirty, remove the drain plug (D) and drain the fluid.



4. Reinstall the drain plug with a new washer, and refill the transmission fluid to the proper level.

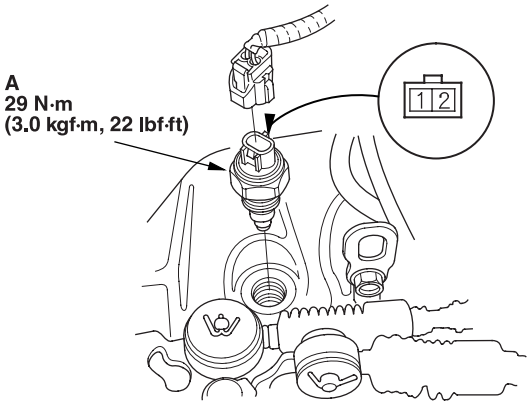
Oil Capacity
2WD model:
1.9 ℓ (1.9 US qt, 1.6 Imp qt) at fluid change
2.1 ℓ (2.2 US qt, 1.8 Imp qt) at overhaul
4WD model:
1.9 ℓ (2.0 US qt, 1.7 Imp qt) at fluid change
2.3 ℓ (2.4 US qt, 2.0 Imp qt) at overhaul

Always use Honda Manual Transmission Fluid (MTF). Using motor oil can cause stiffer shifting because it does not contain the proper additives.

5. Reinstall the oil filler plug with a new washer.

Back-Up Light Switch Test

1. Disconnect the back-up light switch (A) connector.

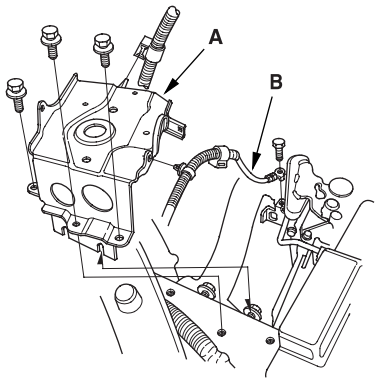


2. Check for continuity between the back-up light switch 2P connector No. 1 and No. 2 terminals. There should be continuity when the shift lever is in reverse.
3. If necessary, replace the back-up light switch. Apply liquid gasket (P/N 08C70-K0234M), and install it on the transmission housing.

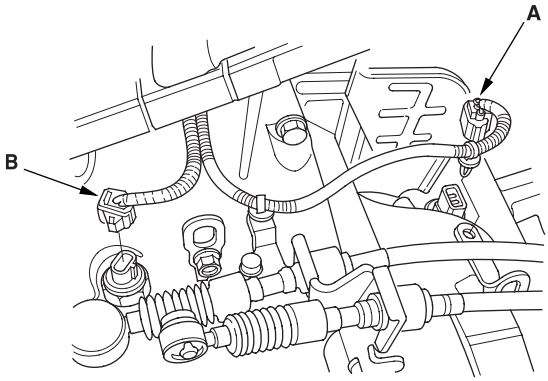
Transmission Removal

NOTE: Use fender covers to avoid damaging painted surfaces.

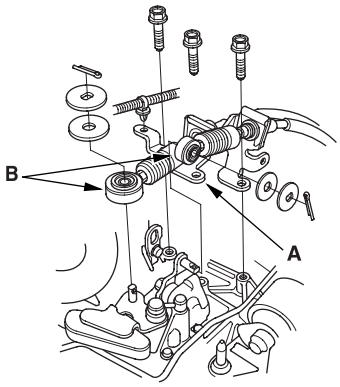
1. Write down the frequencies for the radio's preset buttons. Disconnect the negative (-) cable first, then the positive (+) cable from the battery. Remove the battery.
2. Remove the air cleaner housing (see step 5 on page 05-3).
3. Remove the intake duct (see step 6 on page 05-3).
4. Remove the battery tray (A).
5. Disconnect the transmission ground cable (B).



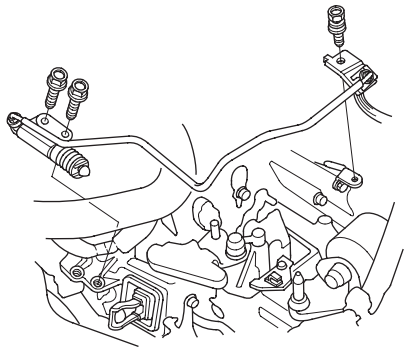
6. Disconnect the vehicle speed sensor (A) and the back-up light switch connector (B).



7. Remove the cable bracket (A), then disconnect the cables (B) from the top of the transmission housing. Carefully remove both cables and the bracket together so as not to bend the cables.



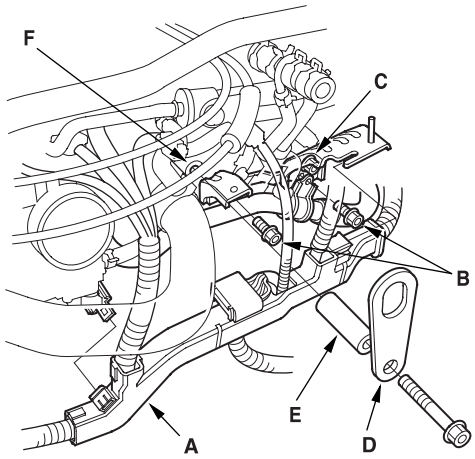
8. Carefully remove the slave cylinder so as not to bend the clutch line. Do not operate the clutch pedal once the slave cylinder has been removed.



(cont'd)

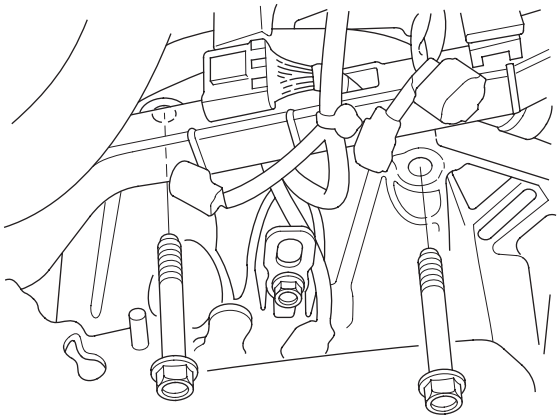
Transmission Removal (cont'd)

9. Remove the harness cover (A), water pipe mounting bolts (B), and loosen the air cleaner housing mounting bracket bolt (C). Lower the water pipe slightly.

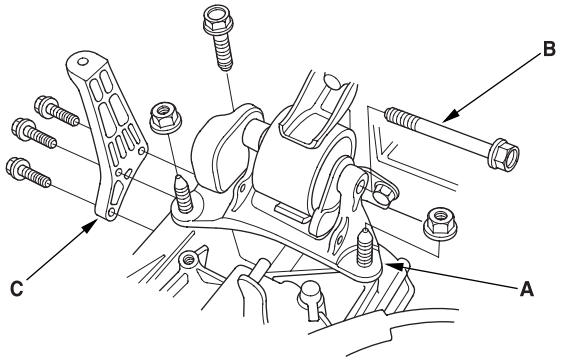


10. Attach a engine hanger (D) with a collar (E) to the bolt hole (F) on the engine cylinder block.

11. Remove the two upper transmission mounting bolts.



12. Remove the transmission mount bracket (A) and transmission mounting bolt (B).

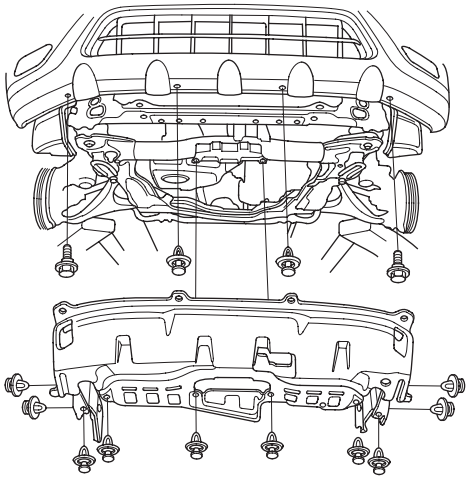


13. Remove the air cleaner bracket (C).

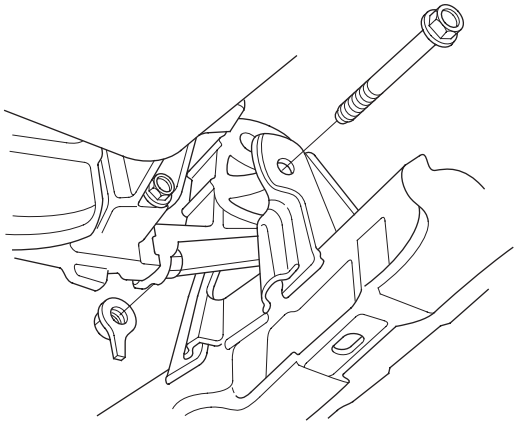
14. Raise vehicle and make sure it is securely supported.

15. Drain the transmission fluid. Reinstall the drain bolt using a new washer (see page 13-4).

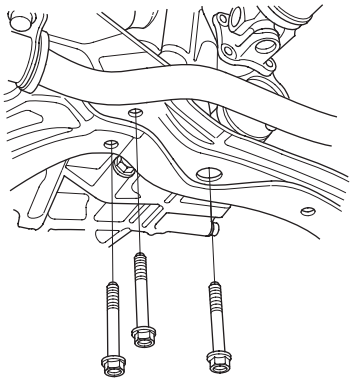
16. Remove the splash shield.



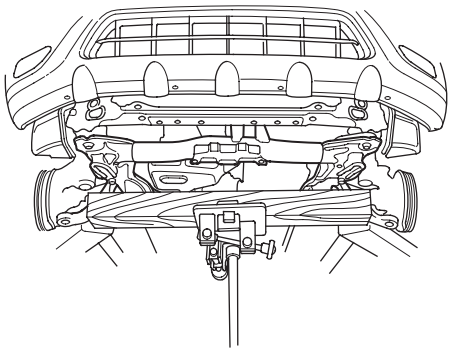
17. Remove the driveshafts (see page 16-3).
18. Remove the intermediate shaft (see page 16-19).
19. For 4WD models, remove the propeiler shaft (see page 16-33).
20. Remove the front engine mount bracket mounting bolt.



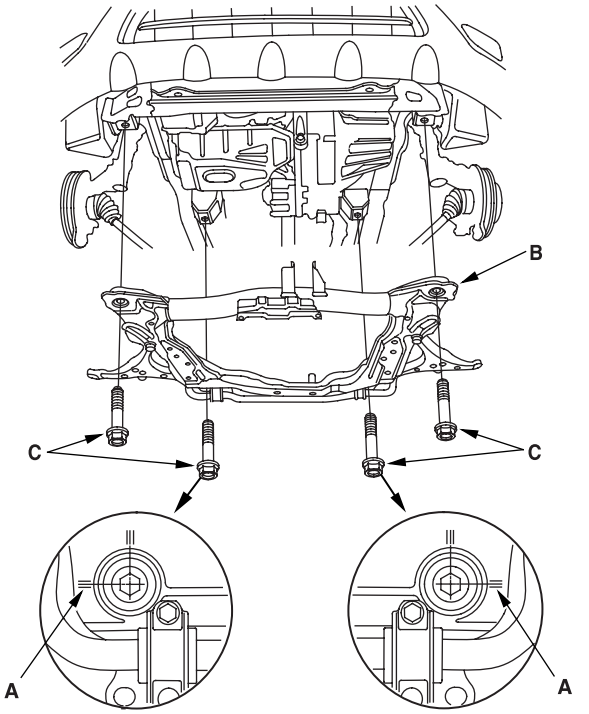
21. Remove the three bolts securing the transmission rear mount.



22. Support the subframe with a 4 x 4 x 40 in. piece of wood and a jack.



23. Make reference marks (A) on the front suspension subframe (B) and mounting bolts (C), then remove the front suspension subframe.

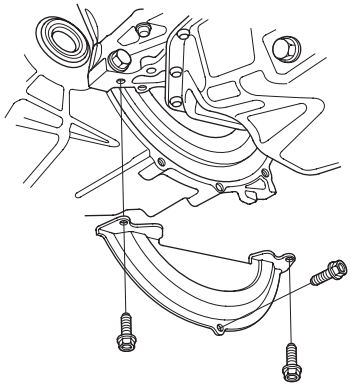


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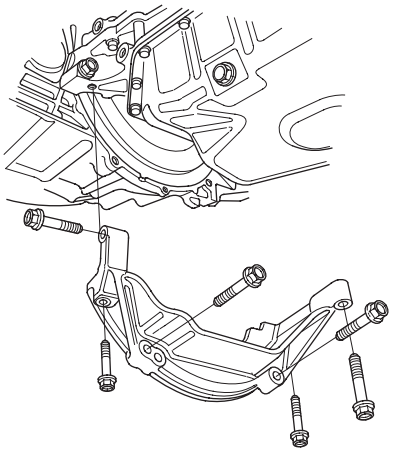
Transmission Removal (cont'd)

24. Remove the clutch cover.

2.0 / model:

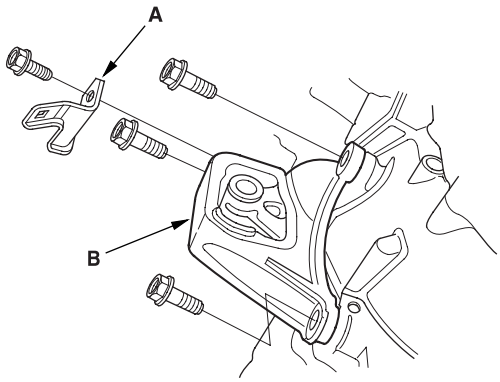


2.4 / model:

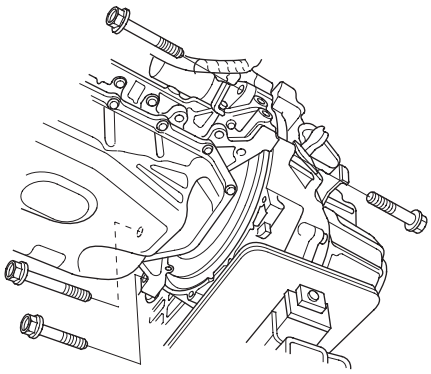


25. Remove the harness clamp (A).

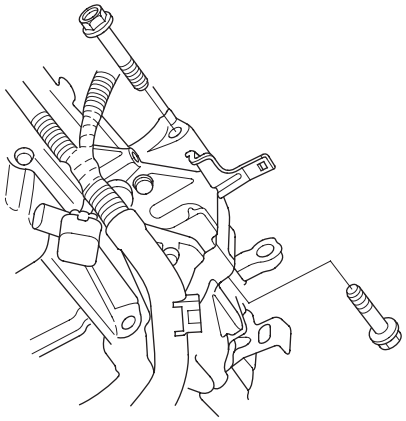
26. Remove the front engine mount (B).



27. Place the transmission jack under the transmission and remove the four lower transmission mounting bolts.

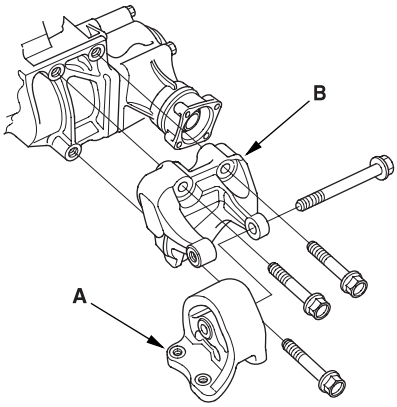


28. Remove the two lower transmission mounting bolts.

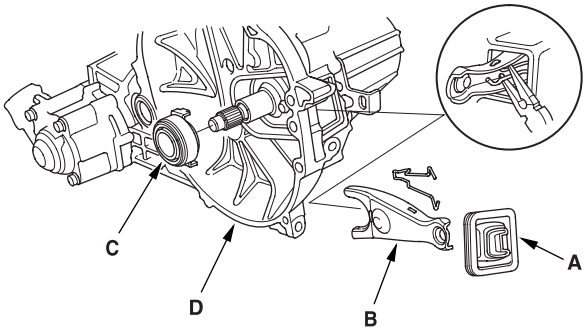


29. Pull the transmission away from the engine until the transmission mainshaft clears the clutch pressure plate, then lower the transmission on the transmission jack.

30. Remove the transmission rear mount (A) and the transmission rear mount bracket (B).

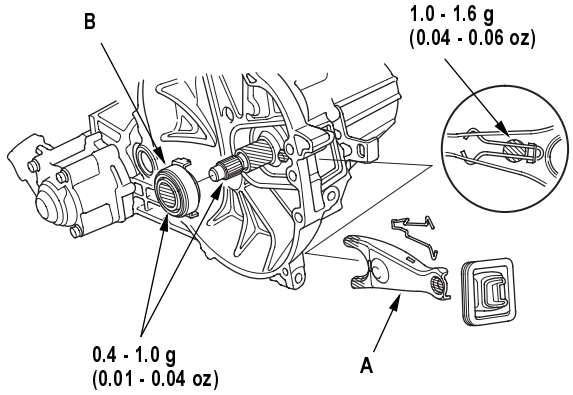


31. Remove the boot (A), the release fork (B), and the release bearing (C) from the transmission (D).

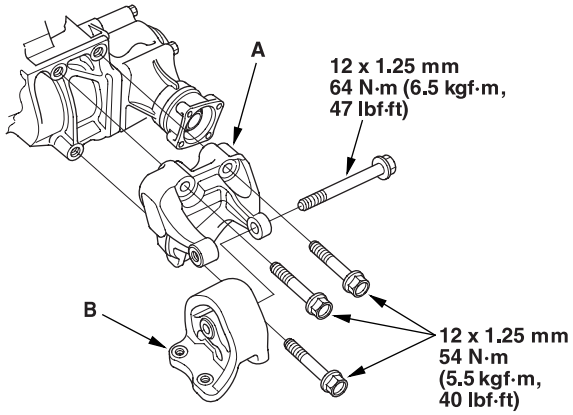


Transmission Installation

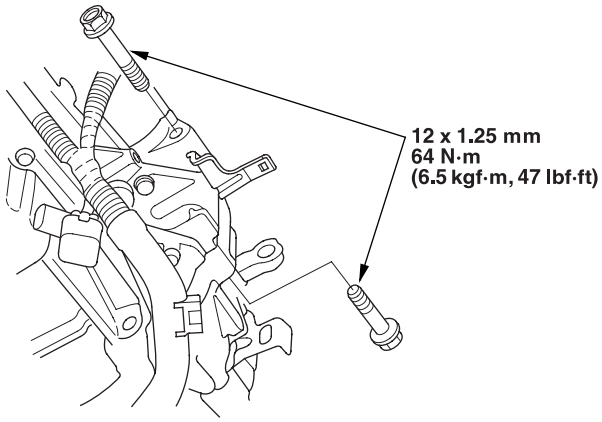
1. Check the two dowel pins are installed in the clutch housing.
2. Apply Urea Grease UM264 (P/N 41211-PY5-305) to the release fork (A) and the release bearing (B). Install the release fork and the release bearing.



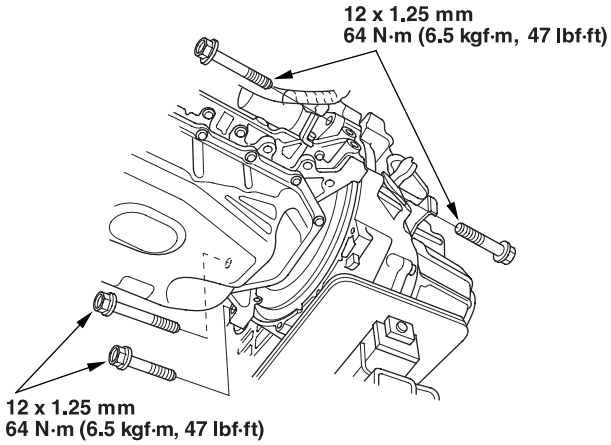
3. Install the transmission rear mount bracket (A) and the transmission rear mount (B).



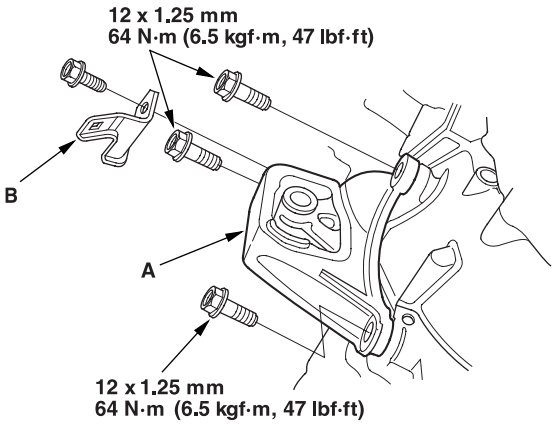
4. Place the transmission on the transmission jack, and raise it to the engine level.
5. Install the two lower transmission mounting bolts.



6. Install the four lower transmission mounting bolts.



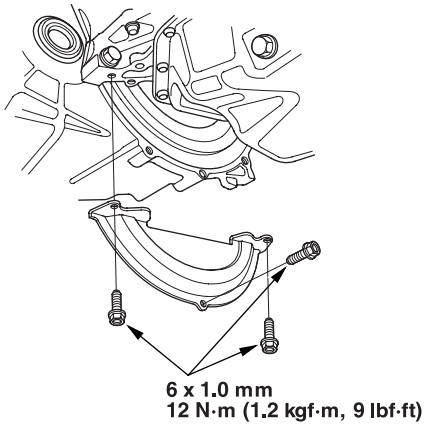
7. Install the front engine mount (A).



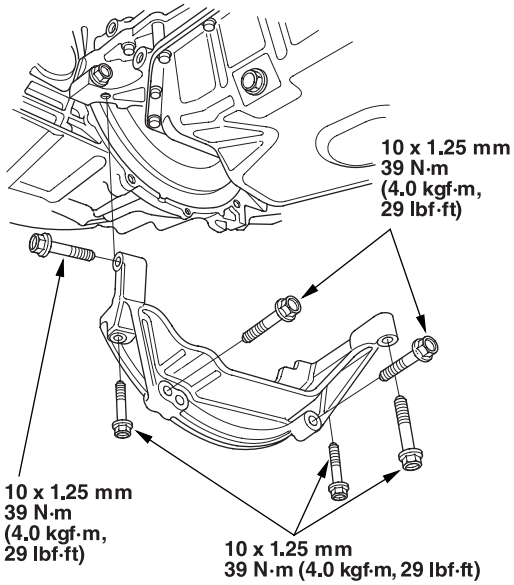
8. Install the harness clamp (B).

9. Install the clutch cover.

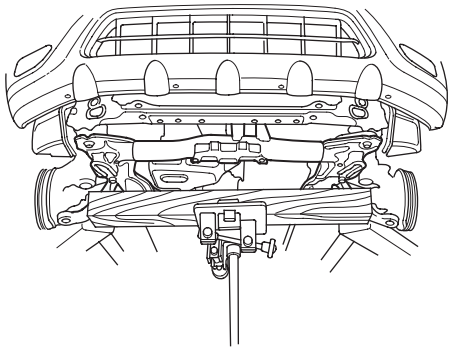
2.0 *l* model:



2.4 *l* model:



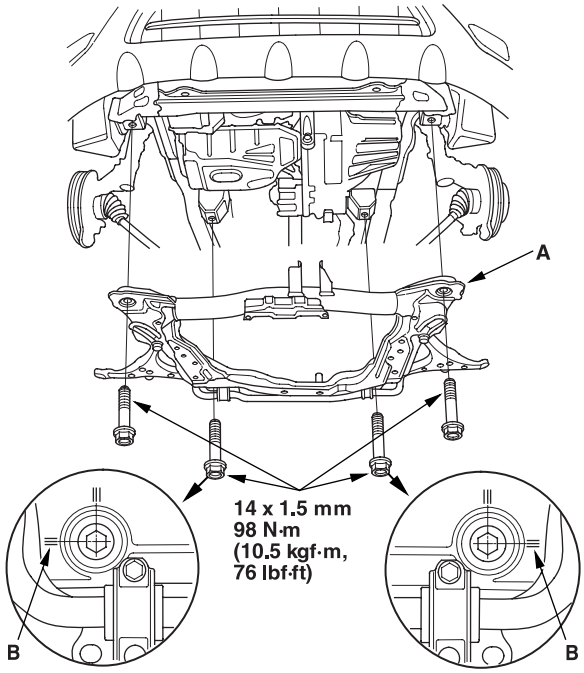
10. Support the subframe with a 4 x 4 x 40 in. piece of wood and a jack.



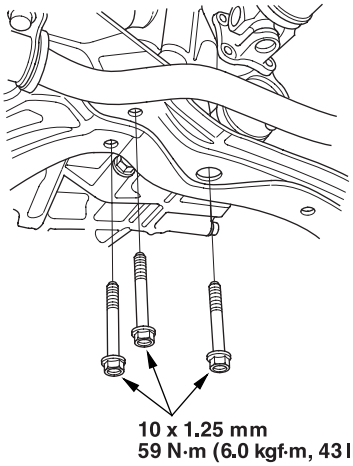
(cont'd)

Transmission Installation (cont'd)

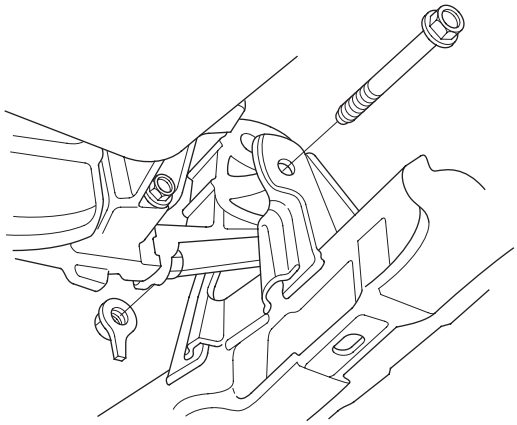
11. Install the front suspension subframe (A) in its original position by aligning the marks (B) you made in the removal procedure.



12. Install the three rear mounting bolts for the transmission rear mount.



13. Loosely tighten the front engine mount bracket mounting bolt.

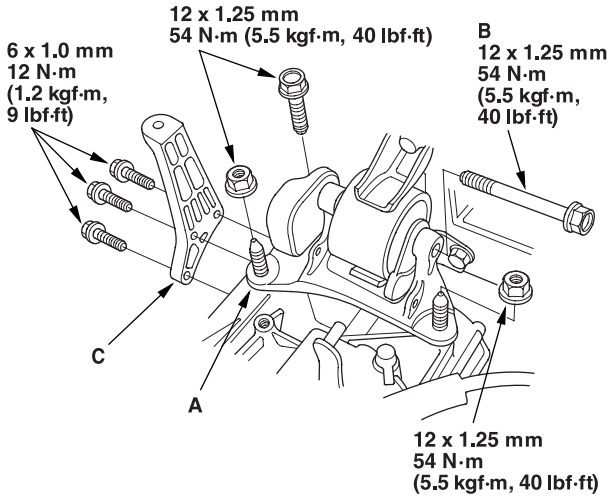


14. Install the intermediate shaft (see page 16-23).

15. Install the driveshafts (see page 16-17).

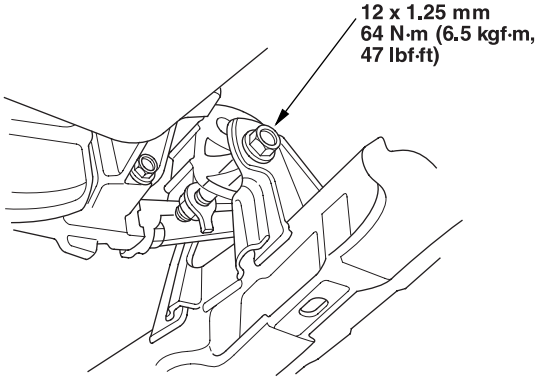
16. For 4WD models, Install the propeller shaft (see page 16-34).

17. Install the transmission mount bracket (A) and the transmission mounting bolt (B).

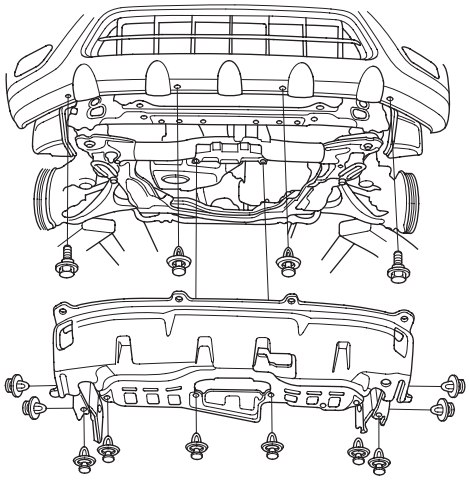


18. Install the air cleaner bracket (C).

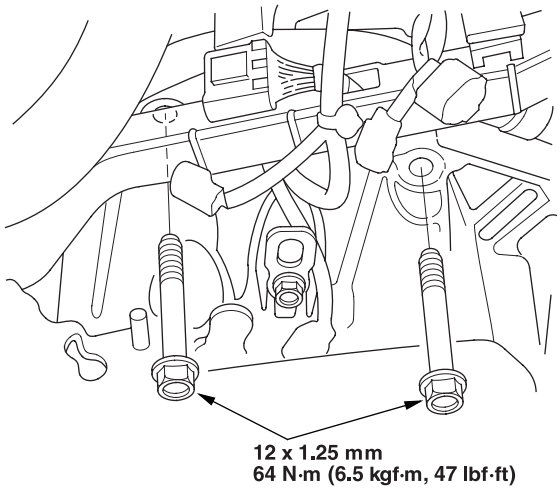
19. Loosen the front engine mount bracket mounting bolt, then tighten the front engine mount bracket mounting bolt.



20. Install the splash shield.

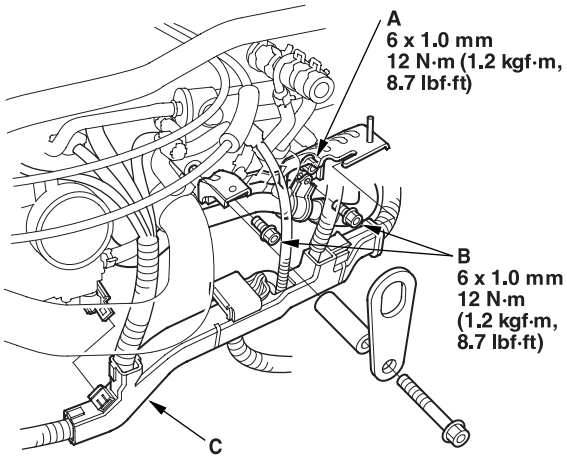


21. Install the two upper transmission mounting bolts.



22. Remove the chain hoist.

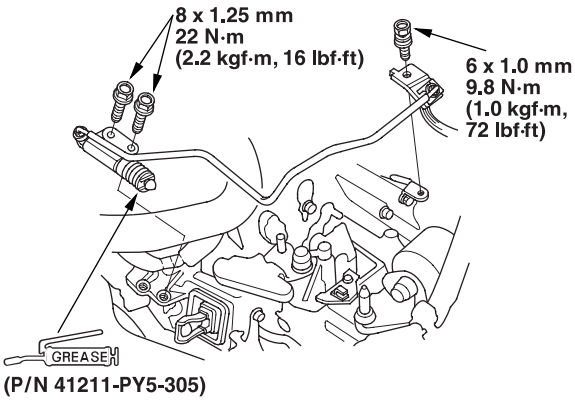
23. Install the air cleaner housing mounting bracket bolt (A), water pipe mounting bolts (B), harness cover (C).



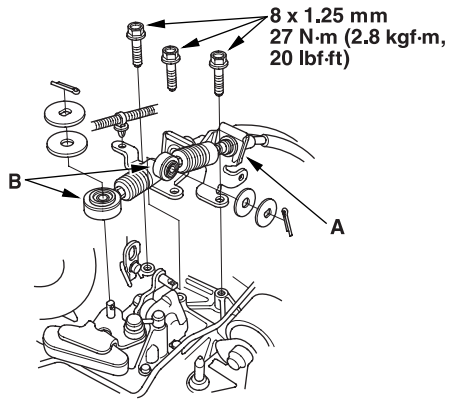
(cont'd)

Transmission Installation (cont'd)

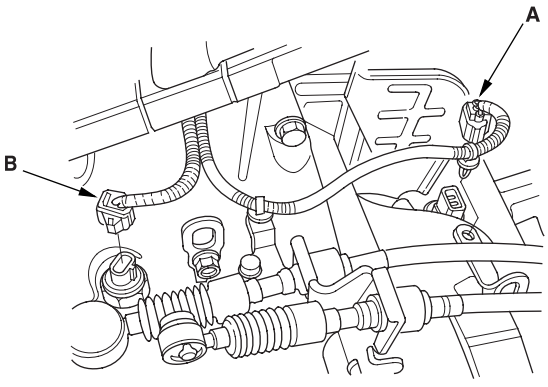
24. Apply Urea Grease UM264 (P/N 41211-PY5-305) to the end of the cylinder rod. Install the slave cylinder. Take care not to bend the clutch line.



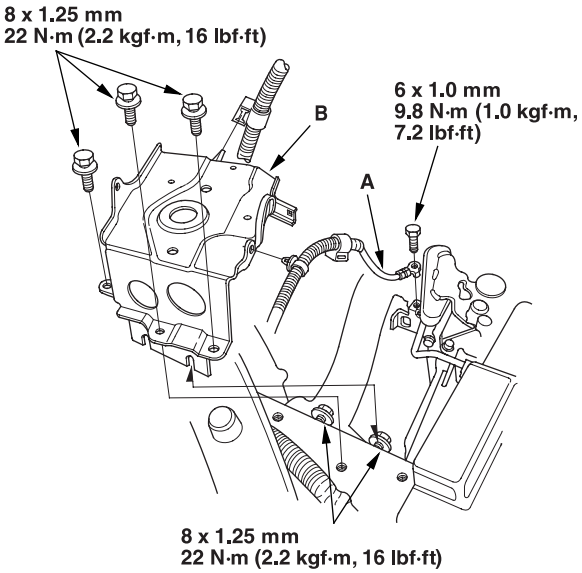
25. Install the cable bracket (A) and cables (B).



26. Connect the vehicle speed sensor (A) and the back-up light switch connector (B).



27. Install the transmission ground cable (A).



28. Install the battery tray (B).

29. Install the intake duct (see step 38 on page 05-16).

30. Install the air cleaner housing (see step 39 on page 05-17).

31. Install the battery. Connect the positive (+) cable first, then the negative (-) cable to the battery.

32. Refill the transmission fluid (see page 13-4).

33. Test-drive the vehicle.

34. Check the clutch operation.

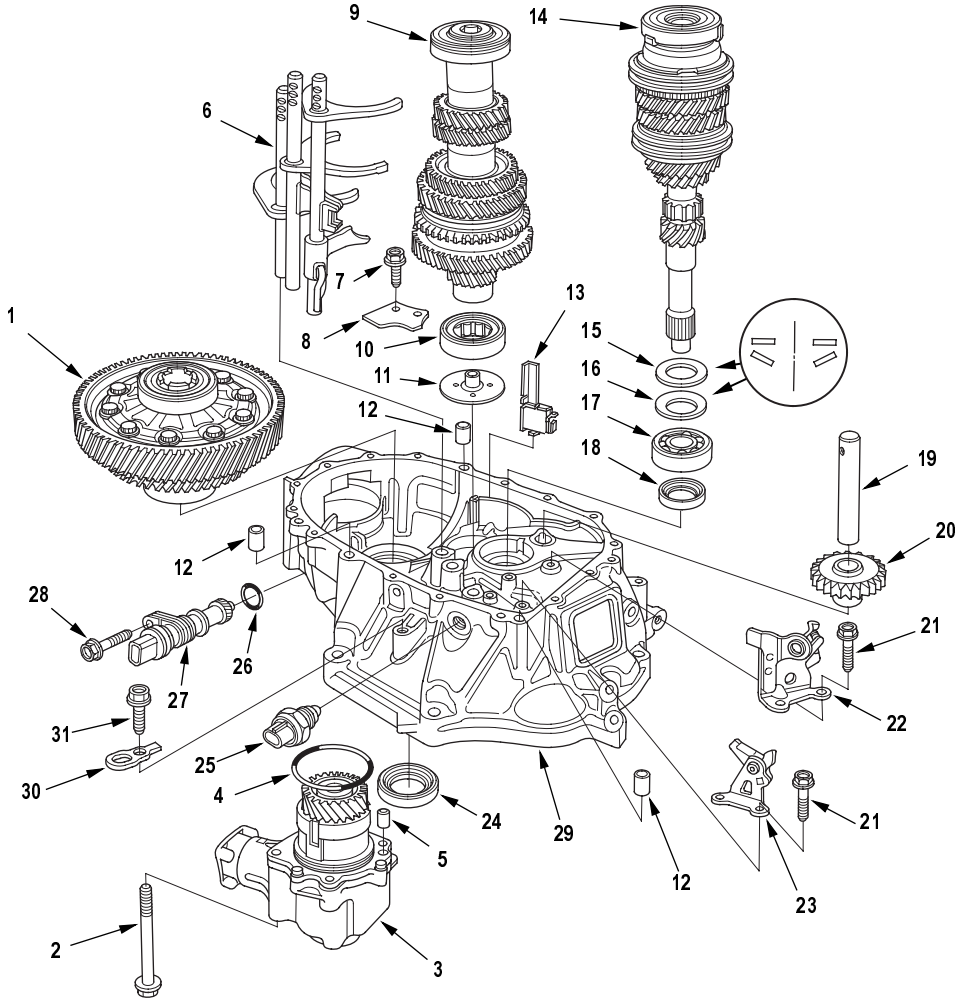
35. Check the front wheel alignment (see page 18-4).

36. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Transmission Disassembly

Exploded View-Clutch Housing

4WD model



1 DIFFERENTIAL ASSEMBLY

2 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)

3 TRANSFER ASSEMBLY

4 O-RING
Replace.

5 10 x 20 mm DOWEL PIN

6 SHIFT FORK ASSEMBLY

7 6 x 1.0 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 9 lbf·ft)

8 BEARING SET PLATE

9 COUNTERSHAFT ASSEMBLY

10 NEEDLE BEARING

11 OIL GUIDE PLATE C

12 14 x 20 mm DOWEL PIN

13 MAGNET

14 MAINSHAFT ASSEMBLY

15 28 mm WASHER

16 28 mm SPRING WASHER

17 BALL BEARING

18 28 x 43 x 7 mm OIL SEAL
Replace.

19 REVERSE GEAR SHAFT

20 REVERSE IDLER GEAR

21 6 mm SPECIAL BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)

22 REVERSE SHIFT FORK

23 REVERSE LOCK CAM

24 35 x 58 x 8 mm OIL SEAL
Replace.

25 BACK-UP LIGHT SWITCH
29 N·m (3.0 kgf·m, 22 lbf·ft)

26 O-RING
Replace.

27 VEHICLE SPEED SENSOR (VSS)

28 8 mm FLANGE BOLT
22 N·m (2.2 kgf·m, 16 lbf·ft)

29 CLUTCH HOUSING

30 TRANSMISSION HANGER

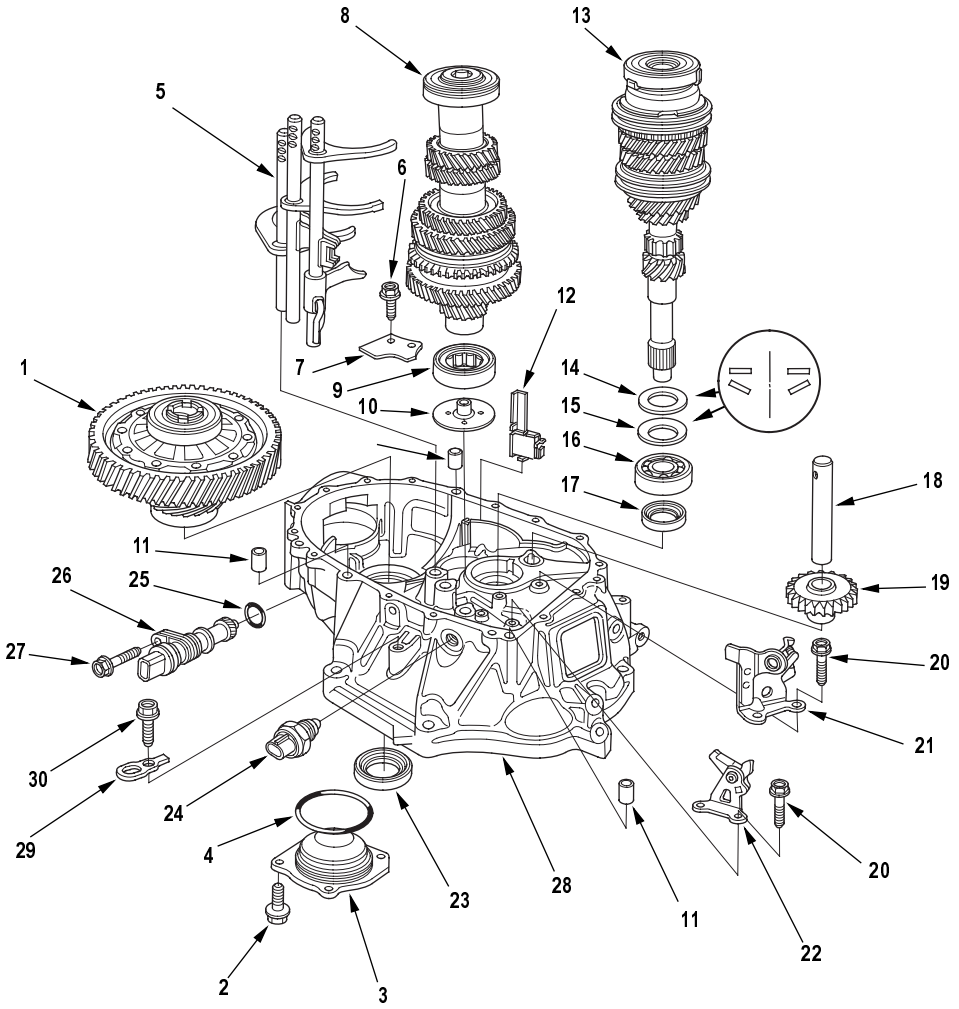
31 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)

(cont'd)

Transmission Disassembly (cont'd)

Exploded View-Clutch Housing (cont'd)

2WD model



1 DIFFERENTIAL ASSEMBLY

2 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)

3 SIDE COVER

4 O-RING
Replace.

5 SHIFT FORK ASSEMBLY

6 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 9 lbf·ft)

7 BEARING SET PLATE

8 COUNTERSHAFT ASSEMBLY

9 NEEDLE BEARING

10 OIL GUIDE PLATE C

11 14 x 20 mm DOWEL PIN

12 MAGNET

13 MAINSHAFT ASSEMBLY

14 28 mm WASHER

15 28 mm SPRING WASHER

16 BALL BEARING

17 28 x 43 x 7 mm OIL SEAL
Replace.

18 REVERSE GEAR SHAFT

19 REVERSE IDLER GEAR

20 6 mm SPECIAL BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)

21 REVERSE SHAFT FORK

22 REVERSE LOCK CAM

23 35 x 58 x 8 mm OIL SEAL
Replace.

24 BACK-UP LIGHT SWITCH
29 N·m (3.0 kgf·m, 22 lbf·ft)

25 O-RING
Replace.

26 VEHICLE SPEED SENSOR (VSS)

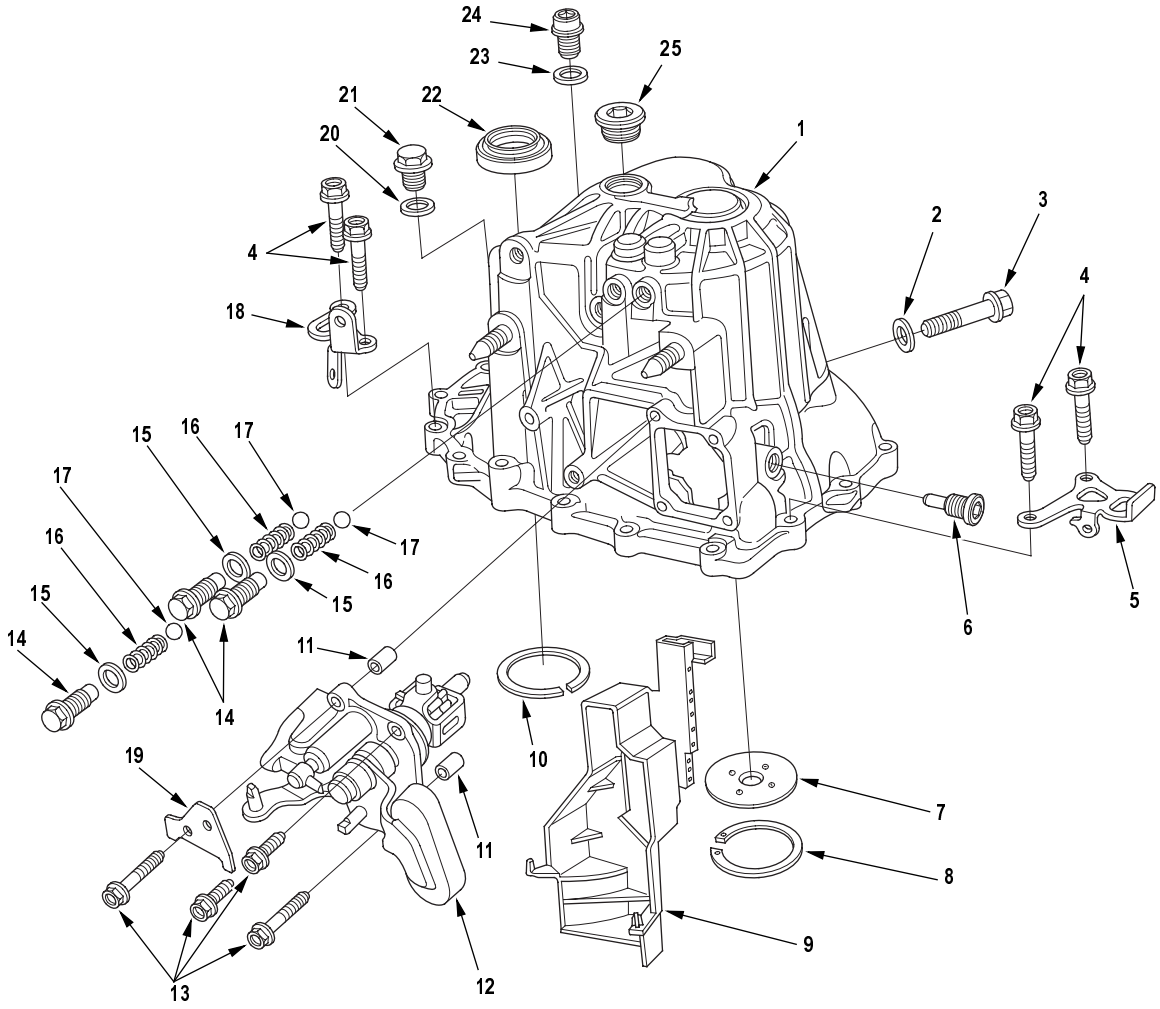
27 8 mm SPECIAL BOLT
22 N·m (2.2 kgf·m, 16 lbf·ft)

28 CLUTCH HOUSING

29 TRANSMISSION HANGER

30 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)

Exploded View-Transmission Housing



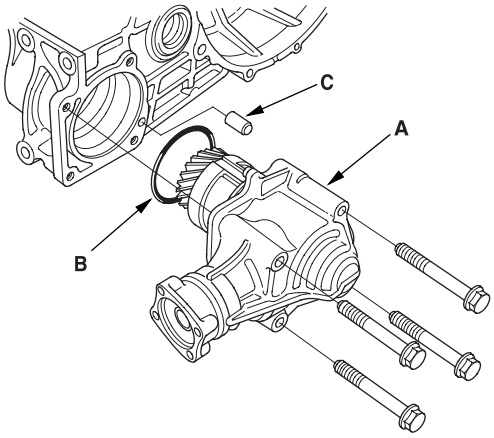
1 TRANSMISSION HOUSING	10 80 mm SHIM	19 CLUTCH LINE CLIP BRACKET
2 10 mm WASHER Replace.	11 8 x 14 mm DOWEL PIN	20 20 mm WASHER Replace.
3 10 x 1.25 mm FLANGE BOLT 44 N·m (4.5 kgf·m, 33 lbf·ft)	12 CHANGE LEVER ASSEMBLY	21 FILLER PLUG 44 N·m (4.5 kgf·m, 33 lbf·ft)
4 8 x 1.25 mm FLANGE BOLT 27 N·m (2.8 kgf·m, 20 lbf·ft)	13 6 x 1.0 mm FLANGE BOLT 12 N·m (1.2 kgf·m, 9 lbf·ft)	22 40 x 56 x 8 mm OIL SEAL Replace.
5 TRANSMISSION HANGER A	14 DETENT BOLT 22 N·m (2.2 kgf·m, 16 lbf·ft)	23 14 mm WASHER Replace.
6 INTERLOCK BOLT 39 N·m (4.0 kgf·m, 29 lbf·ft)	15 12 mm WAHSER Replace.	24 DRAIN PLUG 39 N·m (4.0 kgf·m, 29 lbf·ft)
7 OIL GUIDE PLATE M	16 SPRING	25 32 mm SEALING CAP 34 N·m (3.5 kgf·m, 25 lbf·ft)
8 72 mm SHIM	17 STEEL BALL	
9 OIL GUTTER PLATE	18 TRANSMISSION HANGER B	

(cont'd)

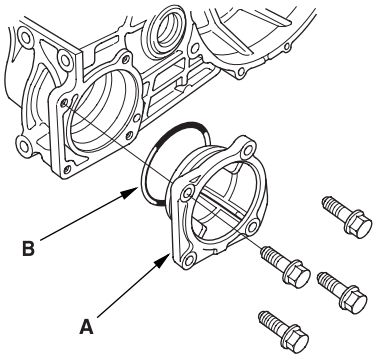
Transmission Disassembly (cont'd)

NOTE: Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from hitting the workbench.

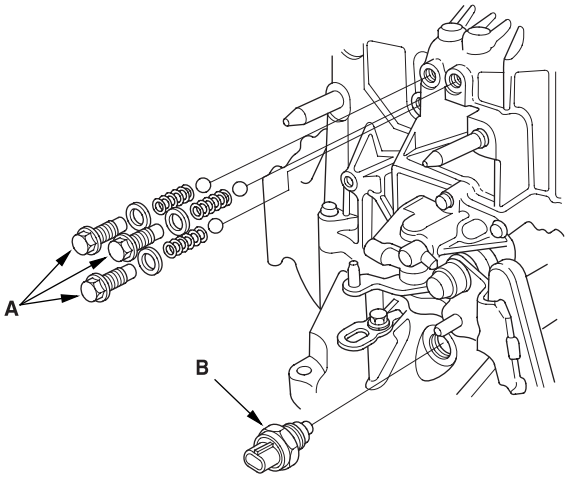
1. Remove the transfer assembly (A), O-ring (B) and 10 x 20 mm dowel pin (C). (4WD model)



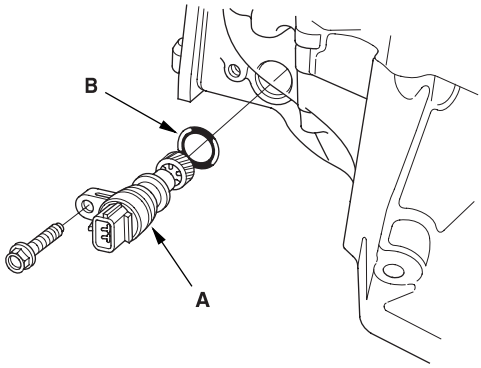
2. Remove the side cover (A) and O-ring (B). (2WD model)



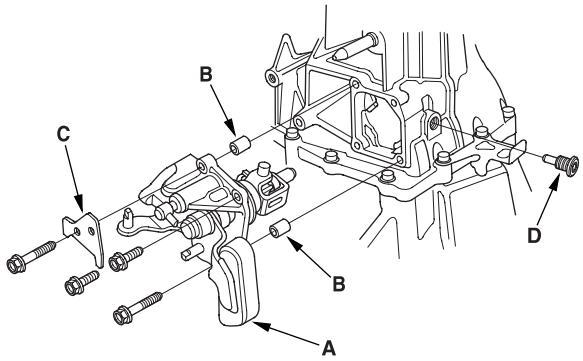
3. Remove the detent bolts (A), springs, steel balls and back-up light switch (B).



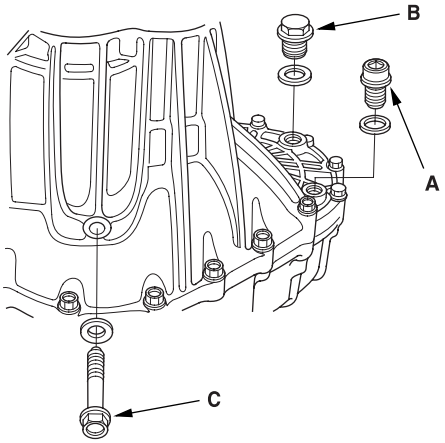
4. Remove the vehicle speed sensor (VSS)(A) and O-ring (B).



5. Remove the change lever assembly (A), 8 x 14 mm dowel pins (B), clutch line clip bracket (C) and interlock bolt (D).

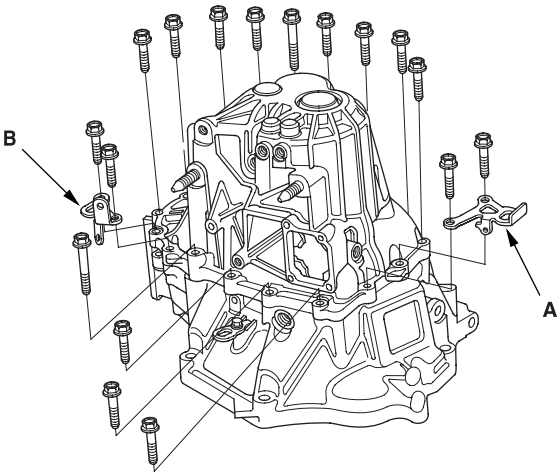


6. Remove the drain plug (A), filler plug (B) and 10 mm flange bolt (C).

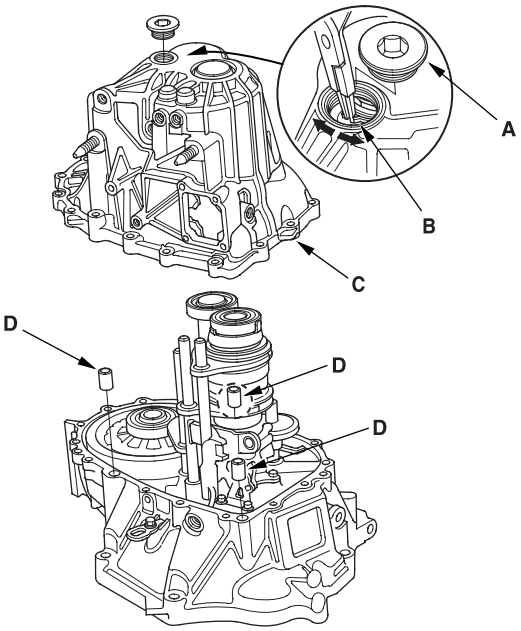


7. Remove the 8 mm flange bolts in a crisscross pattern in several steps.

8. Remove the transmission hanger A and transmisson hanger B.



9. Remove the 32 mm sealing cap (A).



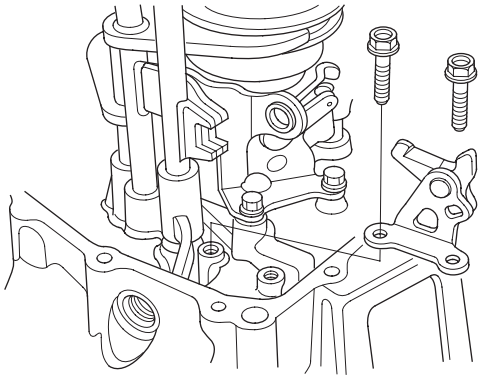
10. Expand the 72 mm snap ring (B) on the countershaft ball bearing, and remove it from the groove using a pair of snap ring pliers.

11. Remove the transmission housing (C) and 14 x 20 mm dowel pins (D).

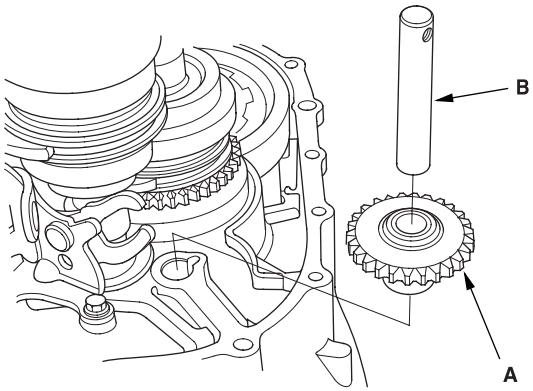
(cont'd)

Transmission Disassembly (cont'd)

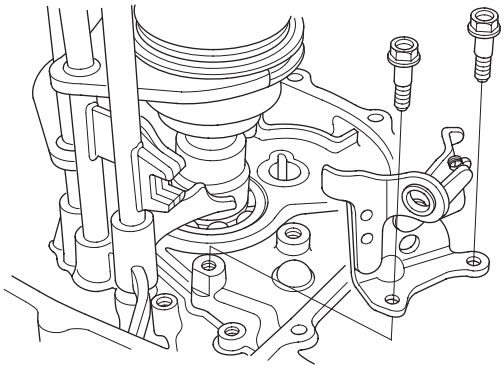
12. Remove the reverse lock cam.



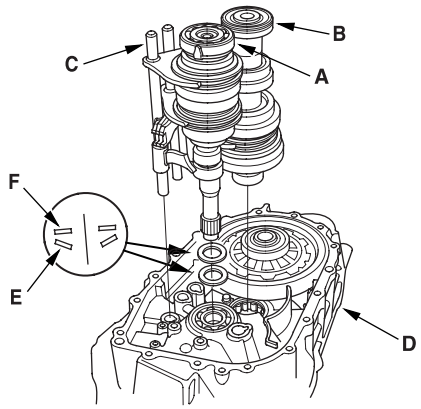
13. Remove the reverse idler gear (A) and reverse gear shaft (B).



14. Remove the reverse shift fork.

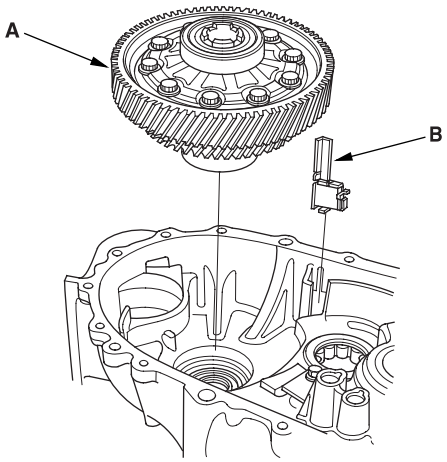


15. Apply tape to the mainshaft splines to protect the seal, then remove the mainshaft assembly (A) and countershaft assembly (B) with the shift forks (C) from the clutch housing (D).

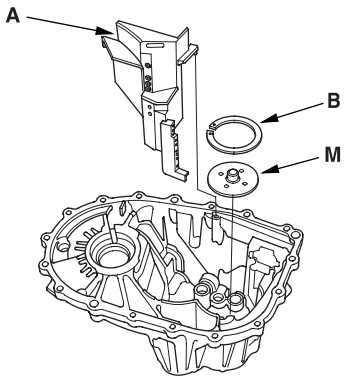


16. Remove the 28 mm spring washer (E) and 28 mm washer (F).

17. Remove the differential assembly (A) and magnet (B).



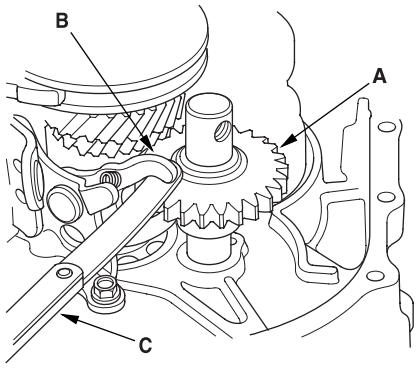
18. Remove the oil gutter plate (A), 72 mm shim (B) and oil guide plate M.



Reverse Shift Fork Clearance Inspection

1. Measure the clearance between the reverse idler gear (A) and the reverse shift fork (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

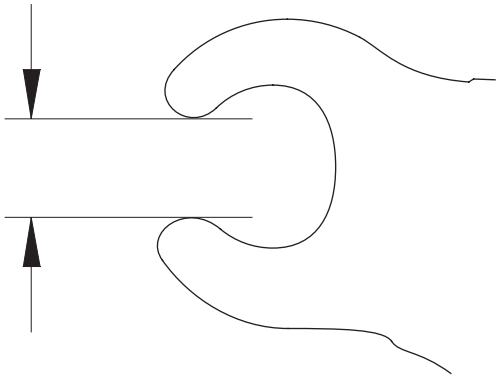
Standard: 0.20 - 0.59 mm (0.007 - 0.023 in.)
Service Limit: 1.2 mm (0.047 in.)



2. Measure the width of the reverse shift fork.

- If distance is not within the standard, replace the reverse shift fork with a new one.
- If distance is within the standard, replace the reverse gear with a new one.

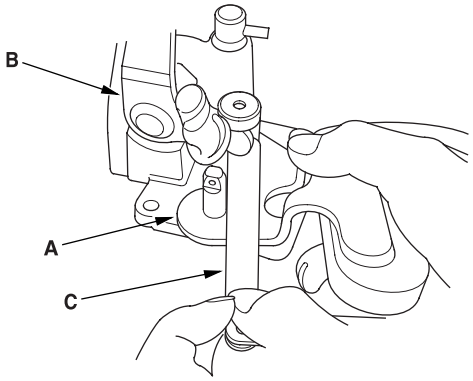
Standard: 13.4 - 13.7 mm (0.527 - 0.539 in.)



Shift Lever Clearance Inspection

1. Measure the clearance between shift lever (A) and the select lever (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

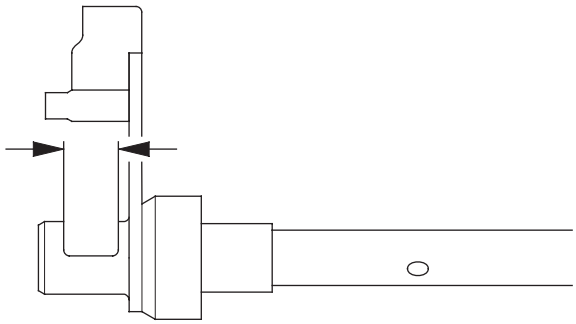
Standard: 0.05 - 0.25 mm (0.002 - 0.010 in.)
Service Limit: 0.50 mm (0.020 in.)



2. Measure the groove of the shift lever.

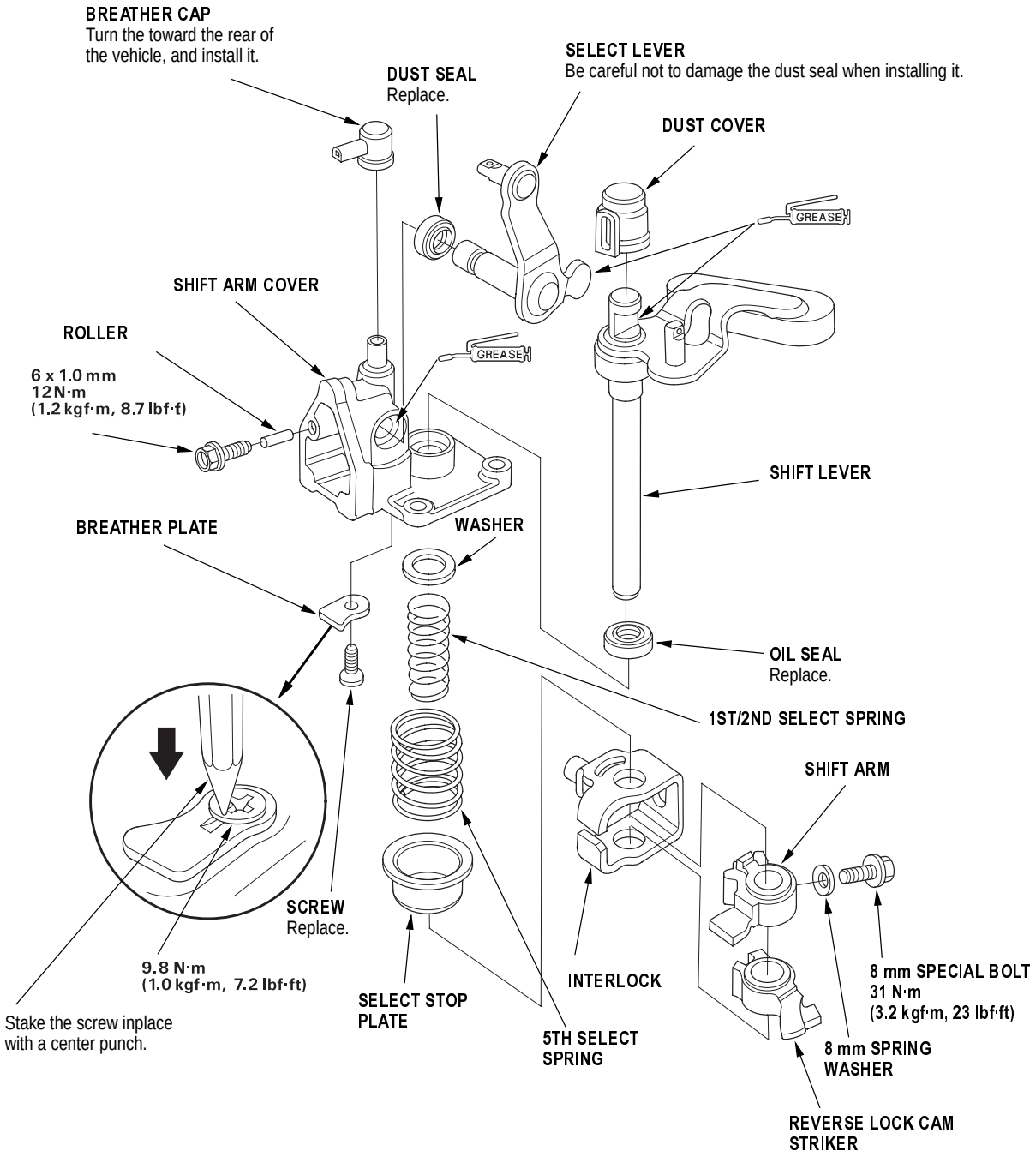
- If distance is not within the standard, replace the shift lever with a new one.
- If distance is within the standard, replace the select lever with a new one.

Standard: 15.00 - 15.10 mm (0.591 - 0.594 in.)



Change Lever Assembly Disassembly/Reassembly

Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricate to any contact surface.

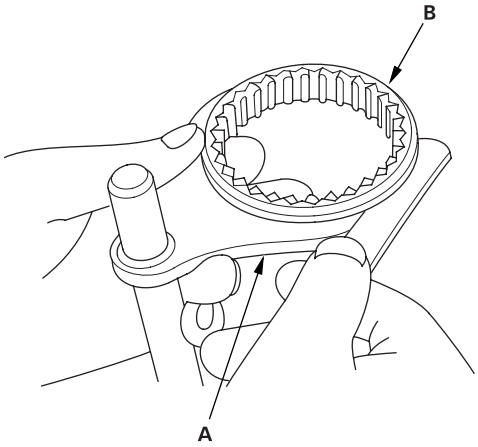


Shift Forks Clearance Inspection

NOTE: The synchro sleeve and synchro hub should be replaced as a set.

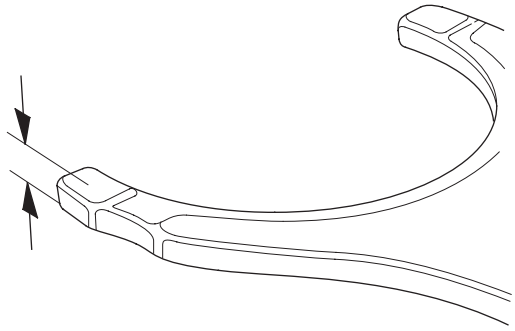
1. Measure the clearance between each shift fork (A) and its matching synchro sleeve (B). If the clearance exceeds the service limit, go to step 2.

   Standard: 0.35 - 0.65 mm (0.014 - 0.026 in.)
   Service Limit: 1.0 mm (0.039 in.)



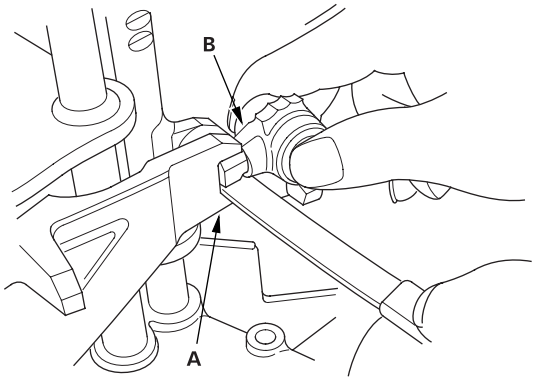
2. Measure the thickness of the shift fork fingers.
   - If the thickness of the shift fork finger is not within the standard, replace the shift fork with a new one.
   - If the thickness of the shift fork finger is within the standard, replace the synchro sleeve with a new one.

   Standard: 7.4 - 7.6 mm (0.29 - 0.30 in.)



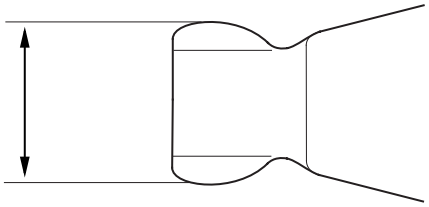
3. Measure the clearance between the shift fork (A) and the shift arm (B). If the clearance exceeds the service limit, go to step 4.

   Standard: 0.2 - .5 mm (0.008 - 0.020 in.)
   Service Limit: 0.60 mm (0.023 in.)



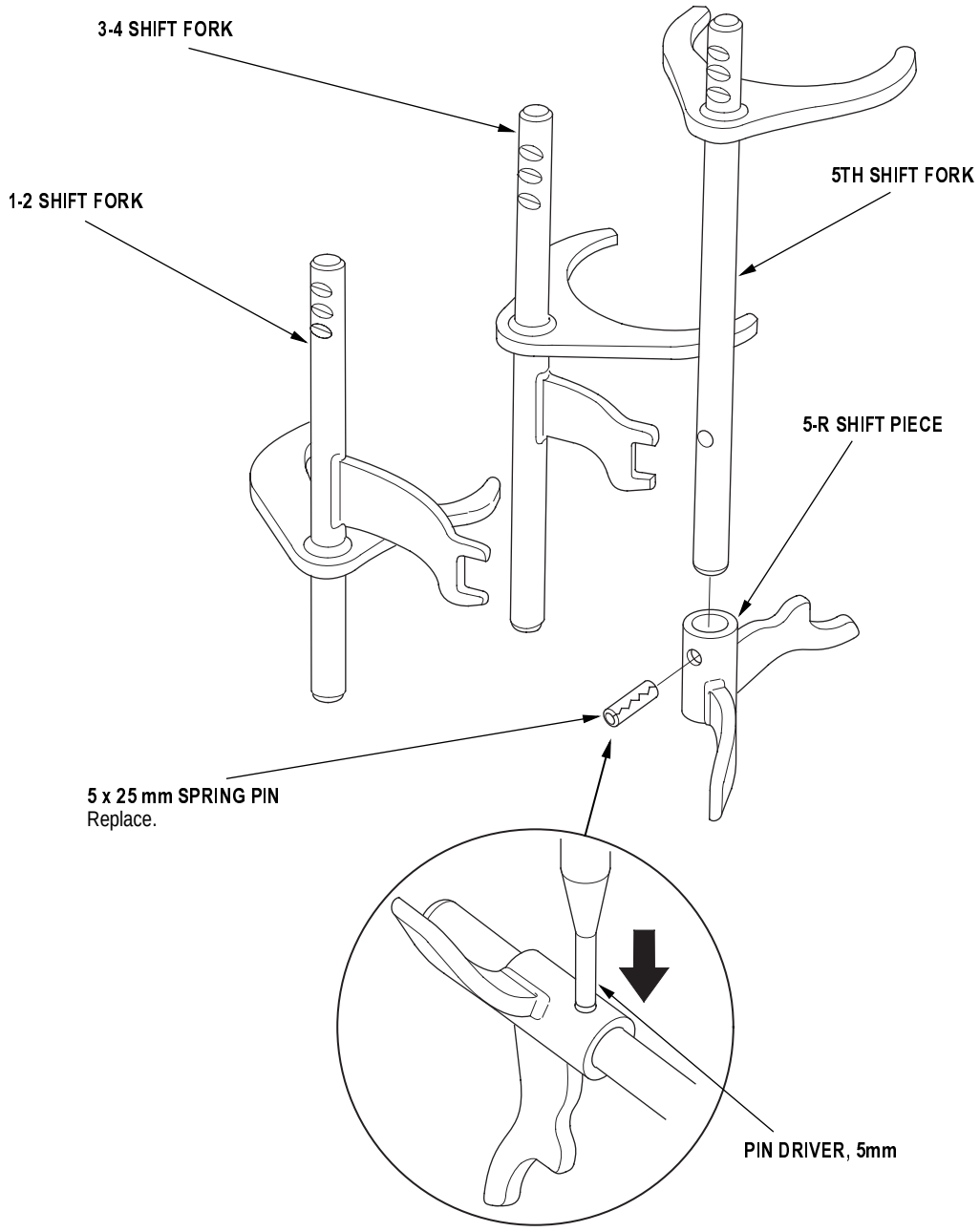
4. Measure the width of the shift arm.
   - If the width of the shift arm is not within the standard, replace the shift arm with a new one.
   - If the width of the shift arm is within the standard, replace the shift fork or shift piece with a new one.

   Standard: 16.9 - 17.0 mm (0.665 - 0.669 in.)



Shift Forks Disassembly/Reassembly

Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.

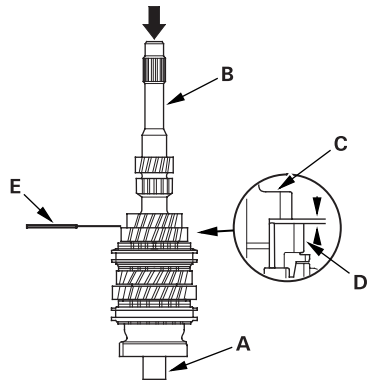


Mainshaft Assembly Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

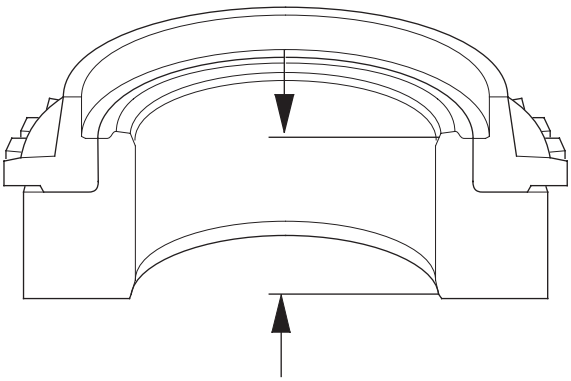
1. Support the bearing inner race with an appropriate sized socket (A), and push down on the mainshaft (B).

Standard: 0.06 - 0.16 mm (0.002 - 0.006 in.)
Service Limit: 0.25 mm (0.010 in.)



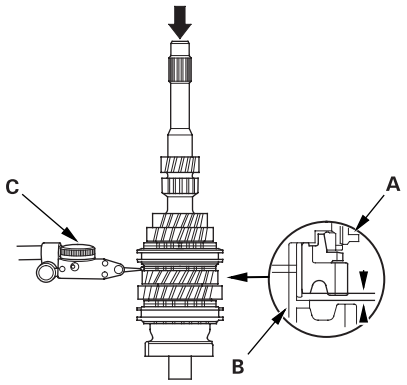
2. Measure the clearance between 2nd (C) and 3rd (D) gears with a feeler gauge (E).
   - If the clearance is more than the service limit, go to step 3.
   - If the clearance is within the service limit, go to step 4.
3. Measure the thickness of 3rd gear.
   - If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.
   - If the thickness of 3rd gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

Standard: 23.92 - 23.97 mm (0.981 - 0.944 in.)
Service Limit: 23.80 mm (0.937 in.)



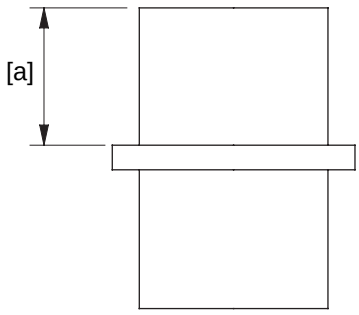
4. Measure the clearance between 4th gear (A) and the spacer collar (B) with a dial indicator (C). If the clearance is more than the service limit, go to step 5.

Standard: 0.06 - 0.16 mm (0.002 - 0.006 in.)
Service Limit: 0.25 mm (0.010 in.)



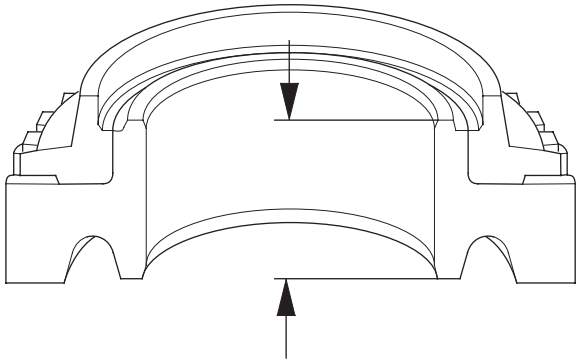
5. Measure distance [a] on the distance collar.
   - If distance a is not within the standard, replace the distance collar with a new one.
   - If distance [a] is within the standard, go to step 6.

Standard: 24.03 - 24.08 mm (0.946 - 0.947 in.)



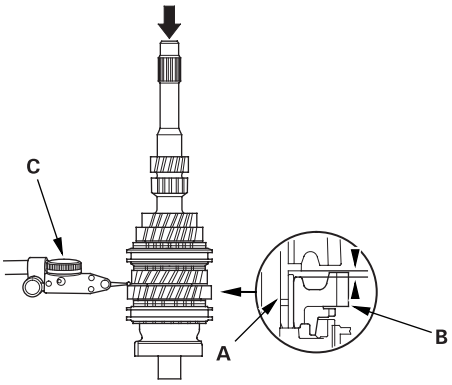
6. Measure the thickness of 4th gear.
   - If the thickness of 4th gear is less than the service limit, replace 4th gear with a new one.
   - If the thickness of 4th gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

   Standard: **23.92 - 23.97 mm (0.981 - 0.944 in.)**
   Service Limit: **23.80 mm (0.937 in.)**



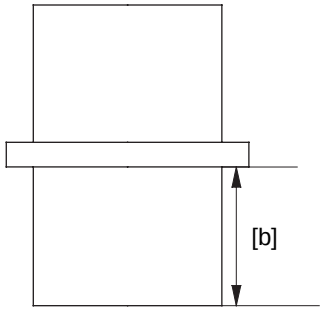
7. Measure the clearance between the distance collar (A) and 5th gear (B) with a dial indicator (C). If the clearance is more than the service limit, go to step 8.

   Standard: **0.06 - 0.16 mm (0.002 - 0.006 in.)**
   Service Limit: **0.25 mm (0.010 in.)**



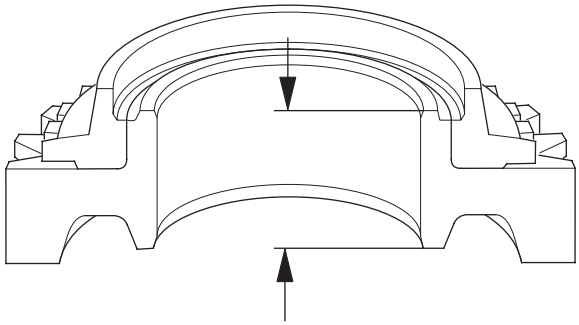
8. Measure distance b on the distance collar.
   - If distance [b] is not within the standard, replace the distance collar with a new one.
   - If distance [b] is within the standard, go to step 9.

   Standard: **24.03 - 24.08 mm (0.946 - 0.947 in.)**



9. Measure the thickness of 5th gear.
   - If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.
   - If the thickness of 5th gear is within the service limit, replace the 5th synchro hub with a new one.

   Standard: **23.92 - 23.97 mm (0.981 - 0.944 in.)**
   Service Limit: **23.80 mm (0.937 in.)**



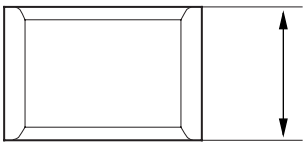
(cont'd)

Mainshaft Assembly Clearance Inspection (cont'd)

10. Measure the thickness of the MBS distance collar.

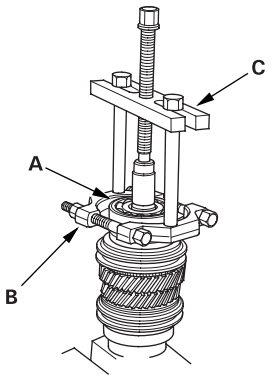
- If the thickness of MBS distance collar is not within standard, replace the MBS distance collar with a new one.

Standard: 23.95 - 24.05 mm (0.943 - 0.947 in.)

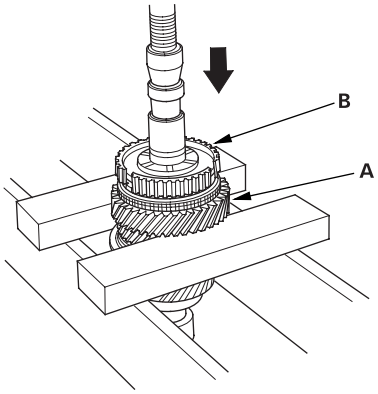


Mainshaft Disassembly

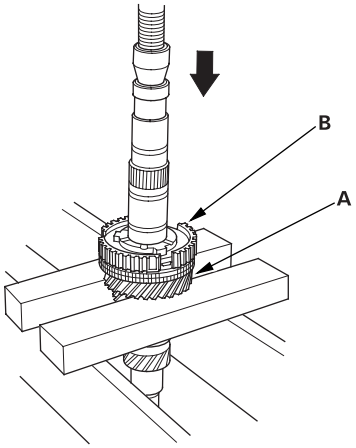
1. Remove the angular ball bearing (A) and the tapered cone ring using a commercially available bearing separator (B) and a commercially available bearing puller (C). Be sure the bearing separator is under the tapered cone ring.



2. Support 5th gear (A) on steel blocks, and press the mainshaft out of the 5th synchro hub (B). Use of a jaw-type puller can damage the gear teeth.



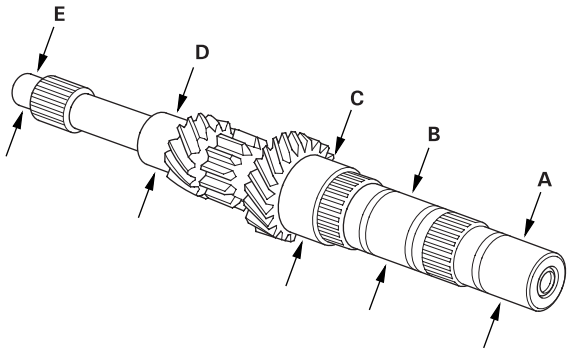
3. Support the 3rd gear (A) on steel blocks, and press the mainshaft out of the 3rd/4th synchro hub (B). Use of a jaw-type puller can damage the gear teeth.



Mainshaft Inspection

1. Inspect the gear surface and bearing surface for wear and damage, then measure the mainshaft at points A, B, and C. If any part of the mainshaft is less than the service limit, replace it with a new one.

Standard:
A Ball bearing surface (transmission housing side):
27.987 - 28.000 mm (1.1019-1.1024 in.)
B Distance collar surface:
31.984 - 32.000 mm (1.2594 - 1.2598 in.)
C Needle bearing surface:
38.984 - 39.000 mm (1.5348 - 1.5354 in.)
D Ball bearing surface (clutch housing side):
27.977 - 27.990 mm (1.1015 - 1.1020 in.)
E Bush surface:
20.80 - 20.85 mm (0.8189 - s0.8209 in.)
Service Limit:
A: 27.94 mm (1.100 in.)
B: 31.93 mm (1.257 in.)
C: 38.93 mm (1.533 in.)
D: 27.94 mm (1.100 in.)
E: 20.75 mm (0.817 in.)

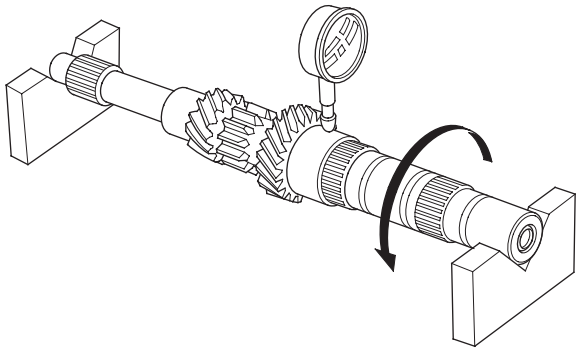


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Mainshaft Inspection (cont'd)

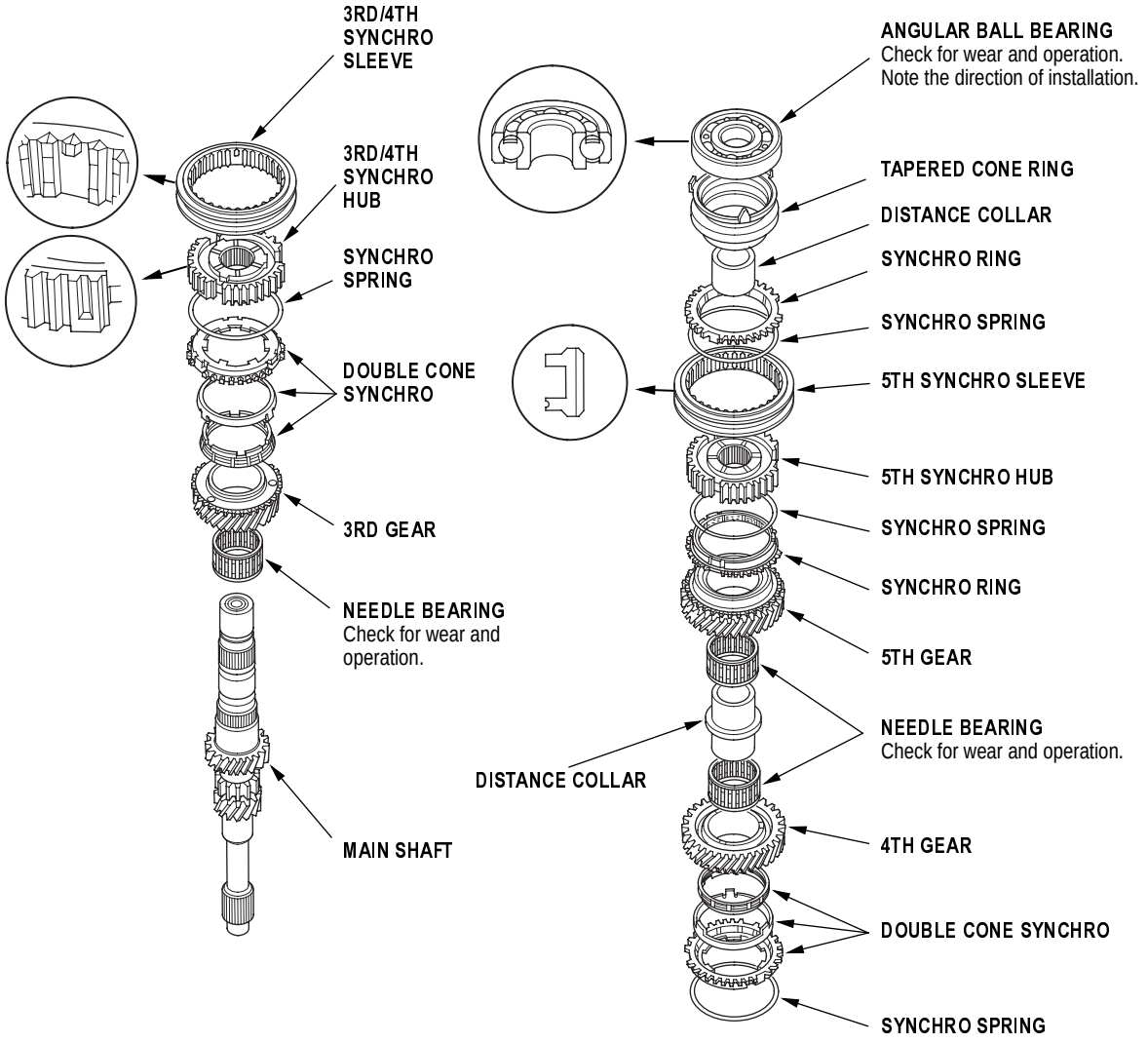
2. Inspect the runout by supporting both ends of the mainshaft. Rotate the mainshaft two complete revolutions when measuring the runout. If the runout is more than the service limit, replace the mainshaft with a new one.

Standard: 0.02 mm (0.001 in.) max.
Service Limit: 0.05 mm (0.002 in.)



Mainshaft Reassembly

Exploded View



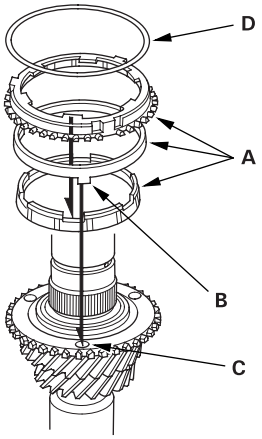
(cont'd)

Mainshaft Reassembly (cont'd)

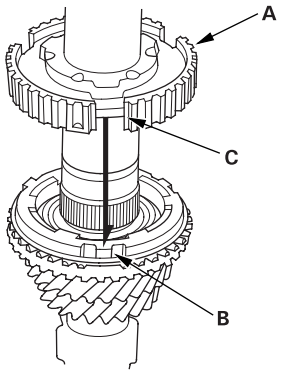
Special Tools Required
- Driver, 40 mm I.D. 07746-0030100
- Attachment, 30 mm I.D. 07746-0030300

NOTE:
- Refer to the Exploded View as needed during this procedure.

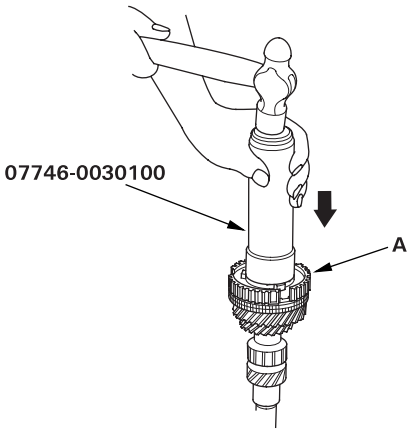
1. Clean all the parts in solvent, dry them, and apply lubricant to all contact surfaces except the 3rd/4th and 5th synchro hubs.
2. Install the needle bearing and 3rd gear on the mainshaft.
3. Install the double cone synchro assembly (A) by aligning the synchro cone fingers (B) with the holes in 3rd gear (C), then install the synchro spring (D).



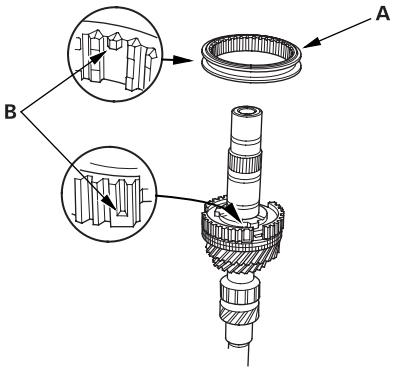
4. Install the 3rd/4th synchro hub (A) by aligning the synchro cone fingers (B) with the grooves in 3rd/4th synchro hub (C).



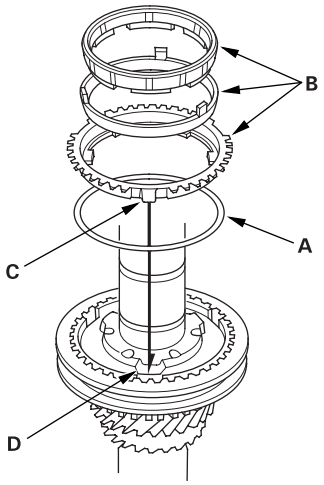
5. Install the 3rd/4th synchro hub (A) using the special tool.



6. Install the 3rd/4th synchro sleeve (A) by aligning the stops (B) with the 3rd/4th synchro sleeve and hub. After installing, check the operation of the 3rd/4th synchro hub set.

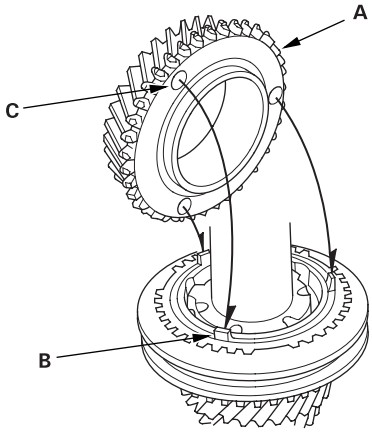


7. Install the synchro spring (A).



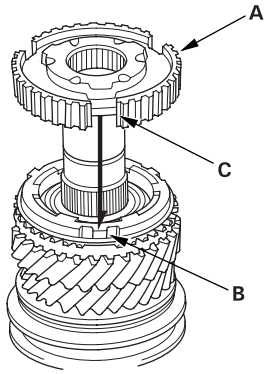
8. Install the double cone synchro assembly (B) by aligning the synchro cone fingers (C) with the grooves in 3rd/4th synchro hub (D).

9. Install the 4th gear (A) by aligning the synchro cone fingers (B) with holes in 4th gear (C).

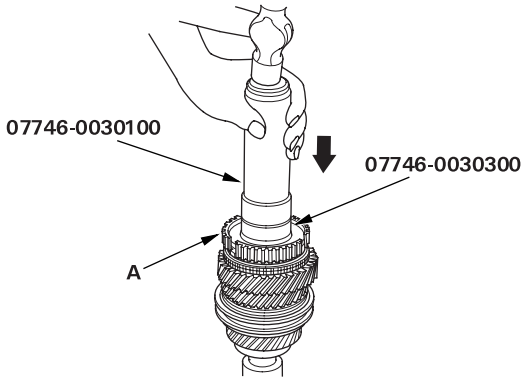


10. Install the needle bearings, distance collar, 5th gear, and 5th gear synchro spring and ring.

11. Install the 5th synchro hub (A) by aligning the synchro cone fingers (B) with the grooves in 5th/6th synchro hub (C).



12. Install the 5th synchro hub (A) using the special tools.

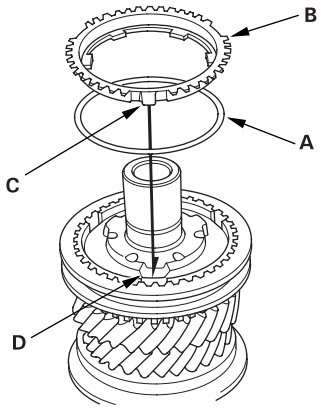


13. Install the 5th synchro sleeve.

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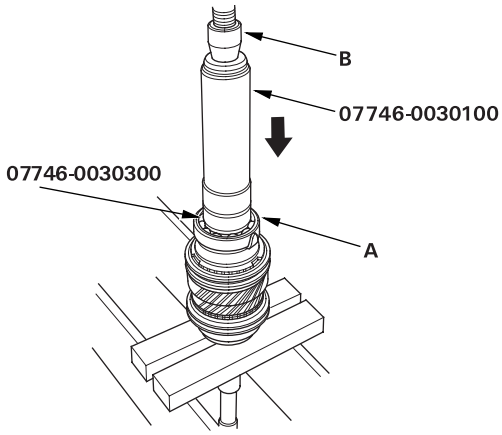
Mainshaft Reassembly (cont'd)

14. Install the synchro spring (A).



15. Install the synchro ring (B) by aligning the synchro cone fingers (C) with the grooves in 5th synchro hub (D).

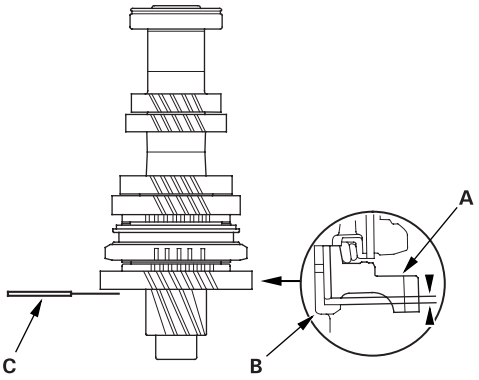
16. Install the new ball bearing (A) using the special tools and press (B).



Countershaft Assembly Clearance Inspection

1. Measure the clearance between the 1st gear (A) and the distance collar (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

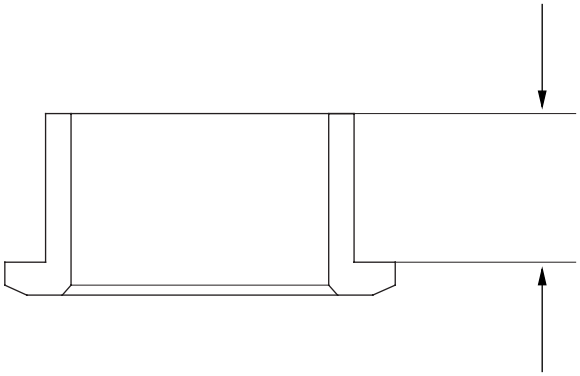
Standard: 0.06 - 0.16 mm (0.002 - 0.006 in.)
Service Limit: 0.25 mm (0.010 in.)



2. Measure the thickness of the distance collar.

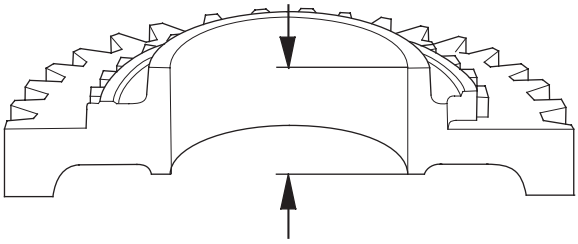
- If the thickness is not within the standard, replace the distance collar with a new one.
- If the thickness is within the standard, go to step 3.

Standard: 23.03 - 23.08 mm (0.907 - 0.909 in.)



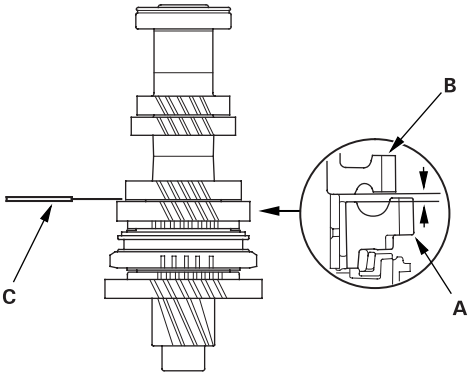
3. Measure the thickness of the 1st gear.
   - If the thickness of 1st gear is less than the service limit, replace 1st gear with a new one.
   - If the thickness of 1st gear is within the service limit, replace the 1st/2nd synchro hub with a new one.

   Standard: **22.92 - 22.97 mm (0.902 - 0.904 in.)**
   Service Limit: **22.87 mm (0.900 in.)**



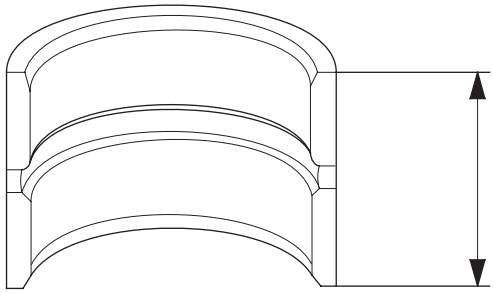
4. Measure the clearance between the 2nd gear (A) and 3rd gear (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 5.

   Standard: **0.06 - 0.16 mm (0.002 - 0.006 in.)**
   Service Limit: **0.25 mm (0.010 in.)**



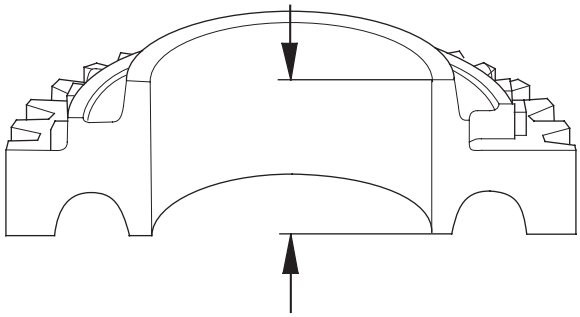
5. Measure the thickness of the distance collar.
   - If the thickness is not within the standard, replace the distance collar with a new one.
   - If the thickness is within the standard, go to step 6.

   Standard: **28.03 - 28.08 mm (1.104 - 1.106 in.)**



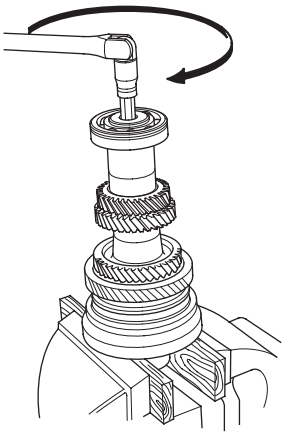
6. Measure the thickness of the 2nd gear.
   - If the thickness of 2nd gear is less than the service limit, replace 2nd gear with new one.
   - If the thickness of 1st gear is within the service limit, replace the 1st/2nd synchro hub with a new one.

   Standard: **27.92 - 27.97 mm (1.099 - 1.101 in.)**
   Service Limit: **27.87 mm (1.097 in.)**

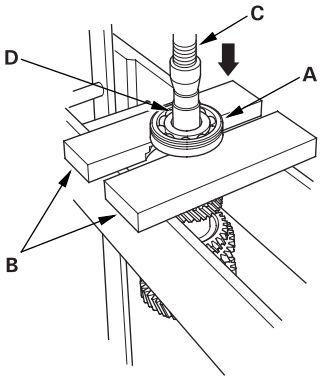


Countershaft Disassembly

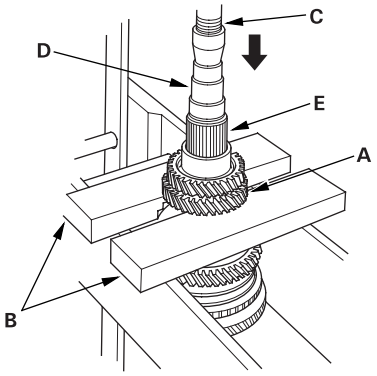
1. Securely clamp the countershaft assembly in a bench vise with wood blocks.



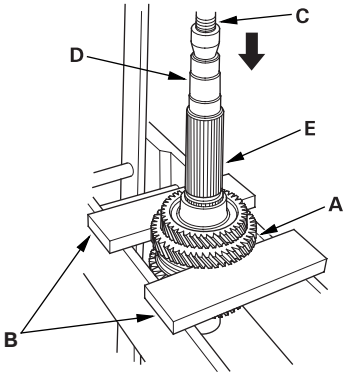
2. Remove the special bolt (left-hand threads).
3. Support ball bearing (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft out of the ball bearing.



4. Remove the 35 mm shim and distance collar.
5. Support 4th gear (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of the 5th gear.



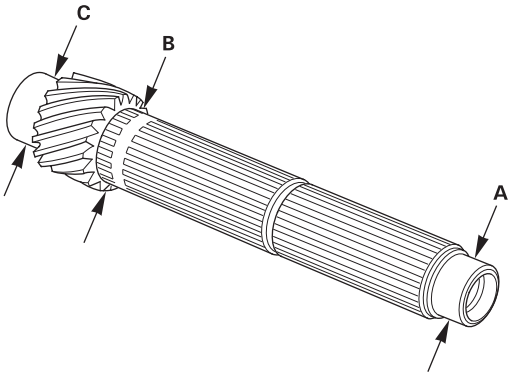
6. Support 2nd gear (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of the 3rd gear.



Countershaft Inspection

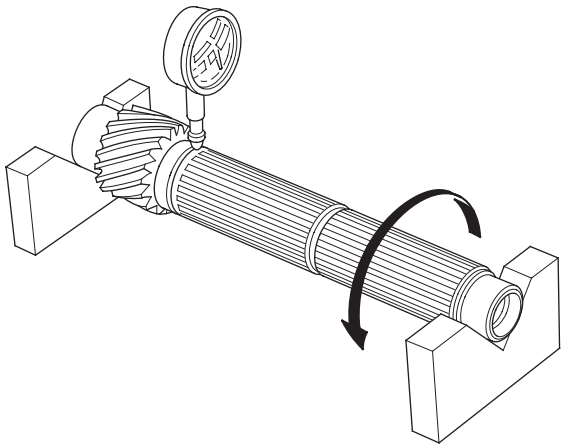
1. Inspect the gear surface and bearing surface for wear and damage, then measure the countershaft at points A, B, and C. If any part of the countershaft is less than the service limit, replace it with a new one.

   Standard:
   A Ball bearing surface (transmission housing side):
   30.020 - 30.033 mm (1.1819 - 1.1824 in.)
   B Distance collar surface:
   39.937 - 39.950 mm (1.5723 - 1.5728 in.)
   C Needle bearing surface (clutch housing side):
   35.000 - 35.015 mm (1.3780 - 1.3785 in.)
   Service Limit:
   A: 29.97 mm (1.180 in.)
   B: 39.88 mm (1.570 in.)
   C: 34.95 mm (1.376 in.)



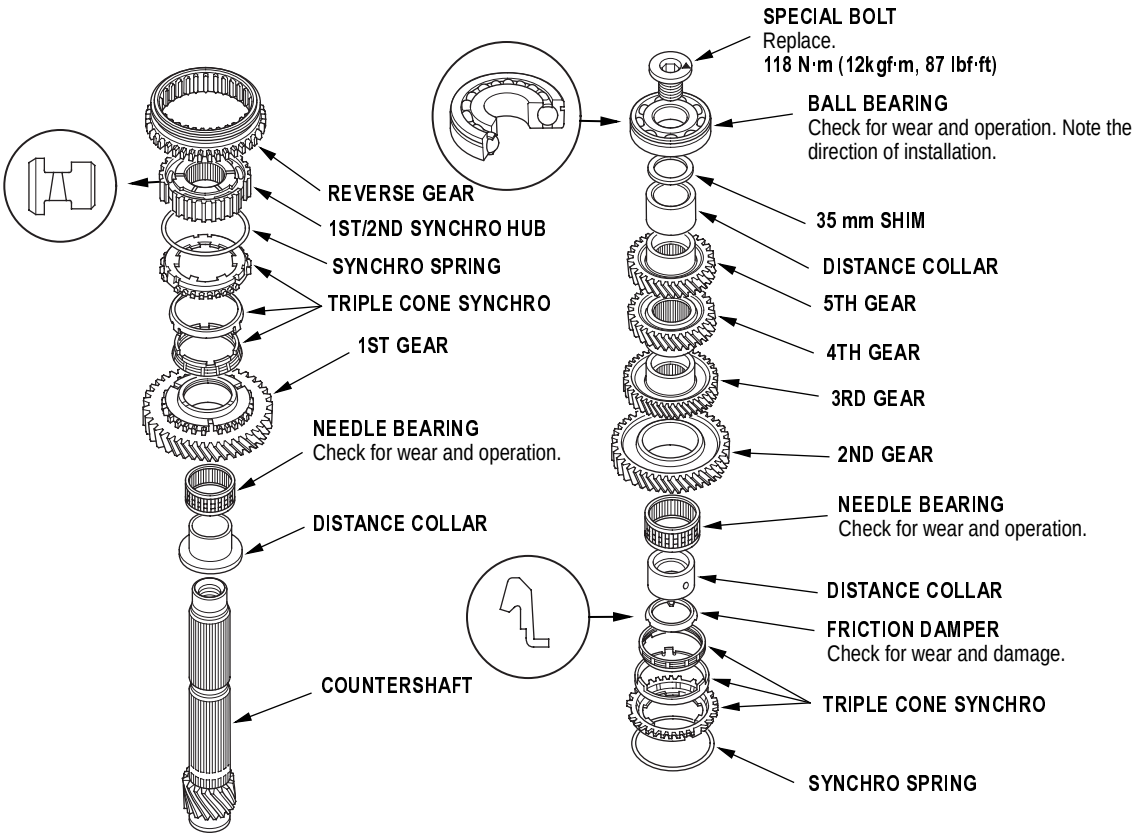
2. Inspect the runout by supporting both ends of the countershaft, Rotate the countershaft two complete revolutions when measuring the runout. If the runout exceeds the service limit, replace the countershaft with a new one.

   Standard: 0.02 mm (0.001 in.) max.
   Service Limit: 0.05 mm (0.002 in.)



Countershaft Reassembly

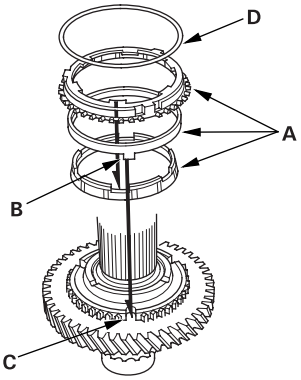
Exploded View



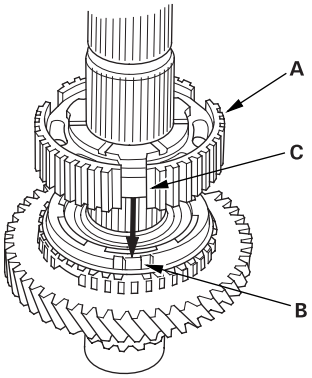
Special Tools Required
- Attachment, 42 x 47 mm 07746-0010300
- Driver, 40 mm I.D. 07746-0030100
- Attachment, 30 mm 07746-0030300
- Driver 07749-0010000

NOTE: Refer to the Exploded View as needed during this procedure.

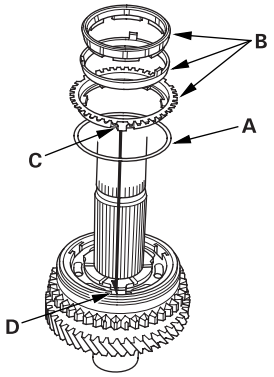
1. Clean all parts in solvent, dry them, and apply lubricant to all contact surfaces.
2. Install the distance collar and needle bearing onto the countershaft.
3. Install the triple cone synchro assembly (A) by aligning the synchro cone fingers (B) with 1st gear grooves (C), then install the synchro spring (D).



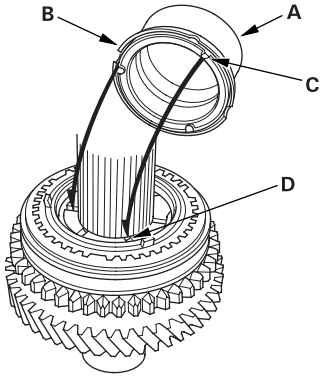
4. Install the 1st/2nd synchro hub (A) by aligning the synchro cone fingers (B) with 1st/2nd synchro hub grooves (C).



5. Install the reverse gear.
6. Install the synchro spring (A).



7. Install the triple cone synchro assembly (B) by aligning the synchro cone fingers (C) with 1st/2nd synchro hub grooves (D).
8. Install the distance collar (A) and friction damper (B) by aligning the friction damper fingers (C) with 1st/2nd synchro hub grooves (D).

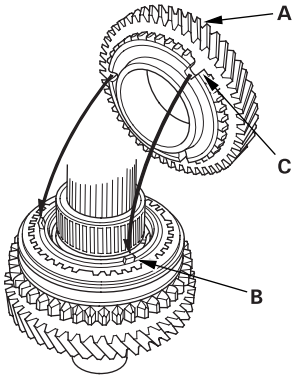


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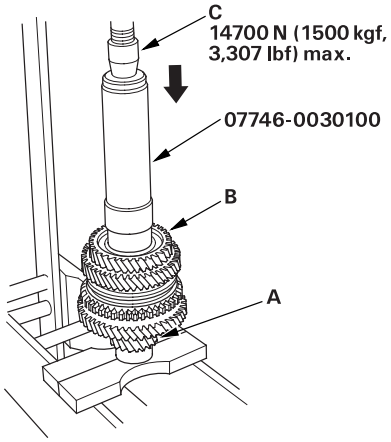
Countershaft Reassembly (cont'd)

9. Install the needle bearing.

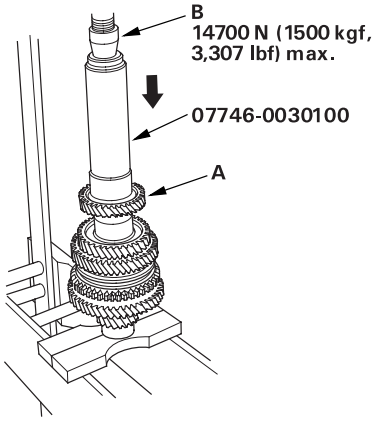
10. Install the 2nd gear (A) by aligning the synchro cone fingers (B) with 2nd gear grooves (C).



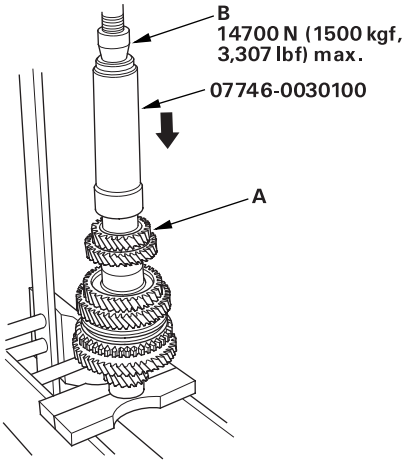
11. Support the countershaft (A) on the steel blocks, then install the 3rd gear (B) using the special tool and a press (C). Do not exceed the maximum pressure.



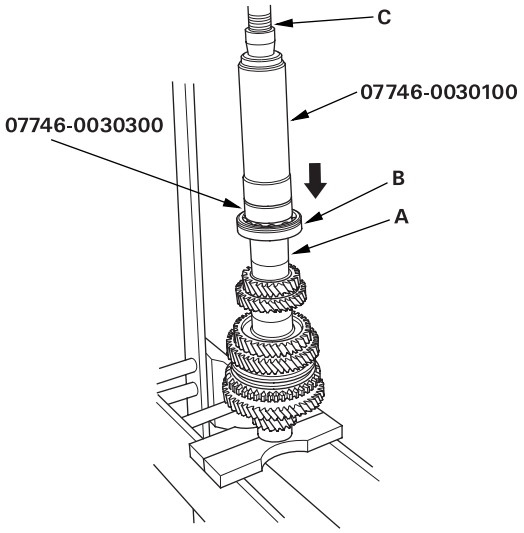
12. Install the 4th gear (A) using the special tool and a press (B). Do not exceed the maximum pressure.



13. Install the 5th gear (A) using the special tool and a press (B). Do not exceed the maximum pressure.

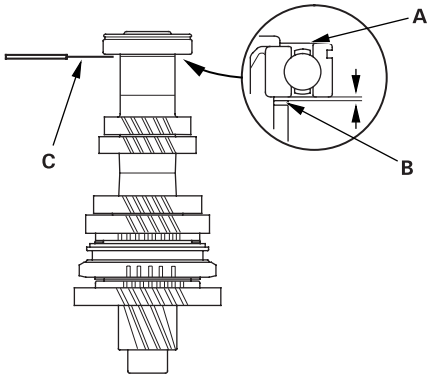


14. Install the distance collar (A), 35 mm shim, and old ball bearing (B) using a special tools and a press (C).



15. Measure the clearance between the old bearing (A) and the 35 mm shim (B) with a feeler gauge (C).

Standard: 0.04 - 0.10 mm (0.002 - 0.004 in.)



16. If the clearance is more than the standard, select a new shim from the following table. If the clearance measured in step 15 is within the standard, replace the new ball bearing.

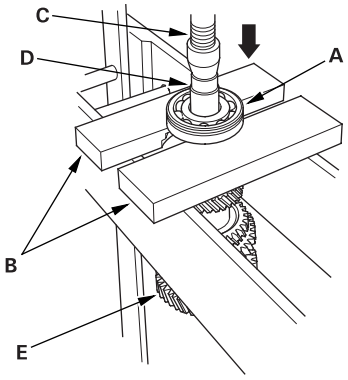
35 mm Shim

	Part Number	Thickness
A	23981-PPP-000	0.87 mm (0.0343 in.)
B	23981-PPP-900	0.91 mm (0.0358 in.)
C	23982-PPP-000	0.95 mm (0.0374 in.)
D	23982-PPP-900	0.99 mm (0.0390 in.)
E	23983-PPP-000	1.03 mm (0.0406 in.)
F	23983-PPP-900	1.07 mm (0.0421 in.)
G	23984-PPP-000	1.11 mm (0.0437 in.)
H	23984-PPP-900	1.15 mm (0.0453 in.)
J	23985-PPP-000	1.19 mm (0.0469 in.)
K	23985-PPP-900	1.23 mm (0.0484 in.)
L	23986-PPP-000	1.27 mm (0.0500 in.)
M	23986-PPP-900	1.31 mm (0.0516 in.)
N	23987-PPP-000	1.35 mm (0.0531 in.)
P	23987-PPP-900	1.39 mm (0.0547 in.)
Q	23988-PPP-000	1.43 mm (0.0563 in.)
R	23988-PPP-900	1.47 mm (0.0579 in.)
S	23989-PPP-000	1.51 mm (0.0594 in.)
T	23989-PPP-900	1.55 mm (0.0610 in.)
U	23990-PPP-000	1.59 mm (0.0626 in.)
W	23990-PPP-900	1.63 mm (0.0642 in.)
X	23991-PPP-000	1.67 mm (0.0657 in.)
Y	23991-PPP-900	1.71 mm (0.0673 in.)
Z	23992-PPP-000	1.75 mm (0.0689 in.)
AA	23992-PPP-900	1.79 mm (0.0705 in.)
AB	23993-PPP-000	1.83 mm (0.0720 in.)
AC	23993-PPP-900	1.87 mm (0.0736 in.)
AD	23994-PPP-000	1.91 mm (0.0752 in.)
AE	23994-PPP-900	1.95 mm (0.0768 in.)
AF	23995-PPP-000	1.99 mm (0.0783 in.)

(cont'd)

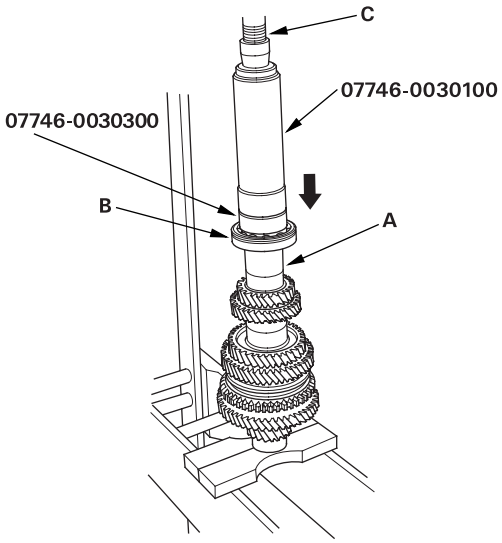
Countershaft Reassembly (cont'd)

17. Support ball bearing (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of the ball bearing.

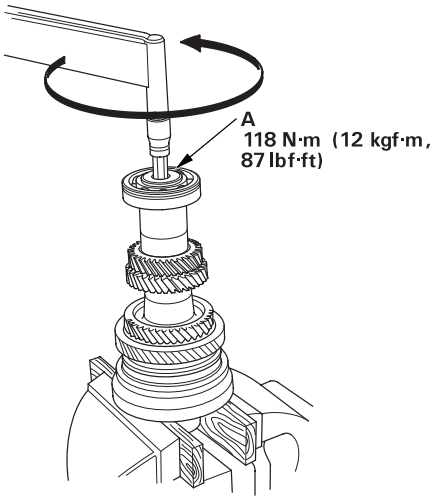


18. Replace the 35 mm shim selected in step 16, then recheck the clearance.

19. Install the distance collar (A) 35 mm shim, and new ball bearing (B) using a special tools and a press (C).



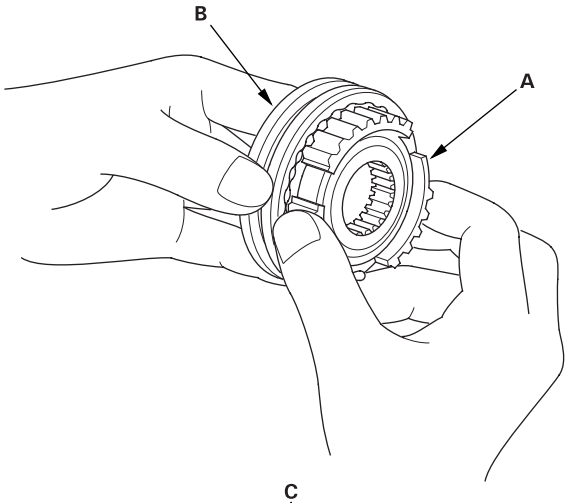
20. Tighten the new special bolt (A) (left-hand threads).

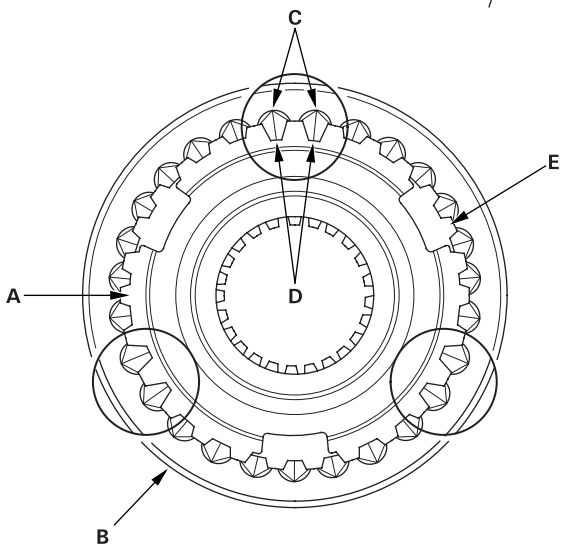


Synchro Sleeve and Hub Inspection and Reassembly

1. Inspect gear teeth on all synchro hubs and synchro sleeves for rounded off corners, which indicate wear.
2. Install each synchro hub (A) in its mating synchro sleeve (B), and check for freedom of movement. Be sure to match the 3 sets of longer teeth (C) (120 degrees apart) on the synchro sleeve with the 3 sets of deeper grooves (D) in the synchro hub. Do not install the synchro sleeve with its longer teeth in the 1st/2nd synchro hub slots (E) because it will damage the spring ring.

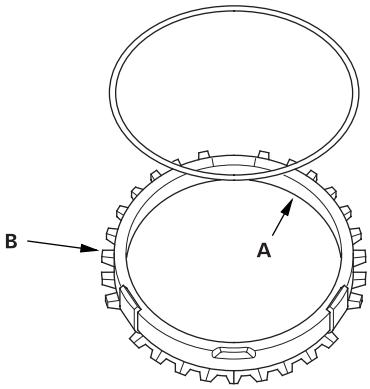
   NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.





Synchro Ring and Gear Inspection

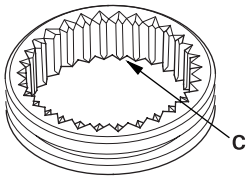
1. Inspect the inside of each synchro ring (A) for wear. Inspect the teeth (B) on each synchro ring for wear (rounded off).



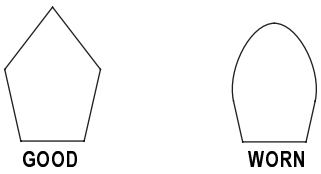
Example of synchro ring teeth



2. Inspect the teeth (C) on each synchro sleeve and matching teeth on each gear for wear (rounded off).



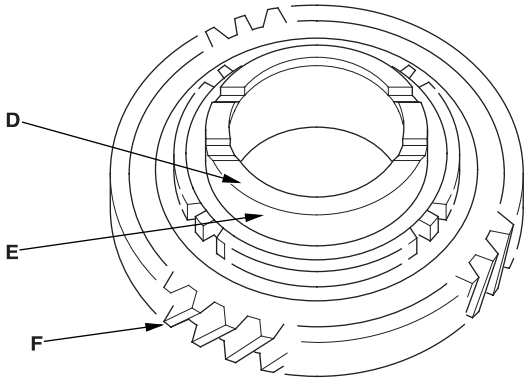
Example of synchro sleeve teeth and gear teeth



(cont'd)

Synchro Ring and Gear Inspection (cont'd)

3. Inspect the thrust surface (D) on each gear hub for wear.



4. Inspect the cone surface (E) on each gear hub for wear and roughness.

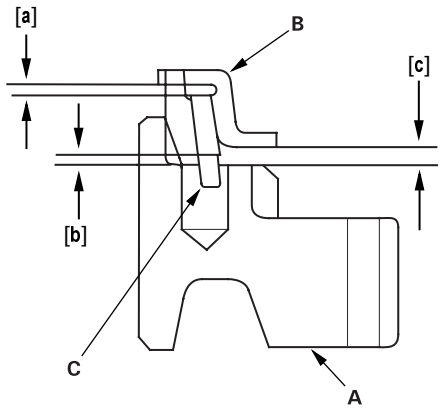
5. Inspect the teeth on all gears (F) for uneven wear, scoring, galling, and cracks.

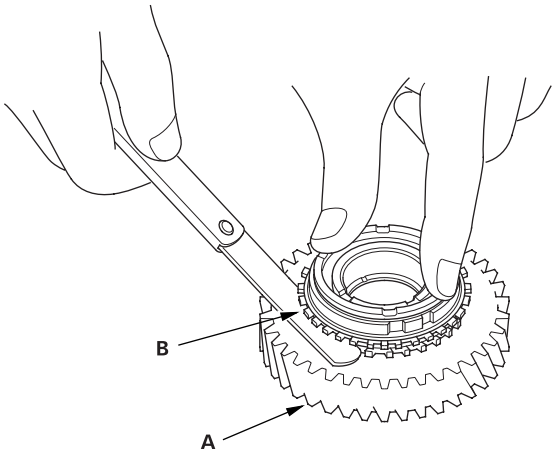
6. Coat the cone surface of each gear (E) with oil, and place its synchro ring on it. Rotate the synchro ring, making sure that it does not slip.

7. Measure the clearance between each gear (A) and its synchro ring (B) all the way around. Hold the synchro ring against the gear evenly while measuring the clearance. If the clearance is less than the service limit, replace the synchro ring and gear.

Synchro Ring-to-Gear Clearance
Standard: 0.70 - 1.49 mm (0.028 - 0.059 in.)
Service Limit: 0.4 mm (0.016 in.)

Double cone synchro and triple cone synchro-to-Gear Clearance
Standard:
[a]: Outer Synchro Ring (B) to Synchro Cone (C) 0.70 - 1.19 mm (0.028 - 0.047 in.)
[b]: Synchro Cone (C) to Gear (A) 0.50 - 1.04 mm (0.020 - 0.041 in.)
[c]: Outer Synchro Ring (B) to Gear (A) 0.95 - 1.68 mm (0.037 - 0.066 in.)
Service Limit:
[a]: 0.3 mm (0.012 in.)
[b]: 0.3 mm (0.012 in.)
[c]: 0.6 mm (0.024 in.)





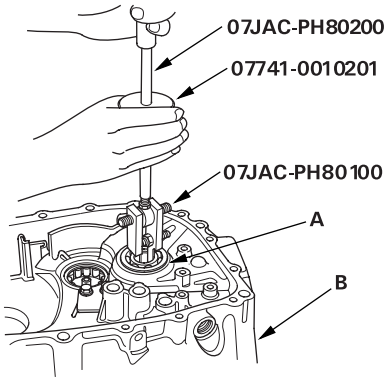
Mainshaft Bearing and Oil Seal Replacement

Special Tools Required

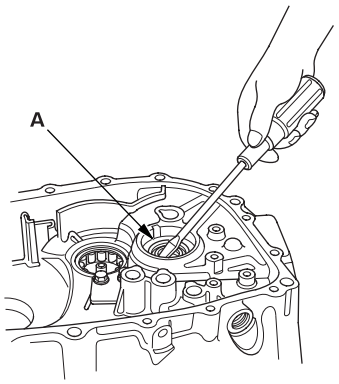
- Adjustable bearing puller, 25 - 40 mm 07JAC-PH80100
- Bearing remover shaft 07JAC-PH80200
- Oil seal driver 07JAD-PL90100
- Slide hammer 07741-0010201
- Driver 07749-0010000
- Attachment, 42 x 47 mm 07746-0010300

1. Remove the differencial assembly.

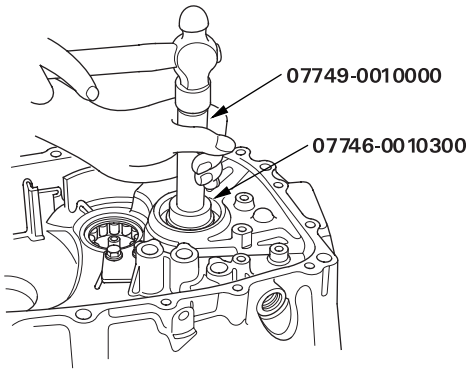
2. Remove the ball bearing (A) from the clutch housing (B) using the special tools.



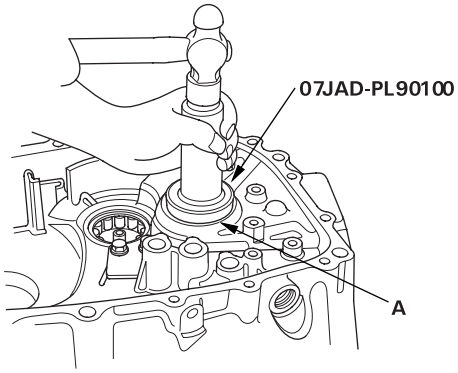
3. Remove the oil seal (A) from the clutch side.



4. Drive the new oil seal in from the transmission side using the special tools.



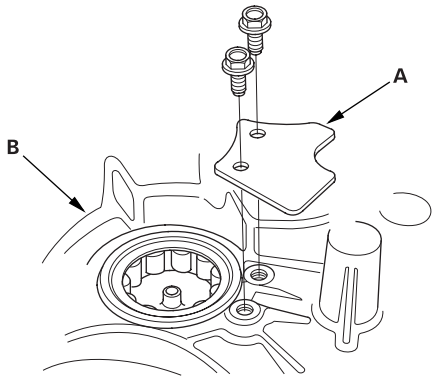
5. Drive the new ball bearing (A) in from the transmission side using the special tools.



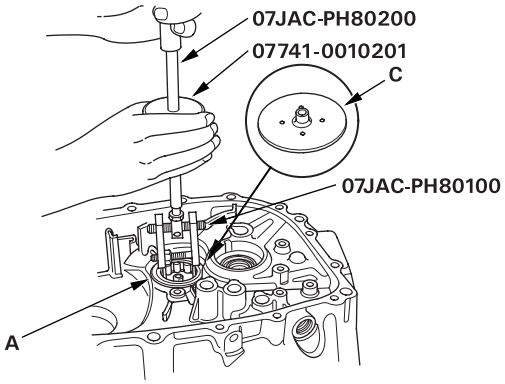
Countershaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25 - 40 mm 07JAC-PH80100
- Bearing remover shaft 07JAC-PH80200
- Slide hammer 07741-0010201
- Oil seal driver 07JAD-PL90100

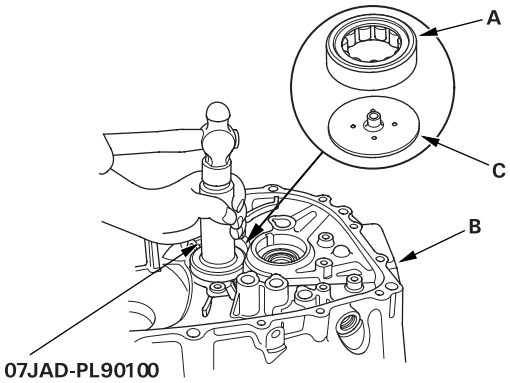
1. Remove the bearing set plate (A) from the clutch housing (B).



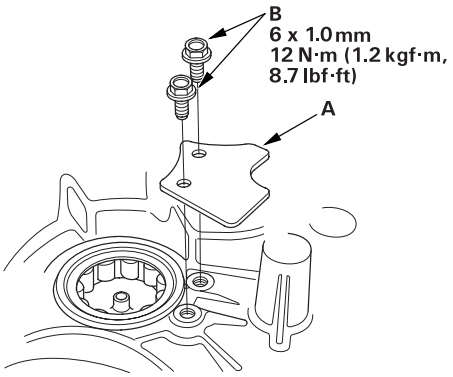
2. Remove the needle bearing (A) using the special tools, then remove the oil guide plate C.



3. Position the oil guide plate C and new needle bearing (A) in the bore of the clutch housing (B).



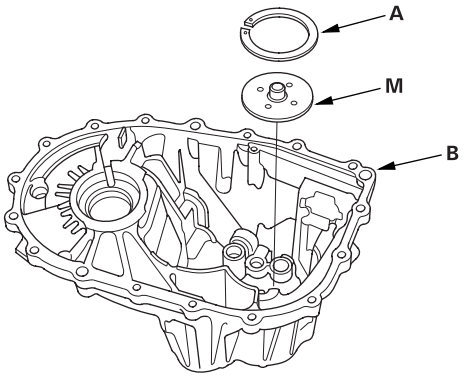
4. Install the needle bearing using the special tools.
5. Install the bearing set plate (A) with bolts (B).



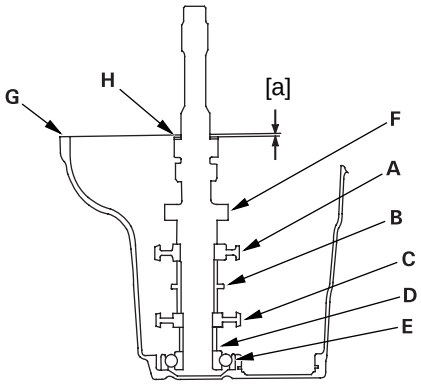
Mainshaft Thrust Clearance Adjustment

Special Tools Required
- Mainshaft base 07GAJ-PG20130
- Mainshaft holder 07GAJ-PG20110

1. Remove the 72 mm shim (A) and oil guide plate M from the transmission housing (B).



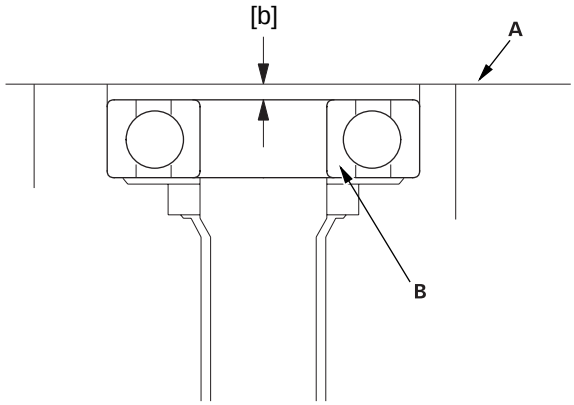
2. Install the 3rd/4th synchro hub (A), the distance collar (B), the 5th synchro hub (C), distance collar (D), and ball bearing (E) on the mainshaft (F), then install the assembled mainshaft in the transmission housing (G).



3. Install the washer (H) on the mainshaft.

4. Measure distance [a] between the end of the transmission housing and washer with a straight edge and vernier caliper. Measure at three locations and average the reading.

5. Measure distance [b] between the end of the clutch housing (A) and bearing inner race (B) with a straight edge and depth gauge. Measure at three locations and average the readings.



Shim Selection Formula:

6. Select the proper 72 mm shim from the chart. Follow the example below, and use the measurements you made in steps 4 and 5:

(Basic Formula)
[a] + [b] - (0.8 + 0.11) = shim thickness (maximum)
[a] + [b] - (0.8 + 0.17) = shim thickness (minimum)

- Add distance [b] (step 5) to distance [a] (step 4).
- 0.8 mm (0.031 in): Spring washer, a dimension in the installation.
- 0.11 mm (0.004 in): Minimum thrust clearance.
- 0.17 mm (0.007 in): Maximum thrust clearance.

(For example)
2.32 + 0.15 - (0.8 + 0.11) = 1.56 mm (0.061 in.)
2.32 + 0.15 - (0.8 + 0.17) = 1.50 mm (0.059 in.)

Take the middle value of the minimum value and the maximum value, and select shim of 1.53 mm (0.060 in.).

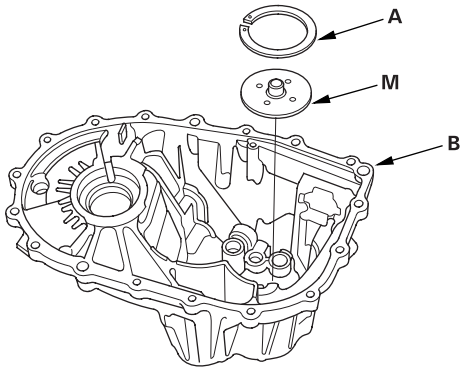
(cont'd)

Mainshaft Thrust Clearance Adjustment (cont'd)

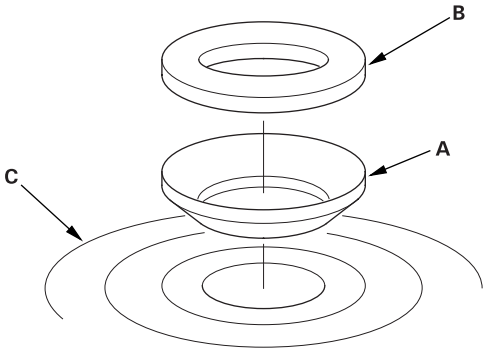
72 mm Shim

	Part Number	Thickness
A	23931-P21-000	0.60 mm (0.0236 in.)
B	23932-P21-000	0.63 mm (0.0248 in.)
C	23933-P21-000	0.66 mm (0.0260 in.)
D	23934-P21-000	0.69 mm (0.0271 in.)
E	23935-P21-000	0.72 mm (0.0283 in.)
F	23936-P21-000	0.75 mm (0.0295 in.)
G	23937-P21-000	0.78 mm (0.0307 in.)
H	23938-P21-000	0.81 mm (0.0319 in.)
I	23939-P21-000	0.84 mm (0.0331 in.)
J	23940-P21-000	0.87 mm (0.0343 in.)
K	23941-P21-000	0.90 mm (0.0354 in.)
L	23942-P21-000	0.93 mm (0.0366 in.)
M	23943-P21-000	0.96 mm (0.0378 in.)
N	23944-P21-000	0.99 mm (0.0390 in.)
O	23945-P21-000	1.02 mm (0.0402 in.)
P	23946-P21-000	1.05 mm (0.0413 in.)
Q	23947-P21-000	1.08 mm (0.0425 in.)
R	23948-P21-000	1.11 mm (0.0437 in.)
S	23949-P21-000	1.14 mm (0.0449 in.)
T	23950-P21-000	1.17 mm (0.0461 in.)
U	23951-P21-000	1.20 mm (0.0472 in.)
V	23952-P21-000	1.23 mm (0.0484 in.)
W	23953-P21-000	1.26 mm (0.0496 in.)
X	23954-P21-000	1.29 mm (0.0508 in.)
Y	23955-P21-000	1.32 mm (0.0520 in.)
Z	23956-P21-000	1.35 mm (0.0531 in.)
AA	23957-P21-000	1.38 mm (0.0543 in.)
AB	23958-P21-000	1.41 mm (0.0555 in.)
AC	23959-P21-000	1.44 mm (0.0567 in.)
AD	23960-P21-000	1.47 mm (0.0579 in.)
AE	23961-P21-000	1.50 mm (0.0591 in.)
AF	23962-P21-000	1.53 mm (0.0602 in.)
AG	23963-P21-000	1.56 mm (0.0614 in.)
AH	23964-P21-000	1.59 mm (0.0626 in.)
AI	23965-P21-000	1.62 mm (0.0638 in.)
AJ	23966-P21-000	1.65 mm (0.0650 in.)
AK	23967-P21-000	1.68 mm (0.0661 in.)
AL	23968-P21-000	1.71 mm (0.0673 in.)
AM	23969-P21-000	1.74 mm (0.0685 in.)
AN	23970-P21-000	1.77 mm (0.0697 in.)
AO	23971-P21-000	1.80 mm (0.0709 in.)

7. Install the 72 mm shim (A) selected and oil guide plate M in the transmission housing (B).



8. Throughly clean the spring washer (A) and washer (B) before installing them on the clutch housing side ball bearing (C). Note the installation direction of the spring washer.



9. Install the mainshaft in the clutch housing.

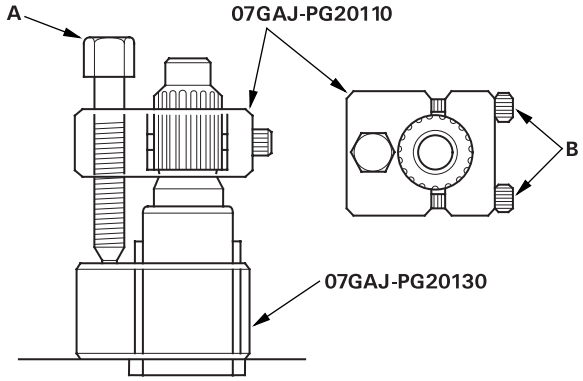
10. Place the transmission housing over the mainshaft and onto the clutch housing.

11. Tighten the clutch and transmission housings with several 8 mm bolts.

NOTE: It is not necessary to use sealing agent between the housings.

12. Tap the mainshaft with a plastic hammer.

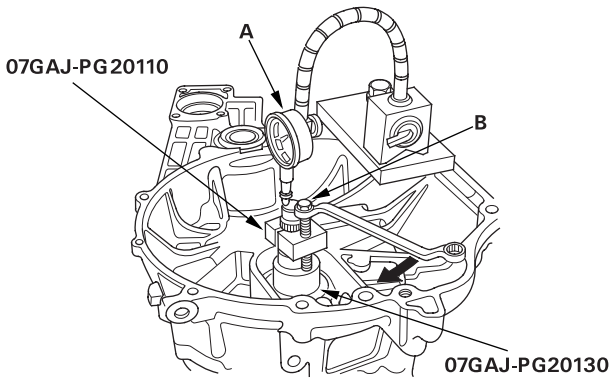
13. Attach the special tool to the mainshaft as follows:
- Back-out the mainshaft holder bolt (A) and loosen the two hex bolts (B).
- Fit the holder over the mainshaft so its lip is towards the transmission.
- Align the mainshaft holder's lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.



14. Seat the mainshaft fully by tapping its end with a plastic hammer.

15. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.

16. Zero a dial gauge (A) on the end of the mainshaft.



17. Turn the mainshaft holder bolt (B) clockwise; stop turning when the dial gauge (A) has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft end play.

Do not turn the mainshaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving, this may damage the transmission.

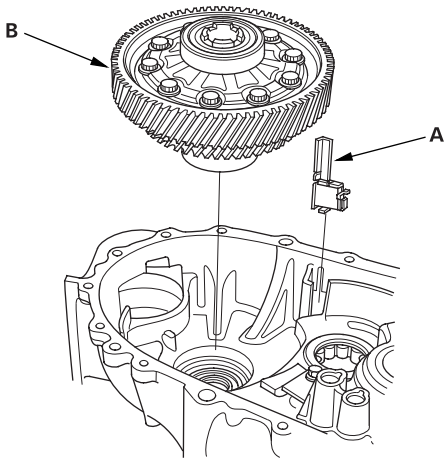
18. If the reading is within the standard, the clearance is correct. If the reading is not within the standard, recheck the shim thickness.

Standard: 0.11 - 0.17 mm (0.004 - 0.007 in.)

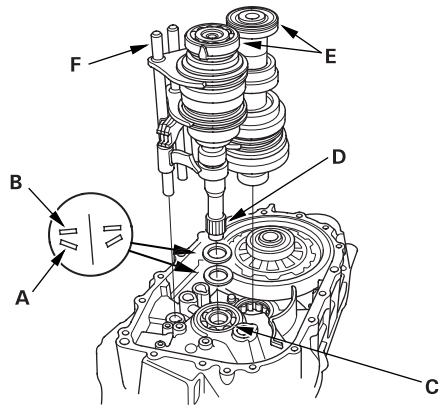
Transmission Reassembly

NOTE: Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact surfaces.

1. Install the magnet (A) and differential assembly (B).

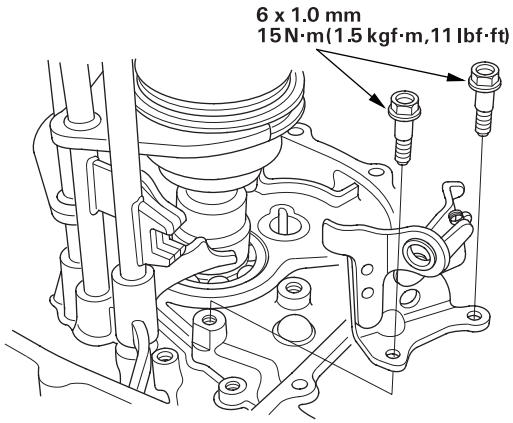


2. Install the 28 mm spring washer (A) and 28 mm washer (B) over the ball bearing (C). Note the installation direction of the spring washer (A).

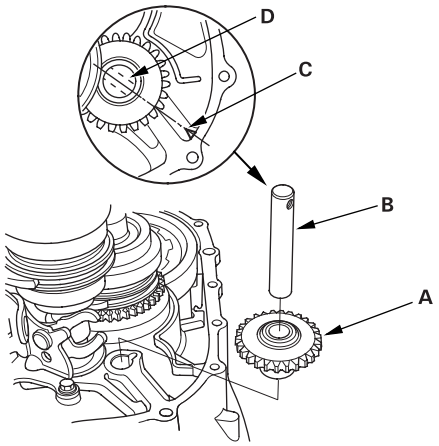


3. Apply vinyl tape the mainshaft splines (D) to protect the seal. Install the mainshaft and countershaft (E) into the shift forks (F), and install them as an assembly.

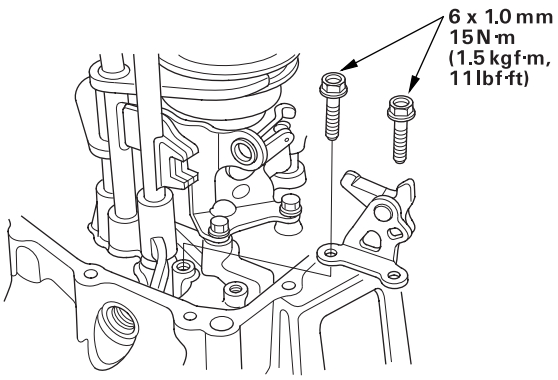
4. Install the reverse shift fork.



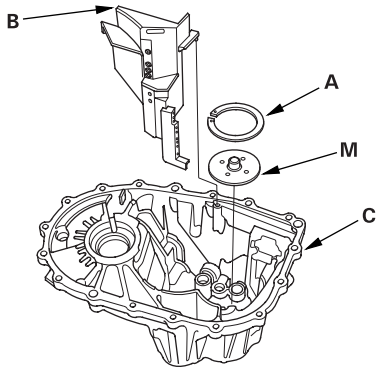
5. Install the reverse idler gear (A) and reverse gear shaft (B) by aligning the mark (C) with reverse gear shaft hole (D).



6. Install the reverse lock cam.

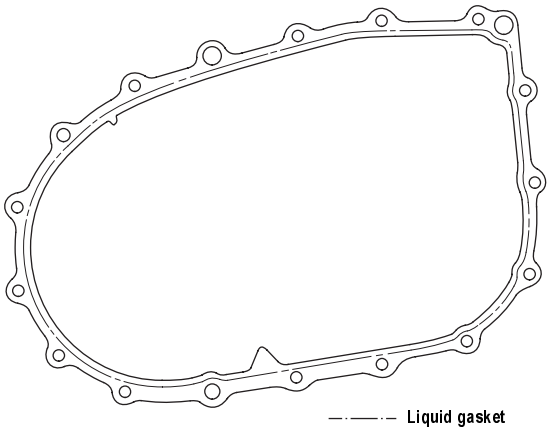


7. Select the proper size 72 mm shim (A) according to the measurements made during the Mainshaft Thrust Clearance Adjustment (see page 13-47). Install the oil gutter plate (B), oil guide plate M, and 72 mm shim into the transmission housing (C).



8. Remove the dirt and oil from the tramsmission housing sealing surface. Apply liquid gasket (P/N 08C70-K0234M) to the sealing surface. Be sure to seal the entire circumference of the bolt holes to prevent oil leakage.

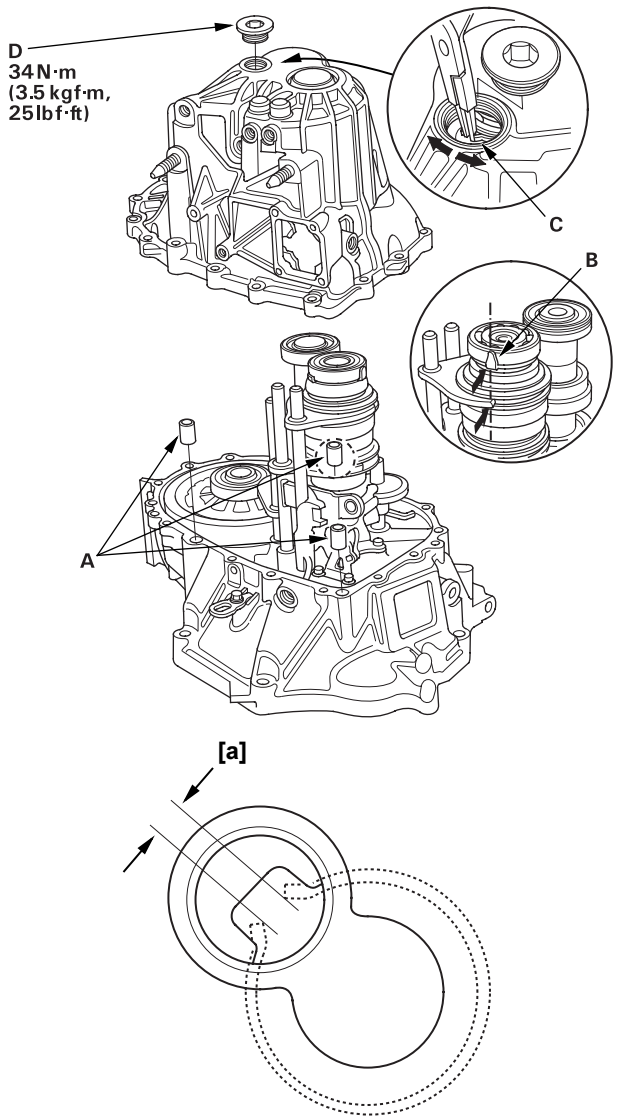
   NOTE: If 5 minutes have passed after applying liquid gasket, reapply it and assemble the housings. Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.



(cont'd)

Transmission Reassembly (cont'd)

9. Install the 14 x 20 mm dowel pins (A).



10. Set the tapered cone ring (B) as shown. Place the transmission housing over the clutch housing, being careful to line up the shafts.

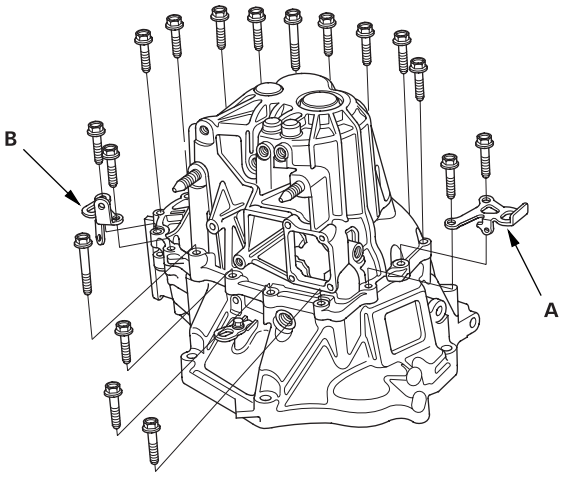
11. Lower the transmission housing the rest of the way as you expand the 72 mm snap ring (C). Release the snap ring so it seats in the groove of the countershaft bearing.

12. Check that the 52 mm snap ring is securely seated in the groove of the countershaft bearing.

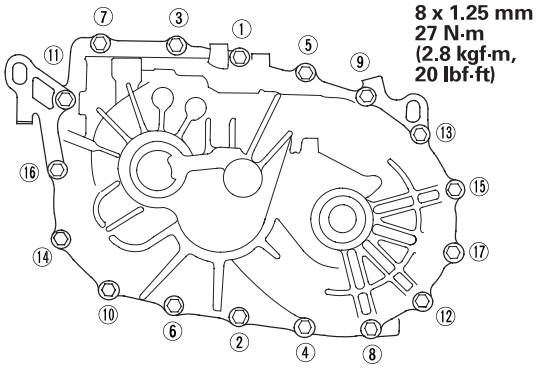
Dimension [a] as installed: 3.3 - 6.0 mm (0.13 - 0.24 in.)

13. Apply liquid gasket (P/N 08C70-K023M) to the threads of the 32 mm sealing cap (D), and install it on the transmission housing.

14. Install the transmission hangers A, B, and the 8 mm flange bolts finger-tight.

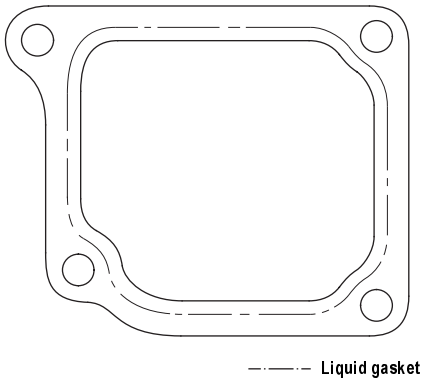


15. Tighten the 8 mm flange bolts in a crisscross pattern in several steps.

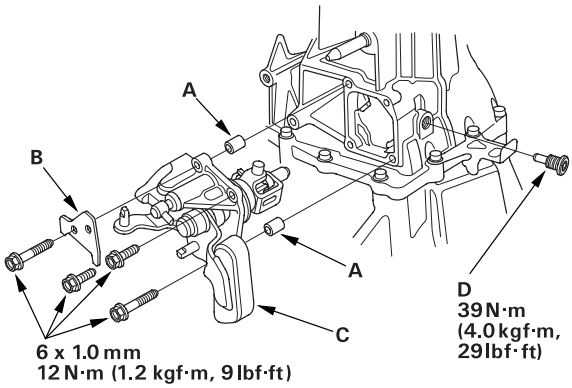


16. Remove the dirt and oil from the shift lever cover sealing surface. Apply liquid gasket (P/N 08C70-K0234M) to the sealing surface.

NOTE: If 5 minutes have passed after applying liquid gasket, reapply it and assemble the housings. Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.

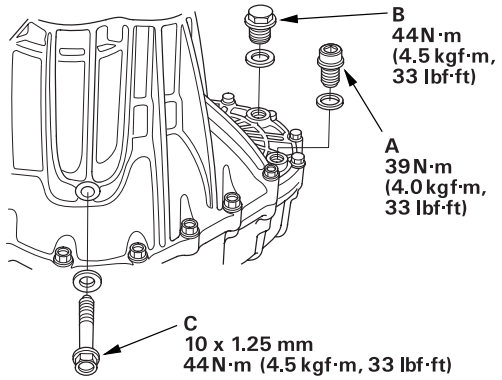


17. Install the 8 x 14 mm dowel pins (A) clutch line clip bracket (B), and change lever assembly (C).

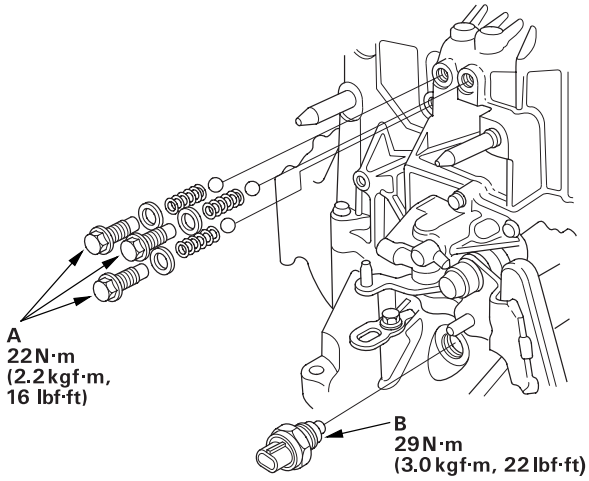


18. Apply liquid gasket (P/N 08C70-K0234M) to the threads of the interlock bolt (D), and install it on the transmission housing.

19. Install the drain plug (A), filler plug (B) and 10 mm flange bolt (C) with new washers.



20. Install the detent bolts (A), spring, steel balls, with new washers.

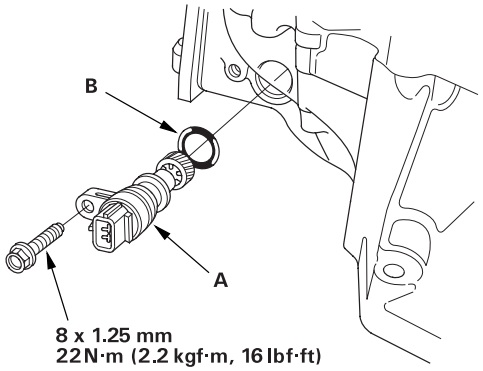


21. Apply liquid gasket (P/N 08C70-K0234M) to the threads of the back-up light switch (B), and install it on the transmission housing.

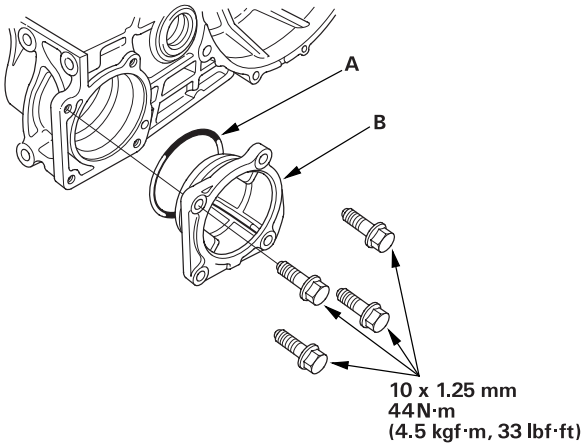
(cont'd)

Transmission Reassembly (cont'd)

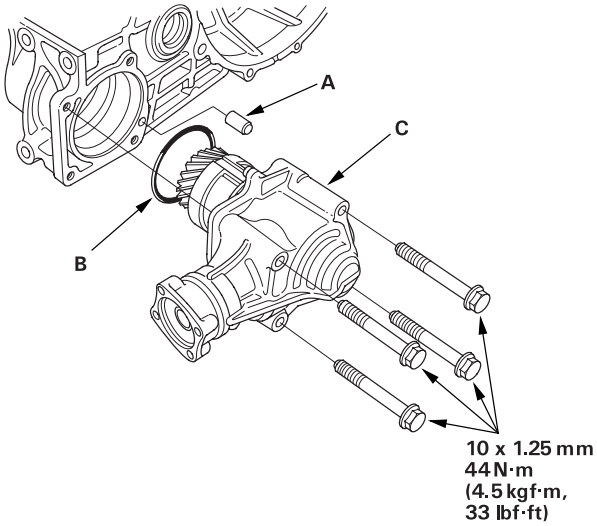
22. Install the vehicle speed sensor (VSS) (A) and O-ring (B).



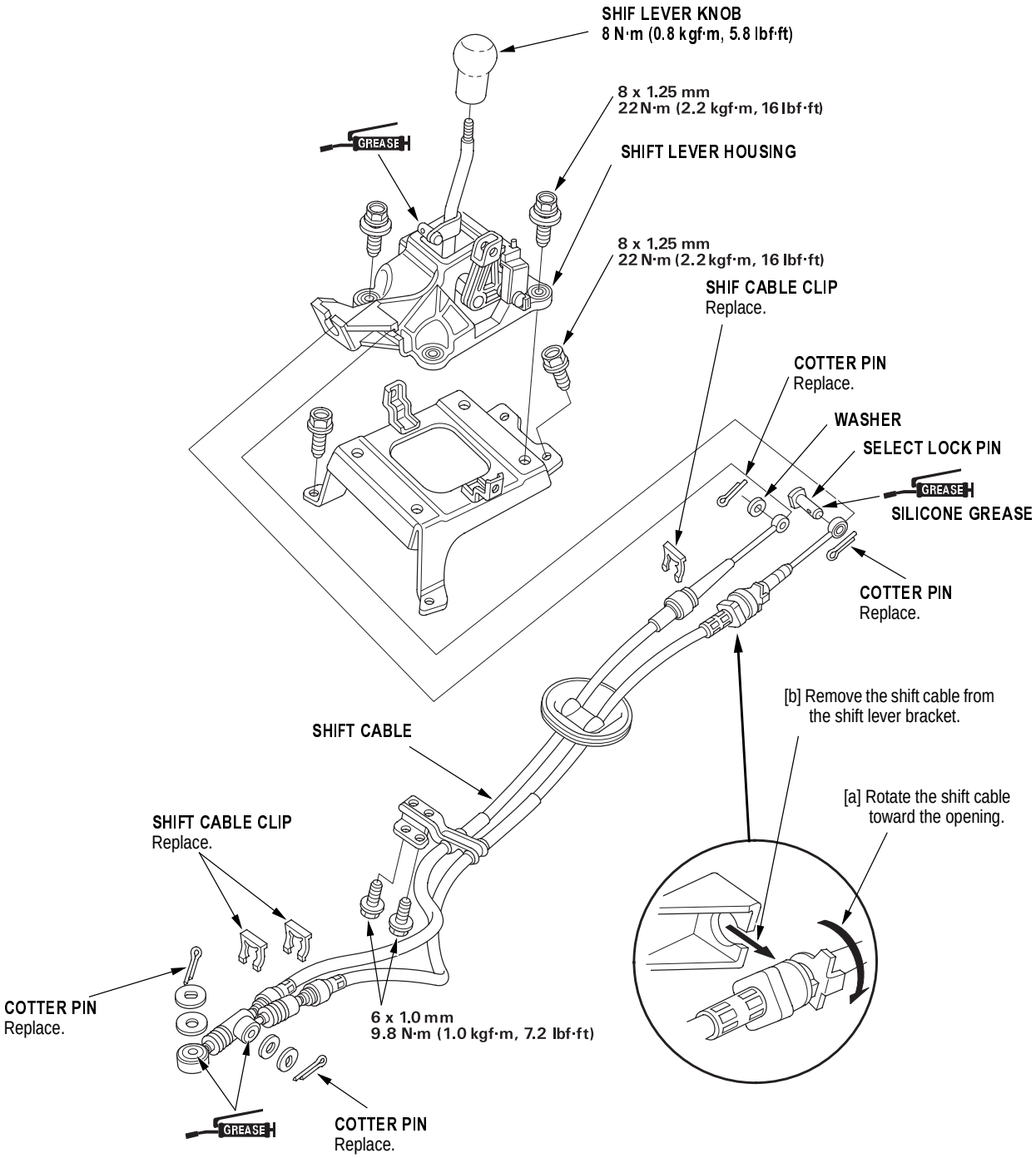
23. Install the O-ring (A) and side cover (B). (2WD model)



24. Install the 10 x 20 mm dowel pin (A), O-ring (B), and transfer assembly (C). (4WD model)



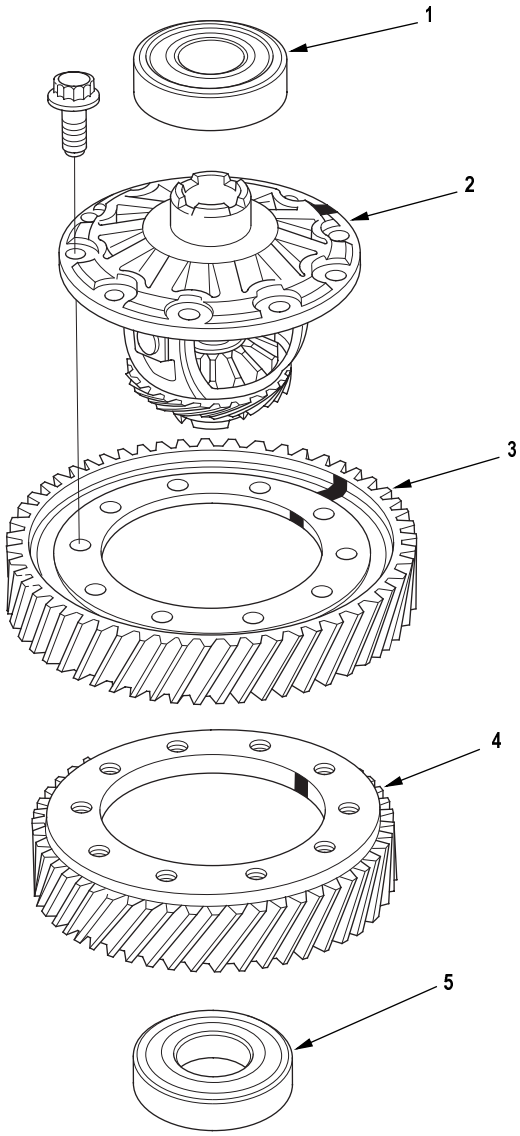
Gearshift Mechanism Replacement



M/T Differential

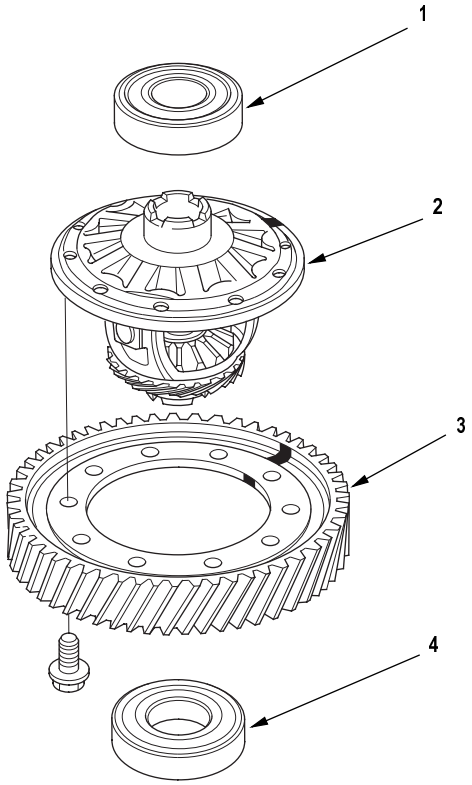
Component Location Index

4WD model



1	BALL BEARING	Replacement, page 13-59
2	DIFFERENTIAL CARRIER	Backlash Inspection, page 13-58; Replacement, page 13-58
3	FINAL DRIVEN GEAR	Replacement, page 13-58
4	TRANSFER DRIVEN GEAR	Replacement, page 13-58
5	BALL BEARING	Replacement, page 13-59

2WD model

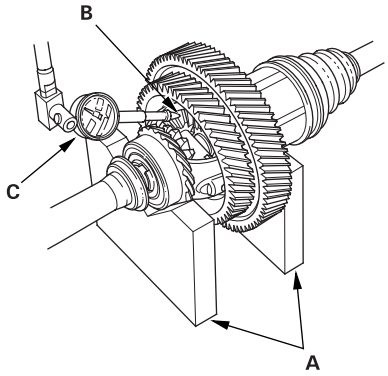


1	BALL BEARING	Replacement, page 13-59
2	DIFFERENTIAL CARRIER	Backlash Inspection, page 13-58; Replacement, page 13-58
3	FINAL DRIVEN GEAR	Replacement, page 13-58
4	BALL BEARING	Replacement, page 13-59

Backlash Inspection

NOTE: 4WD model is shown, 2WD model is similar.

1. Place the differential assembly on V-blocks (A), and install both axles.



2. Measure the backlash of both pinion gears (B) with a dial indicator (C). If the backlash is not within the standard, replace the differential carrier.

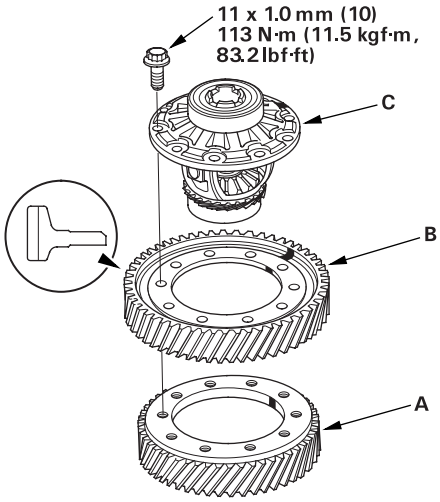
Standard (New): 0.05 - 0.15 mm (0.002 - 0.006 in.)

Driven Gear/Carrier Replacement

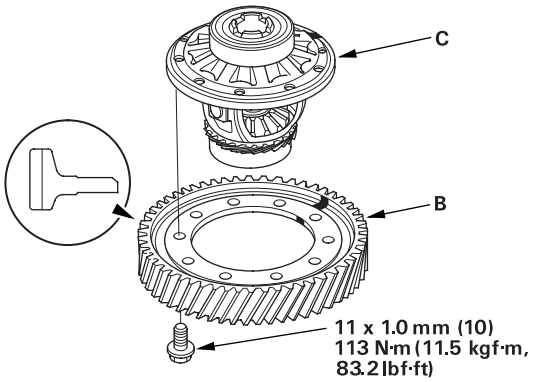
1. Remove the bolts (left-hand threads) in a crisscross pattern in several steps, then remove the transfer driven gear (A), final driven gear (B) from the differential carrier(C).

   NOTE: Align the mark of driven gear and the carrier.

4WD model:



2WD model:



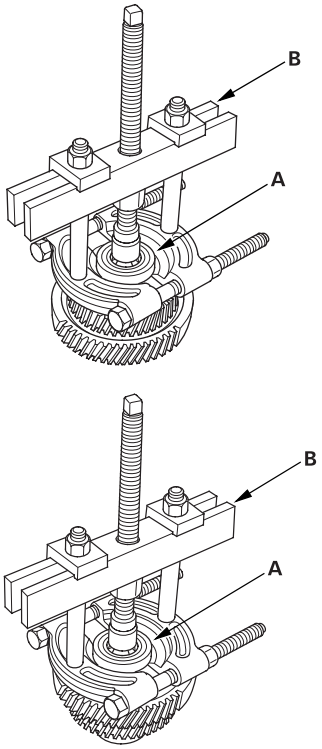
2. Install the final driven gear with the chamfer on the inside diameter facing the carrier. Tighten the bolts in a crisscross pattern in several steps.

Carrier Bearings Replacement

Special Tool Required
Driver, 40 mm I.D. 07746-0030100

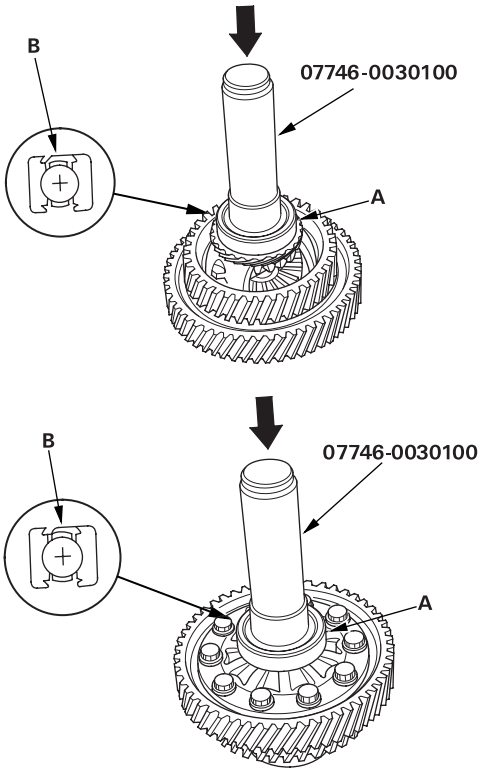
NOTE: 4WD model is shown, 2WD model is similar.

1. Check the carrier bearings for wear and rough rotation. If they rotate smoothly and their rollers show no signs of wear, the beaings are OK.
2. Remove the carrier bearing (A) with a commercially-available bearing puller (B).



3. Install the new bearings (A) with the special tool and a press. Press each bearing on until it bottoms. There should be no clearance between the bearings and the carrier.

   NOTE: Turn the seal (B) part of the bearing to the outside of differential, and install it.

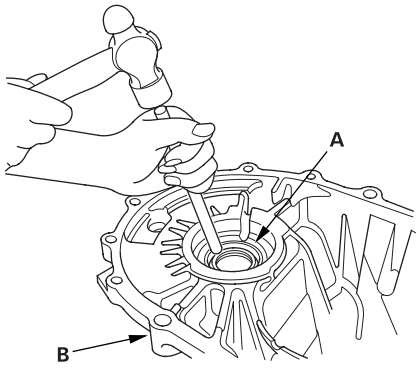


Oil Seal Replacement

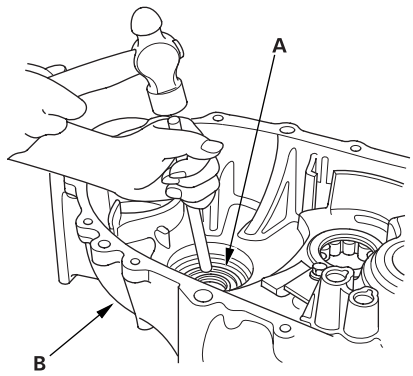
Special Tools Required
- Driver 07749-0010000
- Oil seal driver attachment 07NAD-P200100

1. Remove the differential assembly.

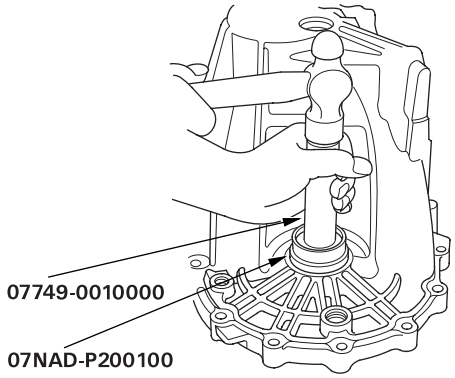
2. Remove the oil seal (A) from the transmission housing (B).



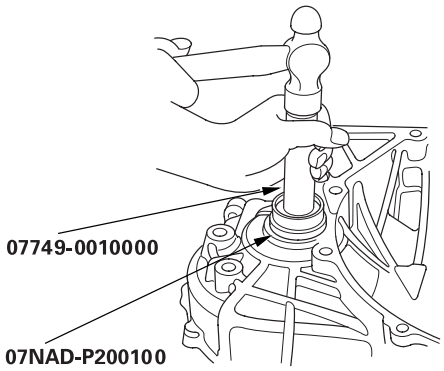
3. Remove the oil seal (A) from the clutch housing (B).



4. Install the new oil seal in the transmission housing with the special tools.



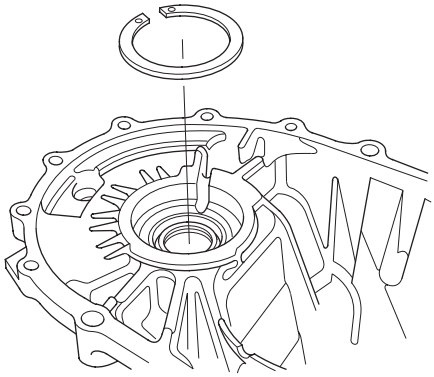
5. Install the new oil seal in the clutch housing with the special tools.



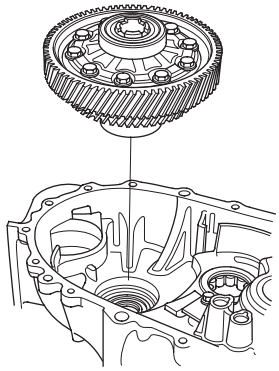
Differential Thrust Clearance Adjustment

Special Tool Required
Driver, 40 mm I.D. 07746-0030100

1. Install the 80 mm shim that's the same size as the one you removed.



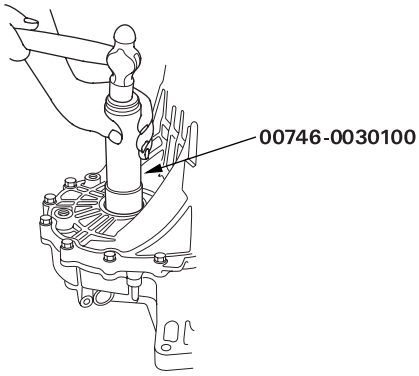
2. Install the differential assembly into the clutch housing.



3. Install the transmission housing onto the clutch housing, then tighten the 8 mm flange bolts in a crisscross pattern in several steps.

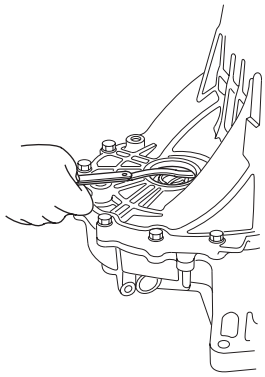
8 x 1.25 mm
27 N·m (2.8 kgf·m, 20 lbf·ft)

4. Use the special tool to bottom the differential assembly in the clutch housing.



5. Measure clearance between 80 mm shim and bearing outer race in transmission housing.

Standard: 0 - 0.10 mm (0 - 0.004 in.)



(cont'd)

Differential Thrust Clearance Adjustment (cont'd)

6. If the clearance is more than the standard, select a new shim from the following table. If the clearance measured in step 5 is within the standard, go to step 9.

80 mm Shim

	Part Number	Thickness
A	41441-PL3-B00	1.0 mm (0.0394 in.)
B	41442-PL3-B00	1.1 mm (0.0433 in.)
C	41443-PL3-B00	1.2 mm (0.0472 in.)
D	41444-PL3-B00	1.3 mm (0.0512 in.)
E	41445-PL3-B00	1.4 mm (0.0551 in.)
F	41446-PL3-B00	1.5 mm (0.0591 in.)
G	41447-PL3-B00	1.6 mm (0.0630 in.)
H	41448-PL3-B00	1.7 mm (0.0669 in.)
J	41449-PL3-B00	1.8 mm (0.0709 in.)
K	41450-PL3-B00	1.05 mm (0.0413 in.)
L	41451-PL3-B00	1.15 mm (0.0453 in.)
M	41452-PL3-B00	1.25 mm (0.0492 in.)
N	41453-PL3-B00	1.35 mm (0.0531 in.)
P	41454-PL3-B00	1.45 mm (0.0571 in.)
Q	41455-PL3-B00	1.55 mm (0.0610 in.)
R	41456-PL3-B00	1.65 mm (0.0650 in.)
S	41457-PL3-B00	1.75 mm (0.0689 in.)

7. Remove the bolts and transmission housing.

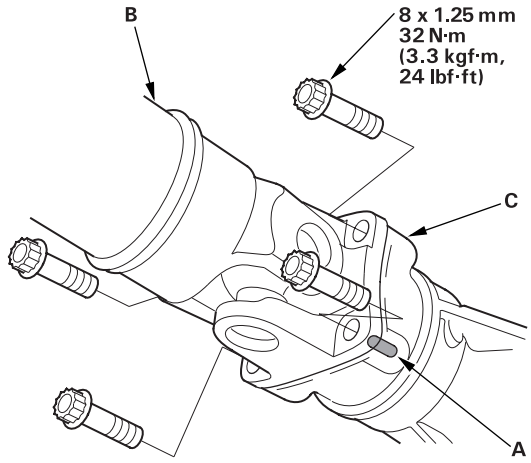
8. Replace the thrust shim selected in step 7, then recheck the clearance.

9. Reinstall the transmission.

Transfer Assembly

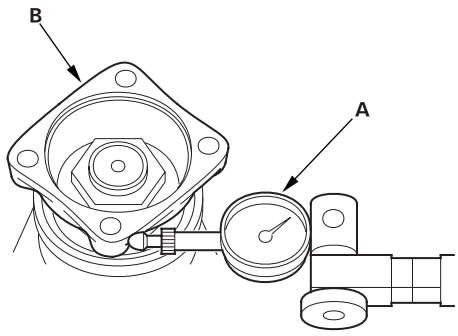
Backlash Inspection on Car

1. Raise the front of the vehicle, and support it with safety stands (see section 01).
2. Set the parking brake, and block both rear wheels securely.
3. Shift to neutral position.
4. Make a reference mark (A) across the propeller shaft (B) and the companion flanges (C).



5. Separate the propeller shaft from the transfer assembly.
6. Set a dial indication (A) on the companion flange (B), then measure the transfer gear backlash.

   STANDARD: 0.06 - 0.16 mm (0.002 - 0.006 in.)

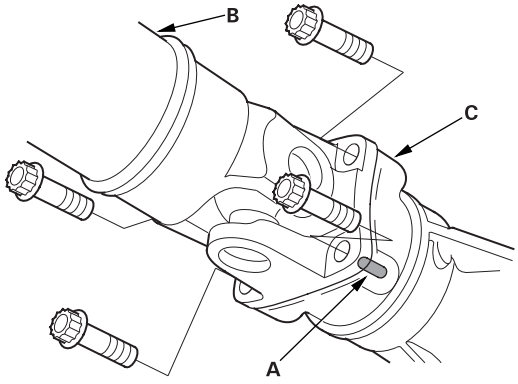


7. If the measurement is out of specification, remove the transfer assembly (see page 13-64) and inspect the transfer assembly (see page 13-67).
8. Before reinstalling the propeller shaft, check the transfer assembly oil seal for damage and fluid leaks.
   - If the seal is leaking, remove the transfer assembly (see page 13-64), replace the oil seal, and adjust the total starting torque (see step 4 on page 13-67). Do not replace the oil seal with the transfer assembly installed on the transmission.
   - If the seal is OK, reinstall the propeller shaft.

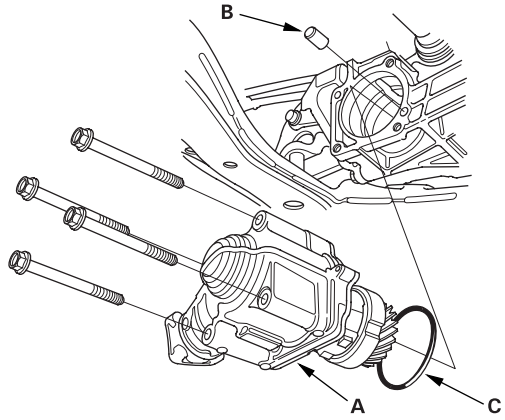
Transfer Removal

NOTE: Make sure the lifts, jacks, and safety stands are placed properly (see page 01-7).

1. Raise the front of the vehicle, and support it with safety stands (see section 01).
2. Set the parking brake, and block both rear wheels securely.
3. Drain the manual transmission fluid. Reinstall the drain plug with a new sealing washer (see page 13-4).
4. Make reference marks (A) across the propeller shaft (B) and the companion flanges (C).



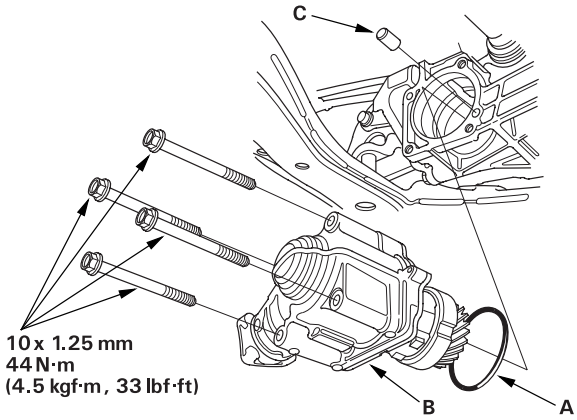
5. Separate the propeller shaft from the transfer assembly.
6. Remove the transfer (A), dowel pin (B) and O-ring (C).



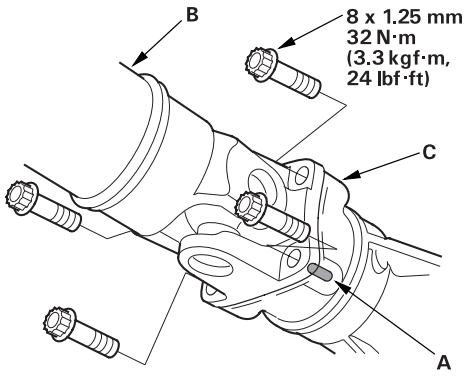
Transfer Installation

NOTE:
- While installing the transfer assembly on the transmission, do not allow dust or other foreign particles to enter the transmission.
- Be careful not to damage the clutch housing with transfer driven gear.

1. Install a new O-ring (A) on the transfer (B), then install the dowel pin (C) on the transmission.
2. Apply MTF to the transfer driven gear and transmission contact area, then install the transfer to the transmission.



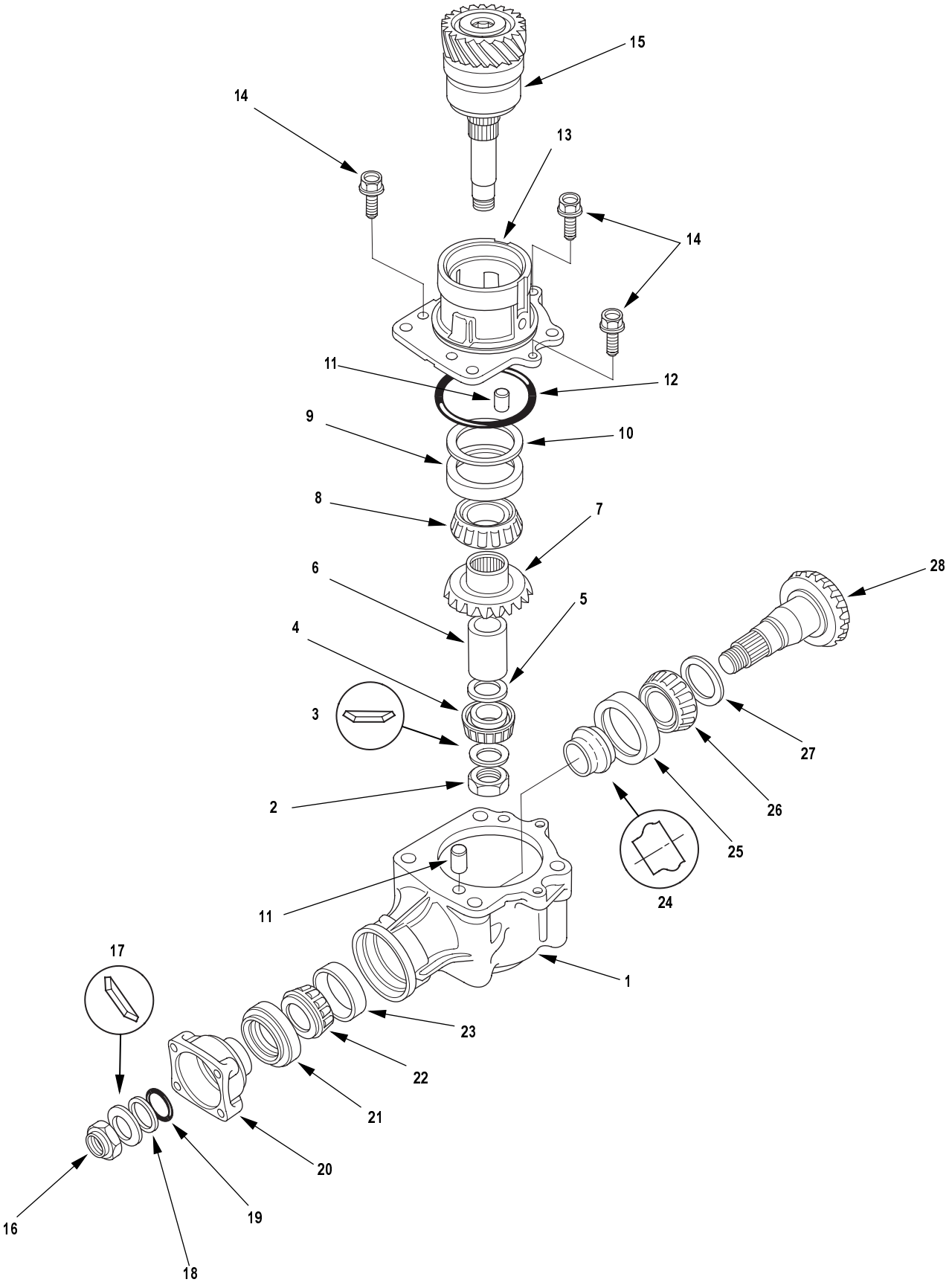
3. Install the propeller shaft to the transfer assembly by aligning the reference marks.



4. Refill the transmission with MTF (see page 13-4).
5. Start the engine, and run it to normal operating temperature (the radiator fan comes on). Turn the engine off, and check fluid level.

Transfer Overhaul

Exploded View



(cont'd)

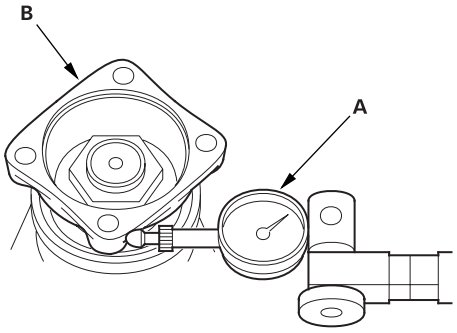
Exploded View (cont'd)

1 TRANSFER HOUSING
2 22 mm LOCKNUT
Replace.
3 CONICAL SPRING WASHER
Replace.
4 TAPERED ROLLER BEARING
5 25 mm THRUST SHIM
6 TRANSFER COLLAR
7 TRANSFER DRIVE GEAR
8 TAPERED ROLLER BEARING
9 TAPERED ROLLER BEARING OUTER RACE
10 76 mm THRUST SHIM
11 DOWEL PIN
12 O-RING
Replace.
13 TRANSFER HOLDER
14 6 mm FLANGE BOLTS
15 TRANSFER SHAFT ASSEMBLY
16 22 mm LOCKNUT
Replace.
17 CONICAL SPRING WASHER
Replace.
18 BACK-UP RING
19 O-RING
Replace.
20 COMPANION FLANGE
21 OIL SEAL
Replace.
22 TAPERED ROLLER BEARING
23 TAPERED ROLLER BEARING OUTER RACE
24 TRANSFER SPACER
Replace.
25 TAPERED ROLLER BEARING OUTER RACE
26 TAPERED ROLLER BEARING
27 35 mm THRUST SHIM
28 TRANSFER DRIVEN GEAR

Transfer Inspection

Transfer Gear (Hypoid gear) Backlash Measurement

1. Set a dial indicator (A) on the companion flange (B) as shown.



2. Measure the transfer gear backlash.

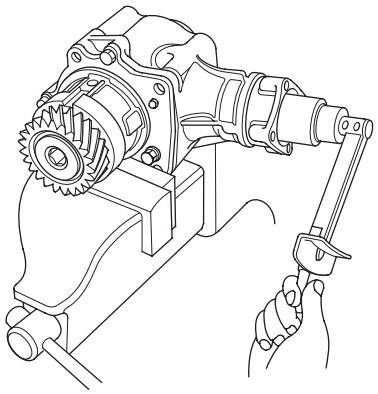
   STANDARD: 0.06 - 0.16 mm (0.002 - 0.006 in.)

Total Starting Torque Measurement

3. Rotate the companion flange several times to seat the tapered roller bearing.
4. Measure the starting torque (companion flange side) using a torque wrench.

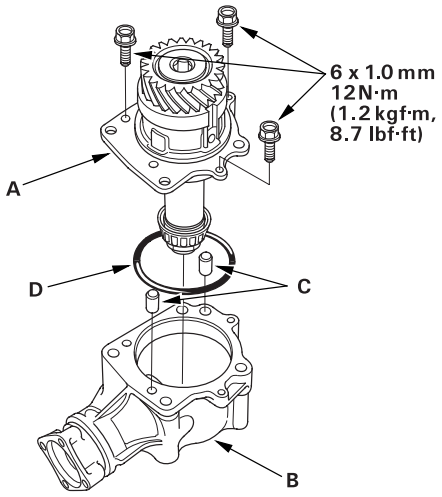
   NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

   STANDARD:
   2.24 - 3.71 N·m
   (22.0 - 36.4 kgf·cm, 19.1 - 31.6 lbf·in.)

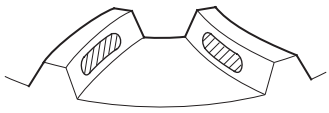


Transfer Drive Gear Tooth Contact Inspection

5. Remove the transfer from the vise.
6. Remove the transfer holder assembly (A) from the transfer housing (B), then remove the dowel pin (C) and O-ring (D).



7. Apply Prussian Blue to the transfer drive gear teeth lightly and evenly.
8. Install the transfer holder assembly to the transfer housing, then tighten the bolts.
9. Rotate the companion flange in both directions until the transfer gear rotates one full turn in both directions.
10. Check the transfer gear tooth contact pattern.

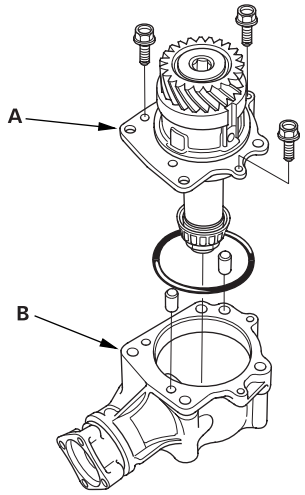


11. If the measurements or the tooth contact pattern are not within the standard, disassemble the transfer assembly, replace worn or damaged parts, and reassemble it.

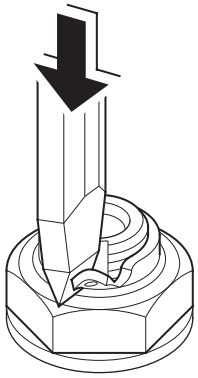
Transfer Disassembly

Special Tools Required
Companion Flange Holder 07PAB-0020000

1. Remove the transfer holder assembly (A) from the transfer housing (B).

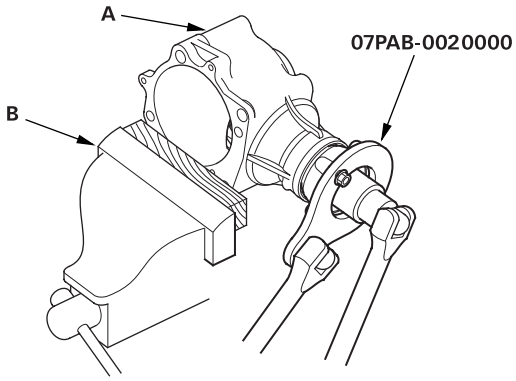


2. Cut the lock tabs of the locknut using a chisel. Keep all of the chiseled particles out of the transfer driven gear.



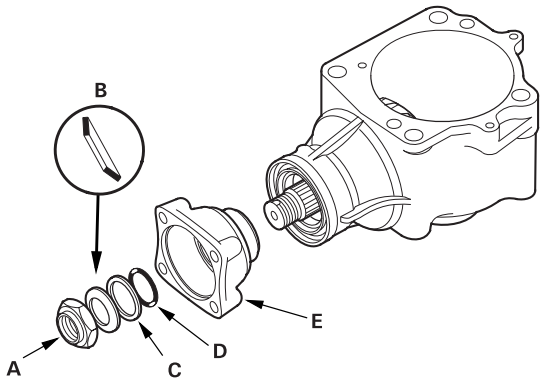
3. Secure the transfer housing (A) in a bench vise (B) with soft jaws.

   NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

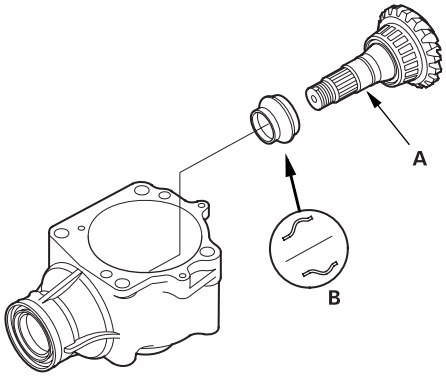


4. Install the special tool on the companion flange, then loosen the transfer driven gear shaft locknut.

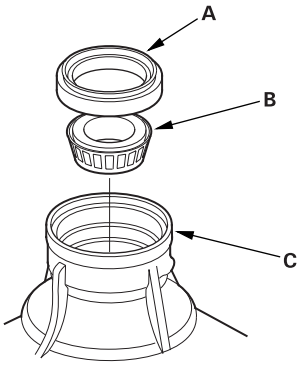
5. Remove the transfer driven gear locknut (A), conical spring washer (B), back-up ring (C), O-ring (D) and companion flange (E).



6. Remove the transfer driven gear (A), then remove the transfer spacer (B) from the transfer driven gear.

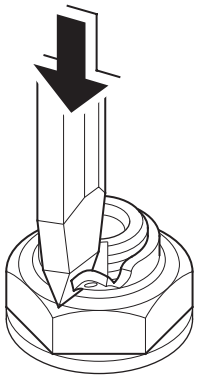


7. Remove the oil seal (A) and the tapered roller bearing (B) from the transfer housing (C).

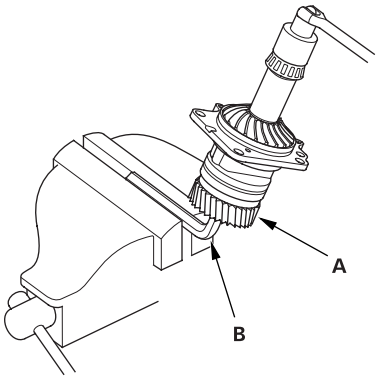


Transfer Holder Disassembly

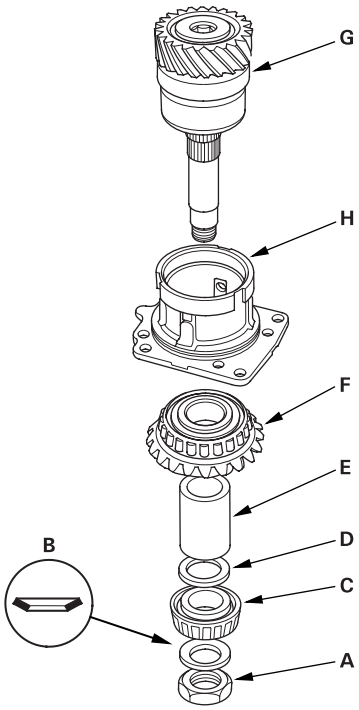
1. Cut the lock tabs of the locknut using a chisel. Keep all of the chiseled particles out of the transfer shaft.



2. Hold the transfer shaft (A) with a 14 mm Allen wrench (B) clamped in a bench vise, then loosen the locknut.



3. Remove the locknut (A), conical spring washer (B), tapered roller bearing (C), 25 mm thrust shim (D), transfer shaft collar (E), transfer drive gear (F), and transfer shaft assembly (G) from the transfer holder (H).

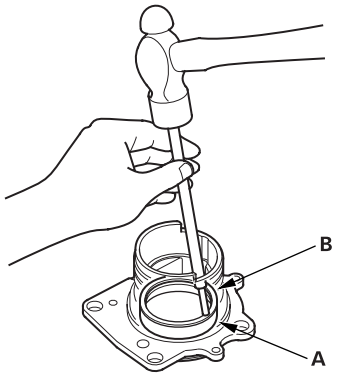


Transfer Holder Tapered Roller Bearing Outer Race Replacement

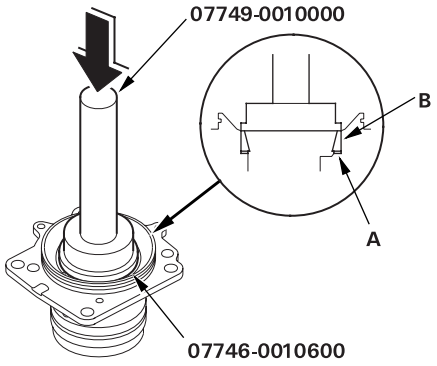
Special Tools Required
- Attachment, 72 x 75 mm 07746-0010600
- Driver 07749-0010000

NOTE: Coat all parts with MTF during reassembly.

1. Remove the tapered roller bearing outer race (A) and 76 mm thrust shim (B) from the transfer holder.



2. Install the 76 mm thrust shim (A) in the transfer holder.



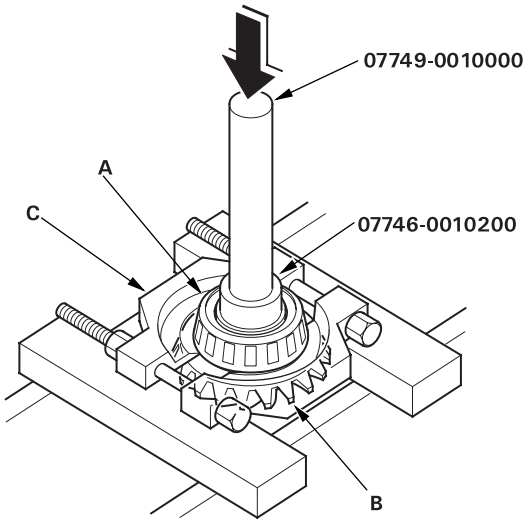
3. Install the tapered roller bearing outer race (B) using the special tools and a press.

Transfer Drive Gear Bearing Replacement

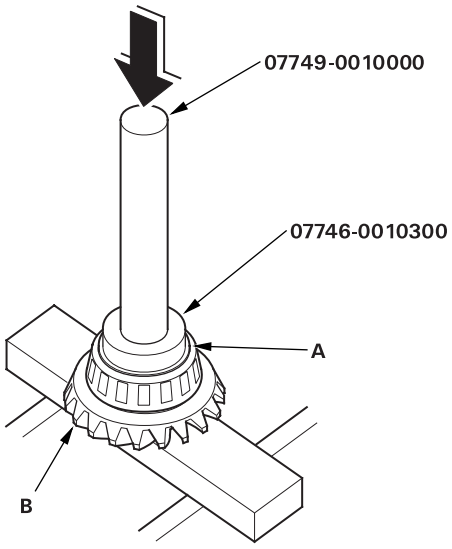
Special Tools Required
- Attachment, 37 x 40 mm 07746-0010200
- Attachment, 42 x 47 mm 07746-0010300
- Driver 07749-0010000

NOTE: Coat all parts with MTF during reassembly.

1. Remove the tapered roller bearing (A) from the transfer drive gear (B) using a commercially available bearing separator (C), the special tools and a press.



2. Install the new tapered roller bearing (A) in the transfer drive gear (B) using the special tools and a press.

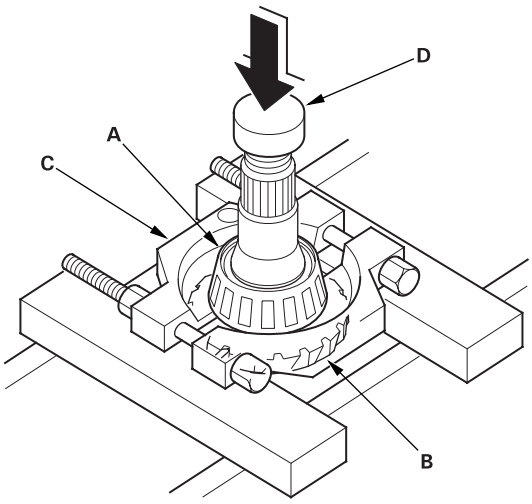


Transfer Driven Gear Bearing Replacement

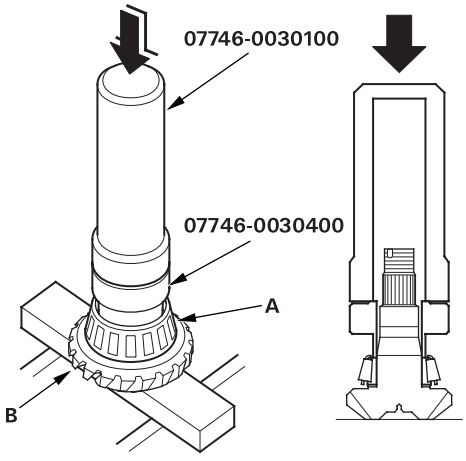
Special Tools Required
- Driver, 40 mm I.D 07746-0030100
- Attachment, 35 mm I.D 07746-0030400

NOTE: Coat all parts with MTF during reassembly.

1. Remove the tapered roller bearing (A) from the transfer driven gear (B) using a commercially available bearing separator (C), an adapter (D), and a press.



2. Install the new tapered roller bearing (A) on the transfer driven gear (B) using the special tools and a press.

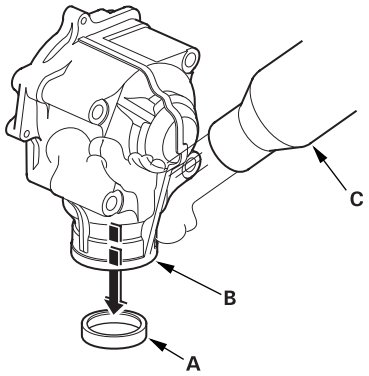


Transfer Housing Bearing Outer Race Replacement

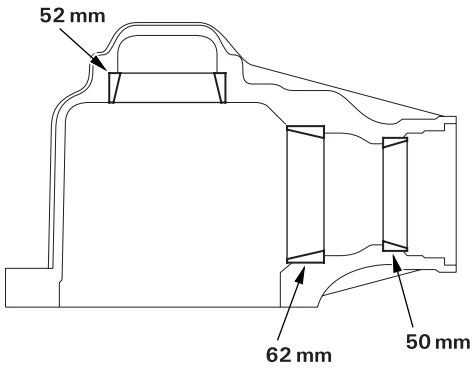
Special Tools Required
- Installer shaft, 14 x 165 mm 07JAF-SJ80110
- Installer nut, 14 mm 07JAF-SJ80120
- Bearing installer attachment 07KAF-PS30120
- Bearing installer attachment 07LAF-PZ70110
- Attachment, 52 x 55 mm 07746-0010400
- Driver 07749-0010000

NOTE:
- Coat all parts with MTF during reassembly.
- Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.

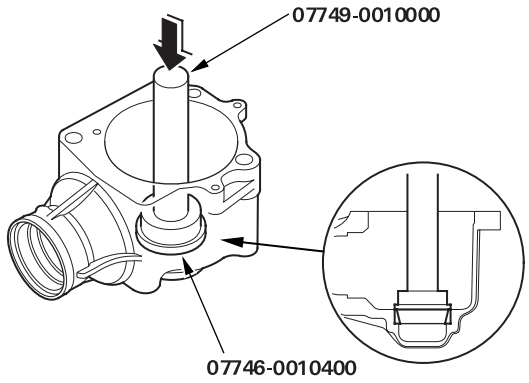
1. Remove the tapered roller bearing outer race (A) from transfer housing (B) by heating the cover to almost 212°F (100°C) using a heat gun (C). Do not heat the cover over 212°F (100°C).



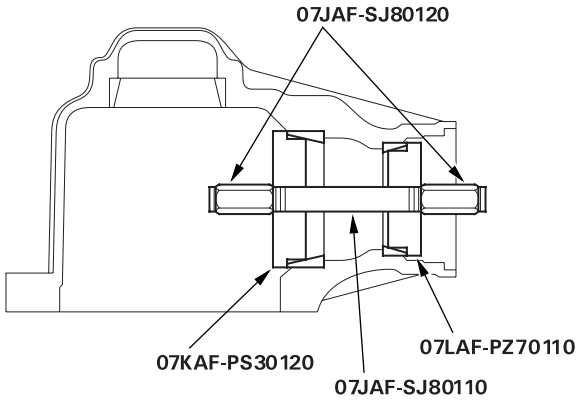
Bearing Outer Race Locations



2. Install the 52 mm tapered roller bearing outer race using the special tools.



3. Install the 62 mm tapered roller bearing outer race and 50 mm tapered roller bearing outer race using the special tools.



Transfer Reassembly

Special Tools Required

- Oil seal driver attachment 07JAD-PH80101
- Companion flange holder 07PAB-0020000
- Attachment, 72 x 75 mm 07746-0010600
- Driver, 40 mm I.D 07746-0030100
- Attachment, 35 mm I.D 07746-0030400
- Driver 07749-0010000

Note these items during reassembly:

- While reassembling the transfer assembly:
  - Check and adjust the transfer gear tooth contact.
  - Measure and adjust the transfer gear backlash.
  - Check and adjust the tapered roller bearing starting torque.
- Cost all parts with MTF during reassembly.
- Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.
- Replace the transfer drive gear and the transfer driven gear shaft as a set if either part is replaced.

Outline of Assembly

1. Select the 35 mm thrust shim.

Perform this procedure if the transfer driven gear shaft or the tapered roller bearing on the transfer driven gear shaft is replaced.

2. Preassemble the parts to check and adjust transfer gear backlash and transfer gear tooth contact.

3. Disassemble the parts, then assemble the transfer driven gear shaft and its related parts.

4. Measure and adjust the starting torque of the transfer driven gear shaft tapered roller bearing.

5. Assemble the transfer shaft and its related parts.

6. Measure and adjust the total starting torque.

(cont'd)

Transfer Reassembly (cont'd)

35 mm Thrust Shim Selection

1. Select the 35 mm thrust shim if the transfer driven gear shaft or the tapered roller bearing on the transfer driven gear shaft is replaced.

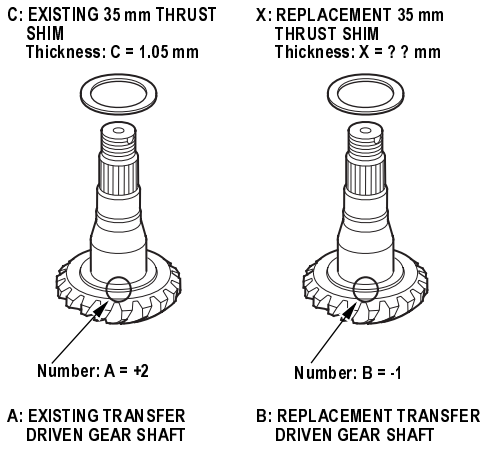
   Calculate the thickness of the 35 mm thrust shim using the formula below.

   FORMULA: $\frac{A}{100} - \frac{B}{100} + C = X$

   A: Number on the existing transfer driven gear shaft
   B: Number on the replacement transfer driven gear shaft.
   C: Thickness of the existing 35 mm thrust shim
   X: Thickness needed for the replacement 35 mm trust shim.

   NOTE: The number on the transfer driven gear shaft is shown in 1/100 mm.

EXAMPLE:



$$X = \frac{A}{100} - \frac{B}{100} + C = \frac{2}{100} - \frac{-1}{100} + 1.05$$

$$= 0.02 + 0.01 + 1.05 = 1.08\,(mm)$$

Select 35 mm thrust shim thickness of 1.08 mm (0.043 in.). If the tapered roller bearing on the transfer driven gear shaft is replaced.

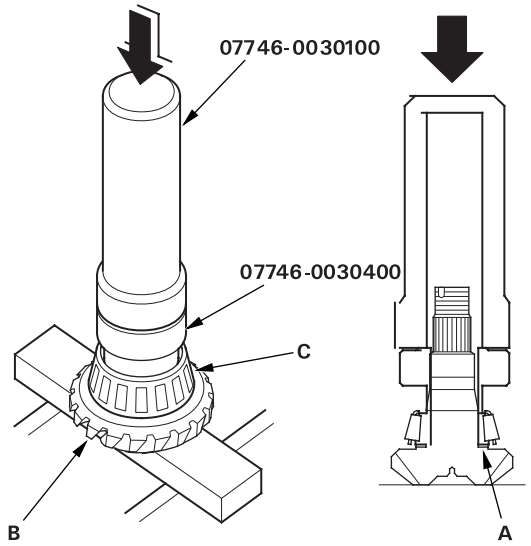
Measure the thickness of the replacement bearing and the existing bearing, and calculate the difference of the bearing thickness. Adjust the thickness of the existing 35 mm thrust shim by the amount of difference in bearing thickness, and select the replacement 35 mm thrust shim. Do not use more than one 35 mm thrust shim to adjust the transfer gear backlash.

THRUST SHIM, 35 mm

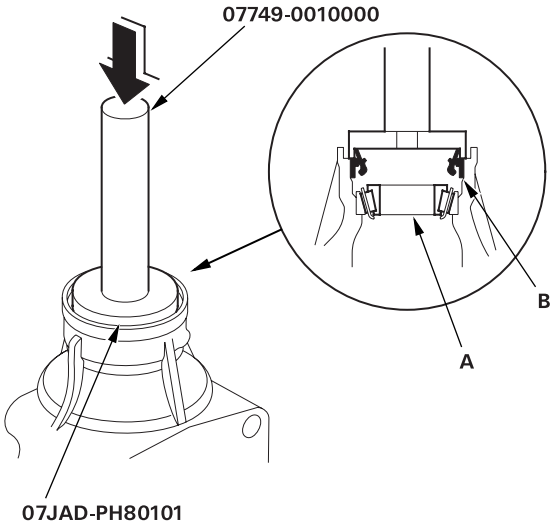
	Part Number	Thickness
A	41361-PS3-000	0.72 mm (0.028 in.)
B	41362-PS3-000	0.75 mm (0.030 in.)
C	41363-PS3-000	0.78 mm (0.031 in.)
D	41364-PS3-000	0.81 mm (0.032 in.)
E	41365-PS3-000	0.84 mm (0.033 in.)
F	41366-PS3-000	0.87 mm (0.034 in.)
G	41367-PS3-000	0.90 mm (0.035 in.)
H	41368-PS3-000	0.93 mm (0.037 in.)
I	41369-PS3-000	0.96 mm (0.038 in.)
J	41370-PS3-000	0.99 mm (0.039 in.)
K	41371-PS3-000	1.02 mm (0.040 in.)
L	41372-PS3-000	1.05 mm (0.041 in.)
M	41373-PS3-000	1.08 mm (0.043 in.)
N	41374-PS3-000	1.11 mm (0.044 in.)

Transfer Gear Backlash Inspection and Transfer Gear Tooth Contact Inspection

2. Install the 35 mm thrust shim (A) on the transfer driven gear (B), then install the tapered roller bearing (C) using the special tools and a press.

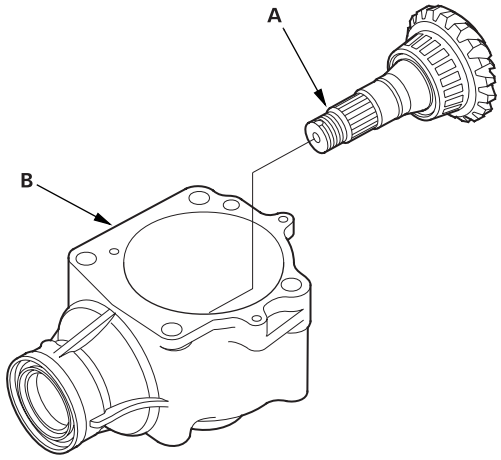


3. Install the bearing outer race, then the tapered bearing (A) on the companion flange side of the transfer housing.

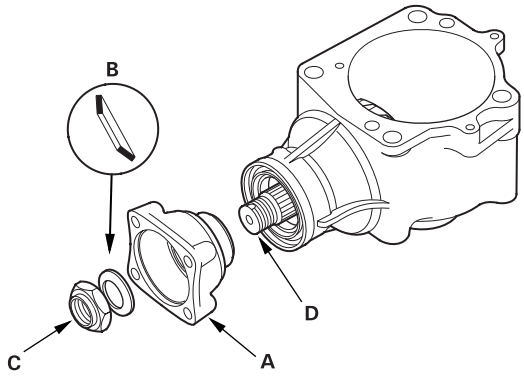


4. Install the new oil seal (B) on the transfer housing using the special tools.

5. Install the transfer driven gear (A) in the transfer housing (B). Do not install the transfer spacer on the transfer driven gear shaft in this step.



6. Install the companion flange (A), conical spring washer (B) and locknut (C) on the transfer driven gear (D). Do not install the O-ring and the back-up ring on the transfer gear shaft in this step.



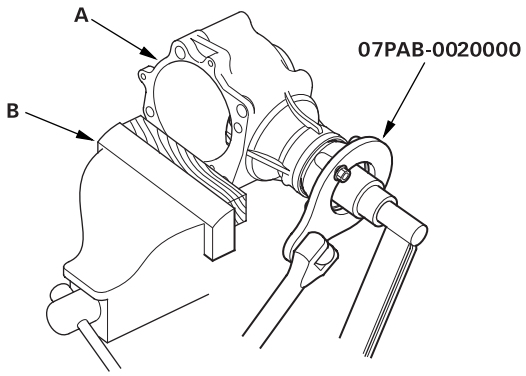
(cont'd)

Transfer Reassembly (cont'd)

35 mm Thrust Shim Selection (cont'd)

7. Secure the transfer housing (A) in a bench vise (B) with soft jaws, then install the special tool on the companion flange.

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



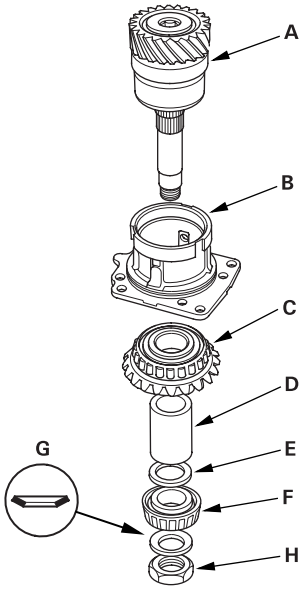
8. Tighten the locknut while measuring the starting torque so the starting torque is within 1.08-1.47 N·m (11.0 - 15.0 kgf·cm, 9.55 - 13.0 lbf·in.).

NOTE:
- Coat the threads of the locknut, and the shaft with MTF before installing the locknut.
- Do not stake the locknut in this step.

STARTING TORQUE:
1.08 - 1.47 N·m
(11.0 - 15.0 kgf·cm, 9.55 - 13.0 lbf·in.)

9. Install the transfer shaft assembly (A) in the transfer holder (B), then install the transfer drive gear (C), transfer collar (D), 25 mm thrust shim (E), tapered roller bearing (F), conical spring washer (G), and locknut (H) on the transfer shaft assembly.

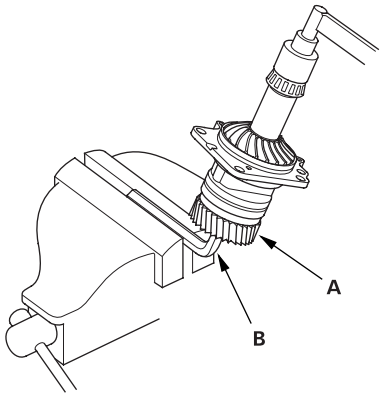
NOTE:
- Coat the threads of the locknut, and the shaft with MTF before installing the locknut.
- Do not stake the locknut in this step.



10. Hold the transfer shaft (A) with a 14 mm Allen wrench (B) clamped in a bench vise, and tighten the locknut.

NOTE: Do not stake the locknut in this step.

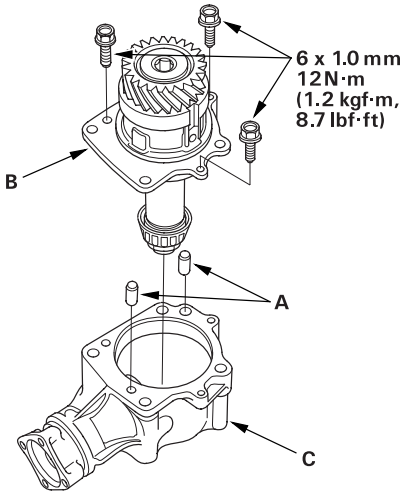
TORQUE: 118 N·m (12.0 kgf·m, 86.8 lbf·ft)



11. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.

12. Install the dowel pin (A) and transfer holder assembly (B) to the transfer housing (C).

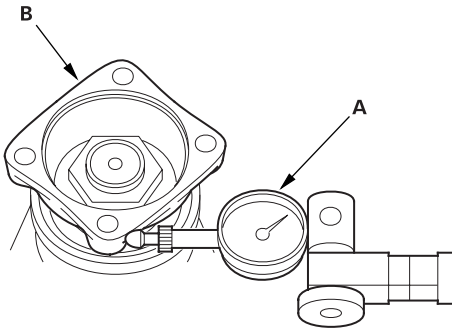
NOTE: Temporarily install the transfer holder assembly without the O-ring.



13. Rotate the companion flange several times to seat the tapered roller bearing.

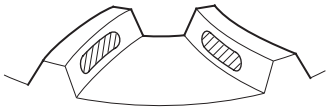
14. Set a dial indicator (A) on the companion flange (B), then measure the transfer gear backlash.

STANDARD: 0.06 - 0.16 mm (0.002 - 0.006 in.)

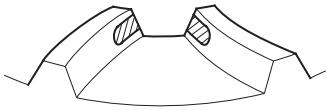


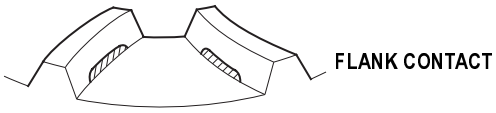
15. Check the transfer gear tooth contact pattern.

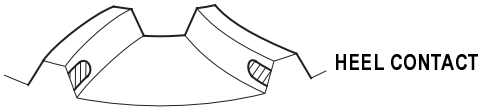
CORRECT TOOTH CONTACT PATTERN

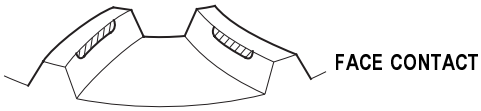


INCORRECT TOOTH CONTACT PATTERN









(cont'd)

Transfer Reassembly (cont'd)

35 mm Thrust Shim Selection (cont'd)

16. If the transfer gear tooth contact is incorrect, adjust the transfer gear tooth contact with a 35 mm or 25 mm thrust shim. If the gear tooth contact is correct, go to step 17.

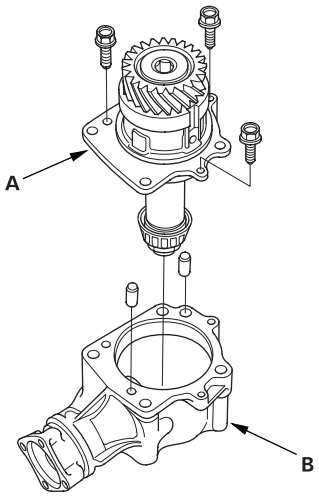
NOTE:
- To select a 35 mm thrust shim, refer to page 13-74.
- Do not use more than one 35 mm shim to adjust the transfer gear tooth contact.
- To select the 25 mm thrust shim, refer to page 13-78.
- Do not use more than one 25 mm shim to adjust the transfer gear tooth contact.

- **Toe Contact**
  Use a thicker 35 mm thrust shim to move the transfer driven gear shaft toward the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear away from the transfer driven gear shaft to adjust the transfer gear backlash as follows:
  - Increase the thickness of the 25 mm thrust shim.
  - Reduce the thickness of the 76 mm thrust shim by the amount of increased thickness of the 25 mm thrust shim.
- **Flank Contact**
  Use a thinner thrust shim to move the transfer drive gear toward the transfer driven gear shaft. Flank contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Heel Contact.
- **Heel Contact**
  Use a thinner 35 mm thrust shim to move the transfer driven gear shaft away from the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear toward the transfer driven gear shaft to adjust the transfer gear backlash as follows:
  - Reduce the thickness of the 25 mm thrust shim.
  - Increase the thickness of the 76 mm thrust shim by the amount of reduced thickness of the 25 mm thrust shim.
- **Face Contact**
  Use a thicker thrust shim to move the transfer drive gear away from the transfer driven gear shaft. Face contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Toe Contact.

THRUST SHIM, 25 mm

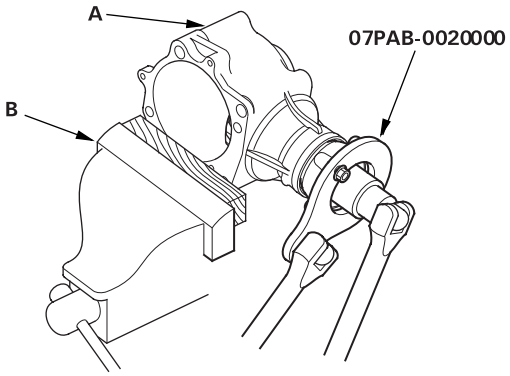
Shim No.	Part Number	Thickness
1.70	29411-P1C-000	1.70 mm (0.067 in.)
1.73	29412-P1C-000	1.73 mm (0.068 in.)
1.76	29413-P1C-000	1.76 mm (0.069 in.)
1.79	29414-P1C-000	1.79 mm (0.070 in.)
1.82	29415-P1C-000	1.82 mm (0.072 in.)
1.85	29416-P1C-000	1.85 mm (0.073 in.)
1.88	29417-P1C-000	1.88 mm (0.074 in.)
1.91	29418-P1C-000	1.91 mm (0.075 in.)
1.94	29419-P1C-000	1.94 mm (0.076 in.)
1.97	29420-P1C-000	1.97 mm (0.078 in.)
2.00	29421-P1C-000	2.00 mm (0.079 in.)
2.03	29422-P1C-000	2.03 mm (0.080 in.)
2.06	29423-P1C-000	2.06 mm (0.081 in.)
2.09	29424-P1C-000	2.09 mm (0.082 in.)
2.12	29425-P1C-000	2.12 mm (0.083 in.)
2.15	29426-P1C-000	2.15 mm (0.085 in.)
2.18	29427-P1C-000	2.18 mm (0.086 in.)
2.21	29428-P1C-000	2.21 mm (0.087 in.)
2.24	29429-P1C-000	2.24 mm (0.088 in.)

17. Remove the transfer holder assembly (A) from the transfer housing (B).



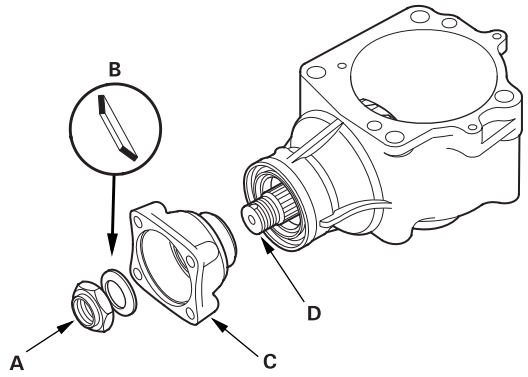
18. Secure the transfer housing (A) in a bench vise (B) with soft jaws.

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

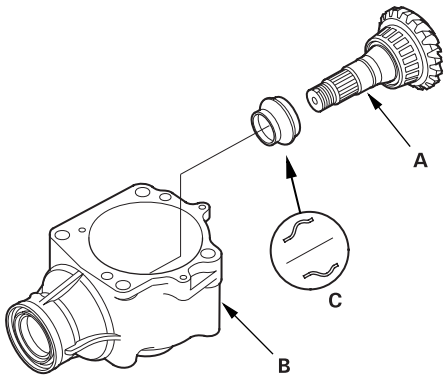


19. Install the special tool on the companion flange, then loosen the locknut.

20. Remove the locknut (A), conical spring washer (B) and companion flange (C) from the transfer driven gear (D).



21. Remove the transfer driven gear (A) from the transfer housing (B).



22. Install the new transfer spacer (C) on the transfer driven gear (A), then install them in the transfer housing (B).

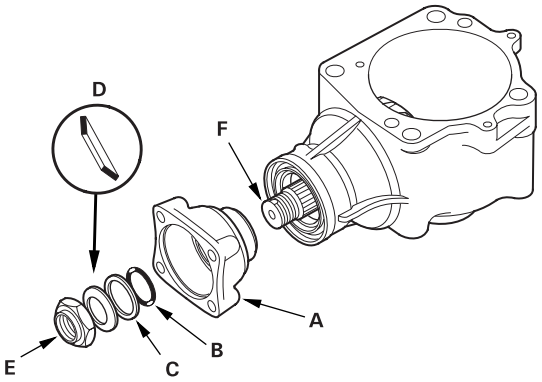
(cont'd)

Transfer Reassembly (cont'd)

35 mm Thrust Shim Selection (cont'd)

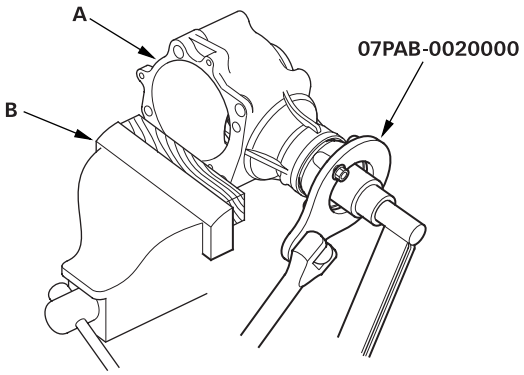
23. Install the companion flange (A), O-ring (B), back-up ring (C), conical spring washer (D) and locknut (E) on the transfer driven gear (F).

NOTE:
- Coat the threads of the locknut, O-ring and transfer shaft with MTF before installing the locknut.
- Install the conical spring washer in the direction shown.



24. Secure the transfer housing (A) in a bench vise (B) with soft jaws.

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

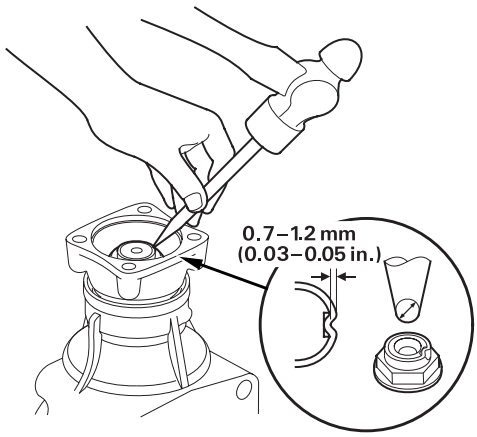


25. Install the special tool on the companion flange, then tighten the transfer driven gear shaft locknut while measuring the starting torque of the transfer driven gear shaft.

STARTING TORQUE:
1.08 - 1.47 N·m
(11.0 - 15.0 kgf·cm, 9.55 - 13.0 lbf·in)
TIGHTENING TORQUE:
132 - 260 N·m
(13.5 - 26.5 kgf·m, 97.6 - 192 lbf·ft)

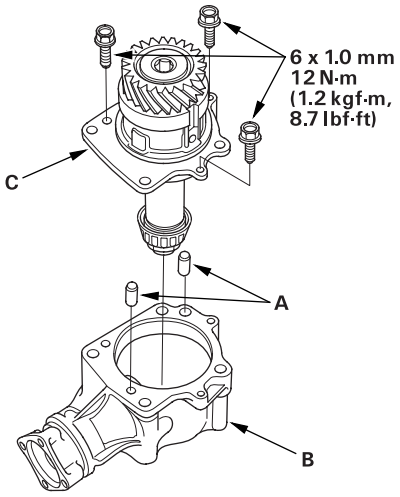
NOTE:
- Rotate the companion flange several times to seat the tapered roller bearing, then measure the starting torque.
- If the starting torque exceeds 1.47 N·m (15.0 kgf·cm, 13.0 lbf·in.), replace the transfer spacer and reassemble the parts. Do not adjust the torque with the locknut loose.
- If the tightening torque exceeds 260 N·m (26.5 kgf·m, 192 lbf·ft), replace the transfer spacer and reassemble the parts.
- Write down the measurement of the starting torque: it is used to measure the total starting torque.

26. Stake the locknut into the transfer driven gear shaft using a 3.5 mm punch.



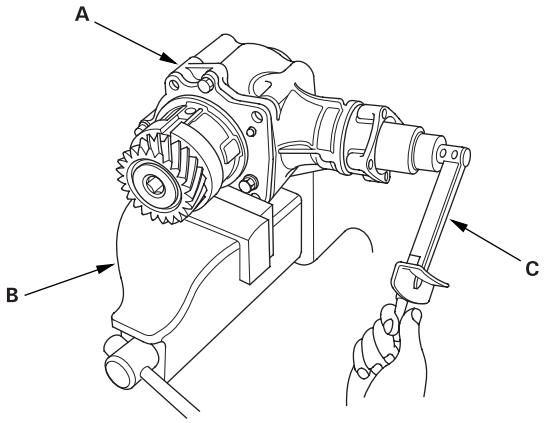
27. Install the dowel pin (A) to the transfer housing (B), then install the transfer holder assembly (C).

NOTE: Temporarily install the transfer holder assembly without the O-ring.



28. Secure the transfer housing (A) in a bench vise (B) with soft jaws, then rotate the companion flange several times to fit the tapered roller bearing.

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



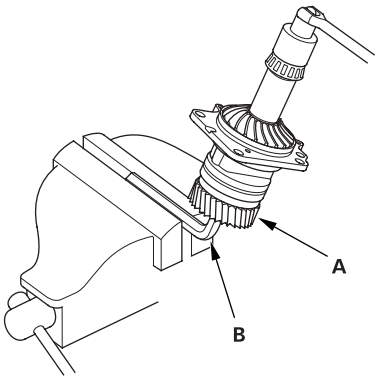
29. Measure the total starting torque using the torque wrench (C).

TOTAL STARTING TORQUE:
1.70 - 2.08 N·m (17.3 - 21.2 kgf·cm, 15.0 - 18.4 lbf·in.) + Transfer Driven Gear Shaft Starting Torque Value (wrote down in step 25).

30. Remove the transfer holder assembly from the transfer housing.

31. If the measurement is not within the specification, go to step 32.
If the measurement is within the specification, go to step 43.

32. Hold the transfer shaft (A) with a 14 mm Allen wrench (B) clamped in a bench vise then loosen the locknut.

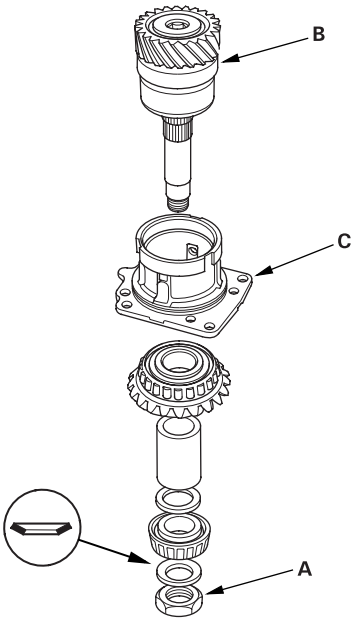


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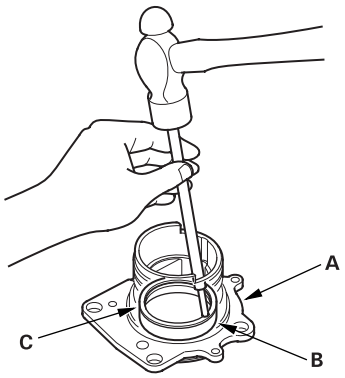
Transfer Reassembly (cont'd)

35 mm Thrust Shim Selection (cont'd)

33. Remove the locknut (A) and transfer shaft assembly (B) from the transfer holder (C).



34. Remove the tapered roller bearing outer race (A) and 76 mm thrust shim (B) from the transfer holder (C).

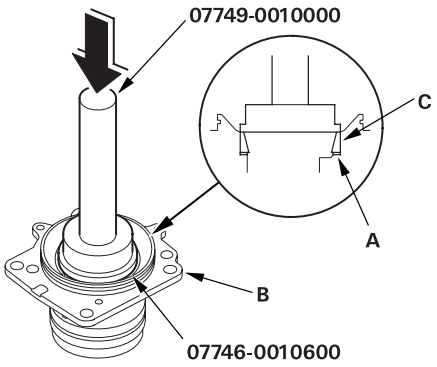


35. Measure the thickness of the removed 76 mm thrust shim, and select a new 76 mm shim.

THRUST SHIM, 76 mm

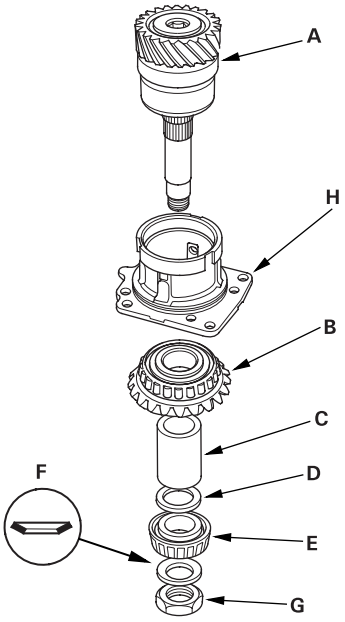
Shim No.	Part Number	Thickness
A	41361-PPS-000	1.20 mm (0.047 in.)
B	41362-PPS-000	1.23 mm (0.048 in.)
C	41363-PPS-000	1.26 mm (0.049 in.)
D	41364-PPS-000	1.29 mm (0.050 in.)
E	41365-PPS-000	1.32 mm (0.052 in.)
F	41366-PPS-000	1.35 mm (0.053 in.)
G	41367-PPS-000	1.38 mm (0.054 in.)
H	41368-PPS-000	1.41 mm (0.055 in.)
J	41369-PPS-000	1.44 mm (0.057 in.)
K	41370-PPS-000	1.47 mm (0.058 in.)
L	41371-PPS-000	1.50 mm (0.059 in.)
M	41372-PPS-000	1.53 mm (0.060 in.)
N	41373-PPS-000	1.56 mm (0.061 in.)
P	41374-PPS-000	1.59 mm (0.062 in.)
R	41375-PPS-000	1.62 mm (0.064 in.)
S	41376-PPS-000	1.65 mm (0.065 in.)
T	41377-PPS-000	1.68 mm (0.066 in.)
U	41378-PPS-000	1.71 mm (0.067 in.)
W	41379-PPS-000	1.74 mm (0.068 in.)
X	41380-PPS-000	1.77 mm (0.070 in.)
Y	41381-PPS-000	1.80 mm (0.071 in.)
Z	41382-PPS-000	1.83 mm (0.072 in.)
AA	41383-PPS-000	1.86 mm (0.073 in.)
AB	41384-PPS-000	1.89 mm (0.074 in.)
AC	41385-PPS-000	1.92 mm (0.076 in.)
AD	41386-PPS-000	1.95 mm (0.077 in.)
AE	41387-PPS-000	1.98 mm (0.078 in.)
AF	41388-PPS-000	2.01 mm (0.079 in.)
AG	41389-PPS-000	2.04 mm (0.080 in.)
AH	41390-PPS-000	2.07 mm (0.081 in.)
AJ	41391-PPS-000	2.10 mm (0.083 in.)
AK	41392-PPS-000	2.13 mm (0.084 in.)
AL	41393-PPS-000	2.16 mm (0.085 in.)
AM	41394-PPS-000	2.19 mm (0.086 in.)
AN	41395-PPS-000	2.22 mm (0.087 in.)
AP	41396-PPS-000	2.25 mm (0.089 in.)
AR	41397-PPS-000	2.28 mm (0.090 in.)
AS	41398-PPS-000	2.31 mm (0.091 in.)
AT	41399-PPS-000	2.34 mm (0.092 in.)
AU	41400-PPS-000	2.37 mm (0.093 in.)
AW	41401-PPS-000	2.40 mm (0.094 in.)
AX	41402-PPS-000	2.43 mm (0.096 in.)
AY	41403-PPS-000	2.46 mm (0.097 in.)
AZ	41404-PPS-000	2.49 mm (0.098 in.)
BA	41405-PPS-000	2.52 mm (0.099 in.)
BB	41406-PPS-000	2.55 mm (0.100 in.)
BC	41407-PPS-000	2.58 mm (0.102 in.)
BD	41408-PPS-000	2.61 mm (0.103 in.)
BE	41409-PPS-000	2.64 mm (0.104 in.)
BF	41410-PPS-000	2.67 mm (0.105 in.)

36. Install the 76 mm thrust shim (A) in the transfer holder (B).



37. Install the tapered roller bearing outer race (C) using the special tool and a press.

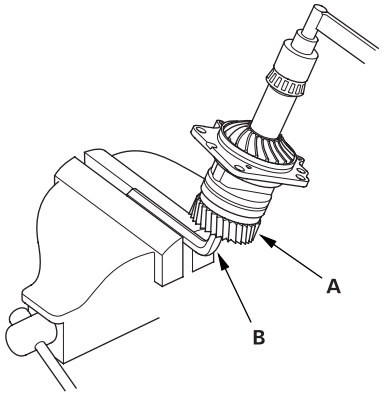
38. Install the transfer shaft assembly (A), transfer drive gear (B), transfer shaft collar (C), 25 mm thrust shim (D), tapered roller bearing (E), conical spring washer (F) and locknut (G) in the transfer holder (H).



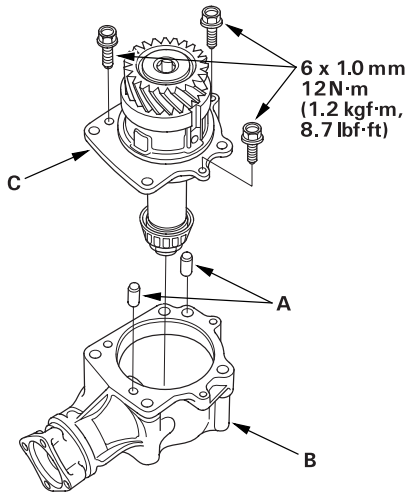
39. Hold the transfer shaft (A) with a 14 mm Allen wrench (B) clamped in a bench vise then tighten the locknut.

NOTE: Do not stake the locknut in this step.

TIGHTENING TORQUE:
118 N·m (12.0 kgf·m, 86.8 lbf·ft)



40. Install the dowel pin (A) to the transfer housing (B), then install the transfer holder assembly (C).



41. Recheck and make sure the total starting torque is within the specification.

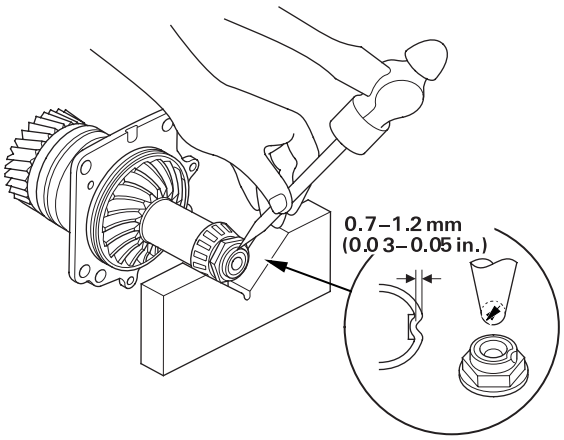
(cont'd)

Transfer Reassembly (cont'd)

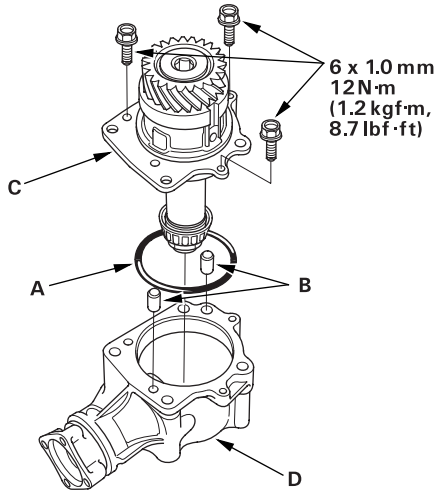
35 mm Thrust Shim Selection (cont'd)

42. Remove the transfer holder assembly from the transfer housing.

43. Stake the locknut on the transfer shaft using a 3.5 mm punch.



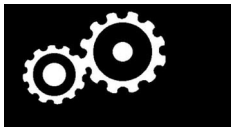
44. Coat the new O-ring (A) with MTF, install it on the transfer holder, then install the dowel pin (B) and transfer holder assembly (C) to the transfer housing (D).



14

Automatic Transmission
A/T

Automatic Transmission 14-2
A/T Gear Position Indicator 14-165
A/T Interlock System 14-172
Transmission End Cover 14-192
Transmission Housing 14-198
Valve Body 14-205
Torque Converter Housing 14-214
Shafts and Clutches 14-218
A/T Differential 14-264
Transfer Assembly 14-273



Automatic Transmission

Service Precautions for 4WD Model

This 4WD model does not have the feature that mechanically switches between 4WD (four-wheel drive) and 2WD (front-wheel drive).

Do not drive the vehicle with rear wheels on the ground even though the front wheels are off the ground. The front wheel power is conveyed to the rear wheels, and the vehicle will start off.

Always lift the vehicle up so all four wheels are off the ground when testing and inspecting the vehicle to rotate the wheels such as Pressure Tests.

Use the free rollers under the rear wheels when performing test the vehicle with the speedometer tester.

Precautions on using free rollers:

- Inspecting and testing using a chassis dynamometer is not feasible.
- Do not operate the accelerator, brake pedal or steering wheel abruptly. It may cause the vehicle to roll and create a hazardous condition.
- The maximum testing speed should be 50 km/h (31 mph).
- The maximum continuous operating time should be 3 minutes.
- Make sure to tie down the vehicle securely with the side anchor wires and center tie down wire. The free rollers are to be set under the rear wheels.

⚠ CAUTION ⚠

- Make sure to place the free rollers parallel to the roller of each speedometer tester.
- Putting the front and rear wheels on the speedometer testers and free rollers inappropriately may cause the vehicle to roll off or over the free rollers and create a hazardous condition.
- The side anchor wires and certain tie-down wire must be appropriately tensioned. If the wires have too much slack, the expected tie-down efficiency cannot be obtained.
- When attaching the side anchor wires and center tie-down wire, make sure they are not interfering with the bumper and other parts of the vehicle body.
- Do not attach the wires to any place other than the designed areas.
- Do not operate the speedometer testers at a speed more than 50 km/h (31 mph) or for more than 3 minutes.

1. Set the free rollers according to the wheel base and tread of the vehicle.
2. Move the vehicle to position the front wheels on the speedometer tester and the rear wheels on the free rollers. Make sure to align the center of the wheels to the center of the speedometer tester and the free rollers.
3. Tie down the vehicle securely using the towing hook and tie-down hook bracket to prevent the vehicle from rolling or over the free rollers.
4. Start the engine, shift the transmission into the [D] position, accelerate the vehicle gradually, and measure the vehicle speed.
5. After measurement, use the brake pedal to gradually decelerate and stop the vehicle.

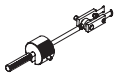
Special Tools

Ref. No.	Tool Number	Description	Qty
1	07GAD-SD40101	Driver Attachment, 78 x 90 mm	1
2	07HAC-PK40102	Housing Puller	1
3	07HAJ-PK40201	Preload Inspection Tool	1
4	07JAC-PH80000	Adjustable Bearing Remover Set	1
4-a	07JAC-PH80100	Bearing Remover Attachment	1
4-b	07JAC-PH80200	Remover Handle Assembly	1
4-c	07741-0010201	Remover Weight	1
5	07JAD-PH80101	Oil Seal Driver Attachment	1
6	07JAF-SJ80110	Installer Shaft 14 x 165 mm	1
7	07JAF-SJ80120	Installer Nuts 14 mm	2
8	07KAF-PS30120	Bearing Installer Attachment	1
9	07KAF-PS30200	Bearing Separator	1
10	07LAD-PW50601	Attachment, 40 x 50 mm	1
11	07LAE-PX40000	Clutch Spring Compressor Set	1
11-a	07LAE-PX40100	Clutch Spring Compressor Attachment	1
11-b	07HAE-PL50100	Clutch Spring Compressor Attachment	1
11-c	07GAE-PG40200	Clutch Spring Compressor Bolt Assembly	1
12	07LAF-PZ70110	Bearing Installer Attachment	1
13	07LGC-0010100	Snap Ring Pliers	1
14	07PAB-0010000	Mainshaft Holder Set	1
15	07PAB-0020000	Companion Flange Holder	1
16	07QAD-P0A0100	Driver Attachment, 42 mm I.D.	1
17	07ZAE-PRP0100	Clutch Compressor Attachment	1
18	07406-0020004	A/T Oil Pressure Gauge Set	1
19	07746-0010100	Driver Attachment, 32 x 35 mm	1
20	07746-0010200	Driver Attachment, 37 x 40 mm	1
21	07746-0010300	Driver Attachment, 42 x 47 mm	1
22	07746-0010400	Driver Attachment, 52 x 55 mm	1
23	07746-0010500	Driver Attachment, 62 x 68 mm	1
24	07746-0010600	Driver Attachment, 72 x 75 mm	1
25	07746-0010800	Driver Attachment, 22 x 24 mm	1
26	07746-0030100	Driver 40 mm I.D.	1
27	07746-0030400	Driver Attachment, 35 mm I.D.	1
28	07749-0010000	Handle Driver	1
29	07947-SD90101	Oil Seal Driver Attachment	1


1


2

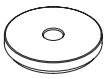

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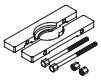

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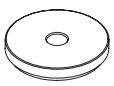

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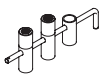

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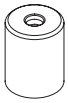

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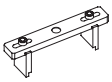

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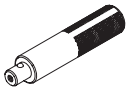

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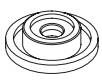

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19/20/21/22/ 23/24/25


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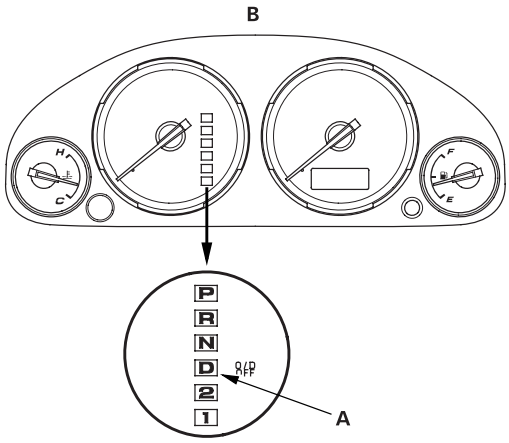

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General Troubleshooting Information

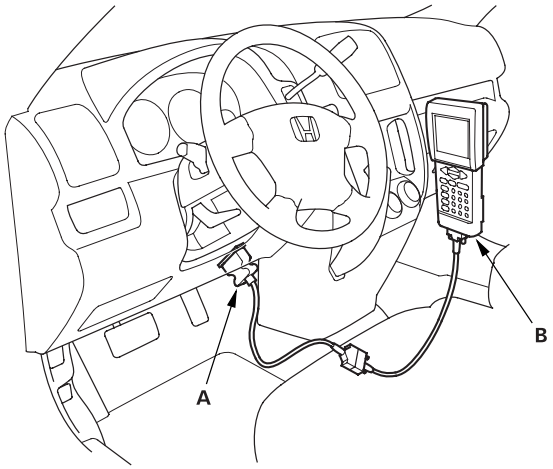
How to Check for DTCs with the PGM Tester/Scan Tool

When the Powertrain Control Module (PCM) senses an abnormality in the input or output systems, the [D] indicator (A) in the gauge assembly (B) will usually blink.



When the 16P Data Link Connector (DLC) (A) (located under the dash behind the center console) is connected to the OBD Scan Tool or Honda PGM Tester (B), it will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

NOTE: The illustration shows LHD model; RHD is symmetrical.



If the [D] indicator or MIL has been reported on, or if a driveability problem is suspected, follow this procedure:

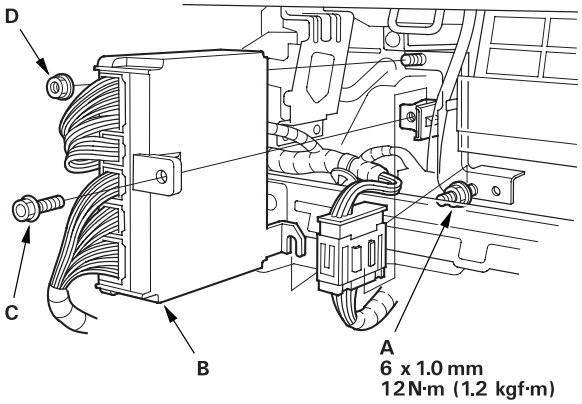
1. Connect the OBD Scan Tool or Honda PGM Tester to the DLC. (See the OBD Scan Tool or Honda PGM Tester user's manual for specific instructions. If you are using the Honda PGM Tester, make sure it is set to the SAE DTC type).
2. Turn the ignition switch ON (II), and observe the DTC on the screen.
3. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
4. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC except for DTC P0700. DTC P0700 means there is one or more A/T DTCs, and no problems were detected in the fuel and emissions circuit of the PCM.
5. Reset the DTC stored in the PCM with the OBD Scan Tool or PGM Tester.
6. Drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or at speeds over 30 mph (50 km/h), and then recheck for DTC(s). If the A/T DTC returns, go to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight.
7. Reset the radio preset stations, and set the clock.

NOTE: You can also check for DTCs with SCS signal terminals short-circuited using with the special tool (DLC pin box 07WAJ-0010100) (see section Appendix).

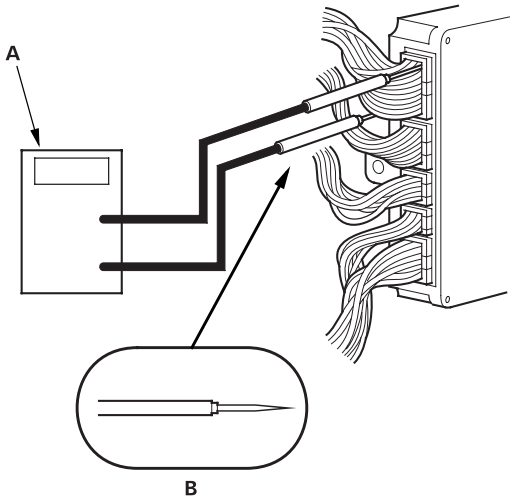
How to Troubleshoot Circuits at the PCM

1. Remove the glove box stops, then bring the glove box down.
2. Loosen the mounting nut (A) on the lower portion of the PCM (B), and remove the mounting bolt (C) and nut (D).

   NOTE: The illustration shows LHD model; RHD is symmetrical.



3. Lift the PCM up to clear the mounting nut on the lower portion of the PCM, then pull out the PCM.
4. Inspect the circuit on the PCM, according to the DTC troubleshooting with a digital multitester (A) and tapered tip probe (B) as shown.



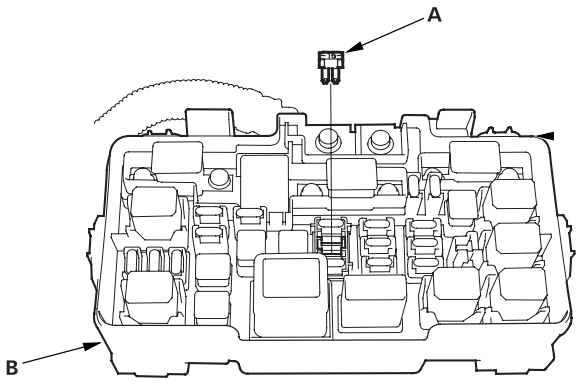
5. If you cannot get to the wire side of the connector or the wire side is sealed, disconnect the connector and use the tester probe to probe the connectors from the terminal side. Do not force the probe into the connector.

(cont'd)

General Troubleshooting Information (cont'd)

PCM Reset Procedure

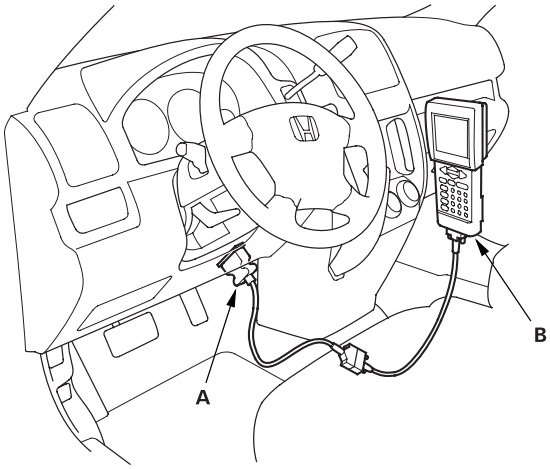
1. Write down the radio station presets.
2. Turn the ignition switch OFF.
3. Remove the No. 6 ECU fuse (15A) (A) from the under-hood fuse/relay box (B) for more than 10 seconds.



How to End a Troubleshooting Session

This procedure must be done after any troubleshooting.

1. Turn the ignition switch OFF.
2. Disconnect the Honda PGM tester (A) from the DLC (B).
   NOTE: The illustration shows LHD model; RHD is symmetrical.



3. Reset the PCM.
4. Turn the ignition switch ON (II).
5. To verify that the problem is repaired, test-drive the vehicle for several minutes at speeds over 30 mph (50 km/h).

DTC Troubleshooting Index

DTC SAE Code (Honda Code)	Detection Item	[D] Indicator	MIL	Page
P0710 (28)	ATF temperature sensor	Blinks	OFF	(see page 14-66)
P0715 (15)	Mainshaft speed sensor	Blinks	ON	(see page 14-68)
P0720 (9)	Countershaft speed sensor	Blinks	ON	(see page 14-71)
P0745 (76)	Hydraulic control system of A/T clutch pressure control solenoid valve A circuit	Blinks	ON	(see page 14-75)
P0748 (16)	A/T clutch pressure control solenoid valve A	Blinks	ON	(see page 14-76)
P0750 (70)	Hydraulic control system of shift solenoid valve A circuit	Blinks	ON	(see page 14-78)
P0753 (7)	Shift solenoid valve A	Blinks	ON	(see page 14-79)
P0758 (8)	Shift solenoid valve B	Blinks	ON	(see page 14-81)
P0763 (22)	Shift solenoid valve C	Blinks	ON	(see page 14-83)
P0773 (61)	Shift solenoid valve E	Blinks	ON	(see page 14-85)
P0775 (77)	Hydraulic control system of A/T clutch pressure control solenoid valve B circuit	Blinks	ON	(see page 14-87)
P0778 (23)	A/T clutch pressure control solenoid valve B	Blinks	ON	(see page 14-88)
P0780 (45)	Mechanical problem in hydraulic control system	Blinks	ON	(see page 14-90)
P0795 (78)	Hydraulic control system of A/T clutch pressure control solenoid valve C circuit	Blinks	ON	(see page 14-91)
P0798 (29)	A/T clutch pressure control solenoid valve C	Blinks	ON	(see page 14-92)
P0840 (25)	2nd clutch pressure switch	Blinks	OFF	(see page 14-94)
P0845 (26)	3rd clutch pressure switch	Blinks	OFF	(see page 14-96)
P1705 (5)	Transmission range switch (short to ground)	Blinks	ON	(see page 14-98)
P1706 (6)	Transmission range switch (open)	OFF	ON	(see page 14-102)
P1717 (62)	Transmission range switch (short or open in [R] circuit)	Blinks	OFF	(see page 14-104)

Symptom Troubleshooting Index

These symptom DO NOT trigger Diagnostic Trouble Codes (DTCs) or cause the [D] indicator to blink. If the Malfunction Indicator Lamp (MIL) was reported ON or the [D] indicator has been blinking, check for DTCs. But if the vehicle has one of the systems in the following chart, check the probable cause(s) for it, in the sequence listed, until you find the problem.

Symptom	Probable cause(s)	Notes
When you turn the ignition switch ON (II), the [D] indicator comes on and stays on or never comes on at all	1 Communication line between multiplex control unit and gauge assembly defective 2 Blown indicator bulb	Check that the MIL indicates code for communication line between the multiplex control unit and gauge assembly (see page 22A-231). If the MIL does not indicate code, replace the indicator bulb (see page 14-171).
[D], [2], or [1] indicator does not indicate while the shift lever is in that position		
Over-drive (O/D) switch does not operate even though the switch is pushed in [D] position	A problem in the O/D switch circuit	Check the O/D switch circuit (see page 14-106).
Shift lever cannot be moved from [P] position while you're pushing on the brake pedal	A problem in the shift lock system (interlock system)	Check the interlock system - shift lock system circuit (see page 14-175).
Shift lever cannot pass through [R] position from [N] position	A problem in the reverse lock system of interlock system	Check the interlock system - reverse lock system circuit (see page 14-178).
Ignition key cannot be moved from ACC (I) position to LOCK (0) position, when you're pushing it with the shift lever in [P] position	A problem in the key interlock system (interlock system)	Check the interlock system - key interlock system circuit (see page 14-179).

Symptom	Probable cause(s)	Notes
Engine runs, but vehicle does not move in any gear	**1** Low ATF level **2** Shift cable broken or out of adjustment **3** Joint in shift cable and transmission or body worn **4** ATF pump worn or binding **5** Regulator valve stuck or spring worn **6** ATF strainer clogged **7** Mainshaft worn or damaged **8** Final gears worn or damaged **9** Transmission-to-engine assembly error **10** Axle disengaged	• Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check for loose shift cable on the shift lever and the transmission control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Measure line pressure. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage. • Check the ATF strainer for clogged. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused debris, and no cause for contamination is found, replace the torque converter. • Inspect the differential pinion shaft for wear under the pinion gears. If the differential pinion shaft is worn, overhaul the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and flush the torque converter, cooler, and lines.
Vehicle moves in [2] or [R], but not in [D] or [1] position	**1** 1st accumulator defective **2** 1st gears worn or damaged **3** 1st clutch defective	• Check the 1st clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch and plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged.

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Vehicle moves in [D], [1], [R], but not in [2] position	1 2nd accumulator defective 2 2nd gears worn or damaged 3 2nd clutch defective	• Check the 2nd clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate.
Vehicle moves in [D], [2], [1], but not in [R] position	1 Shift solenoid valve E defective 2 Shift fork shaft stuck 3 Shift valve E defective 4 4th/reverse accumulator defective 5 4th clutch defective 6 Reverse gears worn or damaged	• Check for [D] indicator indication, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-rings for wear and damage. • Check for a missing shift fork bolt on the shift fork shaft. • Check the 4th clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Inspect the reverse selector gear teeth chamfers, and inspect engagement teeth chamfers of the countershaft 4th gear and reverse gear. Replace the reverse gears and the reverse selector if they are worn or damaged. If the transmission clicking, grinding, or whirring noise, also replace the mainshaft 4th gear, reverse idler gear, and countershaft 4th gear.
Poor acceleration; flares on starting off in [D] position: Stall speed high in [2] and [1] positions, and in [D] position in 1st and 2nd gears	1 Low ATF level 2 Shift cable broken or out of adjustment 3 ATF pump worn or binding 4 Regulator valve stuck or spring worn 5 ATF strainer clogged 6 Torque converter check valve defective	• Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Check for loose shift cable on the shift lever and the transmission control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Check the ATF strainer for clogged. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused debris, and no cause for contamination is found, replace the torque converter.

Symptom	Probable cause(s)	Notes
Poor acceleration; flares on starting off in [D] position: Stall spee4d high when starting off in [2] position	2nd clutch defective	• Check the 2nd clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate.
Poor acceleration; flares on starting off in [D] position: Stall speed high in [R] position	**1** Shift cable broken or out of adjustment **2** 4th clutch defective	• Check for loose shift cable on the shift lever and the transmission control shaft. • Check the 4th clutch pressure in [D] and [R] positions. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate.
Poor acceleration; flares on starting off in [D] position: Stall speed low in [2] and [1] positions, and in [D] position in 1st and 2nd gears	**1** Shift solenoid valve E defective **2** Torque converter one-way clutch defective **3** Engine output low **4** Torque converter clutch piston defective **5** Lock-up shift valve defective **6** Restricted ATF cooler	• Check the [D] indicator indication, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-ring for wear and damage. • Replace the torque converter. • Check ATF cooler system for restriction.
Poor acceleration; flares on starting off in [D] position: Stall speed low in [R] position	**1** Torque converter one-way clutch defective **2** Engine output low **3** Torque converter clutch piston defective **4** Lock-up shift valve defective **5** Restricted ATF cooler	• Replace the torque converter. • Check ATF cooler system for restriction.

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Engine idle vibration	1 Low ATF level 2 Shift solenoid valve E defective 3 Drive plate defective or transmission misassembled 4 Engine output low 5 Torque converter clutch piston defective 6 ATF pump worn or binding 7 Lock-up shift valve defective 8 Restricted ATF cooler 9 Misadjusted engine and transmission mounts	• Check ATF level and check ATF cooler lines for leakage and loose connections. If necessary, flush ATF cooler lines. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Inspect the ATF strainer for clogged with particles of steel or aluminum. If the ATF strainer is clogged, replace it, and flush the torque converter, cooler, and lines. • Check the [D] indicator indication, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-rings for wear and damage. • Check for a misinstalled/damaged drive plate. • Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine and transmission mounts as outlined in the engine section of this shop manual. • Replace the torque converter. • Check ATF cooler system for restriction.
Vehicle moves in [N] position	1 Excessive ATF 2 Foreign material in separator plate orifice 3 Relief valve defective 4 1st clutch defective 5 2nd clutch defective 6 3rd clutch defective 7 4th clutch defective 8 Clutch end plate-to-top disc clearance incorrect 9 Needle bearing seized up, worn, or damaged 10 Thrust washer seized up, worn, or damaged	• Check ATF level, and drain ATF if it is an excess. • Check the ATF strainer for clogged. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused debris, and no cause for contamination is found, replace the torque converter. • Check the 1st, 2nd, 3rd and 4th clutch pressures. • Inspect the clutch piston, clutch piston check valve (3rd and 4th), and O-rings. Check the spring retainer and retainer seal (1st and 2nd) for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the mainshaft if the bushing for the 3rd clutch feed pipe is loose or damaged.

Symptom	Probable cause(s)	Notes
Late shift from [N] position to [D] position, or excessive shock when shifted into [D] position	**1** Shift solenoid valve E defective **2** A/T clutch pressure control solenoid valve A defective **3** A/T clutch pressure control solenoid valves B and C defective **4** Shift cable broken or out of adjustment **5** Joint in shift cable and transmission or body worn **6** Mainshaft speed sensor defective **7** Countershaft speed sensor defective **8** ATF temperature sensor defective **9** Foreign material in separator plate orifice **10** Servo control valve defective **11** 1st accumulator defective **12** 1st check ball stuck **13** Lock-up shift valve defective **14** 1st clutch defective	• Check the [D] indicator indication, check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the mainshaft speed sensor and countershaft speed sensor installation. • Check for loose shift cable on the shift lever and the transmission control shaft. • Check the 1st clutch pressure. • Inspect the clutch piston and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged.
Late shift from [N] position to [R] position, or excessive shock when shifted into [R] position	**1** Shift solenoid valve E defective **2** A/T clutch pressure control solenoid valve A defective **3** Shift cable broken or out of adjustment **4** Joint in shift cable and transmission or body worn **5** Mainshaft speed sensor defective **6** Countershaft speed sensor defective **7** ATF temperature sensor defective **8** Shift fork shaft stuck **9** Foreign material in separator plate orifice **10** Shift valve E defective **11** 4th/reverse accumulator defective **12** Lock-up shift valve defective **13** 4th clutch defective	• Check the [D] indicator indication, check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the mainshaft speed sensor and countershaft speed sensor installation. • Check for loose shift cable on the shift lever and the transmission control shaft. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Check for a missing shift fork bolt on the shift fork shaft. • Check the 4th clutch pressure. • Inspect the servo valve and O-ring.

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
No shift	1 Mainshaft speed sensor defective 2 Countershaft speed sensor defective	Check the [D] indicator indication, and check for loose connectors. Check the mainshaft and countershaft speed sensor installation.
Excessive shock or flares on all upshifts and downshifts	1 A/T clutch pressure control solenoid valves B and C defective 2 Mainshaft speed sensor defective 3 Countershaft speed sensor defective 4 ATF temperature sensor defective 5 Foreign material in separator plate orifice	• Check the [D] indicator indication, check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the mainshaft speed sensor and countershaft speed sensor installation.
Excessive shock or flares on 1-2 upshift or 2-1 downshift	1 Shift solenoid valve E defective 2 A/T clutch pressure control solenoid valve A defective 3 A/T clutch pressure control solenoid valves B and C defective 4 2nd clutch pressure switch defective 5 Foreign material in separator plate orifice 6 1st accumulator defective 7 2nd accumulator defective 8 1st check ball stuck 11 2nd check ball stuck 10 Lock-up shift valve defective 11 1st clutch defective 12 2nd clutch defective	• Check the [D] indicator indication, check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the 1st and 2nd clutch pressures. • Inspect the clutch piston and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are warn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged.

Symptom	Probable cause(s)	Notes
Excessive shock or flares on 2-3 upshift or 3-2 downshift	**1** A/T clutch pressure control solenoid valves B and C defective **2** 3rd clutch pressure switch defective **3** Foreign material in separator plate orifice **4** 2nd accumulator defective **5** 3rd accumulator defective **6** 2nd check ball stuck **7** 2nd clutch defective **8** 3rd clutch defective	• Check the [D] indicator indication, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Check the 2nd and 3rd clutch pressures. • Inspect the clutch piston, clutch piston check valve (3rd), and O-rings. Check the spring retainer and retainer seal (2nd) for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are warn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the mainshaft if the bushing for the 3rd clutch feed pipe is loose or damaged.
Excessive shock or flares on 3-4 upshift or 4-3 downshift	**1** A/T clutch pressure control solenoid valves B and C defective **2** Foreign material in separator plate orifice **3** 3rd accumulator defective **4** 4th accumulator defective **5** 3rd clutch defective **6** 4th clutch defective	• Check the [D] indicator indication, check for loose connectors. Inspect the solenoid valve filter/gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the 3rd and 4th clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer for wear and damage. Inspect the clutch end plate-to-top disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate phase difference. If the phase difference is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and O-ring under the feed pipe guide. • Replace the mainshaft if the bushing for the 3rd clutch feed pipe is loose or damaged.

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Syptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Noise from transmission in all shift lever positions	1 ATF pump worn or binding 2 Mainshaft bearing, countershaft bearing, or secondary shaft bearing defective	• Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage. • Inspect the ATF strainer for clogged with particles of steel or aluminum. If the ATF strainer is clogged, replace it, and flush the torque converter, cooler, and lines. • Inspect the mainshaft, countershaft and secondary shaft for wear or damage.
Vehicle does not accelerate more than 31 mph (50 km/h)	Torque converter one-way clutch defective	• Replace the torque converter. • Check ATF cooler system for restriction.
Vibration in all shift lever positions	Drive plate defective or transmission misassembled	• Check for a misinstalled/damaged drive plate. • Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine and transmission mounts as outlined in the engine section of this shop manual.

Symptom	Probable cause(s)	Notes
Shift lever does not operate smoothly	1 Transmission range switch defective or out of adjustment 2 Shift cable broken out of adjustment 3 Joint in shift cable and transmission or body worn	• Check the [D] indicator indication, and check for loose connectors. Inspect the transmission range switch for operation. • Check for loose shift cable at the shift lever and the transmission control shaft.
Transmission does not shift into [P] position	1 Shift cable broken or out of adjustment 2 Joint in shift cable and transmission or body worn 3 Park mechanism defective	• Check for loose shift cable at the shift lever and the transmission control shaft. • Check the park pawl spring installation and the park lever spring installation. If installation is incorrect, install the spring correctly. Make sure that the park lever stop is not installed upside down. Check the distance between the park pawl shaft and park lever roller pin. If the distance is out of tolerance, adjust the distance with the park lever stop.
Lock-up clutch does not disengage	1 Shift solenoid valve E defective 2 A/T clutch pressure control solenoid valve A defective 3 Torque converter clutch piston defective 4 Lock-up shift valve defective 5 Lock-up control valve defective	• Check the [D] indicator indication, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter.
Lock-up clutch operates unstable	1 Shift solenoid valve E defective 2 A/T clutch pressure control solenoid valve A defective 3 Torque converter clutch piston defective 4 Torque converter check valve defective 5 Lock-up shift valve defective 6 Lock-up control valve defective	• Check the [D] indicator indication, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter.

(cont'd)

Syptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Lock-up clutch does not engage	1 Shift solenoid valve E defective 2 A/T clutch pressure control solenoid valve A defective 3 Mainshaft speed sensor defective 4 Countershaft speed sensor defective 5 Torque converter clutch piston defective 6 Torque converter check valve defective 7 Lock-up shift valve defective 8 Lock-up control valve defective	• Check the [D] indicator indication, and check for loose connectors. Inspect the solenoid valve filter/gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter. • Check the mainshaft speed sensor and countershaft speed sensor installation.
A/T gear position indicator does not indicate shift lever positions	1 Transmission range switch defective or out of adjustment 2 Shift cable broken or out of adjustment 3 Joint in shift cable and transmission or body worn	• Check the [D] indicator indication, and check for loose connectors. Inspect the transmission range switch operation. • Check for loose shift cable at the shift lever and the transmission control shaft.
Speedometer and odometer do not operate	Countershaft speed sensor defective	• Check the [D] indicator indication, and check for loose connectors. Inspect the transmission range switch operation. • Check the countershaft speed sensor installation.
Transmission shifts up during low-rev engine speed condition; engine cannot rev up to high speed	Engine rocker arms defective	Check the engine rocker arms as described in the engine section of this shop manual.

System Description

General Operation

The automatic transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled unit which provides 4 speeds forward and 1 reverse. The entire unit is positioned in line with the engine.

Torque Converter, Gears, and Clutches

The torque converter consists of a pump, turbine, and stator assembly in a single unit. They are connected to the engine crankshaft so they turn together as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as flywheel while transmitting power to the transmission mainshaft, the transmission has three parallel shafts; the mainshaft, the countershaft, the secondary shaft. The mainshaft is in line with the engine crankshaft, and includes the 3rd and 4th clutches, and gears for 3rd, 4th, reverse, and idler. The mainshaft reverse gear is integral with the mainshaft 4th gear. The countershaft includes the gears for 1st, 2nd, 3rd, 4th, reverse, park, and the final drive. The final drive gear is integral with the countershaft. The countershaft 4th gear and the countershaft reverse gear can be locked to the countershaft providing the 4th or reverse gear, depending on which way the selector is moved. The secondary shaft includes the 1st and 2nd clutches, and gears for 1st, 2nd, and idler. The idler shaft is located between the mainshaft and secondary shaft, and the idler gear transmits power between the mainshaft and the secondary shaft. The gears on the mainshaft and the secondary shaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft and the secondary shaft to the countershaft provide [D], [2], [1], and [R] positions.

Electronic Control

The electronic control system consists of the Powertrain Control Module (PCM), sensors, and solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, behind the glove box.

Hydraulic Control

The valve bodies include the main valve body, the regulator valve body, and the servo body. They are bolted to the torque converter housing. The main valve body contains the manual valve, the shift valves A, B, C, and E, the relief valve, the lock-up control valve, the cooler check valve, the servo control valve, and the ATF pump gears. The regulator valve body contains the regulator valve, the torque converter check valve, lock-up shift valve, and the 1st accumulator. The servo body contains the servo valve, the CPB valve, accumulators for 2nd, 3rd and 4th and shift solenoid valves for A, B, C, and E. Fluid from the regulator passed through the manual valve to the various control valves. The 1st and 3rd clutches receive fluid their respective feed pipes, and the 2nd and the 4th clutches receive fluid from the internal hydraulic circuit.

Shift Control Mechanism

The PCM controls to shift gears the shift solenoid valves A, B, C, and E, and the A/T clutch pressure control solenoid valves A, B, and C, while receiving input signals from various sensors and switches located throughout the vehicle. The shift solenoid valves shift the positions of the shift valves to switch the port leading hydraulic pressure to the clutch. The A/T clutch pressure control solenoid valves A, B, and C regulate their respective pressure, and pressurize to the clutches to engage it and its corresponding gear. The pressures of the A/T clutch pressure control solenoid valves also apply to the shift valves to switch the port.

Lock-up Mechanism

The lock-up mechanism operates in [D] position (3rd and 4th) and [D] position over-drive off mode (3rd). The pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the torque converter clutch piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with the hydraulic control, the PCM optimizes the timing and volume of the lock-up mechanism. When the shift solenoid valve E is turned on by the PCM, shift solenoid valve E pressure switch the lock-up shift valve lock-up on and off. The A/T clutch pressure control solenoid valve A and the lock-up control valve control the volume of the lock-up conditions.

(cont'd)

System Description (cont'd)

General Operation (cont'd)

Gear Selection

The shift lever has six positions: [P] PARK, [R] REVERSE, [N] NEUTRAL, [D] DRIVE 1st through 4th gear range with Over-drive mode, and 1st through 3rd gear range with Over-drive OFF mode, [2] 2nd gear, and [1] 1st gear.

Position	Description
[P] PARK	Front wheels locked; park pawl engaged with park gear on countershaft. All clutches are released.
[R] REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch engaged.
[N] NEUTRAL	All clutches are released.
[D] DRIVE with Over-drive mode (1st through 4th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshifts through 3rd, 2nd, and 1st on deceleration to stop. The lock-up mechanism operates in 3rd and 4th gears.
[D] DRIVE with Over-drive OFF mode (1st through 3rd)	For rapid acceleration at highway speeds and general driving, up-hill and down-hill driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop. The lock-up mechanism operates in 3rd gear.
[2] SECOND	Used for engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up and down.
[1] FIRST	Used for engine braking; stays in 1st gear, does not shift up.

Starting is possible only in [P] and [N] positions because of a slide-type neutral-safety switch.

Automatic Transaxle (A/T) Gear Position Indicator

The A/T gear position indicator in the instrument panel shows which position has been selected.

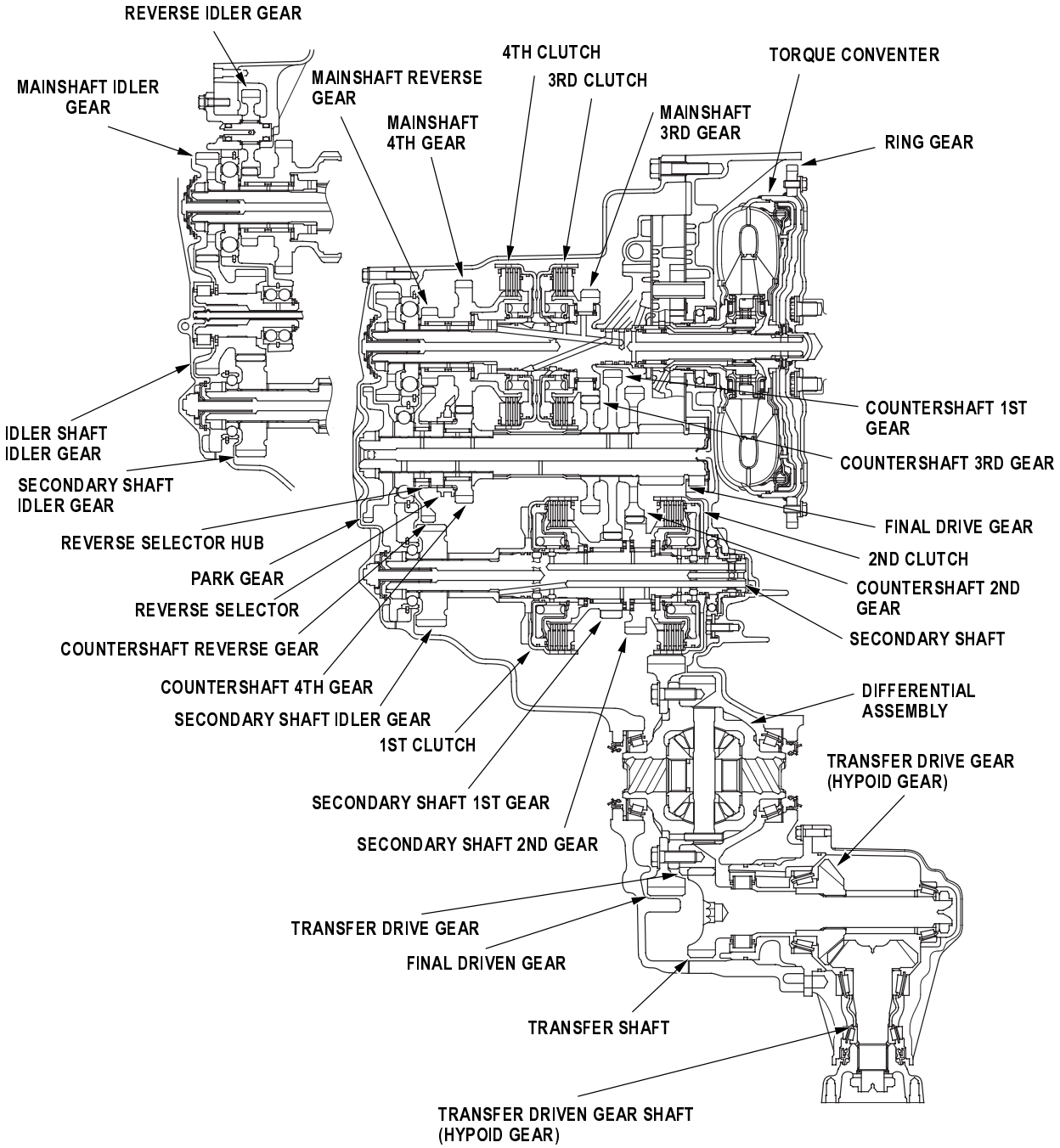
Transfer Mechanism (4WD)

The transfer mechanism consists of the transfer drive gear on the differential, the transfer shaft, the transfer drive gear (hypoid gear), the transfer driven gear shaft (hypoid gear), and the companion flange. The transfer mechanism assembly is on the rear of the transmission, beside the differential. The transfer drive gear on the differential drives the transfer gear shaft and transfer driven gear (hypoid gear), and the transfer drive gear (hypoid gear) drives the transfer driven gear shaft (hypoid gear). Power is transmitted from the transfer drive gear on the differential to the rear differential via the transfer and the propeller shaft.

Transmission Cutaway View

NOTE: The illustration shows 4WD transmission on K20A4 and K20A5 engine models; 2WD does not have the transfer mechanism, K24A1 engine model is similar.

Idler Gears Section Cutway View



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System Description (cont'd)

Clutches

The 4-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and steel plates, and they are free to slide past each other. This allows the gear to spin independently on its shaft, transmitting no power.

1st Clutch
The 1st clutch engages/disengages 1st gear, and is located at the middle of the secondary shaft. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

2nd Clutch
The 2nd clutch engages/disengages 2nd gear, and is located at the end of the secondary shaft, opposite the end cover. The 2nd clutch is supplied hydraulic pressure by a circuit connected to the internal hydraulic circuit.

3rd Clutch
The 3rd clutch engages/disengages 3rd gear, and is located at the middle of the mainshaft. The 3rd clutch is joined back-to-back to the 4th clutch. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

4th Clutch
The 4th clutch engasges/disengages 4th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 3rd clutch. The 4th clutch is supplied hydraulic pressure by a circuit connected to the internal hydraulic circuit.

Gear operation
Gears on the mainshaft:
- The 4th gear is engages/disengages with the mainshaft by the 4th clutch.
- The 3rd gear is engages/disengages with the mainshaft by the 3rd clutch.
- The reverse gear is engages/disengages with the mainshaft by the 4th clutch.
- The idler gear is splined with the mainshaft, and rotates with the mainshaft.

Gears on the countershaft:
- The final drive gear is integral with the countershaft.
- The 1st, 2nd, 3rd, and park gears are splined with the countershaft, and rotates with the countershaft.
- The 4th gear and reverse gear are rotate freely from the countershaft. The reverse selector engages 4th gear and reverse gear with the reverse selector hub. The reverse selector hub is splined to the countershaft so that the 4th gear and reverse gear engage with the countershaft.

Gears on the secondary shaft:
- The 1st gear is engaged/disengages with the secondary shaft by the 1st clutch.
- The 2nd gear is engaged/disengages with the secondary shaft by the 2nd clutch.
- The idler gear is splined with the secondary shaft, and rotates with the secondary shaft.

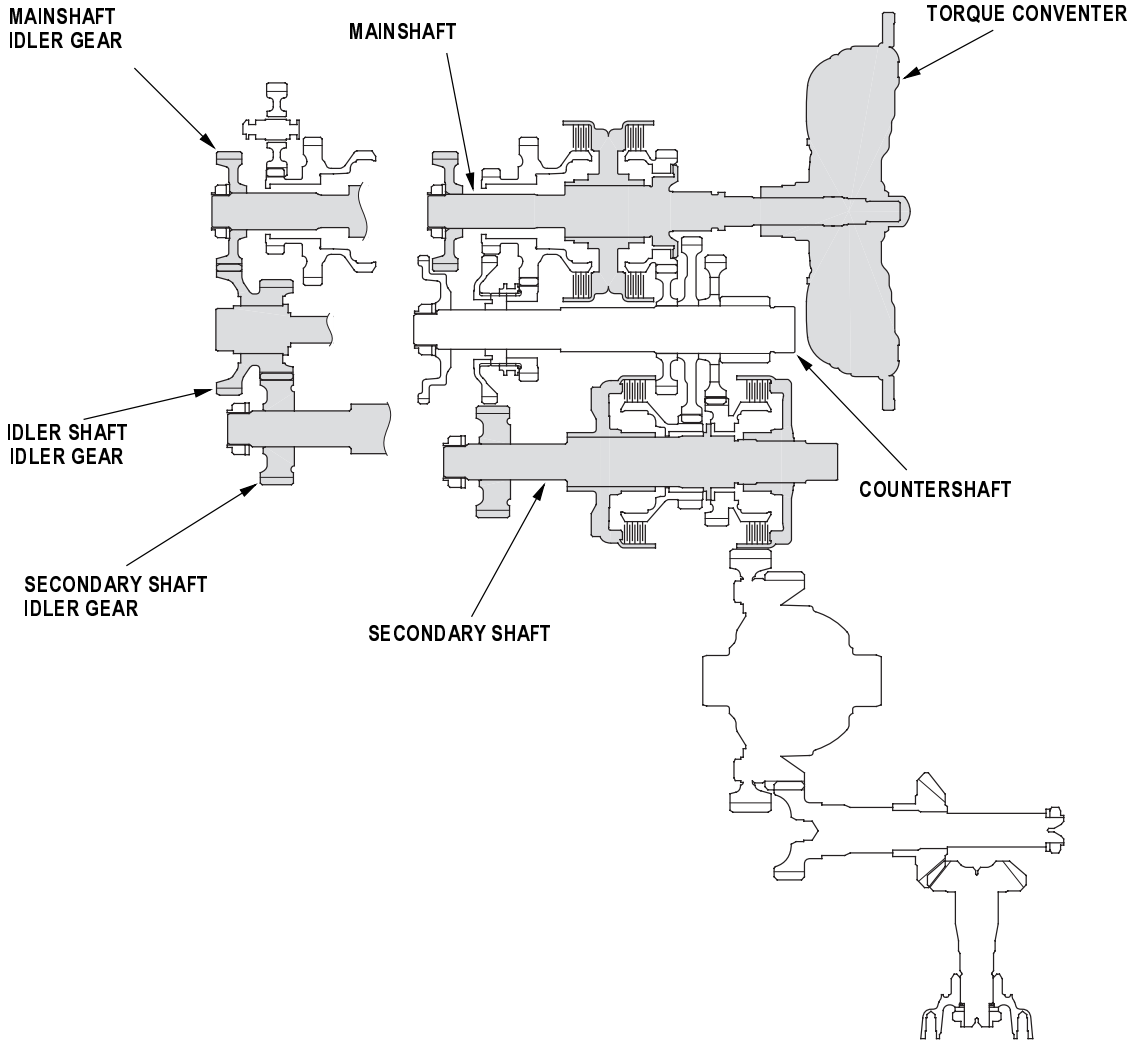
The idler gear on the idler shaft transmits power between the mainshaft and the secondary shaft.
The reverse idler gear transmits power from the mainshaft reverse gear to the countershaft reverse gear, and changes rotation direction of the countershaft to reverse.

[P] Position
Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the park pawl interlocking the park gear.

[N] Position
Engine power transmitted from the torque converter drives the mainshaft idler gear, the idler shaft idler gear, and the secondary shaft idler gear, but hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. In this position, the position of the reverse selector differs according to whether the shift lever shifted from [D] or [R] position:

- When shifted from [D] position, the reverse selector engages with the countershaft 4th gear and the reverse selector hub, and the 4th gear engages with the countershaft.
- When shifted from [R] position, the reverse selector engages with the countershaft reverse gear and the reverse selector hub, and the reverse gear engages with the countershaft.

NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



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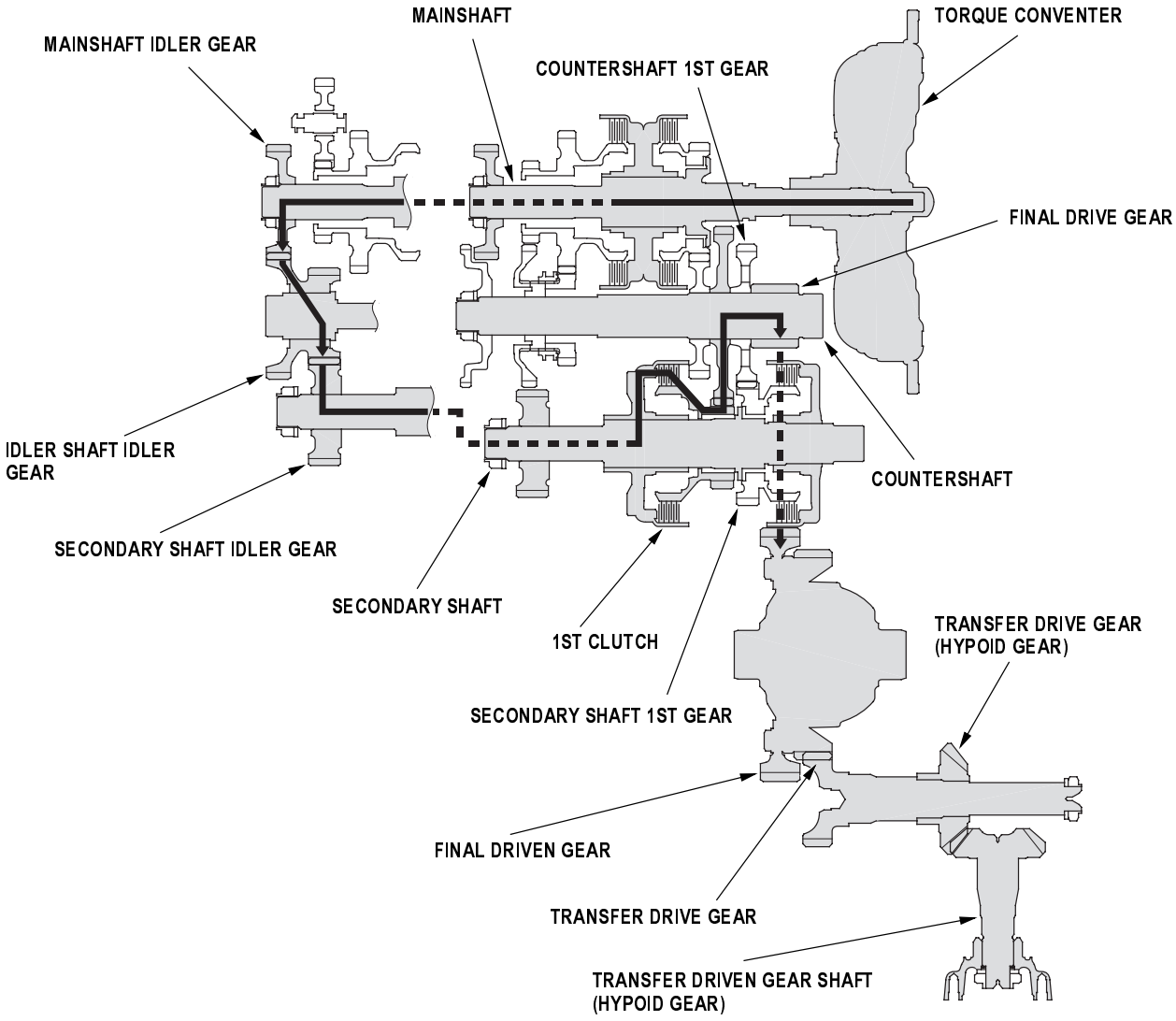
System Description (cont'd)

Power Flow

1st Gear

- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft.
- The mainshaft idler gear drives the secondary shaft via the idler shaft idler gear and the secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).

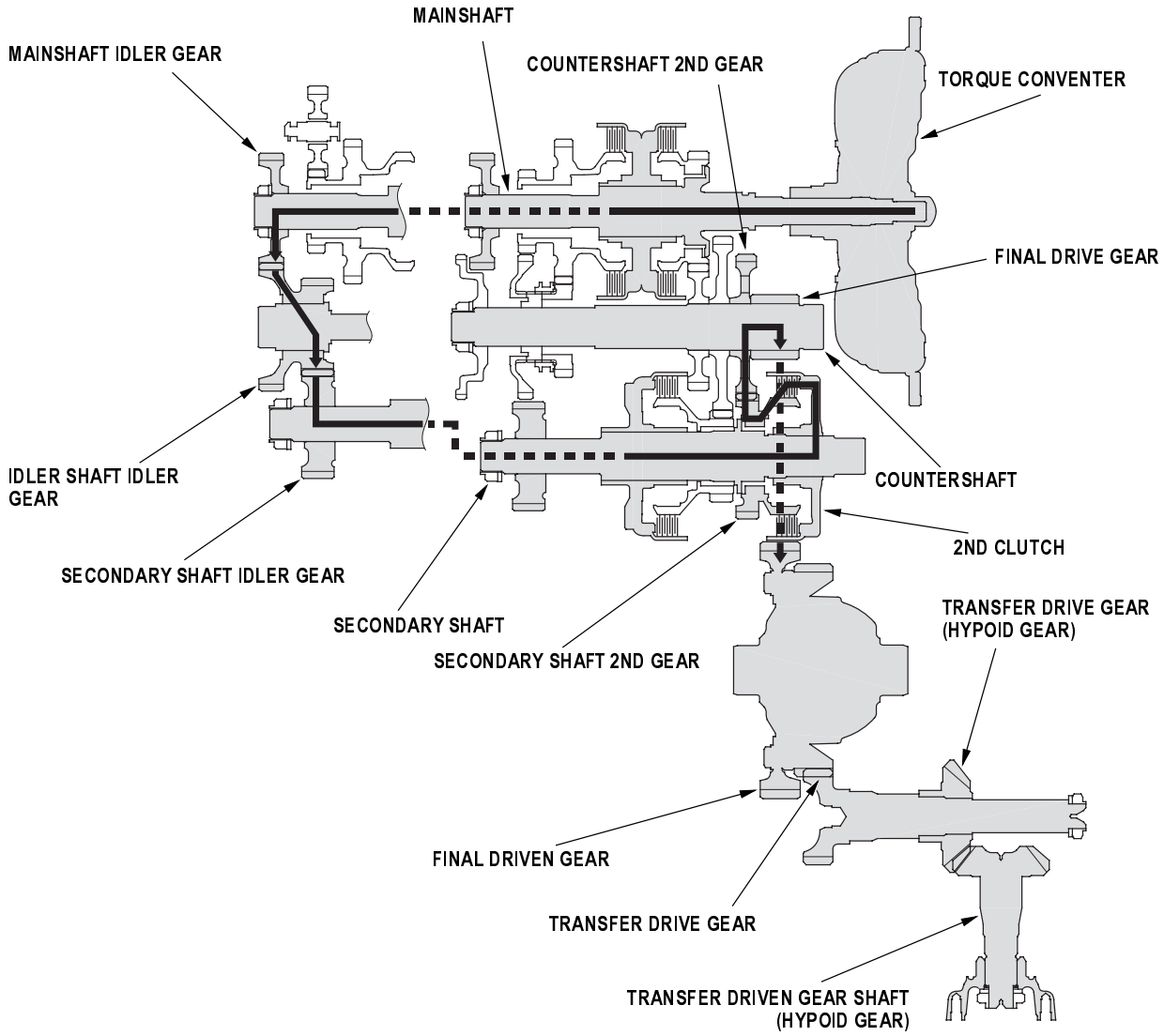
NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



2nd Gear

- Hydraulic pressure is applied to the 2nd clutch, then the 2nd clutch engages the secondary shaft 2nd gear with the secondary shaft.
- The mainshaft idler gear drives the secondary shaft via the idler shaft idler gear and the secondary shaft idler gear.
- The secondary shaft 2nd gear drives the countershaft 2nd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).

NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



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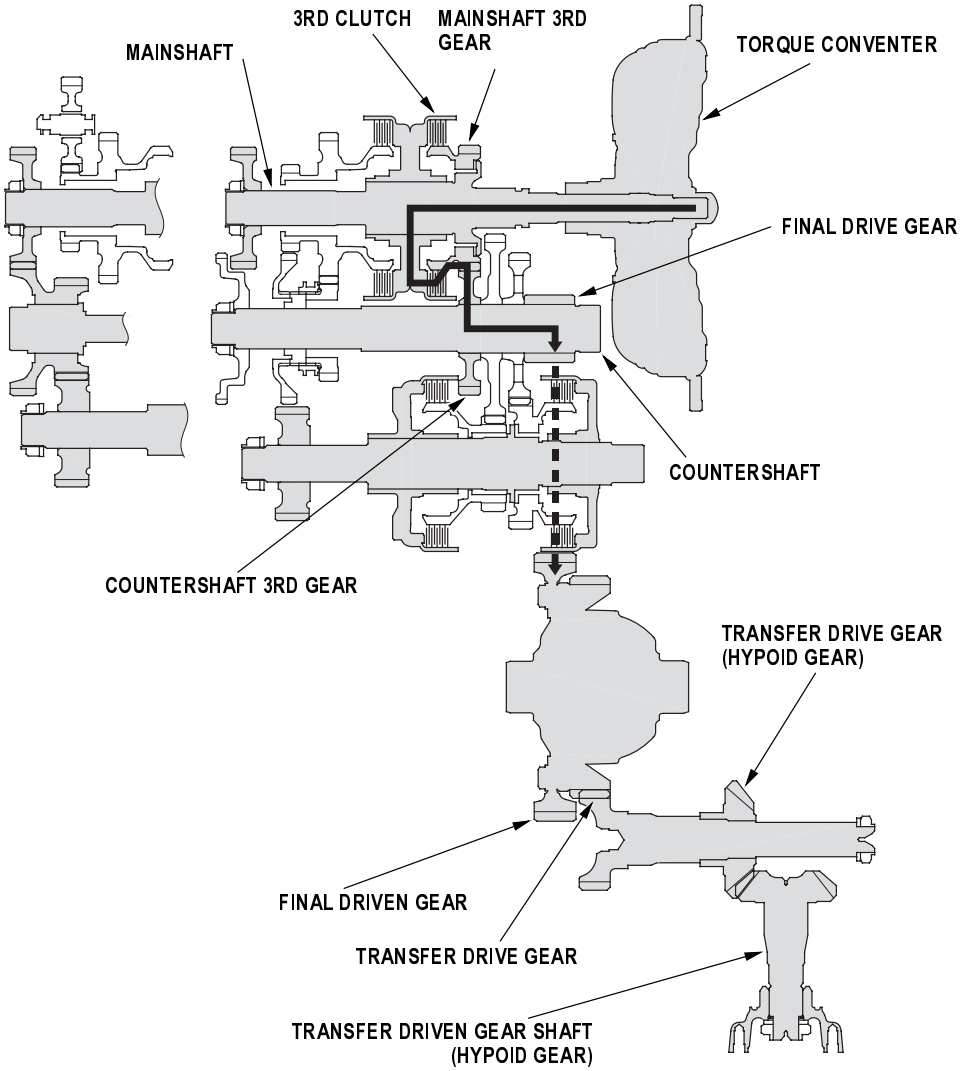
System Description (cont'd)

Power Flow (cont'd)

3rd Gear

- Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the mainshaft 3rd gear with the mainshaft.
- The mainshaft 3rd gear drives the countershaft 3rd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).

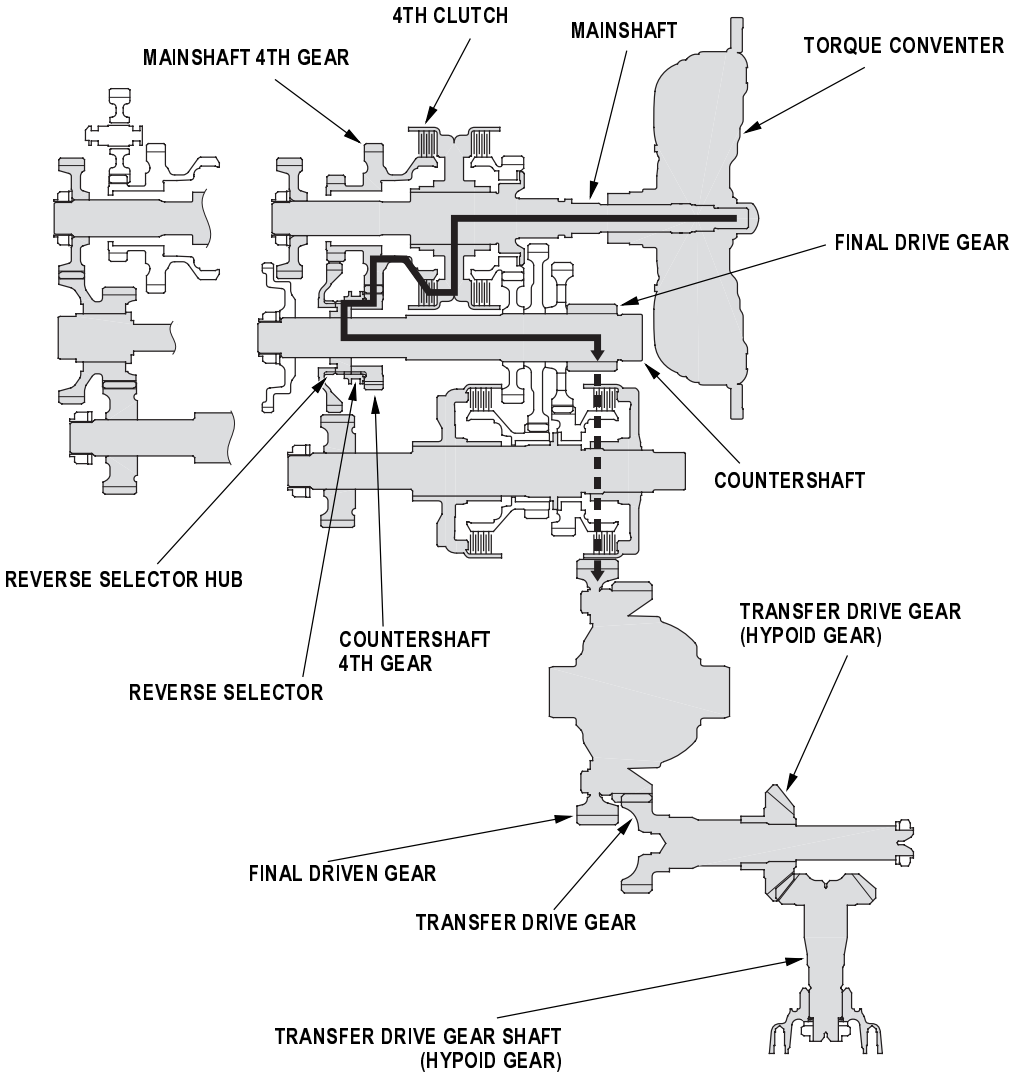
NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



4th Gear

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft 4th gear while the shift lever is in the [D], [2], [1] position (forward range).
- Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft 4th gear with the mainshaft.
- The mainshaft 4th gear drives the countershaft 4th gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).

NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



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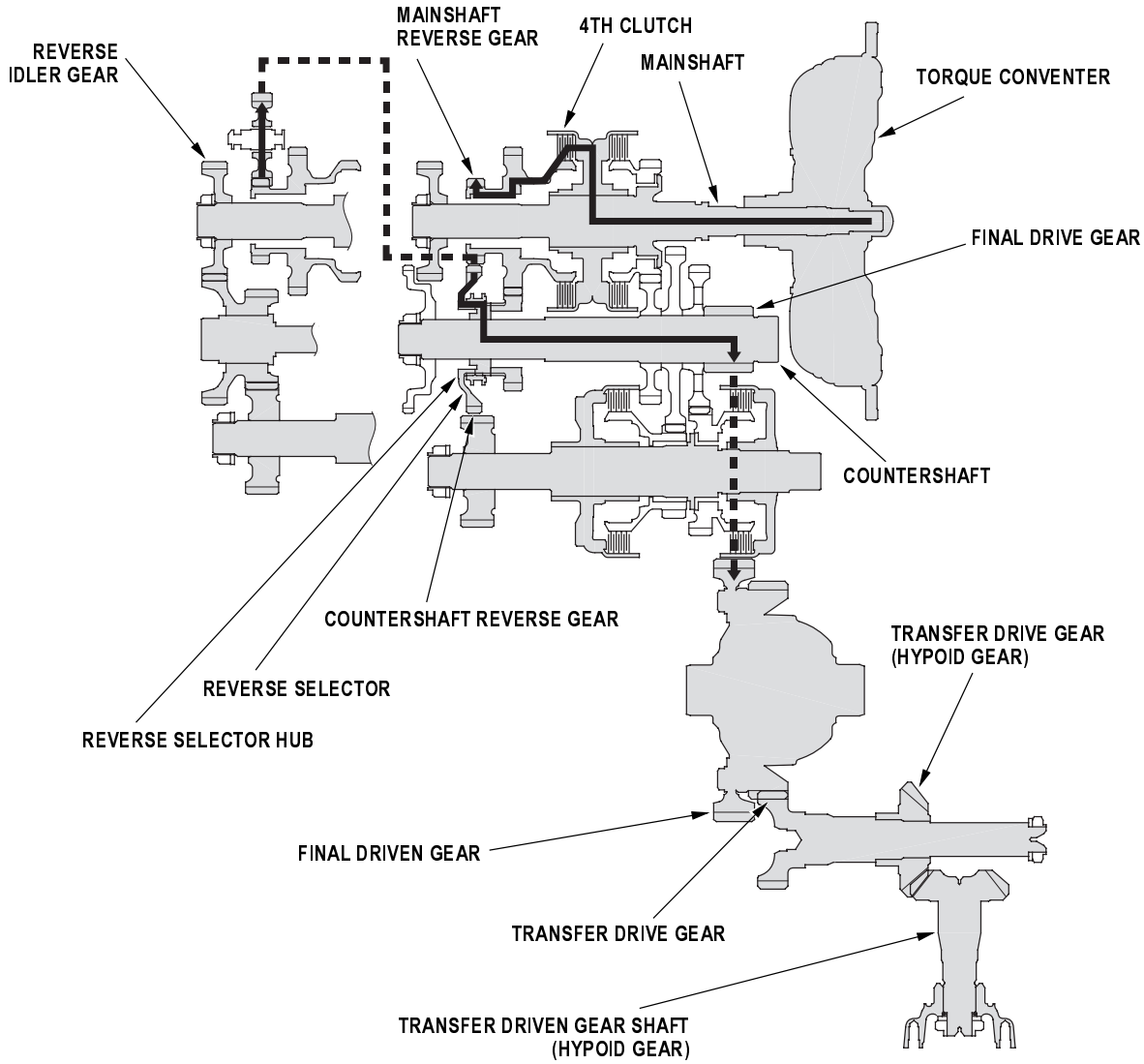
System Description (cont'd)

Power Flow (cont'd)

[R] Position

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft reverse gear while the shift lever is in the [R] position.
- Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft reverse gear with the mainshaft.
- The mainshaft reverse gear drives the countershaft reverse gear via the reverse idler gear.
- The rotation direction of the countershaft reverse gear is changed by the reverse idler gear.
- The countershaft reverse gear drives the countershaft via the reverse selector which drives the reverse selector hub.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer driven gear shaft (hypoid gear).

NOTE: The illustration shows 4WD transmission; 2WD does not have the transfer mechanism.



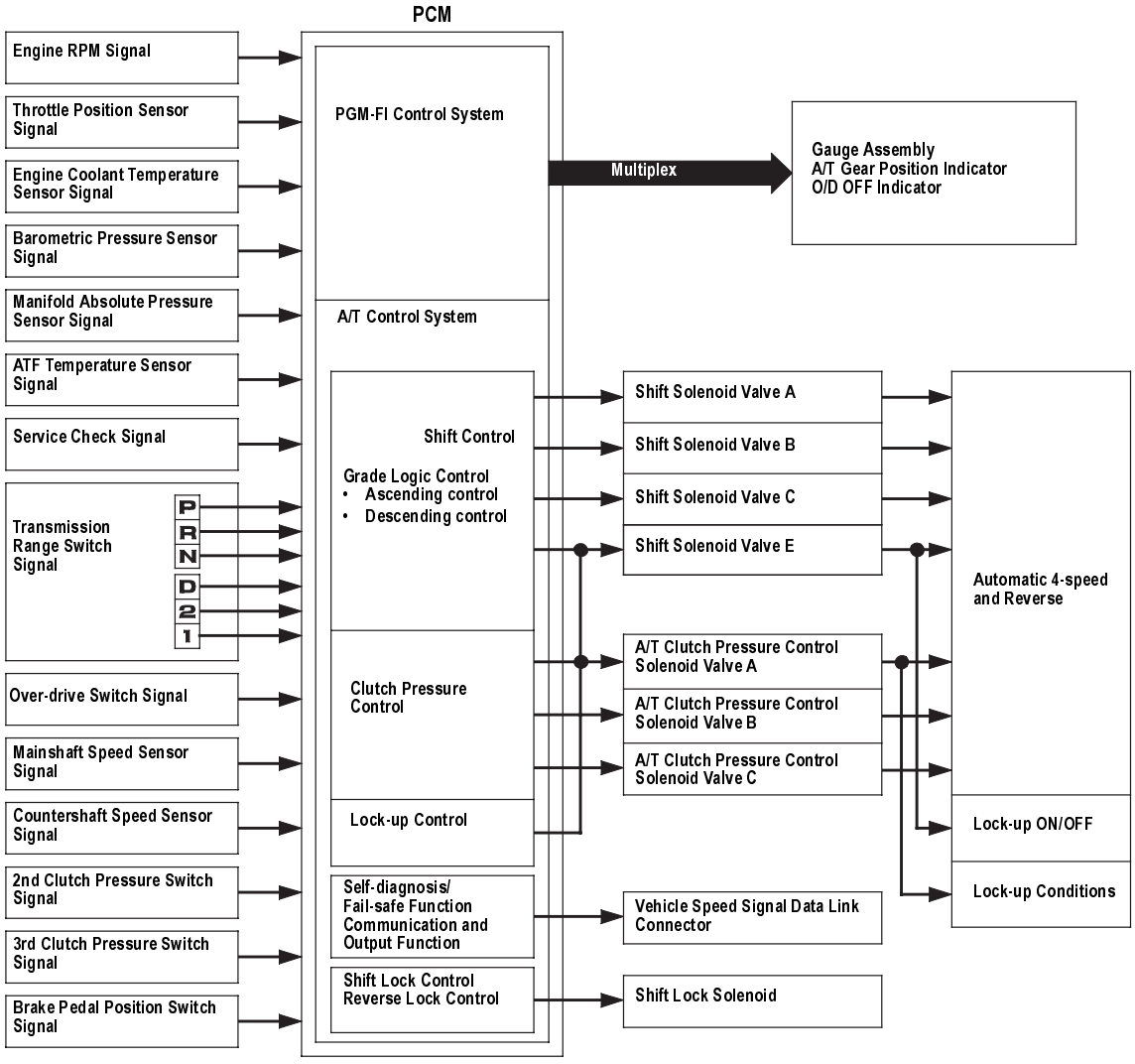
Electronic Control System

Functional Diagram

The electronic control system consists of the Powertrain Control Module (PCM), sensors, and solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The PCM inputs signals from the sensors, switches, and other control units, perform processing data, and outputs signals for engine control system and A/T control system. The A/T control system includes shift control, grade logic control, clutch pressure control, and lock-up control is stored in the PCM.

The PCM switches the shift solenoid valves and the A/T clutch pressure control solenoid valves on hydraulic control to control shifting transmission gears and lock-up torque converter clutch.



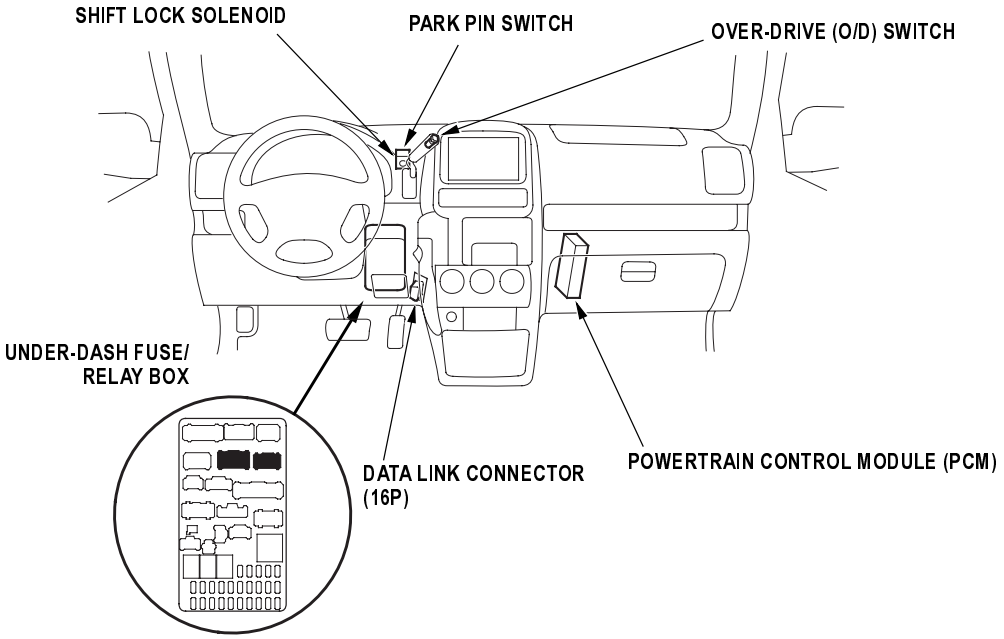
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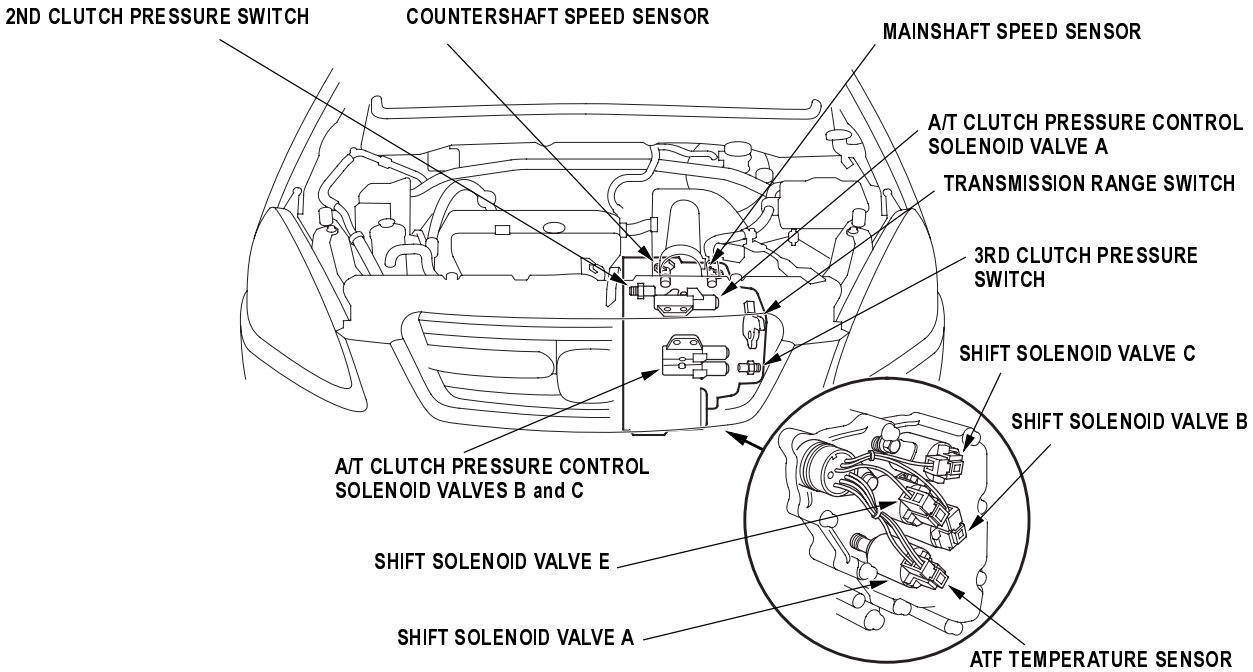
System Description (cont'd)

Electronic Control System (cont'd)

Electronic Controls Location

NOTE: The illustrations shows LHD model; RHD model is similar.

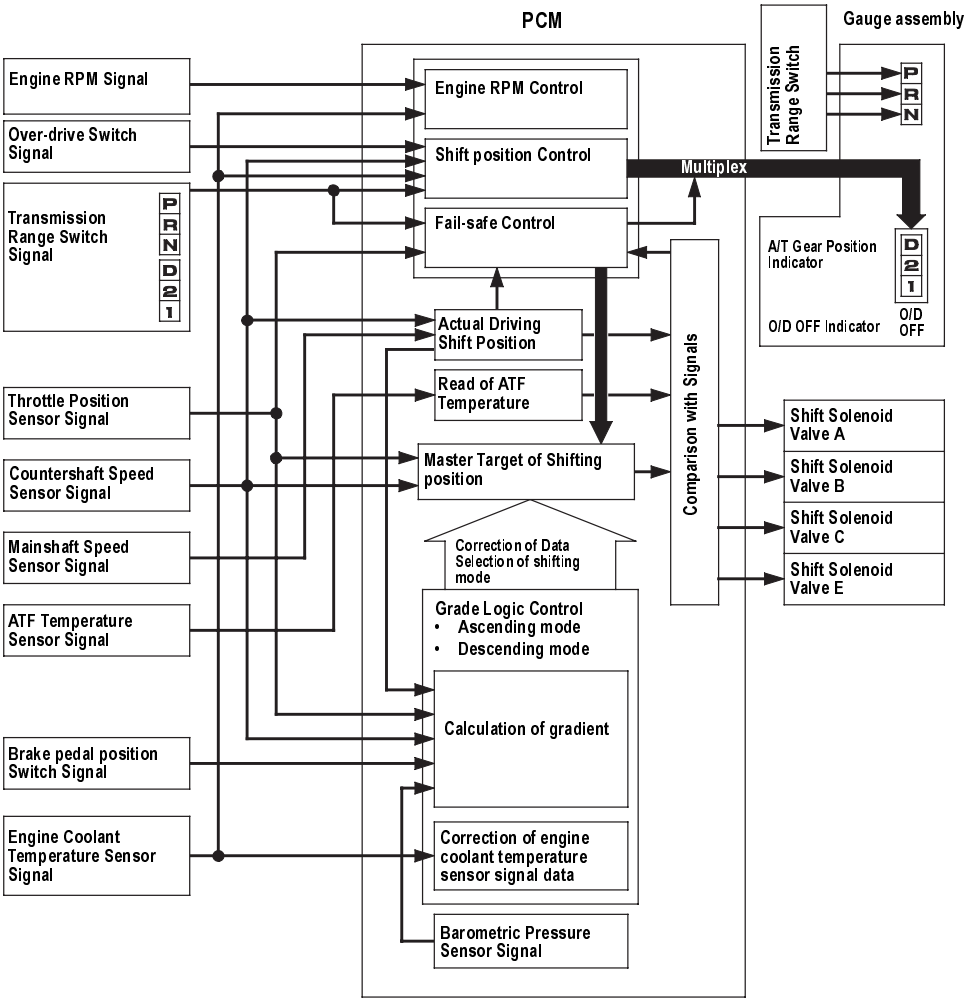




Shift Control

The PCM instantly determines which gear should be selected by various signals sent from sensors and switches, and it actuates the shift solenoid valves A, B, C, and E to control shifting.

Also, a Grade Logic Control System has been adopted to control shifting in [D] position. The PCM compares actual driving conditions with memorized driving conditions, based on the input from the throttle position sensor, the engine coolant temperature sensor, the barometric pressure sensor, the brake pedal position switch signal, and the shift lever position signal, to control shifting while vehicle is ascending or descending a slope.



(cont'd)

System Description (cont'd)

Electronic Control System (cont'd)

The PCM turns the shift solenoid valves A, B, C, and E ON and OFF to control shifting transmission gear. The combination of driving signals to shift solenoid valves A, B, C, and E are shown in table below.

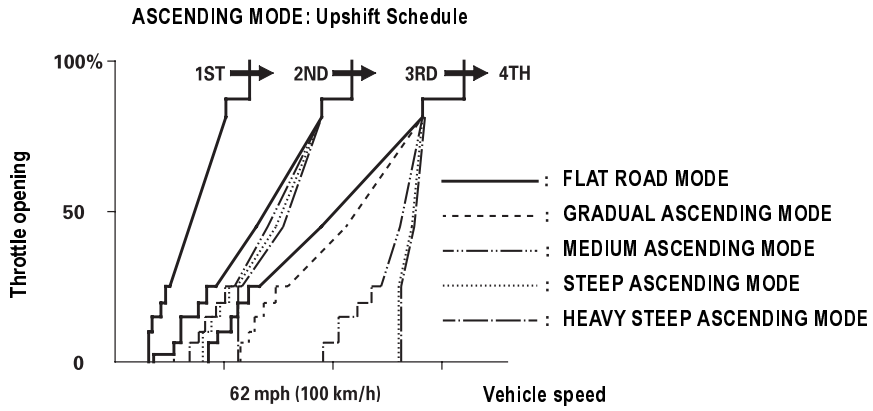
Position	Gear position	Shift solenoid valves			
		A	B	C	E
[D]	Shifting from [N] position	OFF	ON	ON	OFF
	Stays in 1st	ON	ON	ON	OFF
	Shifting gears between 1st and 2nd	OFF	ON	ON	OFF
	Stays in 2nd	OFF	ON	OFF	OFF
	Shifting gears between 2nd and 3rd	OFF	ON	ON	OFF
	Stays in 3rd	OFF	OFF	ON	OFF
	Shifting gears between 3rd and 4th	OFF	OFF	OFF	OFF
	Stays in 4th	ON	OFF	OFF	OFF
[2]	2nd gear	OFF	ON	OFF	OFF
[1]	1st gear	ON	ON	ON	OFF
[R]	Shifting from [P] and [N] position	OFF	ON	OFF	ON
	Stays in reverse	ON	ON	OFF	ON
	Reverse inhibitor control	OFF	OFF	ON	OFF
[P]	Park	OFF	ON	OFF	ON
[N]	Neutral	OFF	ON	ON	OFF

Grade Logic Control

Ascending Control

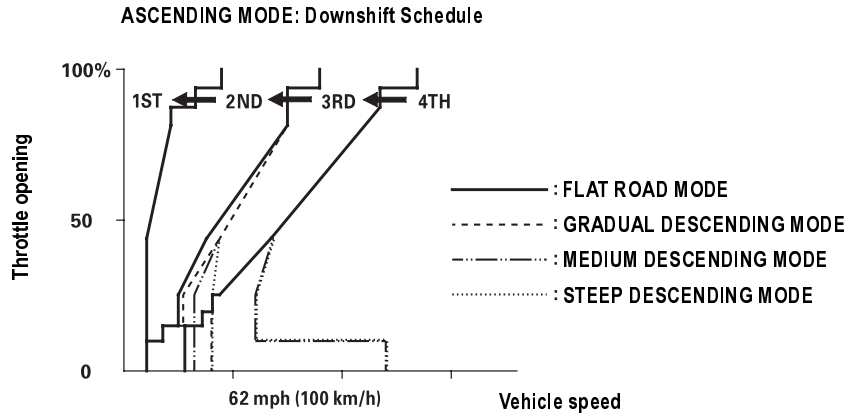
When the PCM determines that the vehicle is climbing a hill in [D] position, the system extends the engagement area of 2nd, and 3rd gears to prevent the transmission from frequently shifting between 2nd and 3rd gears, and between 3rd and 4th gears, so the vehicle can run smooth and have more power when needed.

Shift schedules stored in the PCM between 2nd and 3rd gears, and between 3rd and 4th gears, enable it to automatically select the most suitable gear according to the magnitude of a gradient.



Descending Control

When the PCM determines that the vehicle is going down a hill in [D] position, the shift-up speed from 3rd to 4th gear, and from 2nd to 3rd gear (when the throttle is closed) becomes faster than the set speed for flat road driving to widen the 3rd gear and 2nd gear driving area. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are three descending modes with different 3rd gear driving areas, and 2nd gear driving areas according to the magnitude of a gradient stored in the PCM. When the vehicle is 4th gear, and you are decelerating when you are applying the brakes on a steep hill, the transmission will downshift to lower gear. When you accelerate, the transmission will then return to higher gear.



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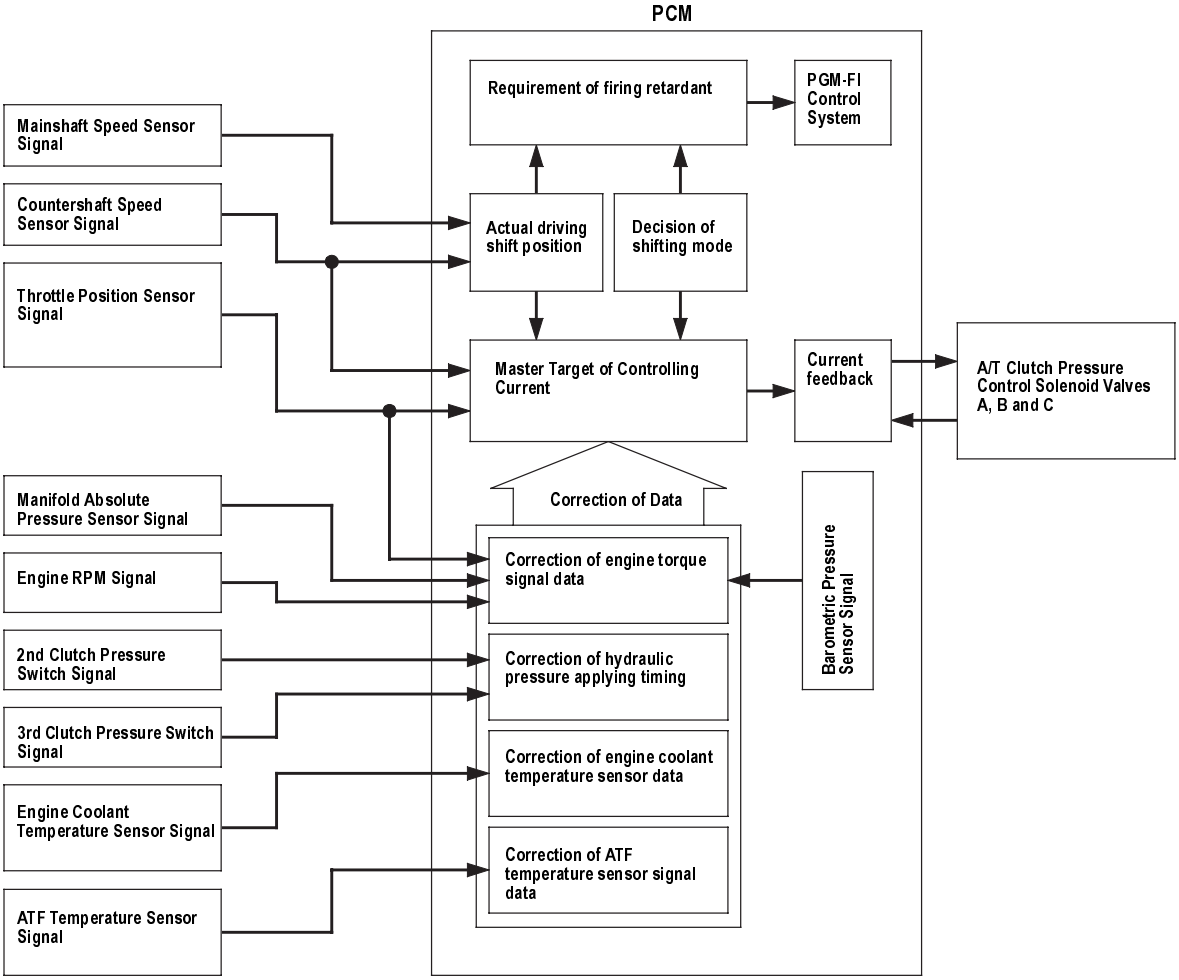
System Description (cont'd)

Electronic Control System (cont'd)

Clutch Pressure Control

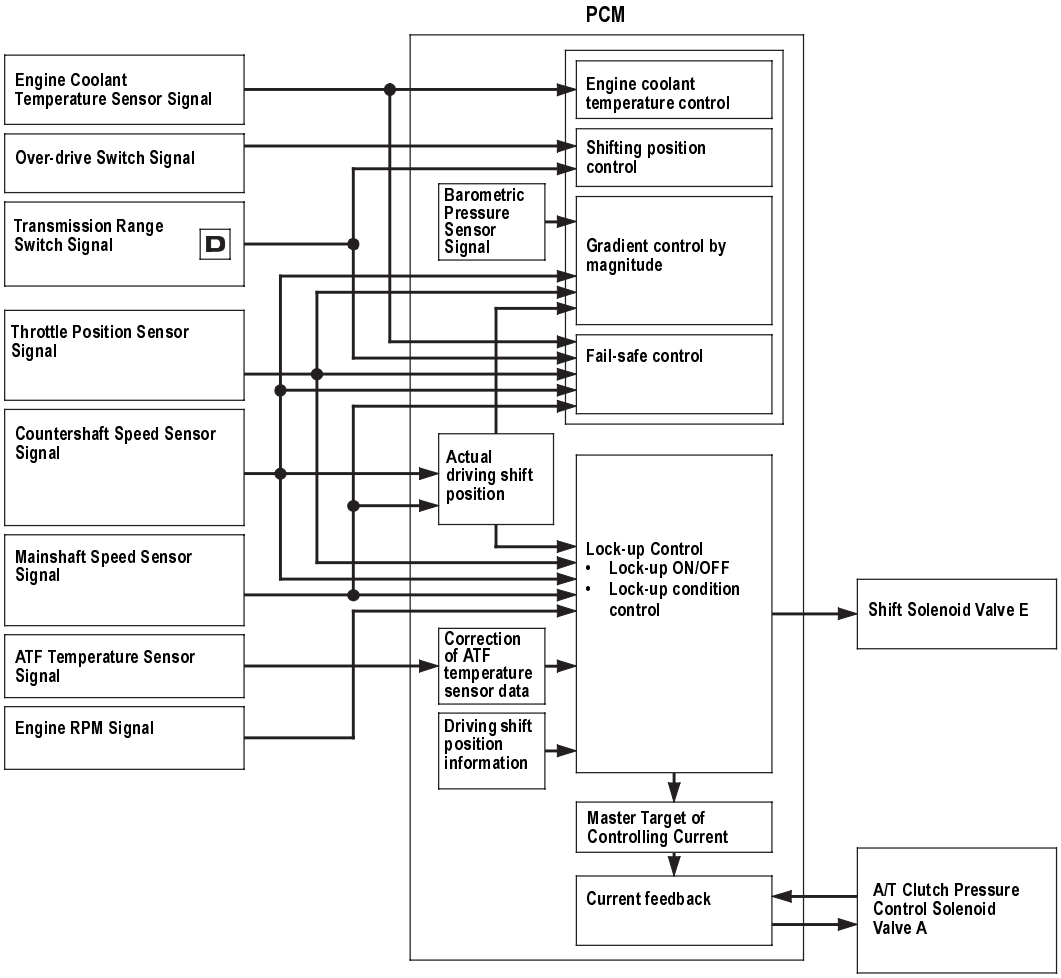
The PCM actuates the A/T clutch pressure control solenoid valves A, B and C to control the clutch pressure. When shifting between lower and higher gears, the clutch pressure regulated by the A/T clutch pressure control solenoid valves A, B, and C engage and disengage the clutch smoothly.

The PCM inputs signals from the various sensors and switches, perform processing data, and outputs a current to the A/T clutch pressure control solenoid valves A, B, and C.



Lock-up Control

The shift solenoid valve E controls the hydraulic pressure to switch the lock-up shift valve and lock-up ON and OFF.
The PCM actuates the shift solenoid valve E and the A/T clutch pressure control solenoid valve A to control the torque converter clutch lock-up. When the shift solenoid valve E is turned ON, the condition of the lock-up starts.
The A/T clutch pressure control solenoid valve A regulates and apply the hydraulic pressure to the lock-up control valve to control the volume of the lock-up.
The lock-up mechanism operates in 3rd and 4th gears in [D] position, and 3rd gear in [D] position over-drive off mode.

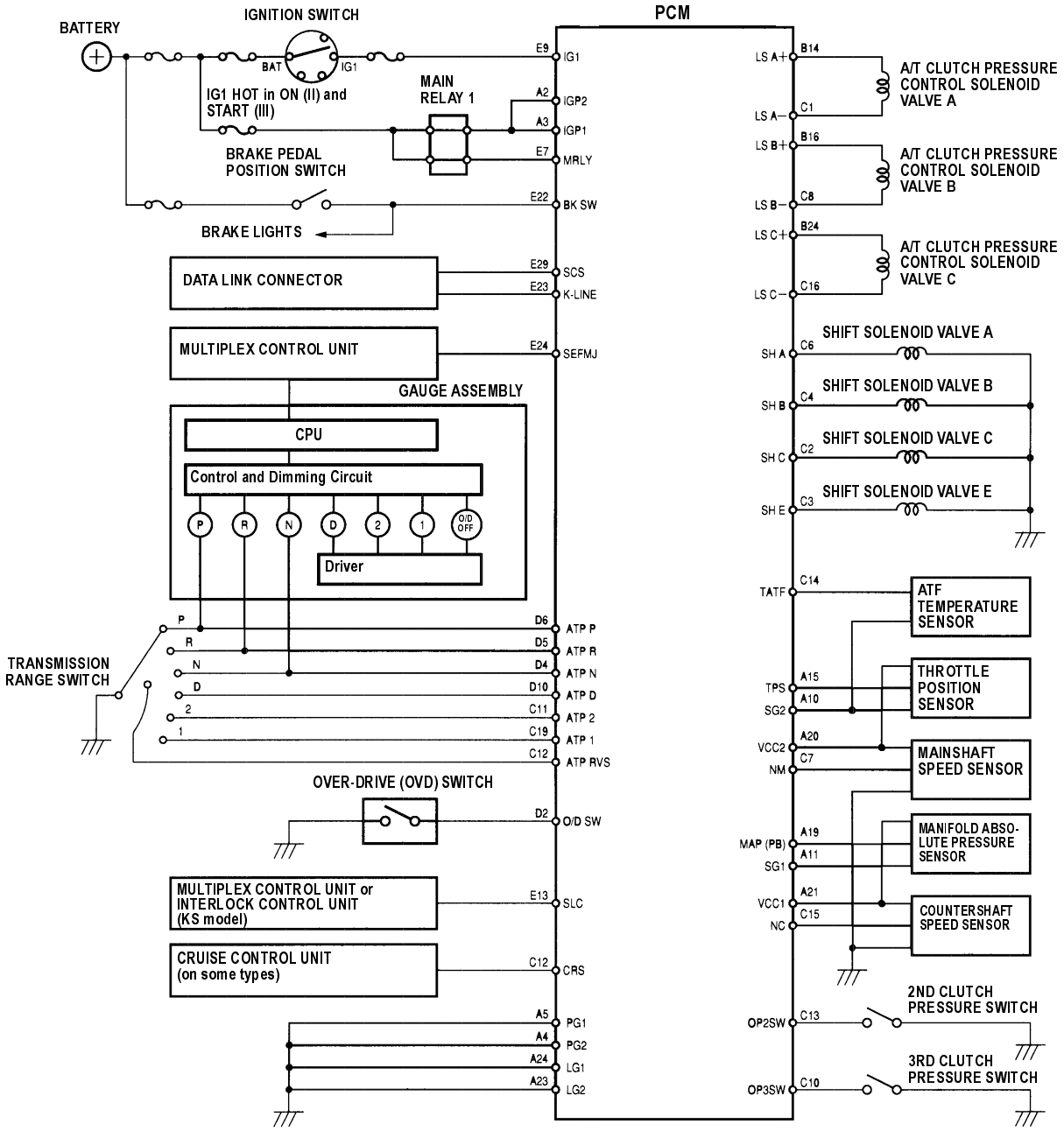


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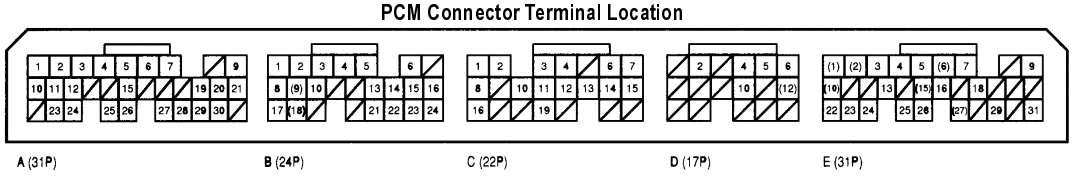
System Description (cont'd)

Electronic Control System (cont'd)

PCM Electrical Connections



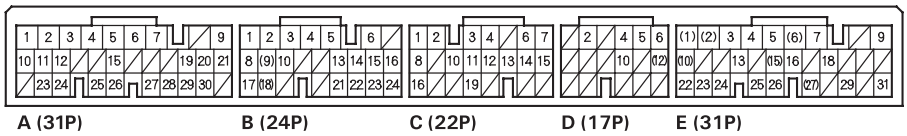
PCM Connector Terminal Location



PCM Inputs and Outputs

The PCM terminal voltage and measuring conditions are shown for the connector terminals that are related to the A/T control system. The other PCM terminal voltage and measuring conditions are described in section 11 (see section 11).

PCM Connector Terminal Locations



PCM CONNECTOR A (31P)

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
A2	YEL/BLK	IGP2	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
A3	YEL/BLK	IGP1	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
A4	BLK	PG2	Ground	
A5	BLK	PG1	Ground	
A10	GRN/YEL	SG2	Sensor ground	
A11	GRN/WHT	SG1	Sensor ground	
A20	YEL/BLU	VCC2	Power supply circuit for sensors	With ignition switch ON (II): About 5 V With ignition switch OFF: 0 V
A21	YEL/RED	VCC1	Power supply circuit for sensors	With ignition switch ON (II): About 5 V With ignition switch OFF: 0 V
A23	BRN/YEL	LG2	Ground	
A24	BRN/YEL	LG1	Ground	

PCM CONNECTOR B (24P)

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
B14	RED/BLK	LS A+	A/T clutch pressure control solenoid valve A power supply positive electrode	With ignition switch ON (II): Pulsing signal
B16	BRN/WHT	LS B+	A/T clutch pressure control solenoid valve B power supply positive electrode	With ignition switch ON (II): Pulsing signal
B24	BLU/YEL	LS C+	A/T clutch pressure control solenoid valve C power supply positive electrode	With ignition switch ON (II): Pulsing signal

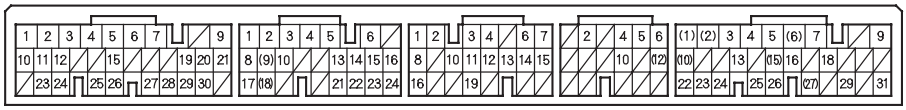
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System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs (cont'd)

PCM Connector Terminal Locations



PCM CONNECTOR C (22P)

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
C1	WHT/BLK	LS A-	A/T clutch pressure control solenoid valve A power supply negative electrode	With ignition switch ON (II): 0 V
C2	GRN	SH C	Shift solenoid valve C control	Battery voltage in these positions: • [N] and [1] • 1st and 3rd gears in [D] 0 V in these positions: • [2], [P] and [R] • 2nd and 4th gears in [D]
C3	YEL	SH E	Shift solenoid valve E control	Battery voltage in these positions: • [P] and [R] 0 V in these positions: • [N], [D], [2], and [1]
C4	GRN/WHT	SH B	Shift solenoid valve B control	Battery voltage in these positions: • [2], [1], [P], [R], and [N] • 1st and 2nd gears in [D] 0 V in these positions: • 3rd and 4th gears in [D]
C6	BLU/BLK	SH A	Shift solenoid valve A control	Battery voltage in these positions: • [R] and [1] • 1st and 4th gears in [D] 0 V in these positions: • [2], [P] and [N] • 2nd and 3rd gears in [D]
C7	WHT/RED	NM	Mainshaft speed sensor input	With ignition switch ON (II): 0 V or about 5 V With engine at idle in [N] position: 1.5 V - 3.5 V

PCM CONNECTOR C (22P)

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
C8	BLK/RED	LS B-	A/T clutch pressure control solenoid valve B power supply negative electrode	With ignition switch ON (II): 0 V
C10	BLU/WHT	OP3SW	3rd clutch pressure switch signal input	With ignition switch ON (II): About 5 V (No 3rd clutch pressure) With 3rd clutch pressure: About 0 V
C11	GRN/RED	ATP 2	Transmission range switch [2] position signal input	In [2] position: 0 V In other than [2] position: About 5 V
C12	RED/WHT	ATP RVS	Transmission range switch RVS ([R] position) signal input	In [R] position: 0 V In other than [R] position: About 5 V
C13	BLU/RED	OP2SW	2nd clutch pressure switch signal input	With ignition switch ON (II): About 5 V (No 2nd clutch pressure) With 2nd clutch pressure: About 0 V
C14	RED/YEL	TATF	ATF temperature sensor signal input	With ignition switch ON (II): 0.2 V - 4.8 V With ignition switch OFF: 0 V
C15	BLU	NC	Countershaft speed sensor input	With ignition switch ON (II): 0V or about 5 V With driving: About 1.5 V - 3.5 V
C16	WHT/BLU	LS C-	A/T clutch pressure control solenoid valve C power supply negative electrode	With ignition switch ON (II): 0 V
C19	BRN	ATP 1	Transmission range switch [1] position signal input	In [1] position: 0 V In other than [1] position: About 5 V

PCM CONNECTOR D (17P)

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
D2	GRN	O/D SW	Over-drive (O/D) switch signal input	With ignition switch ON (II): About 5 V With ignition switch ON (II) and O/D switch ON: 0 V
D4	BLK/RED	ATP N	Transmission range switch [N] position signal input	In [N] position: 0 V In other than [N] position: About 5 V
D5	WHT	ATP R	Transmission range switch [R] position signal input	In [R] position: 0 V In other than [R] position: About 5 V
D6	BLU/BLK	ATP P	Transmission range switch [P] position signal input	In [P] position: 0 V In other than [P] position: About 5 V
D10	WHT/GRN	ATP D	Transmission range switch [D] position signal input	In [D] position: 0 V In other than [D] position: About 5 V

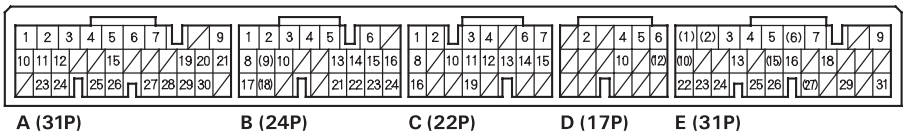
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System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs (cont'd)

PCM Connector Terminal Locations

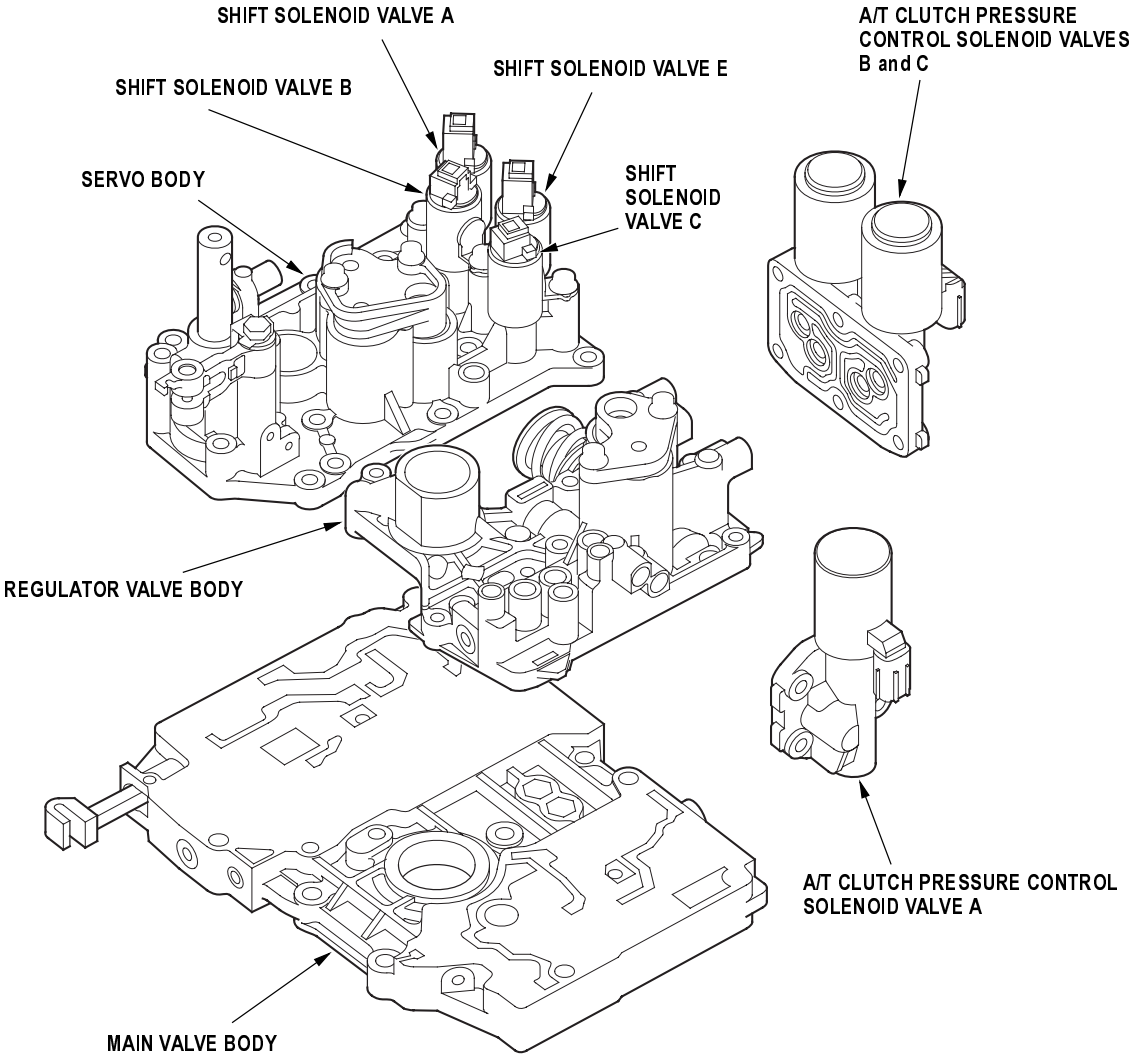


PCM CONNECTOR E (20P)

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
E7	RED/YEL	MRLY	Power supply circuit from main relay 1	With ignition switch ON (II): 0 V With ignition switch OFF: Battery voltage
E9	YEL/BLK	IG1	Power supply circuit for solenoid valves	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
E13	WHT/BLU	SLC	Shift lock control	With ignition switch ON (II), brake pedal pressed, and accelerator pedal released: About 5 V
E22	WHT/BLK	BK SW	Brake pedal position switch signal input	Brake pedal pressed: Battery voltage Brake pedal released: 0 V
E23	LT BLU	K-LINE	Communication line PCM-to-DLC	With ignition switch ON (II): Battery voltage
E24	YEL	SEFMJ	Multiplex line PCM-to-gauge assembly	With ignition switch ON (II): About 5 V
E29	BRN	SCS	SCS terminal on the DLC signal input	With ignition switch ON (II) • SCS terminals on the DLC open: About 5 V or battery voltage • SCS terminals short-circuited to ground: 0 V

Hydraulic Controls

The valve body includes the main valve body, the regulator valve body, and the servo body. The ATF pump is driven by splines on the left end of the torque converter which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to the shift valves and to each of the clutches via the solenoid valves. The shift solenoid valves A, B, C, and E are bolted on the servo body. The A/T clutch pressure control solenoid valves A, B, and C are mounted on the outside of the transmission housing.



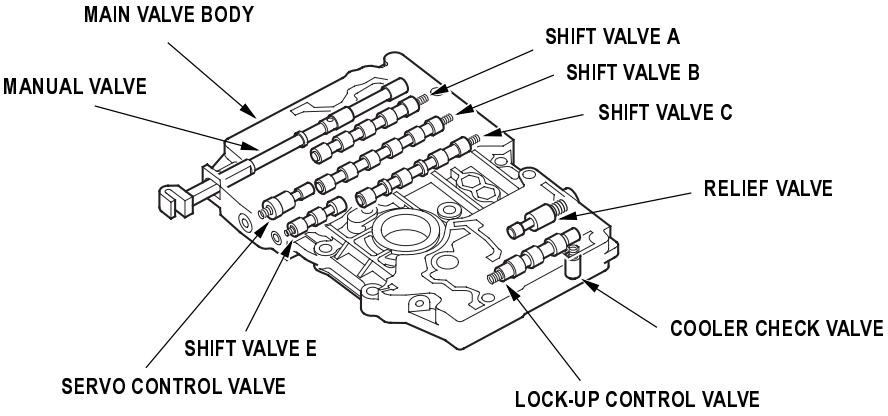
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System Description (cont'd)

Hydraulic Controls (cont'd)

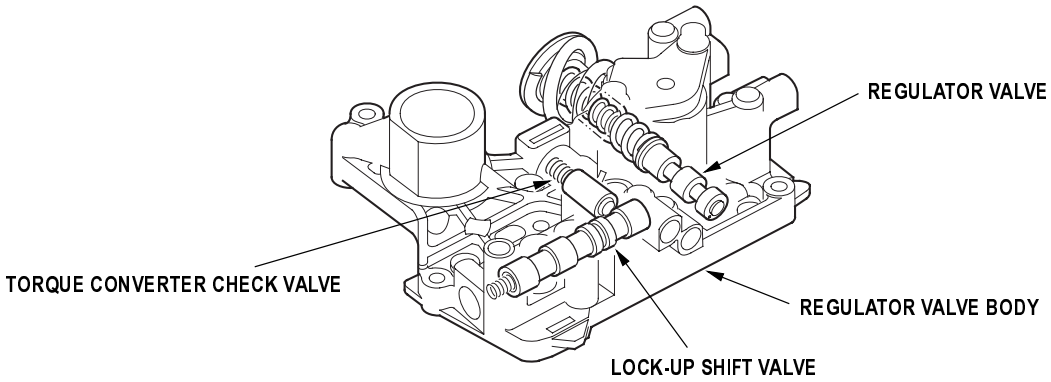
Main Valve Body

The main valve body contains the manual valve, the shift valves A, B, C, and E, the relief valve, the lock-up control valve, the cooler check valve, the servo control valve, and the ATF pump gears. The primary function of the main valve body is to switch fluid pressure on and off and to control hydraulic pressure going to the hydraulic control system.



Regulator Valve Body

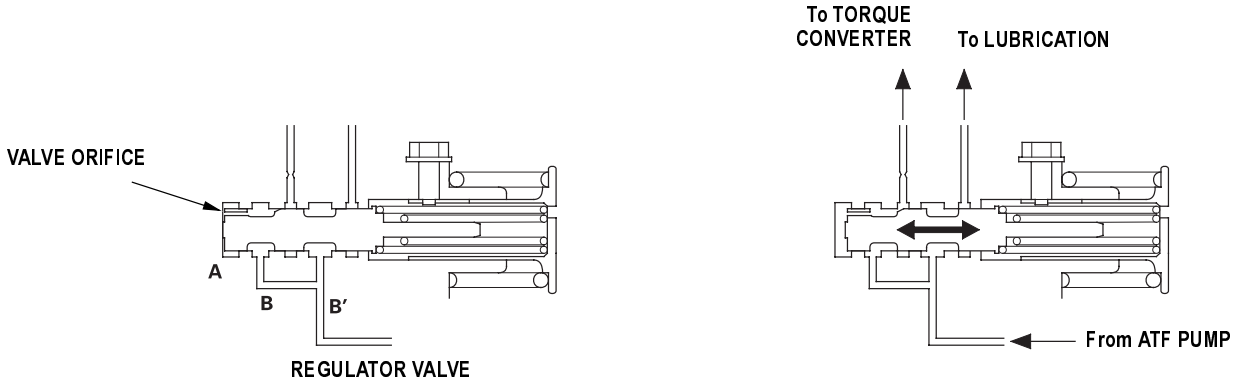
The regulator valve body contains the regulator valve, the torque converter check valve, lock-up shift valve, and the 1st accumulator.



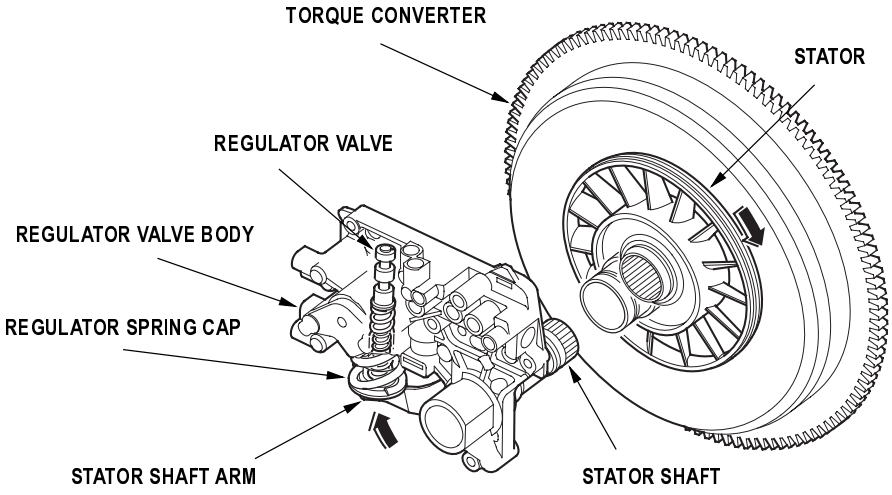
Regulator Valve

The regulator valve maintains a constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubrication system and torque converter. The fluid from the ATF pump flows through B and B'. Fluid entering from B flows through the valve orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the right side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter and the relief valve, and the regulator valve moves to the left side. According to the level of the hydraulic pressure through B, the position of the regulator valve changes, and the amount of fluid from B' through torque converter also changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration below.



Increases in hydraulic pressure according to torque are performed by the regulator valve using stator torque reaction. The stator shaft is splined with the stator in the torque converter, and its arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (Torque Converter Range), stator torque reaction acts on the stator shaft, and the stator arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the line pressure which is regulated by the regulator valve. The line pressure reaches its maximum when the stator torque reaction reaches its maximum.



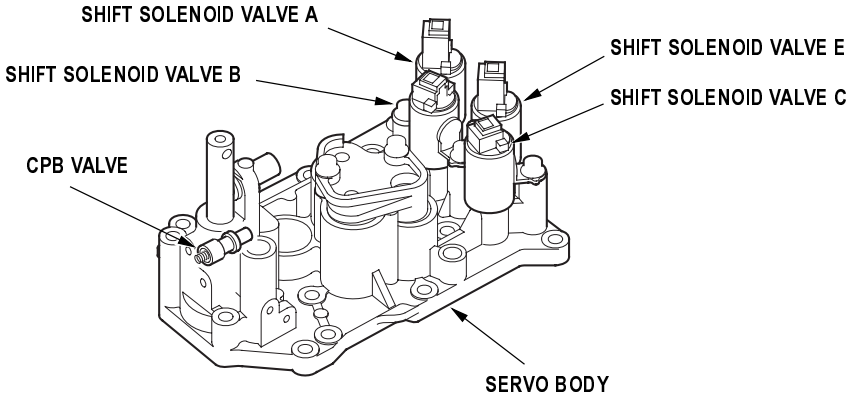
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System Description (cont'd)

Hydraulic Controls (cont'd)

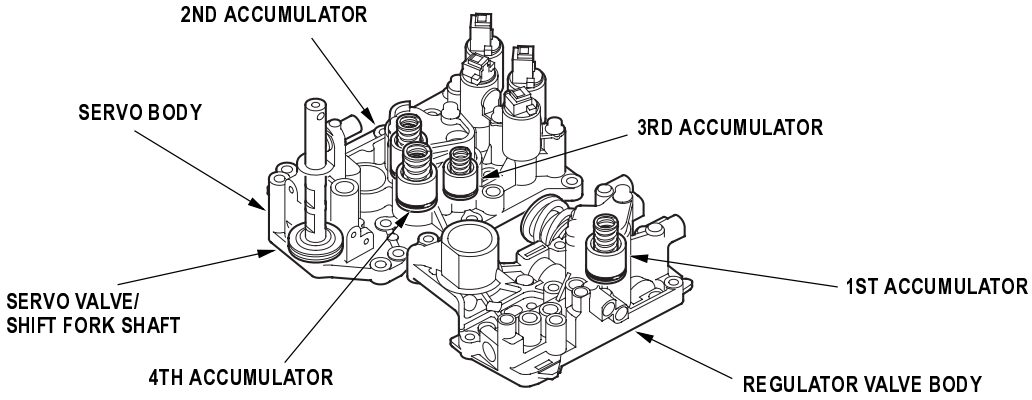
Servo Body

The servo body contains the servo valve, the clutch pressure back-up (CPB) valve, accumulators for 2nd, 3rd, and 4th, and shift solenoid valves for A, B, C, and E.



Accumulator

The accumulators are located in the regulator valve body and the servo body. The regulator valve body contains the 1st accumulator, and the servo body contains the 2nd, 3rd, and 4th accumulators.



Hydraulic Flow

Distribution of Hydraulic Pressure

As the engine turns, the ATF pump starts to operate. Automatic transmission fluid (ATF) is drawn through the ATF strainer (filter) and discharged into the hydraulic circuit. Then, ATF flowing from the ATF pump becomes line pressure that's regulated by the regulator valve. Torque converter pressure from the regulator valve enters the torque converter through the lock-up shift valve, and it is discharged from the torque converter. The torque converter check valve prevents torque converter pressure from rising.

The PCM controls the shift solenoid valves ON and OFF. The shift valve intercepts line pressure from the ATF pump via the manual valve when the shift solenoid valve is OFF. When the shift solenoid valve is turned ON, line pressure changes to shift solenoid valve pressure at the shift solenoid valve, then the solenoid valve pressure flows to the shift valve. Applying shift solenoid pressure to the shift valves moves the position of the shift valve, and switches the port of the hydraulic circuit. The PCM also controls A/T clutch pressure control solenoid valves A, B, and C. The A/T clutch pressure control solenoid valves regulate hydraulic pressure, and apply the pressure to the clutches for engaging smoothly. The clutches are received optimum clutch pressure which is regulated by the A/T clutch pressure control solenoid valves for comfortable driving and shifting under all conditions.

Hydraulic pressure at the port is as follows:

PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE
1	LINE	SC	SHIFT SOLENOID VALVE C
3	LINE	SE	SHIFT SOLENOID VALVE E
3'	LINE	10	1ST CLUTCH
4	LINE	20	2ND CLUTCH
4'	LINE	30	3RD CLUTCH
4''	LINE	40	4TH CLUTCH
7	LINE	55	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A
1A	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A	55'	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A
1B	LINE	56	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B
3A	LINE	57	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C
3B	LINE	90	TORQUE CONVERTER
3C	LINE	91	TORQUE CONVERTER
5A	LINE	92	TORQUE CONVERTER
5B	LINE	93	ATF COOLER
5C	LINE	94	TORQUE CONVERTER
5D	LINE	95	LUBRICATION
5E	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B	96	TORQUE CONVERTER
5F	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A or B	97	TORQUE CONVERTER
5G	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B	99	SUCTION
5H	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	X	DRAIN
5K	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	HX	HIGH POSITION DRAIN
SA	SHIFT SOLENOID VALVE A	AX	AIR DRAIN
SB	SHIFT SOLENOID VALVE B		

(cont'd)

System Description (cont'd)

Hydraulic Flow (cont'd)

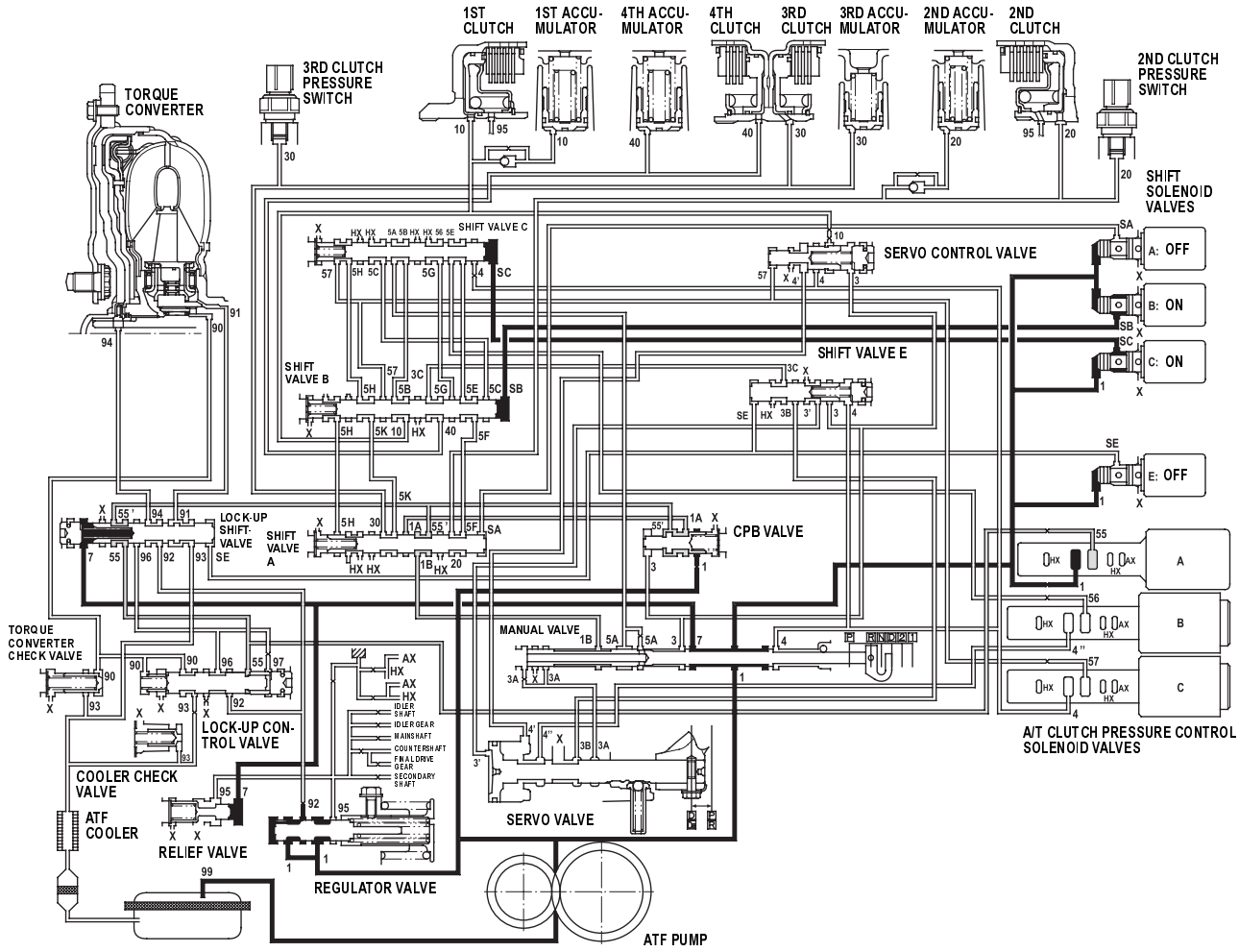
[N] Position

The PCM controls the shift solenoid valves. The conditions of the shift solenoid valves and positions of the shift valves are as follows:

- Shift solenoid valve A: OFF Shift valve A remains in right side
- Shift solenoid valve B: ON Shift valve B moves to left side
- Shift solenoid valve C: ON Shift valve C moves to left side
- Shift solenoid valve E: OFF Shift valve E remains in left side

Line pressure (1) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valve A, and changes to A/T clutch pressure control solenoid valve A pressure (55) at the A/T clutch pressure control solenoid valve A. A/T clutch pressure control solenoid valve A pressure (55) becomes to line pressure (1B) at the shift valve A, and stops at the manual valve. Under this condition, hydraulic pressure is not applied to the clutches.

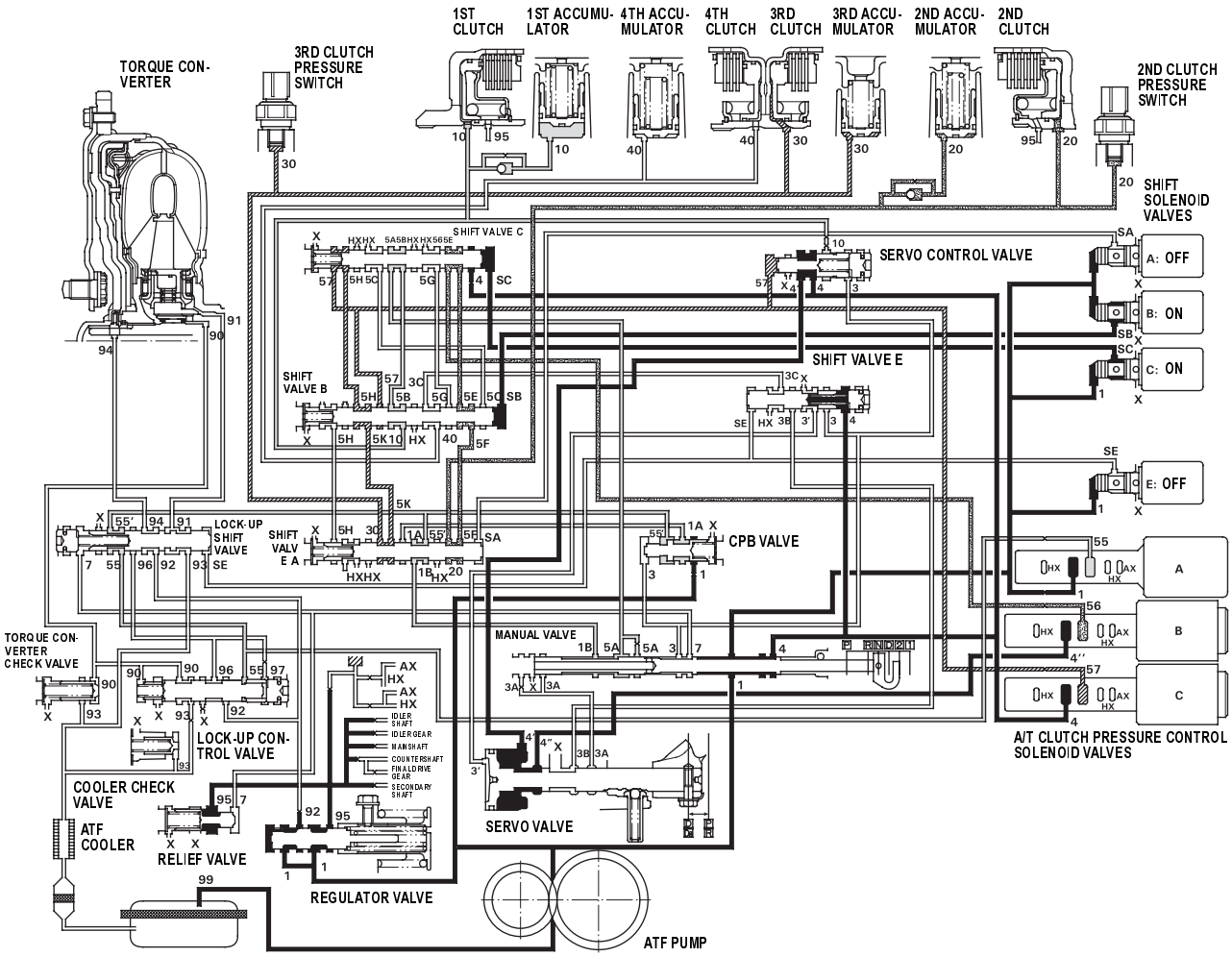
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[D] Position: 1st gear shifting from [N] position

Shift solenoid valves remain the same as in [N] position, when shifting to [D] position from [N]. The manual valve is moved to [D] position, and switches the port of line pressure (4) leading to the A/T clutch pressure control solenoid valves. Hydraulic pressure line to the 1st clutch from the A/T clutch pressure control solenoid valve A is created as shift solenoid valve A is OFF, B and C remain ON. A/T clutch pressure control solenoid valve A pressure (55) changes to 1st clutch pressure (10) at the shift valve B, and flows to the 1st clutch. A/T clutch pressure control solenoid valves B and C pressures also flow to the 2nd and 3rd clutches. The 2nd and 3rd clutch engagement reduces 1st clutch engaging shock. The 1st clutch is engaged gently when shifting to [D] position from [N].

NOTE: When used, ”left” or ”right” indicates direction on the hydraulic circuit.



(cont’d)

System Description (cont'd)

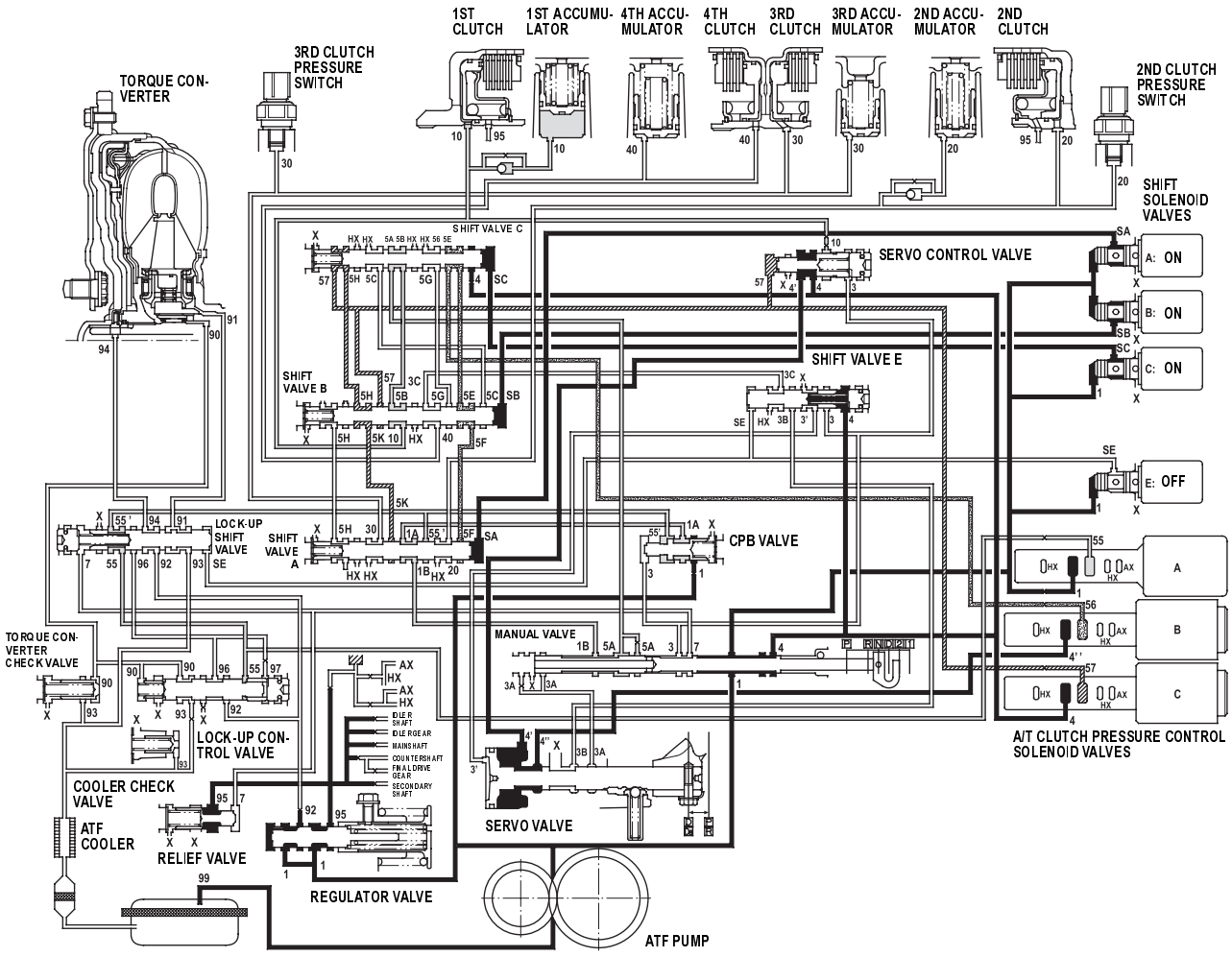
Hydraulic Flow (cont'd)

[D] Position: Driving in 1st gear

The PCM turns shift solenoid valves A ON, and remains B and C ON, E OFF. Shift solenoid valve A pressure (SA) is applied to the right side of the shift valve A. The shift valve A is moved to the left side to uncover the port of line pressure leading to the 1st clutch, and to cover the ports of A/T clutch pressure control solenoid valve pressures. Then A/T clutch pressure control solenoid valves pressures are released at the shift valve A.

Fluid flows to the 1st clutch by way of:
Line pressure (1) A/T clutch pressure control solenoid valve A - A/T clutch pressure control solenoid valve A pressure (55) → CPB valve - Line pressure (1A) → Shift valve A - Line pressure (1B) → Manual valve - Line pressure (5A) → Shift valve C - Line pressure (5B) → Shift valve B - 1st clutch pressure (10) → 1st clutch
The 1st clutch pressure (10) is applied to the 1st clutch, and the 1st clutch is engaged securely.

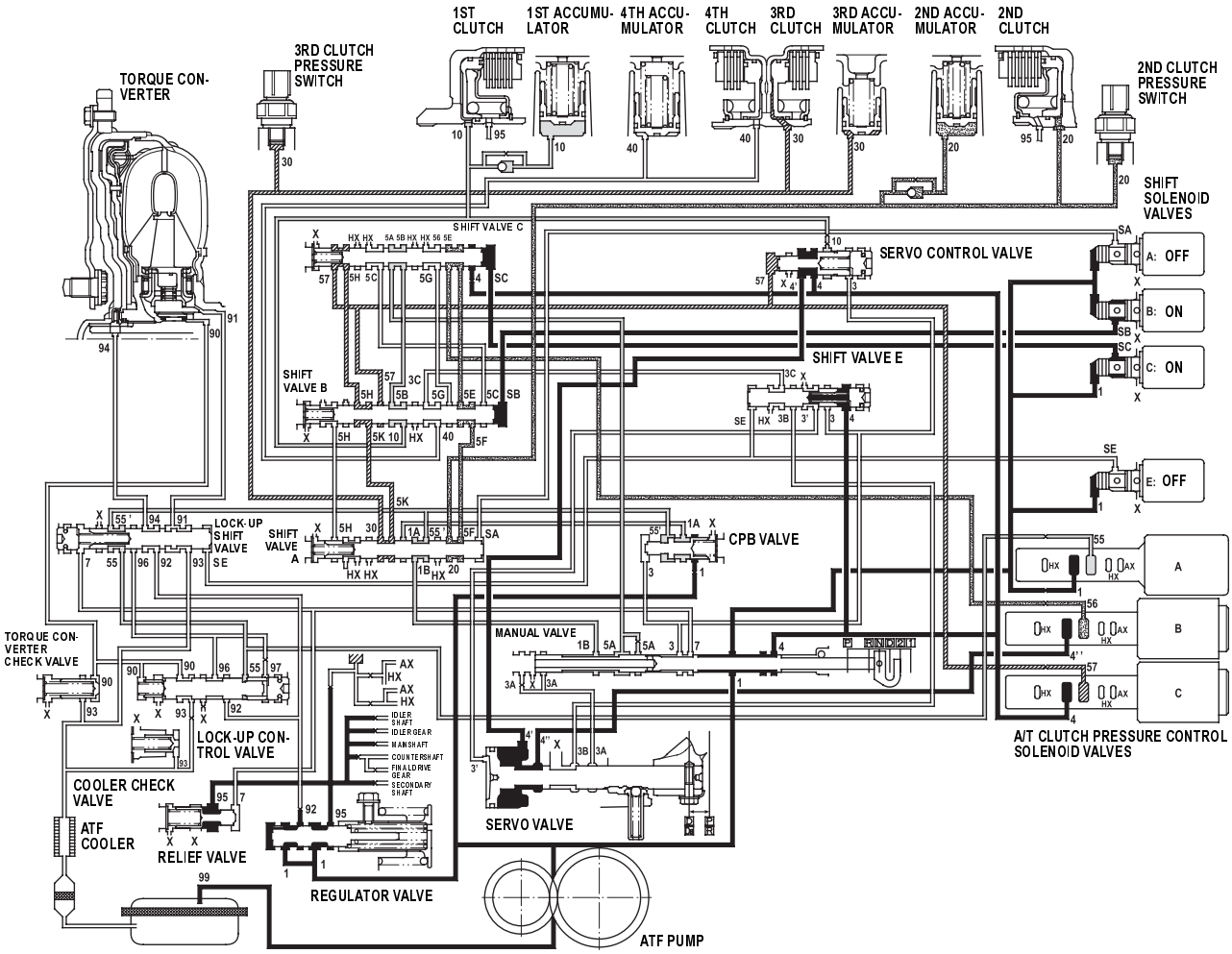
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[D] Position: Shifting between 1st gear and 2nd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valves A OFF, and remains B and C ON, E OFF. Shift solenoid valve A pressure (SA) in the right side of the shift valve A is released. The shift valve A is moved to the right side to uncover the ports of A/T clutch pressure control solenoid valves pressures leading to the 1st, 2nd, and 3rd clutches. The PCM controls the A/T clutch pressure control solenoid valves to regulate hydraulic pressure. A/T clutch pressure control solenoid valve B pressure (56) changes to 2nd clutch pressure (20) at the shift valve A, and flows to the 2nd clutch. The 2nd clutch is engaged gently.

NOTE: When used, ”left” or ”right” indicates direction on the hydraulic circuit.



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System Description (cont'd)

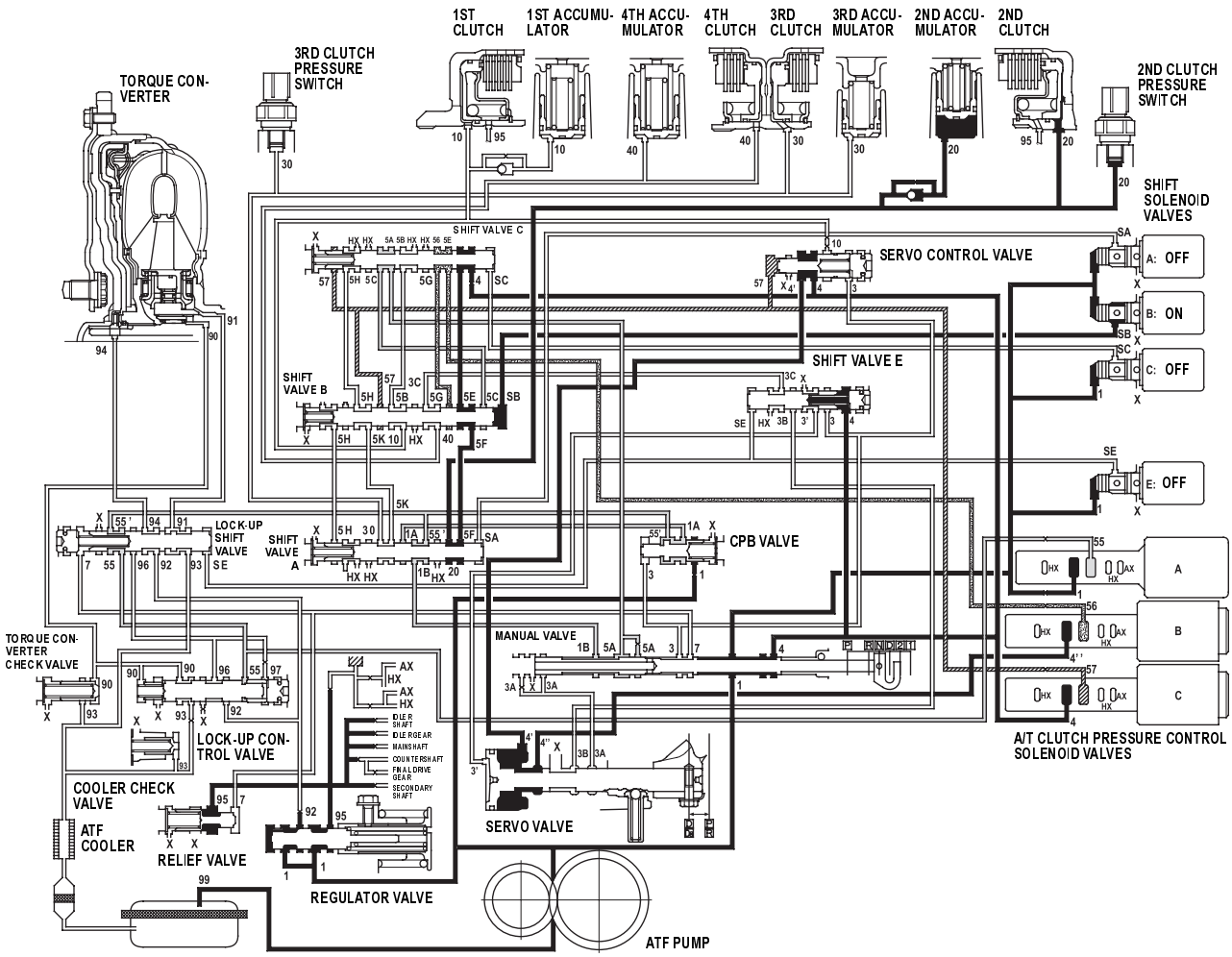
Hydraulic Flow (cont'd)

[D] Position: Driving in 2nd gear

The PCM turns shift solenoid valves C OFF and remains A and E OFF, B ON. Shift solenoid valve C pressure (SC) in the right side of the shift valve C is released. The shift valve C is moved to the right side to switch the ports. This movement covers A/T clutch pressure control solenoid valves pressures to stop at the shift valve C and B, and uncover the port of line pressure leading to the 2nd clutch.

Fluid flows to 2nd clutch by way of:
Line pressure (1) → Manual valve - Line pressure (4) → Shift valve C - Line pressure (5E) → Shift valve B - Line pressure (5F) → Shift valve A - 2nd clutch pressure (20) → 2nd clutch
The 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged securely.

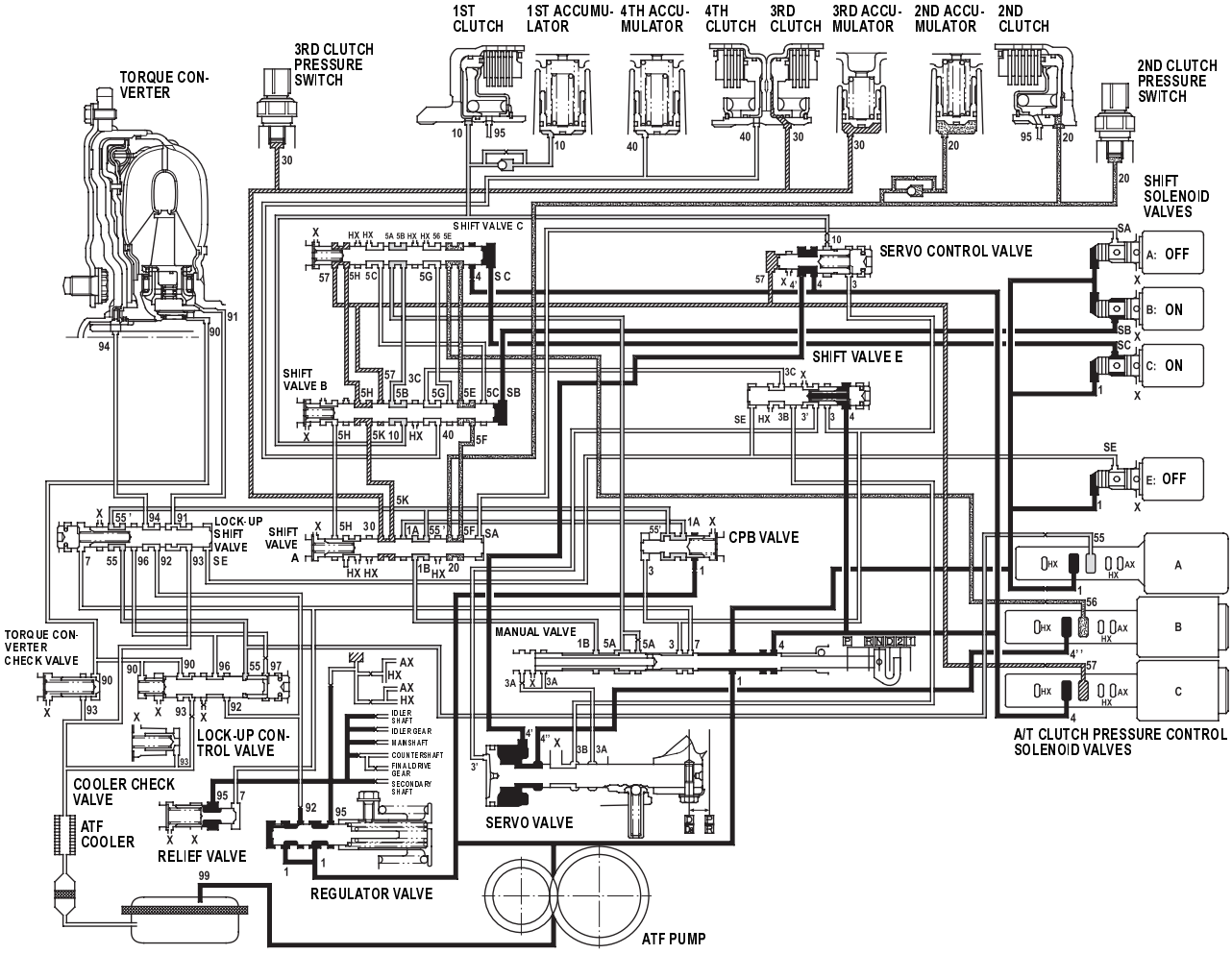
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[D] Position: Shifting between 2nd gear and 3rd gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valves C ON, and remains A and E OFF, B ON. Shift solenoid valve C pressure (SC) is applied to the right side of the shift valve C. The shift valve C is moved to the left side to uncover the ports of A/T clutch pressure control solenoid valves pressures leading to the 1st, 2nd, and 3rd clutches. The PCM controls the A/T clutch pressure control solenoid valves to regulate hydraulic pressure. A/T clutch pressure control solenoid valve B pressure (56) changes to 2nd clutch pressure (20) at the shift valve A, and A/T clutch pressure control solenoid valve C pressure (57) changes to 3rd clutch pressure (30) at the shift valve A. The 2nd and 3rd clutches are engaged gently.

NOTE: When used, ”left” or ”right” indicates direction on the hydraulic circuit.



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System Description (cont'd)

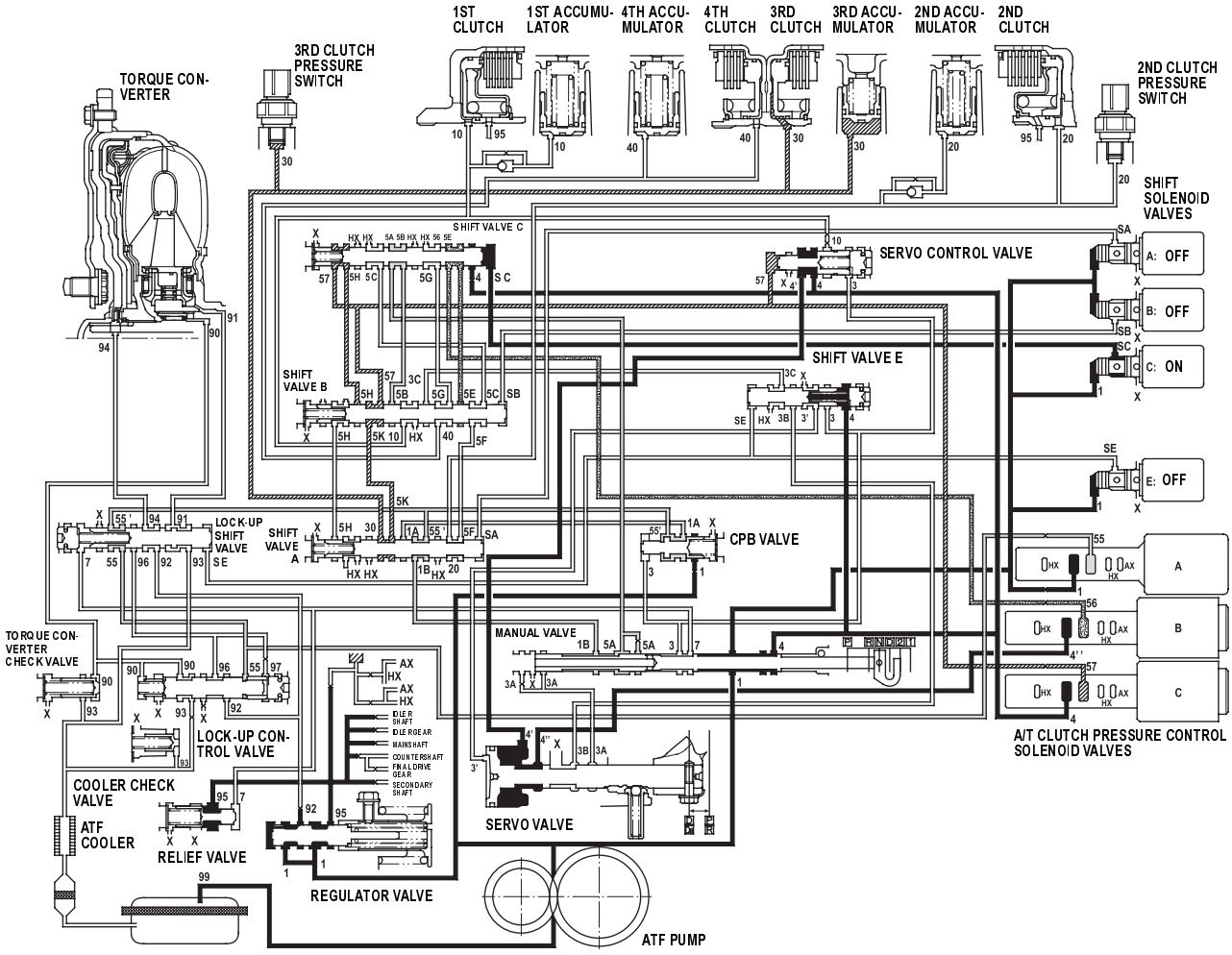
Hydraulic Flow (cont'd)

[D] Position: Driving in 3rd gear

The PCM turns shift solenoid valves B OFF, and remains A and E OFF, C ON. Shift solenoid valve B pressure (SB) in the right side of the shift valve B is released, and the shift valve B is moved to the right side. This movement switches the port of A/T clutch pressure control solenoid valve C pressure leading to the 3rd clutch.

A/T clutch pressure control solenoid valve C pressure (57) changes to (5K) at the shift valve B, and becomes to 3rd clutch pressure (30) at the shift valve A. The 3rd clutch pressure (30) is applied to the 3rd clutch, and the 3rd clutch is engaged securely.

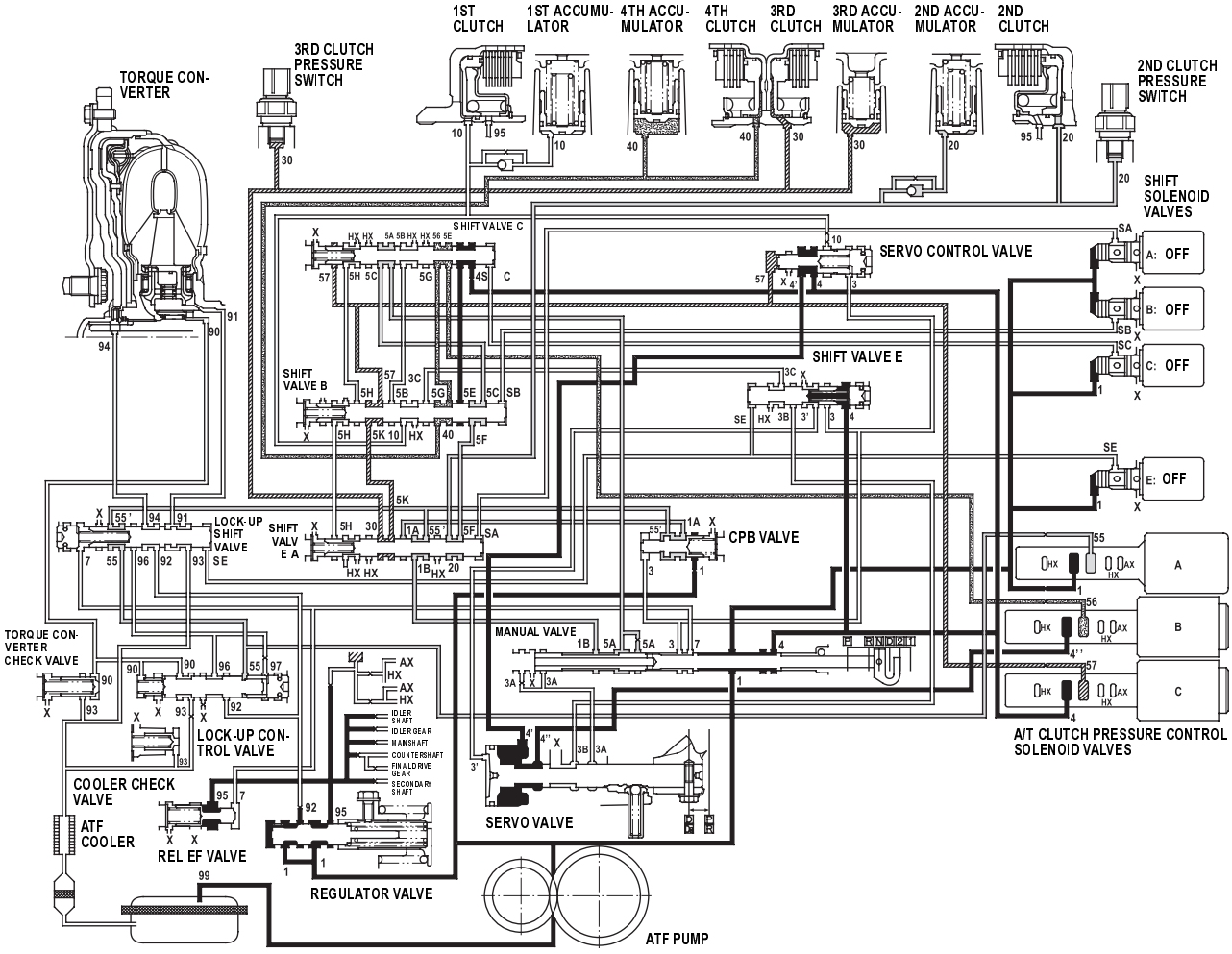
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[D] Position: Shifting between 3rd gear and 4th gear

As the speed of the vehicle reaches the prescribed value, the PCM turns shift solenoid valves C OFF, and remains A, B and E OFF. Shift solenoid valve C pressure (SC) in the right side of the shift valve C is released. The shift valve C is moved to the right side to uncover the ports of A/T clutch pressure control solenoid valves A and B pressures leading to the 2nd and 4th clutches. The PCM controls the A/T clutch pressure control solenoid valves to regulate hydraulic pressure. A/T clutch pressure control solenoid valve A pressure changes to 2nd clutch pressure (20) at the shift valve A, and A/T clutch pressure control solenoid valve B pressure changes to 4th clutch pressure (40) at the shift valve B. The 3rd clutch pressure is regulated to low by the A/T clutch pressure control solenoid valve C. The 3rd and 4th clutches are engaged gently.

NOTE: When used, ”left” or ”right” indicates direction on the hydraulic circuit.



(cont’d)

System Description (cont'd)

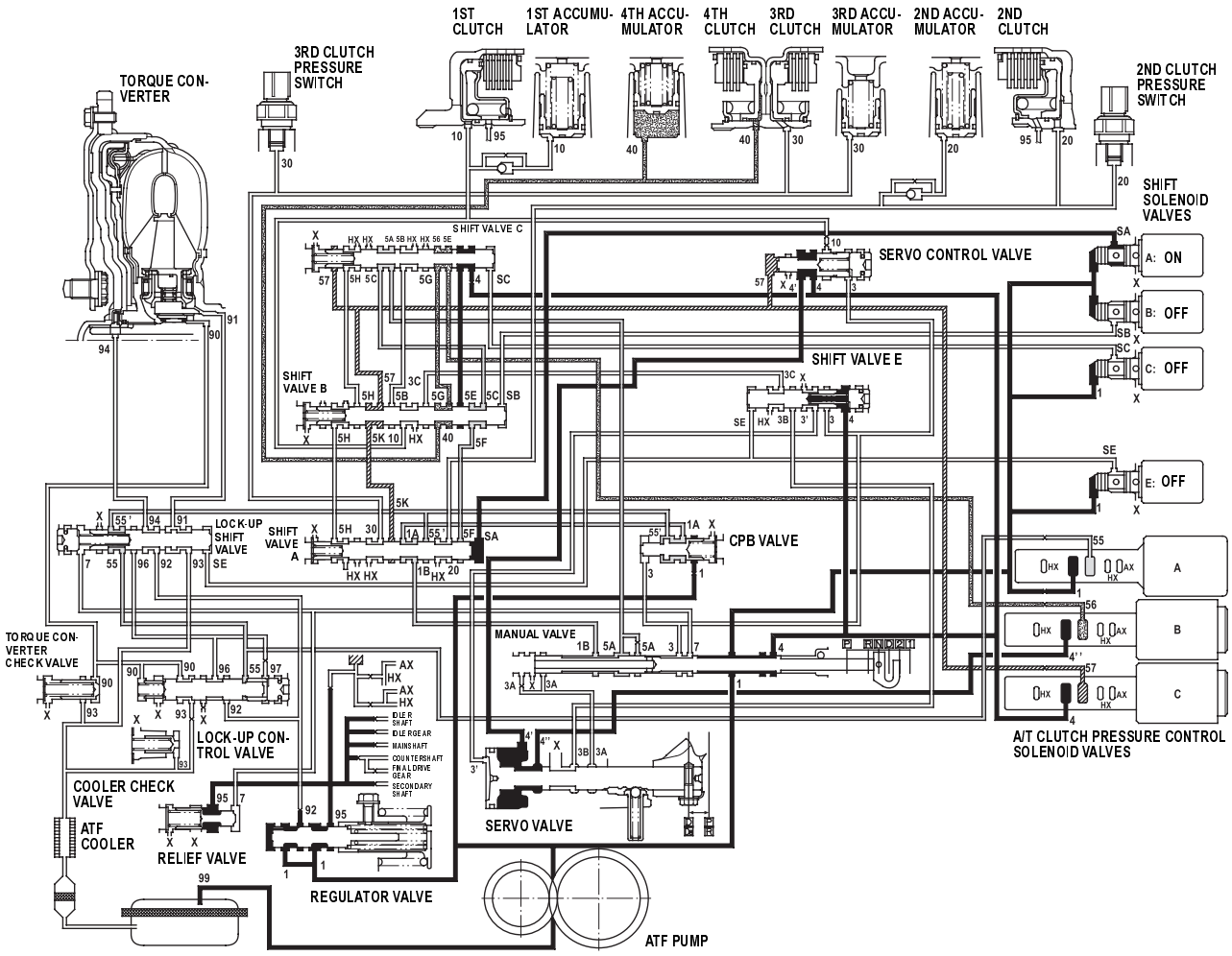
Hydraulic Flow (cont'd)

[D] Position: Driving in 4th gear

The PCM turns shift solenoid valves A ON, and remains B, C and E OFF. Shift solenoid valve A pressure (SA) is applied to the right side of the shift valve A. The shift valve A is moved to the left side to cover the ports of A/T clutch pressure control solenoid valves A and C pressure leading to the 2nd and 3rd clutches.

A/T clutch pressure control solenoid valve B pressure (56) changes to (5G) at the shift solenoid valve C, and becomes to 4th clutch pressure (40) at the shift valve B. The 4th clutch pressure (40) is regulated to high by the A/T clutch pressure control solenoid valve B, and the 4th clutch is engaged securely.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[2] Position

The PCM controls the shift solenoid valves. The conditions of the shift solenoid valves and positions of the shift valves are as follows:

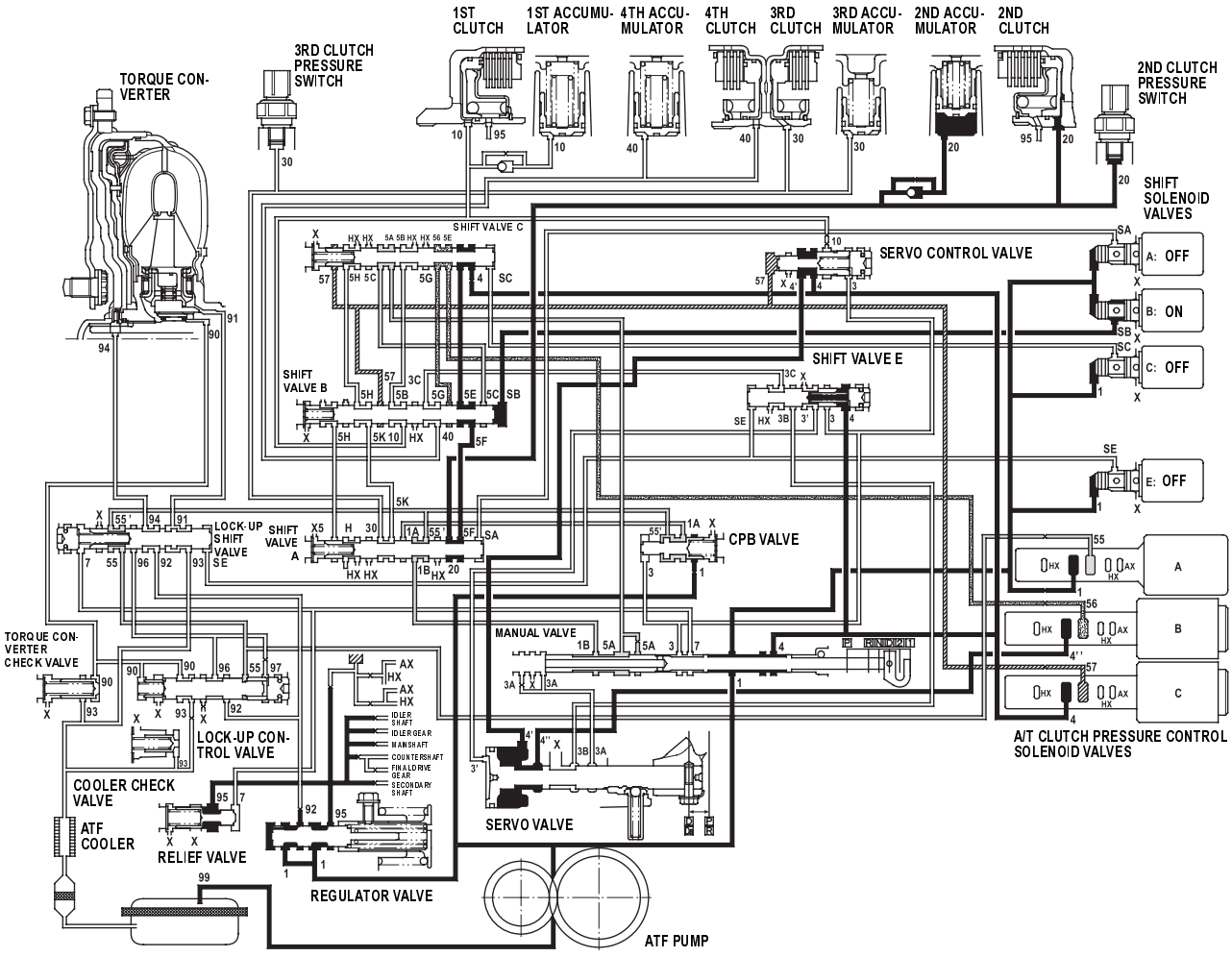
- Shift solenoid valve A: OFF Shift valve A remains in right side
- Shift solenoid valve B: ON Shift valve B moves to left side
- Shift solenoid valve C: OFF Shift valve C remains in right side
- Shift solenoid valve E: OFF Shift valve E remains in left side

Line pressure (1) changes (4) at the manual valve, and flows to the shift valve C. Line pressure (4) becomes the 2nd clutch pressure (20) at the shift valve A.

Fluid Flows to 2nd clutch by way of:
Line pressure (1) → Manual valve - Line pressure (4) → Shift valve C - Line pressure (5E) → Shift valve B - Line pressure (5F) → Shift valve A - 2nd clutch pressure (20) → 2nd clutch

The 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged.

NOTE: When used, ”left” or ”right” indicates direction on the hydraulic circuit.



(cont’d)

System Description (cont'd)

Hydraulic Flow (cont'd)

[1] Position

The PCM controls the shift solenoid valves. The conditions of the shift solenoid valves and positions of the shift valves are as follows:

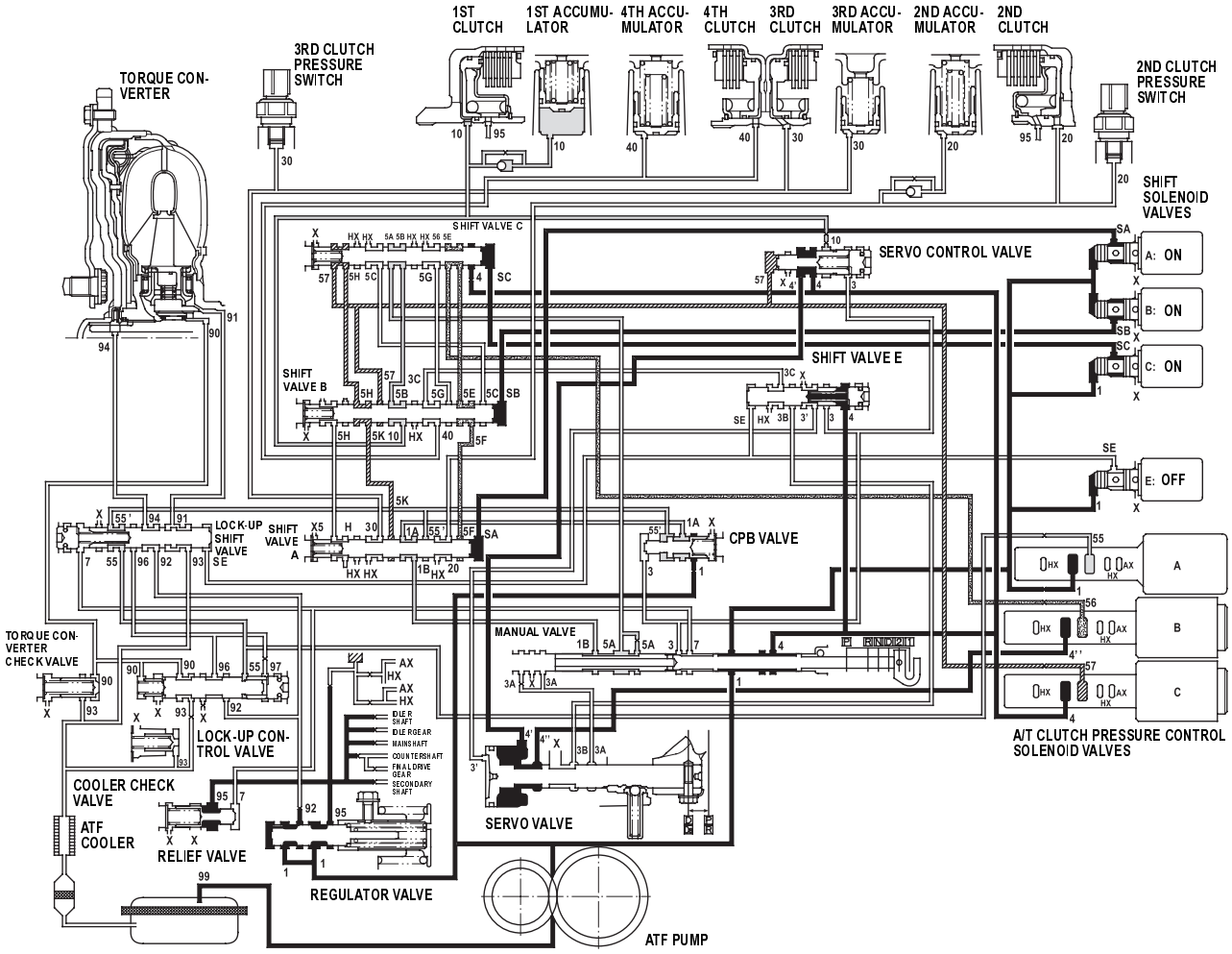
- Shift solenoid valve A: ON Shift valve A moves to left side
- Shift solenoid valve B: ON Shift valve B moves to left side
- Shift solenoid valve C: ON Shift valve C moves to left side
- Shift solenoid valve E: OFF Shift valve E remains in left side

Line pressure (1) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valve A, and changes to A/T clutch pressure control solenoid pressure (55) at the A/T clutch pressure control solenoid valve A.

Fluid Flows to 1st clutch by way of:
A/T clutch pressure control solenoid pressure (55) → CPB valve - Line pressure (1A) → Shift valve A - Line pressure (1B) → Manual valve - Line pressure (5A) → Shift valve C - Line pressure (5B) → Shift valve B - 1st clutch pressure (10) → 1st clutch

The 1st clutch pressure (10) is applied to the 1st clutch, and the 1st clutch is engaged.

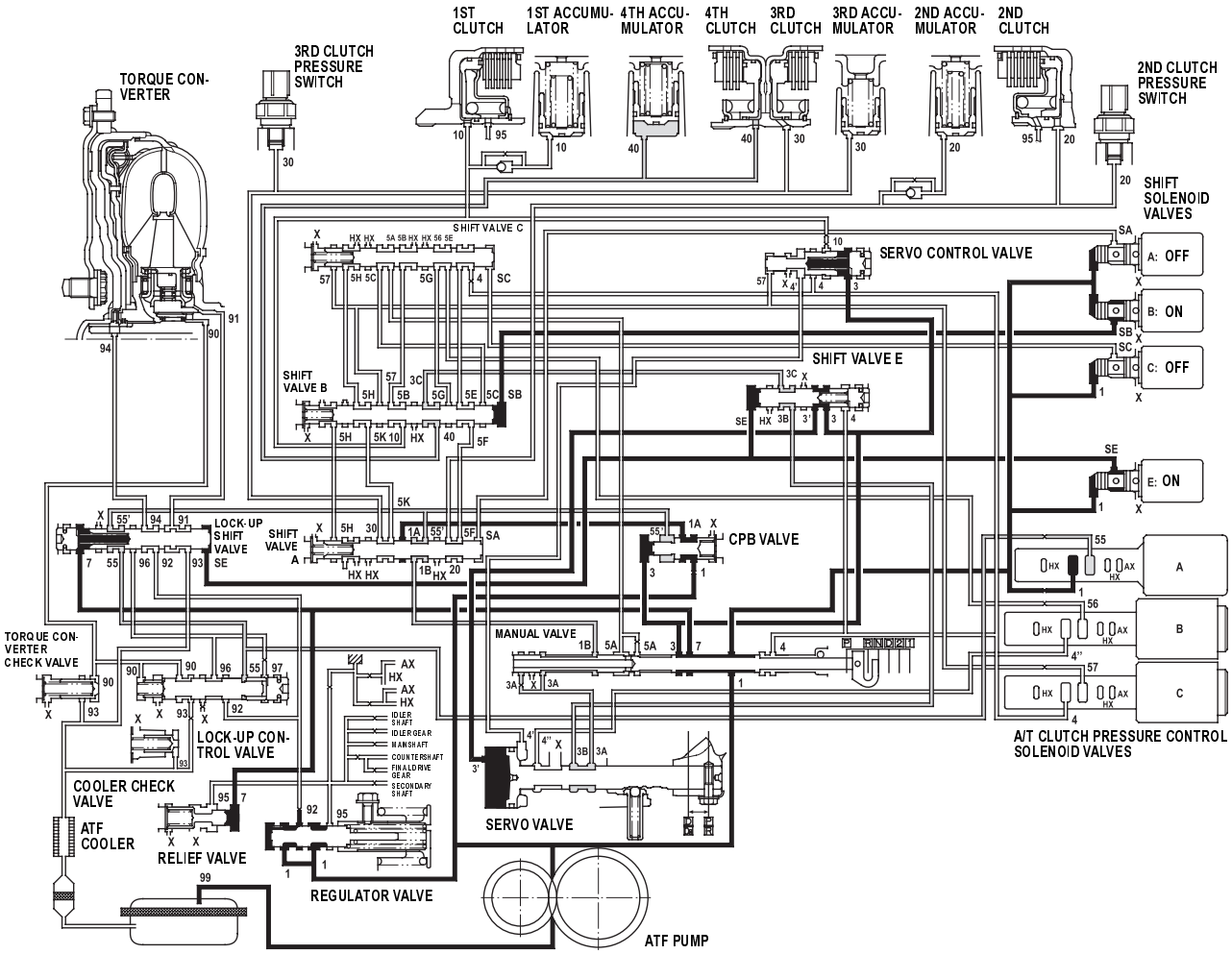
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[R] Position: Shifting to [R] position from [P] or [N] position

When shifting in [R] position, the PCM turns shift solenoid valves B and E ON, A and C OFF. Shift solenoid valve B pressure (SB) is applied to the right side of the shift valve B, and the shift valve B is moved to left side. Shift solenoid valve E pressure (SE) is applied to the left side of the shift valve E, and the shift valve E is moved to the right side. Line pressure (1) changes to (3) at the manual valve, and flows to the servo valve via the shift valve E. The servo valve is moved to reverse range position. Movement of the shift valves B and E, and servo valve creates 4th clutch pressure line between the 4th clutch and the A/T clutch pressure control solenoid valve A. The 4th clutch pressure (40) is applied to the 4th clutch, and the 4th clutch is engaged gently.

NOTE: When used, ”left” or ”right” indicates direction on the hydraulic circuit.



(cont’d)

System Description (cont'd)

Hydraulic Flow (cont'd)

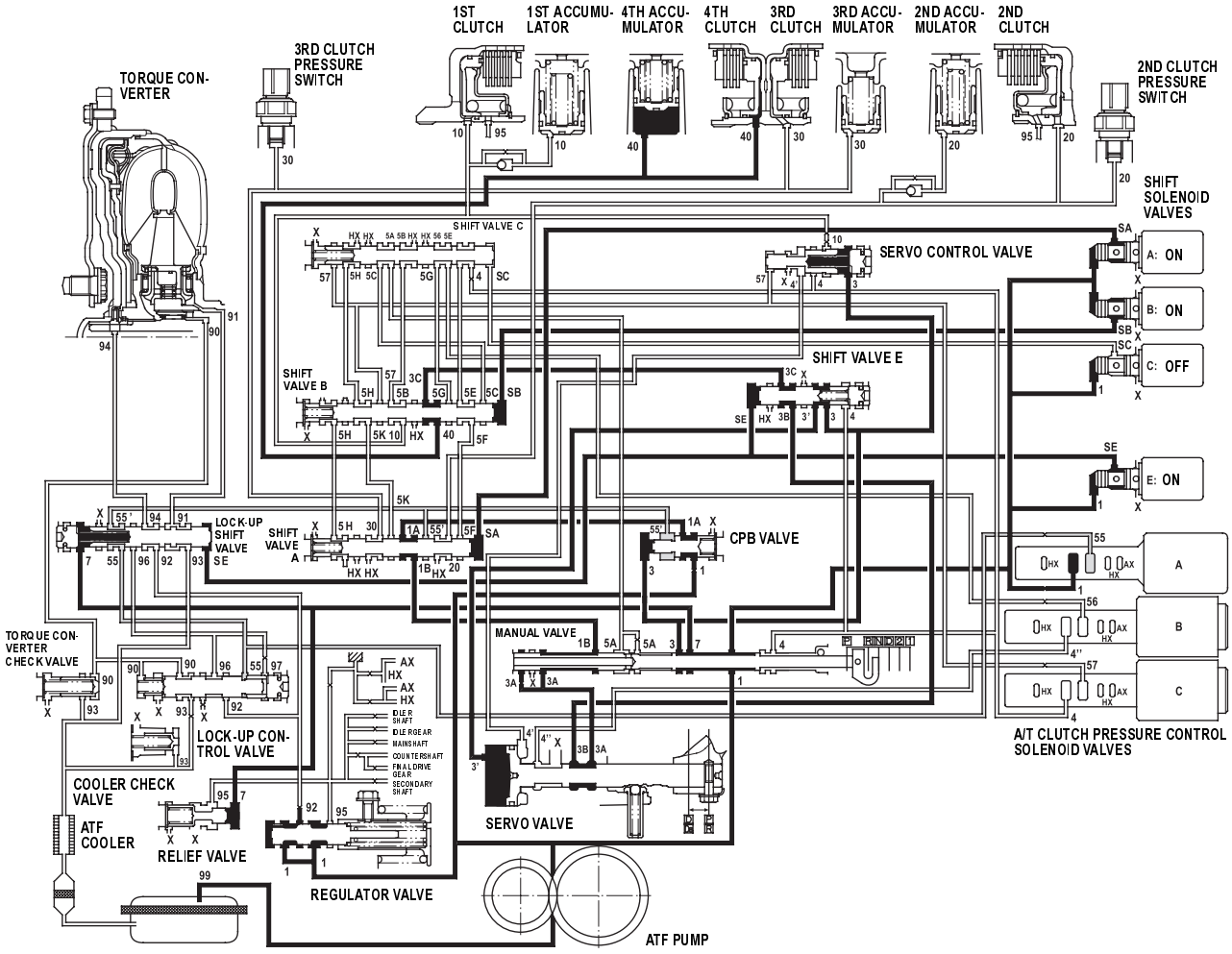
[R] Position: Driving in reverse gear

After starting off in reverse gear, the PCM turns shift solenoid valves A ON, and remains B and E ON, C OFF. Shift solenoid valve A pressure (SA) is applied to the right side of the shift valve A to cover the port of A/T clutch pressure control solenoid valve A pressure, and to uncover the port of line pressure leading to the 4th clutch creating full line pressure. The 4th clutch is engaged securely with line pressure.

Reverse Inhibitor Control

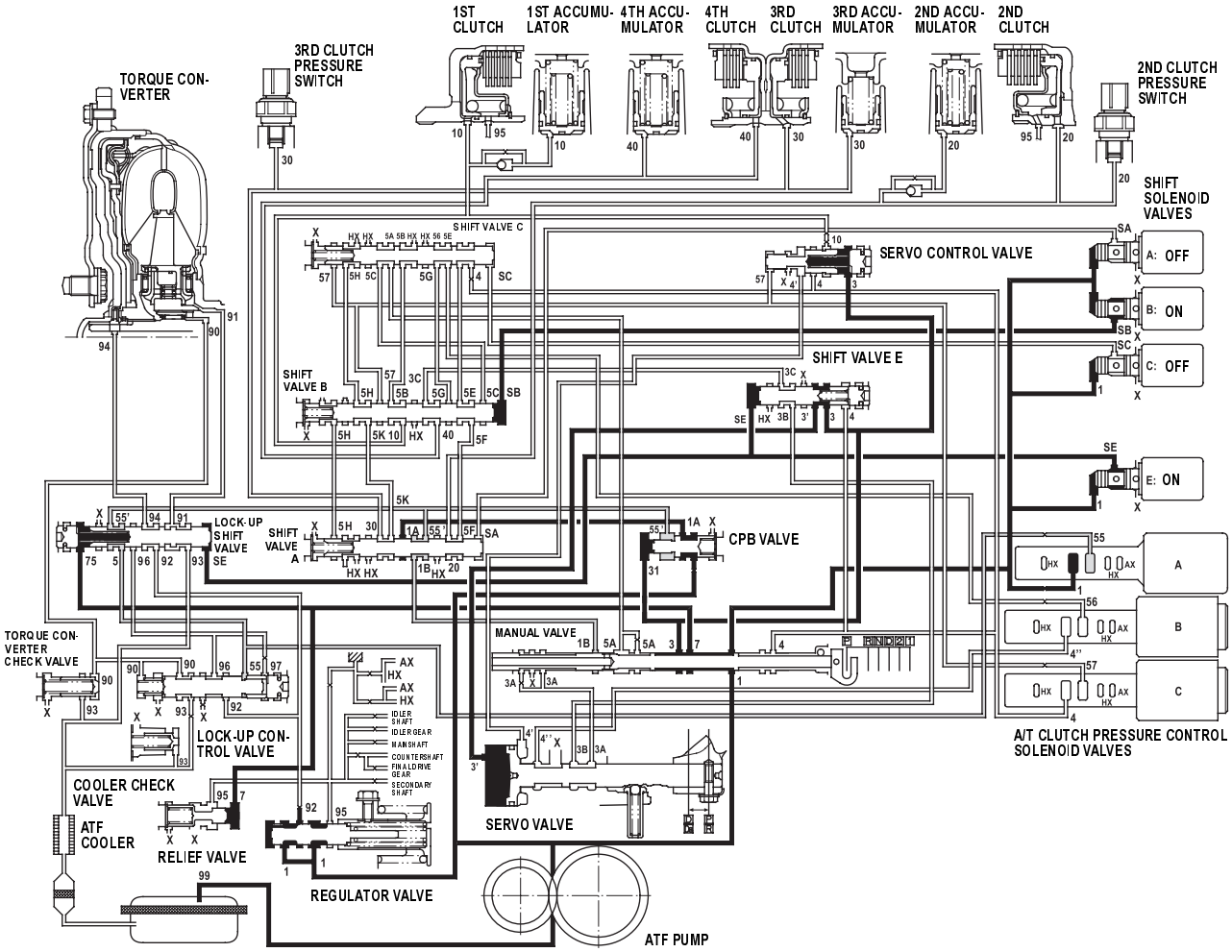
While the vehicle is moving forward, the PCM controls shift solenoid valve E remaining OFF. The shift valve E covers the port of line pressure (3') leading to the servo valve reverse position. The servo valve cannot be shifted to reverse position, and hydraulic pressure is not applied to the 4th clutch from servo valve for reverse, as a result, power is not transmitted to the reverse direction.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[P] Position

Shift solenoid valves B and E are turned ON, and A, and C OFF by the PCM. Line pressure (1) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valve A. Line pressure (3) changes to (3') at the shift valve E, and flows to the servo valve. The servo valve is moved to reverse/park position. Hydraulic pressure is not applied to the clutches.



(cont'd)

System Description (cont'd)

Lock-up System

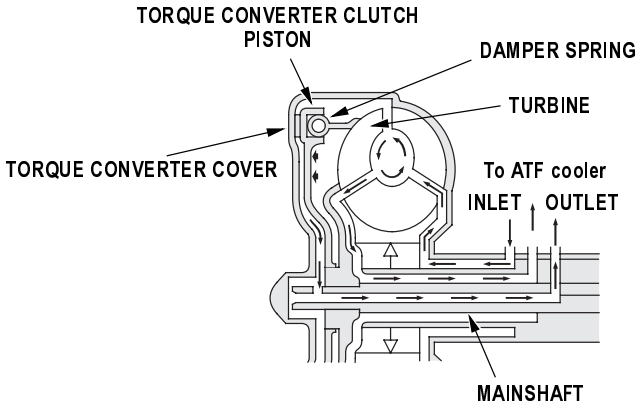
The lock-up mechanism of the torque converter clutch operates in [D] position (3rd and 4th) and [D] position over-drive off mode (3rd). The pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the torque converter clutch piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with the hydraulic control, the PCM optimizes the timing and volume of the lock-up mechanism. When the shift solenoid valve E is turned on by the PCM, shift solenoid valve E pressure switch the lock-up shift valve lock-up on and off. The A/T clutch pressure control solenoid valve A and the lock-up control valve control the volume of the lock-up conditions.

Torque Converter Clutch Lock-up ON (Engaging Torque Converter Clutch)
Fluid in the chamber between the torque converter cover and the torque converter clutch piston is drained off, and fluid entered from the chamber between the pump and stator exerts pressure through the torque converter clutch piston against the torque converter cover. The torque converter clutch piston engages with the torque converter cover; torque converter clutch lock-up ON, and the mainshaft rotates at the same as the engine.

Power flow

The power flows by way of:

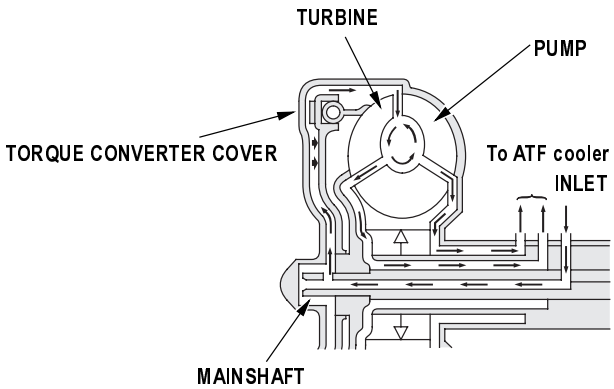
Engine
↓
Drive plate
↓
Torque converter cover
↓
Torque converter clutch piston
↓
Damper spring
↓
Turbine
↓
Mainshaft



Torque Converter Clutch Lock-up OFF (Disengaging Torque Converter Clutch)
Fluid entered from the chamber between the torque converter cover and the torque converter clutch piston passes through the torque converter and goes out from the chambers between the turbine and the stator, and between the pump and the stator. As a result, the torque converter clutch piston moves away from the torque converter, and the torque converter clutch lock-up is released; torque converter clutch lock-up OFF.

Power flow

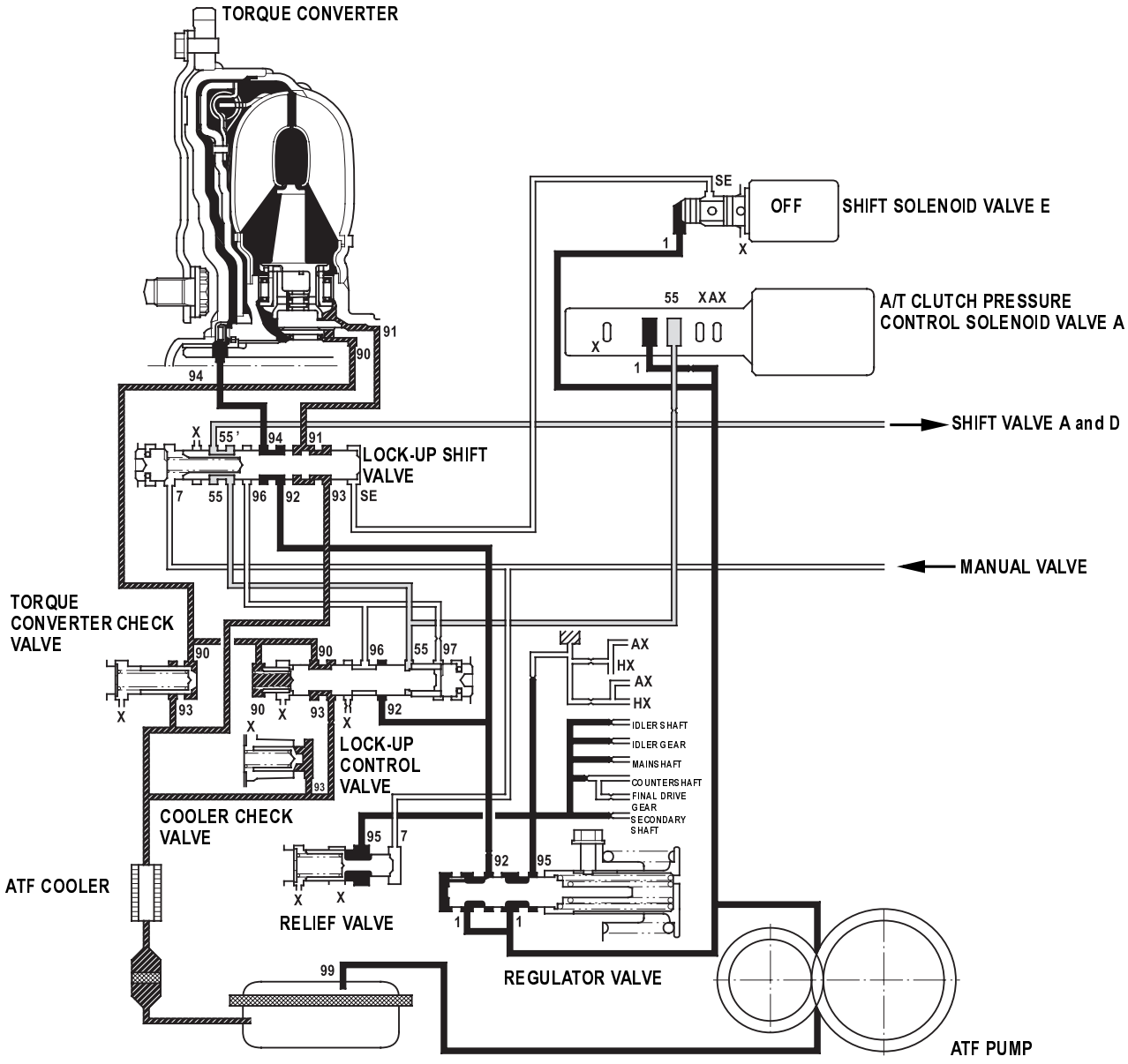
Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft



No Lock-up

Shift solenoid valve E is turned OFF by the PCM, and shift solenoid valve E pressure (SE) is not applied to the lock-up shift valve. The lock-up shift valve stays in the right side to uncover the ports of torque converter pressure leading to the left side of the torque converter and releasing from the right side of the torque converter. Torque converter pressure (92) changes to (94) at the lock-up shift valve, and enters into the left side of the torque converter to disengage the torque converter clutch. The torque converter clutch piston keeps away from the torque converter cover, the torque converter clutch lock-up is OFF.

NOTE: When used, ”left” or ”right” indicates direction on the hydraulic circuit.



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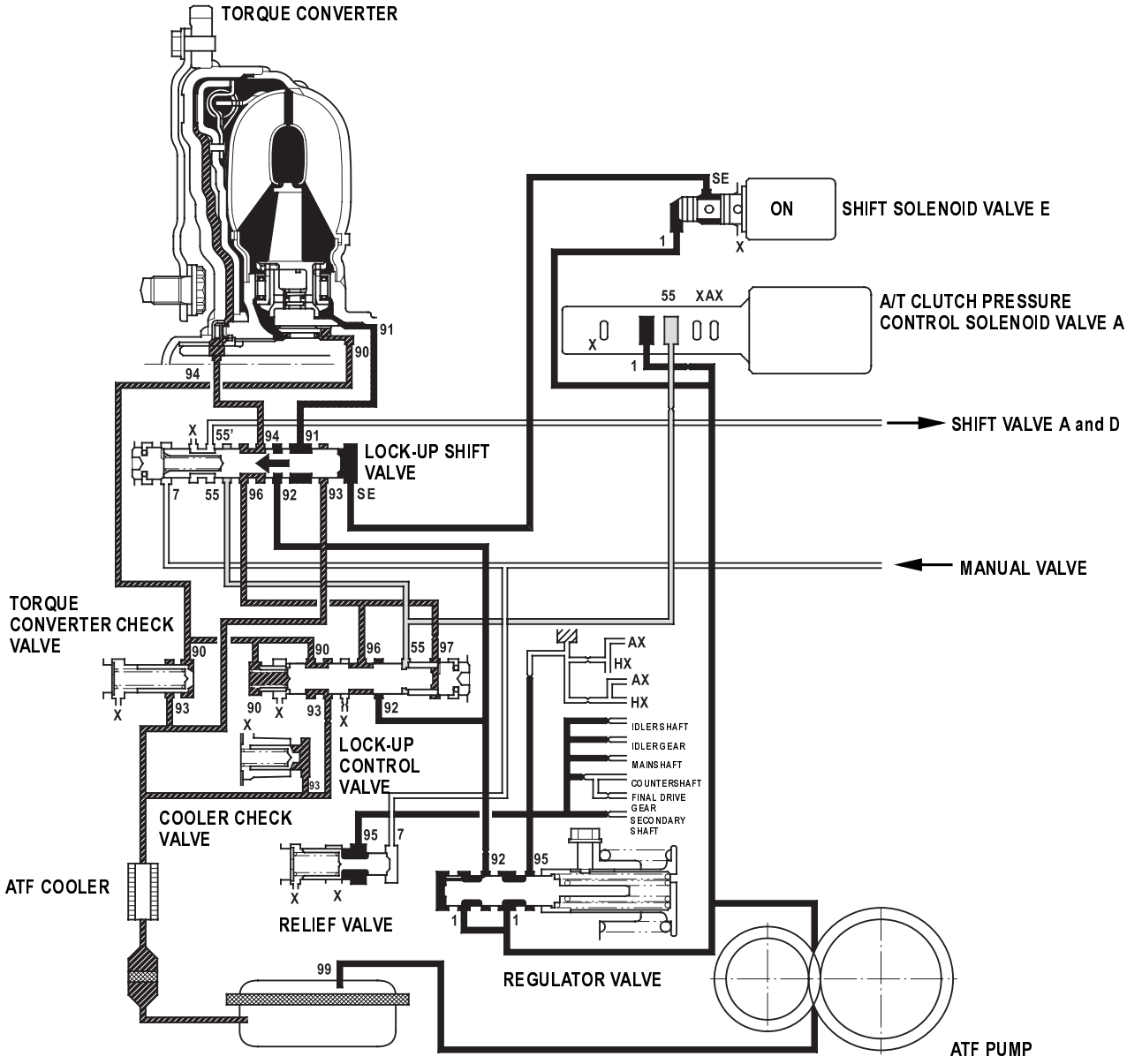
System Description (cont'd)

Lock-up System (cont'd)

Partial Lock-up

As the speed of the vehicle reaches the prescribed value, shift solenoid valve E is turned ON by the PCM, and shift solenoid valve E pressure (SE) is applied to the right side of the lock-up shift valve. The lock-up shift valve is moved to the left side to switch the port of torque converter pressure (91) leading to the right side of the torque converter, and the port of torque converter pressure (94) releasing from the left side of the torque converter. Torque converter pressure (91) flows to the right side of the torque converter to engage the torque converter clutch. The PCM also controls the A/T clutch pressure control solenoid valve A to regulate A/T clutch pressure control solenoid valve A pressure (55) applying to the lock-up shift valve and lock-up control valve. The position of the lock-up control valve depends on A/T clutch pressure control solenoid valve A pressure (55) and torque converter pressure released from the torque converter. The lock-up control valve controls volume of the torque converter clutch lock-up conditions until fluid between the clutch piston and torque converter cover is released fully; the torque converter clutch partial lock-up condition.

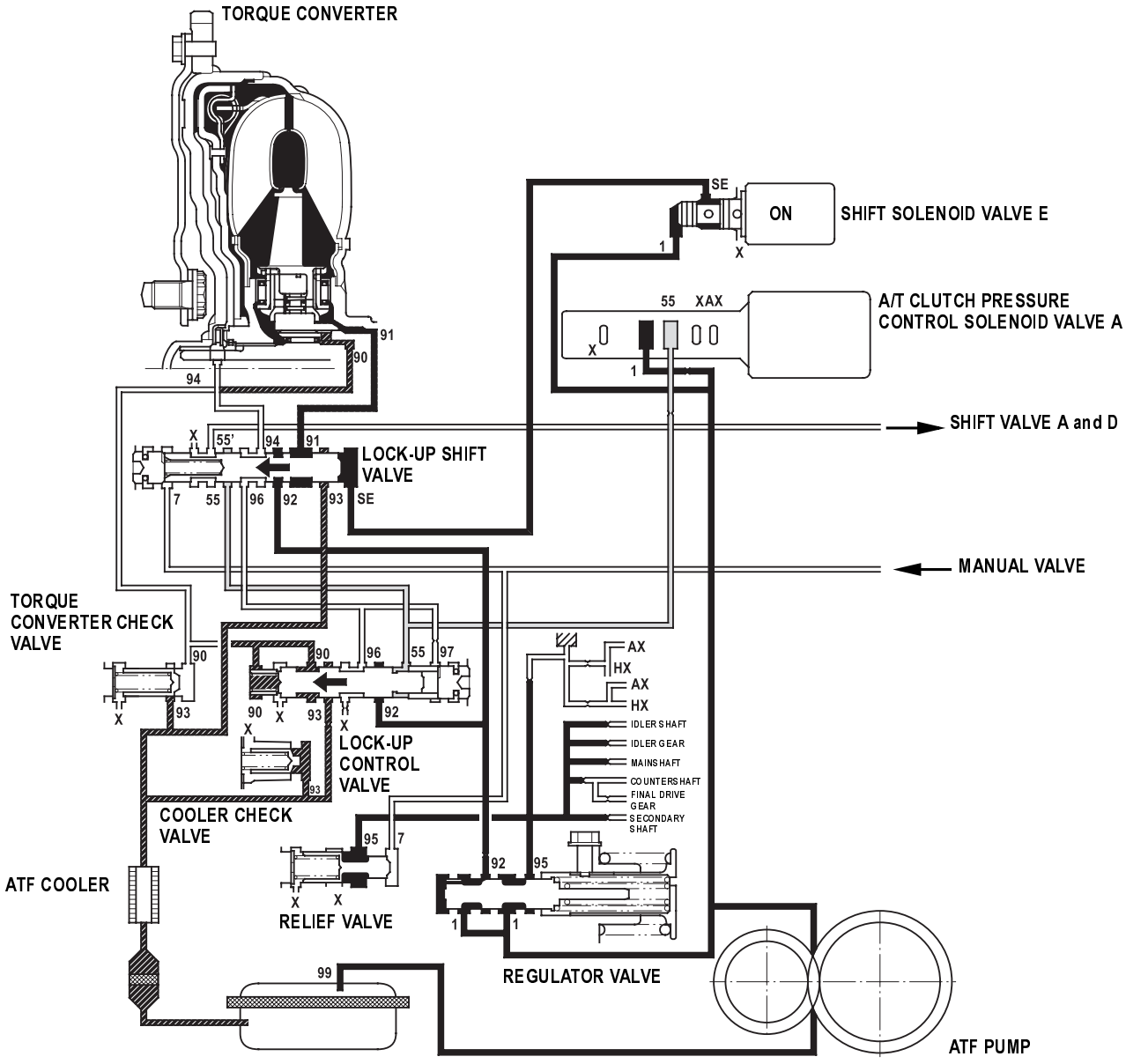
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Full Lock-up

When the vehicle speed further increased, the PCM controls the A/T clutch pressure control solenoid valve A to increase A/T clutch pressure control solenoid valve A pressure (55), and the lock-up control valve is moved to the left by pressure increased amount. Torque converter pressure (94) from the left side of the torque converter is released fully at the lock-up control valve, and torque converter pressure (91) engages the torque converter clutch securely; the torque converter clutch full lock-up condition.

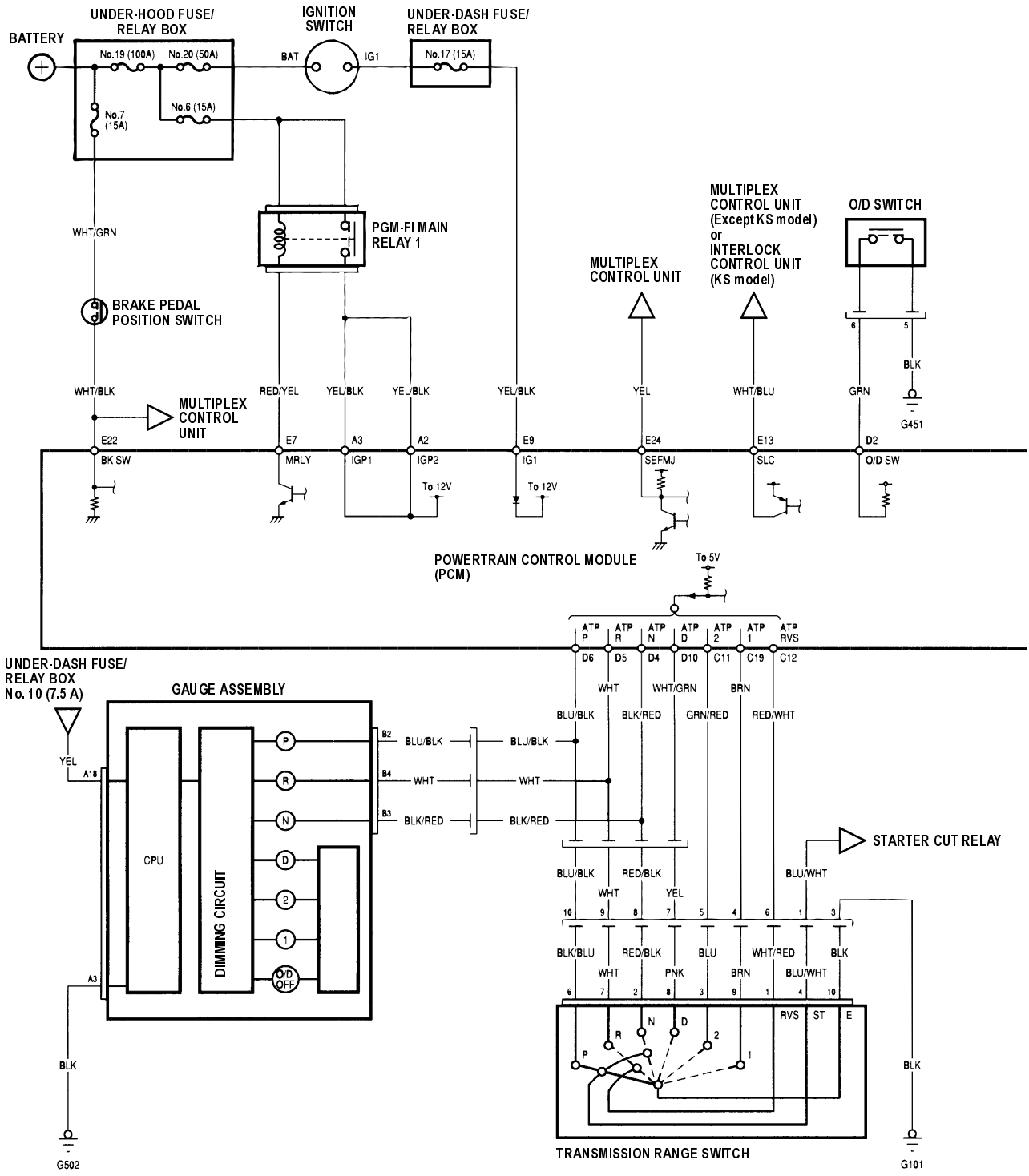
NOTE: When used, ”left” or ”right” indicates direction on the hydraulic circuit.

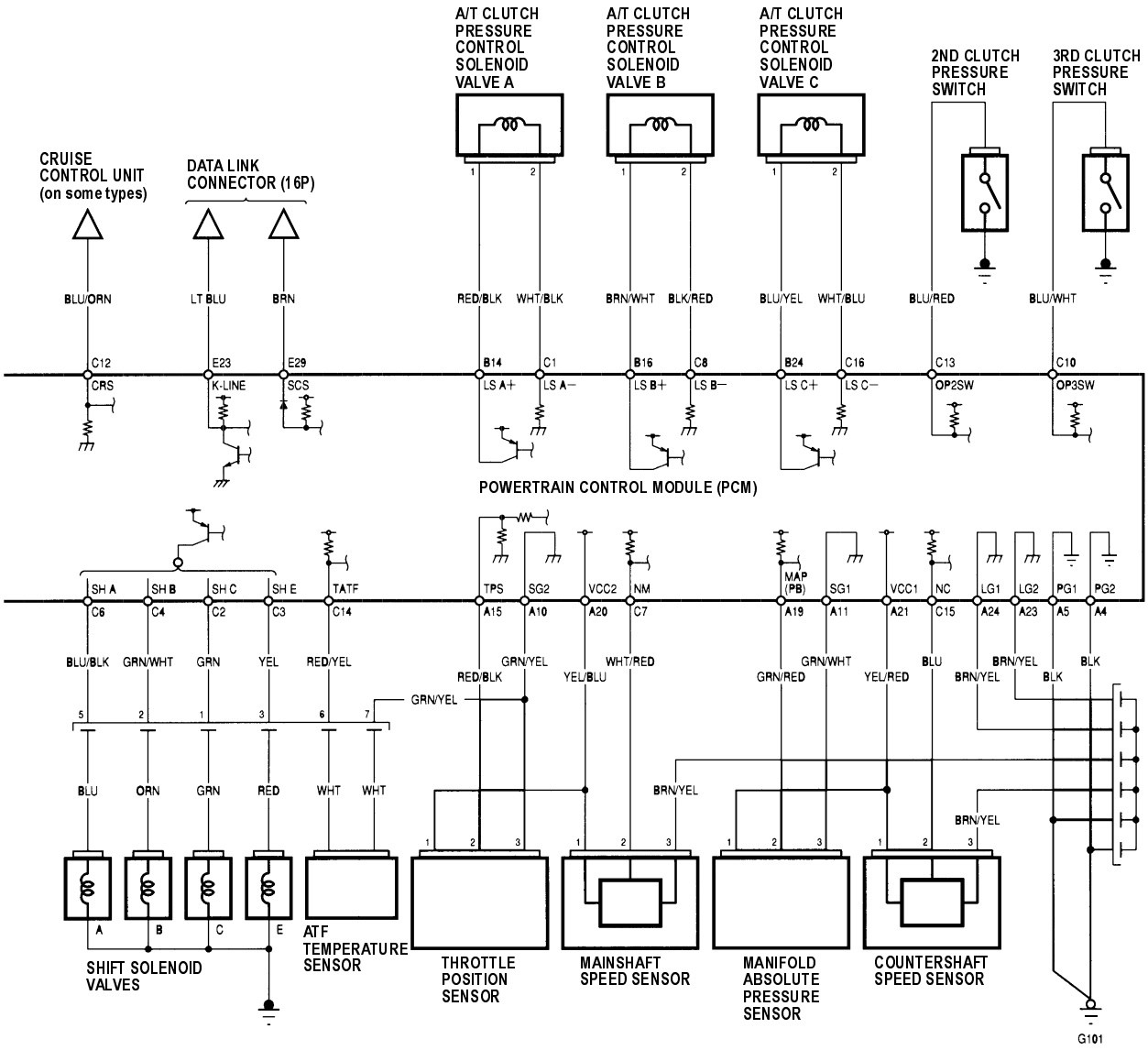


(cont’d)

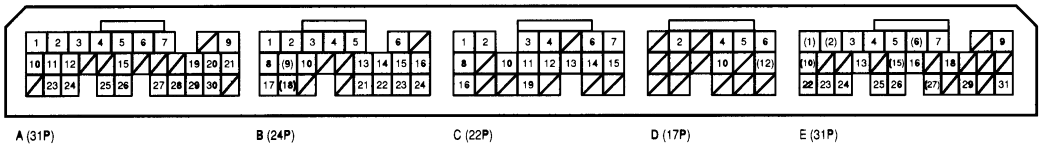
System Description (cont'd)

Circuit Diagram - PCM A/T Control System





PCM Connector Terminal Location

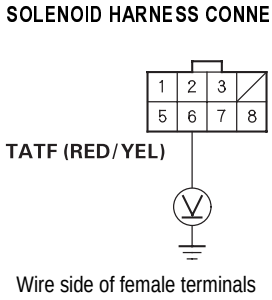


DTC Troubleshooting

DTC P0710: Problem in ATF Temperature Sensor Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the shift solenoid harness connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 6 terminal of the shift solenoid harness connector and body ground.

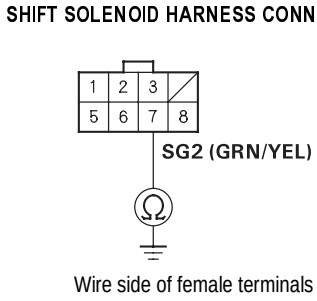


Is there about 5 V?

Yes Go to step 5.

No Go to step 15.

5. Turn the ignition switch OFF.
6. Disconnect the battery nagative terminal.
7. Disconnect PCM connector A (31P).
8. Check for continuity between the No. 7 terminal of the shift solenoid harness connector and body ground.



Is there continuity?

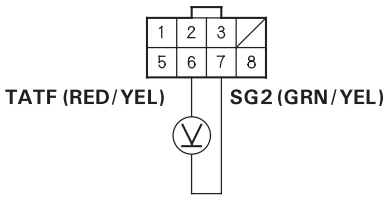
Yes Repair short in the wire between PCM connector terminal A10 and the shift solenoid harness connector.■

No Go to step 9.

9. Connect PCM connector A (31P).
10. Connect the battery nagative terminal.
11. Turn the ignition switch ON (II).

12. Measure the voltage between the No. 6 and No. 7 terminals of the shift solenoid harness connector.

SHIFT SOLENOID HARNESS CONNECTOR



Wire side of female terminals

Is there about 5 V?

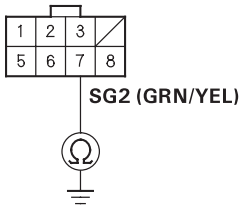
Yes Check the ATF temperature sensor and shift solenoid harness in the transmission housing (see page 14-122).■

No Go to step 13.

13. Turn the ignition switch OFF.

14. Check for continuity between the No. 7 terminal of the shift solenoid harness connector and body ground.

SHIFT SOLENOID HARNESS CONNECTOR



Wire side of female terminals

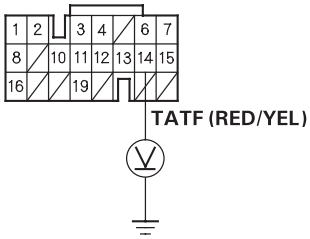
Is there continuity?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Repair open in the wire between PCM connector terminal A10 and the shift solenoid harness connector, or between PCM connector terminals A23 and ground (G101), between A24 and ground (G101), and repair poor ground (G101).■

15. Measure the voltage between PCM connector terminal C14 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there about 5 V?

Yes Repair open in the wire between PCM connector terminal C14 and the shift solenoid harness connector.■

No Check for a short in the wire between PCM connector terminal C14 and the shift solenoid harness connector. If the wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0715: Problem in Mainshaft Speed Sensor Circuit

NOTE: Record all freeze data before you troubleshoot.

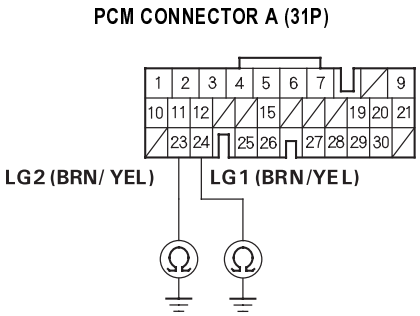
1. Check the fuel and emissions system problem is indicated by the DTC.

   Is there any fuel and emissions DTC?

   Yes Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P0715 after troubleshooting.■

   No Go to step 2.

2. Turn the ignition switch OFF.
3. Disconnect the battery negative terminal.
4. Disconnect PCM connector A (31P).
5. Check for continuity between PCM connector terminals A23 and body ground, and between A24 and body ground.



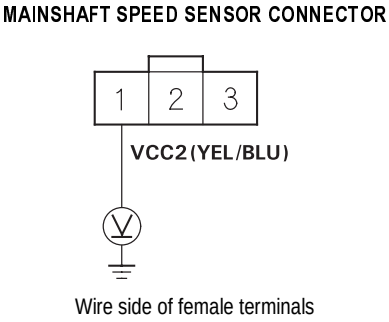
Wire side of female terminals

   Is there continuity?

   Yes Go to step 6.

   No Repair open in the wires between PCM connector terminals A23 and ground (G101), between A24 and ground (G101), and repair poor ground (G101).■

6. Connect PCM connector A (31P).
7. Connect the battery negative terminal.
8. Disconnect the mainshaft speed sensor connector.
9. Turn the ignition switch ON (II).
10. Measure the voltage between the No. 1 terminal of the mainshaft speed sensor connector and body ground.



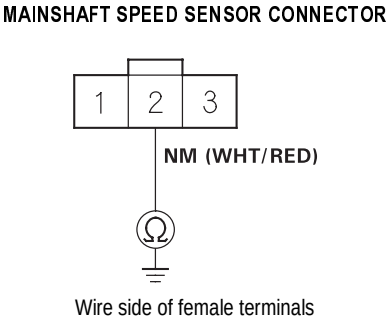
Wire side of female terminals

    Is there about 5 V?

    Yes Go to step 11.

    No Go to step 20.

11. Turn the ignition switch OFF.
12. Check for continuity between the No. 2 terminal of the mainshaft speed sensor connector and body ground.



Wire side of female terminals

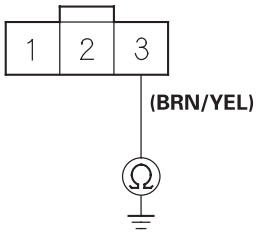
    Is there continuity?

    Yes Repair short to ground in the wire between PCM connector terminal C7 and mainshaft speed sensor connector.■

    No Go to step 13.

13. Check for continuity between the No. 3 terminal of the mainshaft speed sensor connector and body ground.

MAINSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there continuity?

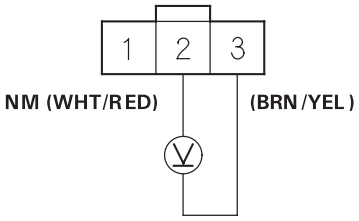
Yes Go to step 14.

No Repair open in the wire between the mainshaft speed sensor connector and ground (G101).■

14. Turn the ignition switch ON (II).

15. Measure the voltage between the No. 2 and No. 3 terminals of the mainshaft speed sensor connector.

MAINSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there about 5 V?

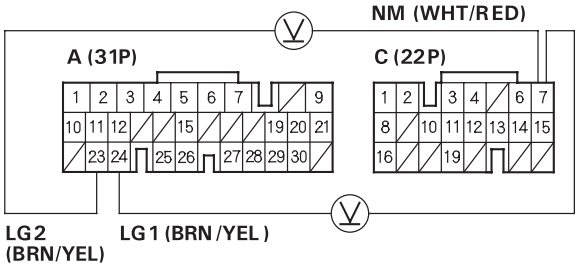
Yes Go to step 16.

No Go to step 25.

16. Connect the mainshaft speed sensor connector.

17. Measure the voltage between PCM connector terminals C7 and A23 or A24.

PCM CONNECTORS



Wire side of female terminals

Is the voltage 0 V or about 5 V?

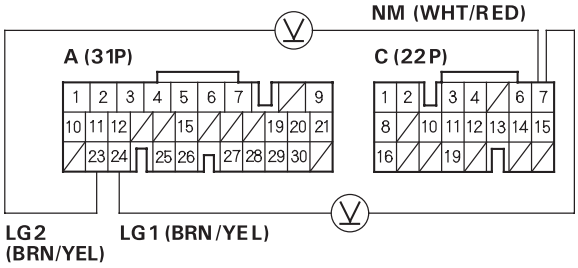
Yes Go to step 18.

No Replace the mainshaft speed sensor.■

18. Shift to [P] position. Start the engine, and run it idle.

19. With engine idling, measure the voltage between PCM connector terminals C7 and A23 or A24.

PCM CONNECTORS



Wire side of female terminals

Is there 1.5 V - 3.5 V?

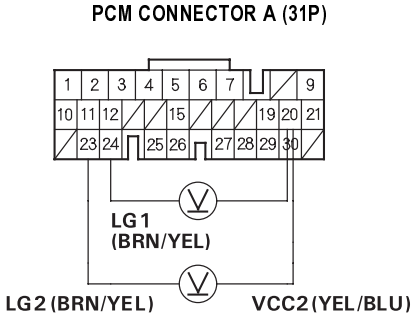
Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Replace the mainshaft speed sensor.■

(cont'd)

DTC Troubleshooting (cont'd)

20. Measure the voltage between PCM connector terminal A20 and A23 or A24.



Wire side of female terminals

Is there 4.75 V - 5.25 V?

Yes Repair open in the wire between PCM connector terminal A20 and the mainshaft speed sensor connector.■

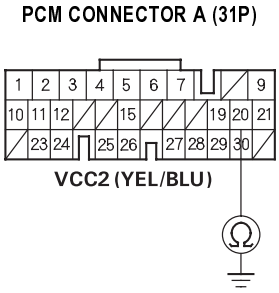
No Go to step 21.

21. Turn the ignition switch OFF.

22. Disconnect the battery negative terminal.

23. Disconnect PCM connector A (31P).

24. Check for continuity between PCM connector A20 and body ground.



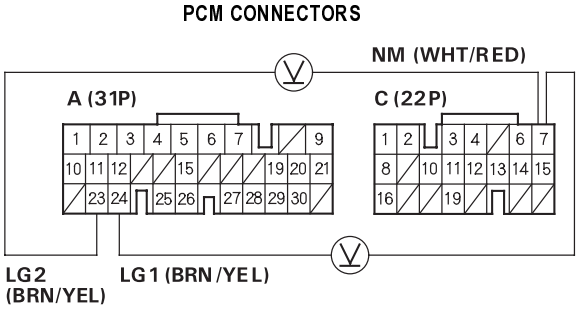
Wire side of female terminals

Is there continuity?

Yes Repair short to ground in the wire between PCM connector terminal A20 and the mainshaft speed sensor connector.■

No Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

25. Measure the voltage between PCM connector terminal C7 and A23 or A24.



Wire side of female terminals

Is there about 5 V?

Yes Repair open in the wire between PCM connector C7 and the mainshaft speed sensor connector.■

No Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

DTC P0720: Problem in Countershaft Speed Sensor Circuit

NOTE: Record all freeze data before you troubleshoot.

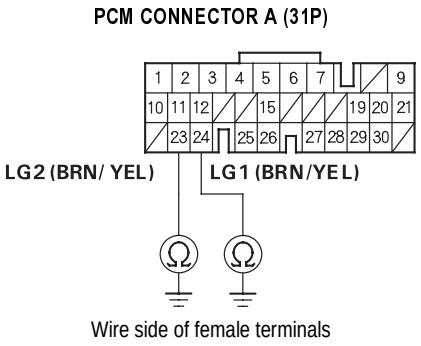
1. Check the fuel and emissions system problem is indicated by the DTC.

   Is there any fuel and emissions DTC?

   Yes Perform the troubleshooting flowchart for the indicated code(s). Recheck for code P0720 after troubleshooting.■

   No Go to step 2.

2. Turn the ignition switch OFF.
3. Disconnect the battery negative terminal.
4. Disconnect PCM connector A (31P).
5. Check for continuity between PCM connector terminals A23 and body ground, and between A24 and body ground.

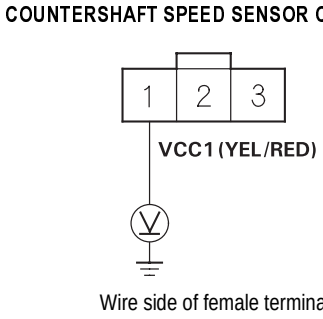


   Is there continuity?

   Yes Go to step 6.

   No Repair open in the wires between PCM connector terminals A23 and ground (G101), between A24 and ground (G101), and repair poor ground (G101).■

6. Connect PCM connector A (31P).
7. Connect the battery negative terminal.
8. Disconnect the countershaft speed sensor connector.
9. Turn the ignition switch ON (II).
10. Measure the voltage between the No. 1 terminal of the countershaft speed sensor connector and body ground.

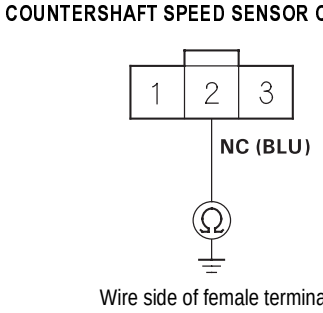


   Is there about 5 V?

   Yes Go to step 11.

   No Go to step 21.

11. Turn the ignition switch OFF.
12. Check for continuity between the No. 2 terminal of the countershaft speed sensor connector and body ground.



   Is there continuity?

   Yes Repair short to ground in the wire between PCM connector terminal C15 and the countershaft speed sensor connector.■

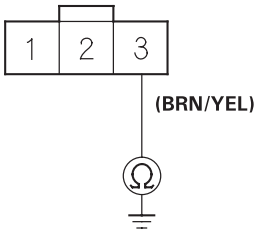
   No Go to step 13.

(cont'd)

DTC Troubleshooting (cont'd)

13. Check for continuity between the No. 3 terminal of the countershaft speed sensor connector and body ground.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there continuity?

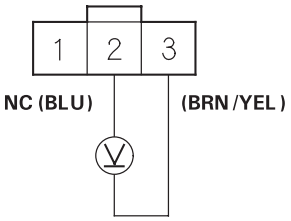
Yes Go to step 14.

No Repair open in the wire between the countershaft speed sensor connector and ground (G101).■

14. Turn the ignition switch ON (II).

15. Measure the voltage between the No. 2 and No. 3 terminals of the countershaft speed sensor connector.

COUNTERSHAFT SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there about 5 V?

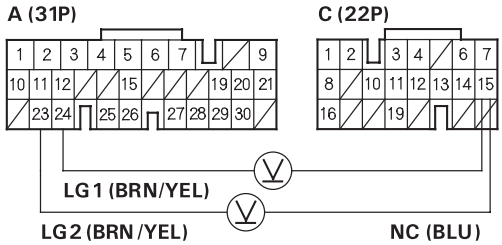
Yes Go to step 16.

No Go to step 26.

16. Connect the countershaft speed sensor connector.

17. Measure the voltage between PCM connector terminals C15 and A23 or A24.

PCM CONNECTORS



Wire side of female terminals

Is the voltage 0 V or about 5 V?

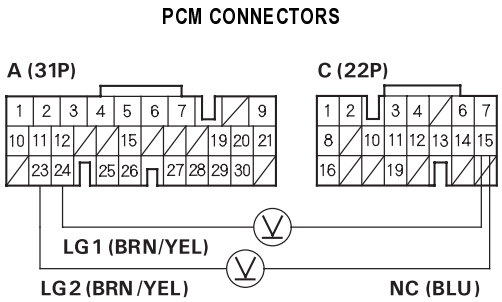
Yes Go to step 18.

No Replace the countershaft speed sensor.■

18. For 4WD model: Raise the vehicle, make sure it is securely supported, and allow the all four wheels to rotate freely.
For 2WD model: Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.

19. Start the engine, then shift to [D] position and drive the vehicle.

20. Measure the voltage between PCM connector terminals C15 and A23 or A24.



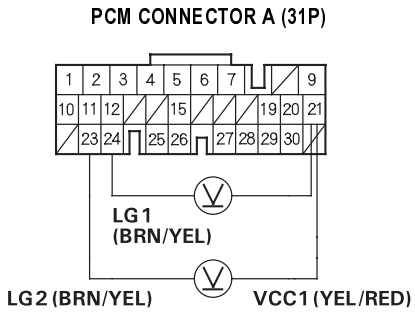
Wire side of female terminals

Is there 1.5 V - 3.5 V?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Replace the countershaft speed sensor.■

21. Measure the voltage between PCM connector terminals A21 and A23 or A24.



Wire side of female terminals

Is there 4.75 V - 5.25 V?

Yes Repair open in the wire between PCM connector terminal A21 and the countershaft speed sensor connector.■

No Go to step 22.

(cont'd)

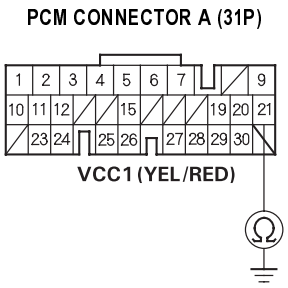
DTC Troubleshooting (cont'd)

22. Turn the ignition switch OFF.

23. Disconnect the battery negative terminal.

24. Disconnect PCM connector A (31P).

25. Check for continuity between PCM connector terminal A21 and body ground.



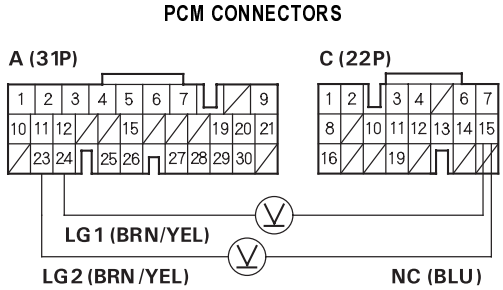
Wire side of female terminals

Is there continuity?

Yes Repair short to ground in the wire between PCM connector terminal A21 and the countershaft speed sensor connector.■

No Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

26. Measure the voltage between PCM connector terminals C15 and A23 or A24.



Wire side of female terminals

Is there about 5 V?

Yes Repair open in the wire between PCM connector terminal C15 and the countershaft speed sensor connector.■

No Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

DTC P0745: Problem in Hydraulic Control System of A/T Clutch Pressure Control Solenoid Valve A Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Check the fuel and emissions system problem or A/T system problem is indicated by the DTC.

   Is there any of the DTC?

   Yes Perform the troubleshooting flowchart for the indicated code(s). Turn the ignition switch OFF, and go to step 4 after troubleshooting.

   No Go to step 2.

2. Turn the ignition switch OFF.
3. Replace the A/T clutch pressure control solenoid valve A (see page 14-117).
4. Reset the PCM memory by removing the No. 6 ECU fuse (15A) in the under-hood fuse/relay box for more than 10 seconds.
5. Start the engine, and shift to [1] position. Start the vehicle off in [1] position, drive at 19 mph (30 km/h) for 10 seconds, shift into [2] position, drive at 19 mph (30 km/h) for 10 seconds, then decelerate to a stop.
6. Repeat step 5 to test-drive the vehicle.
7. Recheck for DTC P0745.

   Is DTC P0745 indicated?

   Yes Replace the transmission assembly.■

   No The problem has been corrected.■

(cont'd)

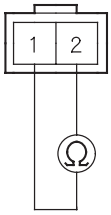
DTC Troubleshooting (cont'd)

DTC P0748: Problem in A/T Clutch Pressure Control Solenoid Valve A Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Disconnect the A/T clutch pressure control solenoid valve A connector.
2. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid valve connector terminals.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

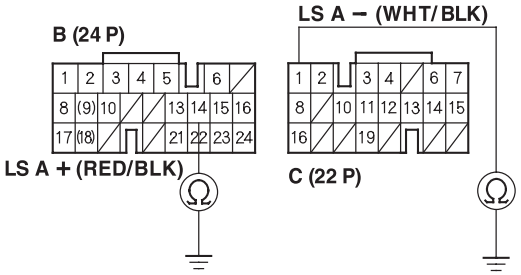
Is there about 5 Ω?

Yes Go to step 3.

No Replace the A/T clutch pressure control solenoid valve A.■

3. Disconnect the battery negative terminal.
4. Disconnect PCM connectors B (24P) and C (22P).
5. Check for continuity between PCM connector terminals B14 and body ground, and between C1 and body ground.

PCM CONNECTORS



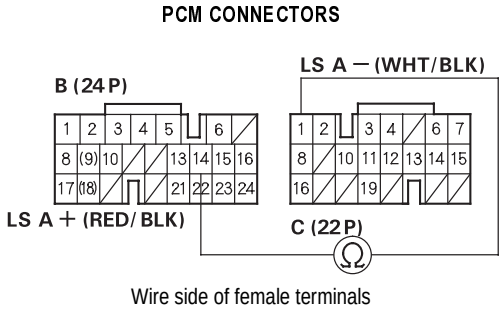
Wirel side of female terminals

Is there continuity?

Yes Repair short to ground in the wires between PCM connector terminals B14 and the A/T clutch pressure control solenoid valve A, and between C1 and the solenoid valve A.■

No Go to step 6.

6. Connect the A/T clutch pressure control solenoid valve A connector.
7. Measure the resistance between PCM connector terminals B14 and C1.

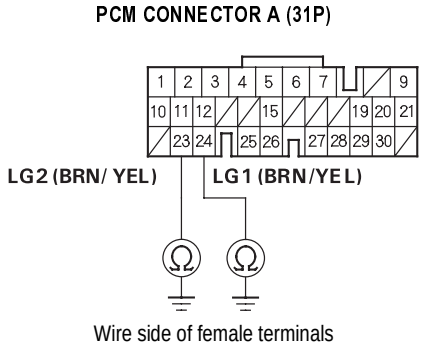


Is there about 5 Ω?

Yes Go to step 8.

No Repair loose terminal or open in the wires between PCM connector terminals B14 and the A/T clutch pressure control solenoid valve A, and between C1 and the solenoid valve A.■

8. Disconnect PCM connector A (31P).
9. Check for continuity between PCM connector terminals A23 and body ground, and between A24 and body ground.



Is there continuity?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Repair open in the wires between PCM connector terminals A23 and ground (G101), and between A24 and ground (G101), and repair poor ground (G101).■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0750: Problem in Hydraulic Control System of Shift Solenoid Valve A Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Check the fuel and emissions system problem or A/T system problem is indicated by the DTC.

   Is there any of the DTC?

   Yes Perform the troubleshooting flowchart for the indicated code(s). Turn the ignition switch OFF, and go to step 4 after troubleshooting.

   No Go to step 2.

2. Turn the ignition switch OFF.
3. Replace the shift solenoid valve A (see page 14-114).
4. Reset the PCM memory by removing the No. 6 ECU fuse (15 A) in the under-hood fuse/relay box for more than 10 seconds.
5. Start the engine, and shift to [1] position. Start the vehicle off in [1] position, drive at 25 mph (40 km/h) for 10 seconds, shift into [2] position, drive at 25 mph (40 km/h) for 10 seconds, then shift into [1] position, and drive at 25 mph (40 km/h) for 10 seconds.
6. Recheck for DTC P0750.

   Is DTC P0750 indicated?

   Yes Go to step 7.

   No The problem has been corrected.■

7. Turn the ignition switch OFF.
8. Remove the transmission, and overhaul transmission hydraulic control system and the 2nd clutch line.
9. Install the transmission on the vehicle.
10. Reset the PCM memory by removing the No. 6 ECU fuse (15 A) in the under-hood fuse/relay box for more than 10 seconds, if necessary.
11. Start the engine, and shift to [1] position. Start the vehicle off in [1] position, drive at 25 mph (40 km/h) for 10 seconds, shift into [2] position, drive at 25 mph (40 km/h) for 10 seconds, then shift into [1] position, and drive at 25 mph (40 km/h) for 10 seconds.
12. Recheck for DTC P0750.

    Is DTC P0750 indicated?

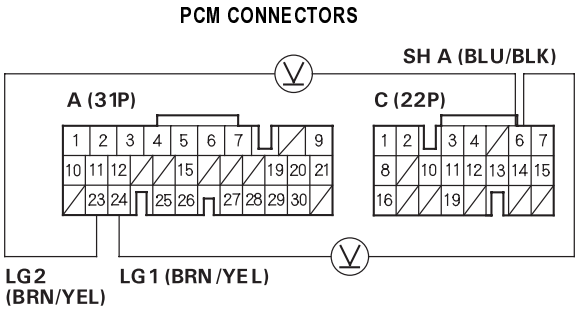
    Yes Replace the transmission assembly.■

    No The problem has been corrected.■

DTC P0753: Problem in Shift Solenoid Valve A Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connectors A (31P) and C (22P).
4. Reconnect the battery negative terminal.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminals C6 and A23 or A24.



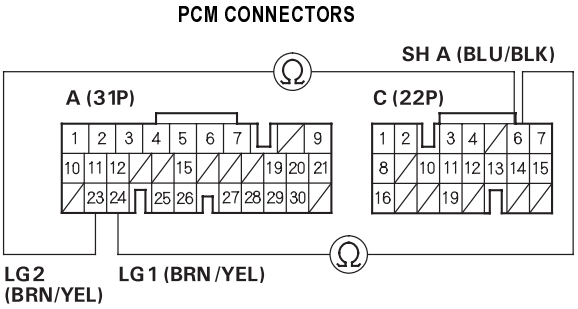
Wire side of female terminals

Is there voltage?

Yes Repair short to power in the wire between PCM connector terminal C6 and the shift solenoid valve A.■

No Go to step 7.

7. Turn the ignition switch OFF.
8. Disconnect the shift solenoid harness connector at the transmission housing.
9. Check for continuity between PCM connector terminals C6 and A23 or A24.



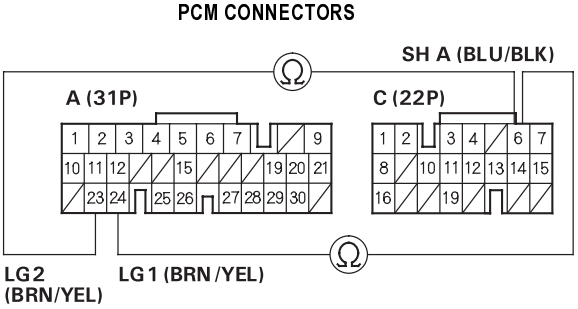
Wire side of female terminals

Is there continuity?

Yes Repair short to ground in the wire between PCM connector terminal C6 and the shift solenoid harness connector.■

No Go to step 10.

10. Connect the shift solenoid harness connector.
11. Measure the resistance between PCM connector terminals C6 and A23 or A24.



Wire side of female terminals

Is there 12 - 25 Ω?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

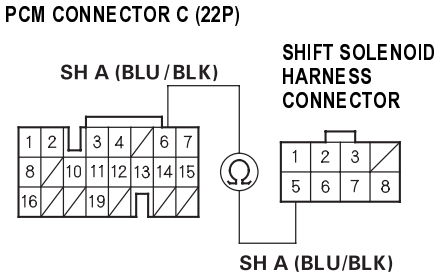
No Go to step 12.

(cont'd)

DTC Troubleshooting (cont'd)

12. Disconnect the shift solenoid harness connector.

13. Check for continuity between PCM connector terminal C6 and the No. 5 terminal of the shift solenoid harness connector.



Wire side of female terminals

Is there continuity?

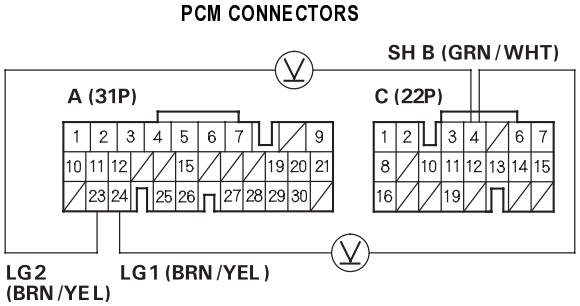
Yes Check the shift solenoid valve A, and check for an open in the shift solenoid harness in the transmission (see page 14-112).■

No Repair open in the wire between PCM connector terminal C6 and the shift solenoid harness connector.■

DTC P0758: Problem in Shift Solenoid Valve B Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connectors A (31P) and C (22P).
4. Reconnect the battery negative terminal.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminals C4 and A23 or A24.



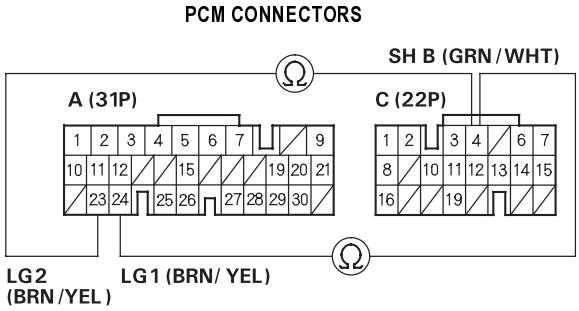
Wire side of female terminals

Is there voltage?

Yes Repair short to power in the wire between PCM connector terminal C4 and the shift solenoid valve B.■

No Go to step 7.

7. Turn the ignition switch OFF.
8. Disconnect the shift solenoid harness connector at the transmission housing.
9. Check for continuity between PCM connector terminals C4 and A23 or A24.



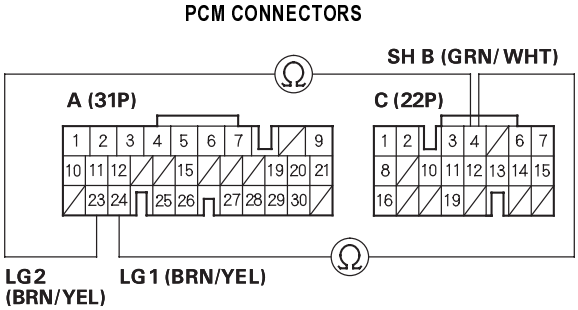
Wire side of female terminals

Is there continuity?

Yes Repair short to ground in the wire between PCM connector terminal C4 and the shift solenoid harness connector.■

No Go to step 10.

10. Connect the shift solenoid harness connector.
11. Measure the resistance between PCM connector terminals C4 and A23 or A24.



Wire side of female terminals

Is there 12 - 25 Ω?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

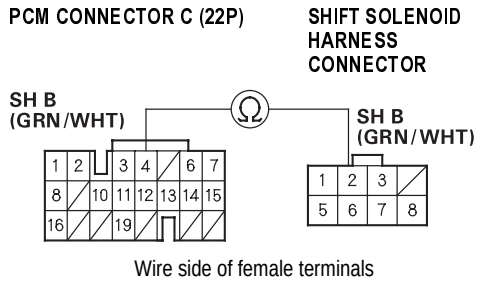
No Go to step 12.

(cont'd)

DTC Troubleshooting (cont'd)

12. Disconnect the shift solenoid harness connector.

13. Check for continuity between PCM connector terminal C4 and No. 2 terminal of the shift solenoid harness connector.



Wire side of female terminals

Is there continuity?

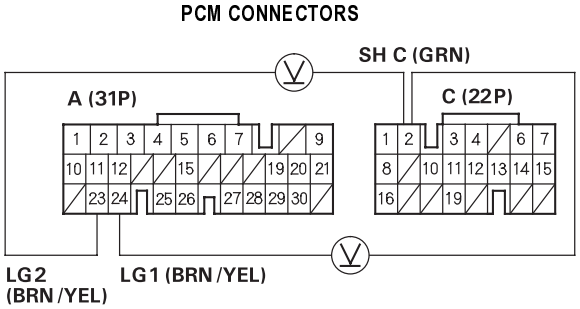
Yes Check the shift solenoid valve B, and check for an open in the shift solenoid harness in the transmission (see page 14-112).■

No Repair open in the wire between PCM connector terminal C4 and the shift solenoid harness connector.■

DTC P0763: Problem in Shift Solenoid Valve C Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connectors A (31P) and C (22P).
4. Reconnect the battery negative terminal.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminals C2 and A23 or A24.



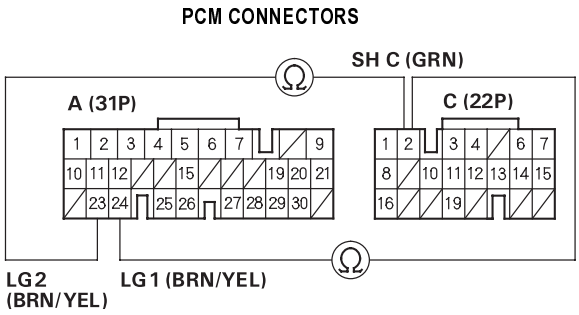
Wire side of female terminals

Is there voltage?

Yes Repair short to power in the wire between PCM connector terminal C2 and the shift solenoid valve C.■

No Go to step 7.

7. Turn the ignition switch OFF.
8. Disconnect the shift solenoid harness connector at the transmission housing.
9. Check for continuity between PCM connector terminals C2 and A23 or A24.



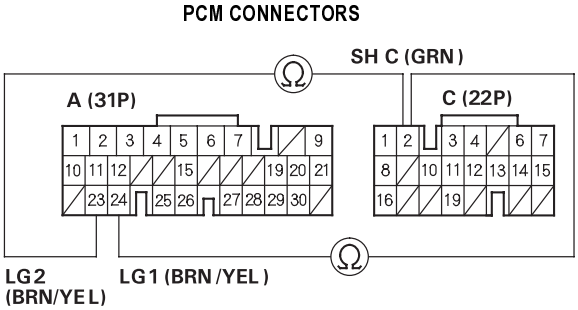
Wire side of female terminals

Is there continuity?

Yes Repair short to ground in the wire between PCM connector terminal C2 and the shift solenoid harness connector.■

No Go to step 10.

10. Connect the shift solenoid harness connector.
11. Measure the resistance between PCM connector terminals C2 and A23 or A24.



Wire side of female terminals

Is there 12 - 25 Ω?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

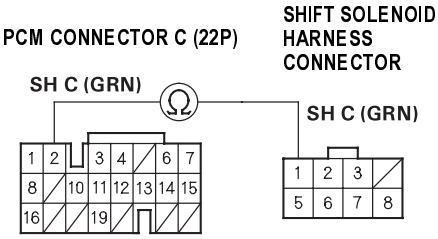
No Go to step 12.

(cont'd)

DTC Troubleshooting (cont'd)

12. Disconnect the shift solenoid harness connector.

13. Check for continuity between PCM connector terminal C2 and the No. 1 terminal of the shift solenoid harness connector.



Wire side of female terminals

Is there continuity?

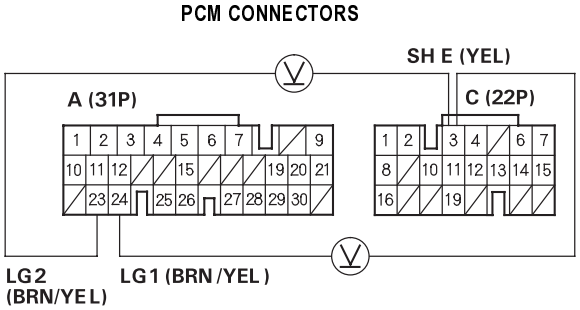
Yes Check the shift solenoid valve C, and check for an open in the shift solenoid harness in the transmission (see page 14-112).■

No Repair open in the wire between PCM connector terminal C2 and the shift solenoid harness connector.■

DTC P0773: Problem in Shift Solenoid Valve E Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch OFF.
2. Disconnect the battery negative terminal.
3. Disconnect PCM connectors A (31P) and C (22P).
4. Reconnect the battery negative terminal.
5. Turn the ignition switch ON (II).
6. Measure the voltage between PCM connector terminals C3 and A23 or A24.



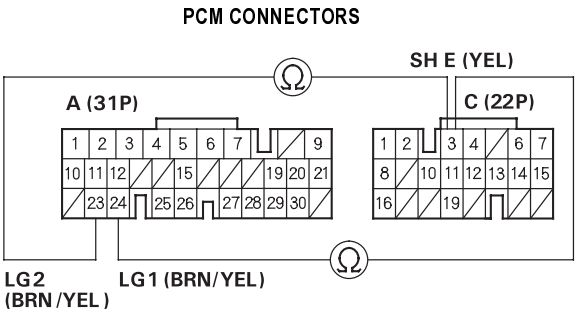
Wire side of female terminals

Is there voltage?

Yes Repair short to power in the wire between PCM connector terminal C3 and the shift solenoid valve E.■

No Go to step 7.

7. Turn the ignition switch OFF.
8. Disconnect the shift solenoid harness connector at the transmission housing.
9. Check for continuity between PCM connector terminals C3 and A23 or A24.



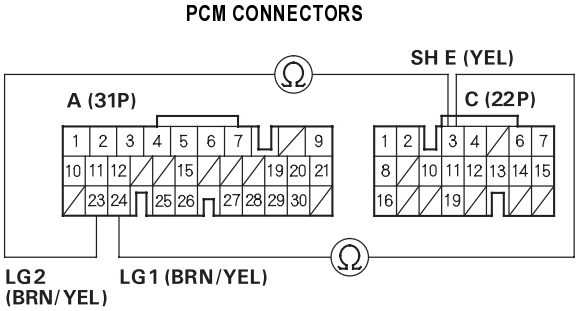
Wire side of female terminals

Is there continuity?

Yes Repair short to ground in the wire between PCM connector terminal C3 and the shift solenoid harness connector.■

No Go to step 10.

10. Connect the shift solenoid harness connector.
11. Measure the resistance between PCM connector terminals C3 and A23 or A24.



Wire side of female terminals

Is there 12 - 25 Ω?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

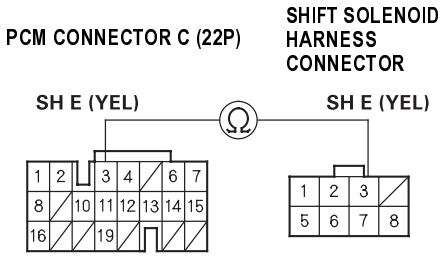
No Go to step 12.

(cont'd)

DTC Troubleshooting (cont'd)

12. Disconnect the shift solenoid harness connector.

13. Check for continuity between PCM connector terminal C3 and the No. 3 terminal of the shift solenoid harness connector.



Wire side of female terminals

Is there continuity?

Yes Check the shift solenoid valve E, and check for an open in the shift solenoid harness in the transmission (see page 14-112).■

No Repair open in the wire between PCM connector terminal C3 and the shift solenoid harness connector.■

DTC P0775: Problem in Hydraulic Control System of A/T Clutch Pressure Control Solenoid Valve B Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Check the fuel and emissions system problem or A/T system problem is indicated by the DTC.

   Is there any of the DTC?

   Yes Perform the troubleshooting flowchart for the indicated code(s). Turn the ignition switch OFF, and go to step 4 after troubleshooting.

   No Go to step 2.

2. Turn the ignition switch OFF.
3. Replace the A/T clutch pressure control solenoid valve B (with C as a set) (see page 14-119).
4. Reset the PCM memory by removing the No. 6 ECU (15 A) fuse in the under-hood fuse/relay box for more than 10 seconds.
5. Start the engine, and shift to [2] position. Test-drive the vehicle in [2] position at 25 mph (40 km/h) for 10 seconds, shift into [D] position with over-drive OFF mode in 3rd gear, drive at 25 mph (40 km/h) for 10 seconds, then decelerate to a stop. Do not stop the engine. Start off in [1] position, and drive at 19 mph (30 km/h) for 10 seconds.
6. Repeat step 5 to test-drive the vehicle.
7. Recheck for DTC P0775.

   Is DTC P0775 indicated?

   Yes Replace the transmission assembly.■

   No The problem has been corrected.■

(cont'd)

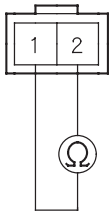
DTC Troubleshooting (cont'd)

DTC P0778: Problem in A/T Clutch Pressure Control Solenoid Valve B Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Disconnect the A/T clutch pressure control solenoid valve B connector.
2. Measure A/T clutch pressure control solenoid valve B resistance at the solenoid valve connector terminals.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



Terminal side of male terminals

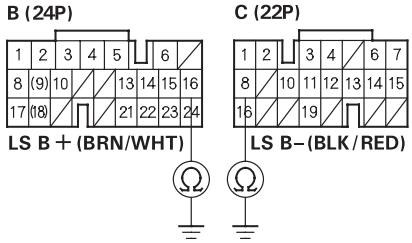
Is there about 5 Ω?

Yes Go to step 3.

No Replace the A/T clutch pressure control solenoid valve B.■

3. Disconnect the battery negative terminal.
4. Disconnect PCM connectors B (24P) and C (22P).
5. Check for continuity between PCM connector terminals B16 and body ground, and between C8 and body ground.

PCM CONNECTORS



Wire side of female terminals

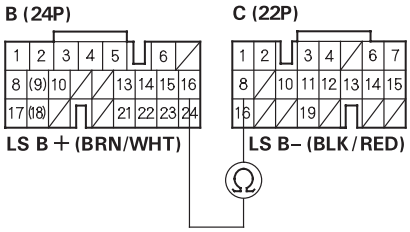
Is there continuity?

Yes Repair short to ground in the wires between PCM connector terminals B16 and the A/T clutch pressure control solenoid valve B, and between C8 and the solenoid valve B.■

No Go to step 6.

6. Connect the A/T clutch pressure control solenoid valve B connector.
7. Measure the resistance between PCM connector terminals B16 and C8.

PCM CONNECTORS



Wire side of female terminals

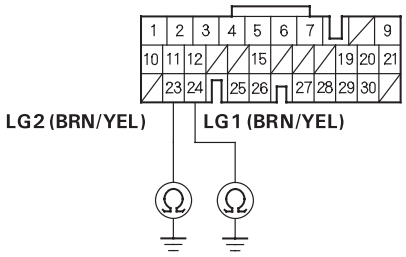
Is there about 5 Ω?

Yes Go to step 8.

No Repair loose terminal or open in the wires between PCM connector terminals B16 and the A/T clutch pressure control solenoid valve B, and between C8 and the solenoid valve B.■

8. Disconnect PCM connector A (31P).
9. Check for continuity between PCM connector terminals A23 and body ground, and between A24 and body ground.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Repair open in the wires between PCM connector terminals A23 and ground (G101), and between A24 and ground (G101), and repair poor ground (G101).■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P0780: Mechanical Problem in Hydraulic Control System

NOTE:
- Record all freeze data before you troubleshoot.
- Keep these replacement solenoid valves on hand:
  - A/T clutch pressure control solenoid valves A, B and C.
  - Shift solenoid valves A, B, C and E.

1. Check the fuel and emissions system problem and A/T system problem is indicated by the DTC.

   Is there any of the DTC?

   Yes Perform the troubleshooting flowchart for the indicated code(s). Check for DTC P0780 after troubleshooting.■

   No Go to step 2.

2. Turn the ignition switch OFF.
3. Replace the A/T clutch pressure control solenoid valve A (see page 14-117).
4. Replace the A/T clutch pressure control solenoid valves B and C (see page 14-119).
5. Reset the PCM memory by removing the No. 6 ECU (15A) fuse in the under-hood fuse/relay box for more than 10 seconds.
6. Drive the vehicle for several minutes in 1st, 2nd, 3rd and 4th gears in [D] position, and stop the vehicle. Do not stop the engine.
7. Repeat step 6 to test-drive the vehicle five times.
8. Recheck for DTC P0780.

   Is DTC P0780 indicated?

   Yes Go to step 9.

   No The problem has been corrected.■

9. Turn the ignition switch OFF.
10. Replace the shift solenoid valves A, B, C and E (see page 14-114).
11. Reset the PCM memory by removing the No. 6 ECU (15A) fuse in the under-hood fuse/relay box for more than 10 seconds.
12. Drive the vehicle for several minutes in 1st, 2nd, 3rd and 4th gears in [D] position, and stop the vehicle. Do not stop the engine.
13. Repeat step 12 to test-drive the vehicle five times.
14. Recheck for DTC P0780.

    Is DTC P0780 indicated?

    Yes Go to step 15.

    No The problem has been corrected.■

15. Turn the ignition switch OFF.
16. Remove the transmission, and overhaul transmission hydraulic control system.
17. Install the transmission on the vehicle.
18. Reset the PCM memory by removing the No. 6 ECU (15A) fuse in the under-hood fuse/relay box for more than 10 seconds.
19. Drive the vehicle for several minutes in 1st, 2nd, 3rd and 4th gears in [D] position, and stop the vehicle. Do not stop the engine.
20. Repeat step 19 to test-drive the vehicle five times.
21. Recheck for DTC P0780.

    Is DTC P0780 indicated?

    Yes Replace the transmission assembly.■

    No The problem has been corrected.■

DTC P0795: Problem in Hydraulic Control System of A/T Clutch Pressure Control Solenoid Valve C Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Check the fuel and emissions system problem or A/T system problem is indicated by the DTC.

   Is there any of the DTC?

   Yes Perform the troubleshooting flowchart for the indicated code(s). Turn the ignition switch OFF, and go to step 4 after troubleshooting.

   No Go to step 2.

2. Turn the ignition switch OFF.
3. Replace the A/T clutch pressure control solenoid valve C (with B as a set) (see page 14-119).
4. Reset the PCM memory by removing the No. 6 ECU (15A) fuse in the under-hood fuse/relay box for more than 10 seconds.
5. Start the vehicle off in [2] position, accelerate to 25 mph (40 km/h), then shift into [D] position with the O/D switch turned off for over-drive off mode. Drive in 3rd gear at 25 mph (40 km/h) for several seconds, then shift into [2] position and drive at 25 mph (40 km/h) for 10 seconds.
6. Recheck for DTC P0795.

   Is DTC P0795 indicated?

   Yes Go to step 7.

   No The problem has been corrected.■

7. Turn the ignition switch OFF.
8. Remove the transmission, and overhaul transmission hydraulic control system and the 3rd clutch line.
9. Install the transmission on the vehicle.
10. Reset the PCM memory by removing the No. 6 ECU (15A) fuse in the under-hood fuse/relay box for more than 10 seconds.
11. Start the vehicle off in [2] position, accelerate to 25 mph (40 km/h), then shift into [D] position with the O/D switch turned off for over-drive off mode. Drive in 3rd gear at 25 mph (40 km/h) for several seconds, then shift into [2] position and drive at 25 mph (40 km/h) for 10 seconds.
12. Recheck for DTC P0795.

    Is DTC P0795 indicated?

    Yes Replace the transmission assembly.■

    No The problem has been corrected.■

(cont'd)

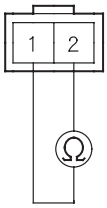
DTC Troubleshooting (cont'd)

DTC P0798: Problem in A/T Clutch Pressure Control Solenoid Valve C Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Disconnect the A/T clutch pressure control solenoid valve C connector.
2. Measure A/T clutch pressure control solenoid valve C resistance at the solenoid valve connector terminals.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Terminal side of male terminals

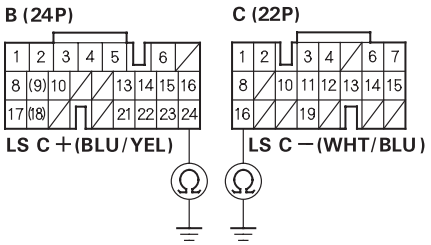
Is there about 5 Ω?

Yes Go to step 3.

No Replace the A/T clutch pressure control solenoid valve C.■

3. Disconnect the battery negative terminal.
4. Disconnect PCM connectors B (24P) and C (22P).
5. Check for continuity between PCM connector terminals B24 and body ground, and between C16 and body ground.

PCM CONNECTORS



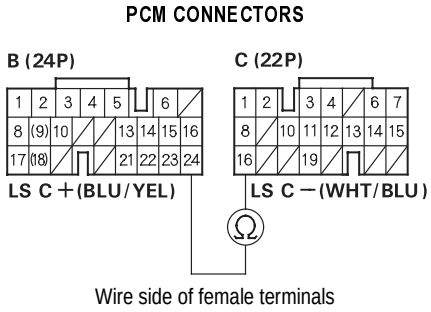
Wire side of female terminals

Is there continuity?

Yes Repair short to ground in the wires between PCM connector terminals B24 and the A/T clutch pressure control solenoid valve C, and between C16 and the solenoid valve C.■

No Go to step 6.

6. Connect the A/T clutch pressure control solenoid valve C connector.
7. Measure the resistance between PCM connector terminals B24 and C16.

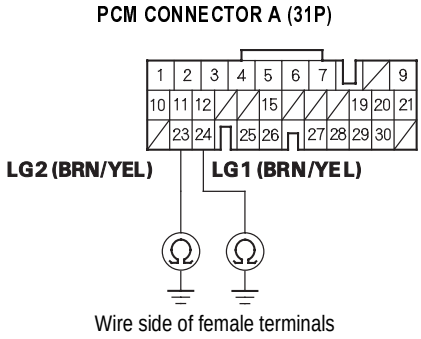


Is there about 5 Ω?

Yes Go to step 8.

No Repair loose terminal or open in the wires between PCM connector terminals B24 and the A/T clutch pressure control solenoid valve C, and between C16 and the solenoid valve C.■

8. Disconnect PCM connector A (31P).
9. Check for continuity between PCM connector terminals A23 and body ground, and between A24 and body ground.



Is there continuity?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Repair open in the wires between PCM connector terminals A23 and ground (G101), and between A24 and ground (G101), and repair poor ground (G101).■

(cont'd)

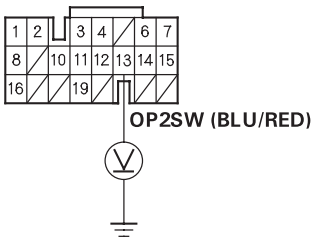
DTC Troubleshooting (cont'd)

DTC P0840: Problem in 2nd Clutch Pressure Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Disconnect the 2nd clutch pressure switch.
2. Turn the ignition switch ON (II).
3. Measure the voltage between PCM connector terminal C13 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there about 5 V?

Yes Go to step 4.

No Check for a short to ground in the wire between PCM connector terminal C13 and the 2nd clutch pressure switch. If wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

4. Measure the voltage between the 2nd clutch pressure switch connector terminal and body ground.

2ND CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminals

Is there about 5 V?

Yes Go to step 5.

No Repair open in the wire between PCM connector terminal C13 and the 2nd clutch pressure switch.■

5. Turn the ignition switch OFF.
6. Measure the resistance between the 2nd clutch pressure switch connector terminal and body ground.

2ND CLUTCH PRESSURE SWITCH CONNECTOR



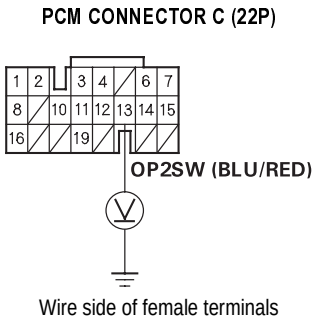
Terminal side of male terminals

Is there 40 M Ω or more?

Yes Go to step 7.

No Replace the 2nd clutch pressure switch.■

7. Connect the 2nd clutch pressure switch connector.
8. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
9. Start the engine, and shift into [2] position.
10. Drive the vehicle in 2nd gear for more than five seconds.
11. With driving in [2] position, measure the voltage between PCM connector terminal C13 and body ground.



Is there 0 V?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Replace the 2nd clutch pressure switch.■

(cont'd)

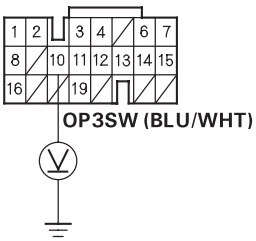
DTC Troubleshooting (cont'd)

DTC P0845: Problem in 3rd Clutch Pressure Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Disconnect the 3rd clutch pressure switch.
2. Turn the ignition switch ON (II).
3. Measure the voltage between PCM connector terminal C10 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there about 5 V?

Yes Go to step 4.

No Check for short to ground in the wire between PCM connector terminal C10 and the 3rd clutch pressure switch. If wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

4. Measure the voltage between the 3rd clutch pressure switch connector terminal and body ground.

3RD CLUTCH PRESSURE SWITCH CONNECTOR



Wire side of female terminals

Is there about 5 V?

Yes Go to step 5.

No Repair open in the wire between PCM connector terminal C10 and the 3rd clutch pressure switch.■

5. Turn the ignition switch OFF.
6. Measure the resistance between the 3rd clutch pressure switch connector terminal and body ground.

3RD CLUTCH PRESSURE SWITCH CONNECTOR



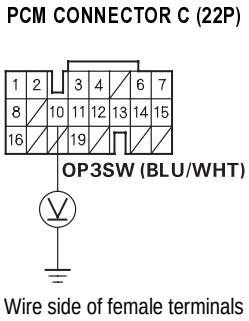
Terminal side of male terminals

Is there 40 M Ω or more?

Yes Go to step 7.

No Replace the 3rd clutch pressure switch.■

7. Connect the 3rd clutch pressure switch connector.
8. For 4WD model: Raise the vehicle, make sure it is securely supported, and allow the all four wheels to rotate freely.
   For 2WD model: Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
9. Start the engine. Shift into the [D] position, then turn the O/D switch off for driving with over-drive OFF mode.
10. Accelerate the vehicle until the speed exceeds 19 mph (30 km/h), then release the accelerator. Shift into the [N] positon, and return to the [D]; the transmission will shift to 3rd gear.
11. Drive the vehicle in 3rd gear for more than 5 seconds.
12. With driving in 3rd gear, measure the voltage between PCM connector terminal C10 and body ground.



Is there 0 V?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Replace the 3rd clutch pressure switch.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P1705: Short in Transmission Range Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Turn the ignition switch ON (II).
2. Observe the A/T gear position indicator while shifting to each position.

   Do any indicators stay on when the shift lever is not in that position?

   Yes Go to step 3.
3. Turn the ignition switch OFF, then go to step Disconnect the transmission range switch connector, and watch the A/T gear position indicator.

   Do all gear position indicators go out?

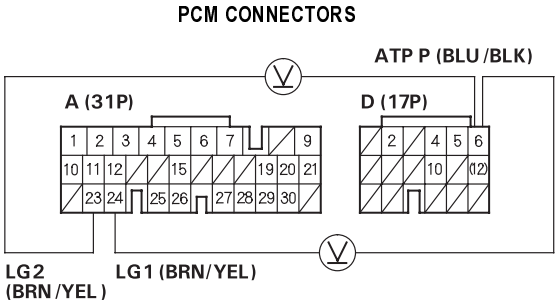
   Yes Replace the transmission range switch.■

   No Turn the ignition switch OFF, then go to step 5.
4. Inspect the transmission range switch (see page 14-168).

   Is the switch OK?

   Yes Go to step 5.

   No Replace the transmission range switch.■
5. Connect the transmission range switch connector.
6. Turn the ignition switch ON (II).
7. Shift to all positions other than [P].
8. Measure the voltage between PCM connector terminals D6 and A23 or A24.



Wire side of female terminals

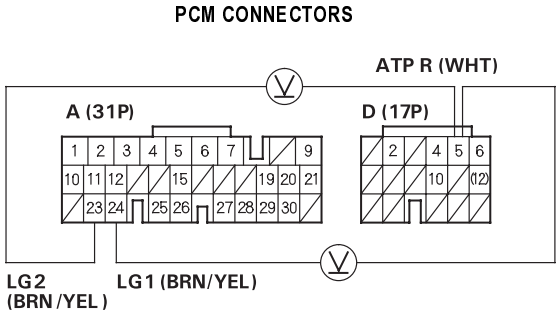
Is there about 5 V?

Yes Go to step 9.

No Check for a short in the wire between PCM connector terminal D6 and the transmission range switch or A/T gear position indicator, and check for an open in the wires between ground G101 and PCM connector terminals A23 and A24. If the wires are OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

9. Shift to all positions other than [R].

10. Measure the voltage between PCM connector terminals D5 and A23 or A24.



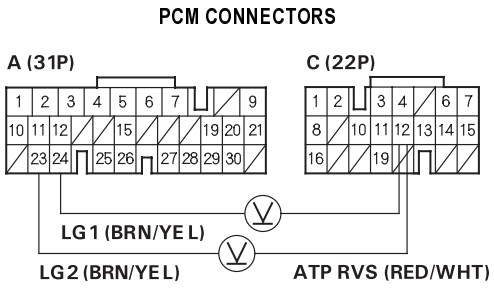
Wire side of female terminals

Is there about 5 V?

Yes Go to step 11.

No Check for a short in the wire between PCM connector terminal D5 and the transmission range switch or A/T gear position indicator. If the wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

11. Measure the voltage between PCM connector terminals C12 and A23 or A24.



Wire side of female terminals

Is there about 5 V?

Yes Go to step 12.

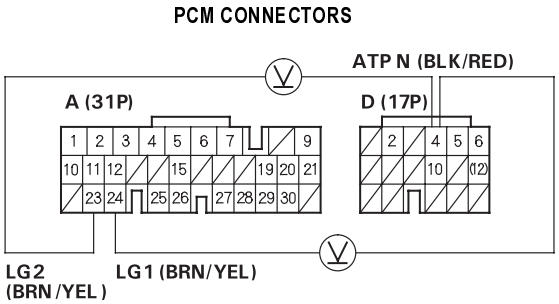
No Check for a short in the wire between PCM connector terminal C12 and the transmission range switch. If the wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

(cont'd)

DTC Troubleshooting (cont'd)

12. Shift to all positions other than [N].

13. Measure the voltage between PCM connector terminals D4 and A23 or A24.



Wire side of female terminals

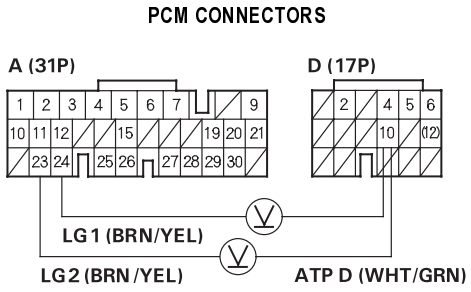
Is there about 5 V?

Yes Go to step 14.

No Check for a short in the wire between PCM connector terminal D4 and the transmission range switch, or A/T gear position indicator. If the wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

14. Shift to all positions other than [D].

15. Measure the voltage between PCM connector terminals D10 and A23 or A24.



Wire side of female terminals

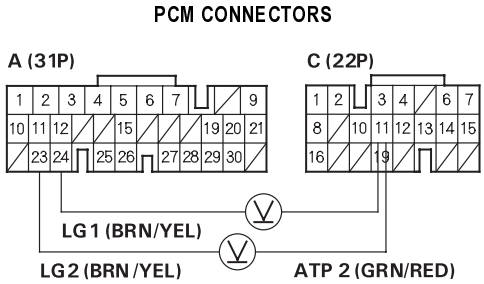
Is there about 5 V?

Yes Go to step 16.

No Check for a short in the wire between PCM connector terminal D10 and the transmission range switch. If the wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

16. Shift to all positions other than [2].

17. Measure the voltage between PCM connector terminals C11 and A23 or A24.



Wire side of female terminals

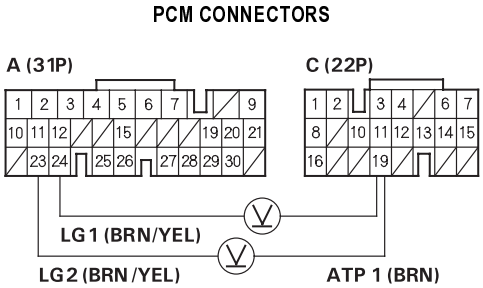
Is there about 5 V?

Yes Go to step 18.

No Check for a short in the wire between PCM connector terminal C11 and the transmission range switch. If the wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

18. Shift to all positions other than [1].

19. Measure the voltage between PCM connector terminals C19 and A23 or A24.



Wire side of female terminals

Is there about 5 V?

Yes Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

No Check for a short in the wire between PCM connector terminal C19 and the transmission range switch. If the wire is OK, check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC P1706: Open in Transmission Range Switch Circuit

NOTE: Record all freeze data before you troubleshoot.

1. Check whether DTC P1705 is indicated.

   Is there DTC P1705?

   Yes Perform the troubleshooting flowchart for DTC P1705, then go to step 2.

   No Go to step 8.

2. Turn the ignition switch OFF.
3. Reset the PCM memory by removing the No. 6 ECU (15A) fuse in the under-hood fuse/relay box for more than 10 seconds.
4. Drive the vehicle in [D] position until vehicle speed reaches to 37 mph (60 km/h), and decelerate to a stop.
5. Turn the ignition switch OFF, and turn it ON (II) again.
6. Drive the vehicle in [D] position until vehicle speed reaches to 37 mph (60 km/h), and decelerate to a stop.
7. Recheck for DTC P1706.

   Is DTC P1706 indicated?

   Yes Go to step 8.

   No The problem has been corrected.■

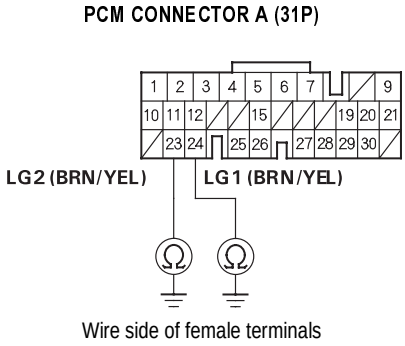
8. Inspect the transmission range switch (see page 14-168).

   Is the switch OK?

   Yes Go to step 9.

   No Replace the transmission range switch.■

9. Connect the transmission range switch connector.
10. Check for continuity between PCM connector terminals A23 and body ground, and between A24 and body ground.



Wire side of female terminals

Is there continuity?

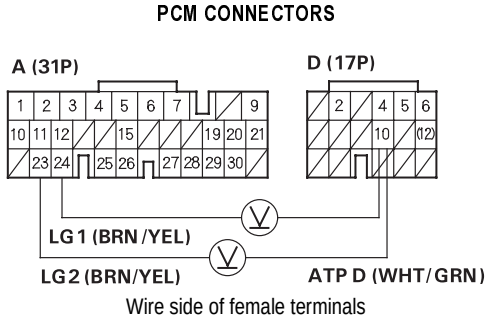
Yes Go to step 11.

No Repair open in the wire between PCM connector terminals A23 and ground (G101), and between A24 and ground (G101), and repair poor ground (G101).■

11. Turn the ignition switch ON (II).

12. Shift to [D] position.

13. Measure the voltage between PCM connector terminals D10 and A23 or A24.



Wire side of female terminals

Is there voltage?

Yes Repair open in the wire between PCM connector terminal D10 and the transmission range switch.■

No Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

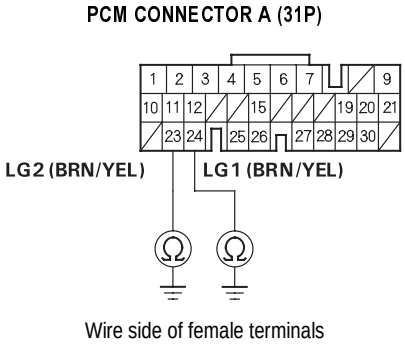
(cont'd)

DTC Troubleshooting (cont'd)

DTC P1717: Problem in ATP RVS Signal Circuit of Transmission Range Switch

NOTE: Record all freeze data before you troubleshoot.

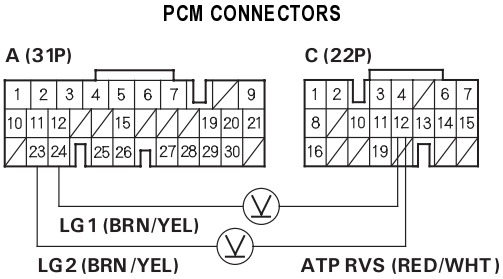
1. Check whether DTC P1705 or P1706 is indicated.
   Is DTC P1705 or P1706 indicated?
   Yes Perform the troubleshooting flowchart for the indicated code(s), then go to step 2.
   No Go to step 6.
2. Shift the shift lever into [P] position, and shift to [R], [N], [D], then shift back to [N], [R], and into [P]. The shift lever should stop for more than 2 seconds at each position.
3. Turn the ignition switch OFF, then turn it ON (II).
4. Shift the shift lever to [R] position for more than 2 seconds, then shift into [N].
5. Check for DTC P1717.
   Is DTC P1717 indicated?
   Yes Go to step 6.
   No The problem has been corrected.■
6. Turn the ignition switch OFF.
7. Check for continuity between PCM connector terminals A23 and body ground, and between A24 and body ground.



Wire side of female terminals

Is there continuity?
Yes Go to step 8.
No Repair open in the wires between PCM connector terminals A23 and ground (G101), and between A24 and ground (G101), and repair poor ground (G101).■

8. Turn the ignition switch ON (II).
9. Shift to [R] position.
10. Measure the voltage between PCM connector terminals C12 and A23 or A24.



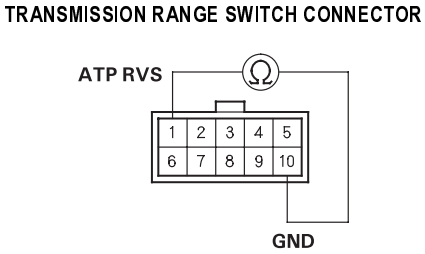
Wire side of female terminals

Is there voltage?

Yes Go to step 11.

No Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

11. Turn the ignition switch OFF.
12. Disconnect the transmission range switch connector.
13. Check for continuity between the No. 1 and No. 10 terminals of the transmission range switch connector. The shift position must be [R].



Terminal side of male terminals

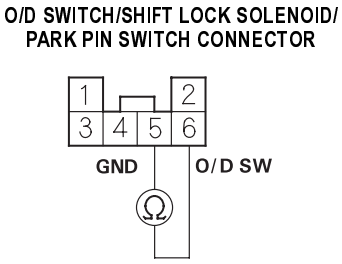
Is there continuity?

Yes Repair open in the wire between PCM connector terminal C12 and the transmission range switch.■

No Replace the transmission range switch.■

Over-drive (O/D) Switch Circuit Troubleshooting

1. Turn the ignition switch OFF.
2. Disconnect the O/D switch/shift lock solenoid/park pin switch connector (see page 14-124).
3. Check for continuity between the No. 5 and No. 6 terminals of the O/D switch/shift lock solenoid/park pin switch connector while pushing the O/D switch and when the switch released.



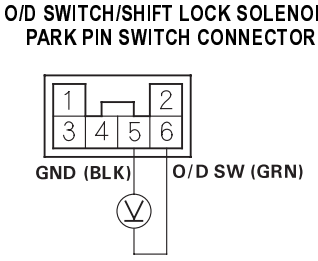
Wire side of female terminals

Is there continuity while pushing the O/D switch, and no continuity when the switch released?

Yes Go to step 4.

No Replace the O/D switch.■

4. Turn the ignition switch ON (II).
5. Shift to [D] position.
6. Measure the voltage between the No. 5 and No. 6 terminals of the O/D switch/shift lock solenoid/park pin switch connector.



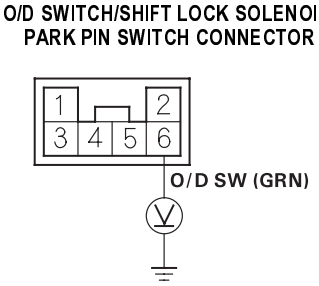
Terminal side of male terminals

Is there about 5 V?

Yes O/D switch circuit is OK.■

No Go to step 7.

7. Measure the voltage between No. 6 terminal and body ground.



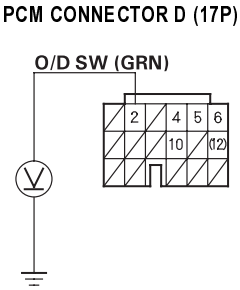
Terminal side of male terminals

Is there about 5 V?

Yes Repair open in the wire between the No. 5 terminal of the O/D switch/shift lock solenoid/park pin switch connector and ground (G451), or repair poor ground (G451).■

No Go to step 8.

8. Measure the voltage between PCM connector terminal D2 and body ground.



Wire side of female terminals

Is there about 5 V?

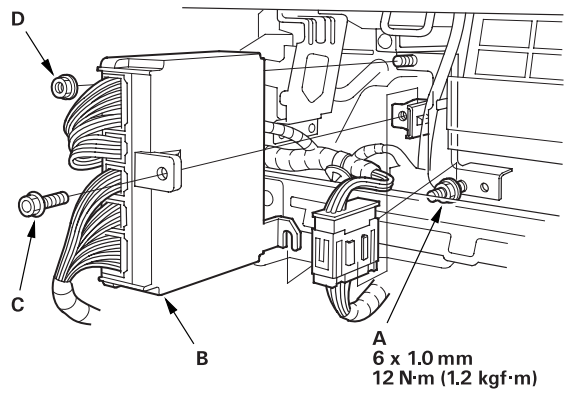
Yes Repair open or short in the wire between PCM connector terminal D2 and O/D switch/shift lock solenoid/park pin switch connector.■

No Check for loose terminal fit in the PCM connectors. If necessary, substitute a known-good PCM and recheck.■

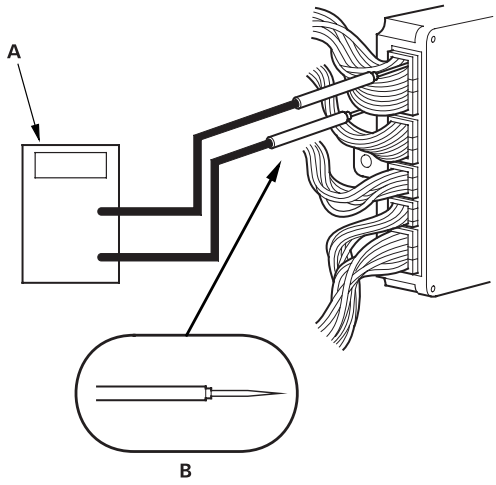
Road Test

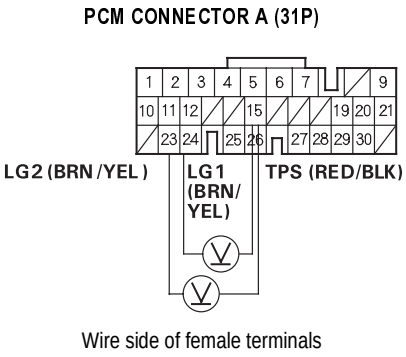
1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Apply the parking brake, and block all four wheels. Start the engine, then shift to [D] position while pressing the brake pedal. Press the accelerator pedal, and release it suddenly. The engine should not stall.
3. If the Honda PGM Tester is available, connect the Honda PGM Tester to the DLC (see page 14-4), and go to the PGM-FI Data List, then go to step 8. If the PGM Tester is not available, go to step 4.
4. Remove the glove box stops, then bring the glove box down.
5. Loosen the mounting nut (A) on the lower portion of the PCM (B), and remove the mounting bolt (C) and nut (D).

   NOTE: The illustration shows LHD model; RHD model is symmetrical.



6. Lift the PCM up to clear the mounting nut on the lower portion of the PCM, then pull out the PCM.
7. Connect a digital multitester (A) and tapered tip probe (B) to check voltage between the A15 (+) terminal and A23 (-) or A24 (-) terminal of the PCM.





Wire side of female terminals

(cont'd)

Road Test (cont'd)

8. Test-drive the vehicle on a flat road in the [D] position, check for abnormal noise and clutch slippage. While driving, check that the shift points occur at the proper speeds by monitoring the throttle position sensor voltage and comparing your shift point speeds and voltage to those in the table. (The throttle position sensor voltage represents the throttle opening.)

[D] position
Upshift

Throttle Opening	Unit of Speed	1st → 2nd	2nd → 3rd	3rd → 4th
Throttle position sensor voltage: 0.8 V	mph	11 - 13	20 - 23	27 - 32
	km/h	17 - 21	32 - 37	44 - 51
Throttle position sensor voltage: 2.25 V	mph	21 - 24	38 - 43	56 - 62
	km/h	33 - 39	61 - 69	90 - 99
Fully-opened throttle, throttle position sensor voltage: 4.5 V	mph	34 - 39	63 - 71	94 - 104
	km/h	55 - 63	101 - 114	151 - 168

Downshift

Throttle Opening	Unit of Speed	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.8 V	mph	19 - 22	5 - 8 (3rd → 1st)	
	km/h	30 - 35	8 - 13 (3rd → 1st)	
Fully-opened throttle, throttle position sensor voltage: 4.5 V	mph	80 - 89	53 - 60	25 - 30
	km/h	128 - 144	85 - 96	41 - 49

Lock-up ON and OFF
(Schedule of shift solenoid valve E turned ON and OFF)

Throttle Opening	Unit of Speed	Lock-up ON	Lock-up OFF
Throttle position sensor voltage: 0.8 V	mph	55 - 61	53 - 60
	km/h	88 - 98	86 - 86
Throttle position sensor voltage: 2.25 V	mph	93 - 106	73 - 81
	km/h	150 - 170	117 - 130
Fully-opened throttle, throttle position sensor voltage: 4.5 V	mph	93 - 106	90 - 99
	km/h	150 - 170	145 - 160

9. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th gear, then shift to 2nd gear. The vehicle should immediately begin slowing down from engine braking.

10. Accelerate from a stop at full throttle in [1] position. Check that there is no abnormal noise or slippage.Upshifts should not occur with the shift lever in this position.

11. Accelerate from a stop at full throttle in [2] position. Check that there is no abnormal noise or slippage.Upshifts and downshifts should not occur with the shift lever in this position.

12. Accelerate from a stop at full throttle in [R] position. Check that there is no abnormal noise or slippage.

13. Test in [P] (Parking) Position.
Park the vehicle on a slope (about 16°), apply the parking brake, and shift into [P] position. Release the brake; the vehicle should not move.

Stall Speed Test

1. Set the parking brake, and block all four wheels.
2. Connect a tachometer to the engine, and start the engine.
3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift to [2] position.
5. Fully press the brake pedal and accelerator for 6 to 8 seconds, and note engine speed. Do not move the shift lever while raising engine speed.
6. Allow 2 minutes for cooling, then repeat the test in [D], [1] and [R] positions.

   NOTE:
   - Do not test stall speed for more than 10 seconds at a time.
   - Stall speed tests should be used for diagnostic purposes only.
   - Stall speed should be the same in [D], [2], [1] and [R] positions.
   - Do not stall speed with the A/T pressure gauges installed.

   Stall Speed rpm:
   Specification: **2,320 rpm (min^{-1})**
   Service Limit: **2,170 - 2,470 rpm (min^{-1})**

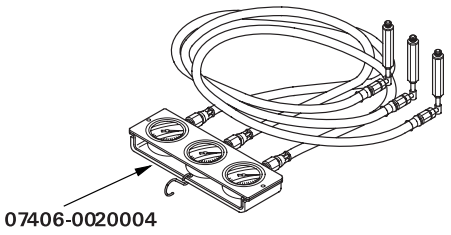
7. If the measurements are out of the service limit, problems and probable causes are listed in the table below:

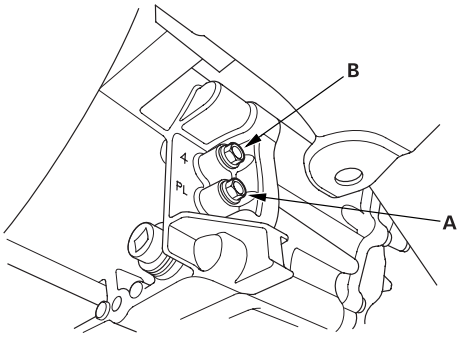
Problem	Probable causes
Stall speed rpm high in [D], [2], [1] and [R] positions	• Low fluid level • ATF pump output low • ATF pump defective • Clogged ATF strainer • Pressure regulator valve stuck closed
Stall speed high in [R] position	Slippage of 4th clutch
Stall speed high in [2] position	Slippage of 2nd clutch
Stall speed high in [1] position	Slippage of 1st clutch
Stall speed low in [D], [2], [1] and [R] positions	• Engine output low • Engine throttle valve closed • Torque converter one-way clutch slipping

Pressure Tests

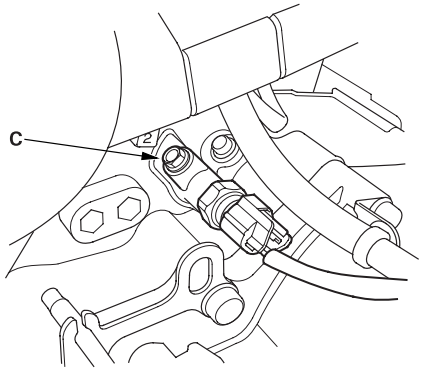
Special Tools Required
A/T oil pressure gauge set 07406-0020004

1. Before testing, be sure the transmission fluid filled to the proper level.
2. 4WD: Lift up the vehicle.
   2WD: Raise the front of the vehicle, and make sure it is securely supported. Set the parking brake, and block rear wheels securely.
3. Allow the all four wheels (4WD) or front wheels (2WD) to rotate freely.
4. Warm up the engine (the radiator fan comes on), then stop it, and connect the tachometer.
5. Connect the oil pressure gauge to the line pressure inspection hole (A) and 4th clutch pressure inspection hole (B). Do not allow dust or other foreign particles to enter the holes while connecting the gages.

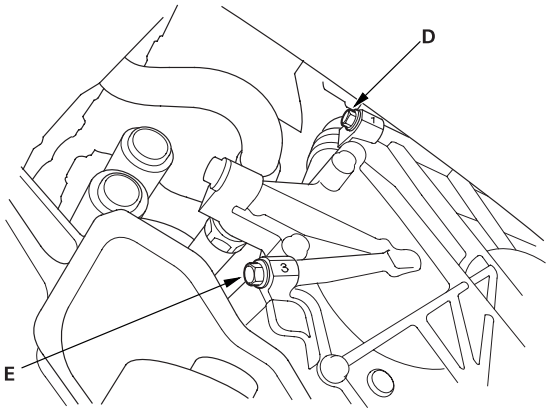




6. Remove the air cleaner housing, and connect the oil pressure gauge to the 2nd clutch pressure inspection hole (C). Then temporarily reinstall the air cleaner housing.



7. Connect the oil pressure gauges to the 1st clutch pressure inspection hole (D) and 3rd clutch pressure inspection hole (E).



8. Start the engine, and run it at 2,000 rpm (min^{-1}).
9. Shift to [N] or [P] position, and measure line pressure at the line pressure inspection hole (A).

   NOTE: Higher pressure may be indicated if measurements are made in shift lever position other than [N] or [P].

PRESSURE	FLUID PRESSURE	
	Standard	Service Limit
Line (A)	900 - 960 kPa (9.2 - 9.8 kgf/cm², 130 - 140 psi)	850 kPa (8.7 kgf/cm², 120 psi)

10. Shift to [1] position, and measure 1st clutch pressure at the 1st clutch pressure inspection hole (D) with holding engine speed at 2,000 rpm (min^{-1}).
11. Shift to [2] position, and measure 2nd clutch pressure at the 2nd clutch pressure inspection hole (C) with holding engine speed at 2,000 rpm (min^{-1}).
12. Shift to [D] position, and select the over-drive OFF mode by turning the O/D switch off. Measure 3rd clutch pressure at the 3rd clutch pressure inspection hole (E) with holding engine speed at 2,000 rpm (min^{-1}).
13. Select the over-drive mode by turning the O/D switch on, and measure 4th clutch pressure at the 4th clutch pressure inspection hole (B) with holding engine speed at 2,000 rpm (min^{-1}).
14. Shift to [R] position, and measure 4th clutch pressure at the 4th clutch pressure inspection hole (B) with holding engine speed at 2,000 rpm (min^{-1}).

PRESSURE	FLUID PRESSURE	
	Standard	Service Limit
1st clutch (D) 2nd clutch (C) 3rd clutch (E) 4th clutch (B)	890 - 970 kPa (9.1 - 9.9 kgf/cm², 130 - 140 psi)	840 kPa (8.6 kgf/cm², 120 psi)

15. If the measurements are out of service limit, problems and probable causes are listed in the table below:

Problem	Probable causes
No or low line pressure	• Torque converter • Regulator valve • Torque converter check valve • ATF pump • Low fluid level • Clogged ATF strainer
No or low 1st clutch pressure	• 1st clutch • O-rings
No or low 2nd clutch pressure	• 2nd clutch • O-rings
No or low 3rd clutch pressure	• 3rd clutch • O-rings
No or low 4th clutch pressure in [D] position	• 4th clutch • O-rings
No or low 4th clutch pressure in [R] position	• Servo valve • 4th clutch • O-rings

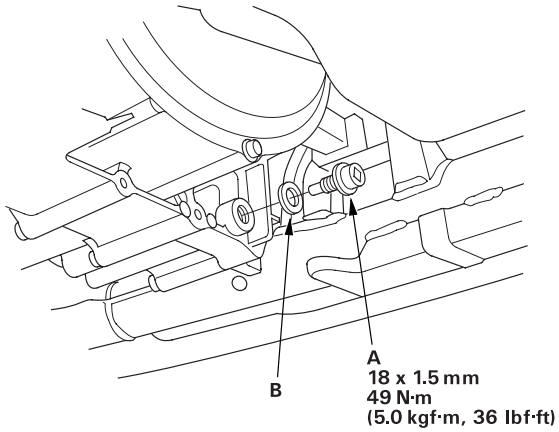
16. Install the sealing bolt with a new sealing washer, and tighten the bolts to the specified torque.

    TORQUE: 18 N·m (1.8 kgf·m,13 lbf·ft)

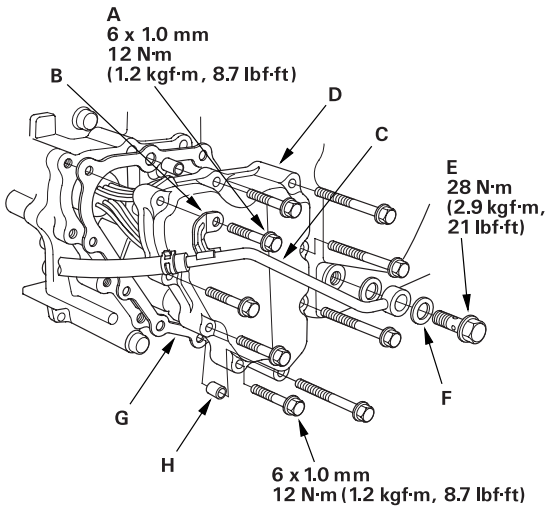
    NOTE: Do not reuse old sealing washers.
17. Install the air cleaner housing.

Shift Solenoid Valves Test

1. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

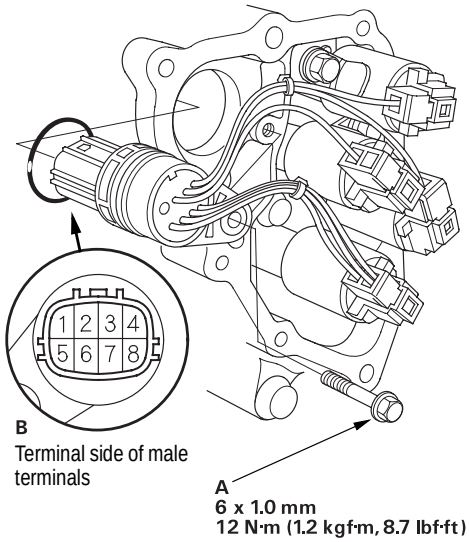


2. Reinstall the drain plug with a new sealing washer (B).
3. Place the transmission jack under the transmission, and lift it up create clearance between the transmission and front sub-frame.
4. Disconnect the shift solenoid harness connector.
5. Remove the bolt (A) securing the bracket (B) of the AFT cooler inlet line (C) on the shift solenoid valve cover (D), and remove the line bolt (E) with sealing washers (F).



6. Remove the shift solenoid valve cover, gasket (G), and dowel pins (H).

7. Remove the bolt (A), and remove the shift solenoid harness connector (B).



8. Measure shift solenoid valves resistance between the shift solenoid harness connector terminals No. 1, No. 2, No. 3, No. 5 and body ground.
Shift solenoid valve A: No. 5 terminal (BLU)
Shift solenoid valve B: No. 2 terminal (ORN)
Shift solenoid valve C: No. 1 terminal (GRN)
Shift solenoid valve E: No. 3 terminal (RED)

   STANDARD: 12 - 25 Ω

9. If the resistance is out of standard, disconnect the shift solenoid valve connector, and measure its resistance at the solenoid valve connector. Replace the shift solenoid valve if the resistance is out of standard.

10. Connect the battery positive terminal to the shift solenoid harness connector terminals, and connect the battery negative terminal to body ground individually. A clicking sound should be heard.

11. If no sound is heard, connect the battery positive terminal to the shift solenoid valve connector terminal, and check the clicking sound is heard. Replace the shift solenoid valve if no sound is heard.

12. Replace the solenoid harness if the tests results are OK.

13. Install the new O-ring on the shift solenoid harness connector, and install the connector in the transmission housing.

14. Install the shift solenoid valve cover with the new gasket and dowel pins.

15. Install the ATF cooler inlet line with the line bolt and the new sealing washers. Create clearance with the jack between the transmission and the front sub-frame to tighten the line bolt with the torque wrench.

16. Install the bracket of the ATF cooler inlet line on the shift solenoid valve cover with the bolt.

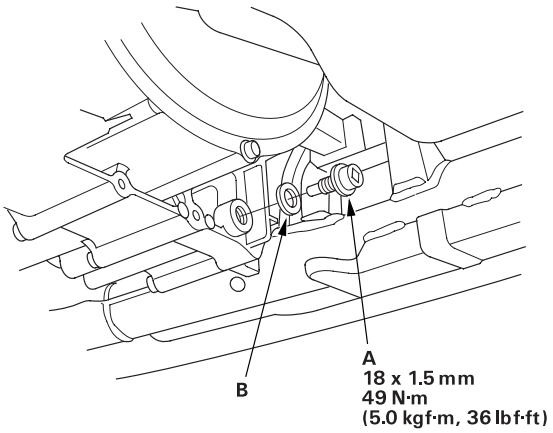
17. Check the connector for rust, dirt, or oil, then connect the connector securely.

18. Remove the transmission jack.

19. Refill the transmission with the recommended fluid (see page 14-131).

Shift Solenoid Valves Replacement

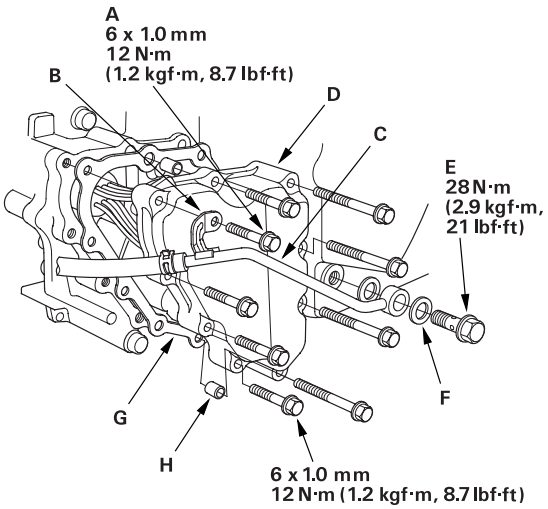
1. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).



2. Reinstall the drain plug with a new sealing washer (B).

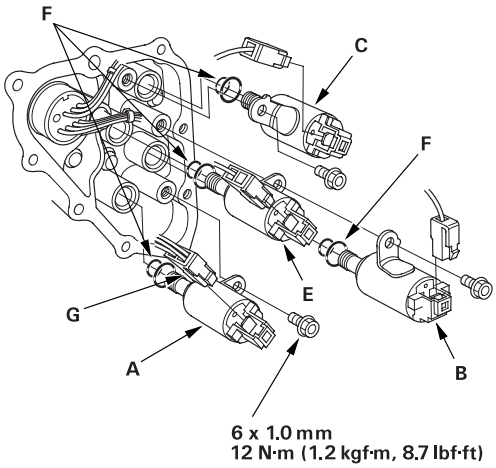
3. Place the transmission jack under the transmission, and lift it up to create clearance between the transmission and front sub-frame.

4. Remove the bolt (A) securing the bracket (B) of the ATF cooler inlet line (C) on the shift solenoid valve cover (D), and remove the line bolt (E) with sealing washers (F).



5. Remove the shift solenoid valve cover, gasket (G), and dowel pins (H).

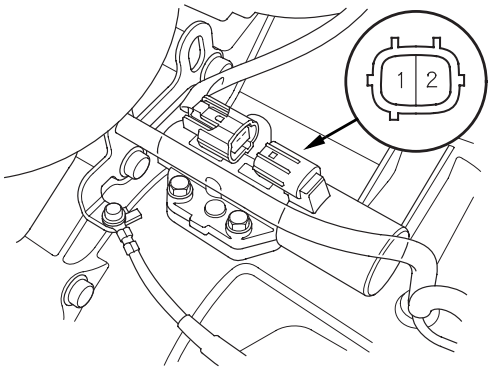
6. Disconnect the shift solenoid valve connectors.
7. Remove the bolts, and hold the shift solenoid valve body, then remove them. Do not hold the connector to remove.
8. Install the new O-rings (two O-rings per a solenoid valve) (F) on the good solenoid valve. The replacement solenoid valve is equipped with the new O-rings.



9. Install the shift solenoid valve A, C, and E with holding the shift solenoid valve body, be sure to install the solenoid valves until their mounting bolt brackets contact to the servo body.
10. Install the shift solenoid valve B with holding the shift solenoid valve body, be sure to install the solenoid valve until its mounting bolt brackets contact to the bracket of installed solenoid. Do not install the shift solenoid valve B before installing the shift solenoid valve E. If solenoid valve B is installed before solenoid valve E, it may damage to hydraulic control system.
11. Connect the shift solenoid valve A connector (G) with the ATF temperature sensor.
12. Connect the solenoid valve B connector (ORN wire), solenoid valve C connector (GRN wire), and solenoid valve E connector (RED wire).
13. Install the shift solenoid valve cover with the new gasket and dowel pins.
14. Install the ATF cooler inlet line with the line bolt and the new sealing washers. Create clearance with the jack between the transmission and the front sub-frame to tighten the line bolt with the torque wrench.
15. Install the bracket of the ATF cooler inlet line on the shift solenoid valve cover with the bolt.
16. Remove the transmission jack.
17. Refill the transmission with the recommended fluid (see page 14-131).

A/T Clutch Pressure Control Solenoid Valve A Test

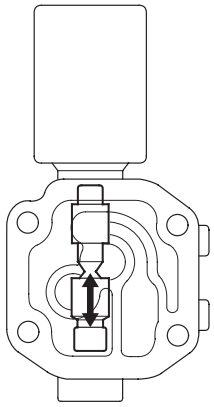
1. Remove the air cleaner housing.
2. Disconnect the A/T clutch pressure control solenoid valve A connector.



3. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid valve A connector.

   STANDARD: About 5 Ω

4. If the resistance is out of standard, replace the A/T clutch pressure control solenoid valve A.
5. Connect the battery positive terminal to the No. 1 terminal of the A/T clutch pressure control solenoid valve A connector, and connect the battery negative terminal to the No. 2 terminal. A clicking sound should be heard.
6. If no sound is heard, remove the A/T clutch pressure control solenoid valve A.
7. Check the fluid passage of the A/T clutch pressure control solenoid valve for dust or dirt.
8. Connect the No. 1 terminal of the A/T clutch pressure control solenoid valve A connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure the A/T clutch pressure control solenoid valve moves.



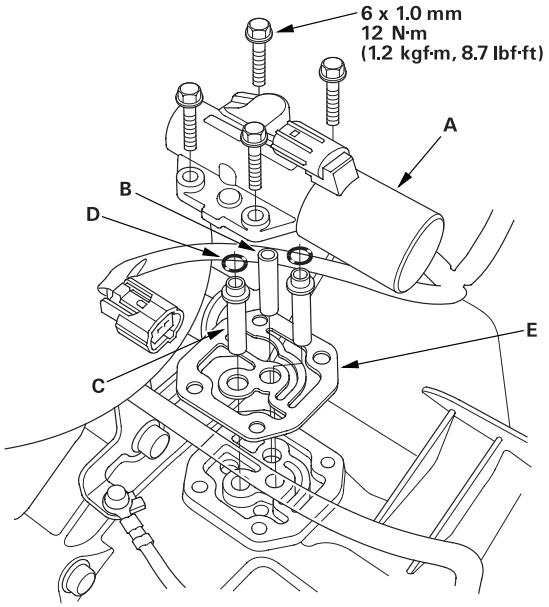
9. Disconnect one of the battery terminal and check valve movement.

   NOTE: You can see valve movement through the fluid passage in the mounting surface of the A/T clutch pressure control solenoid valve A body.

10. If the valve binds or moves sluggishly, or if the solenoid valve does not operate, replace the A/T clutch pressure control solenoid valve A.

A/T Clutch Pressure Control Solenoid Valve A Replacement

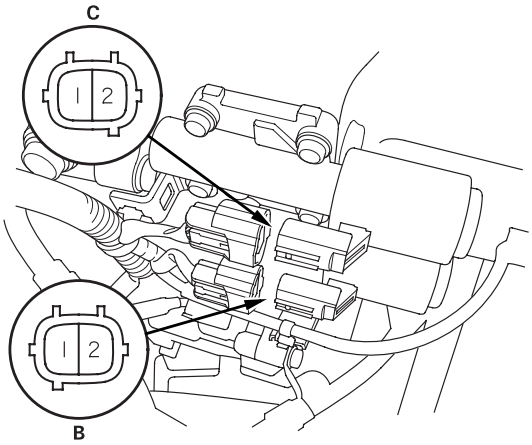
1. Remove the air cleaner housing.
2. Disconnect the A/T clutch pressure control solenoid valve A connector.
3. Remove the mounting bolts and the A/T clutch pressure control solenoid valve A.



4. Remove the ATF pipe (B), ATF joint pipes (C), O-rings (D), and gasket (E).
5. Clean the mounting surface and fluid passage of the A/T clutch pressure control solenoid valve A and transmission housing.
6. Install the new gasket on the transmission housing, and install the ATF pipe and ATF joint pipes.
7. Install the new O-rings over the ATF joint pipes.
8. Install the new A/T clutch pressure control solenoid valve A.
9. Check the A/T clutch pressure control solenoid valve A connector for rust, dirt, or oil, then connect it securely.
10. Install the air cleaner housing.

A/T Clutch Pressure Control Solenoid Valves B and C Test

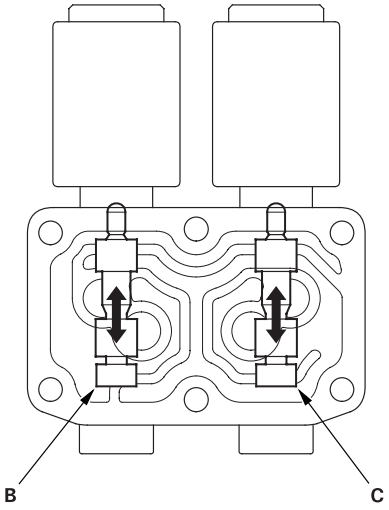
1. Remove the air cleaner housing.
2. Disconnect the A/T clutch pressure control solenoid valves B and C connectors.



3. Measure A/T clutch pressure control solenoid valve B resistance at the solenoid valve B connector, and measure A/T clutch pressure control solenoid valve C resistance at the solenoid valve C connector.

   STANDARD: About 5 Ω

4. If the resistance of either A/T clutch pressure control solenoid valve is out of standard, replace the A/T clutch pressure control solenoid valves B and C.
5. Connect the battery positive terminal to the No. 1 terminal of the A/T clutch pressure control solenoid valves B and C connectors, and connect the battery negative terminal to the No. 2 terminal. A clicking sound should be heard.
6. If no sound is heard, remove the A/T clutch pressure control solenoid valves B and C.
7. Check the fluid passage of the A/T clutch pressure control solenoid valve for dust or dirt.
8. Connect the No. 1 terminal of the A/T clutch pressure control solenoid valves B and C connectors to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure the A/T clutch pressure control solenoid valves B and C move.



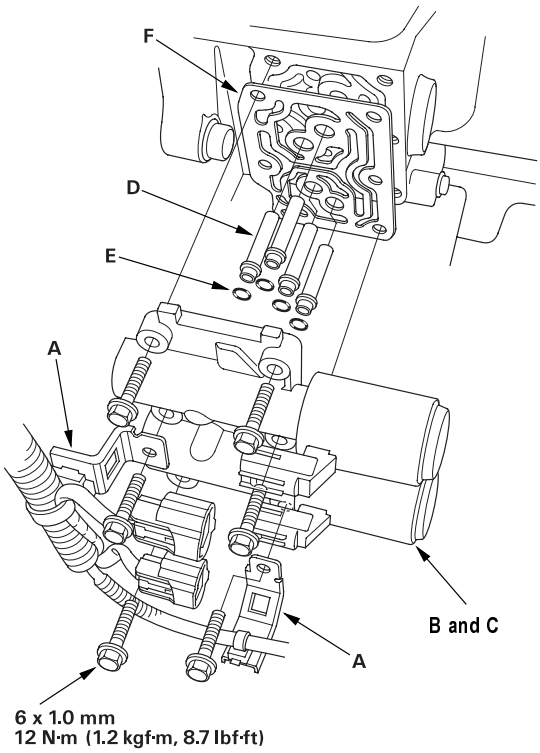
9. Disconnect one of the battery terminal and check valve movement.

   NOTE: You can see valve movement through the fluid passage in the mounting surface of the A/T clutch pressure control solenoid valves B and C body.

10. If either valve binds or moves sluggishly, or if the solenoid valve does not operate, replace the A/T clutch pressure control solenoid valves B and C.

A/T Clutch Pressure Control Solenoid Valves B and C Replacement

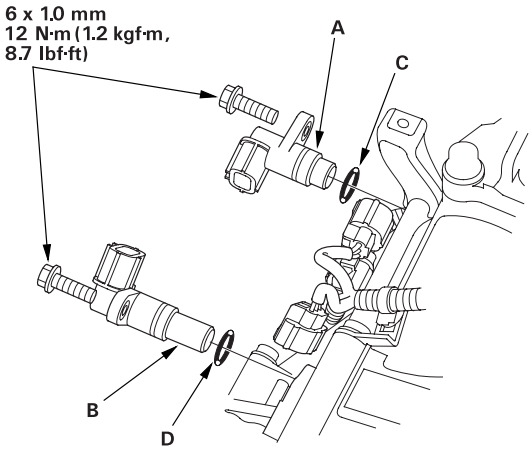
1. Remove the air cleaner housing.
2. Disconnect the A/T clutch pressure control solenoid valves B and C connectors.
3. Remove the mounting bolts, harness clamp brackets (A), and the A/T clutch pressure control solenoid valves B and C.



4. Remove the ATF joint pipes (D), O-rings (E), and gasket (F).
5. Clean the mounting surface and fluid passage of the A/T clutch pressure control solenoid valves B and C and transmission housing.
6. Install the new gasket on the transmission housing, and install the ATF joint pipes.
7. Install the new O-rings over the ATF joint pipes.
8. Install the new A/T clutch pressure control solenoid valves B and C, and harness clamp brackets.
9. Check the A/T clutch pressure control solenoid valves B and C connectors for rust, dirt, or oil, then connect them securely.
10. Install the air cleaner housing.

Mainshaft and Countershaft Speed Sensors Replacement

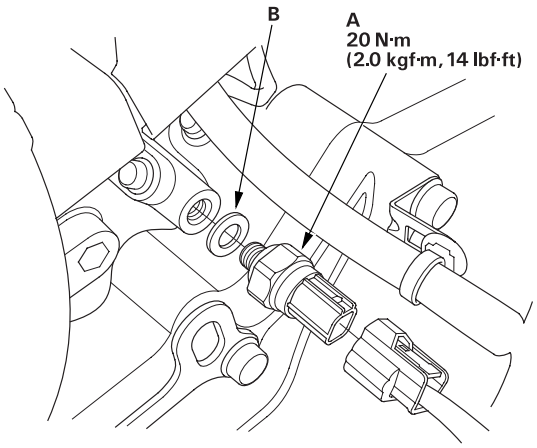
1. Disconnect the mainshaft speed sensor connector and countershaft speed sensor connector.
2. Remove the mainshaft speed sensor (A) and countershaft speed sensor (B).



3. Install the new O-ring (C) on the mainshaft speed sensor, and install the mainshaft speed sensor in the transmission housing.
4. Install the new O-ring (D) on the countershaft speed sensor, and install the countershaft speed sensor in the transmission housing.
5. Check the connectors for rust, dirt, or oil, then connect the connectors securely.

2nd Clutch Pressure Switch Replacement

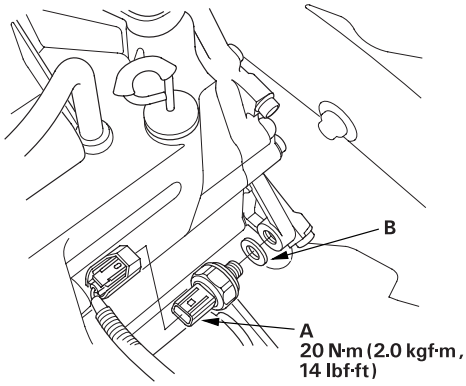
1. Remove the air cleaner housing.
2. Disconnect the connector from the 2nd clutch pressure switch (A).



3. Replace the 2nd clutch pressure switch, then install a new one with a new sealing washer (B). Tighten the switch on the metal pert, not the plastic part.
4. Reconnect the connector, making sure there is no water, oil, dust, or foreign particles inside it.
5. Install the air cleaner housing.

3rd Clutch Pressure Switch Replacement

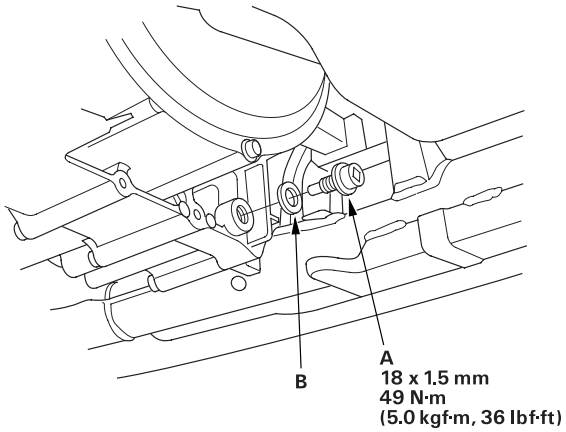
1. Disconnect the connector from the 3rd clutch pressure switch (A).



2. Replace the 3rd clutch pressure switch ,then install a new one with a new sealing washer (B). Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or foreign particles inside it.

ATF Temperature Sensor Test/Replacement

1. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

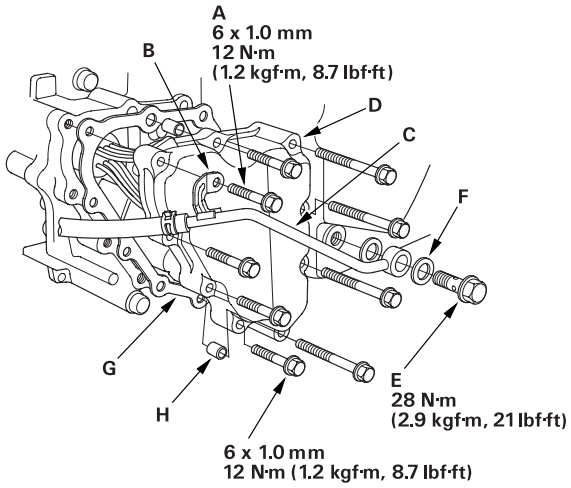


2. Reinstall the drain plug with a new sealing washer (B).

3. Place the transmission jack under the transmission, and lift it up to create clearance between the transmission and front sub-frame.

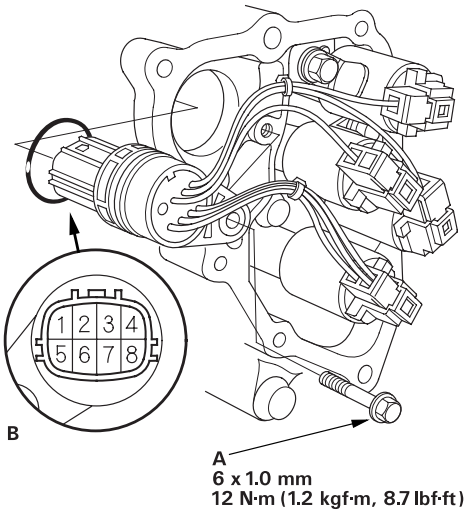
4. Disconnect the shift solenoid harness connector.

5. Remove the bolt (A) securing the bracket (B) of the ATF cooler inlet line (C) on the shift solenoid valve cover (D), and remove the line bolt (E) with sealing washers (F).



6. Remove the shift solenoid valve cover, gasket (G), and dowel pins (H).

7. Remove the bolt (A), and remove the shift solenoid harness connector (B).



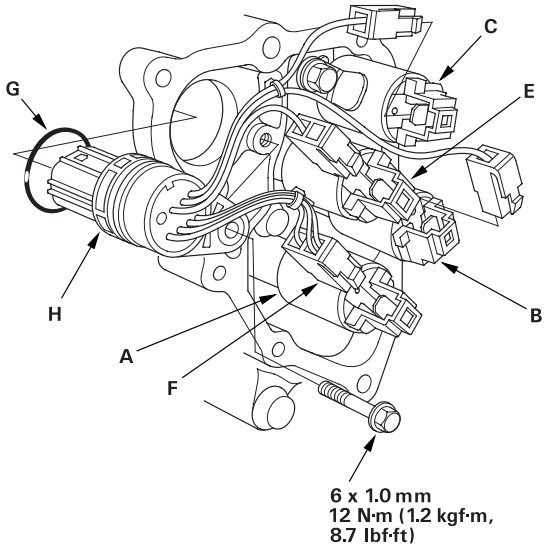
8. Measure ATF temperature sensor resistance between the No. 6 and No. 7 terminals of the shift solenoid harness connector.

   STANDARD: 50 Ω - 25 k Ω

9. If the resistance is out of standard, replace the ATF temperature sensor. The ATF temperature sensor is not available separately.

10. Disconnect the connectors from the shift solenoid valves.

11. Connect the shift solenoid valve A connector with the ATF temperature sensor (F) on the new solenoid harness.



12. Connect the solenoid valve B connector (ORN wire), solenoid valve C connector (GRN wire), and solenoid valve E connector (RED wire).

13. Install the new O-ring (G) on the shift solenoid harness connector (H), and install the connector in the transmission housing.

14. Install the shift solenoid valve cover with the new gasket and dowel pins.

15. Install the ATF cooler inlet line with the line bolt and the new sealing washers. Create clearance with the jack between the transmission and the front sub-frame to tighten the line bolt with the torque wrench.

16. Install the bracket of the ATF cooler inlet line on the shift solenoid valve cover with the bolt.

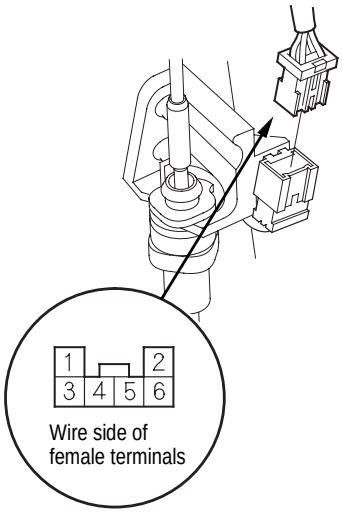
17. Check the connector for rust, dirt, or oil, then connect the connector securely.

18. Remove the transmission jack.

19. Refill the transmission with the recommended fluid (see page 14-131).

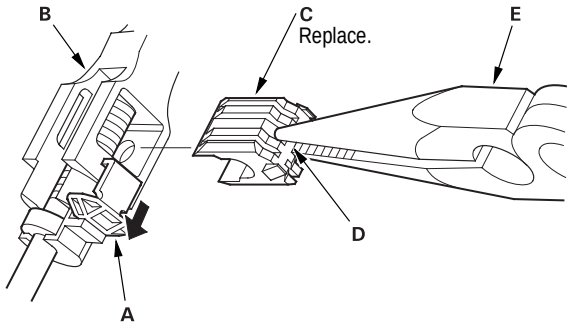
O/D Switch Test/Replacement

1. Remove the ash tray, front console box, heater control panel (see page 20-91), driver's dashboard lower cover (see page 20-88), and dashboard gauge assembly cover (see page 20-87).
2. Disconnect the O/D switch/shift lock solenoid/park pin switch connector.
   NOTE: The illustration shows LHD model; RHD is symmetrical.



O/D SWITCH/SHIFT LOCK SOLENOID
PARK PIN SWITCH CONNECTOR

3. Check for continuity between the No. 5 and No. 6 terminals of the O/D switch/shift lock solenoid/park pin switch connector while pushing the O/D switch, and when the switch is released.
4. If the O/D switch is OK, connect the connector and install the removed parts.
   If the switch is faulty, go to step 5 for the O/D switch replacement.
5. Shift the shift lever to [R] position.
6. Slide the lock tab (A) down on the shift cable and holder (B).

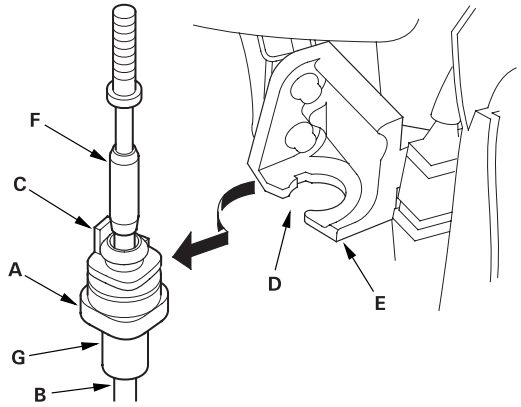


7. Remove the shift cable lock (C) with holding at the middle (D) of it using needle-nose pliers (E) from the shift cable end and shift cable end holder.
   NOTE: Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.
8. Separate the shift cable end from the shift cable end holder.

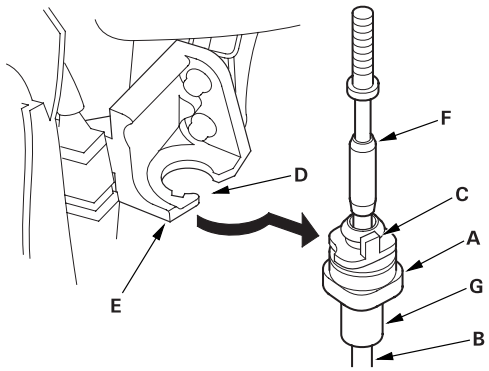
9. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the socket holder bracket (E). Then slide the holder to remove the shift cable from the socket holder bracket.

NOTE: Do not remove the shift cable by twisting the shift cable guide (F) and damper (G).

LHD Model:

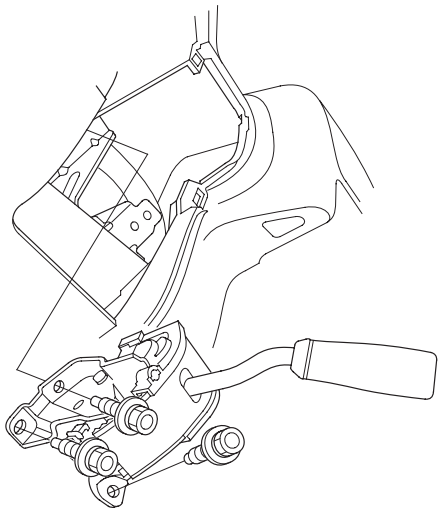


RHD Model:



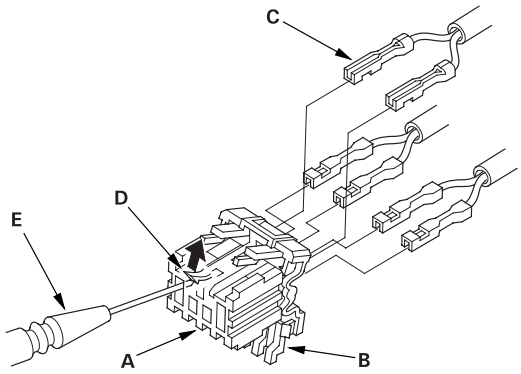
10. Remove the shift lever assembly.

NOTE: The illustration shows LHD model; RHD is symmetrical.



11. Remove the harness from the harness clamp on the shift lever bracket base, and remove the harness band from the harness.

12. Pry the lock tabs on the back of the O/D switch/shift lock solenoid/park pin switch connector (A), and remove the back cover (B).

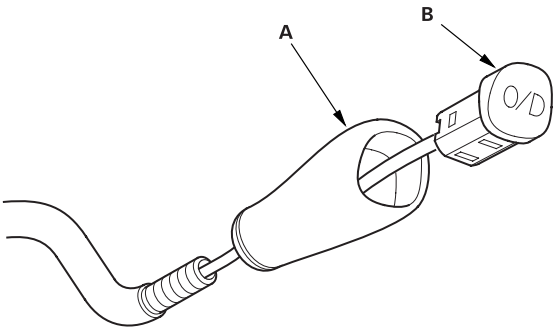


13. Remove the terminal (C) from the connector by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all six terminals.

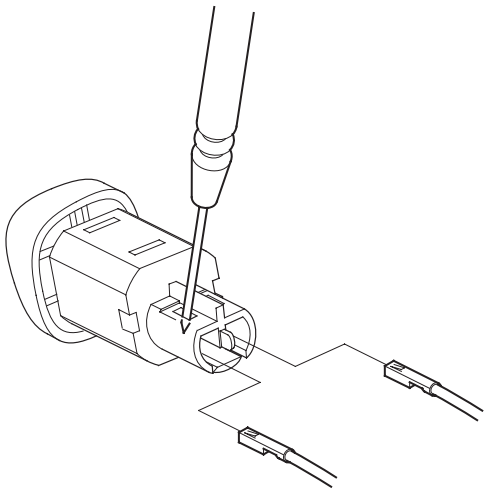
(cont'd)

O/D Switch Test/Replacement (cont'd)

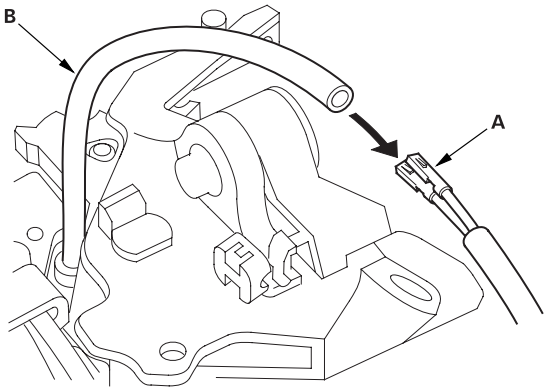
14. Remove the shift lever knob (A), then remove the O/D switch (B) from the knob.



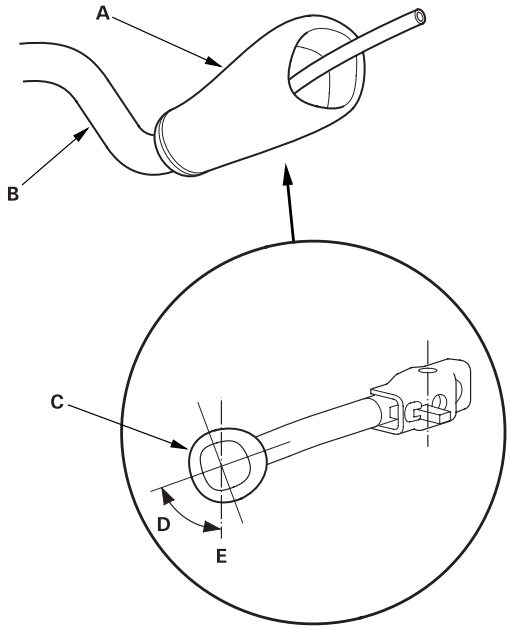
15. Remove the O/D switch connector terminals by pushing the lock tabs in the connector using a thin blade screwdriver.



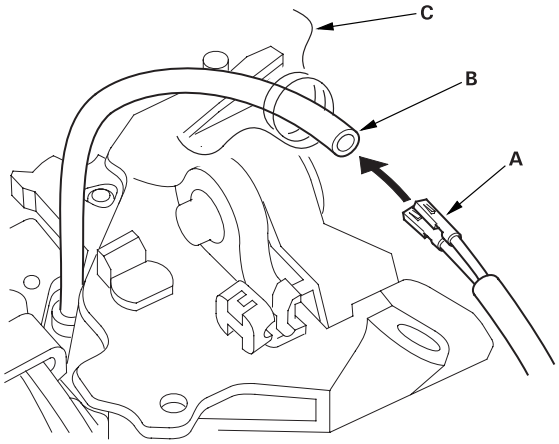
16. Pull the O/D switch harnesses (A) from shift lever bracket side, and remove them. Leave the harness tube (B) while removing the harnesses.



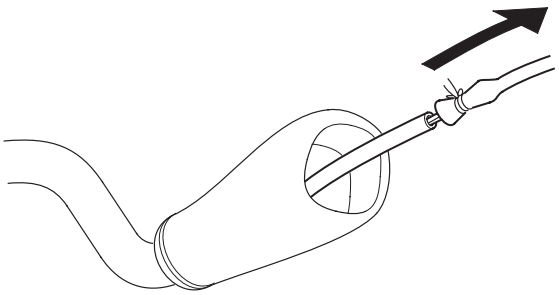
17. Install the shift lever knob (A) on the shift lever (B), and align the opening (C) of the switch with inclined 50° (D) toward the vartical axis (E).



18. Insert the new O/D switch harness terminals (A) in preserved harness tube (B), then tie a string (C) over the tube not to allow the terminals out of the tube.

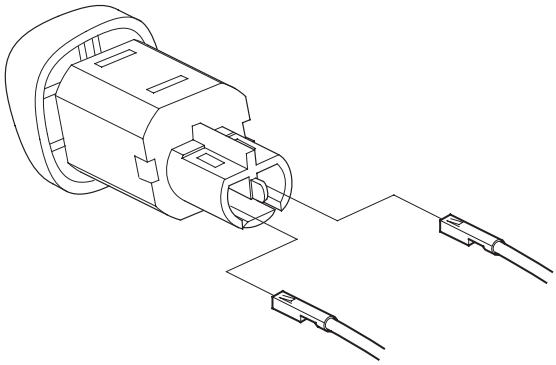


19. Pull the old tube from the shift lever knob side, and install the O/D switch harnesses.



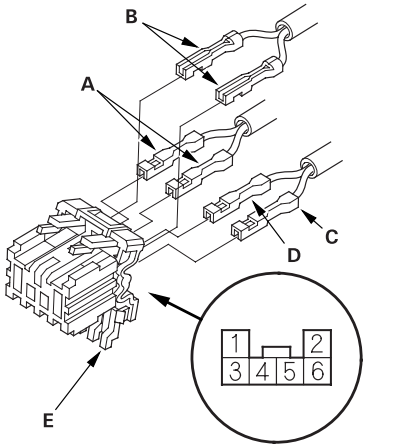
20. Remove the old harness tube from the O/D switch harness terminals.

21. Install the O/D switch harness terminals in the new O/D switch. Both harness terminals can be installed in either cavities.



22. Install the new O/D switch in the shift lever knob.

23. Install the O/D switch harness terminals (A) in the No. 5 and No. 6 cavities. Both of O/D switch harness terminals can be installed in No. 5 and No.6 cavities.



Wire side of female terminals

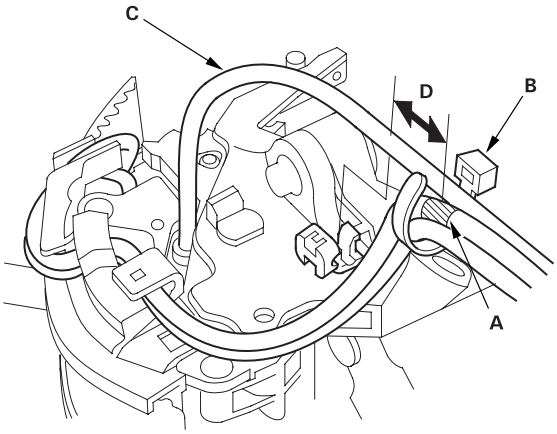
24. Install the park pin switch harness terminals (B) in the No. 1 and No. 2 cavities. Both of park pin switch harness terminals can be installed in No. 1 and No. 2 cavities.

25. Install BLU harness terminal (C) of the shift lock solenoid in the No. 3 cavity, and RED harness terminal (D) in the No. 4 cavity. Make sure that the all six terminals lock securely, then install the back cover (E) locked securely in place.

(cont'd)

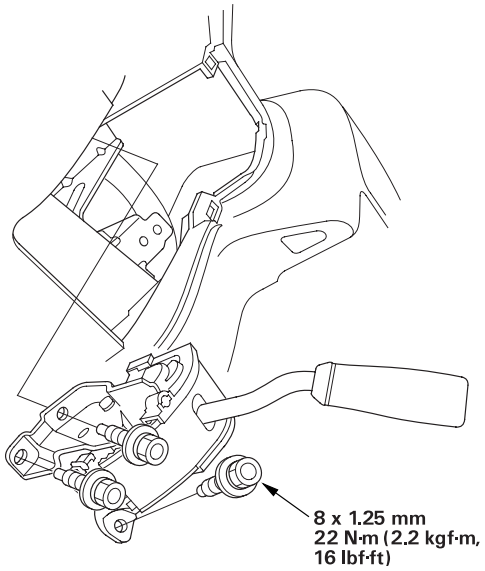
O/D Switch Test/Replacement (cont'd)

26. Align the marks (A) on the harnesses, and tie the harness band (B) over the marks. Clamp the O/D switch harness (C) at 15 mm (0.6 in.) (D) from the harness band.



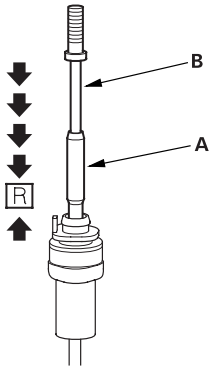
27. Install the shift lever assembly.

NOTE: The illustration shows LHD model; RHD is symmetrical.



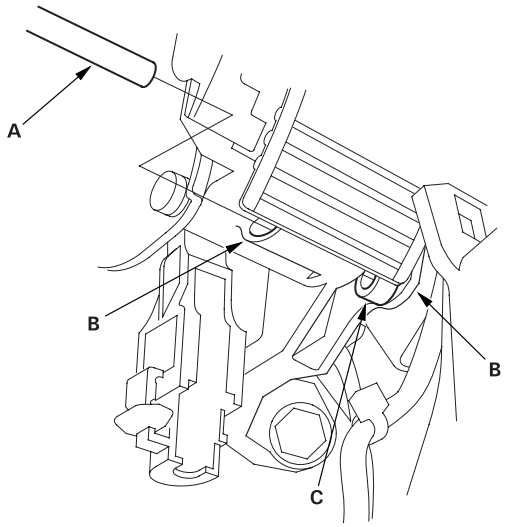
28. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.

29. If necessary, push the shift cable until it stops, then release it. Pull the shift cable back one step so that the shift cable is in [R]. Do not hold the shift cable guide (A) to adjust the shift cable (B).



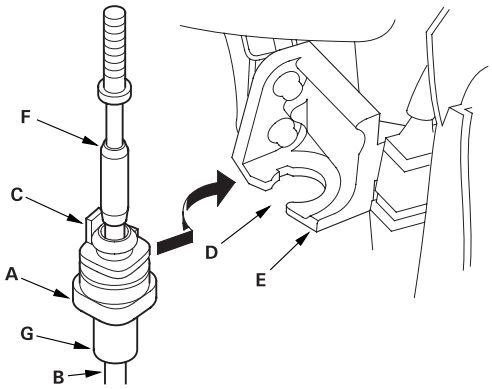
30. Turn the ignition switch OFF.

31. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning holes (B) on the shift lever bracket base through the positioning hole (C) on the shift lever. The shift lever is secured in [R] position.

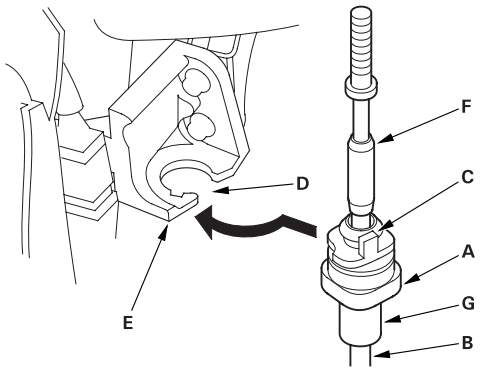


32. Rotate the socket holder (A) on the shift cable (B) to face the tab (C) on the holder opposite to the opening (D) in the socket holder bracket (E). Align the holder with the opening in the bracket, then slide the holder into the bracket. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (F) and damper (G).

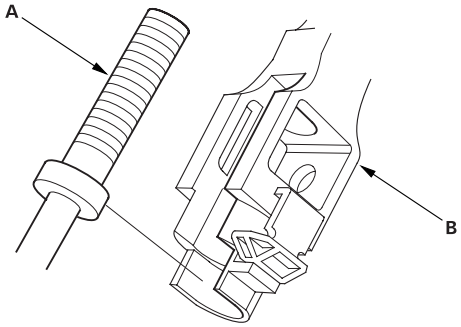
LHD Model:



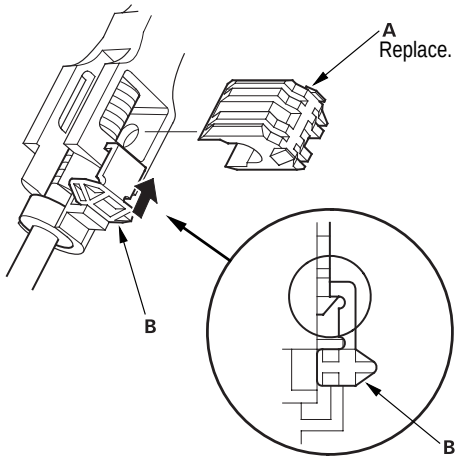
RHD Model:



33. Install the shift cable end (A) in the shift cable end holder (B). Keep the shift cable end and end holder free of grease.



34. Install the new shift cable lock (A) to secure the shift cable end and shift cable end holder, then push the lock tab (B) up until it stops to lock the joint.



35. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

36. Connect the O/D switch/shift lock solenoid/park pin switch connector.

37. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

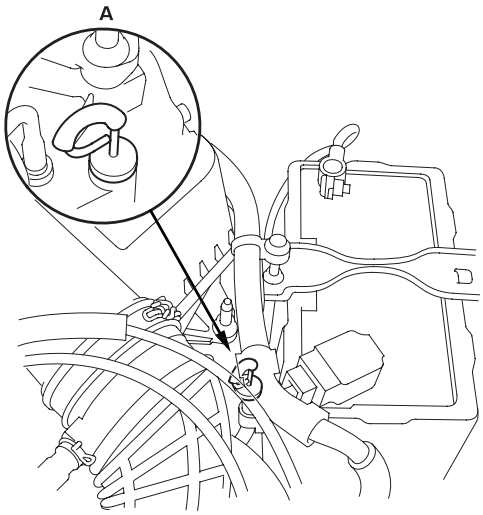
38. Check that the O/D switch operates.

39. Install the dashboard gauge assembly cover (see page 20-87), driver's dashboard lower cover (see page 20-88), heater control panel (see page 20-91), front console box, and ash tray.

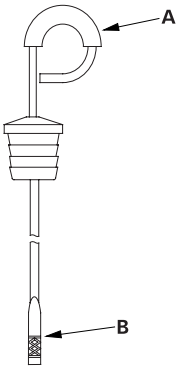
ATF Level Check

NOTE: Keep all foreign particles out of the transmission.

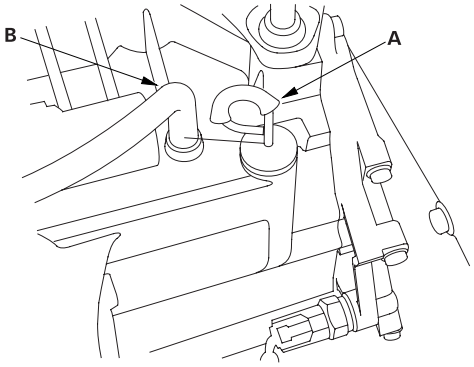
1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Park the vehicle on level ground, and turn the engine off.
3. Remove the dipstick (yellow loop) (A) from the transmission, and wipe it with a clean cloth.



4. Insert the dipstick back into the transmission.
5. Remove the dipstick (A) and check the fluid level. It should be at upper mark (B).



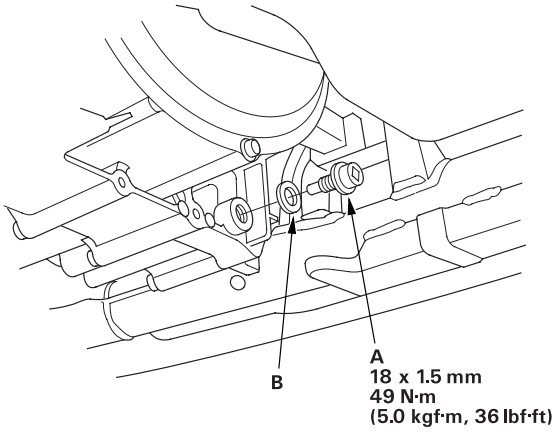
6. If the level is below the upper mark, check for fluid leaks at the transmission, hose and line joints, and cooler lines.
7. Pour the recommended fluid amount into the dipstick hole to bring it to the upper mark. Always use Genuine Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.
8. Insert the dipstick (A) back into the transmission with facing the handle toward the breathe tube (B).



ATF Replacement

NOTE: Keep all foreign particles out of the transmission.

1. Bring the transmission up to normal operating temperature (the radiator fan comes on) by driving the vehicle.
2. Park the vehicle on level ground, and turn the engine off.
3. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

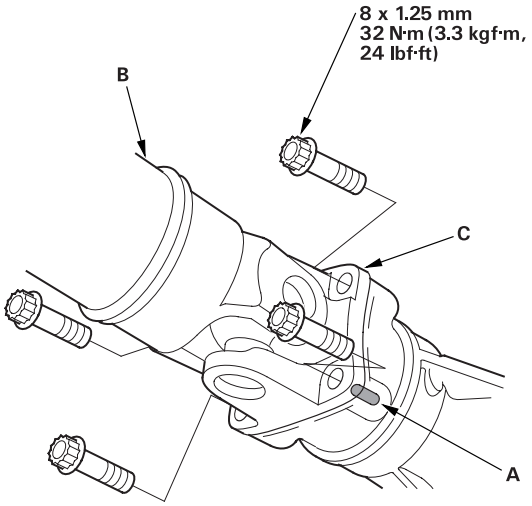


4. Reinstall the drain plug with a new sealing washer (B).
5. Refill transmission with the recommended fluid amount through the dipstick hole until the lever reaches the upper mark on the dipstick. Always use Genuine Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

Automatic Transmission Fluid Capacity:
4WD:
3.1 L (3.3 US qt, 2.7 Imp qt) at change
7.2 L (7.6 US qt, 6.3 Imp qt) at overhaul
2WD:
2.9 L (3.1 US qt, 2.6 Imp qt) at change
6.5 L (6.9 US qt, 5.7 Imp qt) at overhaul

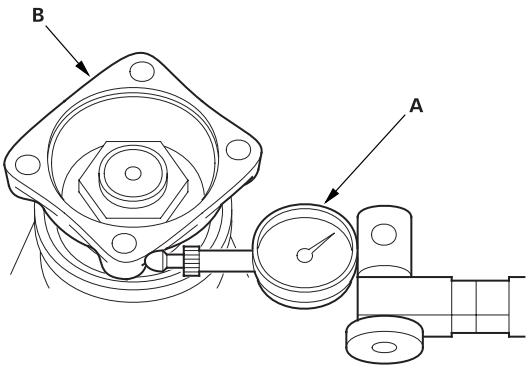
Transfer Assembly Inspection

1. Rise the vehicle, and make sure it is supported securely.
2. Shift the transmission into the [N] position.
3. Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C).



4. Separate the propeller shaft from the transfer assembly.
5. Set a dial indicator (A) on the transfer companion flange (B), and measure the transfer gear backlash.

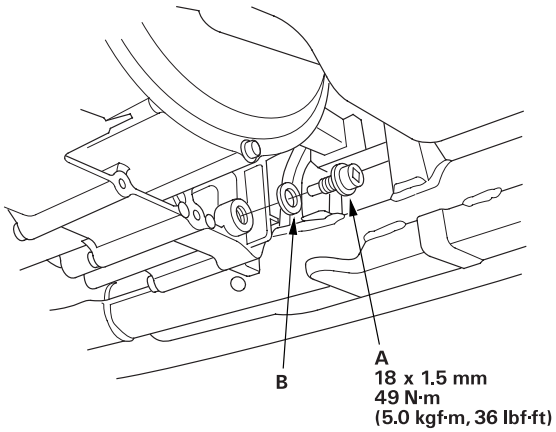
STANDARD: 0.06 - 0.16 mm (0.02 - 0.06 in.)



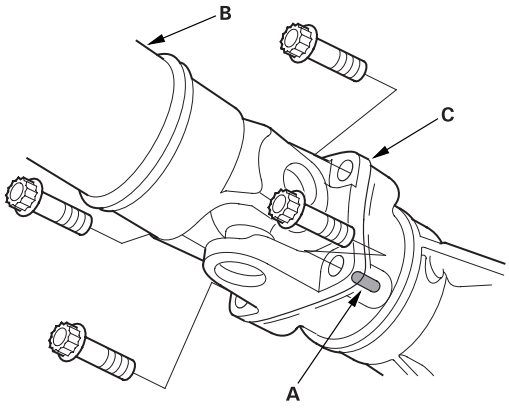
6. If the measurement is out of standard, remove the transfer assembly, and adjust the transfer gear backlash (see page 14-281).
7. Check for fruid leaks between the masting faces of the transfer assembly and transmission.
8. If there is a leak, remove the transfer assembly, and replace the O-ring. Also check for fluid leaks between the mating faces of the transfer housing and transfer cover. If there is a leak, remove the transfer cover, and replace the O-ring.
9. Check for leaks between the transfer companion flange and transfer oil seal.
10. If there is a leak, remove the transfer assembly from the transmission, and replace the transfer oil seal and O-ring on the transfer driven gear shaft. If oil seal and O-ring replacement is required, you will need to check and adjust the transfer gear tooth contact, transfer gear backlash, the tapered roller bearing starting torque, and the total starting torque (see page 14-281). Do not replace the oil seal with the transfer assembly on the transmission.

Transfer Assembly Removal

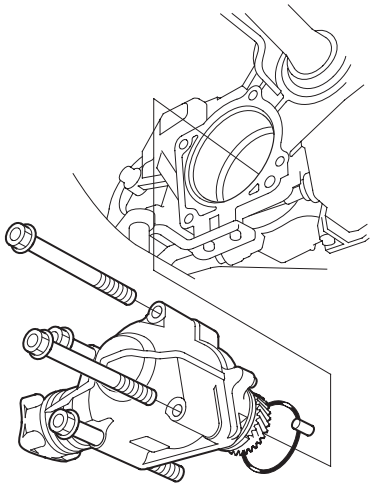
1. Raise the vehicle, and make sure it is supported securely.
2. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (B).



3. Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C).

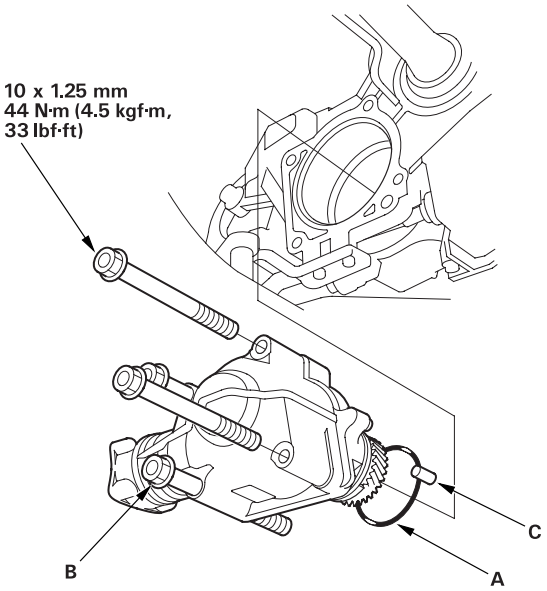


4. Separate the propeller shaft form the transfer assembly.
5. Remove the transfer assembly.

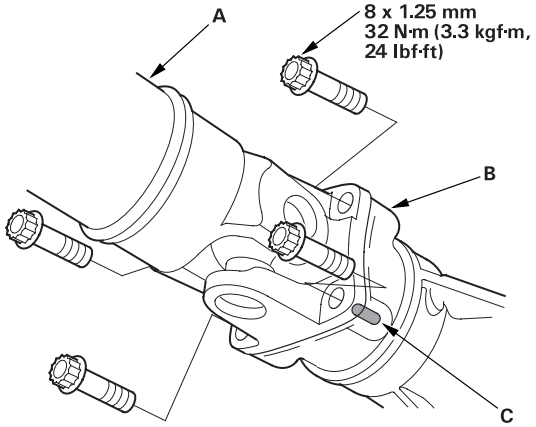


Transfer Assembly Installation

1. Clean the area where the trainer assembly contacts the transmission with solvent or carburetor cleaner, and dry with compressed air. Then apply transmission fluid to the contact areas. When installing the transfer assembly, be sure not to allow dust or other foreign particles to enter the transmission.
2. Install the new O-ring (A) on the transfer.



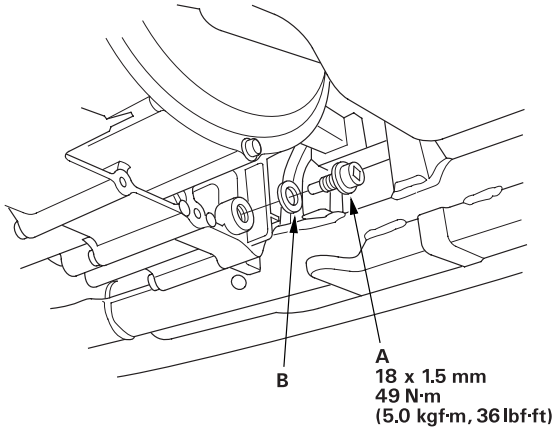
3. Insert the two bolts in the rear of the transfer housing, then install the transfer assembly (B) with the dowel pin (C).
4. Install the propeller shaft (A) to the transfer companion flange (B) by aligning the reference mark (C).



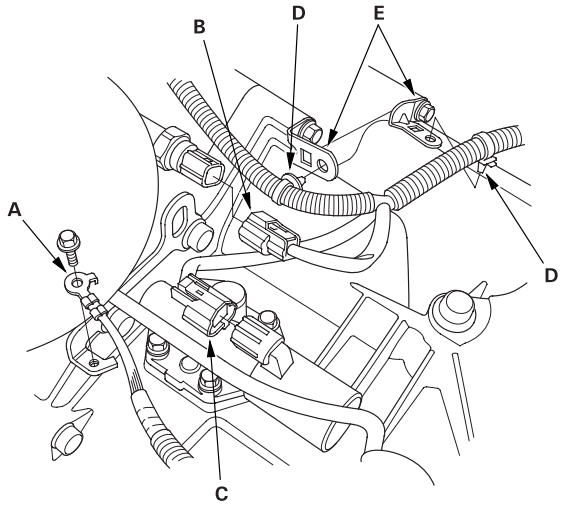
5. Refill the transmission fluid (see page 14-131).
6. Start the engine, and run it to normal operating temperature (the radiator fan comes on). Turn the engine off, and check the fluid level (see page 14-130).

Transmission Removal

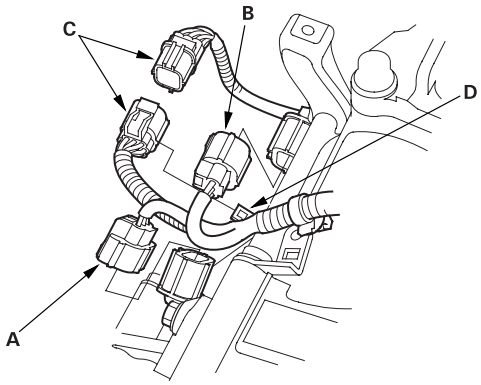
1. Raise the vehicle, and make sure it is securely supported.
2. Remove the splash shield.
3. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (B).



4. Disconnect the battery negative terminal, then disconnect the battery positive terminal.
5. Remove the air cleaner housing and the intake air duct.
6. Remove the battery hold-down bracket, then remove the battery and battery tray.
7. Remove the harness clamp from the battery base, then remove the battery base.
8. Remove the transmission ground terminal (A).



9. Disconnect the 2nd clutch pressure switch connector (B) and A/T clutch pressure control solenoid valve A connector (C), and remove the harness clamps (D) from the clamp brackets (E).
10. Disconnect the countershaft speed sensor connector (A) and mainshaft speed sensor (B).

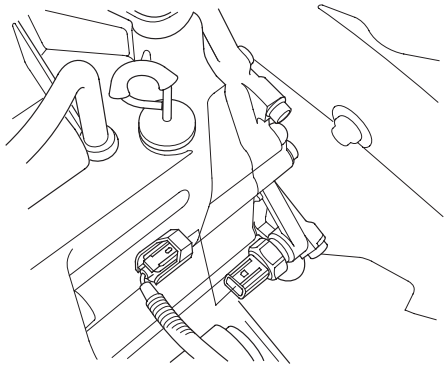


11. Remove the transmission range switch connector (C) from its bracket (D), then disconnect it.

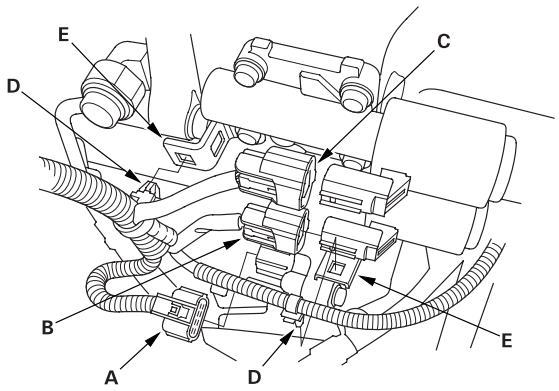
(cont'd)

Transmission Removal (cont'd)

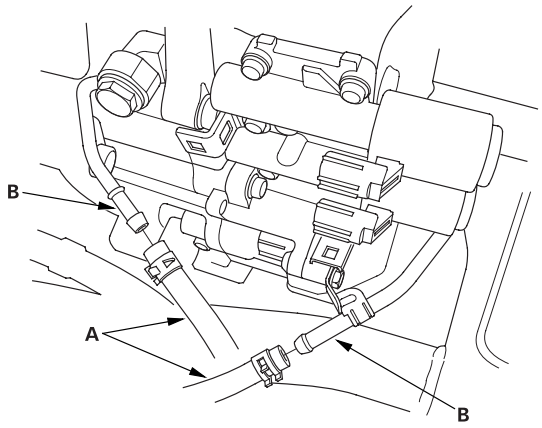
12. Disconnect the 3rd clutch pressure switch connector.



13. Disconnect the shift solenoid harness connector (A), A/T clutch pressure control solenoid valve B connector, and solenoid valve C connector, then remove the harness clamps (D) from the clamp brackets (E).

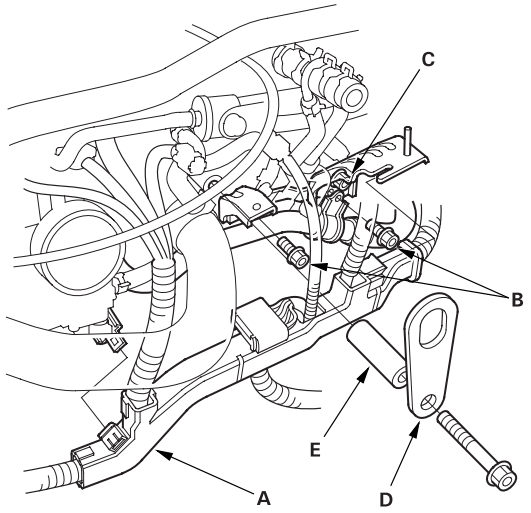


14. Remove the ATF cooler hoses (A) from the ATF cooler lines (B). Turn the ends of the ATF cooler hoses up to prevent ATF from flowing out, then plug the ATF cooler hoses and lines.



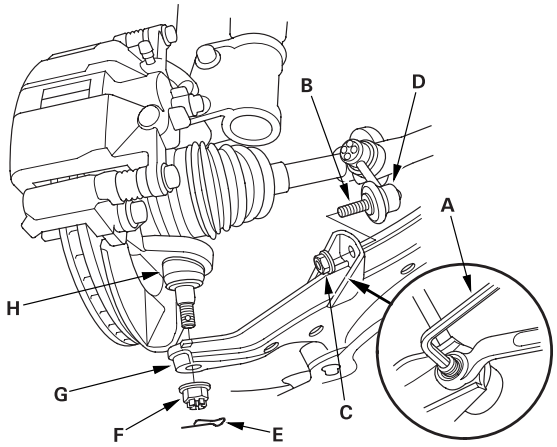
15. Check for any signs of leakage at the hose joints.

16. Remove the harness cover (A) and water pipe bolts (B). Loosen the air cleaner housing mounting bracket bolt (C), then lower the water pipe.



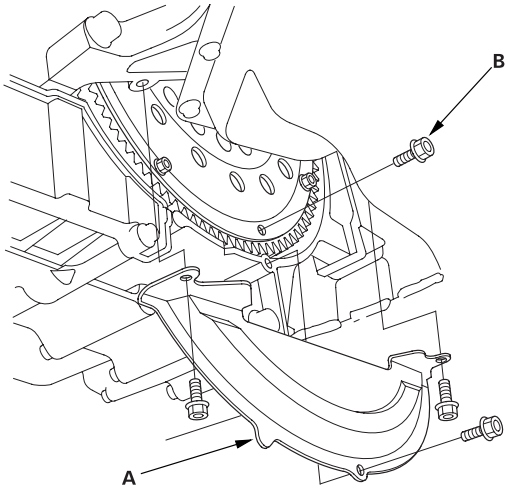
17. Attach a hoisting bracket (D) with a collar (E) to the hose clamp bracket bolt hole on the engine cylinder block, and lift the engine.

18. Insert a 5 mm Allen wrench (A) in the top of the ball joint pin (B), and remove the nut (C), then separate the stabilizer link (D) from the lower arm.



19. Remove the spring clips (E) and castle nuts (F), and separate the lower arms (G) from the knuckles (H) (see page 18-10).

20. Remove the torque converter cover (A), and remove the eight drive plate bolts (B) while rotating the crankshaft pulley.

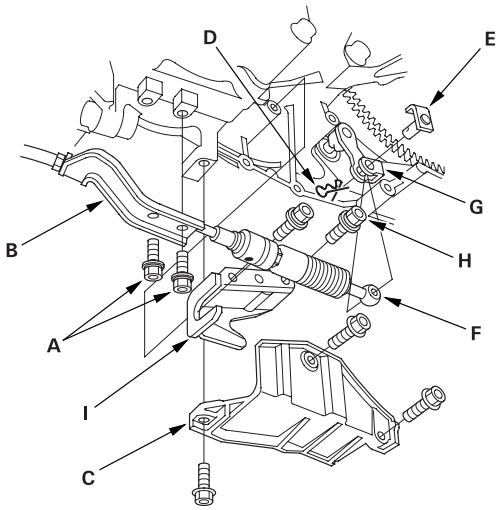


21. Remove the shift cable for 4WD model.

1 Remove the bolts (A) securing the shift cable bracket (B), then remove the shift cable cover (C).

2 Remove the spring clip (D) and control pin (E), then separate the shift cable (F) from the control lever (G). Do not bend the shift cable excessively.

3 Remove the bolts (H) securing the shift cable bracket (I), then remove the shift cable bracket (I) from the shift cable.



(cont'd)

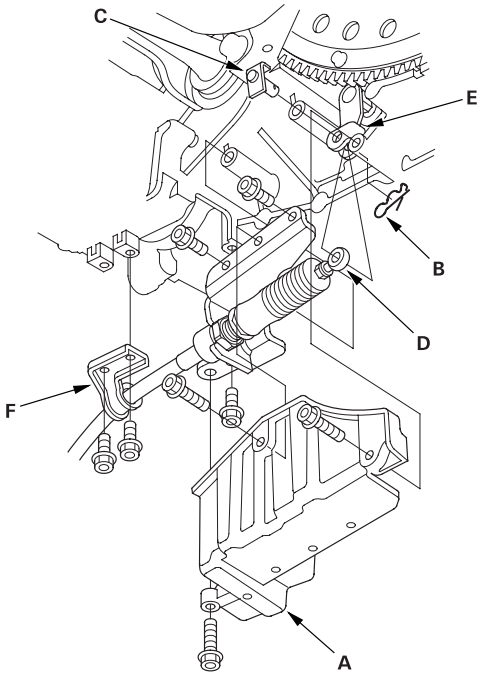
Transmission Removal (cont'd)

22. Remove the shift cable for 2WD model.

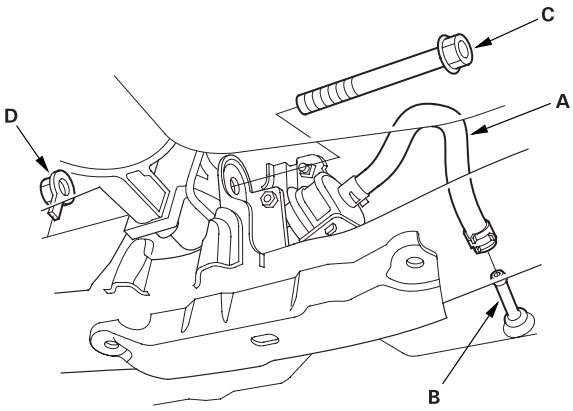
1 Remove the shift cable cover (A).

2 Remove the spring clip (B) and control pin (C), then separate the shift cable (D) from the control lever (E).

3 Remove the bolts securing the shift cable bracket (F). Do not bend the shift cable excessively.

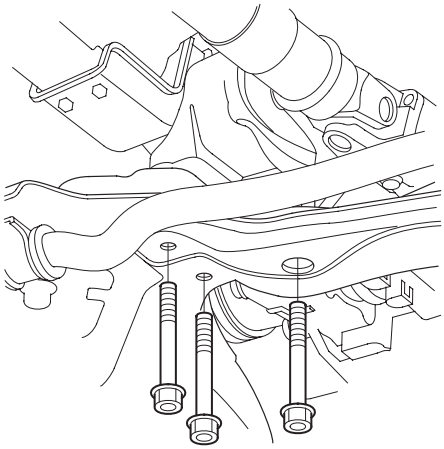


23. Disconnect the ATF cooler hose (A) from the ATF cooler line (B), then plug the end of the hose.

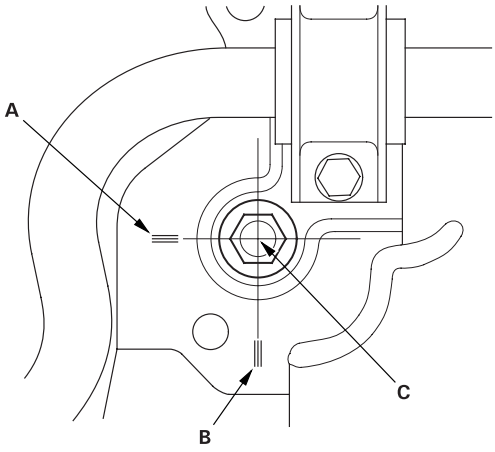


24. Remove the front mount bolt (C) and nut (D).

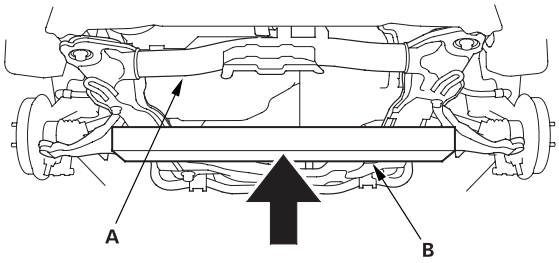
25. Remove the rear mount bolts.



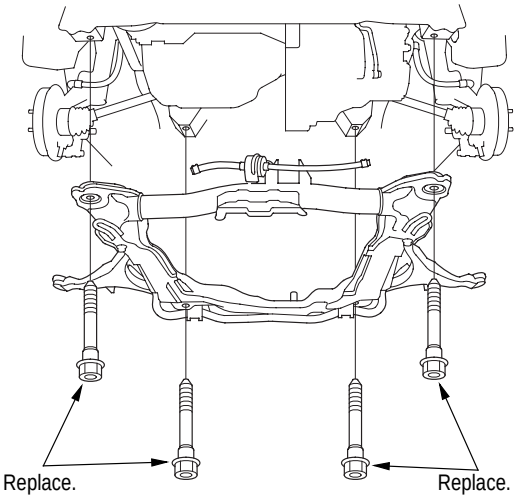
26. Make the appropriate reference lines at positions A and B that line up with the center of the sub-frame mounting bolts (C).



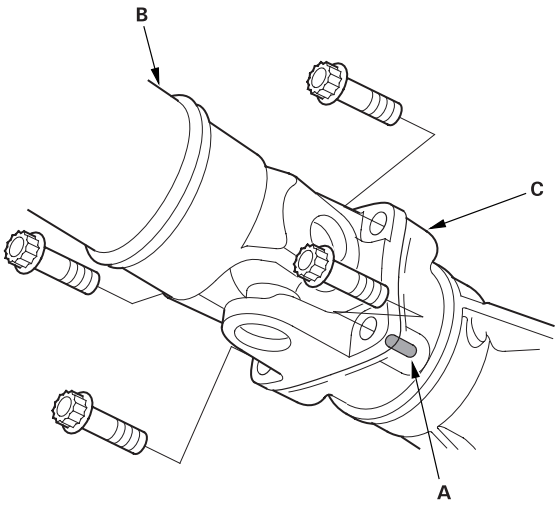
27. Support the sub-frame (A) with a 4 x 4 x 40 in. piece of wood (B) and a jack.



28. Remove the four sub-frame mounting bolts, then lower the sub-frame.



29. For 4WD model; Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C), then separate the propeller shaft from the transfer assembly.

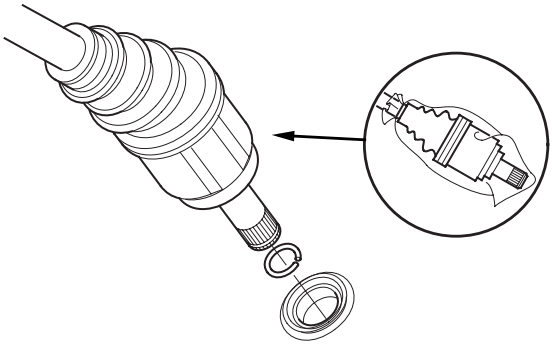


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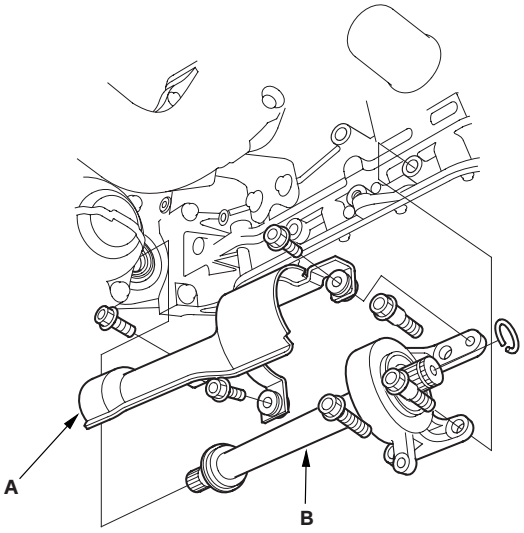
Transmission Removal (cont'd)

30. Pry the left driveshaft out of the differential (see page 16-3).

31. Remove the driveshafts from the differential and intermediate shaft.



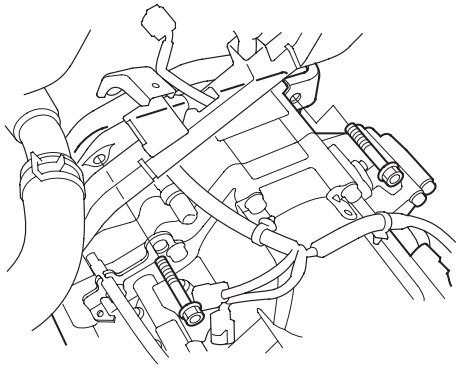
32. Remove the intermediate shaft cover (A).



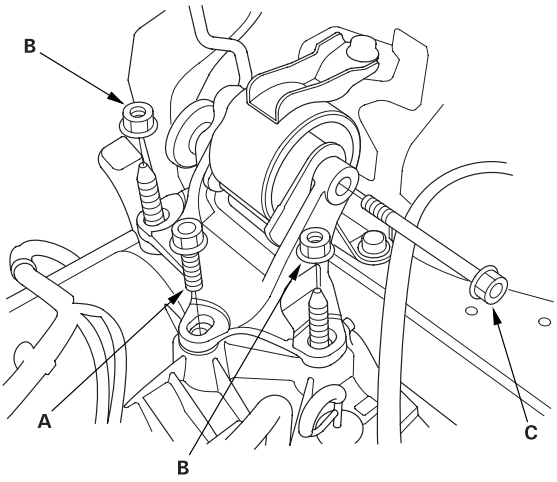
33. Remove the intermediate shaft (B). Coat all precision finished surfaces with clean engine oil, then tie plastic bags over the driveshaft and intermediate shaft ends.

34. Place a jack under the transmission.

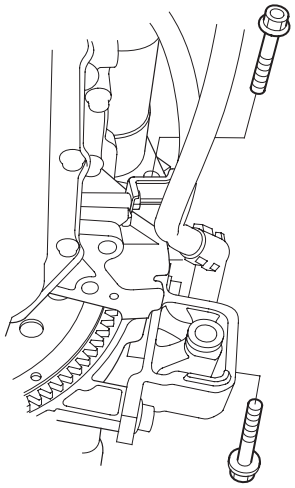
35. Remove the transmission housing mounting bolts.



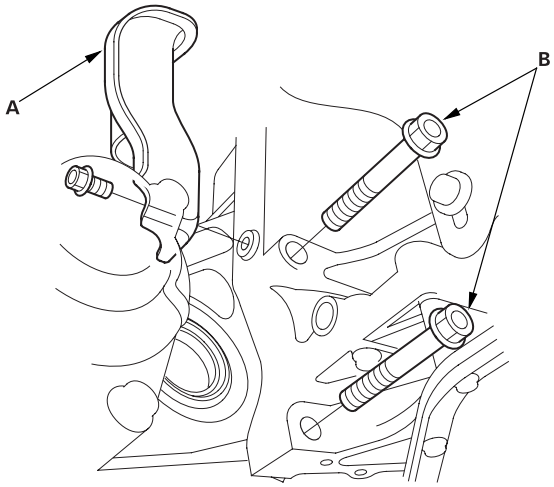
36. Remove the transmission mount bracket bolt (A) and nuts (B), then remove the transmission mount bolt (C).



37. Remove the transmission housing mounting bolts located on front lower of the transmission.

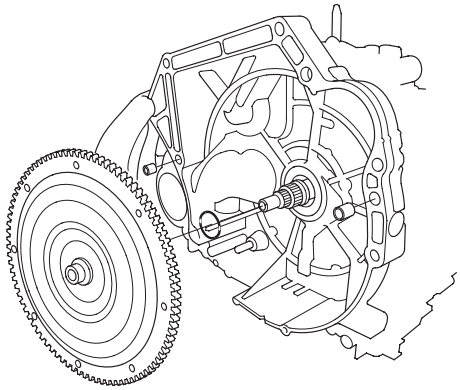


38. Remove the stiffener (A), then remove the transmission housing mounting bolts (B) located on rear lower of the transmission.

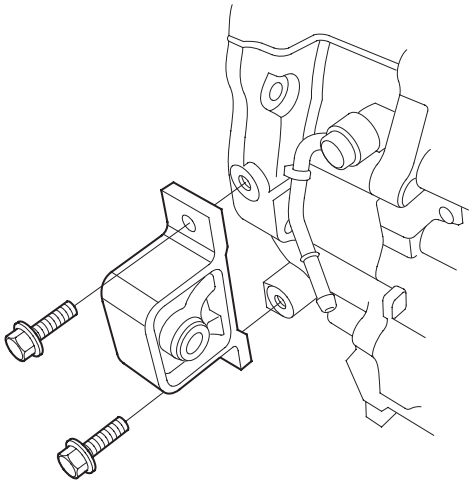


39. Slide the transmission away from the engine to remove it from the vehicle.

40. Remove the torque converter assembly.



41. Remove the front mount.

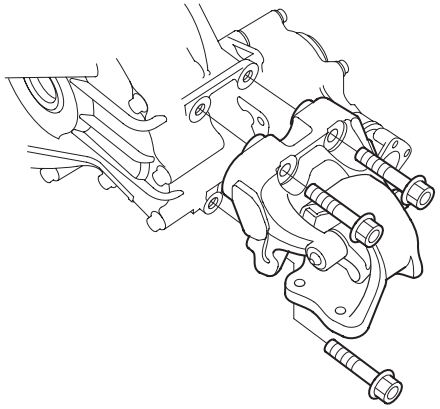


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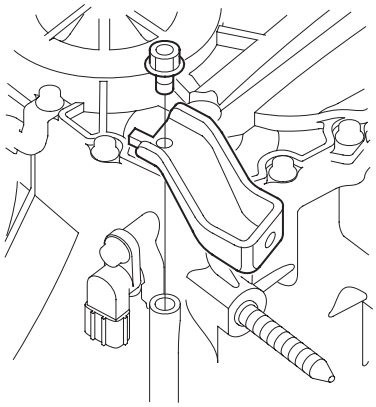
Transmission Removal (cont'd)

42. Remove the rear mount/bracket.

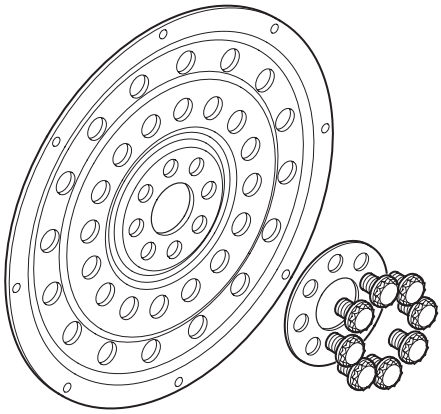
NOTE: The illustration shows the 4WD model; 2WD model is similar.



43. Remove the air cleaner housing mounting bracket.

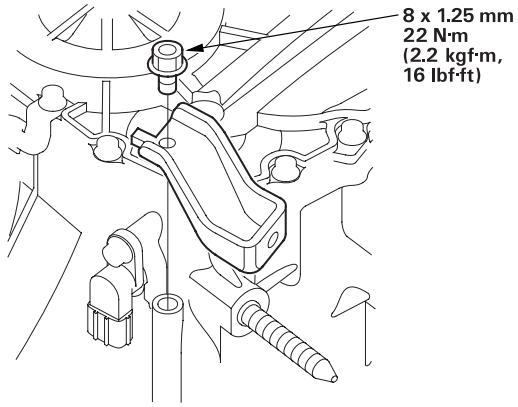


44. Inspect the drive plate, and replace it if it's damaged.

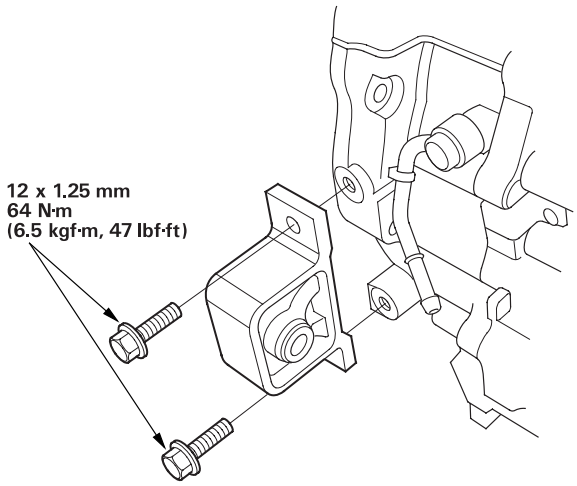


Transmission Installation

1. Install the air cleaner housing mounting bracket.

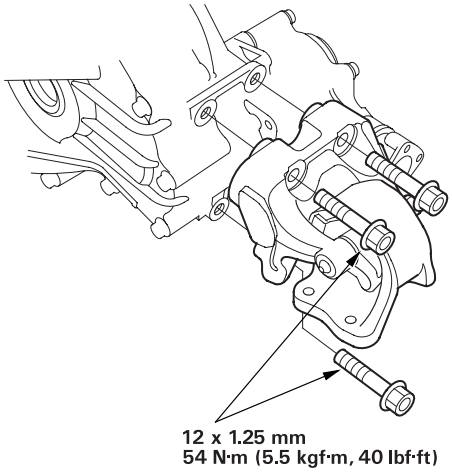


2. Install the front mount.

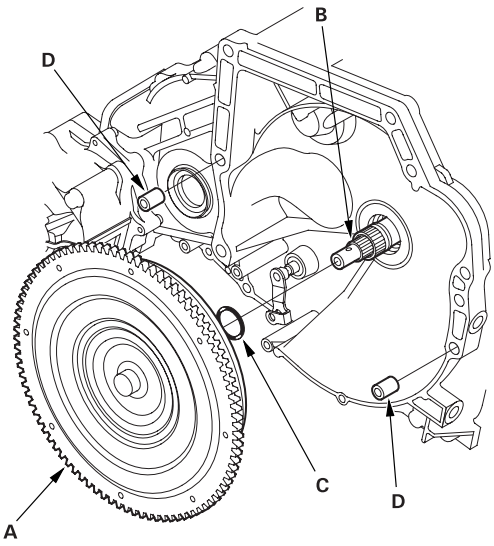


3. Install the rear mount/bracket.

NOTE: The illustration shows the 4WD model; 2WD model is similar.



4. Install the torque converter assembly (A) on the mainshaft (B) with the new O-ring (C).



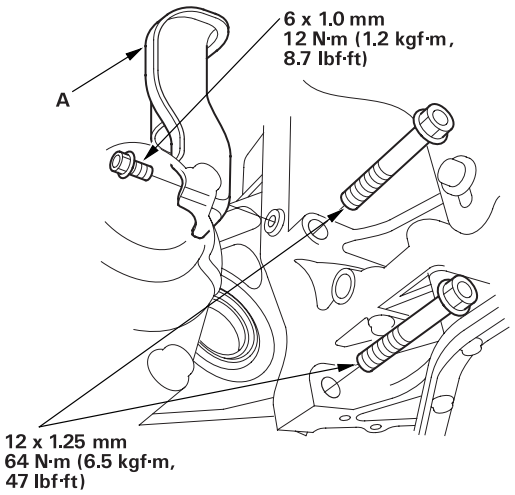
5. Install the 14 x 20 mm dowel pins (D) in the torque converter housing.

(cont'd)

Transmission Installation (cont'd)

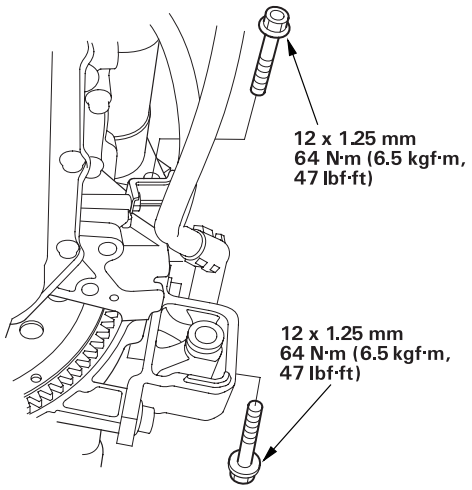
6. Place the transmission on a jack, and raise the transmission to the engine level.

7. Attach the transmission to the engine, then install the transmission housin mounting bolts.

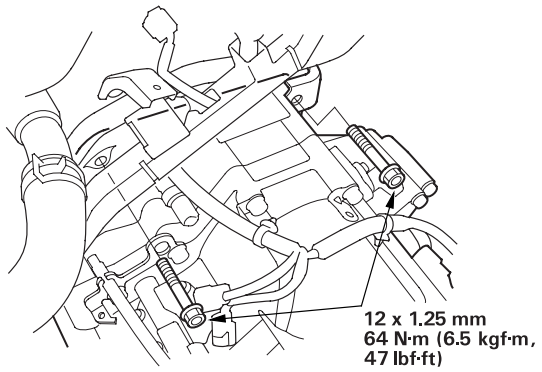


8. Install the stiffener (A).

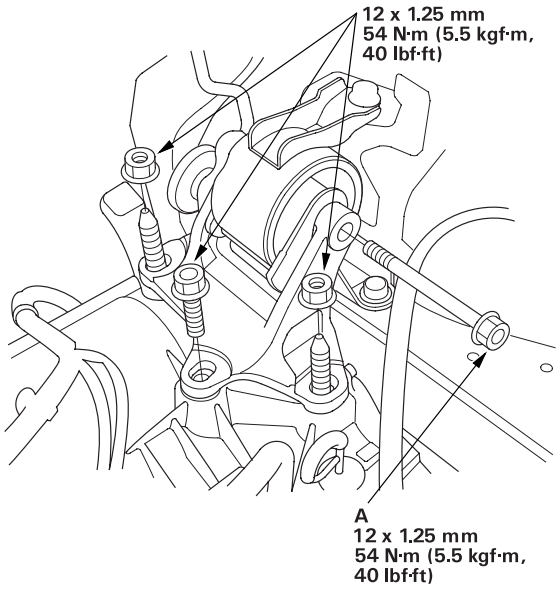
9. Install the transmission housing mounting bolts.



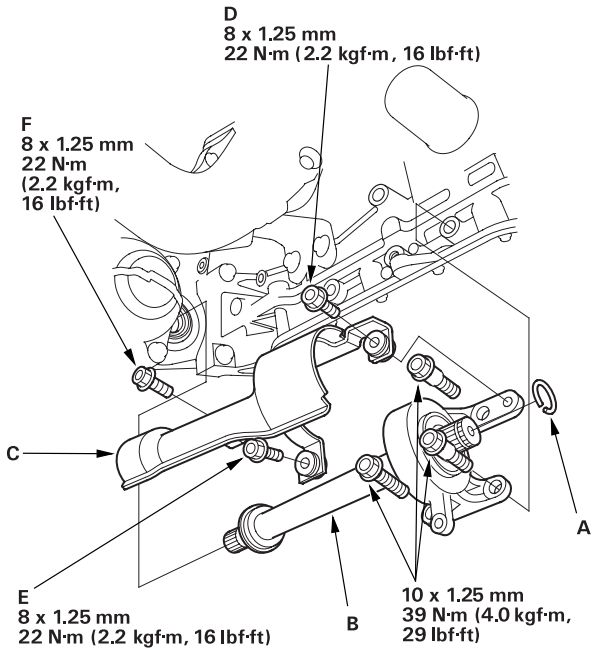
10. Install the transmission housing mounting bolts.



11. Install the transmission mount bracket. Tighten the mount bolt (A) loosely, and tighten the transmission mount bracket bolt and nuts to the specified torque, then tighten the mount bolt to the specified torque.



12. Install the new set ring (A) on the intermediate shaft (B).

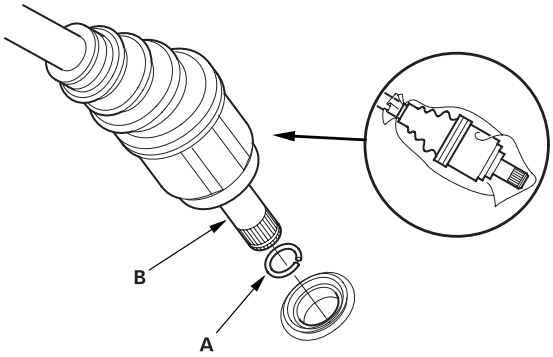


13. Clean the areas where the intermediate shaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air. Then install the intermediate shaft in the differential. While installing the intermediate shaft, be sure not to allow dust or other foreign particles to enter the transmission.

14. Install the intermediate shaft cover (C) with installing the mounting bolts loosely.

15. First tighten the right upper bolt (D) on the cover, then right lower bolt (E), and lastly the left bolt (F).

16. Install the new set ring (A) on the left driveshaft (B).



17. Install the right and left driveshaft (see page 16-17). While installing the left driveshaft in the differential, be sure not to allow dust or other foreign particles to enter the transmission.

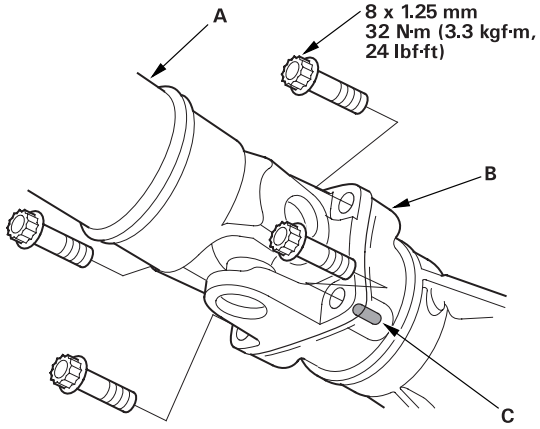
NOTE:

- Clean the areas where the left driveshaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air.
- Turn the right and left steering knuckle fully outward, and slide the left driveshaft into the differential until you feel its set ring engages the side gear. Slide the right driveshaft over the intermediate shaft splines until you feel the driveshaft engages the intermediate shaft set ring.

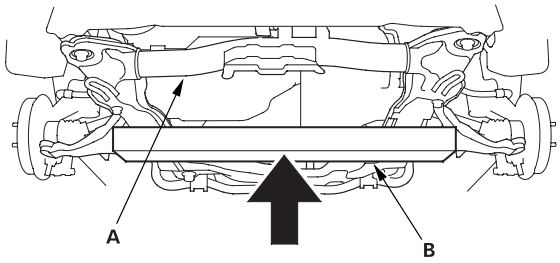
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Transmission Installation (cont'd)

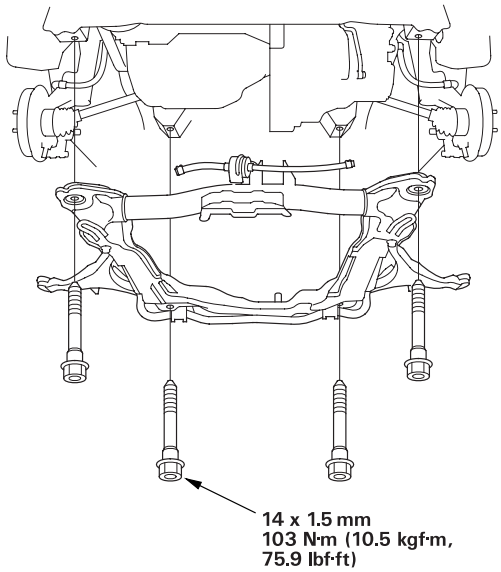
18. Install the propeller shaft (A) to the transfer companion flange (B) by aligning the reference mark (C).



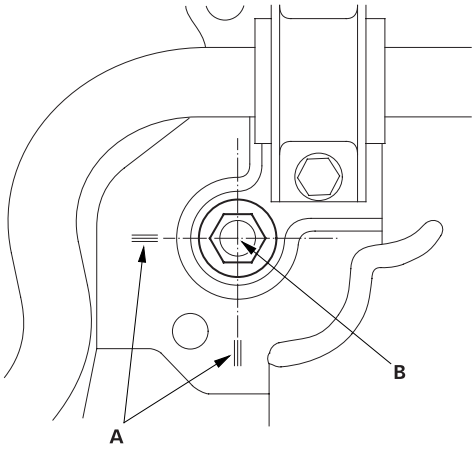
19. Support the sub-frame (A) with a 4 x 4 x 40 in. piece of wood (B), and lift it up to body.



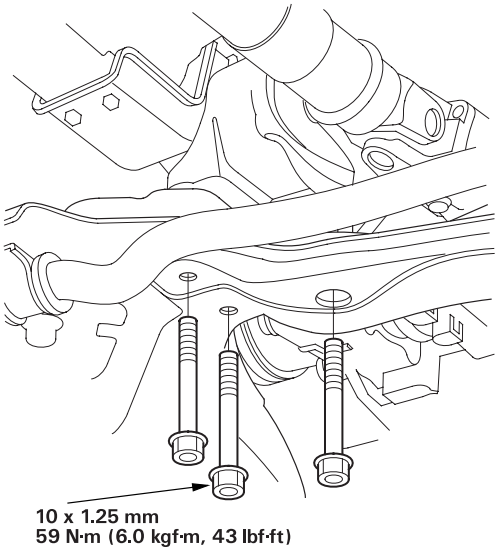
20. Loosely install the new sub-frame mounting bolts.



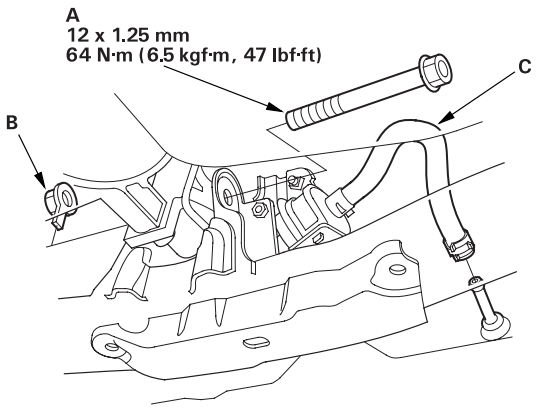
21. Align the reference marks (A) with the center of the sub-frame mounting bolts (B), then tighten the bolts to the specified torque.



22. Install the rear mount bolts.



23. Install the front mount bolt (A) and nut (B), connect the ATF cooler hose (C) to the ATF cooler line, then secure the hose with the clip (see page 14-151).



24. Install the shift cable for 4WD model.

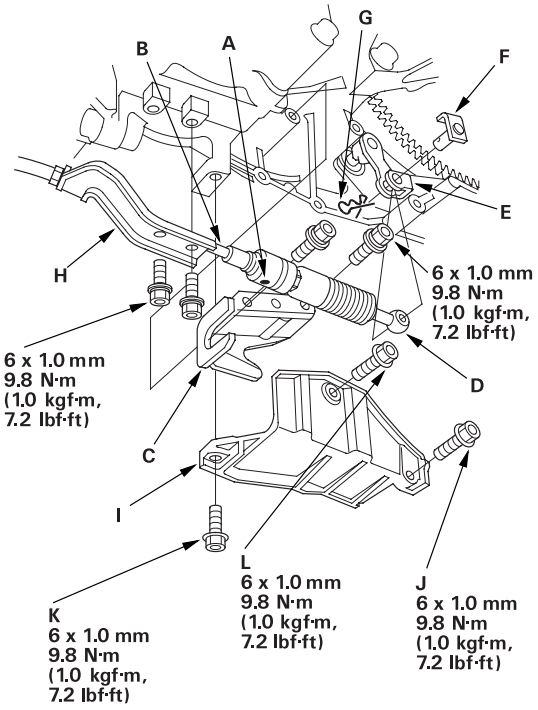
1 Face the dot (A) on the shift cable (B) down, then install the shift cable bracket (C) on the shift cable.

2 Attach the shift cable end (D) to the control lever (E), then insert the control pin (F) into the control lever hole through the shift cable end.

3 Secure the control pin with the spring clip (G). Do not bend the shift cable excessively.

4 Secure the shift cable bracket (H) with the bolts, and install the shift cable cover (I) with installing the mounting bolts loosely.

5 First tighten the front bolt (J) on the cover, then lower bolt (K), and lastly the middle bolt (L).



(cont'd)

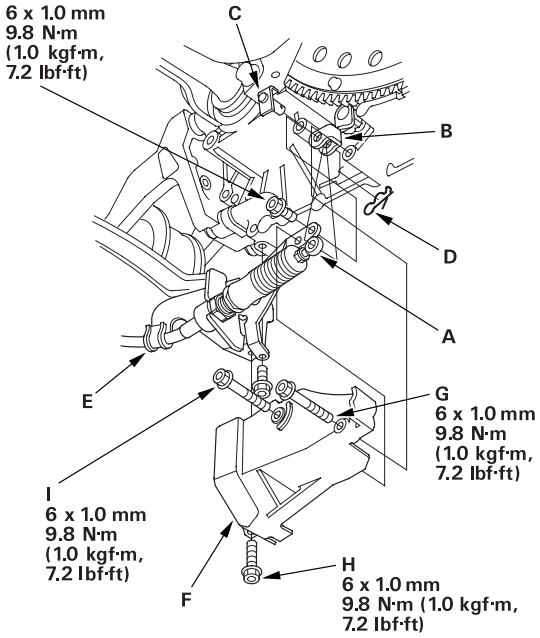
Transmission Installation (cont'd)

25. Install the shift cable for 2WD model.

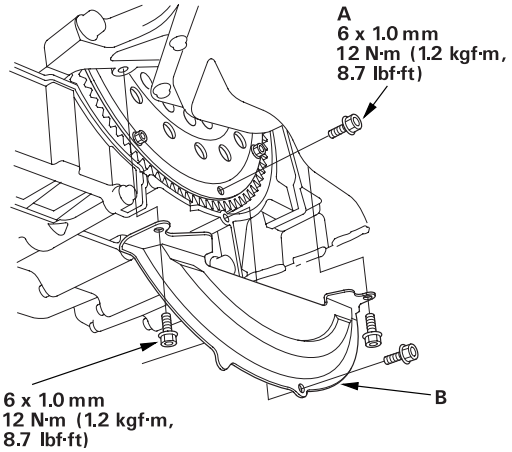
1 Attach the shift cable end (A) to the control lever (B), then insert the control pin (C) into the control lever hole through the shift cable end, and secure the control pin with the spring clip (D). Do not bend the shift cable excessively.

2 Secure the shift cable bracket (E) with the bolt, and install the shift cable cover (F) with installing the mounting bolts loosely.

3 First tighten the front bolt (G) on the cover, then lower bolt (H), and lastly the middle bolt (I).

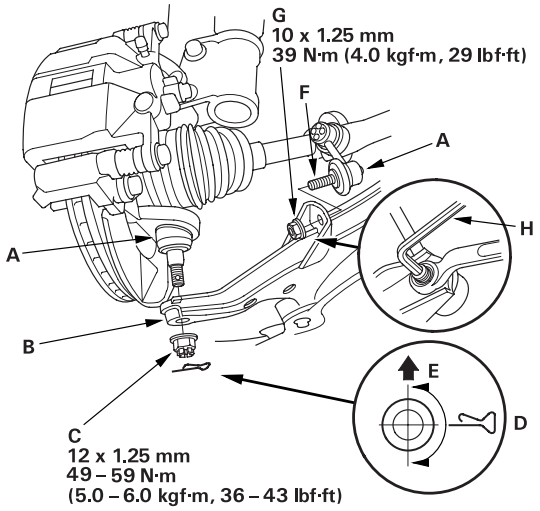


26. Attach the torque converter to the drive plate with eight bolt (A). Rotate the crankshaft pulley as necessary to tighten the bolts to 1/2 of the specified torque, then to the final torque, in a crisscross pattern. After tightening the last bolt, check that the crankshaft rotates freely.



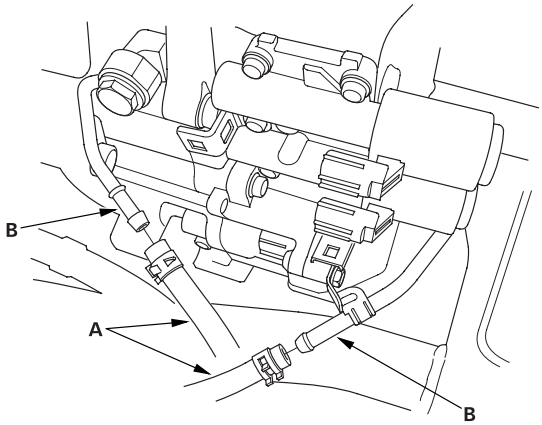
27. Install the torque converter cover (B).

28. Connect the ball joints (A) to the lower arms (B), and install the castle nuts (C) and spring clips (D). Install the spring clips from the inside of the vehicle, and its hooked side facing the front (E) of the vehicle in the range of the insertion direction shown.

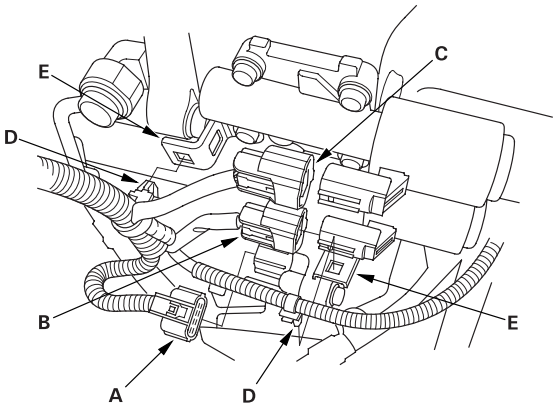


29. Connect the ball joints (F) to the lower arms, and install the nuts (G). Insert a 5 mm Allen wrench (H) in the top of the ball joint pins, and tighten the nuts.

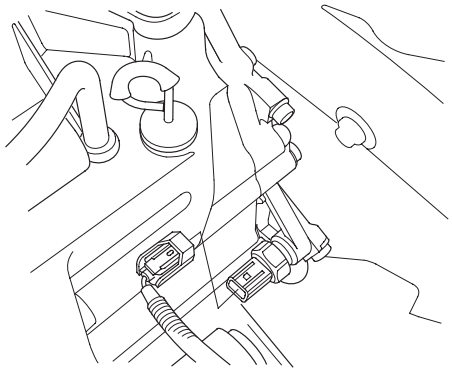
30. Connect the ATF cooler hoses (A) to the ATF cooler lines (B) (see page 14-151).



31. Connect the shift solenoid harness connector (A), A/T clutch pressure control solenoid valve B connector, and solenoid valve C connector. Install the harness clamps (D) on the clamp brackets (E).

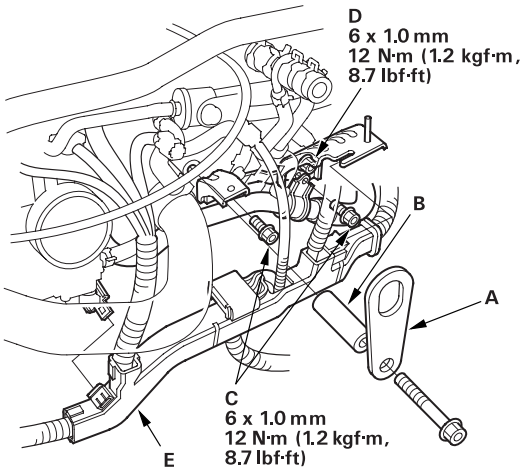


32. Connect the 3rd clutch pressure switch connector.



33. Install the splash shield.

34. Remove the hoist from the hoisting bracket (A), and remove the hoisting bracket and collar (B) (if installed) from the engine.

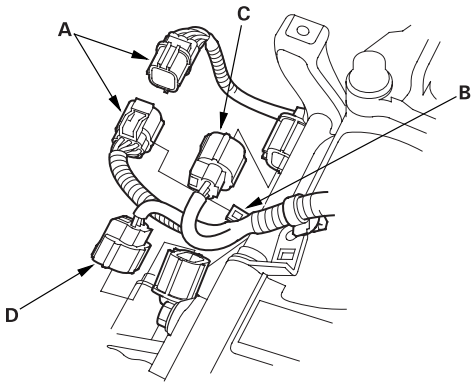


35. Install the water pipe bolts (C), and tighten the air cleaner housing mounting bracket bolt (D). Install harness cover (E).

(cont'd)

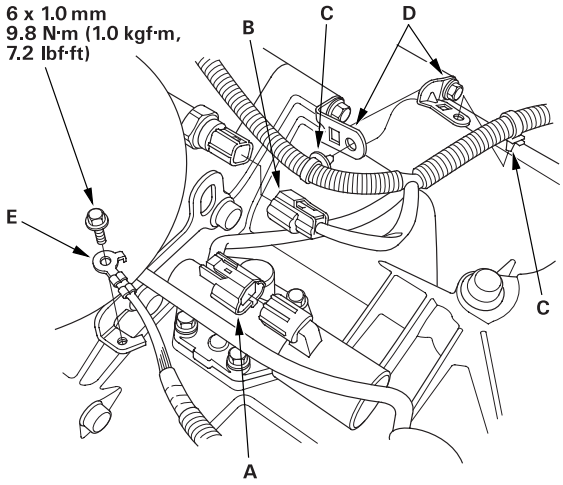
Transmission Installation (cont'd)

36. Connect the transmission range switch connector (A), and install it on its bracket (B).



37. Connect the connectors to the mainshaft speed sensor (C) and countershaft speed sensor (D).

38. Connect the A/T clutch pressure control solenoid valve A connector and 2nd clutch pressure switch connector (B), and install the harness clamps (C) on the clamp brackets (D).



39. Install the transmission ground terminal (E).

40. Install the battery base, then install the harness clamp on the clamp bracket on the base.

41. Refill the transmission with ATF (see page 14-131).

42. Install the intake air duct and air cleaner housing.

43. Install the battery tray and battery, then secure the battery with its hold-down bracket.

44. Connect the battery positive terminal, then connect the negative terminal.

45. Set the parking brake. Start the engine, and shift the transmission through all gears three times.

46. Check the shift lever operation, A/T gear position indicator operation, and shift cable adjustment.

47. Check and adjust the front wheel alignment (see page 18-4).

48. Start the engine and let it idle reach normal operating temperature (the radiator fan comes on) with the transmission in [P] or [N] position, then turn if off and check the ATF level (see page 14-130).

49. Perform the road test (see page 14-107).

50. Loosen the bolts of the front, rear and transmission mounts after the road test.

51. Retighten the transmission mount bolt.

NOTE: Be sure to tighten the mount bolts following sequence.

Torque: **54 N·m (5.5 kgf·m, 40 lbf·ft)**

52. Retighten the rear mount bolt.

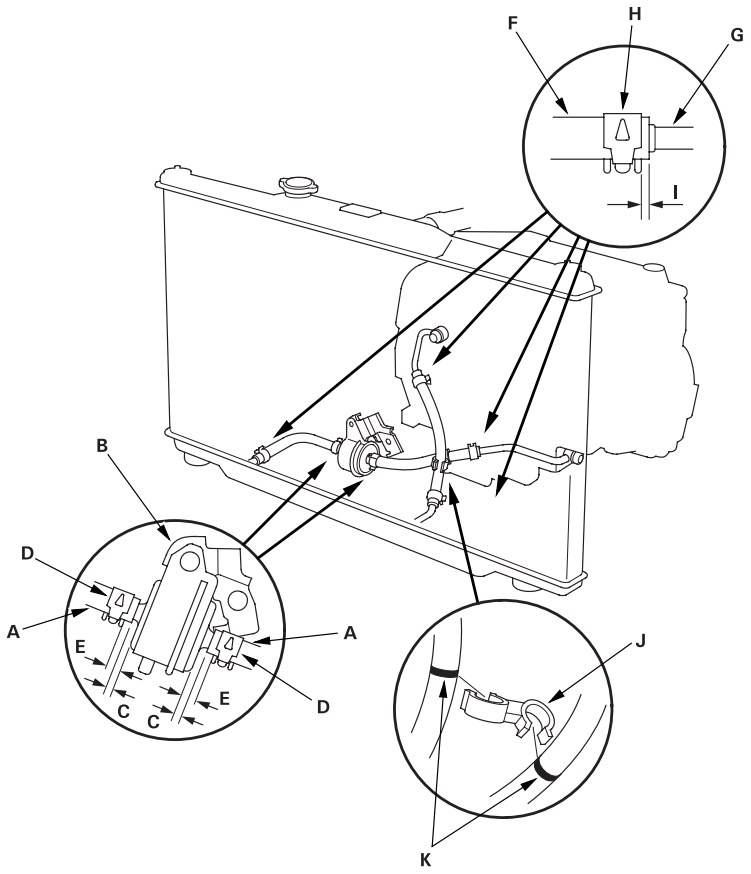
Torque: **64 N·m (6.5 kgf·m, 47 lbf·ft)**

53. Retighten the front mount bolt.

Torque: **64 N·m (6.5 kgf·m, 47 lbf·ft)**

ATF Cooler Hoses Replacement

1. Insert the ATF cooler hoses (A) to the ATF filter (B) at 5 - 6 mm (0.20 - 0.24 in.) (C) away from the ATF filter surfaces.
2. Secure the hoses with the clips (D) at 10 - 12 mm (0.4 - 0.5 in.) (E) away from the ATF filter surfaces.

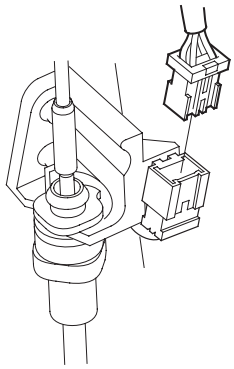


3. Insert the ATF cooler hoses (F) over the ATF cooler lines (G), then secure the hoses with the clips (H) at 2 - 4 mm (0.1 - 0.2 in.) (I) from hose end.
4. Install the hose clamp (J) on the marks (K) on the ATF cooler hoses.

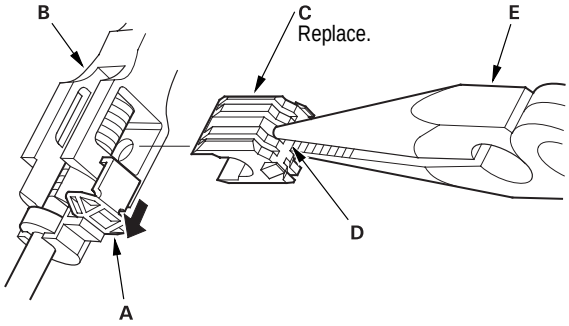
Shift Lever Removal

1. Remove the ash tray, front console box, heater control panel (see page 20-91), driver's dashboard lower cover (see page 20-88), and dashboard gauge assembly cover (see page 20-87).
2. Disconnect the O/D switch/shift lock solenoid/park pin switch connector.

   NOTE: The illustration shows LHD model; RHD is symmetrical.



3. Shift the shift lever to [R] position.
4. Slide the lock tab (A) down on the shift cable end holder (B).

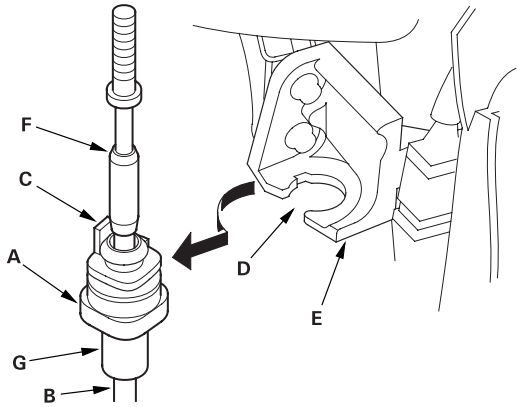


5. Remove the shift cable lock (C) with holding at the middle (D) of it using needle-nose pliers (E) from the shift cable end and shift cable end holder.

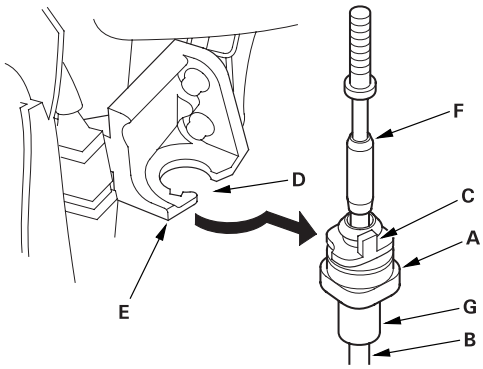
   NOTE: Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.
6. Separate the shift cable end from the shift cable end holder.
7. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the socket holder bracket (E). Then slide the holder to remove the shift cable from the socket holder bracket.

   NOTE: Do not remove the shift cable by twisting the shift cable guide (F) and damper (G).

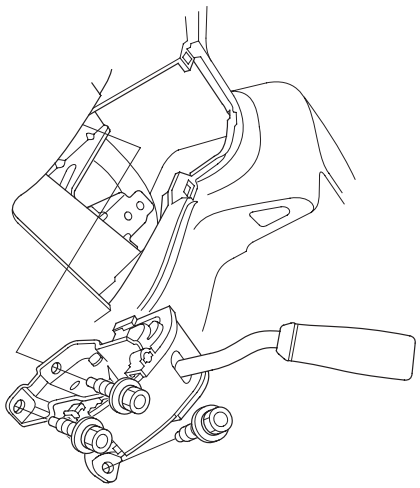
LHD Model:



RHD Model:



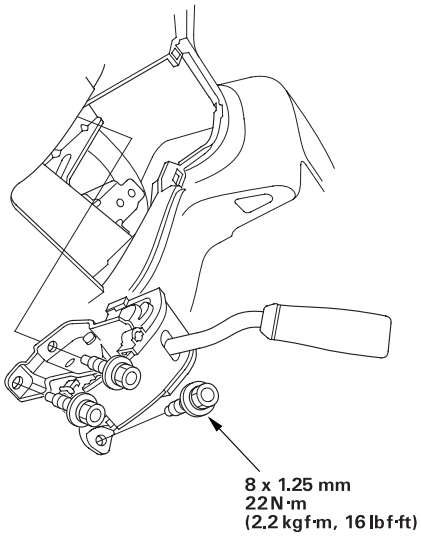
8. Remove the shift lever assembly.
NOTE: The illustration shows LHD model; RHD is symmetrical.



Shift Lever Installation

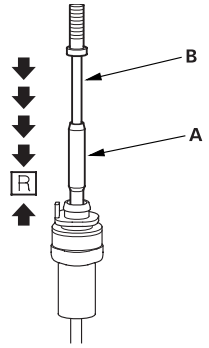
1. Install the shift lever assembly.

NOTE: The illustration shows LHD model; RHD is symmetrical.



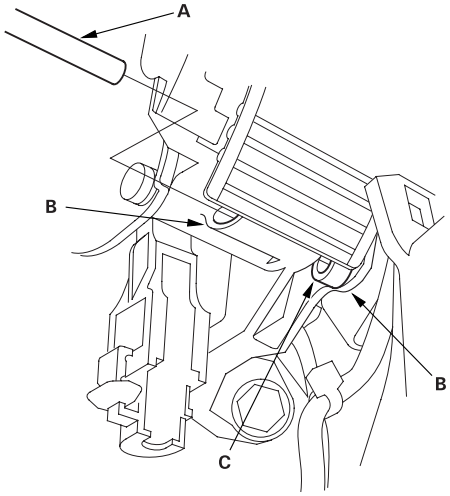
2. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.

3. If necessary, push the shift cable until it stops, then release it. Pull the shift cable back one step so that the shift cable is in [R]. Do not hold the shift cable guide (A) to adjust the shift cable (B).



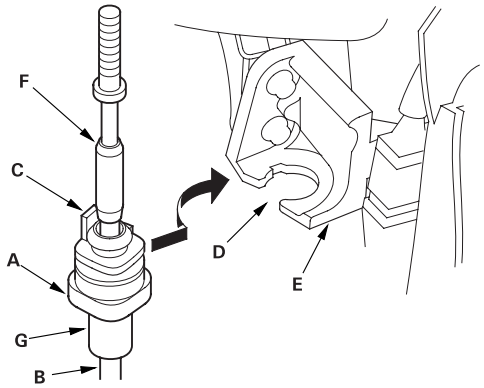
4. Turn the ignition switch OFF.

5. Insert a 6.0 mm (0,24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole (C) on the shift lever. The shift lever is secured in [R] position.

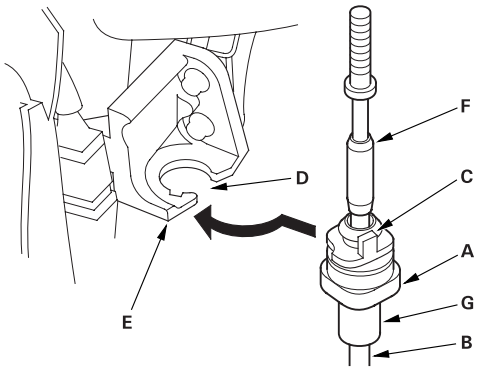


6. Rotate the socket holder (A) on the shift cable (B) to face the tab (C) on the holder opposite to the opening (D) in the socket holder bracket (E). Align the holder with the opening the bracket, then slide the holder into the bracket. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (F) and damper (G).

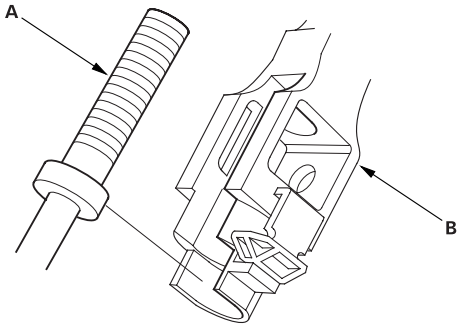
LHD Model:



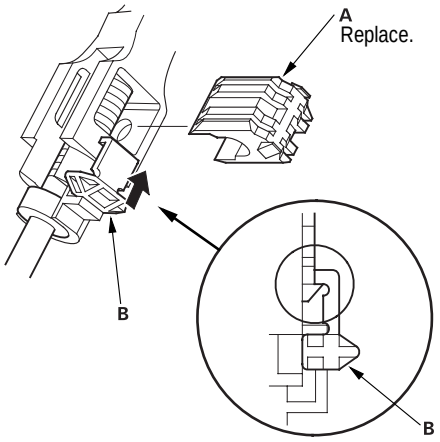
RHD Model:



7. Install the shift cable end (A) in the shift cable end holder (B). Keep the shift cable end and end holder free of grease.



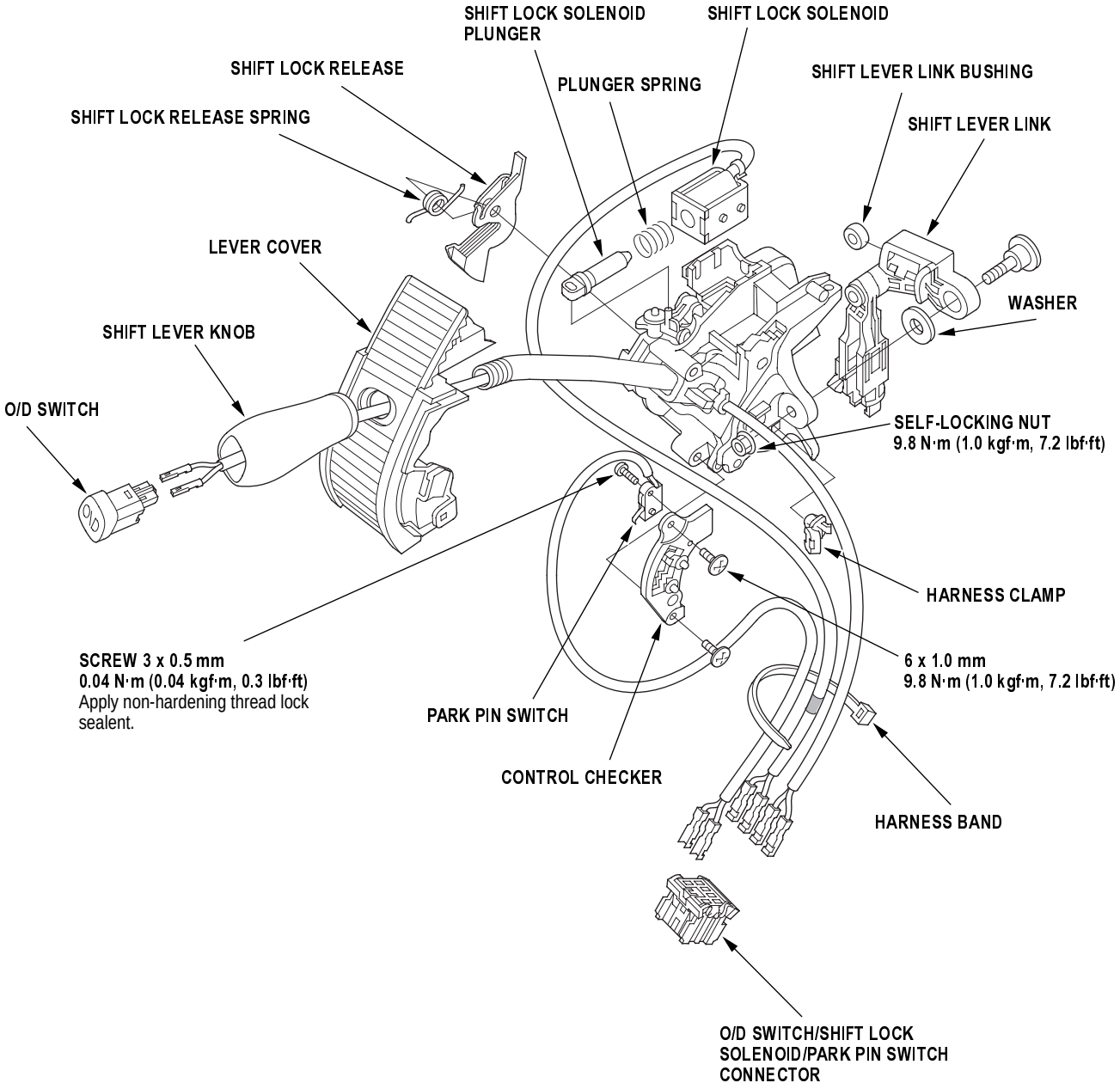
8. Install the new shift cable lock (A) to secure the shift cable end and shift cable end holder, then push the lock tab (B) up unitil it stops to lock the joint.



9. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.
10. Connect the O/D switch/shift lock solenoid/park pin switch connector.
11. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.
12. Install the dashboard gauge assembly cover (see page 20-87), driver's dashboard lower cover (see page 20-88), heater control panel (see page 20-91), front console box, and ash tray.

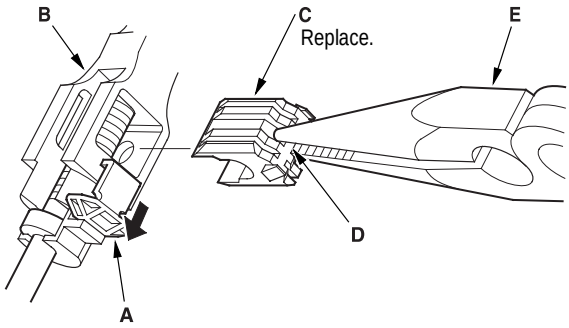
Shift Lever Disassembly/Reassembly

NOTE: The illustration shows the LHD model: RHD is symmetrical.



Shift Cable Replacement

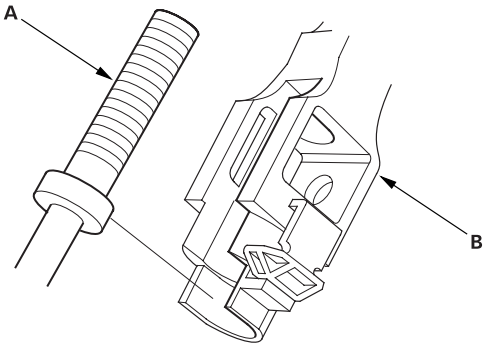
1. Raise the front of the vehicle, and make sure it is securely supported, or lift the vehicle up.
2. Remove the ash tray, front console box, heater control panel (see page 20-91), driver's dashboard lower cover (see page 20-88), and dashboard gauge assembly cover (see page 20-87).
3. Shift the shift lever to [R] position.
4. Slide the lock tab (A) down on the shift cable end holder (B).



5. Remove the shift cable lock (C) with holding at the middle (D) of it using needle-nose pliers (E) from the shift cable end and shift cable end holder.

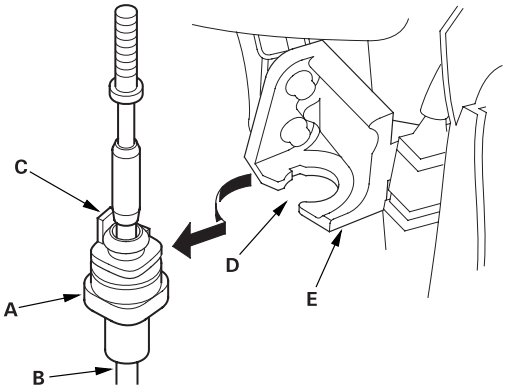
   NOTE: Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.

6. Separate the shift cable end (A) from the shift cable holder (B).

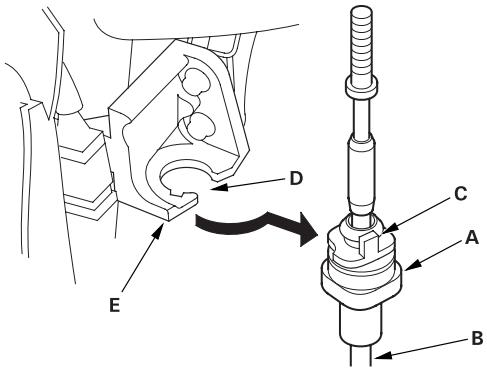


7. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the socket holder bracket (E). Then slide the holder to remove the shift cable from the socket holder bracket.

LHD Model:



RHD Model:

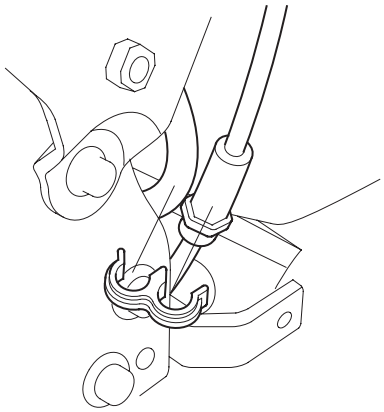


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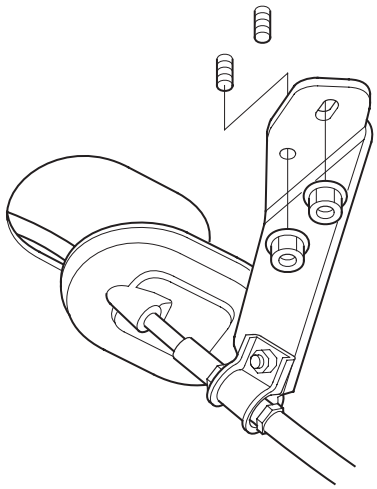
Shift Cable Replacement (cont'd)

8. For RHD model; Remove the shift cable from the clamp.

NOTE: The LHD model doesn't have shift cable clamp.



9. Remove the grommet under the body, and pull out the shift cable.



10. Replace the shift cable for 4WD model.

1 Remove the bolts (A) securing the shift cable bracket (B), then remove the shift cable cover (C).

2 Remove the spring clip (D) and control pin (E), then separate the shift cable (F) from the control lever (G).

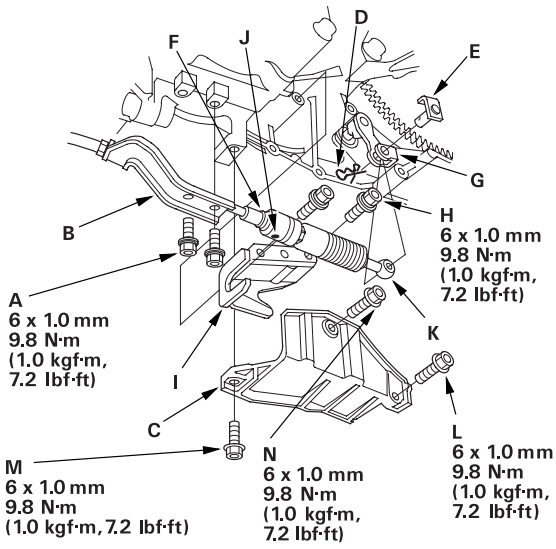
3 Remove the bolts (H) securing the shift cable bracket (I), then remove the shift cable bracket (I) from the shift cable.

4 Replace the shift cable, and insert it through the grommet hole. Do not bend the shift cable excessively. Face the dot (J) on the shift cable (F) down, then install the shift cable bracket (I) on the shift cable.

5 Attach the shift cable end (K) to the control lever (G), then insert the control pin (E) into the control lever hole through the shift cable end. Secure the control pin with the spring clip (D).

6 Secure the shift cable bracket (B) with the bolts (A), and install the shift cable cover (C) with installing the mounting bolts loosey.

7 First tighten the front bolt (L) on the cover, then lower bolt (M), and lastly the middle bolt (N).



11. Replace the shift cable for 2WD model.

1 Remove the shift cable cover (A).

2 Remove the spring clip (B) and control pin (C), then separate the shift cable (D) from the control lever (E).

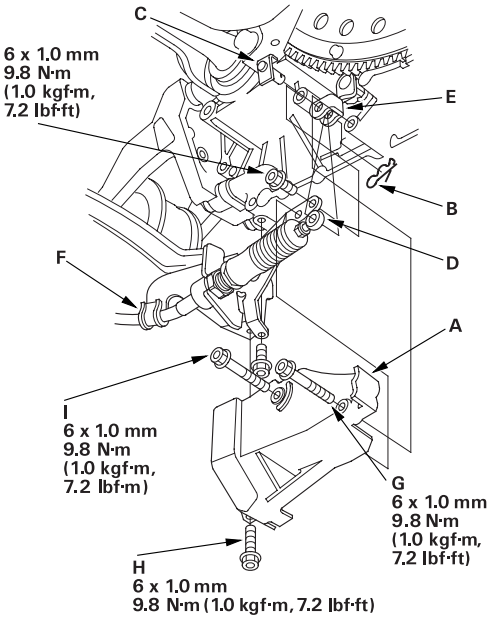
3 Remove the bolts securing the shift cable bracket (F).

4 Replace the shift cable, and insert it through the grommet hole. Do not bend the shift cable excessively.

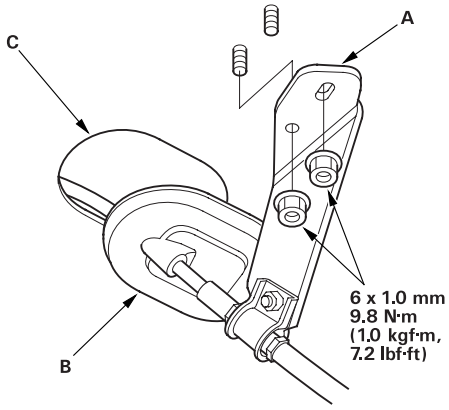
5 Attach the shift cable end (D) to the control lever (E), then insert the control pin (C) into the control lever hole through the shift cable end, and secure the control pin with the spring clip (B).

6 Secure the shift cable bracket (F) with the bolt, and install the shift cable cover (A) with installing the mounting bolts loosey.

7 First tighten the front bolt (G) on the cover, then lower bolt (H), and lastly the middle bolt (I).

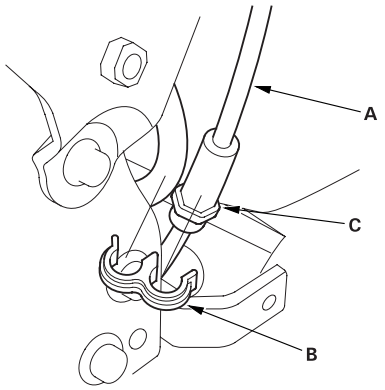


12. Install the shift cable bracket (A) on the body, then install the grommet (B) in its hole (C).



13. For RHD model; Install the shift cable (A) on its clamp (B) at the crimped ring (C).

NOTE: The LHD model doesn't have shift cable clamp.

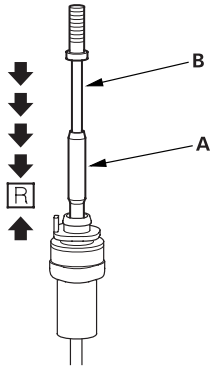


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Shift Cable Replacement (cont'd)

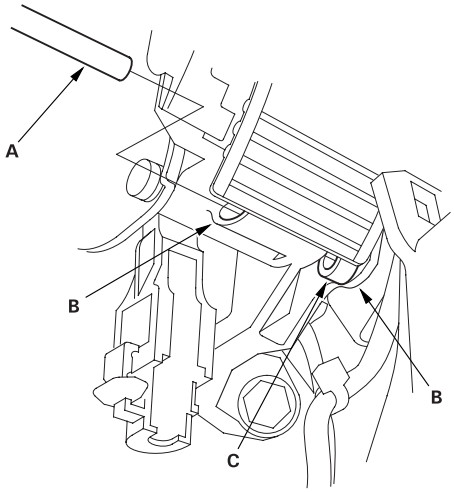
14. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.

15. If necessary, push the shift cable until it stops, then release it. Pull the shift cable back one step so that the shift cable is in [R]. Do not hold the shift cable guide (A) to adjust the shift cable (B).



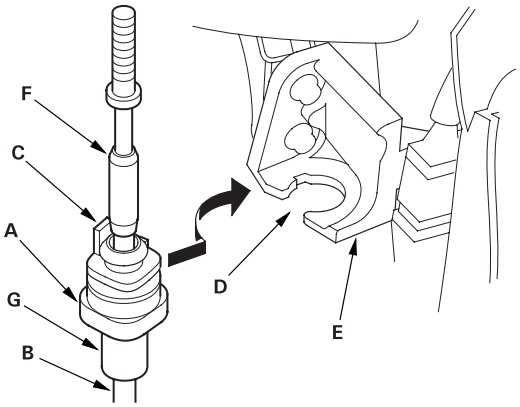
16. Turn the ignition switch OFF.

17. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning holes (B) on the shift lever bracket base through the positioning hole (C) on the shift lever. The shift lever is secured in [R] position.

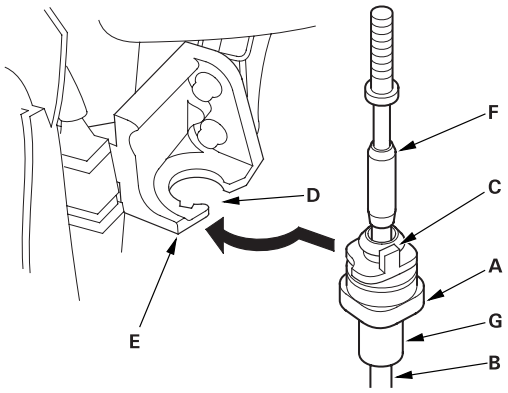


18. Rotate the socket holder (A) on the shift cable (B) to face the tab (C) on the holder opposite to the opening (D) in the socket holder bracket (E). Align the holder with the opening in the bracket, then slide the holder into the bracket. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (F) and damper (G).

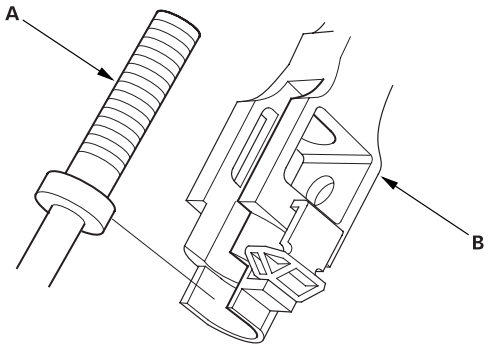
LHD Model:



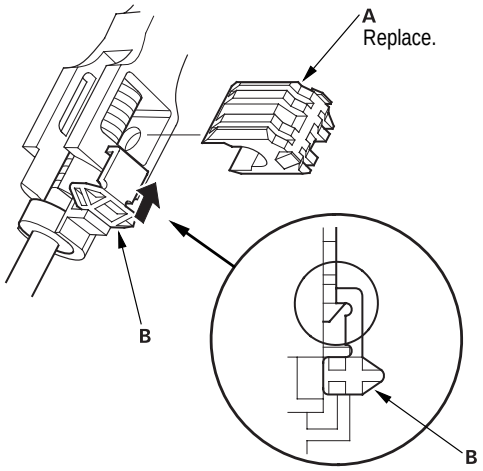
RHD Model:



19. Install the shift cable end (A) in the shift cable end holder (B). Keep the shift cable end and end holder free of grease.



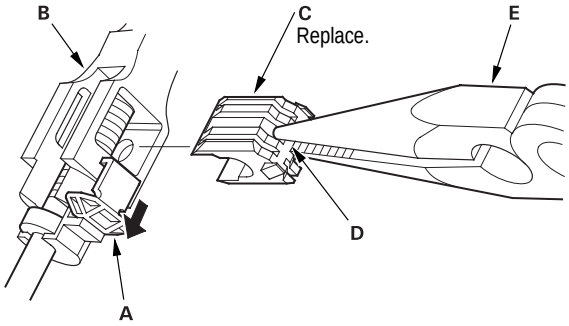
20. Install the new shift cable lock (A) to secure the shift cable end and shift cable end holder, then push the lock tab (B) up until it stops to lock the joint.



21. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.
22. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.
23. Allow the wheels to rotate freely.
24. Start the engine, and check the shift lever operation in all gears.
25. Install the dashboard gauge assembly cover (see page 20-87), driver's dashboad lower cover (see page 20-88), heater control panel (see page 20-91), front console box, and ash tray.

Shift Cable Adjustment

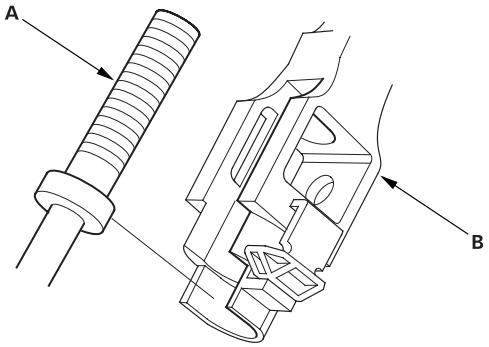
1. Remove the ash tray, front console box, heater control panel (see page 20-91), driver's dashboard lower cover (see page 20-88), and dashboard gauge assembly cover (see page 20-87).
2. Shift the shift lever to [R] position.
3. Slide the lock tab (A) down on the shift cable end holder (B).



4. Remove the shift cable lock (C) with holding at the middle (D) of it using needle-nose pliers (E) from the shift cable end and shift cable end holder.

   NOTE: Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.

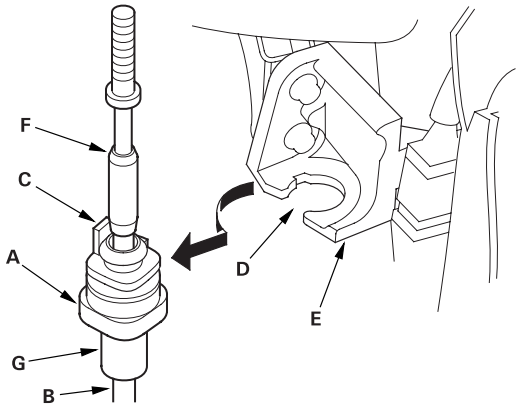
5. Separate the shift cable end (A) from the shift cable end holder (B).



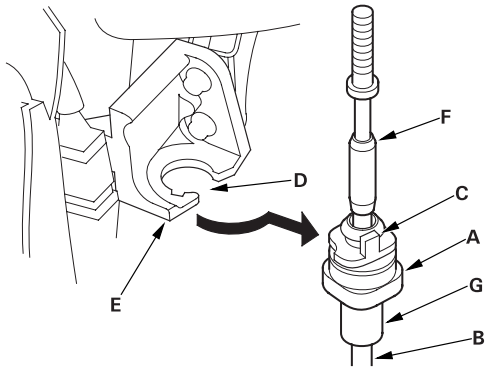
6. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the socket holder bracket (E). Then slide the holder to remove the shift cable from the socket holder bracket.

   NOTE: Do not remove the shift cable by twisting the shift cable guide (F) and damper (G).

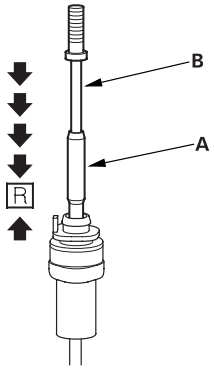
LHD Model:



RHD Model:



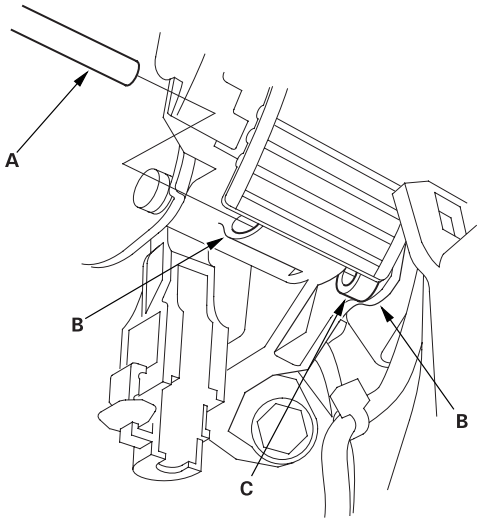
7. Push the shift cable down until it stops, then release it. Pull the shift cable back one step so that the shift cable is in [R]. Do not hold the shift cable guide (A) to adjust the shift cable (B).



8. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.

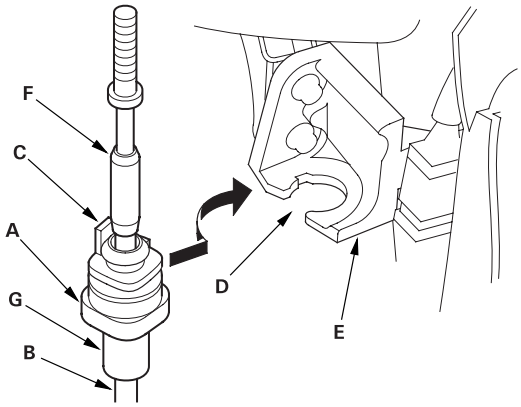
9. Turn the ignition switch OFF.

10. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket base through the positioning hole (C) on the shift lever. The shift lever is secured in [R] position.

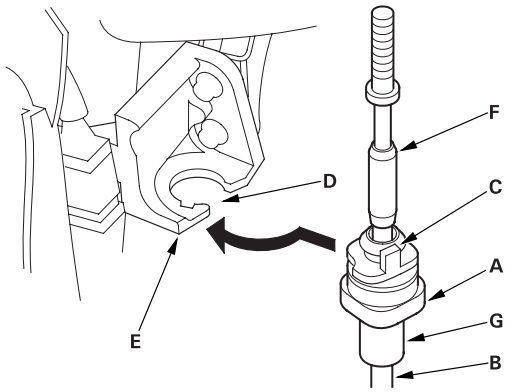


11. Rotate the socket holder (A) on the shift cable (B) to face the tab (C) on the holder opposite to the opening (D) in the socket holder bracket (E). Align the holder with the opening in the bracket, then slide the holder into the bracket. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (F) and damper (G).

LHD Model:



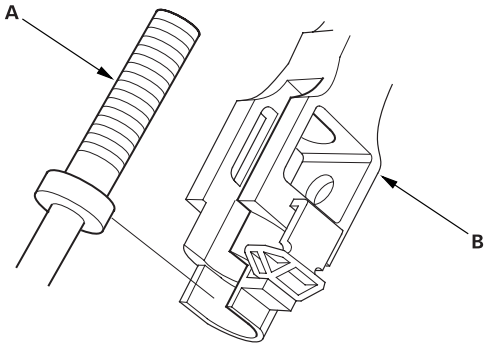
RHD Model:



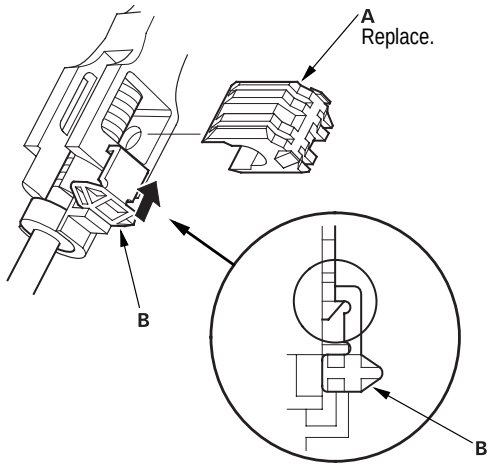
(cont'd)

Shift Cable Adjustment (cont'd)

12. Install the shift cable end (A) in the shift cable end holder (B). Keep the shift cable end and end holder free of grease.



13. Install the new shift cable lock (A) to secure the shift cable end and shift cable end holder, then push the lock tab (B) up until it stops to lock the joint.



14. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

15. Connect the O/D switch/shift lock solenoid/park pin switch connector.

16. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

17. Allow the wheels to rotate freely.

18. Start the engine, and check the shift lever operation in all gears.

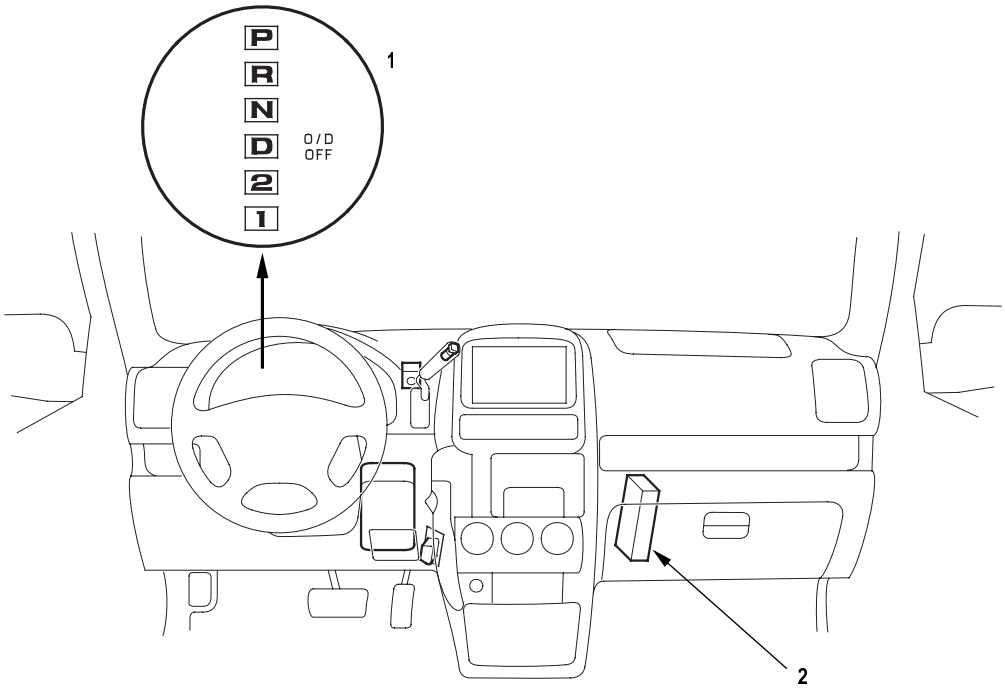
19. Turn the engine off. Push the shift lock release, and verify that the shift lever releases.

20. Install the dashboard gauge assembly cover (see page 20-87), driver's dashboard lower cover (see page 20-88), heater control panel (see page 20-91), front console box, and ash tray.

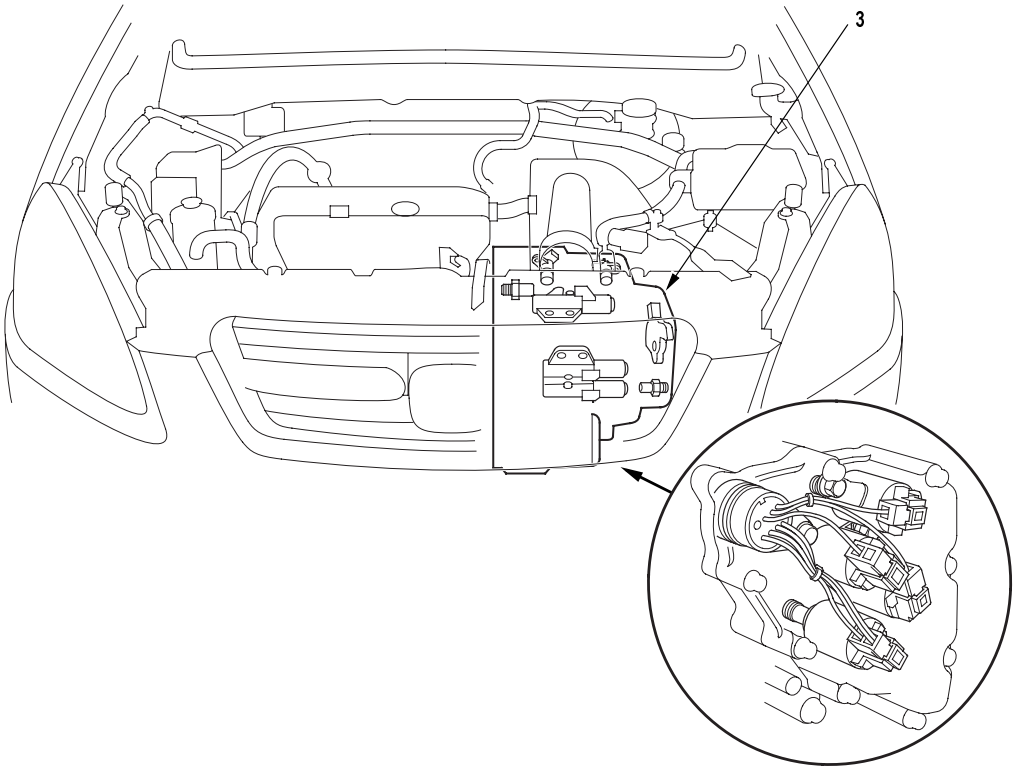
A/T Gear Position Indicator

Component Location Index

NOTE: The illustration shows the LHD model; RHD is symmetrical.



NOTE: The illustration shows the LHD model; RHD is similar.

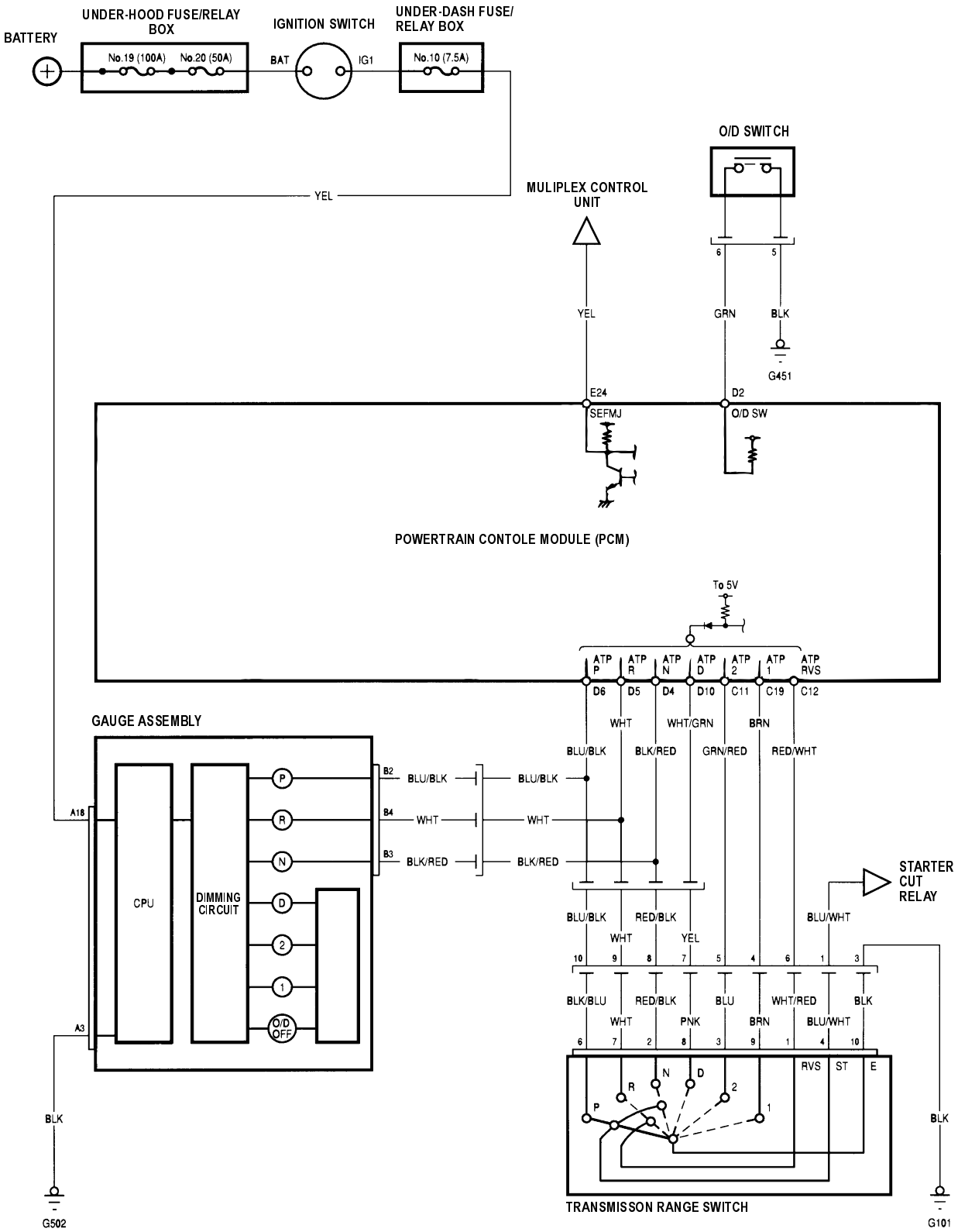


1 A/T GEAR POSITION INDICATOR Indicator Input test, page 14-167; Indicator Bulb Replacement, page 14-171

2 POWERTRAIN CONTROL MODULE (PCM)

2 TRANSMISSION RANGE SWITCH Test, page 14-168; Replacement, page 14-169

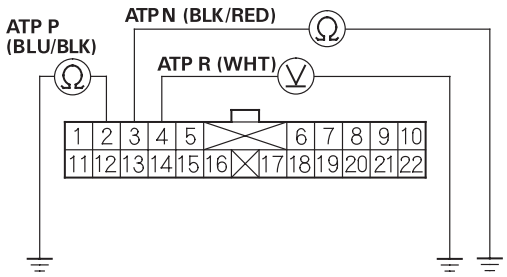
Circuit Diagram



Indicator Input Test

1. If the MIL has been reported, check for a DTC, and repair the system as indicated by DTC.
2. If the MIL does not come on, and the A/T gear position indicator [P], [N], or [R] does not come on, remove the gauge assembly from the dashboard, then disconnect gauge assembly connector A (22P) and B (22P).
3. Inspect the connectors and connector terminals to be sure they are making good contact.
4. If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
5. Turn the ignition switch ON (II).
6. Shift to [P] position, and check for continuity between B2 terminal (BLU/BLK) and ground.
   There should be continuity in [P] position and no continuity in any other shift lever position. If the test results are different, check for a faulty transmission range switch or an open in the wire.
   NOTE: The illustration shows example of connector terminal arrangement; connector terminal arrangement varies with models.

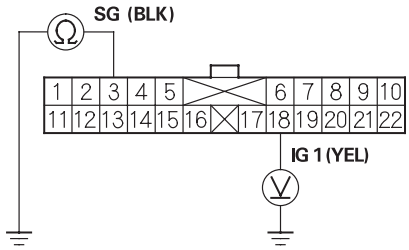
GAUGE ASSEMBLY CONNECTOR B (22P)



Wire side of female terminals

7. Shift to [R] position, and check for voltage between B4 terminal (WHT) and ground.
   There should be 0 V in [R] position. There should be battery voltage in any other shift lever position. If the test results are different, check for a faulty transmission range switch or an open in the wire.
8. Shift to [N] position, and check for continuity between B3 terminal (BLK/RED) and ground.
   There should be continuity in [N] position and no continuity in any other shift lever position. If the test results are different, check for faulty transmission range switch or an open in the wire.
9. Check for voltage A18 terminal (YEL) and ground with the ignition switch ON (II).
   There should be battery voltage. If the test result is different, check for a blown No. 10 (7.5A) fuse in the under-dash fuse/relay box or an open in the wire.
   NOTE: The illustration shows example of connector terminal arrangement; connector terminal arrangement varies with models.

GAUGE ASSEMBLY CONNECTOR A (22P)

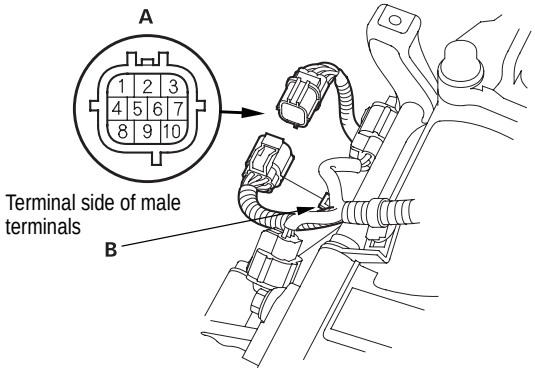


Wire side of female terminals

10. Turn the ignition switch OFF, and check for continuity between A3 terminal (BLK) and ground under all conditions.
    There should be continuity. If the test result is different, check for a poor ground (G502) or an open in the wire.
11. If a input test prove OK, but the indicator is faulty, replace the printed circuit board.

Transmission Range Switch Test

1. Remove the transmission range switch harness connector (A) from the connector bracket (B), then disconnect the connector.



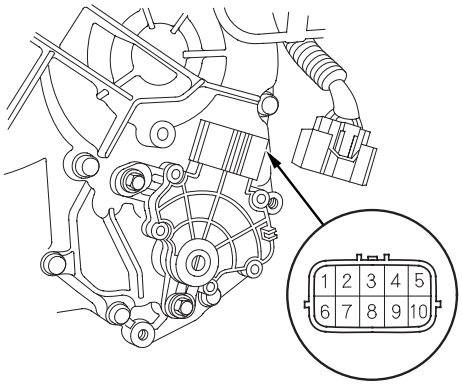
Connector Terminal Specification

Terminal	Signal	Terminal	Signal
1	ATP NP (ST)	6	ATP RVS
2	——	7	[D]
3	Ground (E)	8	[N]
4	[1]	9	[R]
5	[2]	10	[P]

2. Check for continuity between terminals at the harness connector. There should be continuity between the terminals in the following table for each switch position.

Position	Connector Terminal									
	1	2	3	4	5	6	7	8	9	10
P	○	——	○							○
R			○	——	——	○	——	——	○	
N	○	——	○	——	——	——	——	○		
D			○	——	——	——	○			
2			○	——	○					
1			○	○						

3. If there is no continuity between any terminals, remove the transmission range switch cover, and disconnect the connect at the switch.



Connector Terminal Specification

Terminal	Signal	Terminal	Signal
1	ATP RVS	6	[P]
2	[N]	7	[R]
3	[2]	8	[D]
4	ATP NP (ST)	9	[1]
5	——	10	Ground (E)

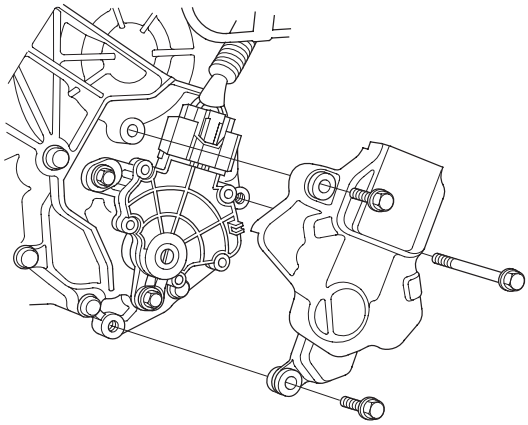
4. Check for continuity between terminals at the switch connector. There should be continuity between the terminals in the following table for each switch position.

Position	Connector Terminal									
	1	2	3	4	5	6	7	8	9	10
P				○	——	○				○
R	○	——	——	——	——	——	○	——	——	○
N		○	——	○	——	——	——	——	——	○
D								○	——	○
2			○	——	——	——	——	——	——	○
1									○	○

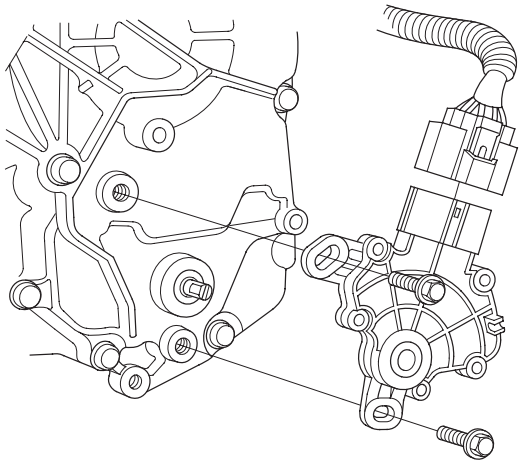
5. If there is no continuity between any terminals, check the transmission range switch installation. If the transmission range switch installation is OK, replace the switch.
If the transmission range switch continuity check was OK, replace the faulty transmission range switch harness.

Transmission Range Switch Replacement

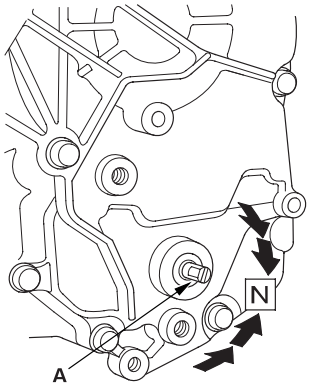
1. Raise the vehicle, and make sure it is securely supported.
2. Shift to [N] position.
3. Remove the transmission range switch cover.



4. Disconnect the transmission range switch connector.

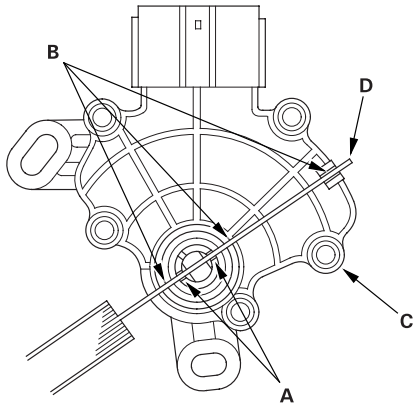


5. Remove the old transmission range switch, and install the new switch.
6. Make sure that the control shaft is in [N] position. If necessary, move the shift lever to [N] position.



7. Align the cutout (A) on the rotary-frame with the neutral positioning cutouts (B) on the transmission range switch (C), then put a 2.0 mm (0.08 in.) feeler gauge blade (D) in the cutouts to hold it in the [N] position.

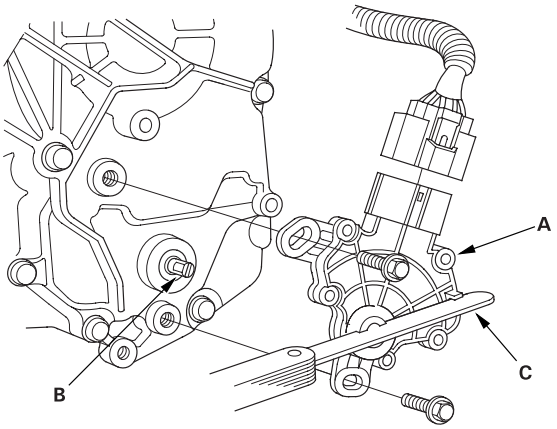
   NOTE: Be sure to use a 2.0 mm (0.08 in.) blade or equivalent to hold the switch in the [N] position.



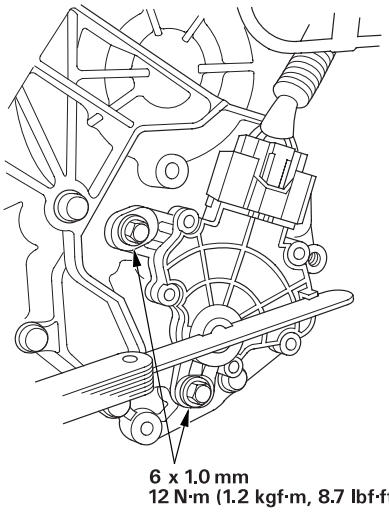
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Transmission Range Switch Replacement (cont'd)

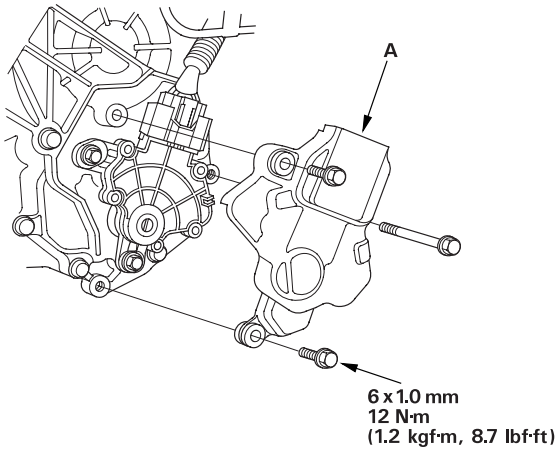
8. Install the transmission range switch (A) gently on the control shaft (B) with holding the [N] position with the 2.0 mm (0.08 in.) blade (C).



9. Tighten the bolts on the transmission range switch while you continue to hold the [N] position. Do not move the transmission range switch when tightening the bolts. Remove the feeler gauge.



10. Connect the connector securely, then install the transmission range switch cover (A).



11. Turn the ignition switch ON (II). Move the shift lever through all gear positions, and check the transmission range switch synchronization with the A/T gear position indicator.

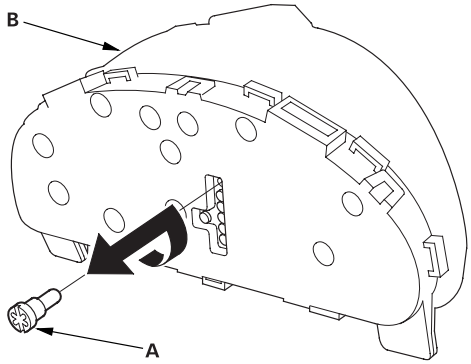
12. Check that the engine can start in [P] and [N] positions, and cannot start in any other shift lever position.

13. Check that the back-up lights come on when the shift lever is in [R] position.

14. Allow the wheels to rotate freely, then start the engine, and check the shift lever operation.

Indicator Bulb Replacement

1. Remove the gauge assembly.
2. Replace the bulb (A) at the gauge assembly (B).



A/T Interlock System

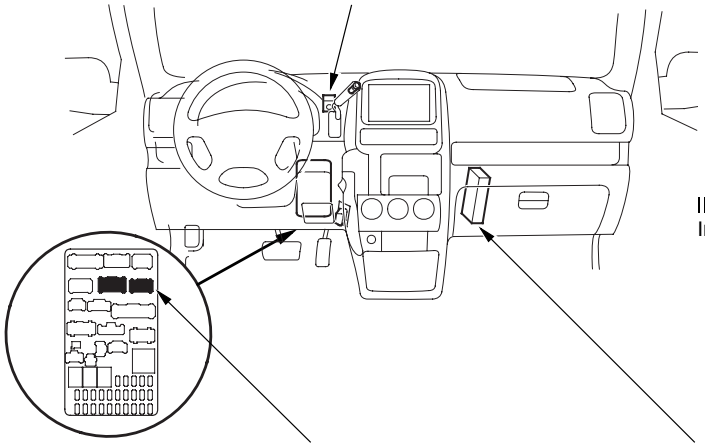
Component Location Index

LHD Model:

STEERING LOCK ASSEMBLY KEY INTERLOCK SOLENOID
System circuit troubleshooting, page 14-179
Test, page 14-181

PARK PIN SWITCH
Test/Replacement, page 14-187

SHIFT LOCK SOLENOID
System circuit troubleshooting, page 14-175
Test/Replacement, page 14-182



INTERLOCK CONTROL UNIT (KS) MODEL
Input test, page 14-180

UNDER-DASH FUSE/RELAY BOX MULTIPLEX CONTROL UNIT

No. 10 CONNECTOR (13P)

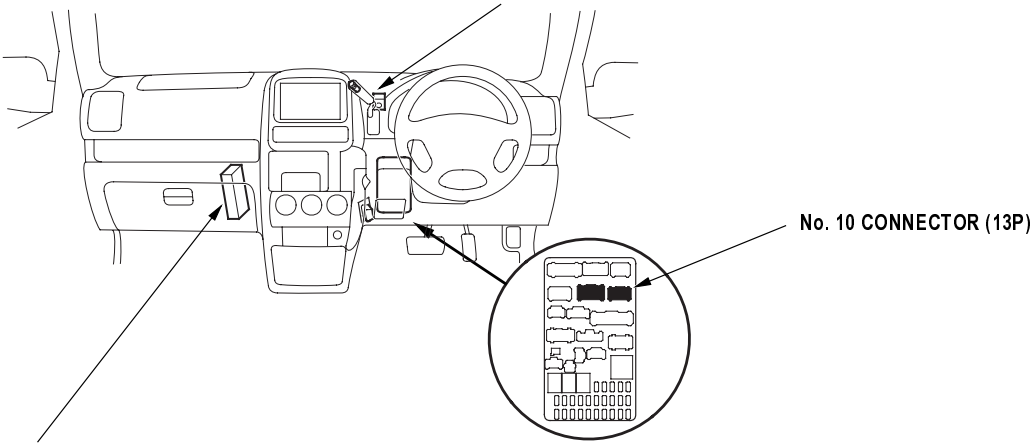
POWERTRAIN CONTROL MODULE (PCM)

RHD Model:

STEERING LOCK ASSEMBLY KEY INTERLOCK SOLENOID
System circuit troubleshooting, page 14-179
Test, page 14-181

PARK PIN SWITCH
Test/Replacement, page 14-187

SHIFT LOCK SOLENOID
System circuit troubleshooting, page 14-175
Test/Replacement, page 14-182



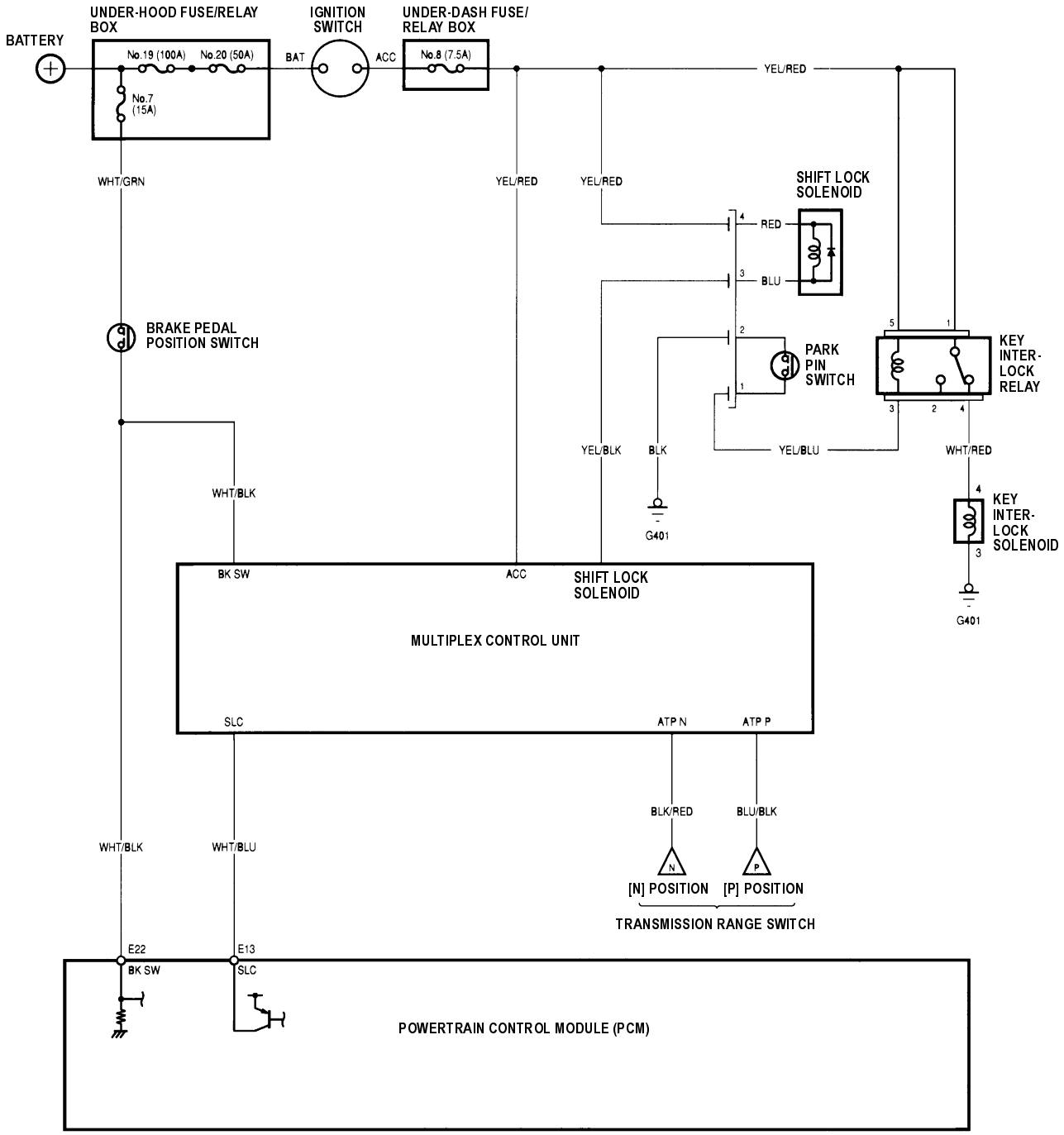
No. 10 CONNECTOR (13P)

POWERTRAIN CONTROL MODULE (PCM)

UNDER-DASH FUSE/RELAY BOX MULTIPLEX CONTROL UNIT

Circuit Diagram

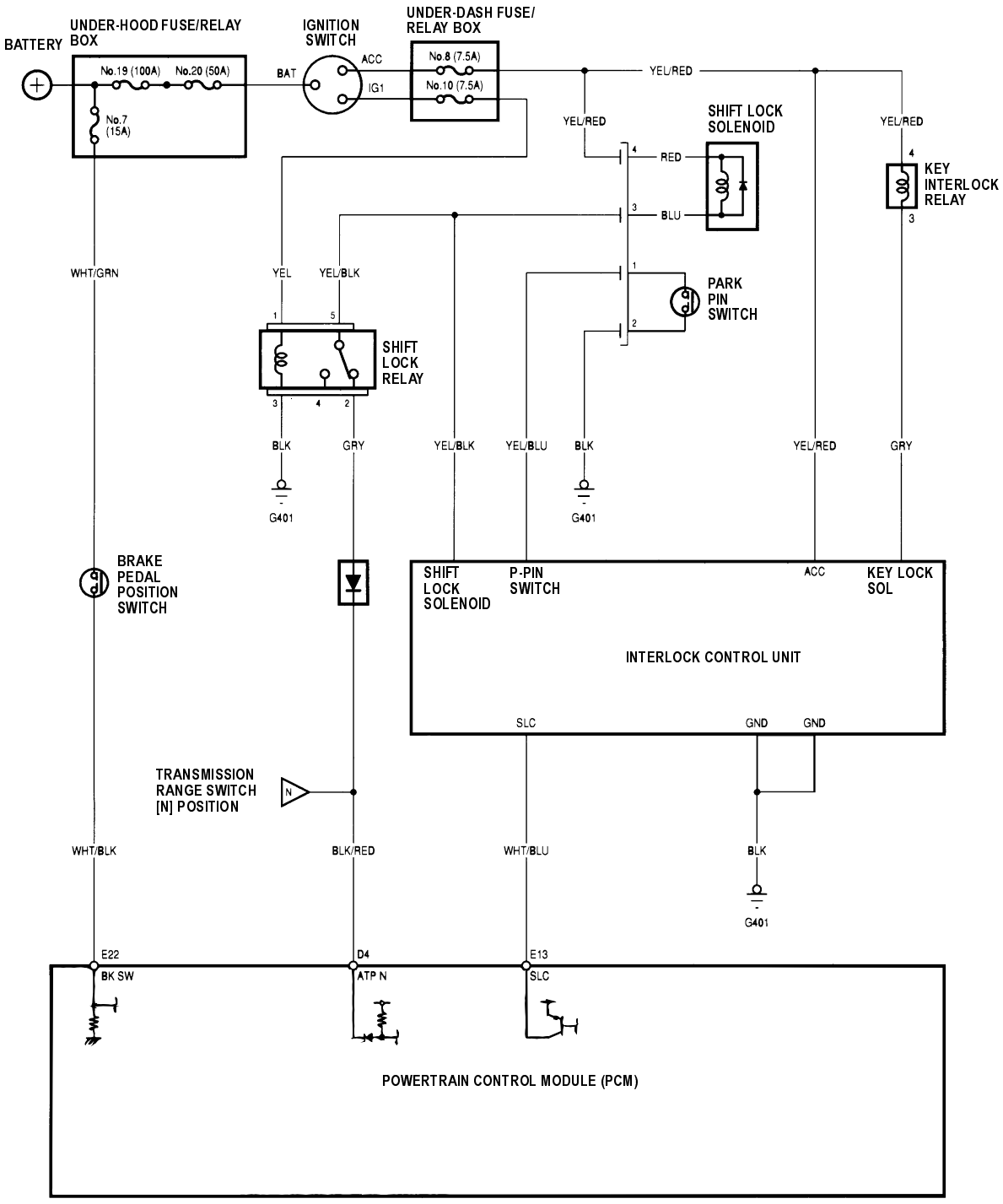
Except KS Model



(cont'd)

Circuit Diagram (cont'd)

KS Model



Shift Lock System Circuit Troubleshooting

1. Press the brake pedal.

Are the brake lights ON?

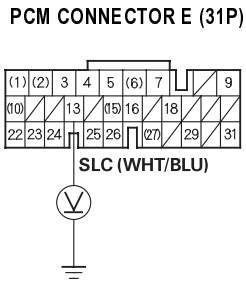
Yes Go to step 2.

No Repair faulty brake light circuit.■

2. Turn the ignition switch ON (II).

3. With the accelerator pedal released, press the brake pedal.

4. Measure the voltage between PCM connector terminal E13 and body ground.



Wire side of female terminals

Is there battery voltage?

Yes Check for an open in the wire between PCM connector terminal E13 and the multiplex control unit (except KS model) or interlock control unit (KS model). If the wire is OK, check for a loose terminal fit in the multiplex control unit (except KS model) or interlock control unit (KS model) connectors. If necessary, substitute a known-good multiplex control unit (except KS model) or interlock control unit (KS model) and recheck.■

No Go to step 5.

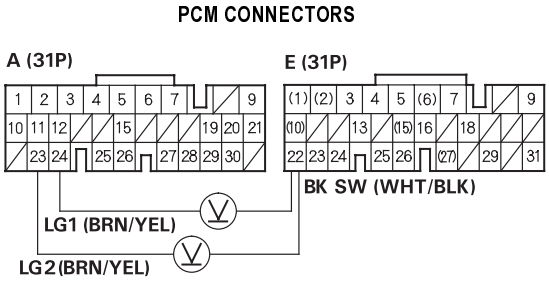
5. Turn the ignition switch OFF.

6. Disconnect the battery negative terminal.

7. Disconnect PCM connectors A (31P) and E (31P).

8. Reconnect the battery negative terminal.

9. Press the brake pedal, and measure the voltage between PCM connector terminals E22 and A23 or A24.



Wire side of female terminals

Is there battery voltage?

Yes Release the brake pedal, and go to step 10 except for KS model; for KS model, go to step 12.

No Repair open in the wire between PCM connector terminal E22 and the brake pedal position switch.■

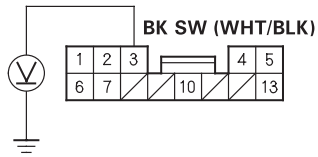
(cont'd)

Shift Lock System Circuit Troubleshooting (cont'd)

10. Remove the under-dash fuse/relay box, and disconnect the No. 10 connector (13P) from the fuse/relay box.

11. Measure the voltage between the No. 3 terminal of the No. 10 connector (13P) and body ground while pressing the brake pedal.

UNDER-DASH FUSE/RELAY BOX No. 10 CONNECTOR (13P)



Wire side of female terminals

Is there battery voltage?

Yes Release the brake pedal, and go to step 12.

No Repair open or short in the wire between the multiplex control unit and the brake pedal position switch via the No. 3 terminal of the No. 10 connector (13P).■

12. Disconnect the battery negative terminal.

13. Connect PCM connectors A (31P) and E (31P).

14. Connect the No. 10 connector (13P) except for KS model.

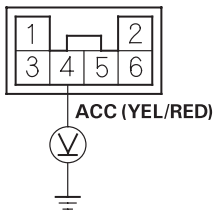
15. Reconnect the battery negative terminal.

16. Disconnect the O/D switch/shift lock solenoid/park pin switch connector (see page 14-152).

17. Turn the ignition switch ON (II).

18. With the accelerator pedal released, press the brake pedal, and measure the voltage between the No. 4 terminal of the O/D switch/shift lock solenoid/park pin switch connector and body ground.

O/D SWITCH/SHIFT LOCK SOLENOID/PARK PIN SWITCH CONNECTOR



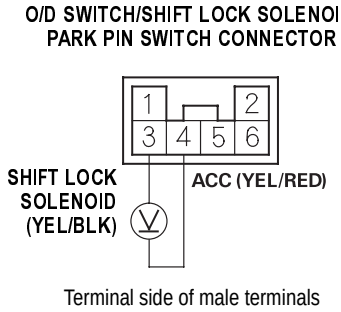
Terminal side of male terminals

Is there battery voltage?

Yes Go to step 19.

No Repair open or short in the wire between the O/D switch/shift lock solenoid/park pin switch connector and under-dash fuse/relay box.■

19. Measure the voltage between the No. 3 and No. 4 terminals of the O/D switch/shift lock solenoid/park pin switch connector while pressing the brake pedal.



Terminal side of male terminals

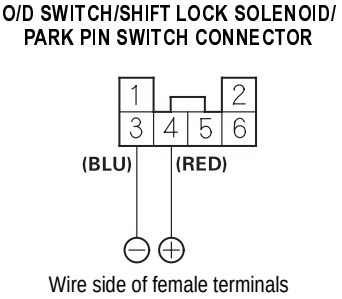
Is there battery voltage?

Yes Go to step 20.

No Repair open in the wire between the O/D switch/shift lock solenoid/park pin switch connector and the multiplex control unit (except KS model) or interlock control unit (KS model).■

20. Connect the battery positive terminal to the No. 4 terminal of the O/D switch/shift lock solenoid/park pin switch connector, and connect the battery negative terminal to the No. 3 terminal. Check that the shift lock solenoid operates.

NOTE: Do not connect the battery positive terminal to the No. 3 terminal or you will damage the diode inside the shift lock solenoid.



Wire side of female terminals

Does the shift lock solenoid operate properly?

Yes Check that the shift lock mechanism works properly. If the mechanism does not work, repair or replace the shift lever assembly. If necessary, substitute a known-good multiplex control unit (except KS model) or interlock control unit (KS model) and recheck.■

No Replace the shift lock solenoid.■

Reverse Lock System Circuit Troubleshooting

1. Check whether the DTC 1705 or 1706 is indicated.
   Is either DTC indicated?
   - **Yes** Perform the Troubleshooting Flowchart for the indicated Code(s).■
   - **No** Go to step 2.
2. Turn the ignition switch OFF.
3. Shift the shift lever to the [P] position while pushing the shift lock release.
4. Turn the ignition switch ON (II).
5. Press the brake pedal and release the accelerator, shift the shift lever out of the [P] position, and check that the shift lock solenoid operates.
   Does the shift lock solenoid operate properly?
   - **Yes** Check the reverse lock mechanism. If the mechanism does not work, repair or replace the shift lever assembly.■
   - **No** Perform the Shift Lock System Circuit Troubleshooting (see page 14-175).■

Key Interlock System Circuit Troubleshooting

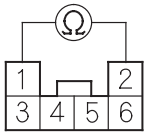
1. Disconnect the steering lock assembly connector.
2. Check if the ignition key can be turned to LOCK (0) position, and removed from the key cylinder.

   Is the ignition key able to turn to LOCK (0) position, and remove from key cylinder?

   Yes Go to step 3.

   No Replace the ignition key cylinder/steering lock assembly.■
3. Disconnect the O/D switchshift lock solenoid/park pin switch connector (see page 14-187).
4. Check for continuity between the No. 1 and No. 2 terminals of the O/D switch/shift lock solenoid/park pin switch connector while the shift lever is in [P] position, and when shift lever out of [P].

   O/D SWITCH/SHIFT LOCK SOLENOID/
   PARK PIN SWITCH CONNECTOR

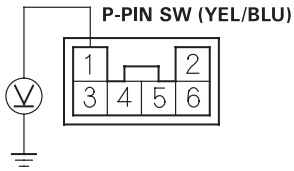
   Wire side of female terminals

   Is there continuity while the shift lever is in [P] *position, and no continuity when the shift lever out of* [P]*?*

   Yes Go to step 5.

   No Faulty park switch, replace it.■
5. Connect the steering lock assembly connector.
6. Turn the ignition switch to ACC (I).
7. Measure the voltage between the No. 1 terminal of the O/D switch/shift lock solenoid/park pin switch connector and body ground.

   O/D SWITCH/SHIFT LOCK SOLENOID/
   PARK PIN SWITCH CONNECTOR

   Terminal side of male terminals

   Is there voltage?

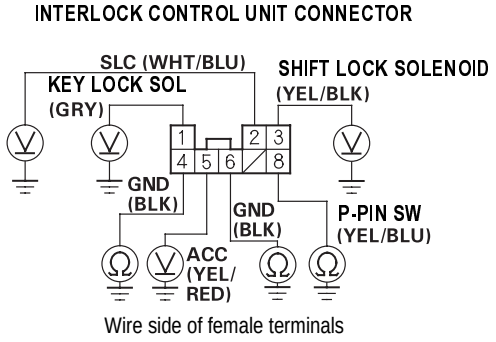
   Yes Repair open in the wire between the park pin switch and ground (G401), or repair poor ground (G401).■

   No Except KS model: Check for an open in the wire between the park pin switch connector and the under-dash fuse/relay box via the key interlock relay. If the wire is OK, replace the key interlock relay, and recheck.■
   KS model: Check for an open in the wire between the park pin switch connector and the interlock control unit. If the wire is OK, check for loose terminal fit in the interlock control unit connector. If necessary, substitute a known-good interlock control unit and recheck.■

Interlock Control Unit Input Test

KS Model

1. Disconnect interlock control unit connector.
2. Inspect the connector and connector terminals to be sure they are making good contact.
3. If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
4. Turn the ignition switch ACC (I).
5. Measure the voltage between interlock control unit connector terminal No. 1 and body ground. There should be voltage. If there is no voltage, check for a blown No. 8 (7.5A) fuse in the under-dash fuse/relay box, a key lock solenoid defect, or an open or a short in the wire.

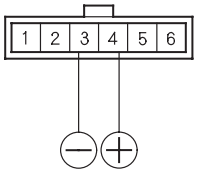


6. Measure the voltage between interlock control unit connector terminal No. 3 and body ground. There should be voltage. If there is no voltage, check for a blown No. 8 (7.5A) fuse, a shift lock solenoid defect, or an open or a short in the wire.
7. Measure the voltage between interlock control unit connector terminal No. 5 and body ground. There should be battery voltage. If there is no voltage, check for a blown No. 8 (7.5A) fuse or an open or a short in the wire.
8. Turn the ignition switch ON (II), and shift the shift lever in [P] position.
9. Press the brake pedal, release the accelerator pedal, and measure the voltage between interlock control unit connector terminal No. 2 and body ground. There should be battery voltage. If there is no voltage, check for an open or short in the wire.
10. Check for continuity between interlock control unit connector terminal No. 8 and body ground while shift lever in [P] position, and when shift lever out of [P]. There should be continuity while shift lever in [P] position, and there should be no continuity when shift lever out of [P]. If the test results are different, a park pin switch defect, and check for an open in the wire.
11. Check for continuity between interlock control unit connector terminals No. 4 and body ground, and between No. 6 and body ground. There should be continuity to ground under all conditions. If there is no continuity, check for an open in the wires, or poor ground (G401).

Key Interlock Solenoid Test

1. Remove the driver's dashboard lower cover and lower steering column cover.
2. Disconnect steering lock assembly connector.
3. Insert the ignition key in the key cylinder, then turn the ignition key to ACC (I).
4. Connect the battery positive terminal to steering lock assembly connector terminal No. 4, and connect the battery negative terminal to No. 3 terminal. Make sure that the ignition key cannot be turned to LOCK (0) position. Release the battery terminals, and make sure that the key can be turned to LOCK (0) position and removed from cylinder.
5. If the key interlock solenoid works improperly, replace the ignition key cylinder/steering lock assembly.

STEERING LOCK ASSEMBLY CONNECTOR

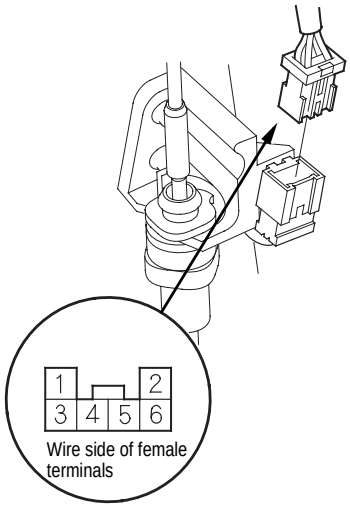


Terminal side of male terminals

Shift Lock Solenoid Test/Replacement

1. Remove the ash tray, front console box, heater control panel (see page 20-91), driver's dashboard lower cover (see page 20-88), and dashboard gauge assembly cover (see page 20-87).
2. Disconnect the O/D switch/shift lock solenoid/park pin switch connector.

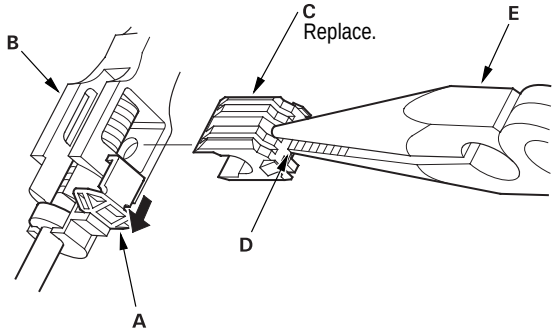
   NOTE: The illustration shows LHD model; RHD is symmetrical.



O/D SWITCH/SHIFT LOCK SOLENOID/ PARK PIN SWITCH CONNECTOR

3. Connect the battery positive terminal to the No. 4 terminal of the O/D switch/shift lock solenoid/park pin switch connector, and connect the battery negative terminal to the No. 3 terminal.

   NOTE: Do not connect the battery negative terminal to the No. 3 terminal or you will damage the diode inside the solenoid.
4. Check that the shift lever can be moved from [P] position. Release the battery terminals, move the shift lever back to the [P], and make sure it locks. If the shift lock solenoid works properly, connect the connector and install the removed parts.
   If the shift lock solenoid is faulty, go to step 5 for replacement.
5. Shift the shift lever to [R] position.
6. Slide the lock tab (A) down on the shift cable end holder (B).



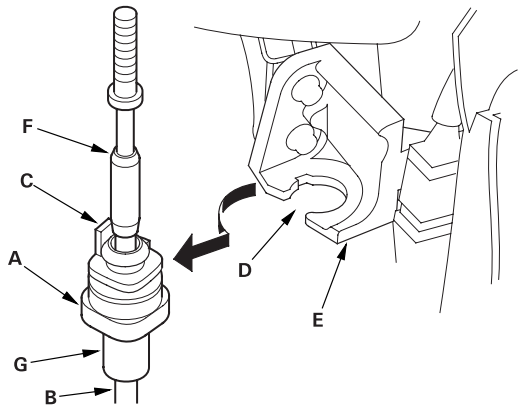
7. Remove the shift cable lock (C) with holding at the middle (D) of it using needle-nose pliers (E) from the shift cable end and shift cabel end holder.

   NOTE: Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.
8. Separate the shift cable end from the shift cable end holder.

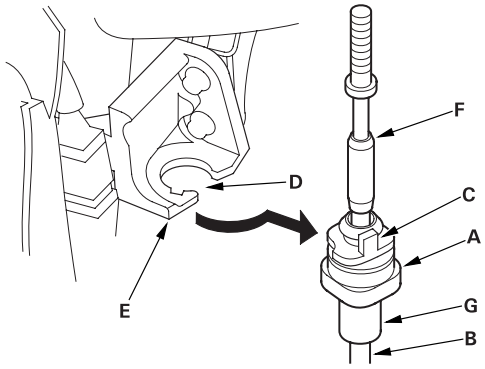
9. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the socket holder bracket (E). Then slide the holder to remove the shift cable from the socket holder bracket.

NOTE: Do not remove the shift cable by twisting the shift cable guide (F) and damper (G).

LHD Model:

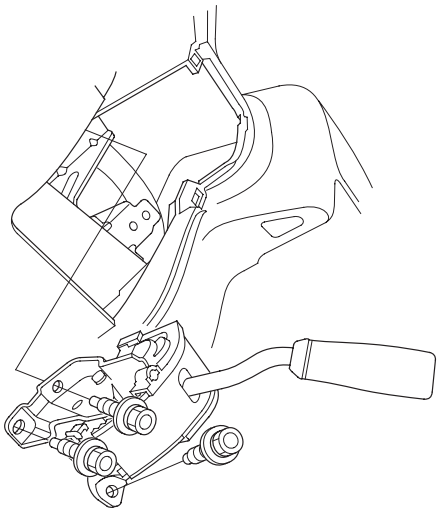


RHD Model:



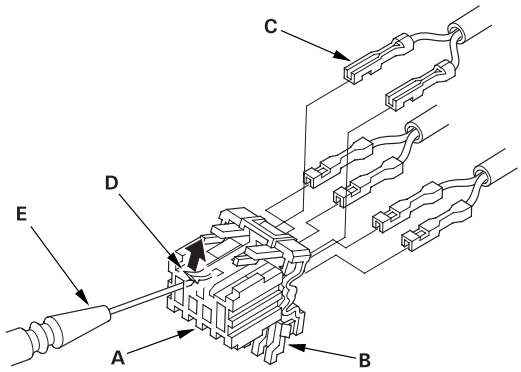
10. Remove the shift lever assembly.

NOTE: The illustration shows LHD model; RHD is symmetrical.



11. Remove the harness from the harness clamp on the shift lever bracket base, and remove the harness band from the harness.

12. Pry the lock tabs on the back of the O/D switch/shift lock solenoid/park pin switch connector (A), and remove the back cover (B).



13. Remove the terminal (C) from the connector by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all six terminals.

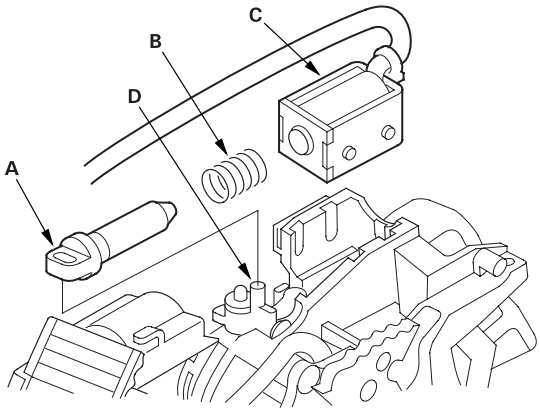
(cont'd)

Shift Lock Solenoid Test/Replacement (cont'd)

14. Remove the shift lever cover.

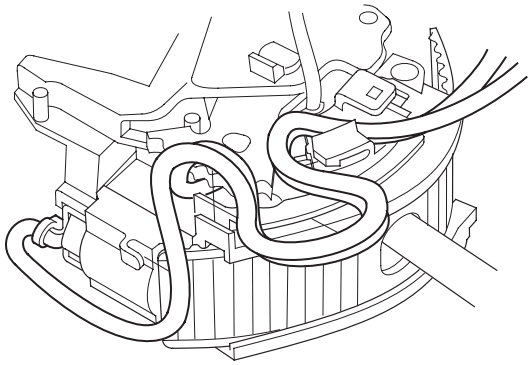
15. Remove the shift lock solenoid.

16. Install the shift lock solenoid plunger (A) and plunger spring (B) in the new shift lock solenoid (C).

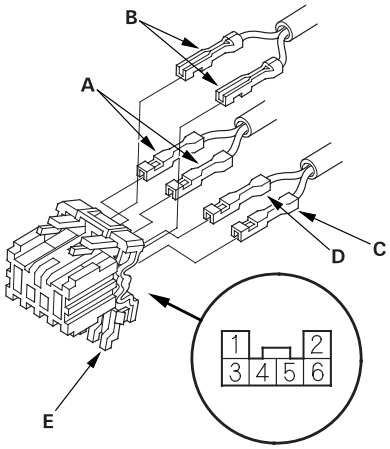


17. Install the shift lock solenoid by aligning the joint of the shift lock solenoid plunger with the tip of the shift lock stop (D).

18. Route the harnesses, and clamp them as shown.



19. Install the O/D switch harness terminals (A) in the No. 5 and No. 6 cavities. Both of O/D switch harness terminals can be installed in No. 5 and No. 6 cavities.

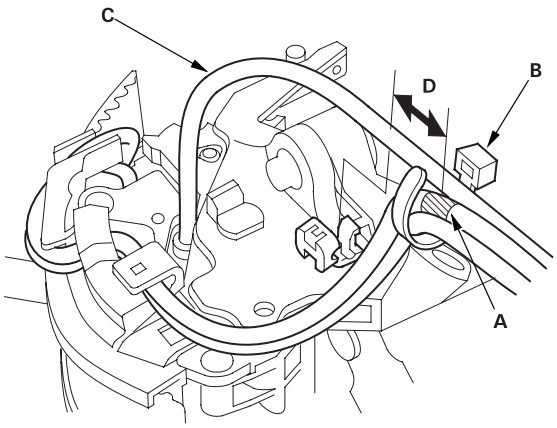


Wire side of female terminals

20. Install the park pin switch harness terminals (B) in the No. 1 and No. 2 cavities. Both of park pin switch harness terminals can be installed in No. 1 and No. 2 cavities.

21. Install BLU harness terminal (C) of the shift lock solenoid in the No. 3 cavity, and RED harness terminal (D) in the No. 4 cavity. Make sure that the all six terminals lock securely, then install the back cover (E) locked securely in place.

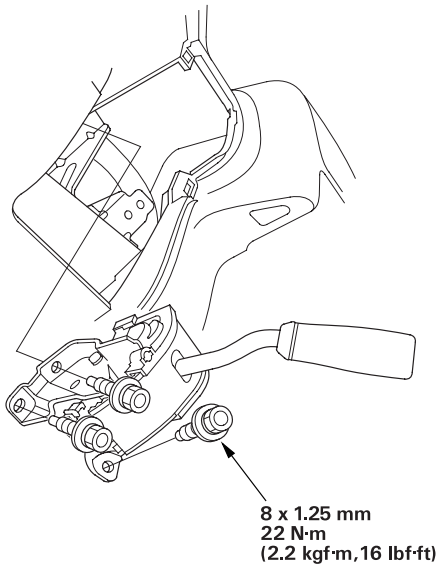
22. Align the marks (A) on the harnesses, and tie the harness band (B) over the marks. Clamp the O/D switch harness (C) at 15 mm (0.6 in.) (D) from the harness band.



23. Install the shift lever cover.

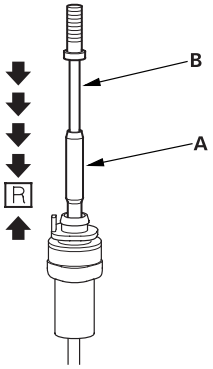
24. Install the shift lever assembly.

NOTE: The illustration shows LHD model; RHD is symmetrical.



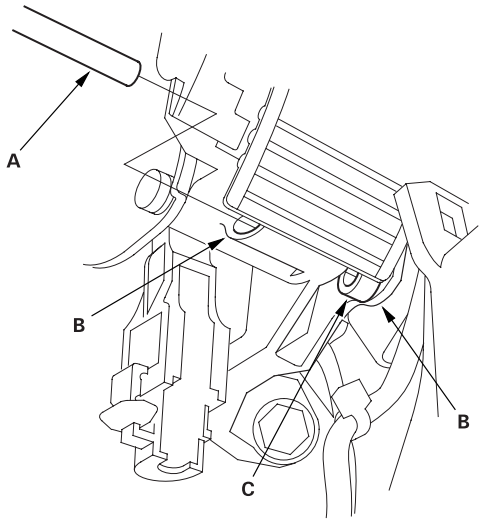
25. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.

26. If necessary, push the shift cable until it stops, then release it. Pull the shift cable back one step so that the shift cable is in [R]. Do not hold the shift cable guide (A) to adjust the shift cable (B).



27. Turn the ignition switch OFF.

28. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning holes (B) on the shift lever bracket base through the positioning hole (C) on the shift lever. The shift lever is secured in [R] position.

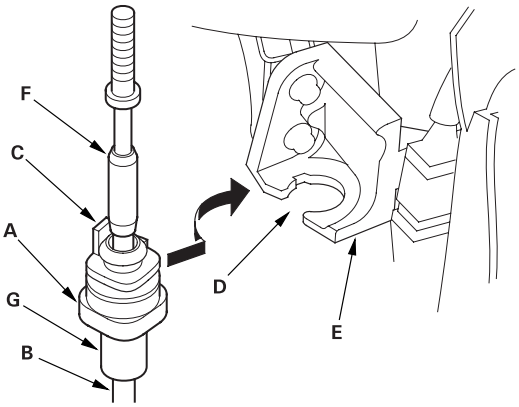


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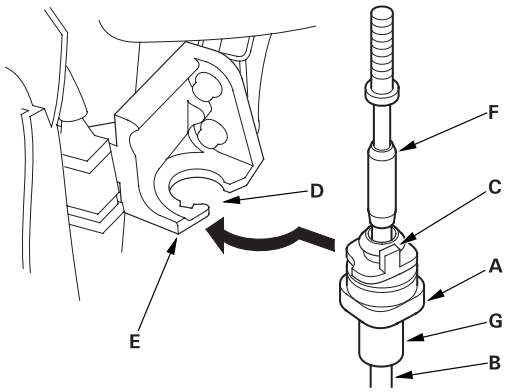
Shift Lock Solenoid Test/Replacement (cont'd)

29. Rotate the socket holder (A) on the shift cable (B) to face the tab (C) on the holder opposite to the opening (D) in the socket holder bracket (E). Align the holder with the opening in the bracket, then slide the holder into the bracket. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (F) and damper (G).

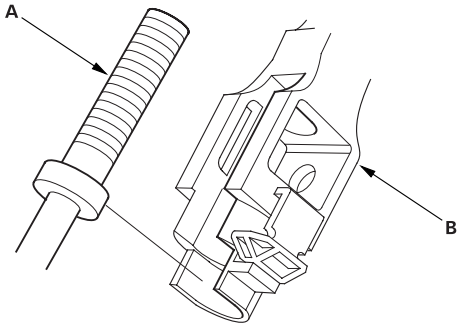
LHD Model:



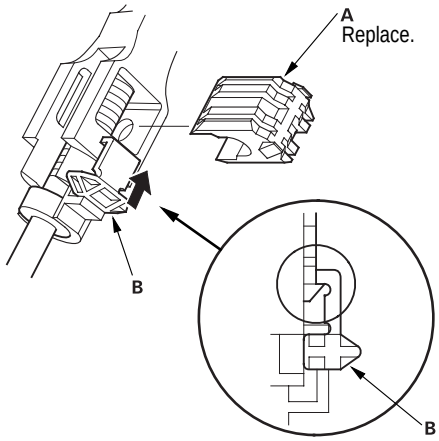
RHD Model:



30. Install the shift cable end (A) in the shift cable end holder (B). Keep the shift cable end and end holder free of grease.



31. Install the new shift cable lock (A) to secure the shift cable end and shift cable end holder, then push the lock tab (B) up until it stops to lock the joint.



32. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

33. Connect the O/D switch/shift lock solenoid/park pin switch connector.

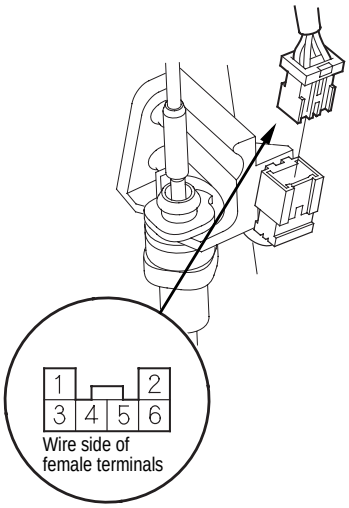
34. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

35. Check that the shift lock solenoid operates.

36. Install the dashboard gauge assembly cover (see page 20-87), driver's dashboard lower cover (see page 20-88), heater control panel (see page 20-91), front console box, and ash tray.

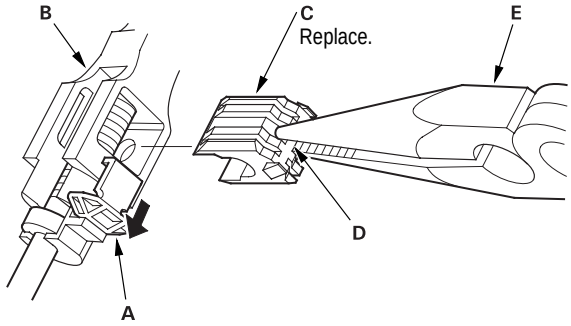
Park Pin Switch Test/Replacement

1. Remove the ash tray, front console box, heater control panel (see page 20-91), driver's dashboard lower cover (see page 20-88), and dashboard gauge assembly cover (see page 20-87).
2. Disconnect the O/D switch/shift lock solenoid/park pin switch connector.
   NOTE: The illustration shows LHD model; RHD is symmetrical.



O/D SWITCH/SHIFT LOCK SOLENOID/
PARK PIN SWITCH CONNECTOR

3. Check for continuity between the No. 1 and No. 2 terminals of the O/D switch/shift lock solenoid/park pin switch connector while the shift lever is in [P] position, and when shift lever out of [P]. If the park pin switch is OK, connect the connector and install the removed parts.
   If the park pin switch is faulty, go to step 4 for replacement.
4. Shift the shift lever to [R] position.
5. Slide the lock tab (A) down on the shift cable end holder (B).



6. Remove the shift cable lock (C) with holding at the middle (D) of it using needle-nose pliers (E) from the shift cable end and shift cabel end holder.
   NOTE: Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.
7. Separate the shift cable end from the shift cable end holder.

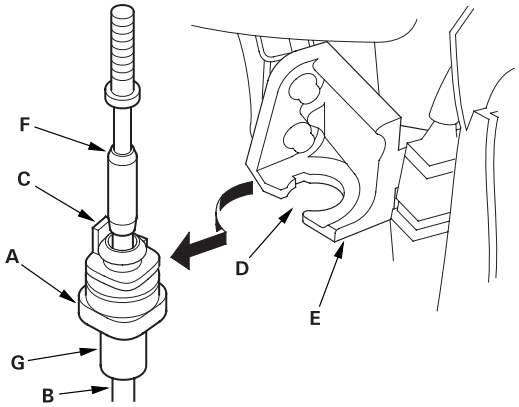
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Park Pin Switch Test/Replacement (cont'd)

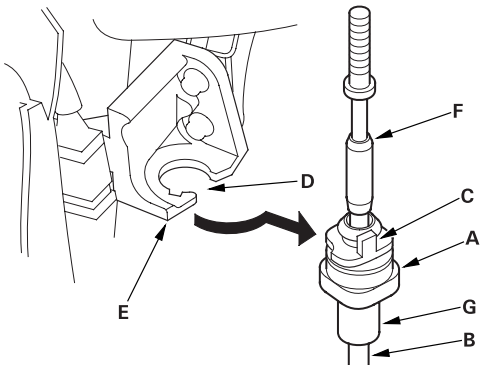
8. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the socket holder bracket (E). Then slide the holder to remove the shift cable from the socket holder bracket.

NOTE: Do not remove the shift cable by twisting the shift cable guide (F) and damper (G).

LHD Model:

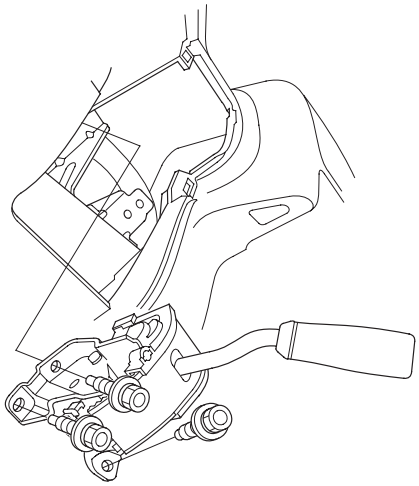


RHD Model:



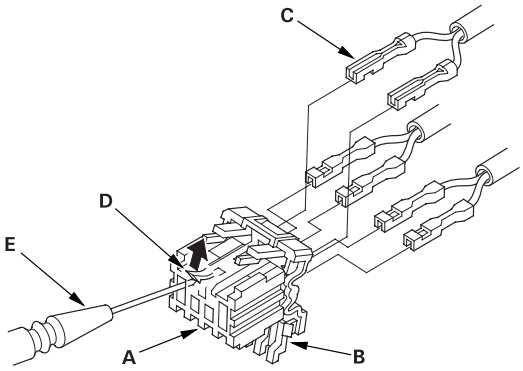
9. Remove the shift lever assembly.

NOTE: The illustration shows LHD model; RHD is symmetrical.



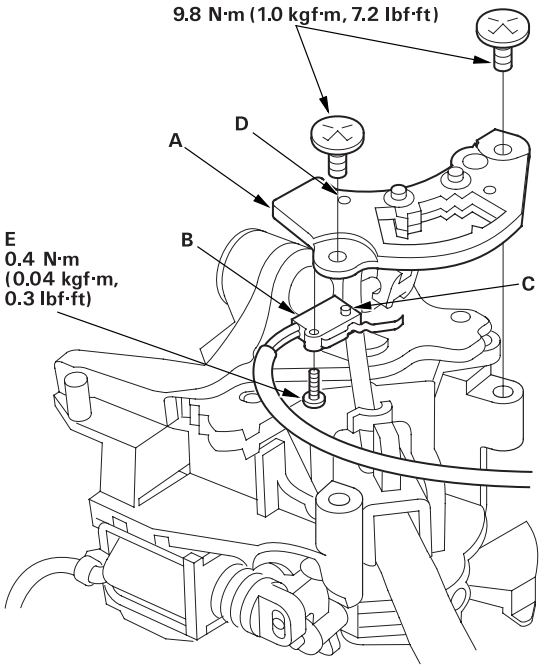
10. Remove the harness from the harness clamp on the shift lever bracket base, and remove the harness band from the harness.

11. Pry the lock tabs on the back of the O/D switch/shift lock solenoid/park pin switch connector (A), and remove the back cover (B).

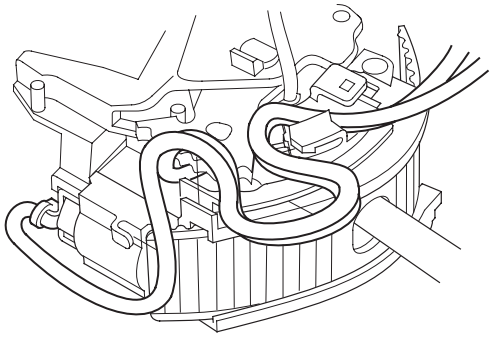


12. Remove the terminal (C) from the connetor by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all six terminals.

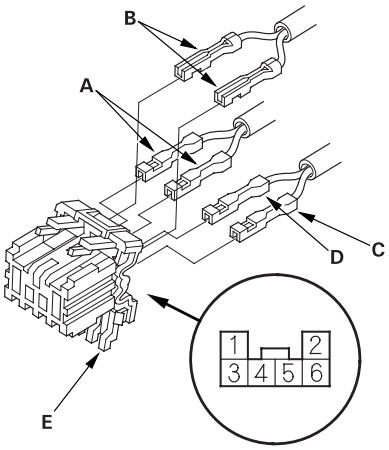
13. Remove the shift lever cover.
14. Remove the control checker (A) from the shift lever, and remove the park pin switch from the control checker.



15. Install the new park pin switch (B) by aligning its tab (C) with the positioning hole (D) on the control checker. Apply non-hardening thread lock sealant to the screw (E), then secure the park pin switch with the screw.
16. Install the control checker on the shift lever.
17. Route the harnesses, and clamp them as shown.



18. Install the O/D switch harness terminals (A) in the No. 5 and No. 6 cavities. Both of O/D switch harness terminals can be installed in No. 5 and No. 6 cavities.



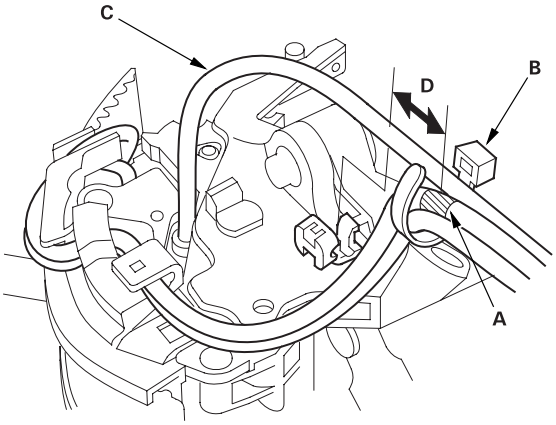
Wire side of female terminals

19. Install the park pin switch harness terminals (B) in the No. 1 and No. 2 cavities. Both of park pin switch harness terminals can be installed in No. 1 and No. 2 cavities.
20. Install BLU harness terminal (C) of the shift lock solenoid in the No. 3 cavity, and RED harness terminal (D) in the No. 4 cavity. Make sure that the all six terminals lock securely, then install the back cover (E) locked securely in place.

(cont'd)

Park Pin Switch Test/Replacement (cont'd)

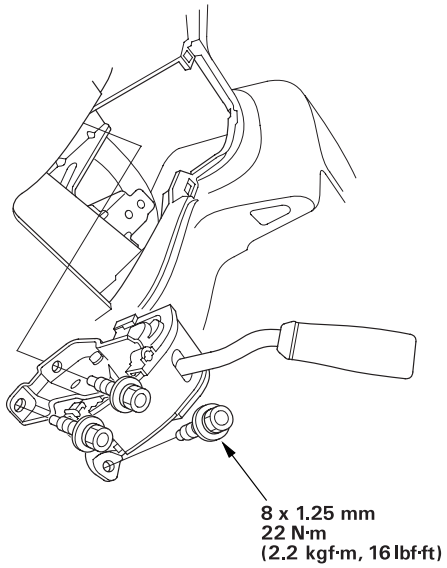
21. Align the marks (A) on the harnesses, and tie the harness band (B) over the marks. Clamp the O/D switch harness (C) at 15 mm (0.6 in.) (D) from the harness band.



22. Install the shift lever cover.

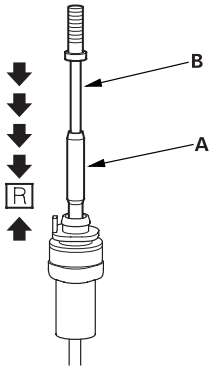
23. Install the shift lever assembly.

NOTE: The illustration shows LHD model; RHD is symmetrical.



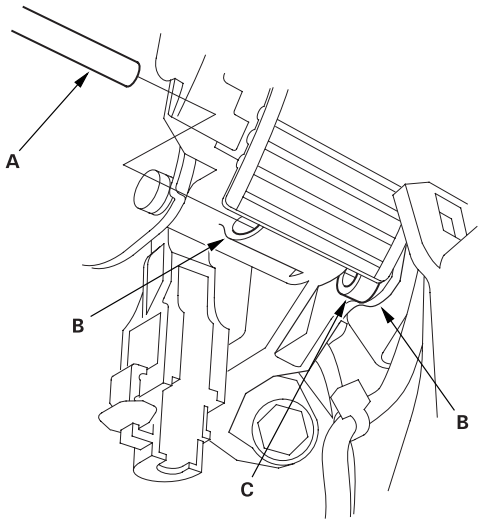
24. Turn the ignition switch ON (II), and verify that the [R] position indicator comes on.

25. If necessary, push the shift cable until it stops, then release it. Pull the shift cable back one step so that the shift cable is in [R]. Do not hold the shift cable guide (A) to adjust the shift cable (B).



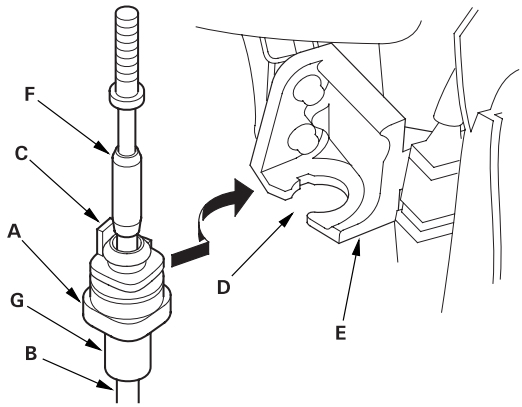
26. Turn the ignition switch OFF.

27. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning holes (B) on the shift lever bracket base through the positioning hole (C) on the shift lever. The shift lever is secured in [R] position.

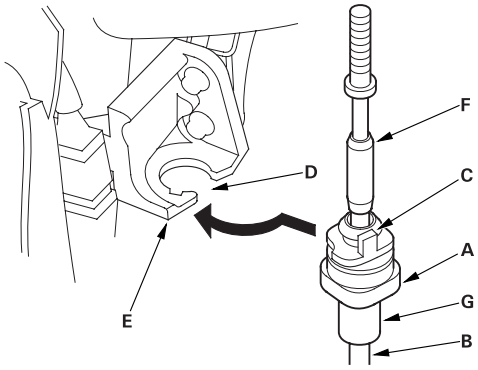


28. Rotate the socket holder (A) on the shift cable (B) to face the tab (C) on the holder opposite to the opening (D) in the socket holder bracket (E). Align the holder with the opening in the bracket, then slide the holder into the bracket. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (F) and damper (G).

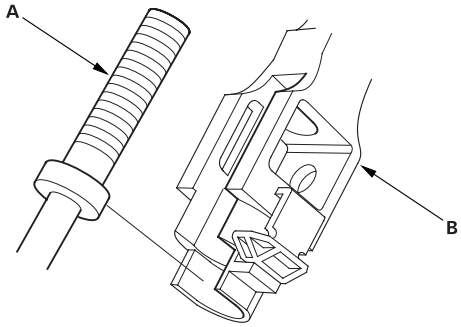
LHD Model:



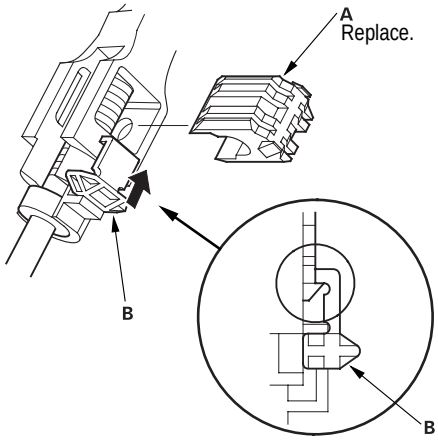
RHD Model:



29. Install the shift cable end (A) in the shift cable end holder (B). Keep the shift cable end and end holder free of grease.



30. Install the new shift cable lock (A) to secure the shift cable end and shift cable end holder, then push the lock tab (B) up until it stops to lock the joint.



31. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

32. Connect the O/D switch/shift lock solenoid/park pin switch connector.

33. Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

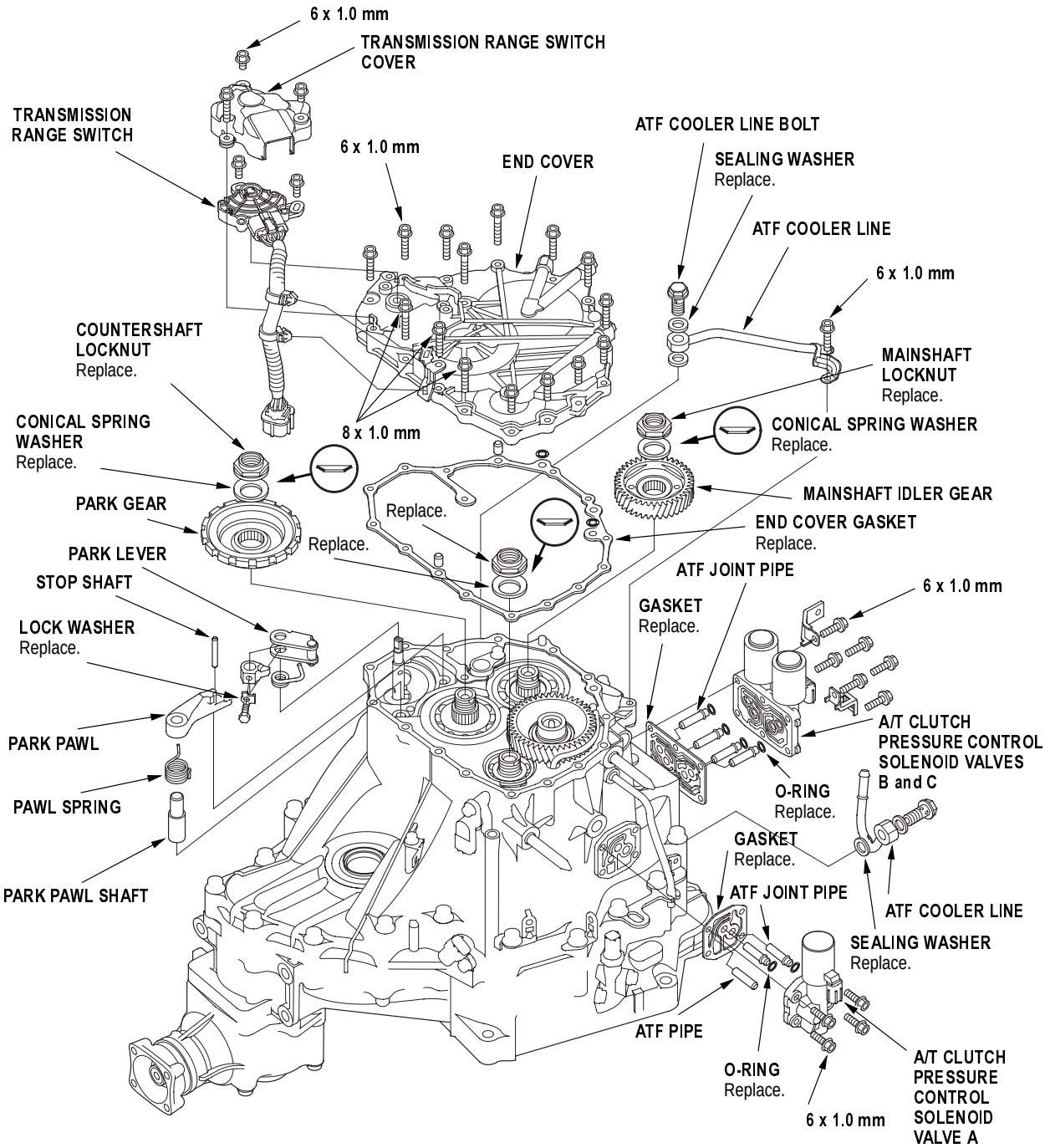
34. Check that the park pin switch operates.

35. Install the dashboard gauge assembly cover (see page 20-87), driver's dashboard lower cover (see page 20-88), heater control panel (see page 20-91), front console box, and ash tray.

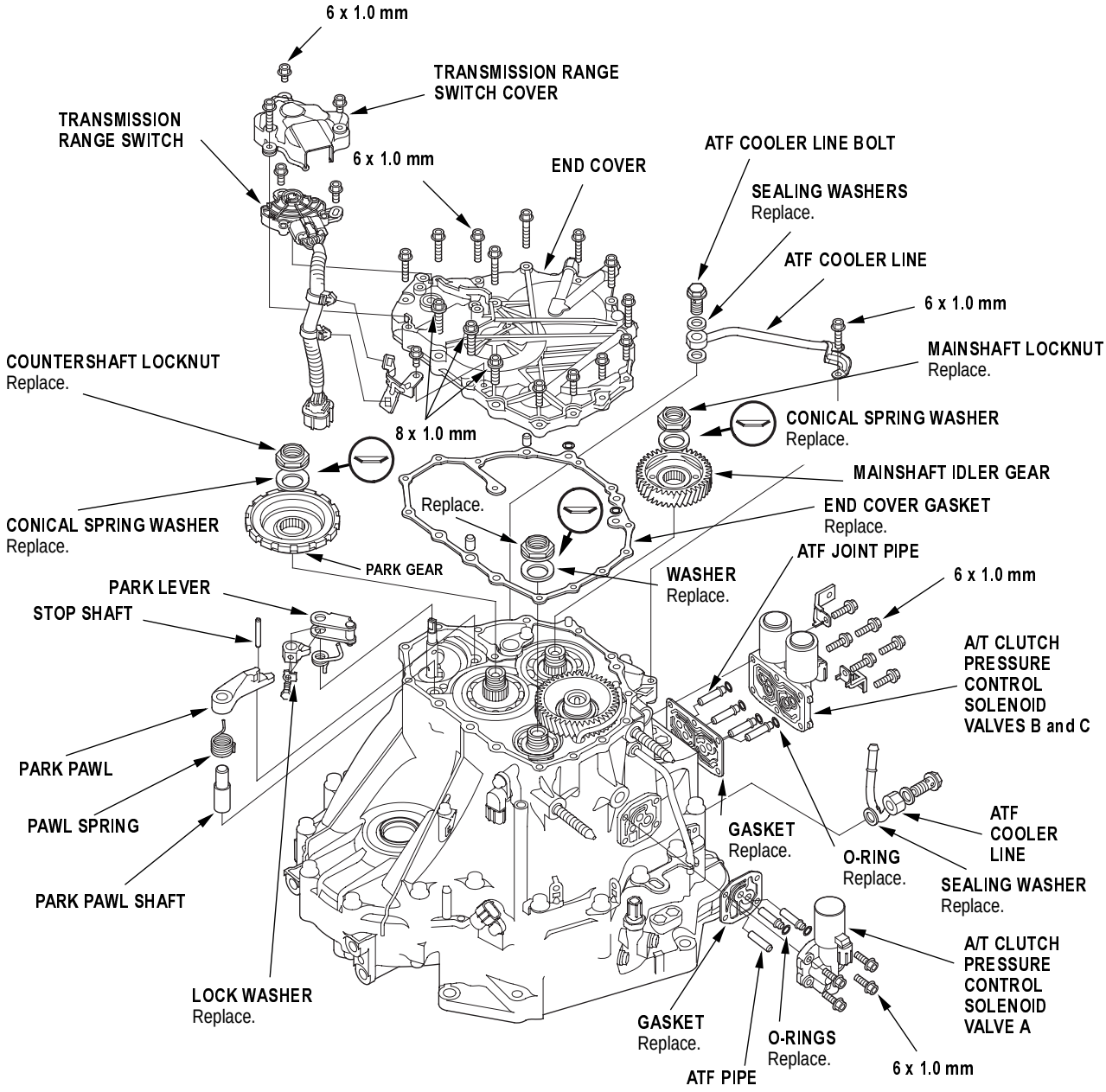
Transmission End Cover

End Cover Removal

Exploded View -4WD



Exploded View -2WD



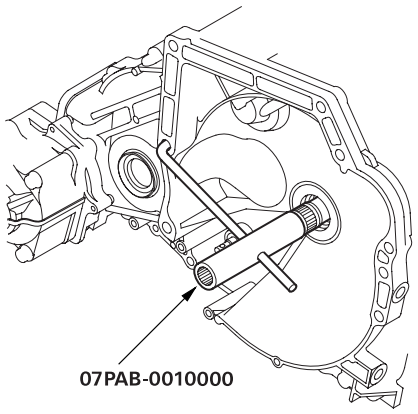
(cont'd)

End Cover Removal (cont'd)

Special Tools Required
Mainshaft holder set 07PAB-0010000

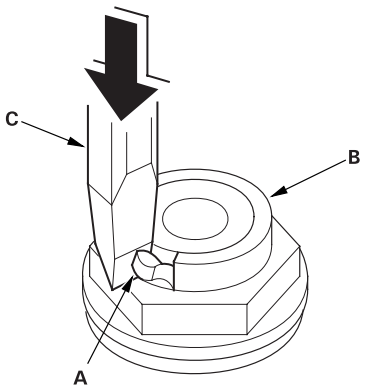
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF cooler lines.
2. Remove the A/T clutch pressure control solenoid valve A, then remove the ATF pipe, ATF joint pipes, and gasket.
3. Remove the A/T clutch pressure control solenoid valves B and C, then remove the ATF joint pipes and gasket.
4. Remove the transmission range switch cover.
5. Remove the transmission range switch harness clamps from the clamp brackets, then remove the transmission range switch.
6. Remove the end cover.
7. Slip the special tool onto the mainshaft.



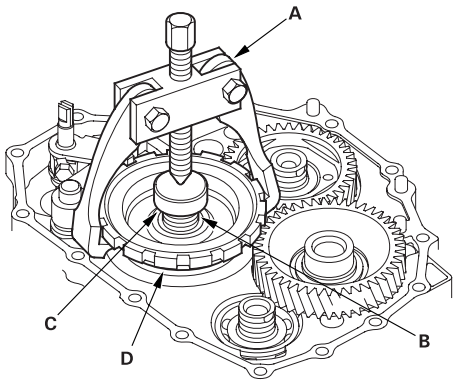
8. Engage the park pawl with the park gear.
9. Cut the lock tab (A) of the each shaft locknut (B) using a chisel (C). Then remove the locknuts and conical spring washers from each shaft.

   NOTE:
   - Countershaft and secondary shaft locknuts have left-hand threads.
   - Keep all of the chiseled particles out of the transmission.
   - Clean the old mainshaft and countershaft locknuts; they are used to install the press fit idler gear on the mainshaft, and park gear on the countershaft.

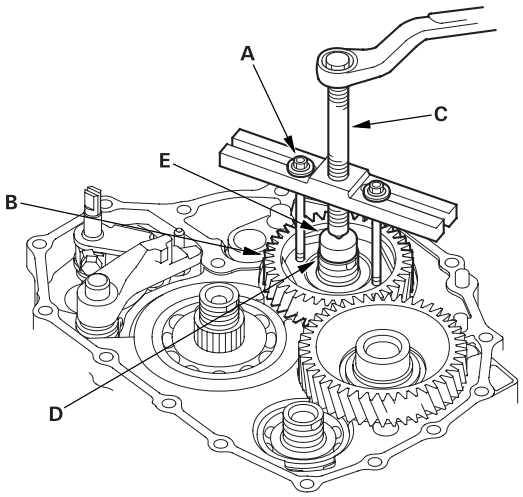


10. Remove the special tool from the mainshaft.

11. Set a two-jaw (or three-jaw) puller (A) on the countershaft (B) with putting a collar (C) between the puller and countershaft, then remove the park gear (D).



12. Install 6 x 1.0 mm bolts (A) on the mainshaft idler gear (B). Set a puller (C) on the mainshaft (D) with putting a collar (E) between the puller and mainshaft, then remove the mainshaft idler gear.



13. Remove the park pawl, park pawl spring, park pawl shaft, and stop shaft.

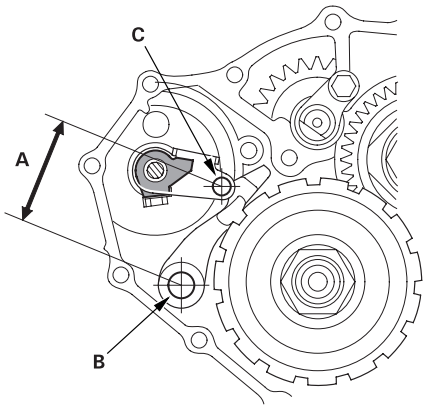
14. Remove the park lever from the control shaft.

Park Lever Stop Inspection and Adjustment

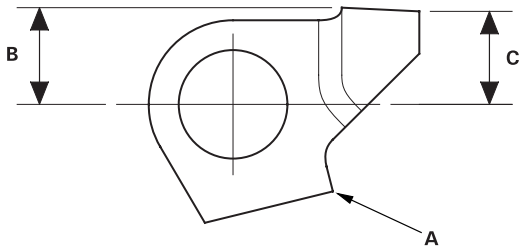
1. Set the park lever in the [P] position.

2. Measure the distance (A) between the park pawl shaft (B) and the park lever roller pin (C).

STANDARD: 57.7 - 58.7 mm (2.27 - 2.31 in.)



3. If the measurement is out of standard, select and install the appropriate park lever stop (A) from the table below.



PARK LEVER STOP

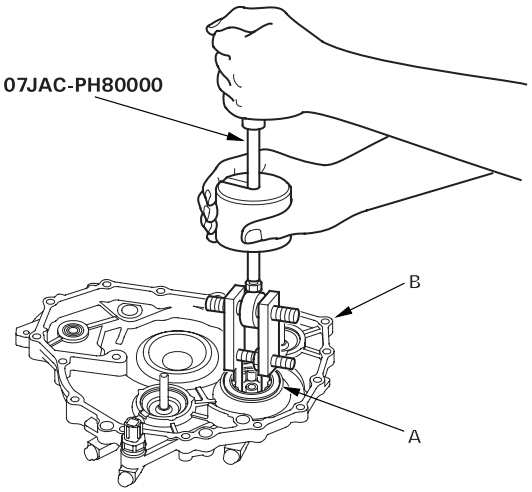
Mark	Part Number	B	C
1	24537-PA9-003	11.00 mm (0.433 in.)	11.00 mm (0.433 in.)
2	24538-PA9-003	10.80 mm (0.425 in.)	10.65 mm (0.419 in.)
2	24539-PA9-003	10.60 mm (0.417 in.)	10.30 mm (0.406 in.)

4. After replacing the park lever stop, make sure the distance is within tolerance.

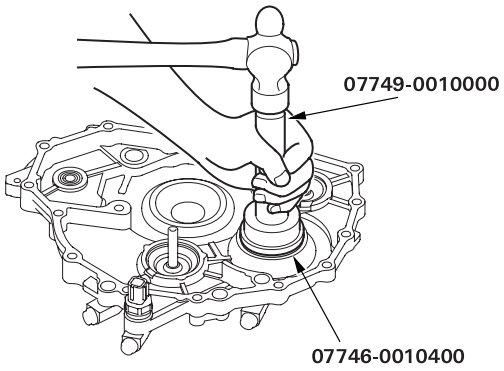
Idler Gear Shaft Bearing Replacement

Special Tools Required
- Adjustable bearing remover set 07JAC-PH80000
- Handle driver 07749-0010000
- Driver attachment, 52 x 55 mm 07746-0010400

1. Remove the idler gear shaft bearing (A) from the end cover (B) with the special tool.



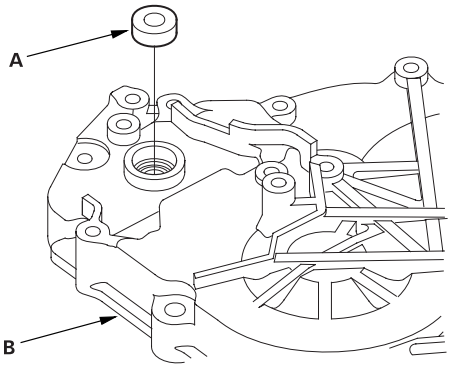
2. Install the new bearing in the end cover with the special tools.



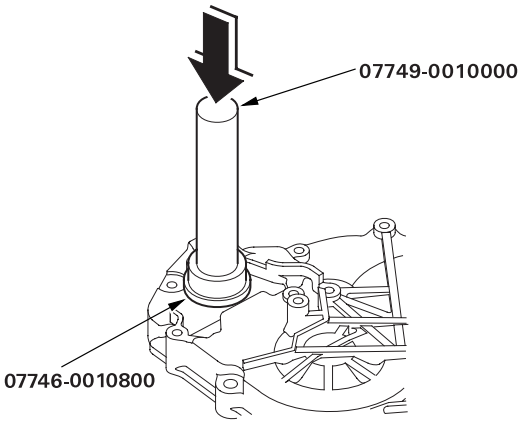
Control Shaft Oil Seal Replacement

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal (A) from the end cover (B).



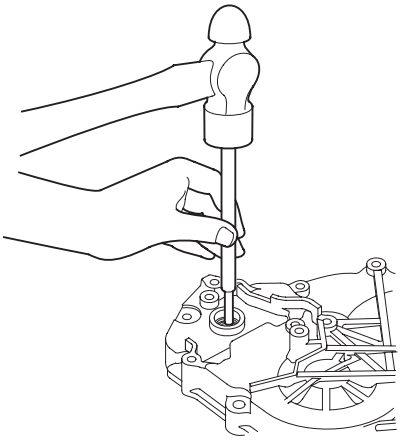
2. Install the new oil seal flush to the end cover with the special tools.



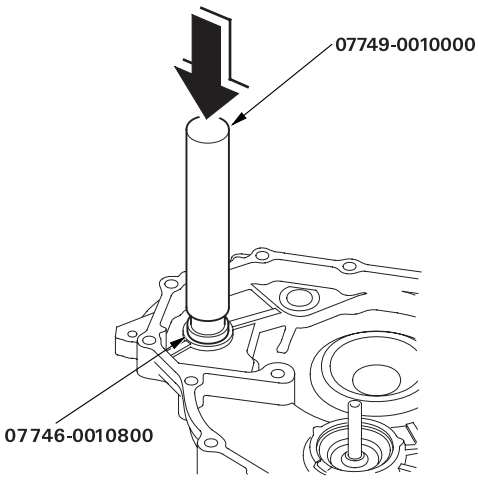
Control Shaft Bearing Replacement

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal from the end cover, then remove the bearing.



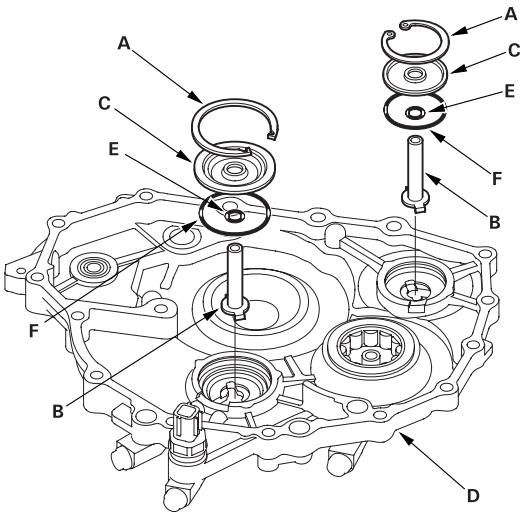
2. Install the new bearing flush to the end cover with the special tools.



3. Install the new oil seal (see page 14-196).

ATF Feed Pipes Replacement

1. Remove the snap rings (A), ATF feed pipes (B) and feed pipe flanges (C) from the end cover (D).

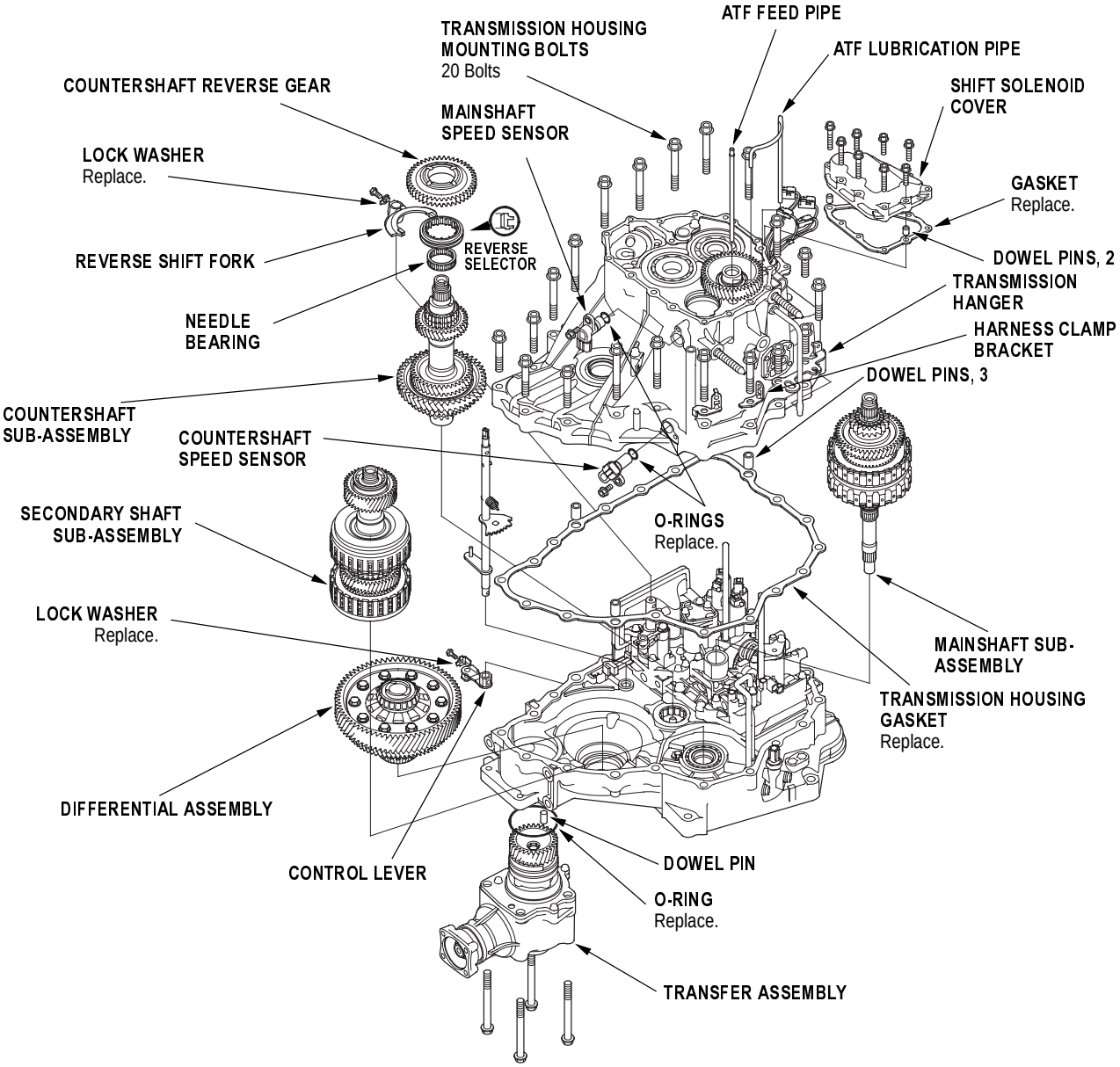


2. Install the new O-ring (E) over the ATF feed pipe.
3. Install the ATF feed pipe in the end cover with aligning the feed pipe tabs with the indentations in the end cover.
4. Install the new O-ring (F) in the end cover, then install the feed pipe flange over the ATF feed pipe and O-ring.
5. Secure the ATF feed pipe and feed pipe flange with the snap ring.

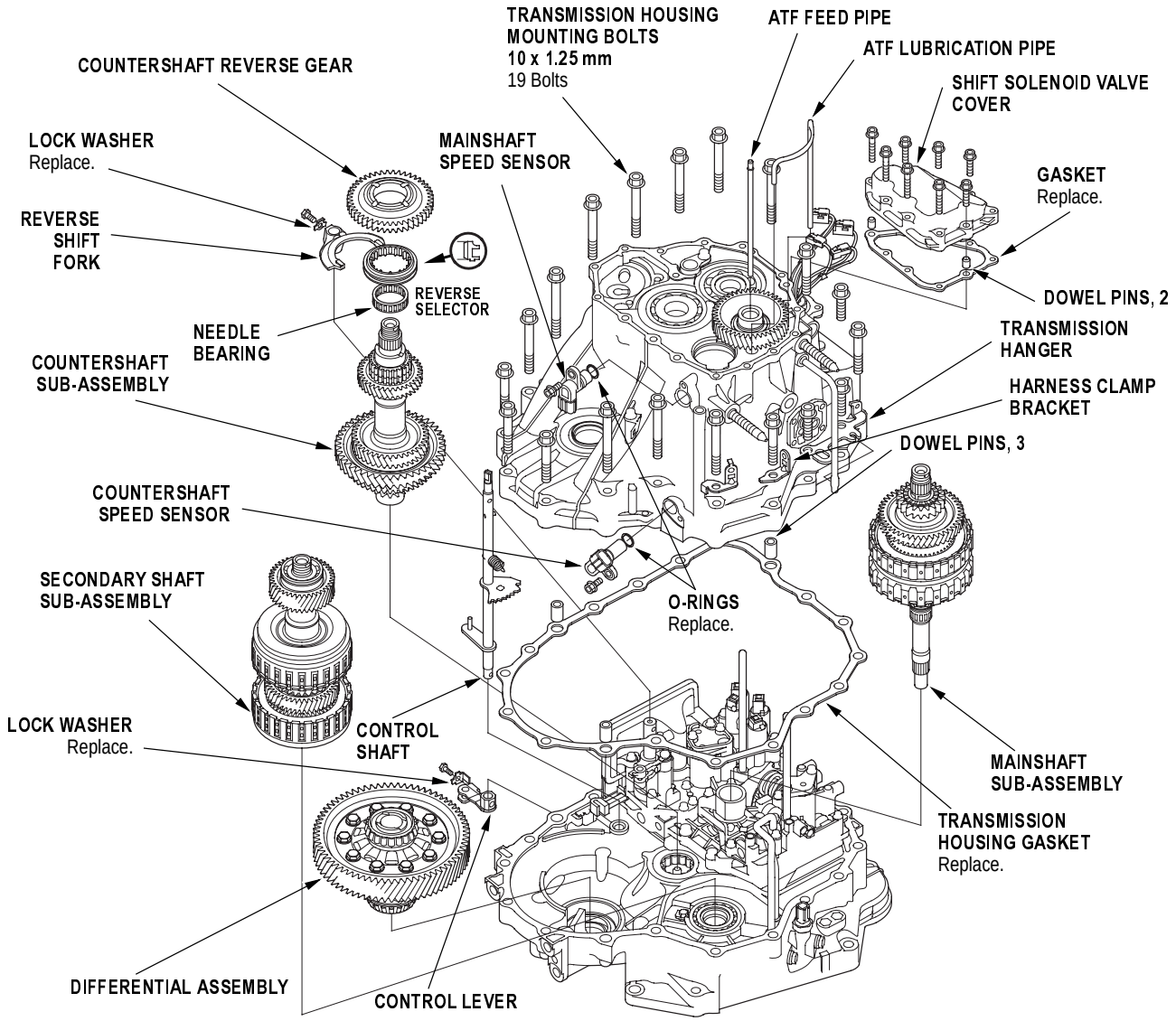
Transmission Housing

Housing and Shaft Assemblies Removal

Exploded View -4WD



Exploded View -2WD



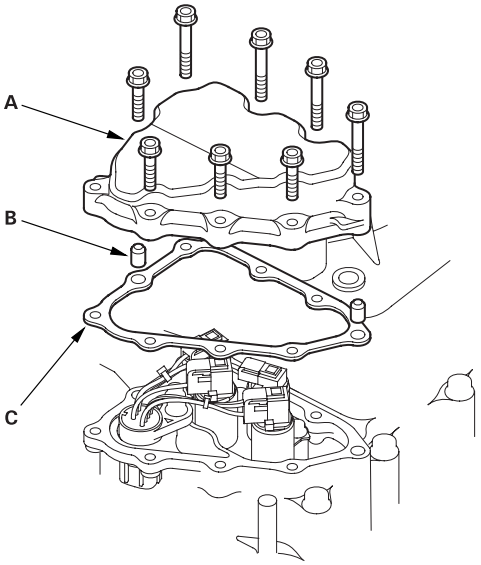
(cont'd)

Housing and Shaft Assemblies Removal (cont'd)

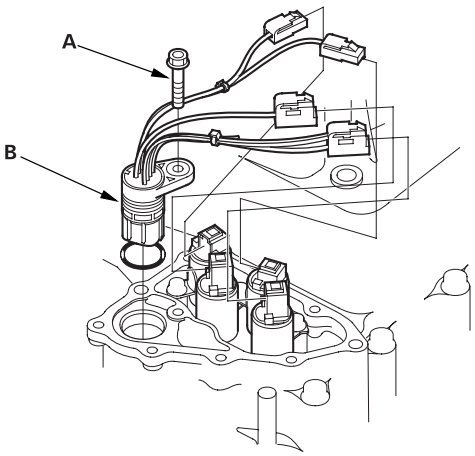
Special Tools Required
- Housing puller 07HAC-PK40102
- Snap ring pliers 07LGC-0010100

NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF feed pipe from the idler gear shaft, and the ATF lubrication pipe from the transmission housing.
2. Remove the shift solenoid valve cover (A), dowel pins (B), and gasket (C).

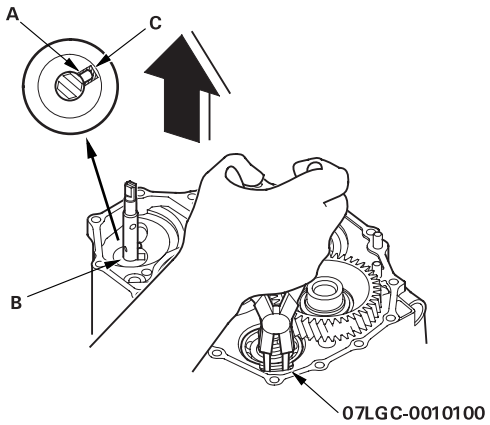


3. Remove the bolt (A) securing the solenoid harness connector (B), and remove the connector.



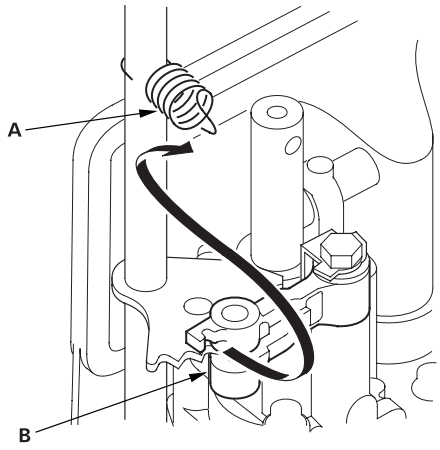
4. Disconnect the connectors from the shift solenoid valves.
5. Remove the mainshaft and countershaft speed sensors.
6. Remove the transmission housing mounting bolts, hanger, and harness clamp brackets.
7. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft.

   NOTE: Do not squeeze the end of the control shaft tips together when turning the shaft. If the tips are squeezed together it will cause a faulty signal or position due to the play between the control shaft and the switch.

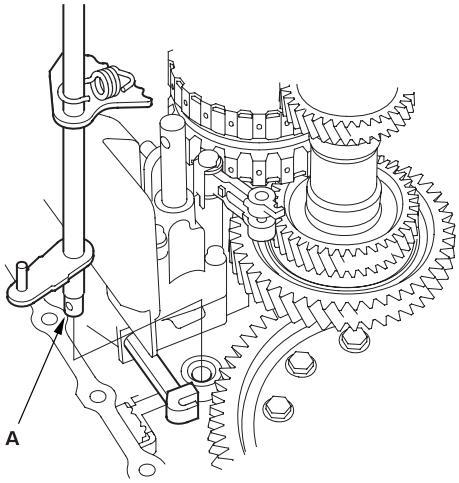


8. With expanding the snap ring of the secondary shaft bearing using the snap ring pliers, lift the transmission housing. Release the snap ring pliers, and remove the transmission housing.
9. Remove the countershaft reverse gear and needle bearing.
10. Remove the lock bolt securing the shift fork, then remove the shift fork with the reverse selector together.
11. Remove the control lever from the control shaft.

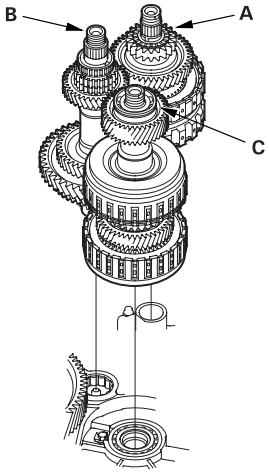
12. Unhook the detent spring (A) from the detent arm (B).



13. Remove the control shaft (A).



14. Remove the mainshaft sub-assembly (A), countershaft sub-assembly (B), and secondary shaft sub-assembly (C) together.



15. Remove the differential assembly.

16. Remove the transfer assembly for 4WD model.

Bearing Removal

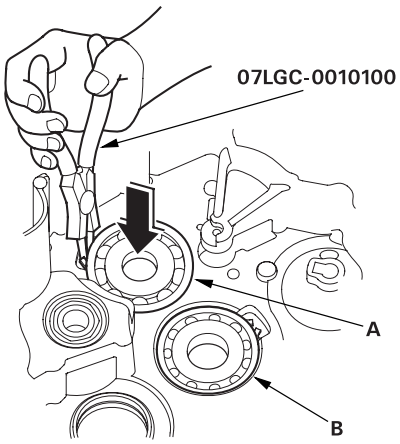
Special Tools Required
- Snap ring pliers 07LGC-0010100
- Driver attachment, 78 x 90 mm 07GAD-SD40101
- Handle driver 07749-0010000
- Driver attachment, 42 x 47 mm 07746-0010300

1. Remove the idler gear shaft when removing the mainshaft bearing and idler gear shaft bearing.

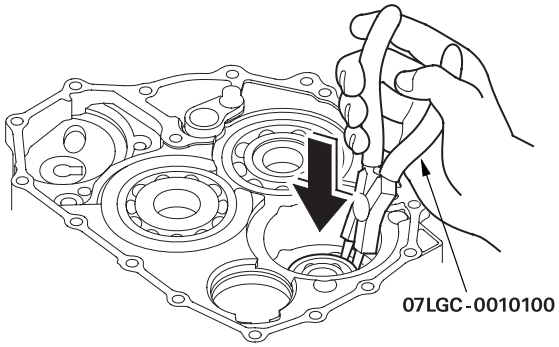
NOTE: If you are only removing the countershaft bearing, idler gear shaft removal is not needed.

2. To remove the mainshaft bearing (A) and countershaft bearing (B) from the transmission housing, expand each snap ring with the snap ring pliers, then push the bearing out.

NOTE: Do not remove the snap ring unless it's necessary to clean the grooves in the housing.



3. Expand the snap ring of the idler gear shaft bearing with the snap ring pliers, then push the bearing out.

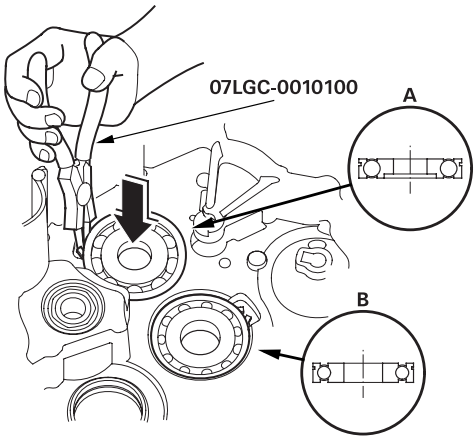


Bearing Installation

Special Tools Required
- Snap ring pliers 07LGC-0010100
- Driver attachment, 78 x 90 mm 07GAD-SD40101
- Handle driver 07749-0010000
- Driver attachment, 42 x 47 mm 07746-0010300

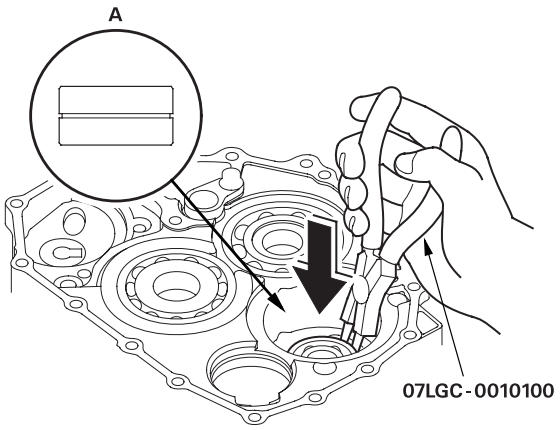
1. Install the bearings in the direction shown.

2. Expand each snap ring with the snap ring pliers, and install the mainshaft bearing (A) and countershaft bearing (B) part-way into the housing.



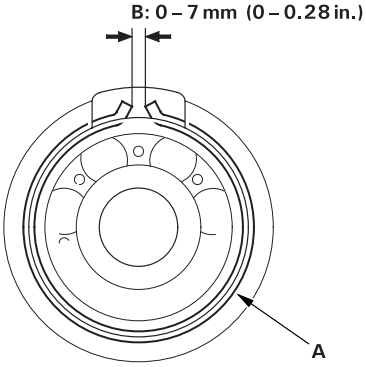
3. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.

4. Expand the snap ring of the idler gear shaft (A) with the snap ring pliers, and install the bearing part-way into the housing.



5. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.

6. After installing the bearings verify that the snap rings (A) are seated in the bearing and housing grooves, and that the ring end gaps (B) are correct.

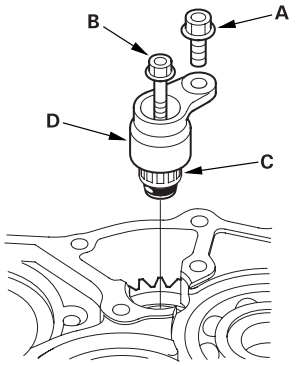


7. Install the idler shaft.

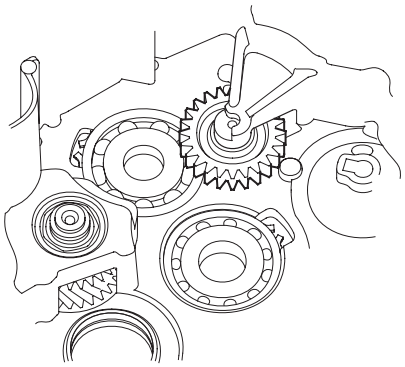
Reverse Idler Gear Removal and Installation

Removal

1. Remove the bolt (A) securing the reverse idler gear shaft holder.

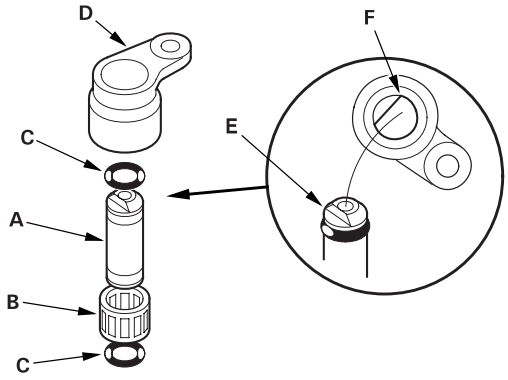


2. Install a 5 x 0.8 mm bolt (B) in the reverse idler gear shaft, and pull it to remove the reverse idler gear shaft (C) and gear shaft holder (D) together.
3. Remove the reverse idler gear.

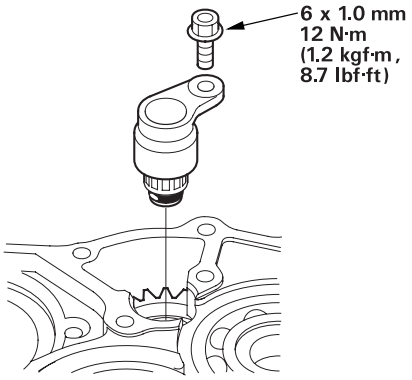


Installation

1. Install the reverse idler gear in the transmission housing.
2. Coat the reverse idler gear shaft (A), needle bearing (B), and new O-rings (C) with lithium grease lightly.



3. Assemble the new O-rings and needle bearing on the reverse idler gear shaft, then install the reverse idler gear shaft in the reverse idler gear shaft holder (D). Align the D-shaped cut out (E) of the shaft with the D-shaped area (F) of the holder.
4. Install the reverse idler gear shaft/holder assembly on the transmission housing.

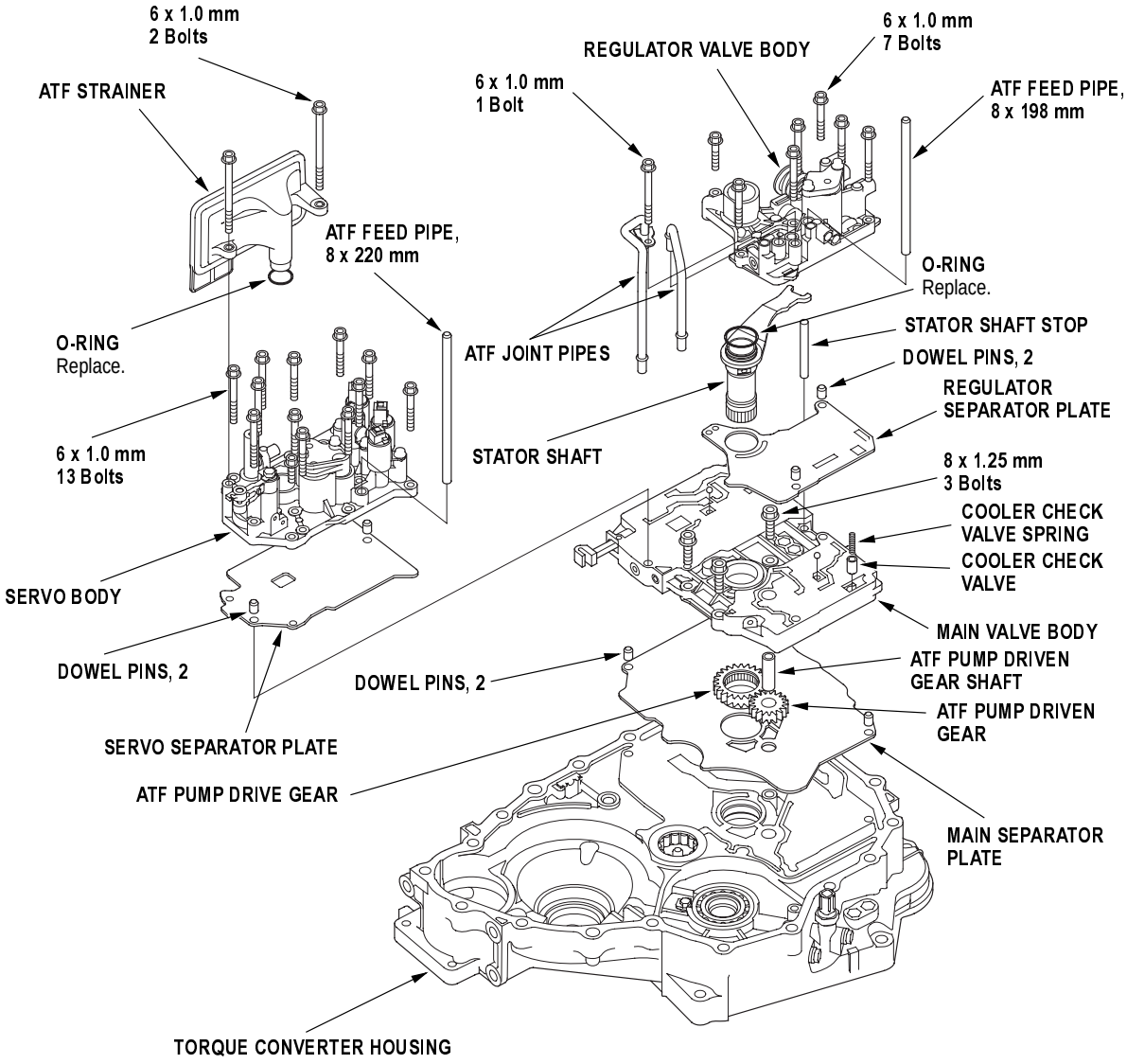


Valve Body

Valve Bodies and ATF Strainer Removal

Exploded View

NOTE: The illustration shows the 4WD transmission; the 2WD is similar.

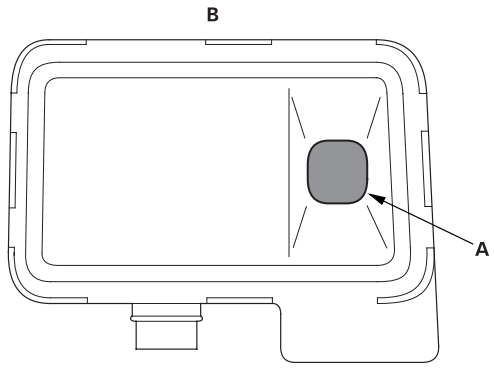


(cont'd)

Valve Bodies and ATF Strainer Removal (cont'd)

NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF feed pipes from the regulator valve body, and servo body.
2. Remove the ATF strainer (two bolts).
3. Remove the servo body (13 bolts), then remove the separator plate and dowel pins (two).
4. Remove the ATF joint pipes (one bolt) from the regulator valve body.
5. Remove the regulator valve body (seven bolts).
6. Remove the stator shaft and stator shaft stop.
7. Remove the regulator separator plate and dowel pins (two).
8. Remove the cooler check valve spring and valve from the main valve body, then remove the main valve body (three bolts). Do not let the check balls fall out.
9. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
10. Remove the main separator plate and dowel pins (two).
11. Clean the inlet opening (A) of the ATF strainer (B) thoroughly with compressed air, then check that it is in good condition and that the inlet opening is not clogged.



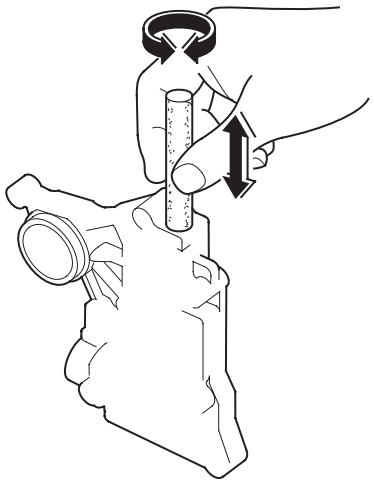
12. Test the ATF strainer by pouring clean ATF through the inlet opening, and replace it if it is clogged or damaged.

Valve Body Repair

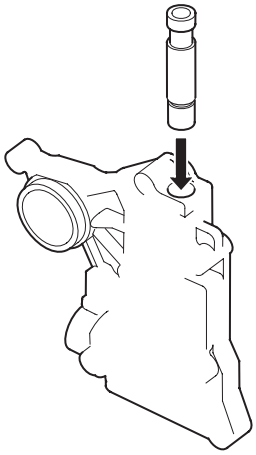
NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. Use this procedure to free the valves.

1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.
3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked #600 paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

   NOTE: The valve body is aluminum and doesn't require much polishing to remove any burrs.



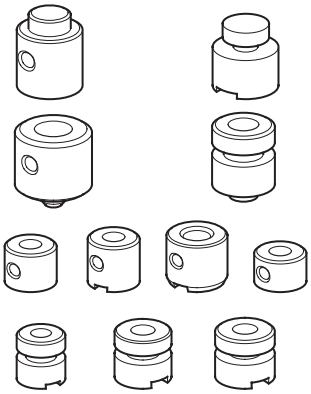
5. Remove the #600 paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat step 4, then retest. If the valve still sticks, replace the valve body.



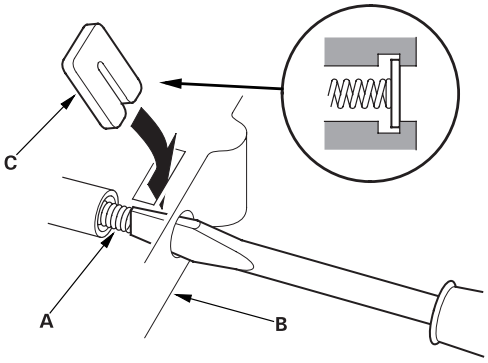
7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

Valve Body Valve Installation

1. Coat all parts with ATF before assembly.
2. Install the valves and springs in the sequence shown for the main valve body (see page 14-209), regulator valve body (see page 14-211), and servo body (see page 14-212). Refer to the following valve cap illustrations, and install each valve cap so the end shown facing up will be facing the outside of the valve body.

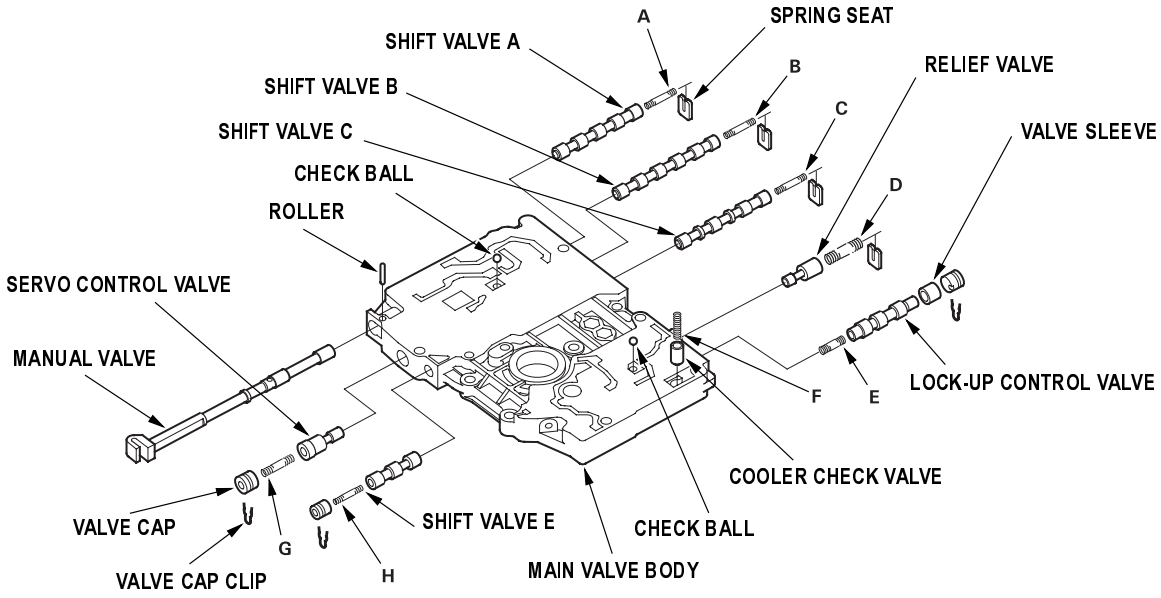


3. Install all the springs and seats. Insert the spring (A) in the valve, then install the valve in the valve body (B). Push the spring in with a screwdriver, then install the spring seat (C).



Main Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Do not use a magnet to remove the check balls, it may magnetize the balls.
3. Inspect the valbe body for scoring and damage.
4. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-207).
5. Coat all parts with ATF during assembly.

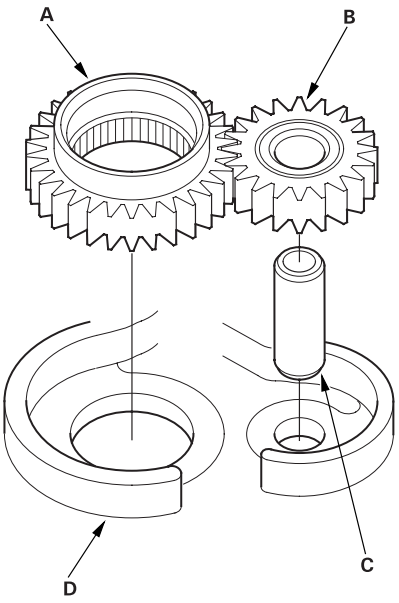


SPRING SPECIFICATIONS

Springs		Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	Shift valve A spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
B	Shift valve B spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
C	Shift valve C spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
D	Relief valve spring	1.0 (0.039)	9.6 (0.378)	34.1 (1.343)	10.2
E	Lock-up control valve spring	0.65 (0.026)	7.1 (0.280)	23.1 (0.909)	12.7
F	Cooler check valve spring	0.9 (0.035)	6.6 (0.260)	26.5 (1.043)	12.6
G	Servo control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
H	Shift valve E spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9

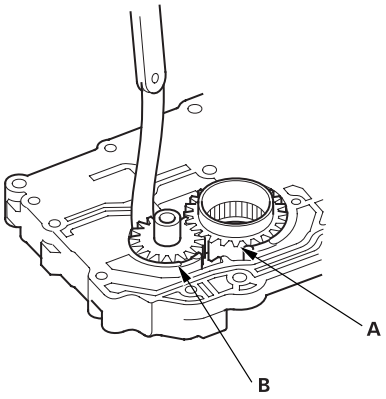
ATF Pump Inspection

1. Install the ATF pump drive gear (A), driven gear (B) and ATF pump driven gear shaft (C) in the main valve body (D). Lubricate all parts with ATF, and install the ATF pump driven gear with its grooved and chamfered side facing up.



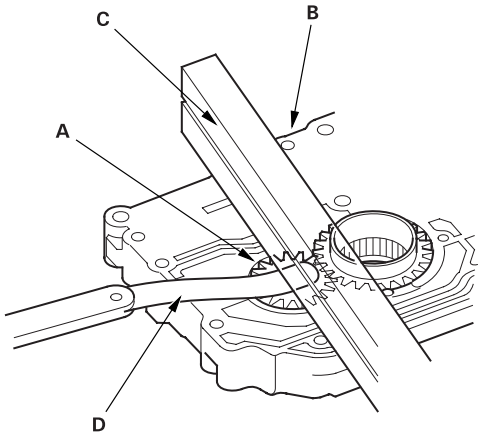
2. Measure the side clearance of the ATF pump drive gear (A) and driven gear (B).

ATF Pump Gears Side (Radial) Clearance:
Standard (New):
ATF Pump Drive Gear
0.210 - 0.265 mm (0.0083 - 0.0104 in.)
ATF Pump Driven Gear
0.070 - 0.125 mm (0.0028 - 0.0049 in.)



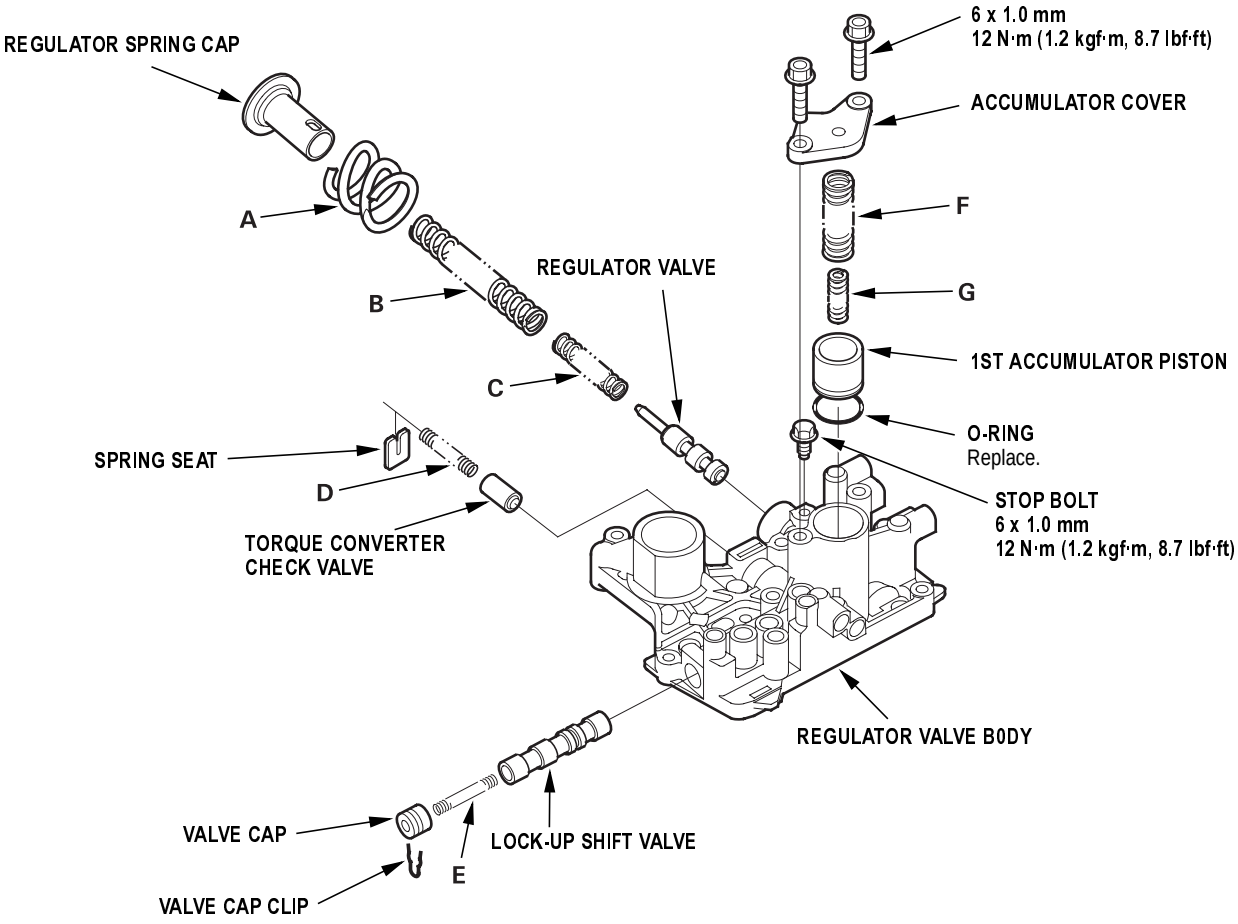
3. Remove the ATF pump driven gear shaft. Measure the thrust clearance between the ATF pump driven gear (A) and the valve body (B) with a straight edge (C) and a feeler gauge (D).

ATF Pump Drive/Driven Gear Thrust (Axial) Clearance:
Standard (New):
0.03 - 0.05 mm (0.001 - 0.002 in.)
Service Limit:
0.07 mm (0.003 in.)



Regulator Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Inspect the valve body for scoring and damage.
3. Check all valves for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-207).
4. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out.
5. Coat all parts with ATF during assembly.
6. When reassembling the valve body, align the hole in the regulator spring cap with the hole in the valve body, then press the spring cap into the valve body, and tighten the stop bolt.

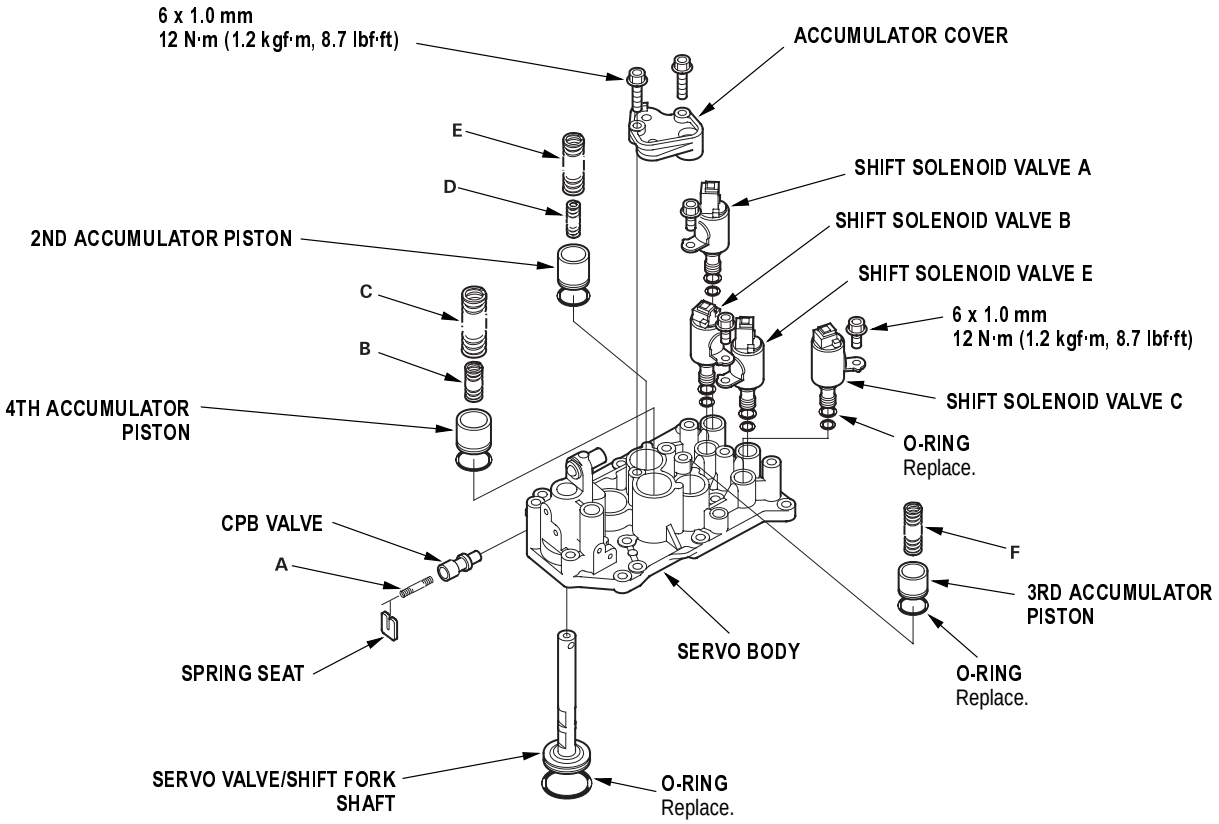


SPRING SPECIFICATIONS

Springs		Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
B	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	80.6 (3.173)	16.1
C	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
D	Torque converter check valve spring	1.2 (0.047)	8.6 (0.339)	33.8 (1.331)	12.2
E	Lock-up shift valve spring	1.0 (0.039)	6.6 (0.260)	35.5 (1.398)	18.2
F	1st accumulator spring A	2.4 (0.094)	18.6 (0.732)	49.0 (1.929)	7.1
G	1st accumulator spring B	2.3 (0.091)	12.2 (0.480)	31.5 (1.240)	6.6

Servo Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Inspect the valve body for scoring and damage.
3. Check CPB valve for free movement. If any fail to slide freely, refer to Valve Body Repair (see page 14-207).
4. Do not hold the shift solenoid valve connector to remove and install it. Be sure to hold the shift solenoid valve body. When installing the shift solenoid vales, refer to Shift Solenoid Valves Installation (see page 14-213).
5. Coat all parts with ATF during assembly.
6. Replace the O-rings with new one.



SPRING SPECIFICATIONS

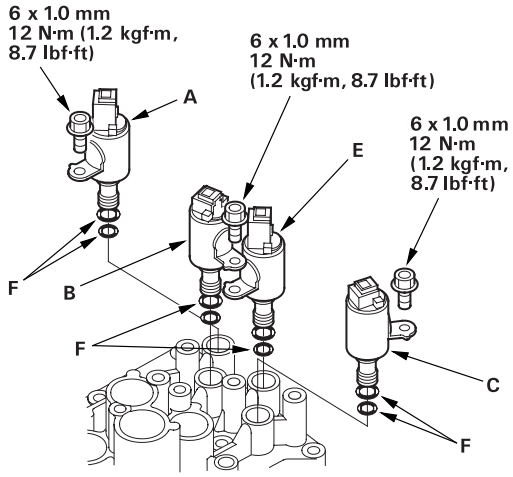
Springs		Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	CPB valve spring	0.7 (0.028)	9.1 (0.358)	32.3 (1.272)	8.6
B	4th accumulator spring B	2.3 (0.091)	12.2 (0.480)	31.5 (1.240)	6.6
C	4th accumulator spring A	2.4 (0.094)	18.6 (0.732)	49.0 (1.929)	7.1
D	2nd accumulator spring B	2.0 (0.079)	10.6 (0.417)	34.0 (1.339)	8.0
E	2nd accumulator spring A	2.2 (0.087)	16.6 (0.654)	48.2 (1.898)	8.5
F	3rd accumulator spring	2.5 (0.098)	14.6 (0.575)	29.9 (1.177)	4.9

Shift Solenoid Valves Installation

NOTE:
- Do not install the shift solenoid valve B before installing the shift solenoid valve E. If solenoid valve B is installed before solenoid valves E, it may damage to hydraulic control system.
- Do not hold the shift solenoid valve connector to install it. Be sure to hold the shift solenoid valve body.

1. Install the new O-rings (F) on each shift solenoid valves.

NOTE: The new shift solenoid valve is equipped with the new O-rings. If you install the new shift solenoid valve, it is no need to replace the new O-rings on it.



2. Install the shift solenoid valve A with holding the shift solenoid valve body, be sure to install the solenoid valve A until its mounting bolt bracket contacts to the servo body.

3. Install the shift solenoid valve E with holding the shift solenoid valve body, be sure to install the solenoid valve E until its mounting bolt bracket contacts to the servo body.

4. Install the shift solenoid valve B with holding the shift solenoid valve body, be sure to install the solenoid valve B until its mounting bolt bracket contacts to the bracket of the shift solenoid valve E.

5. Install the shift solenoid valve C with holding the shift solenoid valve body, be sure to install the solenoid valve C until its mounting bolt bracket contacts to the servo body.

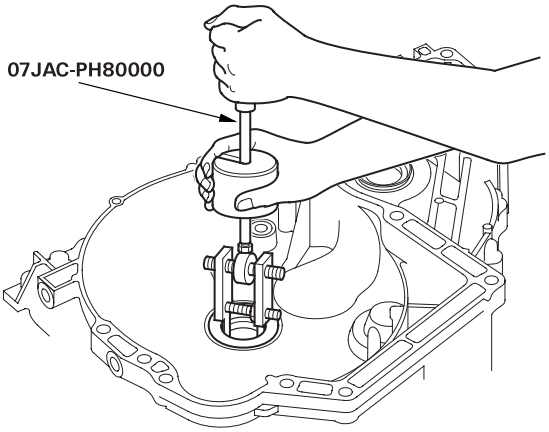
Torque Converter Housing

Mainshaft Bearing and Oil Seal Replacement

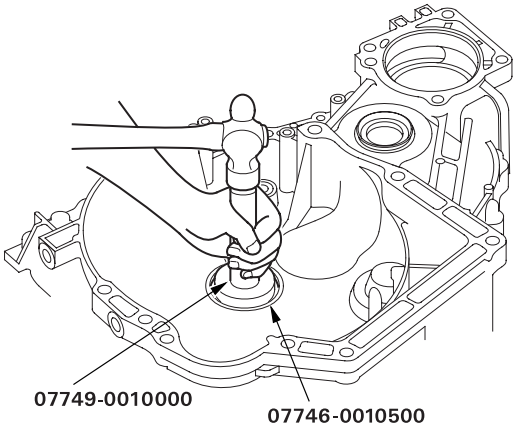
Special Tools Required

- Adjustable bearing remover set 07JAC-PH80000
- Handle driver 07749-0010000
- Driver attachment, 62 x 68 mm 07746-0010500
- Driver attachment, 72 x 75 mm 07746-0010600

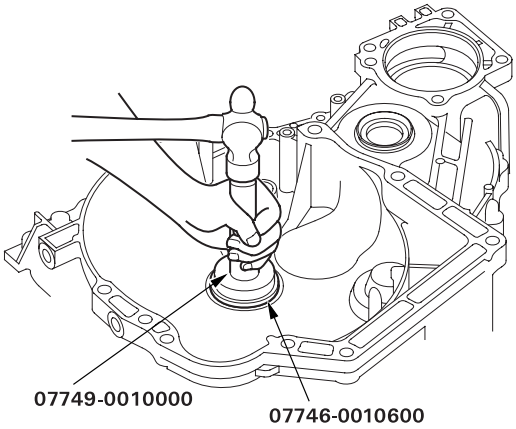
1. Remove the mainshaft bearing and oil seal with the special tool.



2. Install the new mainshaft bearing until it bottoms in the housing with the special tools.



3. Install the new oil seal flush with the housing with the special tools.

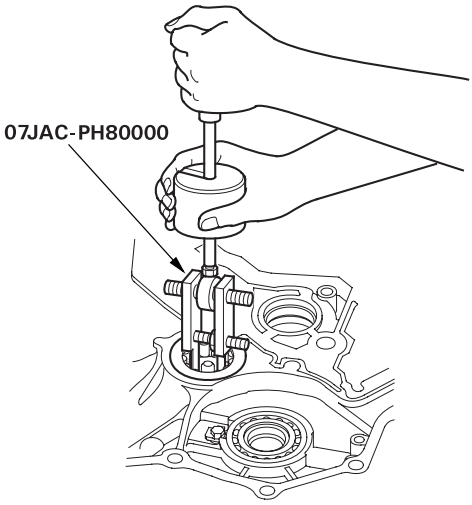


Countershaft Bearing Replacement

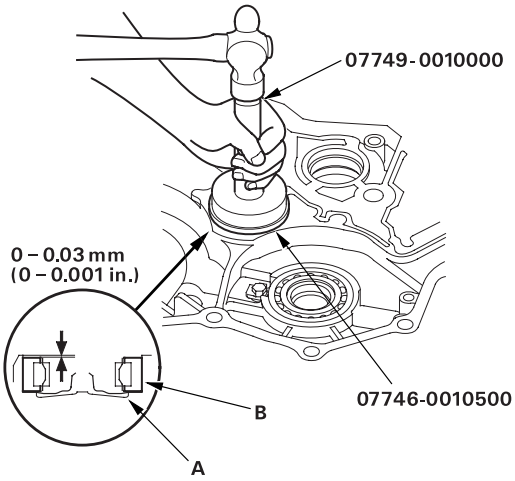
Special Tools Required

- Adjustable bearing remover set 07JAC-PH80000
- Handle driver 07749-0010000
- Driver attachment, 62 x 68 mm 07746-0010500

1. Remove the countershaft bearing with the special tool.



2. Install the ATF guide plate (A).

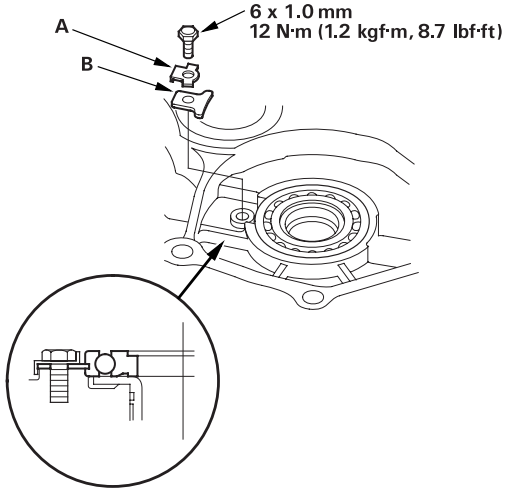


3. Install the new countershaft bearing (B) in the housing with the special tools.

Secondary Shaft Bearing Replacement

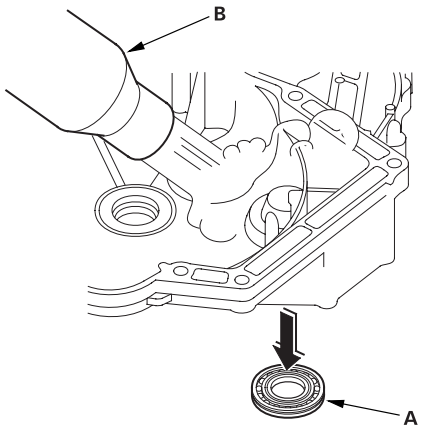
Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 62 x 68 mm 07746-0010500

1. Remove the bolt, then remove the lock washer (A) and bearing set plate (B).

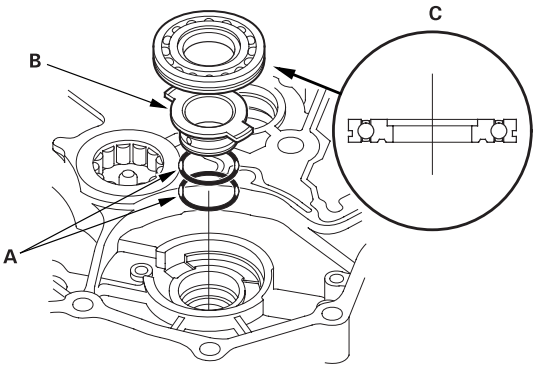


2. Remove the secondary shaft bearing (A) by heating the housing to about 212 °F (100 °C) with a heat gun (B). Do not heat the housing in excess of 212 °F (100 °C).

   NOTE: Let the housing cool to normal temperature before installing the bearing.

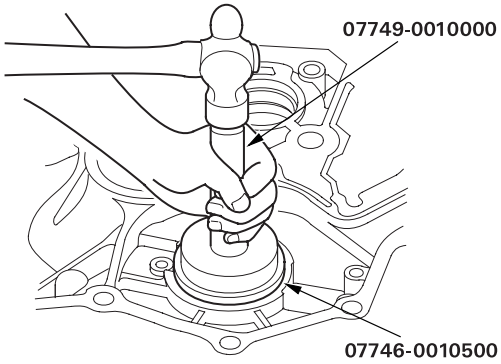


3. Install the new O-rings (A) on the ATF guide collar (B), then install the ATF guide collar in the housing.



4. Install the new secondary shaft bearing (C) in the direction shown.

5. Drive the secondary shaft bearing with the special tools, and install it securely in the housing.



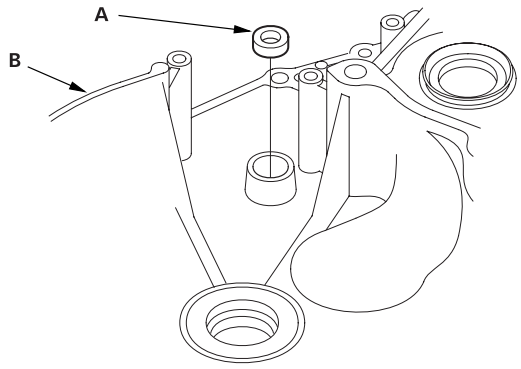
6. Check that the bearing groove aligns with the housing surface, then install the bearing set plate with aligning the bearing groove.

7. Install the new lock washer and bolt, then bend the lock tab of the lock washer against the bolt head.

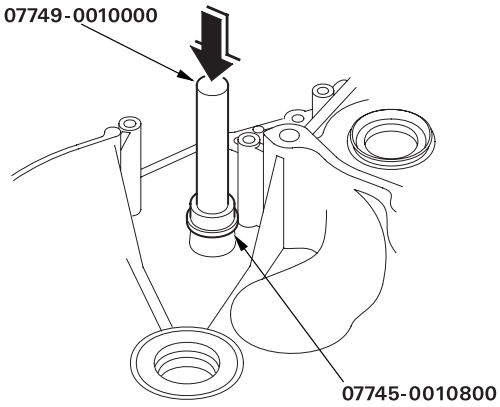
Control Shaft Oil Seal Replacement

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal (A) from the torque converter housing (B).



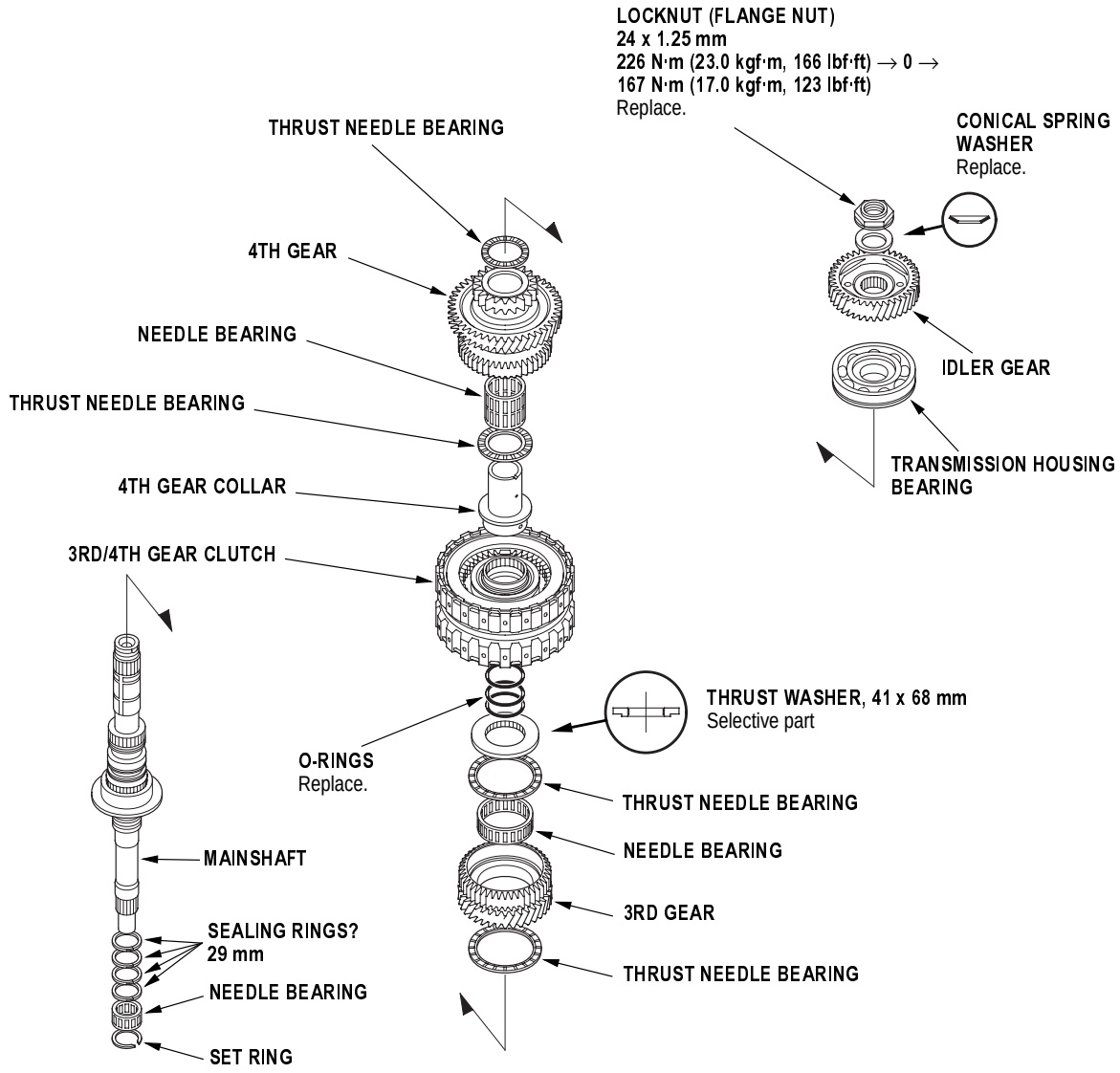
2. Install the new oil seal flush to the torque converter housing with the special tools.



Shafts and Clutches

Mainshaft Disassembly, Inspection and Reassembly

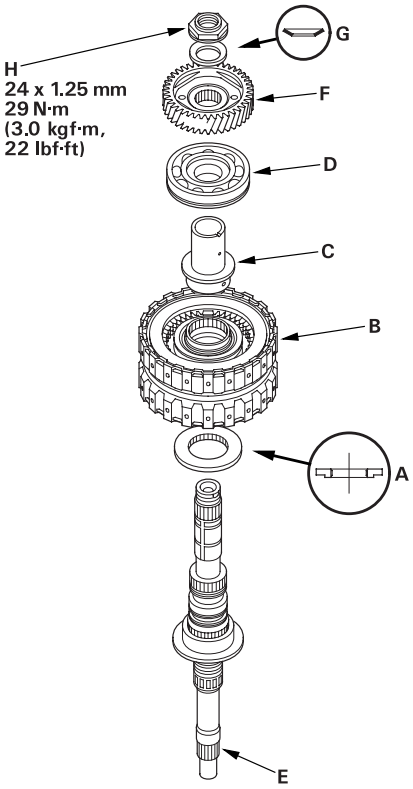
1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.



2. Inspect the splines for excessive wear and damage.
3. Check shaft bearing surface for scoring and excessive wear.
4. Before installing the O-rings, wrap the shaft splines with tape to prevent O-ring damage.
5. Lubricate all parts with ATF during assembly.
6. Install the conical spring washer, 41 x 68 mm thrust washer in the direction shown.
7. Replace the locknut and conical spring washer with new ones when assembling the transmission.
8. Check the clearance of the 3rd gear.

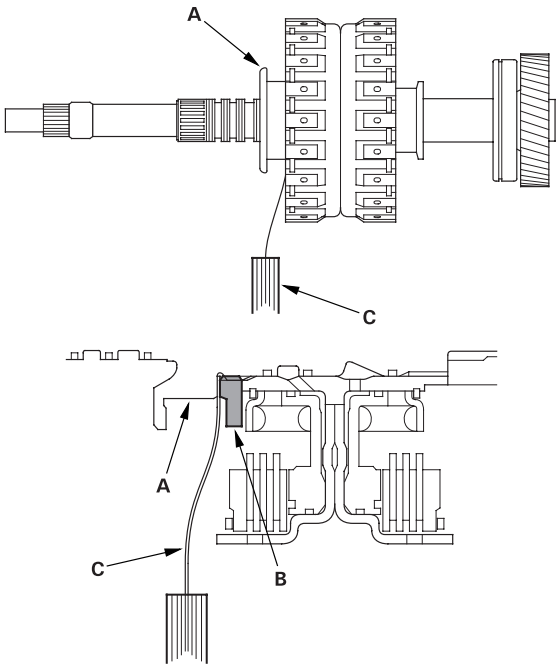
Mainshaft 3rd Gear Clearance Inspection

1. Remove the mainshaft transmission housing bearing (see page 14-202).
2. Assemble 41 x 68 mm thrust washer (A), 3rd/4th clutch (B), 4th gear collar (C), and transmission housing bearing (D) on the mainshaft (E). Do not install the O-rings during inspection.



3. Install the idler gear (F) on the mainshaft by a press, then install the conical spring washer (G) and locknut (H).
4. Tighten the locknut to 29 N·m (3.0 kgf·m, 22 lbf·ft).
5. Measure the clearance between the mainshaft flange (A) and 41 x 68 mm thrust washer (B) with a feeler gauge (C), in at least three places. Use the average as the actual clearance.

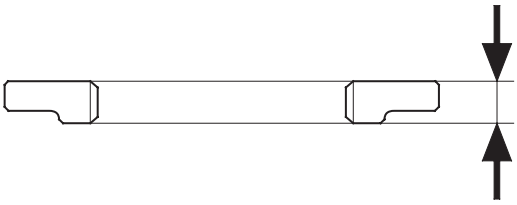
STANDARD: 0.03 - 0.11 mm (0.001 - 0.004 in.)



(cont'd)

Mainshaft 3rd Gear Clearance Inspection (cont'd)

6. If the clearance is out of standard, remove the 41 x 68 mm thrust washer and measure its thickness.



7. Select and install a new thrust washer, then recheck.

THRUST WASHER, 41 x 68 mm

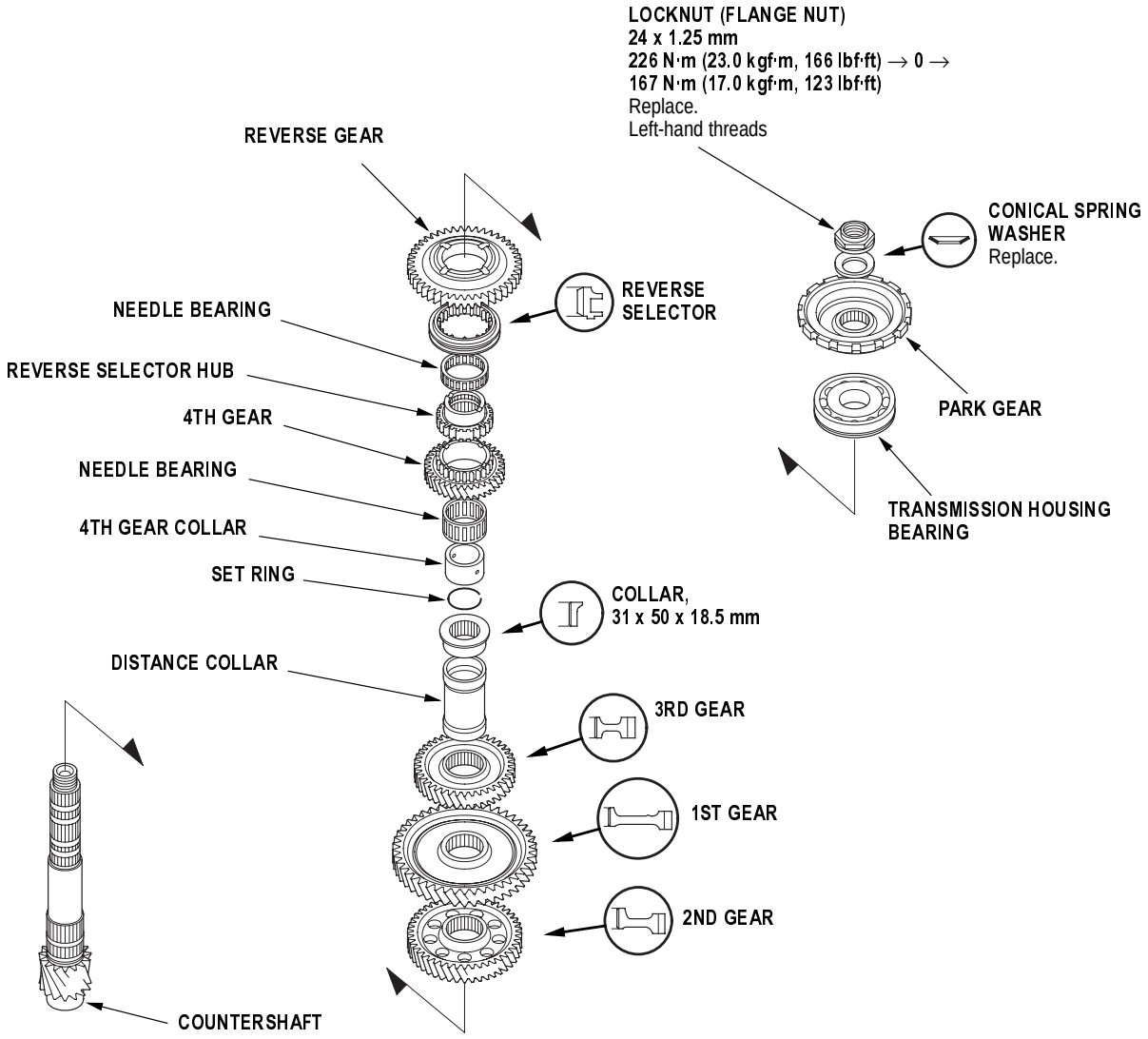
No.	Part Number	Thickness
1	90414-PRP-000	6.35 mm (0.250 in.)
2	90415-PRP-000	6.40 mm (0.252 in.)
3	90416-PRP-000	6.45 mm (0.254 in.)
4	90417-PRP-000	6.50 mm (0.256 in.)
5	90418-PRP-000	6.55 mm (0.258 in.)
6	90419-PRP-000	6.60 mm (0.260 in.)

8. After replacing the thrust washer, make sure the clearance is within standard.
9. Disassemble the shaft and gears.
10. Reinstall the bearing in the transmission housing (see page 14-203).

Countershaft Disassembly, Inspection and Reassembly

K20A4 and K20A5 Engine Models

1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.

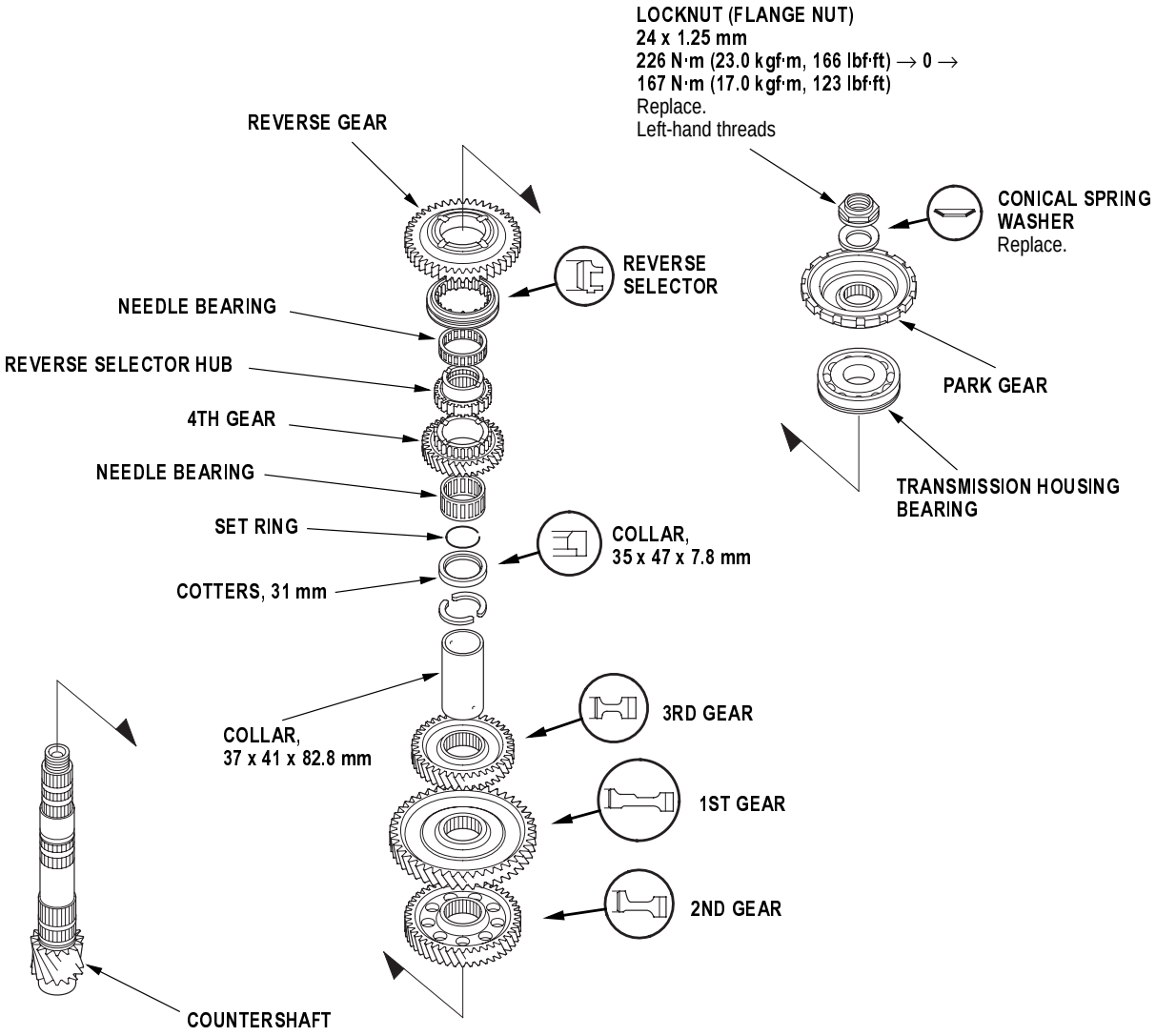


2. Inspect the splines for excessive wear and damage.
3. Check shaft bearing surface for scoring and excessive wear.
4. Lubricate all parts with ATF during assembly.
5. Install the conical spring washer, reverse selector, 31 x 50 x 18.5 mm collar, 3rd gear, 1st gear, and 2nd gear in the direction shown.
6. Countershaft locknut has left-hand threads.
7. Replace the locknut and conical spring washer with new ones when assembling the transmission.
8. Some reverse selector hubs and 4th gear collars are press-fitted to the countershaft; special tools are needed to remove them (see page 14-223) and install them (see page 14-224).

Countershaft Disassembly, Inspection and Reassembly (cont'd)

K24A1 Engine Model

1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.



2. Inspect the splines for excessive wear and damage.
3. Check shaft bearing surface for scoring and excessive wear.
4. Lubricate all parts with ATF during assembly.
5. Install the conical spring washer, reverse selector, 31 x 47 x 7.8 mm collar, 3rd gear, 1st gear, and 2nd gear in the direction shown.
6. Countershaft locknut has left-hand threads.
7. Replace the locknut and conical spring washer with new ones when assembling the transmission.
8. Some reverse selector hubs are press-fitted to the countershaft; special tools are needed to remove them (see page 14-225) and install them (see page 14-226).

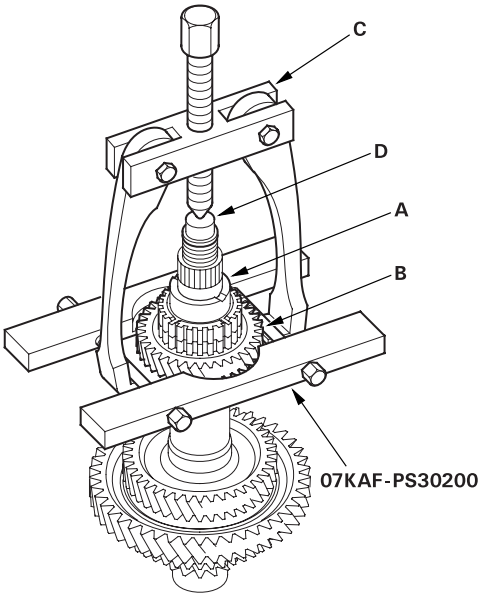
Selector Hub and 4th Gear Collar Removal

Special Tools Required
Bearing separator 07KAF-PS30200

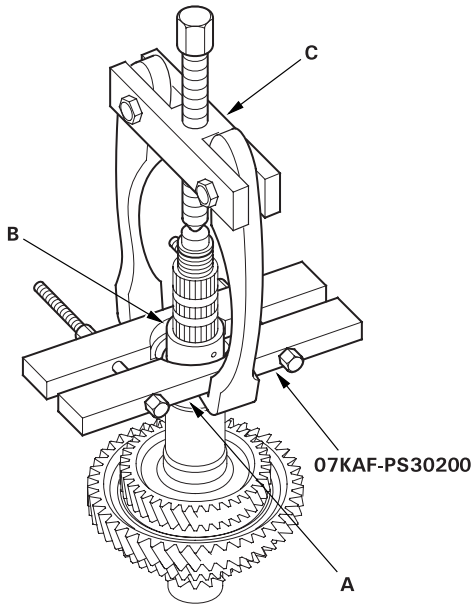
K20A4 and K20A5 Engine Models

NOTE:
- Some reverse selector hubs and 4th gear collars are not press-fitted, and can be removed without using the special tool and a puller.
- Place a shaft protector between the countershaft and a puller to prevent damaging the countershaft.

1. Remove the reverse selector hub (A) and 4th gear (B) with the special tool, a two-jaw (or three-jaw) puller (C), and a shaft protector (D).



2. Install the special tool with inserting it to the opening between 31 x 50 x 18.5 mm collar (A) and 4th gear collar (B). Set the puller (C) to the special tool, then remove the 4th gear collar.



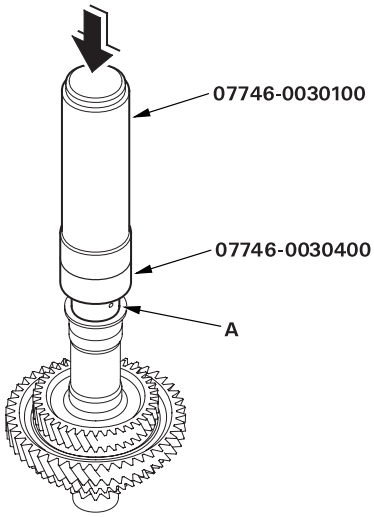
Selector Hub and 4th Gear Collar Installation

Special Tools Required
- Driver 40 mm I.D. 07746-0030100
- Driver attachment, 35 mm I.D. 07746-0030400

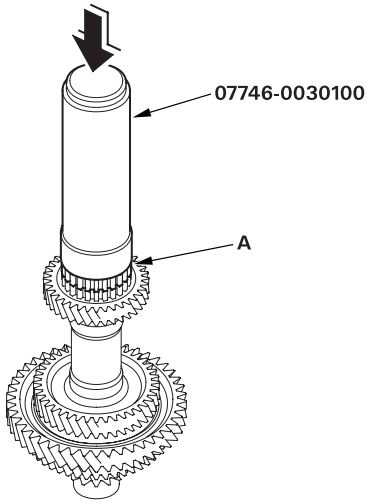
K20A4 and K20A5 Engine Models

NOTE: Some reverse selector hubs and 4th gear collars are not press-fitted, and can be installed without using the special tools and a press.

1. Assemble the 2nd gear, 1st gear, 3rd gear, distance collar, and 31 x 50 x 18.5 mm collar on the countershaft, and secure them with the set ring (see page 14-221).
2. Install the 4th gear collar (A) with the special tools and a press.



3. Install the needle bearing and 4th gear.
4. Install the reverse selector hub (A) with the special tool and a press.

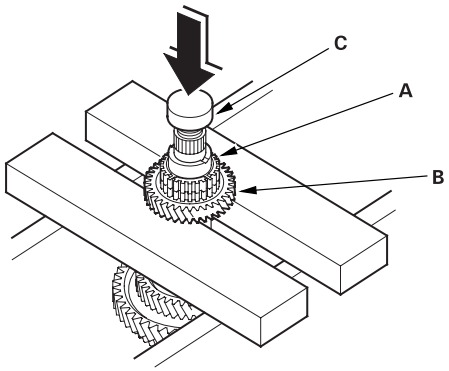


Reverse Selector Hub and 1st Gear Removal

K24A1 Engine Model

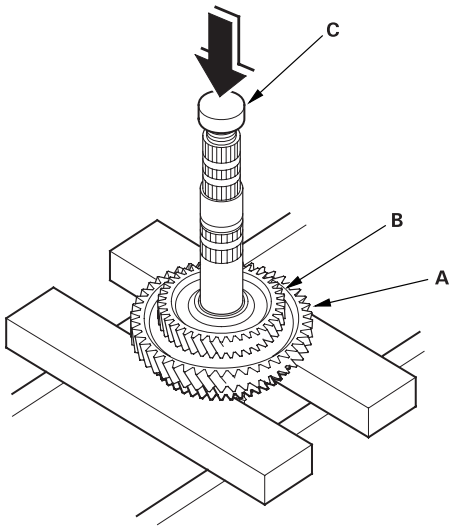
1. Remove the reverse selector hub (A) and the 4th gear (B) from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.

   NOTE: Some reverse selector hubs are not press-fitted, and can be removed without using a press.



2. Remove the needle bearing, set ring, 35 x 47 x 7.8 mm collar, 31 mm cotters, and 37 x 41 x 82.8 mm collar from the countershaft.

3. Remove the 1st gear (A) and 3rd gear (B) from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.



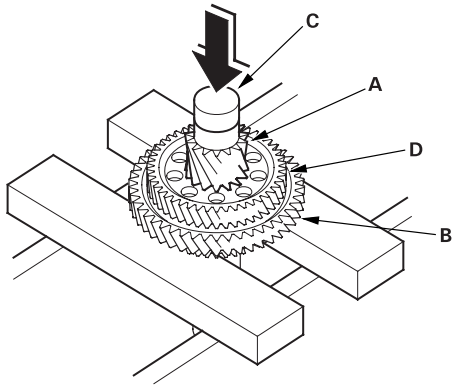
4. Remove the 2nd gear from the countershaft by hand.

Reverse Selector Hub and 1st Gear Installation

Special Tools Required
Driver 40 mm I.D. 07746-0030100

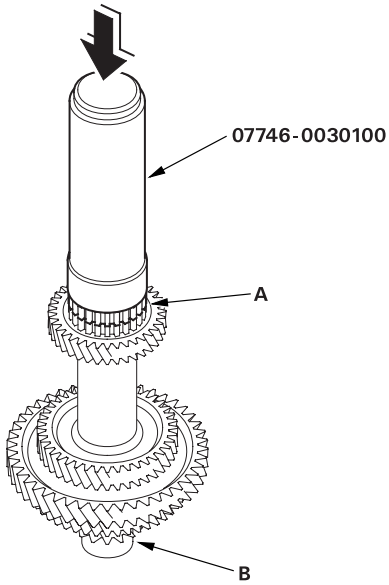
K24A1 Engine Model

1. Apply ATF to the parts.
2. Install the 2nd gear to the countershaft by hand.
3. Align the shaft splines with those on 1st gear, then press the countershaft (A) into the 1st gear (B) with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the contershaft.



4. Stop pressing the countershaft when the 1st gear contacts the 2nd gear (D).
5. Install the 3rd gear, 37 x 41 x 82.8 mm collar, 31 mm cotters, 35 x 47 x 7.8 mm collar, set ring, needle bearing, and 4th gear on the countershaft.
6. Slide the reverse selector hub (A) over the countershaft (B), then press it in place with the special tool and a press.

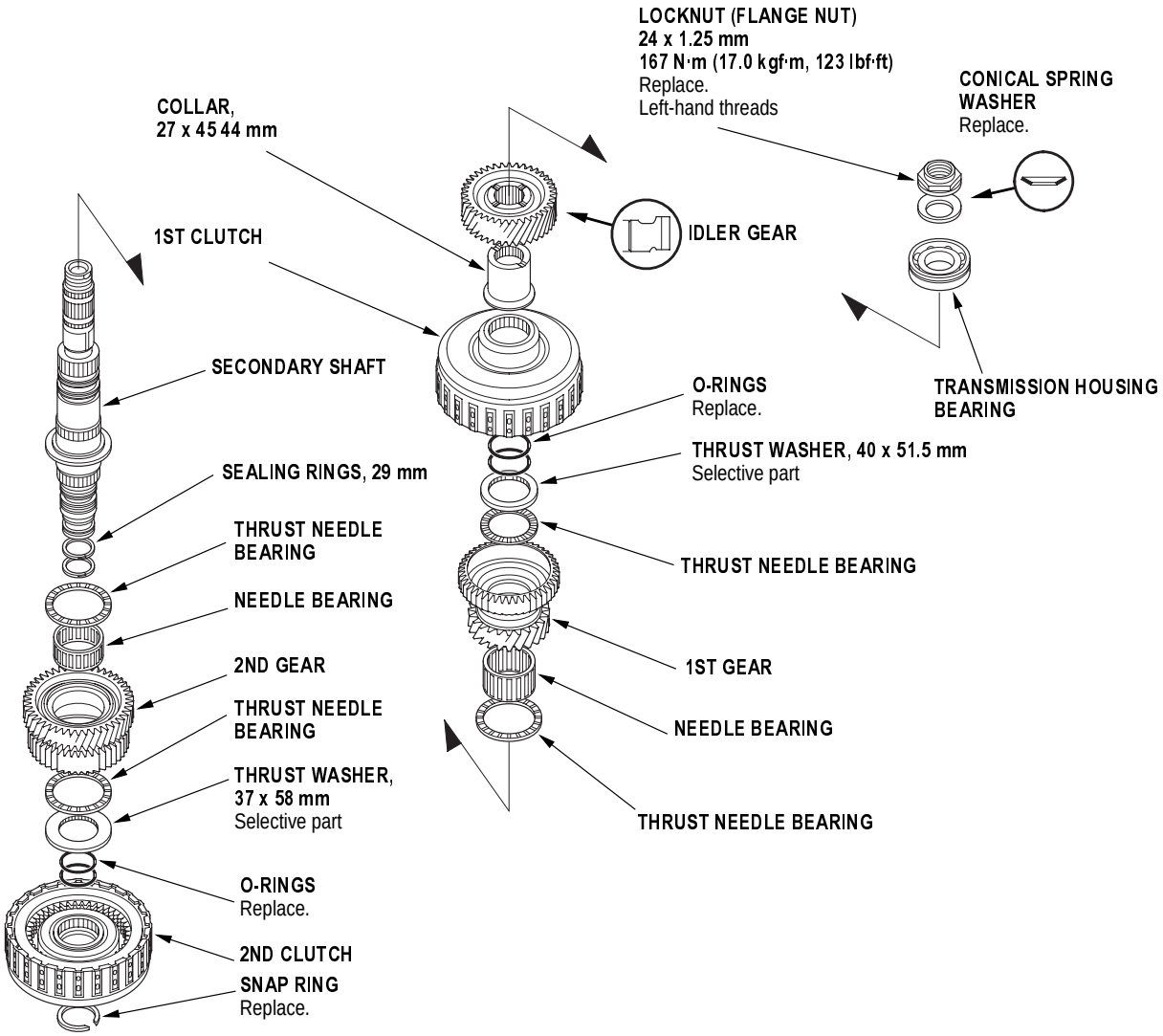
   NOTE: Some reverse selector hubs are not press-fitted, and can be installed without using the special tool and a press.



Secondary Shaft Disassembly, Inspection and Reassembly

NOTE: The illustration shows the K20A4 and K20A5 engine models; the K24A1 engine model is similar.

1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.



2. Inspect the splines for excessive wear and damage.

3. Check shaft bearing surface for scoring and excessive wear.

4. Before installing the O-rings, wrap the shaft splines with tape to prevent O-ring damage.

5. Lubricate all parts with ATF during assembly.

6. Install the conical spring washer, idler gear in the direction shown.

7. Secondary shaft locknut has left-hand threads.

8. Replace the locknut and conical spring washer with new ones when assembling the transmission.

9. Check the clearance of the 2nd and 1st gears.

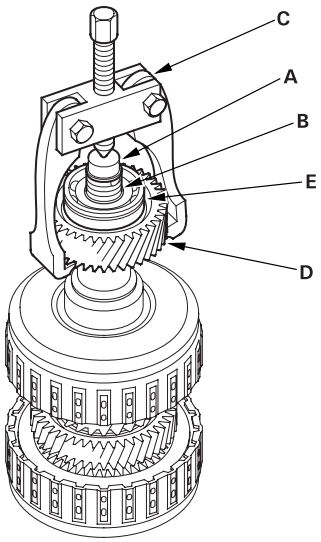
Secondary Shaft Ball Bearing, Idler Gear Removal and Installation

Special Tools Required
Driver attachment, 42 mm I.D. 07QAD-P0A0100

NOTE: The illustration shows the K20A4 and K20A5 engine models; the K24A1 engine model is similar.

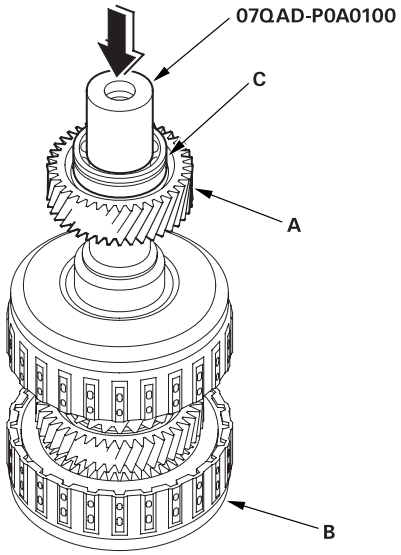
Removal

1. Place a shaft protector (A) on the secondary shaft (B), and set the puller (C) to the idler gear (D), then remove the idler gear and ball bearing (E).



Installation

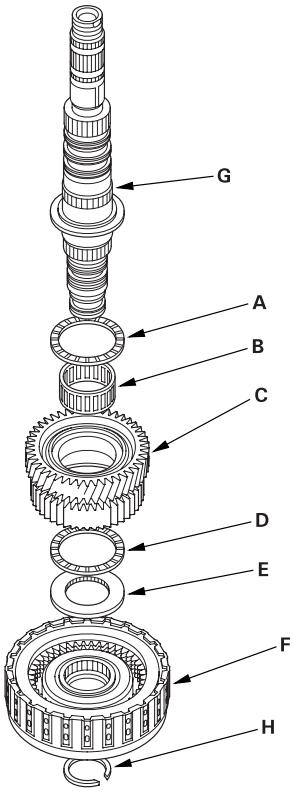
1. Install the idler gear (A) on the secondary shaft (B), and install the ball bearing (C) over the idler gear with the special tool and a press.



Secondary Shaft 2nd Gear Clearance Inspection

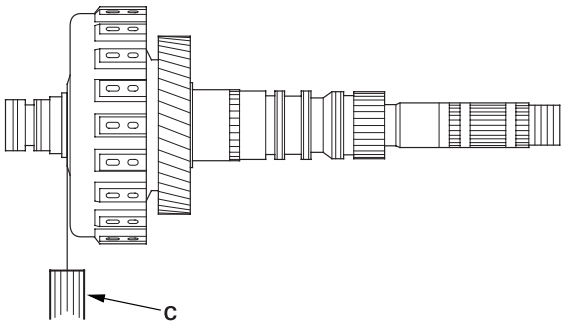
NOTE: The illustration shows the K20A4 and K20A5 engine models; the K24A1 engine model is similar.

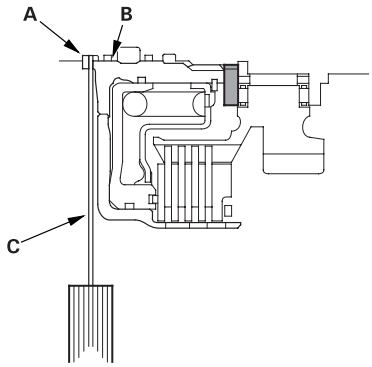
1. Install the thrust needle bearing (A), needle bearing (B), 2nd gear (C), thrust needle bearing (D), 37 x 58 mm thrust washer (E), and 2nd clutch (F) on the secondary shaft (G), then secure them with the snap ring (H).



2. Measure the clearance between the snap ring (A) and the 2nd clutch guide (B) with a feeler gauge (C), in at least three places. Use the average as the actual clearance.

STANDARD: 0.04 - 0.12 mm (0.002 - 0.005 in.)





(cont'd)

Secondary Shaft 2nd Gear Clearance Inspection (cont'd)

3. If the clearance is out of standard, remove the 37 x 58 mm thrust washer and measure its thickness.

4. Select and install a new thrust washer, then recheck.

THRUST WASHER, 37 x 58 mm

No.	Part Number	Thickness
1	90511-PRP-010	3.900 mm (0.154 in.)
2	90512-PRP-010	3.925 mm (0.155 in.)
3	90513-PRP-010	3.950 mm (0.156 in.)
4	90514-PRP-010	3.975 mm (0.156 in.)
5	90515-PRP-010	4.000 mm (0.157 in.)
6	90516-PRP-010	4.025 mm (0.158 in.)
7	90517-PRP-010	4.050 mm (0.159 in.)
8	90518-PRP-010	4.075 mm (0.160 in.)
9	90519-PRP-010	4.100 mm (0.161 in.)
10	90520-PRP-010	4.125 mm (0.162 in.)
11	90521-PRP-010	4.150 mm (0.163 in.)
12	90522-PRP-010	4.175 mm (0.164 in.)
13	90523-PRP-000	4.200 mm (0.165 in.)
14	90524-PRP-000	4.225 mm (0.166 in.)
15	90525-PRP-000	4.250 mm (0.167 in.)
16	90526-PRP-000	4.275 mm (0.168 in.)
17	90527-PRP-000	4.300 mm (0.169 in.)
18	90528-PRP-000	4.325 mm (0.170 in.)
19	90529-PRP-000	4.350 mm (0.171 in.)
20	90530-PRP-000	4.375 mm (0.172 in.)

5. After replacing the thrust washer, make sure the clearance is within standard.

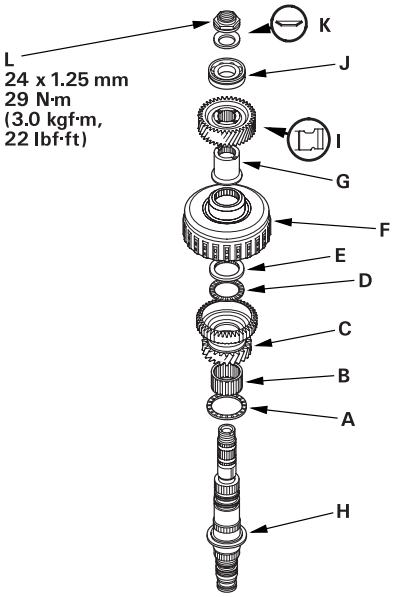
6. Disassemble the shaft and gears.

Secondary Shaft 1st Gear Clearance Inspection

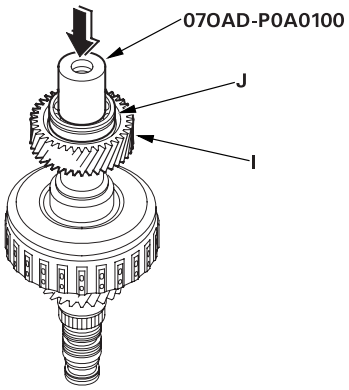
Special Tools Required
Driver attachment, 42 mm I.D. 07QAD-P0A0100

NOTE: The illustration shows the K20A4 and K20A5 engine models; the K24A1 engine model is similar.

1. Install the thrust needle bearing (A), needle bearing (B), 1st gear (C), thrust needle bearing (D), 40 x 51.5 mm thrust washer (E), 1st clutch (F), and 27 x 45 x 44 mm collar (G) on the secondary shaft (H).

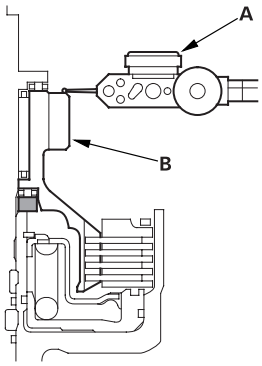


2. Install the idler gear (I), then install the ball bearing (J) on the idler gear with the special tool and a press.



3. Install the conical spring washer (K) and locknut (L), then tighten the locknut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

4. Turn the secondary shaft assembly upside down, and set the dial indicator (A) on the 1st gear (B).

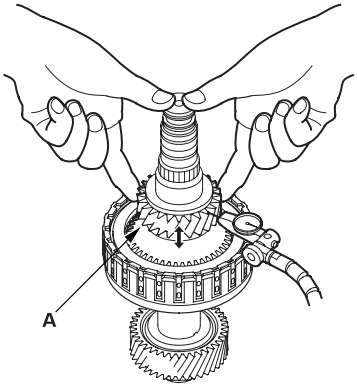


(cont'd)

Secondary Shaft 1st Gear Clearance Inspection (cont'd)

5. Hold the secondary shaft, and measure the 1st gear axial clearance in at least three places while moving the 1st gear (A). Use the average as the actual clearance.

STANDARD: 0.04 - 0.12 mm (0.002 - 0.005 in.)



6. If the clearance is out of standard, remove the 40 x 51.5 mm thrust washer and measure its thickness.

7. Select and install a new thrust washer, then recheck.

THRUST WASHER, 40 x 51.5 mm

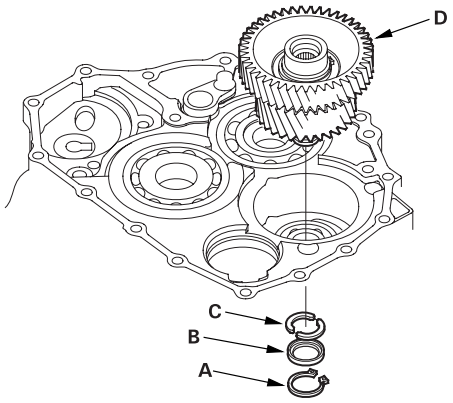
No.	Part Number	Thickness
1	90503-PRP-000	4.80 mm (0.189 in.)
2	90504-PRP-000	4.85 mm (0.191 in.)
3	90505-PRP-000	4.90 mm (0.193 in.)
4	90506-PRP-000	4.95 mm (0.195 in.)
5	90507-PRP-000	5.00 mm (0.197 in.)
6	90508-PRP-000	5.05 mm (0.199 in.)

8. After replacing the thrust washer, make sure the clearance is within standard.

9. Disassemble the shaft and gears.

Idler Gear Shaft Removal and Installation

1. Remove the snap ring (A), cotter retainer (B), and cotter keys (C). Do not distort the snap ring.

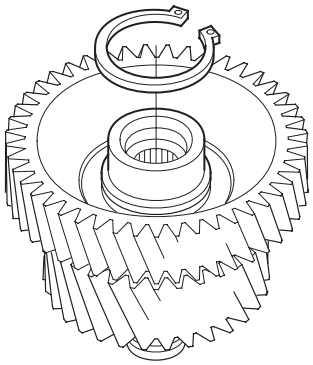


2. Remove the idler gear shaft/idler gear assembly (D) from the transmission housing.
3. Check the snap rings and cotter retainer for wear and damage. Replace them if they are worn, distorted, or damaged.
4. Install the idler gear and shaft in the reverse order of removal.

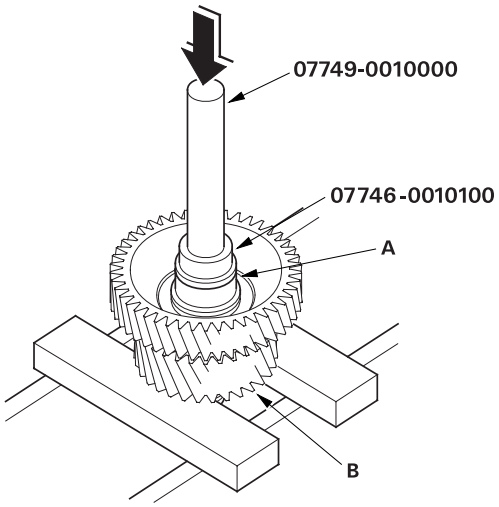
Idler Gear/Idler Gear Shaft Replacement

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 32 x 35 mm 07746-0010100

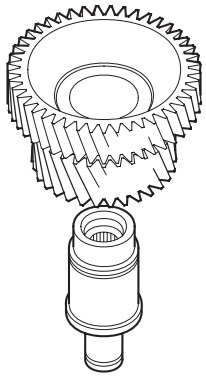
1. Remove the snap ring from the idler gear/idler shaft assembly.



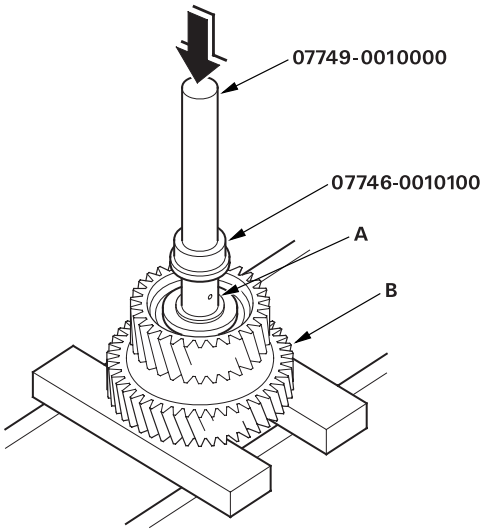
2. Remove the idler gear shaft (A) from the idler gear (B) with the special tools and a press.



3. Replace the idler gear or idler gear shaft, and attach the idler gear shaft to the idler gear.



4. Install the idler gear shaft (A) in the idler gear (B) with the special tools and a press.



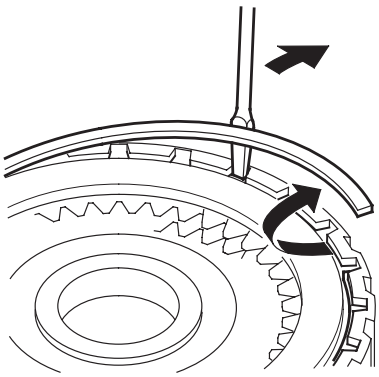
5. Install the snap ring.

Clutch Disassembly

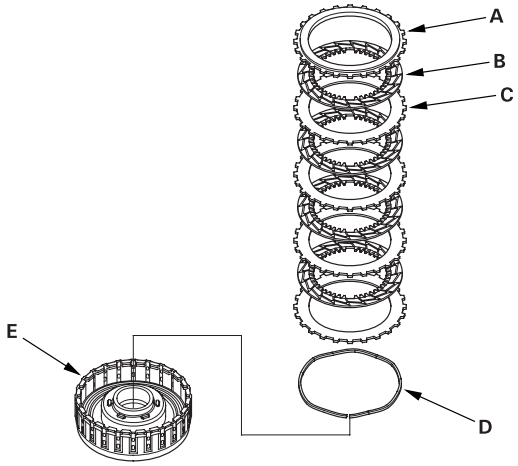
Special Tools Required

- Clutch spring compressor set 07LAE-PX40000
  - Clutch spring compressor attachment 07LAE-PX40100
  - Clutch spring compressor attachment 07HAE-PL50100
  - Clutch spring compressor bolt assembly 07GAE-PG40200
- Snap ring pliers 07LGC-0010100

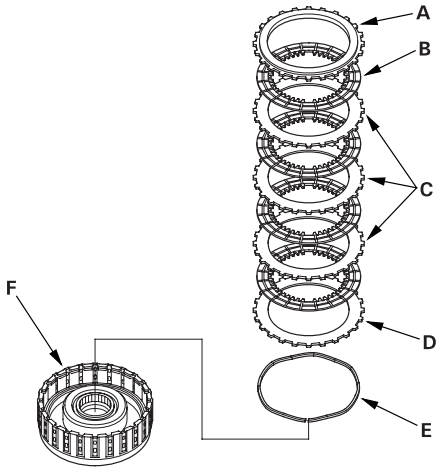
1. Remove the snap ring with a screwdriver.



2. Disassemble the 1st clutch of K20A4 and K20A5 engine models: Remove the clutch end plate (A), clutch discs (4) (B), clutch waved-plates (4) (C), and waved spring (D) from the 1st clutch drum (E).



3. Disassemble the 2nd clutch of K20A4 and K20A5 engine models: Remove the clutch end plate (A), clutch discs (4) (B), clutch waved-plates (3) (C), clutch flat-plate (D), and waved spring (E) from the 2nd clutch drum (F).

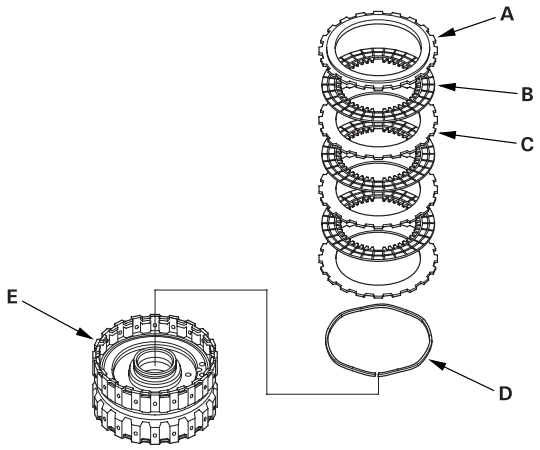


4. Make a reference mark on the clutch flat plate (D).

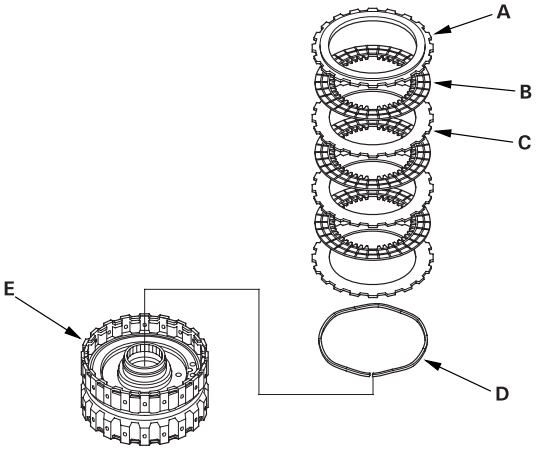
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Clutch Disassembly (cont'd)

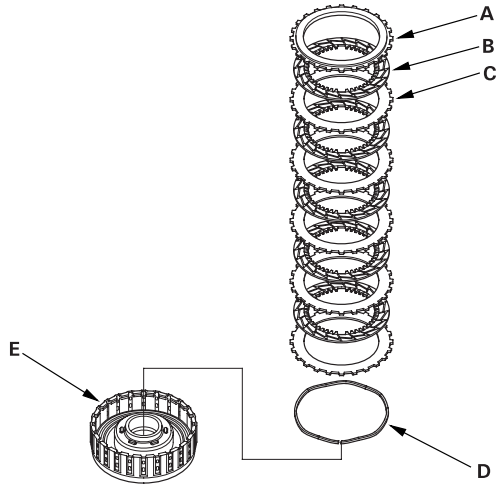
5. Disassemble the 3rd clutch of K20A4 and K20A5 engine models: Remove the clutch end plate (A), clutch discs (3) (B), clutch waved-plates (3) (C), and waved spring (D) from the 3rd clutch drum (E).



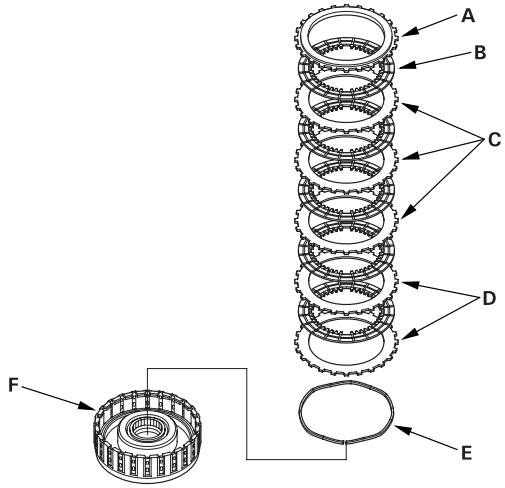
6. Disassemble the 4th clutch of K20A4 and K20A5 engine models: Remove the clutch end plate (A), clutch discs (3) (B), clutch waved-plates (3) (C), and waved spring (D) from the 4th clutch drum (E).



7. Disassemble the 1st clutch of K24A1 engine model: Remove the clutch end plate (A), clutch discs (5) (B), clutch waved-pates (5) (C), and waved spring (D) from the 1st clutch drum (E).

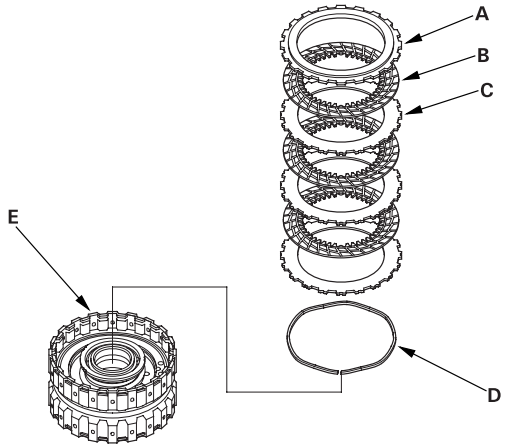


8. Disassemble the 2nd clutch of K24A1 engine model: Remove the clutch end plate (A), clutch discs (5) (B), clutch waved-plates (3) (C), clutch flat-plates (2) (D), and waved spring (E) from the 2nd clutch drum (F).

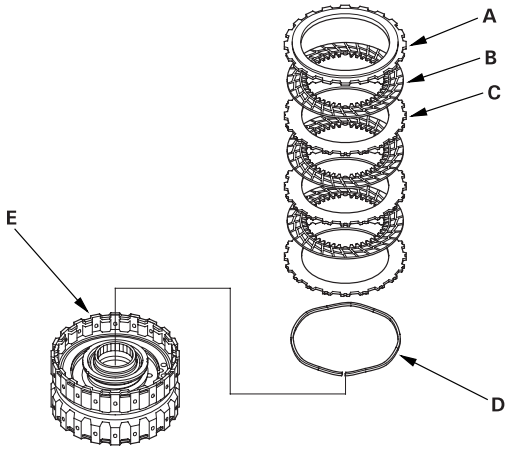


9. Make reference marks on the clutch flat-plates (D).

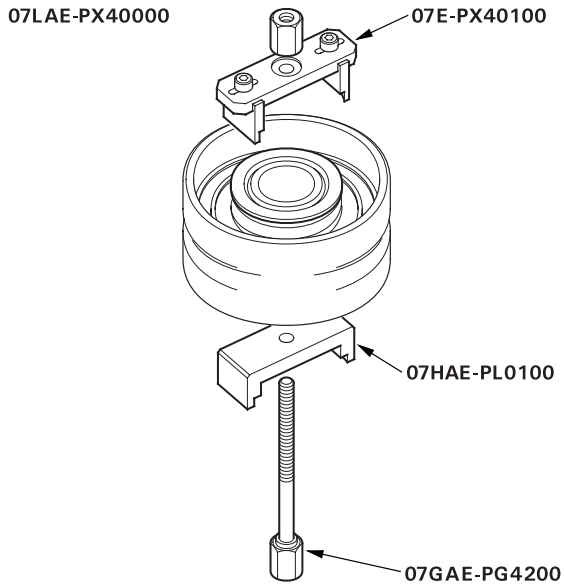
10. Disassemble the 3rd clutch of K24A1 engine model: Remove the clutch end plate (A), clutch discs (3) (B), clutch waved-plates (3) (C), and waved spring (D) from the 3rd clutch drum (E).



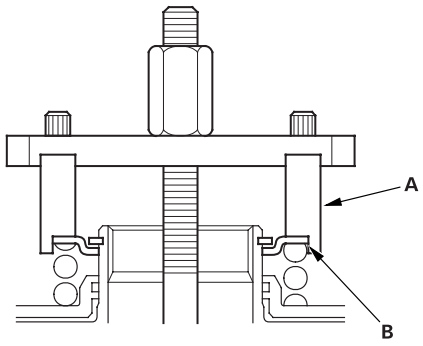
11. Disassemble the 4th clutch of K24A1 engine model: Remove the clutch end plate (A), clutch discs (3) (B), clutch waved-plates (3) (C), and waved spring (D) from the 4th clutch drum (E).



12. Install the special tools.



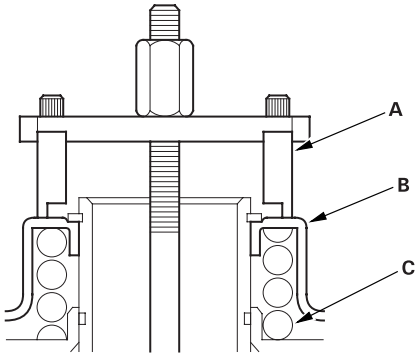
13. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 3rd and 4th clutches.



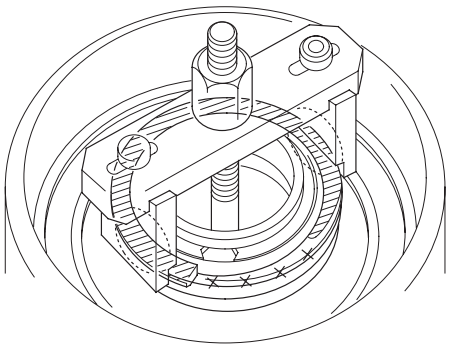
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Clutch Disassembly (cont'd)

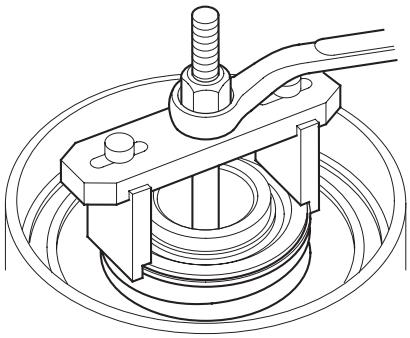
14. Set the special tool (A) on the spring retainer (B) of the 1st and 2nd clutches in such a way that the special tool works on the clutch return spring (C).



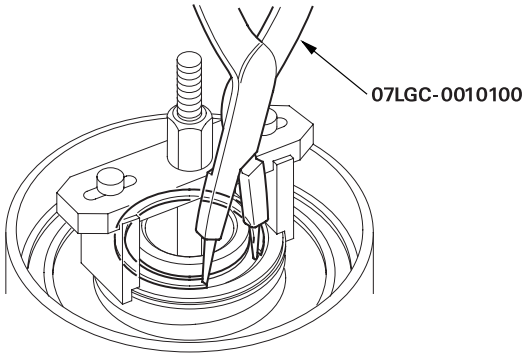
15. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



16. Compress the return spring until the snap ring can be removed.

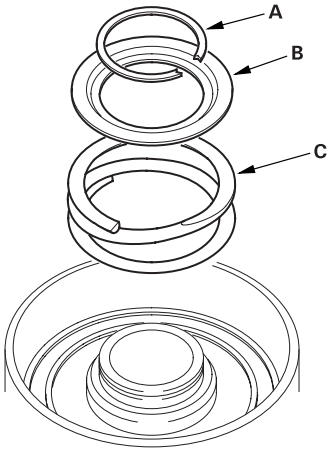


17. Remove the snap ring with snap ring pliers.

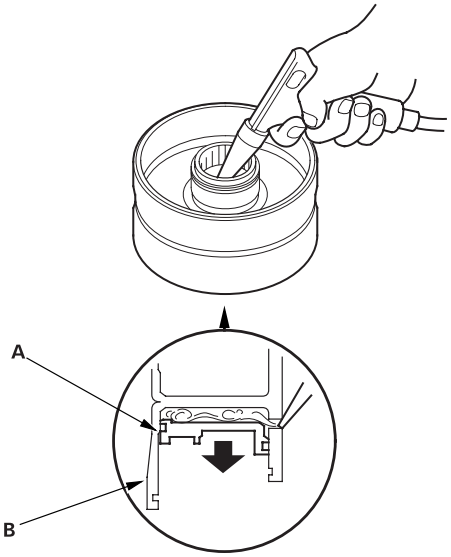


18. Remove the special tools.

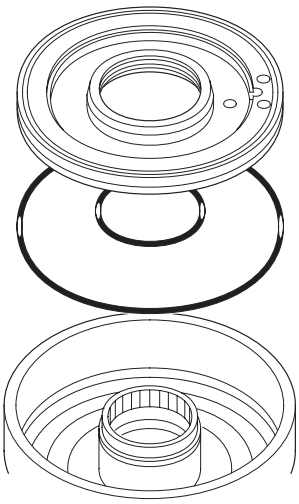
19. Remove the snap ring (A), spring retainer (B), and return spring (C).



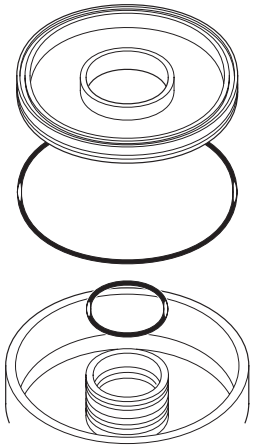
20. Wrap a shop rag around the clutch drum (A), and apply air pressure to the fluid passage to remove the piston (B). Place a finger tip on the other passage while applying air pressure.



21. Remove the piston, then remove the O-rings from the 3rd and 4th clutch pistons.

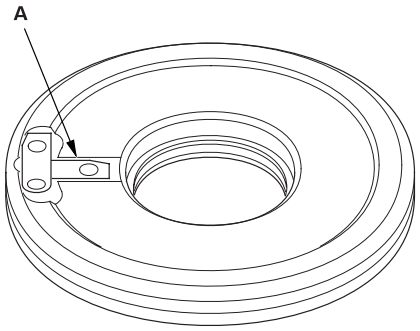


22. Remove the piston, then remove the O-ring from the 1st and 2nd clutch drum, and remove the O-ring from each clutch piston.

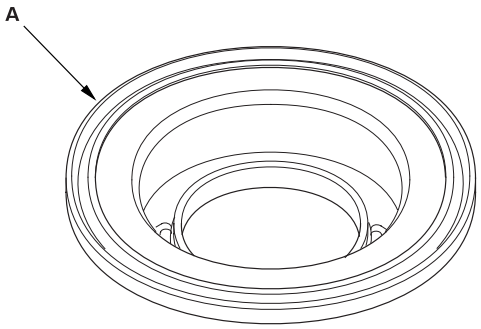


Clutch Inspection

1. Inspect the 3rd and 4th clutch pistons and clutch piston check valves.



2. If the clutch piston check valve is loose or damaged, replace the clutch piston.
3. Check the spring retainer for wear and damage.
4. Check the oil seal on the spring retainer of the 1st and 2nd clutches for wear, damage, and peeling.



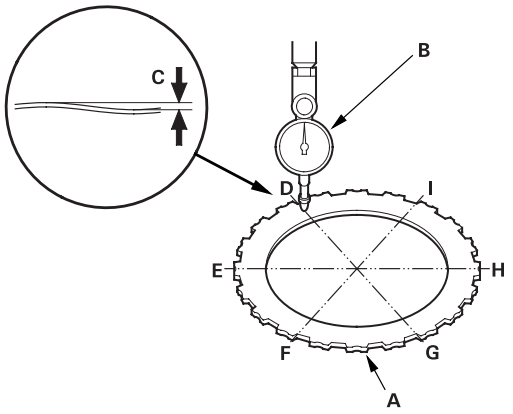
5. If the oil seal is worn, damaged, or peeling, replace the spring retainer.
6. Inspect the clutch discs, clutch plates, and clutch end plate for wear, damage, and discoloration.

Standard Thickness
Clutch Discs: 1.94 mm (0.076 in.)
Clutch Plates:
K20A4 and K20A5 engines
All plates: 2.00 mm (0.079 in.)
K24A1 engine
1st clutch plates: 1.6 mm (0.063 in.)
2nd clutch plates: 2.0 mm (0.079 in.)
3rd and 4th clutch plates: 2.3 mm (0.091 in.)

7. If the clutch discs are worn or damaged, replace them as a set. If the clutch discs are replaced, inspect the clutch end plate-to-top disc clearance.
8. If any plate is worn, damaged, or discolored, replace the damaged plate with the new plate, and inspect the other waved-plates for a phase difference. If the clutch plate is replaced, inspect the clutch end plate-to-top disc clearance.
9. If the clutch end plate is worn, damaged, or discolored, inspect the clutch end plate-to-top disc clearance, then replace the clutch end plate.

Clutch Waved-plate Phase Difference Inspection

1. Place the clutch waved-plate (A) on a surface plate, and set a dial indicator (B) on the waved-plate.



2. Find the bottom (D) of a phase difference of the waved-plate, zero the dial indicator and make a reference mark on the bottom of the waved-plate.
3. Rotate the 1st (K24A1 engine model) and 2nd clutch waved-plate about 60-degree apart from the bottom with holding the waved-plate by its circumference, and rotate the 1st (K20A4 and K20A5 engine models), 3rd, and 4th clutch waved-plate about 72-degree or 54-degree apart from the bottom. There will be presented a top (E) of a phase difference. Do not rotate the waved-plate with holding its surface, always rotate it with holding its circumference.
4. Read the dial indicator. The dial indicator reads the phase difference (C) of the waved-plate between bottom and top.

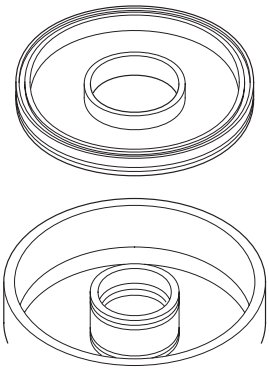
   Standard: 0.05 mm (0.002 in.) minimum

5. Rotate the 1st (K24A1 engine model) and 2nd clutch waved-plate about 60-degree apart from the top, and rotate the 1st (K20A4 and K20A5 engine models), 3rd, and 4th clutch waved-plate 54-degree or 72-degree apart from the top. The dial indicator should be at the bottom of a phase difference (F and H), and zero the dial indicator.
6. Measure the phase difference at the other two tops (G and I) of the waved-plate by following steps 3 thru 5.
7. If the two values of the three measurements are within the standard, the waved-plate is OK. If the two values of the three measurements are out of the standard, replace the waved-plate.

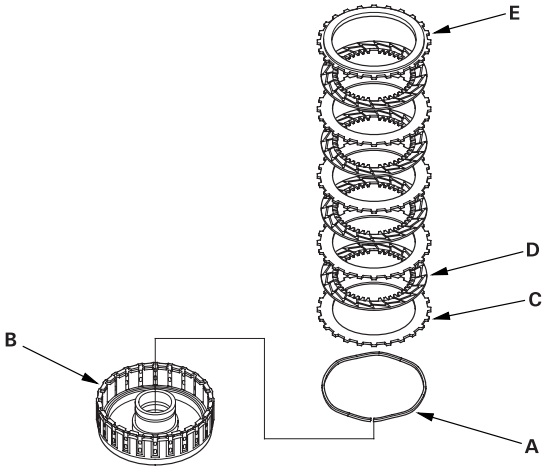
Clutch Clearance Inspection

Special Tools Required
Clutch compressor attachment 07ZAE-PRP0100

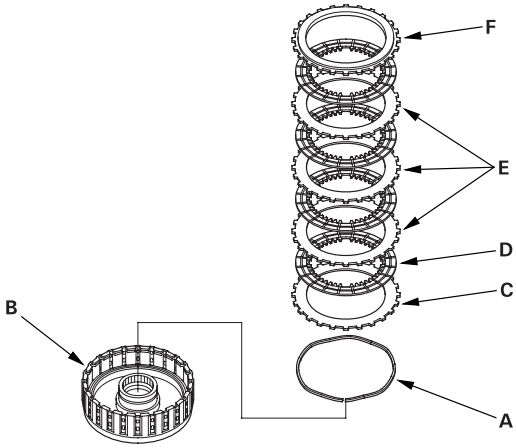
1. Inspect the clutch piston, discs, plates, and end plate for wear and damage (see page 14-240), and inspect clutch waved-plate phase difference (see page 14-241), if necessary.
2. Install the clutch piston in the clutch drum. Do not install the O-rings during inspection.



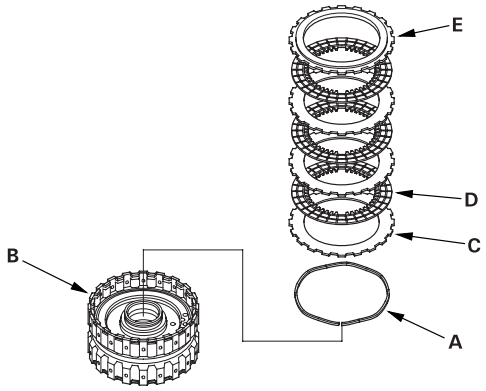
3. Assemble the 1st clutch of K20A4 and K20A5 engine models: Install the waved spring (A) in the 1st clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (4) (C) and discs (4) (D), then install the clutch end plate (E) with the flat side toward the disc.



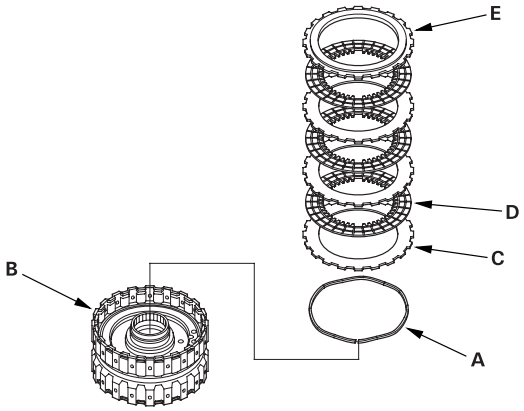
4. Assemble the 2nd clutch of K20A4 and K20A5 engine models: Install the waved spring (A) in the 2nd clutch drum (B). Install the clutch flat-plate (C), then starting with the clutch disc, alternately install the clutch discs (4) (D) and waved-plates (3) (E), then install the clutch end plate (F) with the flat side toward the disc.



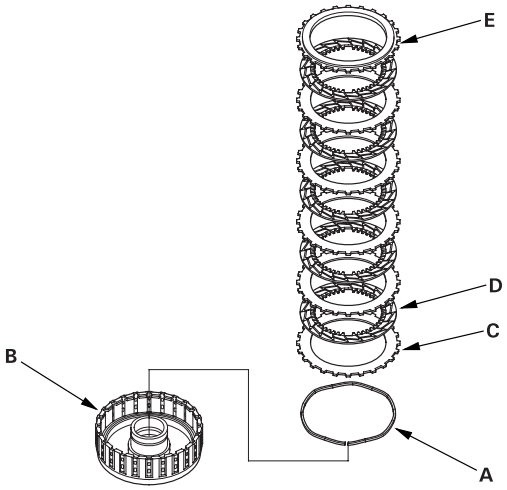
5. Assemble the 3rd clutch of K20A4 and K20A5 engine models: Install the waved spring (A) in the 3rd clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (3) (C) and discs (3) (D), then install the clutch end plate (E) with the flat side toward the disc.



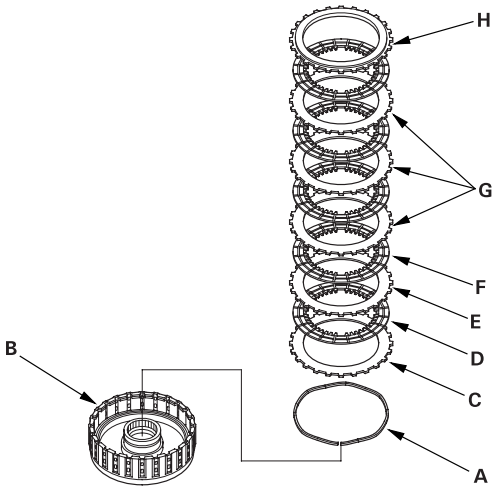
6. Assemble the 4th clutch of K20A4 and K20A5 engine models: Install the waved spring (A) in the 4th clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (3) (C) and discs (3) (D), then install the clutch end plate (E) with the flat side toward the disc.



7. Assemble the 1st clutch of K24A1 engine model: Install the waved spring (A) in the 1st clutch drum (B). Starting with the clutch waved-pate, alternately install the clutch plates (5) (C) and discs (5) (D), then install the clutch end plate (E) with the flat side toward the disc.



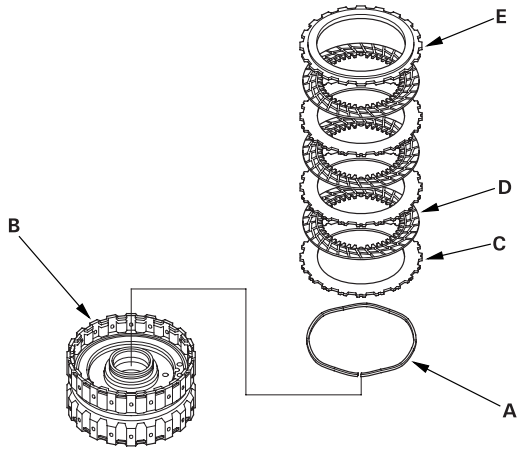
8. Assemble the 2nd clutch of K24A1 engine model: Install the waved spring (A) in the 2nd clutch drum (B). Install the clutch flat-plate (C), clutch disc (D), and clutch flat-plate (E). Starting with the clutch disc, alternately install the clutch discs (4) (F) and clutch waved-pates (3) (G), then install the clutch end plate (H) with the flat side toward the disc.



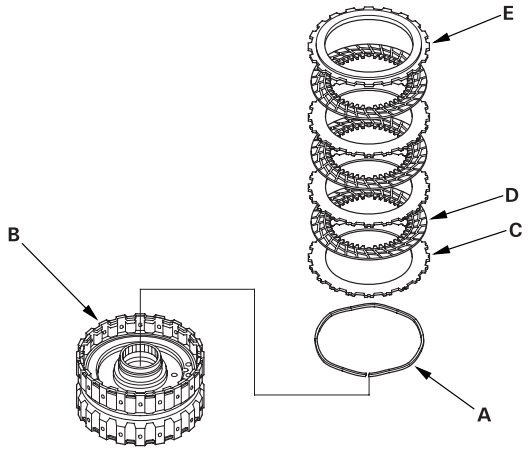
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Clutch Clearance Inspection (cont'd)

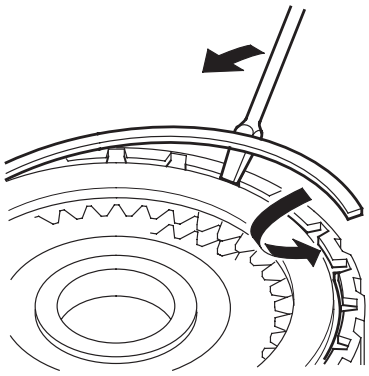
9. Assemble the 3rd clutch of K24A1 engine model: Install the waved spring (A) in the 3rd clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (3) (C) and discs (3) (D), then install the clutch end plate (E) with the flat side toward the disc.



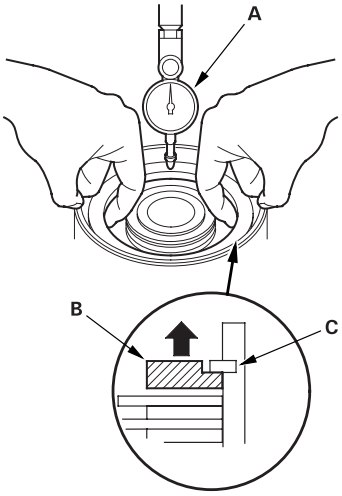
10. Assemble the 4th clutch of K24A1 engine model: Install the waved spring (A) in the 4th clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (3) (C) and discs (3) (D), then install the clutch end plate (E) with the flat side toward the disc.



11. Install the snap ring with a screwdriver.

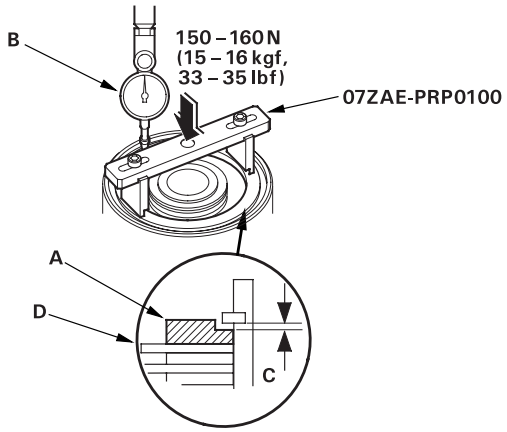


12. Set a dial indicator (A) on the clutch end plate (B).



13. Zero the dial indicator with the clutch end plate lifted up to the snap ring (C).

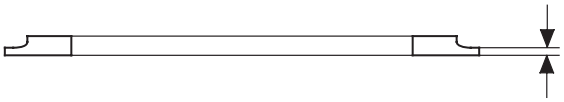
14. Release the clutch end plate to lower the clutch end plate, then put the special tool on the end plate (A).



15. Press the special tool down with 150 - 160 N (15 - 16 kgf, 33 - 35 lbf) using a force gauge, and read the dial indicator (B). The dial indicator reads the clearance (C) between the clutch end plate and top disc (D). Take measurements in at least three places, and use the average as the actual clearance.

Clutch End Plate-to-Top Disc Clearance
Service Limit:
K20A4 and K20A5 engine models
1st Clutch: 1.23 - 1.43 mm (0.048 - 0.056 in.)
2nd Clutch: 0.75 - 0.95 mm (0.030 - 0.037 in.)
3rd Clutch: 0.73 - 0.93 mm (0.029 - 0.037 in.)
4th Clutch: 0.73 - 0.93 mm (0.029 - 0.037 in.)
K24A1 engine model
1st Clutch: 1.28 - 1.48 mm (0.050 - 0.058 in.)
2nd Clutch: 0.85 - 1.05 mm (0.033 - 0.041 in.)
3rd Clutch: 0.73 - 0.93 mm (0.029 - 0.037 in.)
4th Clutch: 0.73 - 0.93 mm (0.029 - 0.037 in.)

16. If the clearance is out of the service limit, select a new clutch end plate from the following table.



CLUTCH END PLATES

K20A4 and K20A5 Engine Models:

For 1st clutch

Plate No.	Part Number	Thickness
1	22551-PRP-003	2.3 mm (0.091 in.)
2	22552-PRP-003	2.4 mm (0.094 in.)
3	22553-PRP-003	2.5 mm (0.098 in.)
4	22554-PRP-003	2.6 mm (0.102 in.)
5	22555-PRP-003	2.7 mm (0.106 in.)
6	22556-PRP-003	2.8 mm (0.110 in.)
7	22557-PRP-003	2.9 mm (0.114 in.)
8	22558-PRP-003	3.0 mm (0.118 in.)
9	22559-PRP-003	3.1 mm (0.122 in.)
10	22560-PRP-003	3.2 mm (0.126 in.)
11	22561-PRP-003	3.3 mm (0.130 in.)
12	22562-PRP-003	3.4 mm (0.134 in.)

For 2nd clutch

Plate No.	Part Number	Thickness
1	22571-PRP-003	2.6 mm (0.102 in.)
2	22572-PRP-003	2.7 mm (0.106 in.)
3	22573-PRP-003	2.8 mm (0.110 in.)
4	22574-PRP-003	2.9 mm (0.114 in.)
5	22575-PRP-003	3.0 mm (0.118 in.)
6	22576-PRP-003	3.1 mm (0.122 in.)
7	22577-PRP-003	3.2 mm (0.126 in.)
8	22578-PRP-003	3.3 mm (0.130 in.)
9	22579-PRP-003	3.4 mm (0.134 in.)

For 3rd and 4th clutches

Plate No.	Part Number	Thickness
11	22581-PRP-003	3.1 mm (0.122 in.)
12	22582-PRP-003	3.2 mm (0.126 in.)
13	22583-PRP-003	3.3 mm (0.130 in.)
14	22584-PRP-003	3.4 mm (0.134 in.)
15	22585-PRP-003	3.5 mm (0.138 in.)
16	22586-PRP-003	3.6 mm (0.142 in.)
17	22587-PRP-003	3.7 mm (0.146 in.)
18	22588-PRP-003	3.8 mm (0.150 in.)
19	22589-PRP-003	3.9 mm (0.154 in.)

(cont'd)

Clutch Clearance Inspection (cont'd)

CLUTCH END PLATES

K24A1 Engine Model:

For 1st clutch

Plate No.	Part Number	Thickness
1	22551-PPV-003	2.6 mm (0.102 in.)
2	22552-PPV-003	2.7 mm (0.106 in.)
3	22553-PPV-003	2.8 mm (0.110 in.)
4	22554-PPV-003	2.9 mm (0.114 in.)
5	22555-PPV-003	3.0 mm (0.118 in.)
6	22556-PPV-003	3.1 mm (0.112 in.)
7	22557-PPV-003	3.2 mm (0.126 in.)
8	22558-PPV-003	3.3 mm (0.130 in.)
9	22559-PPV-003	3.4 mm (0.134 in.)

For 2nd clutch

Plate No.	Part Number	Thickness
1	22571-PRP-003	2.6 mm (0.102 in.)
2	22572-PRP-003	2.7 mm (0.106 in.)
3	22573-PRP-003	2.8 mm (0.110 in.)
4	22574-PRP-003	2.9 mm (0.114 in.)
5	22575-PRP-003	3.0 mm (0.118 in.)
6	22576-PRP-003	3.1 mm (0.122 in.)
7	22577-PRP-003	3.2 mm (0.126 in.)
8	22578-PRP-003	3.3 mm (0.130 in.)
9	22579-PRP-003	3.4 mm (0.134 in.)

For 3rd and 4th clutches

Plate No.	Part Number	Thickness
1	22571-PPV-A01	2.1 mm (0.083 in.)
2	22572-PPV-A01	2.2 mm (0.087 in.)
3	22573-PPV-A01	2.3 mm (0.091 in.)
4	22574-PPV-A01	2.4 mm (0.094 in.)
5	22575-PPV-A01	2.5 mm (0.098 in.)
6	22576-PPV-A01	2.6 mm (0.102 in.)
7	22577-PPV-A01	2.7 mm (0.106 in.)
8	22578-PPV-A01	2.8 mm (0.110 in.)
9	22579-PPV-A01	2.9 mm (0.114 in.)

17. Install the new clutch end plate, then recheck the clearance.

NOTE: If the thickest clutch end plate is installed, but the clearance is still over the service limit, replace the clutch discs and plates.

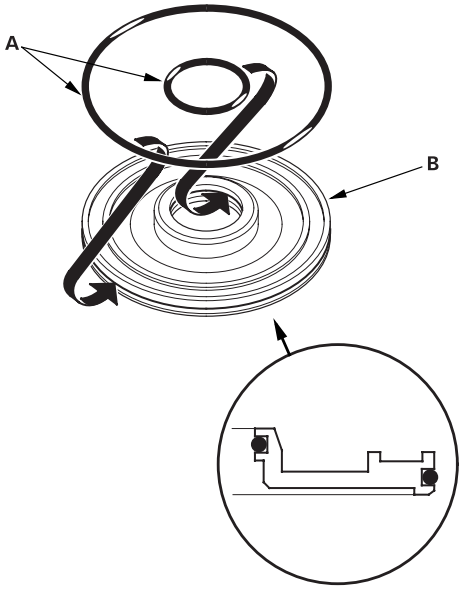
Clutch Reassembly

Special Tools Required

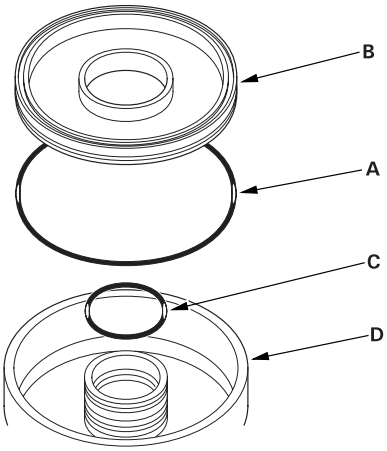
- Clutch spring compressor set 07LAE-PX40000
  - Clutch spring compressor attachment 07LAE-PX40100
  - Clutch spring compressor attachment 07HAE-PL50100
  - Clutch spring compressor bolt assembly 07GAE-PG40200
- Snap ring pliers 07LGC-0010100

1. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.

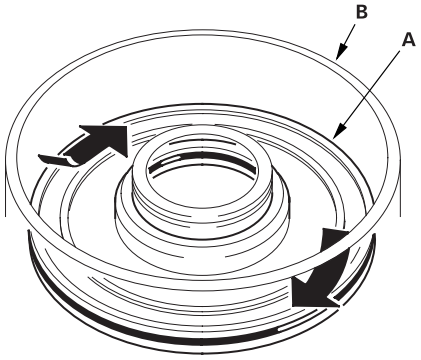
2. Install the new O-rings (A) on the 3rd and 4th clutch piston (B).



3. Install the new O-ring (A) in the 1st, 2nd clutch pistons (B), and install the new O-ring (C) on the clutch drums (D).



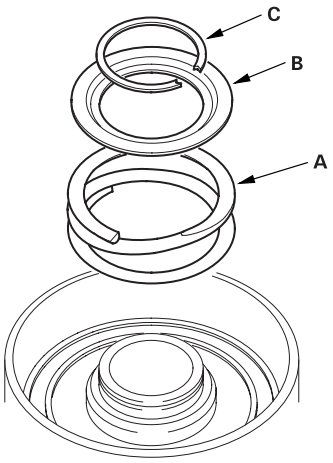
4. Install the clutch piston (A) in the clutch drum (B). Apply pressure and rotate to ensure proper seating. Lubricate the piston O-ring with ATF before installing. Do not pinch the O-ring by installing the piston with to much force.



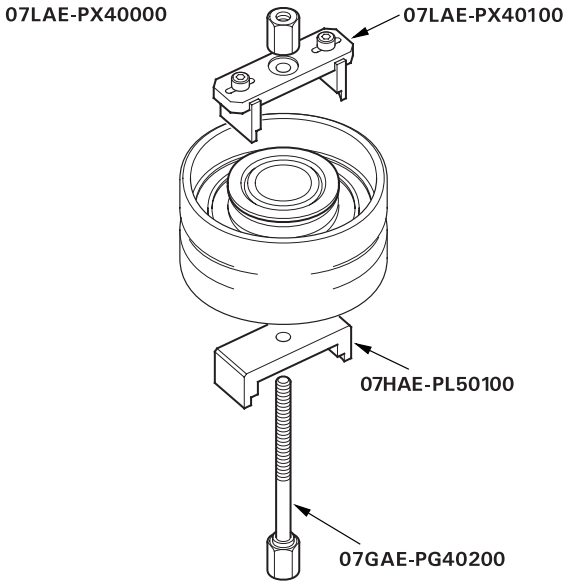
(cont'd)

Clutch Reassembly (cont'd)

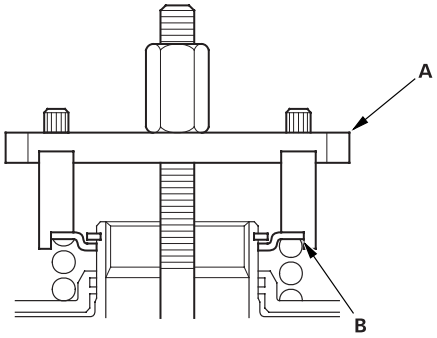
5. Install the return spring (A) and spring retainer (B), and position the snap ring (C) on the retainer.



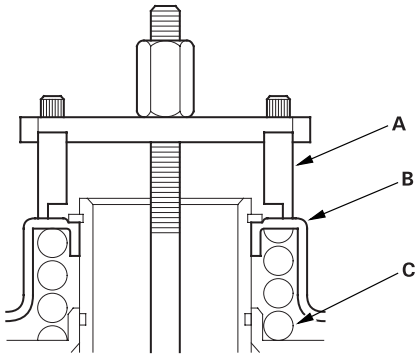
6. Install the special tools.



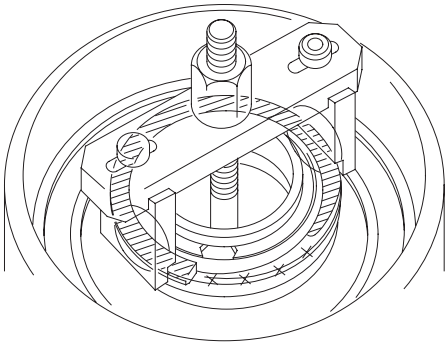
7. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 3rd and 4th clutches.



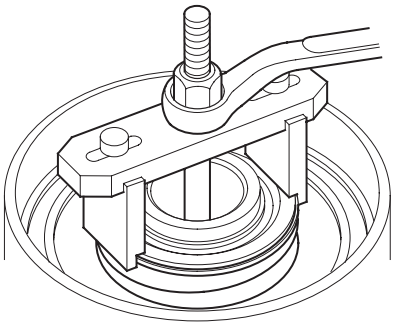
8. Set the special tool (A) on the spring retainer (B) of the 1st and 2nd clutches in such a way that the special tool works on the clutch return spring (C).



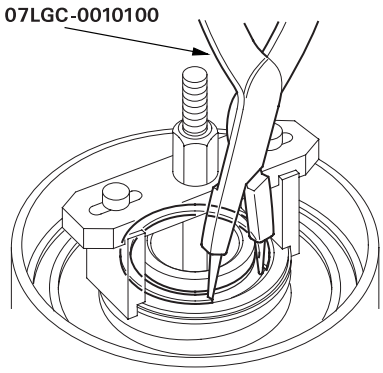
9. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



10. Compress the return spring.

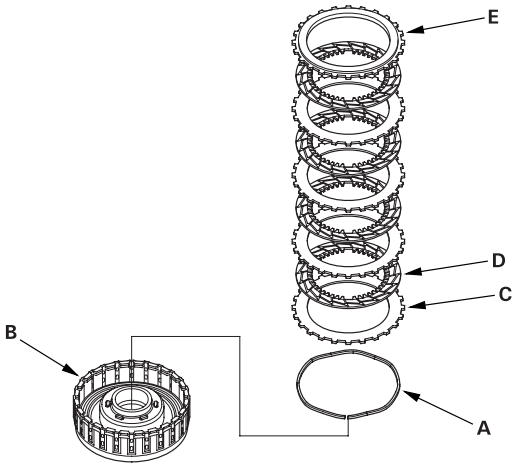


11. Install the snap ring with snap ring pliers.



12. Remove the special tools.

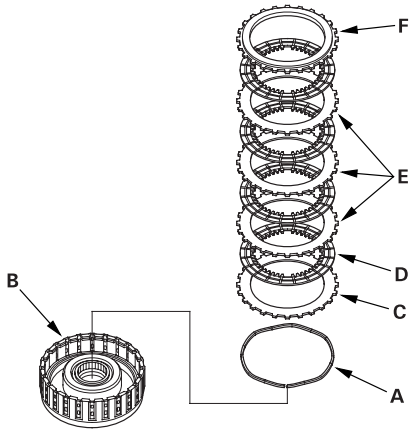
13. Assemble the 1st clutch of K20A4 and K20A5 engine models: Install the waved spring (A) in the 1st clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (4) (C) and discs (4) (D), then install the clutch end plate (E) with the flat side toward the disc.



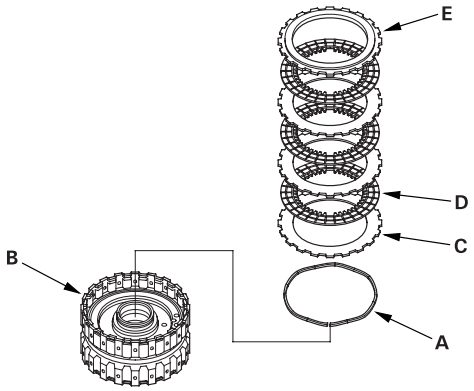
(cont'd)

Clutch Reassembly (cont'd)

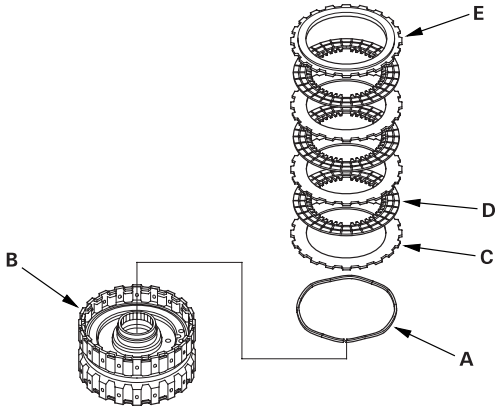
14. Assemble the 2nd clutch of K20A4 and K20A5 engine models: Install the waved spring (A) in the 2nd clutch drum (B). Install the clutch flat-plate (C), then starting with the clutch disc, alternately install the clutch discs (4) (D) and waved-plates (3) (E), then install the clutch end plate (F) with the flat side toward the disc.



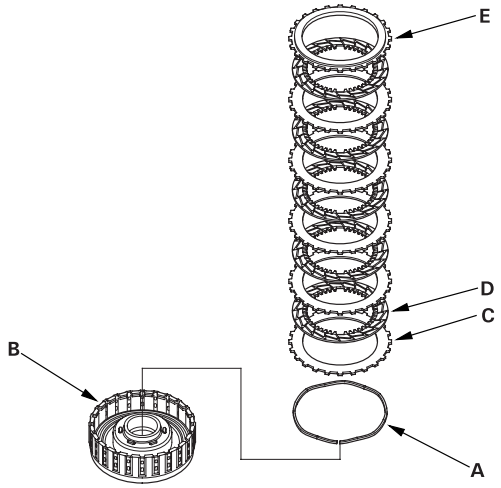
15. Assemble the 3rd clutch of K20A4 and K20A5 engine models: Install the waved spring (A) in the 3rd clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (3) (C) and discs (3) (D), then install the clutch end plate (E) with the flat side toward the disc.



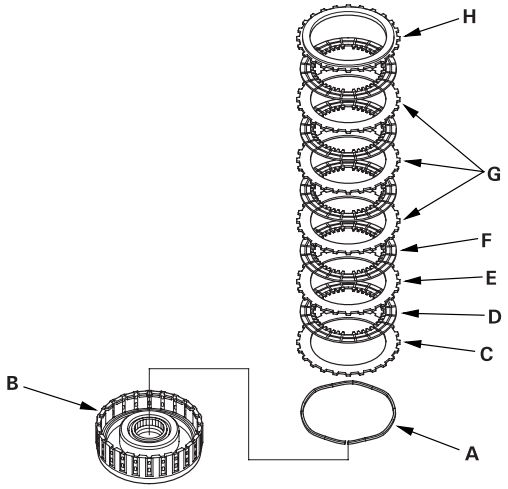
16. Assemble the 4th clutch of K20A4 and K20A5 engine models: Install the waved spring (A) in the 4th clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (3) (C) and discs (3) (D), then install the clutch end plate (E) with the flat side toward the disc.



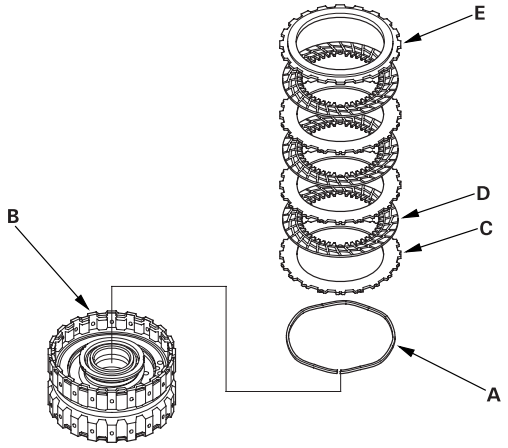
17. Assemble the 1st clutch of K24A1 engine model: Install the waved spring (A) in the 1st clutch drum (B). Starting with the clutch waved-pate, alternately install the clutch plates (5) (C) and discs (5) (D), then install the clutch end plate (E) with the flat side toward the disc.



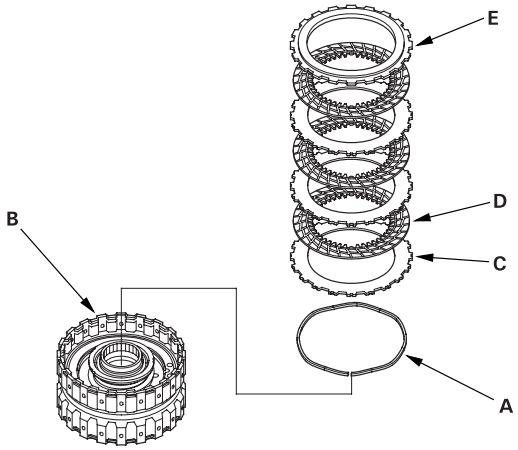
18. Assemble the 2nd clutch of K24A1 engine model: Install the waved spring (A) in the 2nd clutch drum (B). Install the clutch flat-plate (C), clutch disc (D), and clutch flat-plate (E). Starting with the clutch disc, alternately install the clutch discs (4) (F) and clutch waved-pates (3) (G), then install the clutch end plate (H) with the flat side toward the disc.



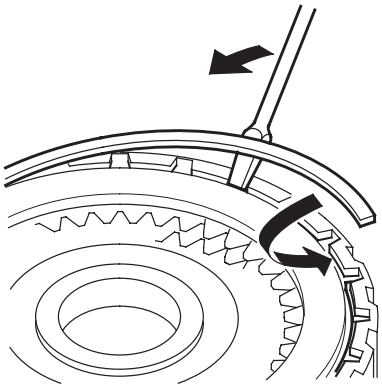
19. Assemble the 3rd clutch of K24A1 engine model: Install the waved spring (A) in the 3rd clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (3) (C) and discs (3) (D), then install the clutch end plate (E) with the flat side toward the disc.



20. Assemble the 4th clutch of K24A1 engine model: Install the waved spring (A) in the 4th clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (3) (C) and discs (3) (D), then install the clutch end plate (E) with the flat side toward the disc.



21. Install the snap ring with a screwdriver.



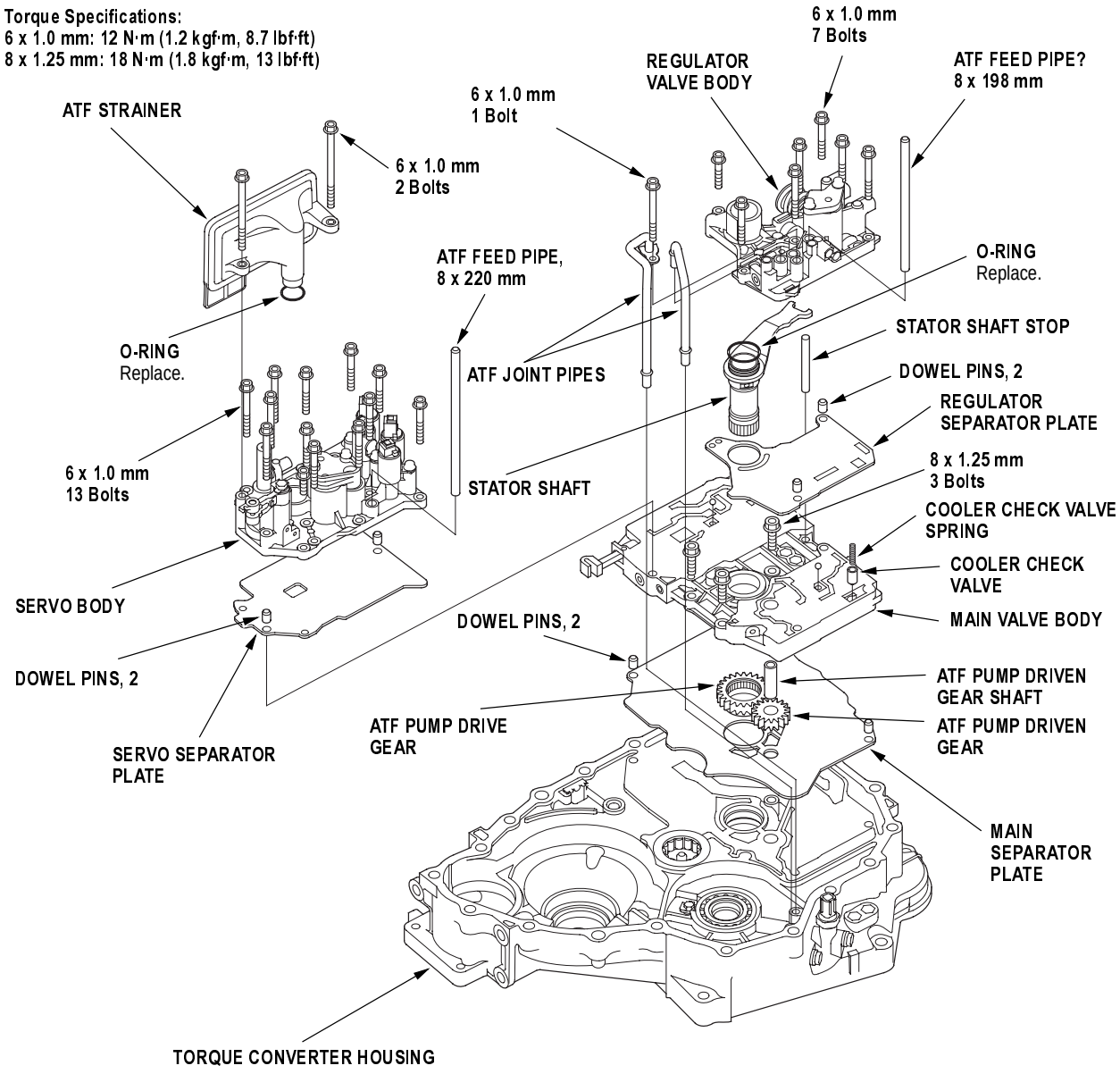
22. Check that the clutch piston moves by applying air pressure into fluid passage.

Valve Body

Valve Bodies and ATF Strainer Installation

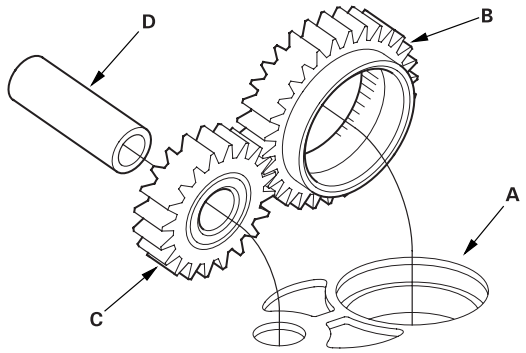
Exploded View

NOTE: The illustration shows the 4WD transmission; the 2WD is similar.

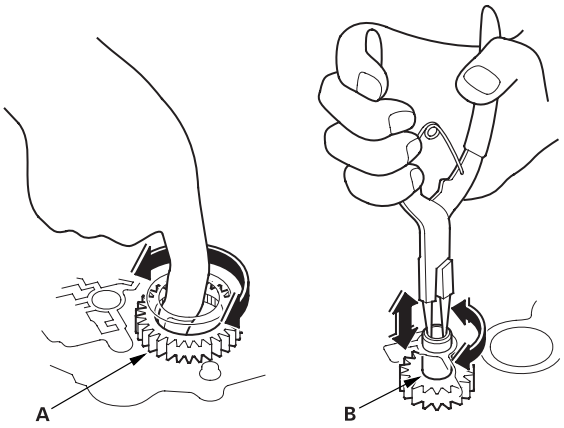


NOTE: Refer to the Exploded View as needed during the following procedure.

1. Install the main separator plate (A) and two dowel pins on the torque converter housing. Then install the ATF pump drive gear (B), driven gear (C), and ATF pump driven gear shaft (D). Install the ATF pump driven gear with its grooved and chamfered side facing down.



2. Install the main valve body.
3. Make sure the ATF pump drive gear (A) rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft (B) moves smoothly in the axial and normal operating direction.

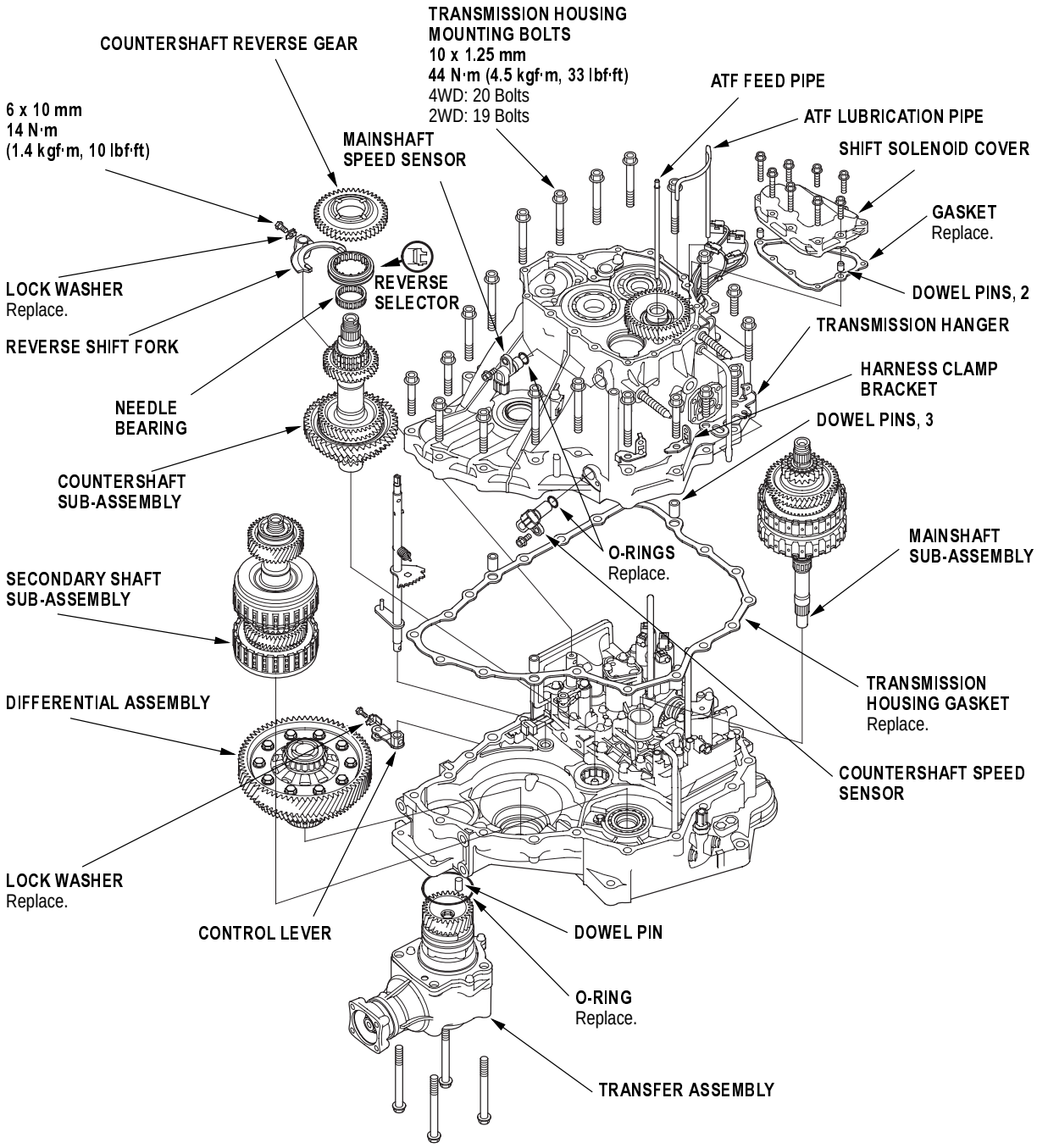


4. If the ATF pump drive gear and ATF pump driven gear shaft do not move smoothly, loosen the main valve body bolts. Realign the ATF pump driven gear shaft, and retighten the bolts to the specified torque, then recheck. Failure to align the ATF pump driven gear shaft correctly will result in a seized ATF pump drive gear or ATF pump driven gear shaft.
5. Make sure that the check balls (two) are in the main valve body, and install the cooler check valve spring and the cooler check valve.
6. Install the regulator separator plate and dowel pins (two) on the main valve body.
7. Install the stator shaft and stator shaft stop.
8. Install the regulator valve body (seven bolts).
9. Install the servo separator plate and dowel pins (two) on the main valve body.
10. Install the servo body (13 bolts).
11. Install the ATF strainer (two bolts).
12. Install the ATF joint pipes (one bolt).
13. Install the ATF feed pipes in the regulator valve body and servo body.

Transmission Housing

Shaft Assemblies and Housing Installation

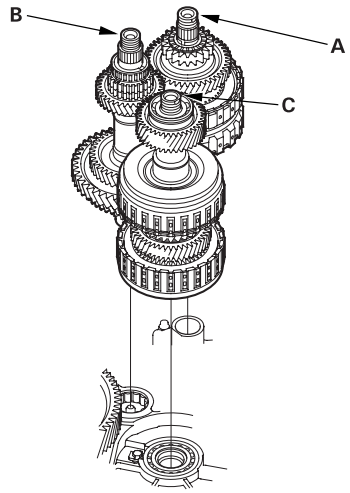
Exploded View



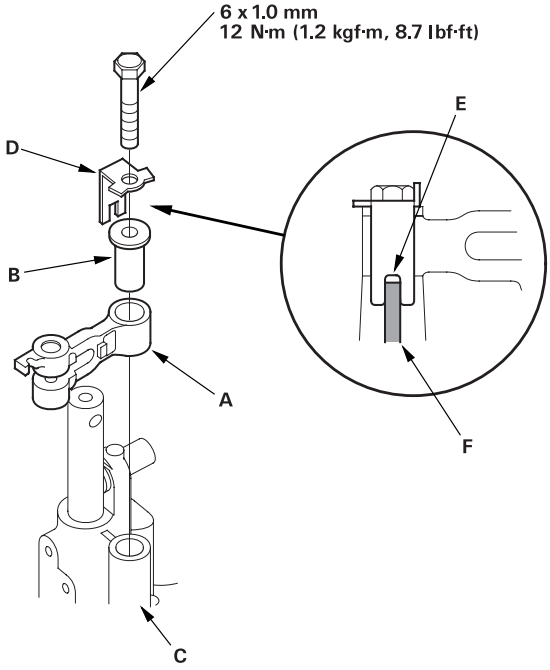
Special Tools Required
Snap ring pliers 07LGC-0010100

NOTE: Refer to the Exploded View as needed during the following procedure. The Exploded View on previous page shows the 4WD transmission model; the 2WD transmission is similar.

1. Install the differential assembly in the torque converter housing.
2. Assemble the mainshaft, countershaft, and secondary shaft.
3. Join the mainshaft sub-assembly (A), countershaft sub-assembly (B), and secondary shaft sub-assembly (C) together, and install them in the torque converter housing.



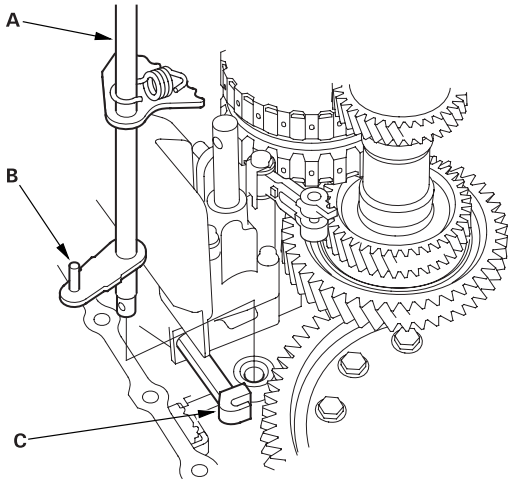
4. If the detent arm was removed, install the detent arm (A) with arm collar (B) on the servo body (C), and install the new lock washer (D) with aligning its cutout (E) with the projection (F) of the servo body. Install and tighten the bolt, then bend the lock tab of the lock washer against the bolt head.



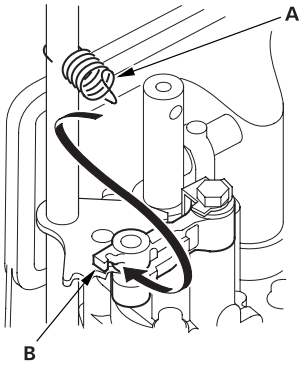
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Shaft Assemblies and Housing Installation (cont'd)

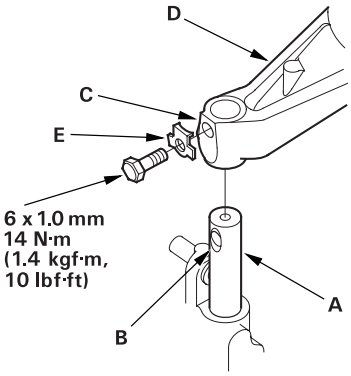
5. Install the control shaft (A) in the torque converter housing aligning the manual valve lever pin (B) on the control shaft with the guide of the manual valve (C). Pull the manual valve gently when aligning the manual valve with the control shaft.



6. Hook the detent arm spring (A) to the detent arm (B).



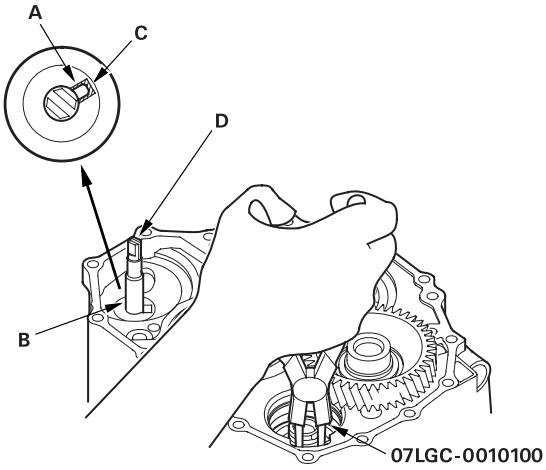
7. Turn the shift fork shaft (A) so the large chamfered hole (B) is facing the fork bolt hole (C) of the shift fork (D).



8. Install the shift fork and reverse selector together on the shift fork shaft and countershaft. Secure the shift fork to the shift fork shaft with the lock bolt and a new lock washer (E), then bend the lock tab of the lock washer against the bolt head.
9. Install the needle bearing and countershaft reverse gear on the countershaft.
10. Install the reverse idler gear in the transmission housing (see page 14-204).
11. Install the idler gear shaft (see page 14-233), if it was removed.
12. Install the three dowel pins and a new gasket on the torque converter housing.

13. Align the spring pin (A) on the control shaft (B) with the transmission housing groove (C) by turning the control shaft.

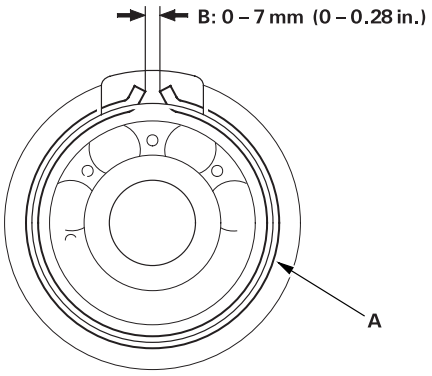
NOTE: Do not squeeze the end (D) of the control shaft tips together when turning the shaft. If the tips are squeezed together will cause a faulty signal or position due to the play between the control shaft and the switch.



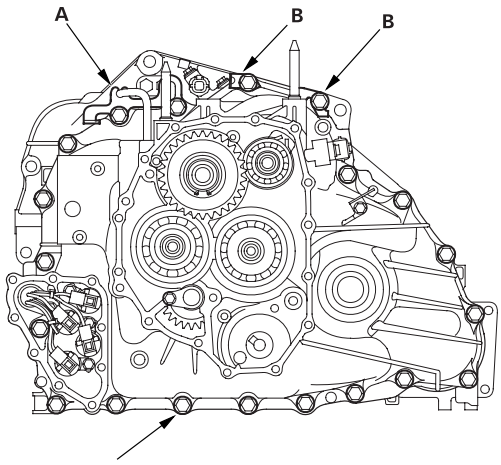
14. Place the transmission housing on the torque converter housing. Do not install the mainshaft and countershaft speed sensors before installing the transmission housing on the torque converter housing.

15. With expanding the snap ring of the secondary shaft bearing using the snap ring pliers, install the transmission housing as the bearing part-way into the housing. Then release the pliers, and push down the housing until it bottoms and until the snap ring snaps in place around the transmission housing snap ring groove.

16. Verify that the secondary shaft bearing snap ring (A) is seated in the bearing and housing groove, and that the ring end gap (B) is correct.



17. Install the transmission housing mounting bolts along with the transmission hanger (A) and harness clamp brackets (B), tighten the bolts in two or three steps in a criss-cross pattern.



TRANSMISSION HOUSING MOUNTING BOLTS

10 x 1.25 mm

44 N·m (4.5 kgf·m, 33 lbf·ft)

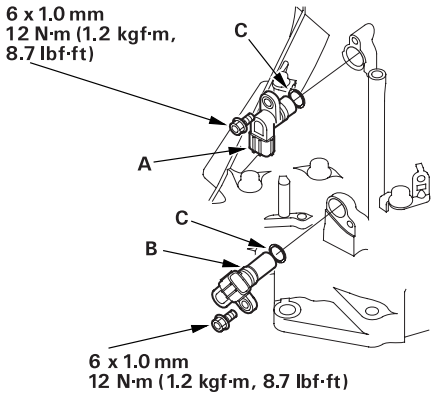
4WD: 20 Bolts

2WD: 19 Bolts

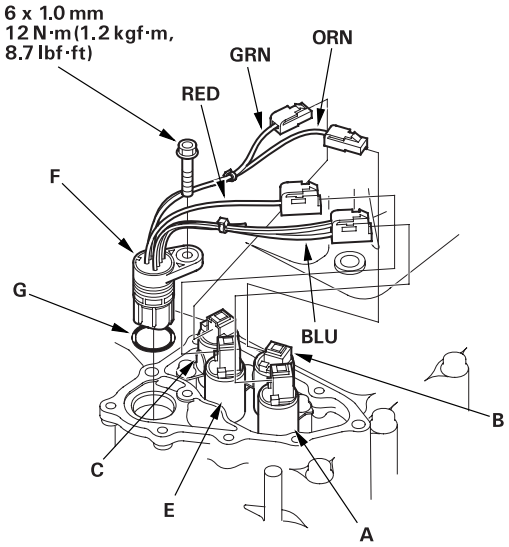
(cont'd)

Shaft Assemblies and Housing Installation (cont'd)

18. Install the mainshaft speed sensor (A) and countershaft speed sensor (B) with new O-rings (C).



19. Install the shift solenoid harness connector (F) in the transmission housing with the new O-ring (G).

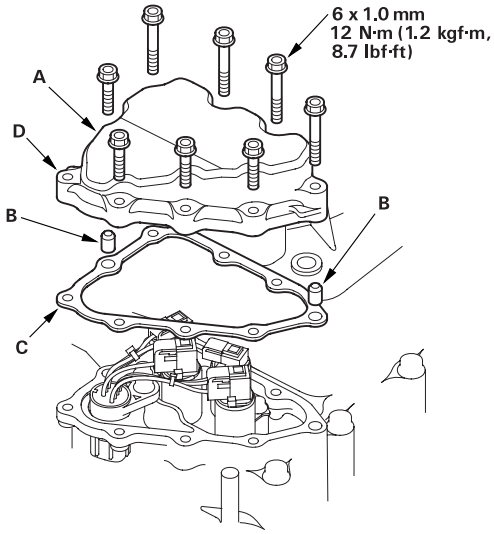


20. Connect the connector (BLU, WHT and WHT wires) to the shift solenoid valve A.

21. Connect the connectors to respective solenoid valves:

- ORN wire to shift solenoid valve B.
- GRN wire to shift solenoid valve C.
- RED wire to shift solenoid valve E.

22. Install the shift solenoid valve cover (A) with the two dowel pins (B) and the new gasket (C), and tighten the bolts (eight). Install the one bolt with the bracket for the ATF cooler line in the bolt hole (D) in step 34 in End Cover Installation (see step 34 on page 14-263).

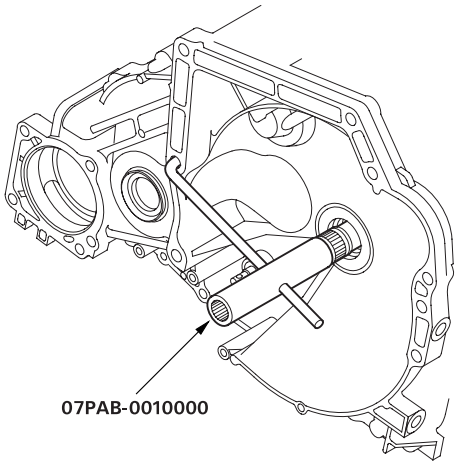


Transmission End Cover

End Cover Installation

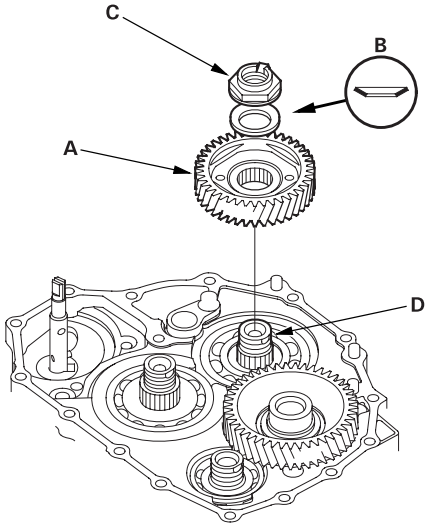
Special Tools Required
Mainshaft holder set 07PAB-0010000

1. Install the special tool onto the mainshaft.

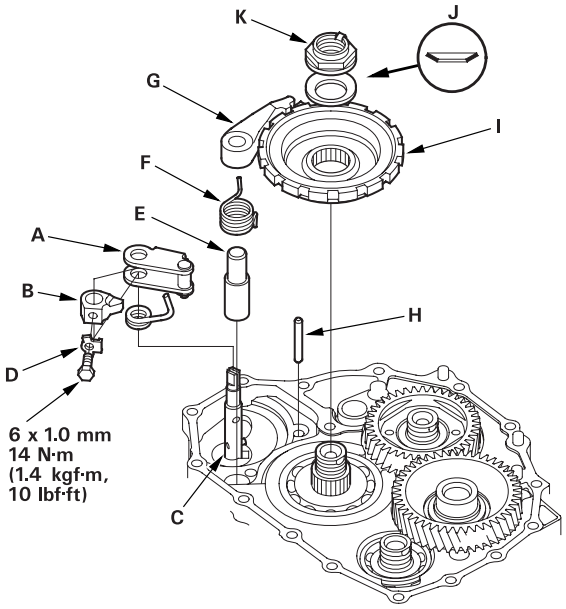


2. Lubricate the following parts with ATF:
   - Splines and threads of the mainshaft.
   - Splines of the mainshaft idler gear.
   - Old conical spring washer and old locknut.
3. Install the mainshaft idler gear (A), old conical spring washer (B), and old locknut (C) on the mainshaft (D), and tighten the locknut to 226 N·m (23.0 kgf·m, 166 lbf·ft).

   NOTE:
   - Do not tap the idler gear to install.
   - Use a torque wrench to tighten the locknut. Do not use an impact wrench.



4. Install the park lever (A) and park lever stop (B) on the control shaft (C), then install the lock bolt with the new lock washer (D). Do not bend the lock tab of the lock washer until step 18.



5. Install the park pawl shaft (E), park pawl spring (F), park pawl (G), and stop shaft (H) on the transmission housing.
6. Lubricate the following parts with ATF:
   - Threads and splines of the countershaft.
   - Old conical spring washer and old locknut.
   - Areas where the park gear contacts the conical spring washer.
7. Install the park gear (I), old conical spring washer (J), and old locknut (K) on the countershaft.
8. Lift the park pawl up, and engage it with the park gear, then tighten the locknut to 226 N·m (23.0 kgf·m, 166 lbf·ft).

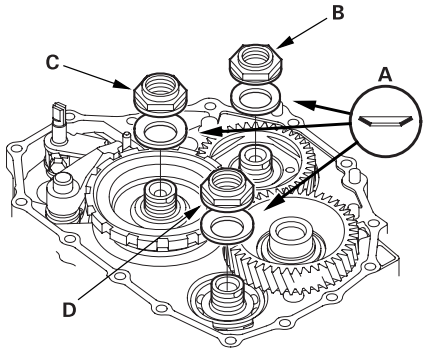
   NOTE:
   - Do not tap the park gear to install.
   - Use a torque wrench to tighten the locknut. Do not use an impact wrench.
   - Countershaft locknut has left-hand threads.
9. Remove the locknuts and conical spring washers from the mainshaft and countershaft.

(cont'd)

End Cover Installation (cont'd)

10. Lubricate the threads of the shafts, the new locknuts and the new conical spring washers with ATF.

11. Install the new conical spring washers (A) with facing stamped mark side up in the direction shown, and install the new mainshaft locknut (B), the new countershaft locknut (C), and the new secondary shaft locknut (D).

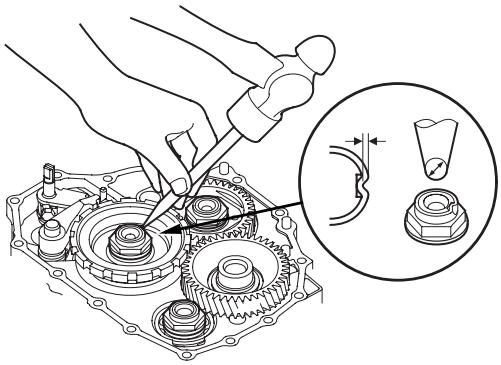


12. Tighten the locknuts to 167 N·m (17.0 kgf·m, 123 lbf·ft).

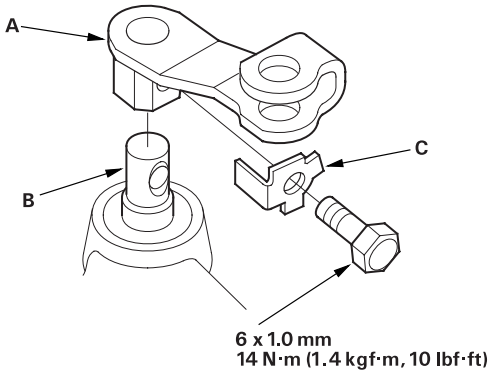
NOTE:
- Be sure to install the conical spring washers in the direction shown.
- Use a torque wrench to tighten the locknut. Do not use an impact wrench.
- Countershaft and secondary shaft locknuts have left-hand threads.

13. Remove the special tool from the mainshaft.

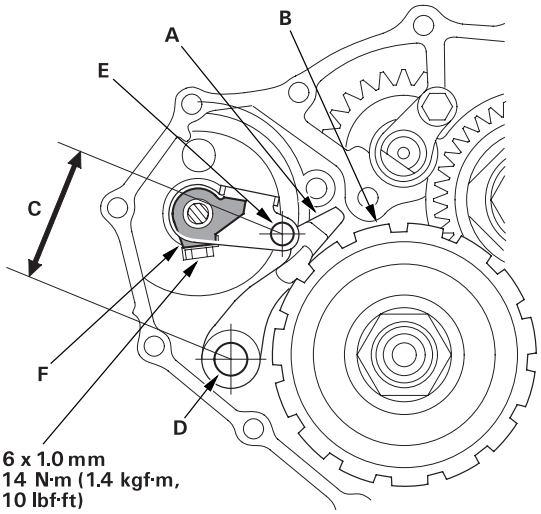
14. Stake the locknuts into the shafts with a punch.



15. Install the control level (A) on the control shaft (B), and install the bolt with the new lock washer (C), then bend the lock tab of the lock washer against the bolt head.



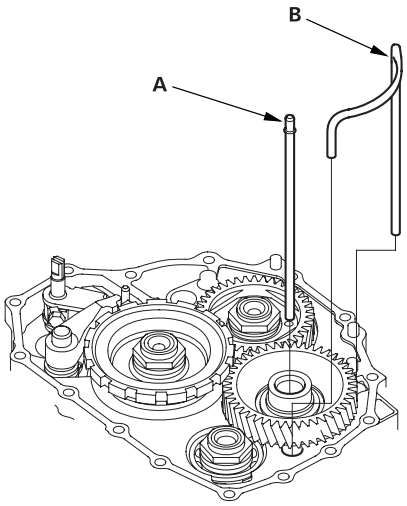
16. Set the park lever in the [P] position, then verify that the park pawl (A) engages the park gear (B).



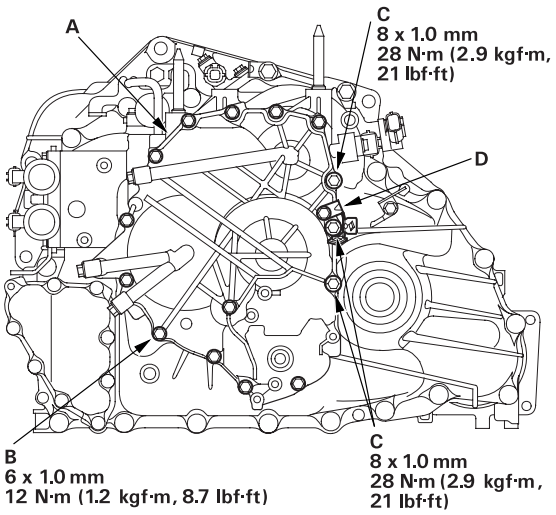
17. If the park pawl does not engage fully, check the distance (C) between the pawl shaft (D) and the park lever roller pin (E) (see page 14-195).

18. Tighten the lock bolt, and bend the lock tab of the lock washer (F) against the bolt head.

19. Install the ATF feed pipe (A) into the idler gear shaft, and install the ATF lubrication pipe (B) into the transmission housing.



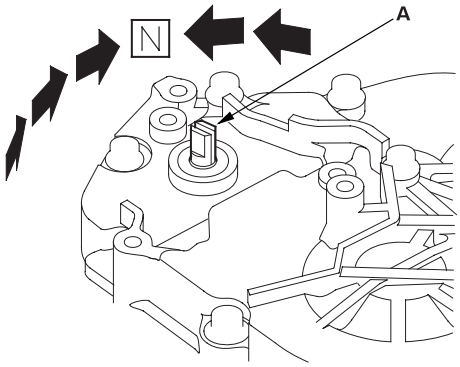
20. Install the end cover (A) with the two dowel pins, new O-rings, and new gasket. Tighten the 6 x 1.0 mm bolts (12) (B) and 8 x 1.0 mm bolts (3) (C).



21. Install the harness clamp bracket (D).

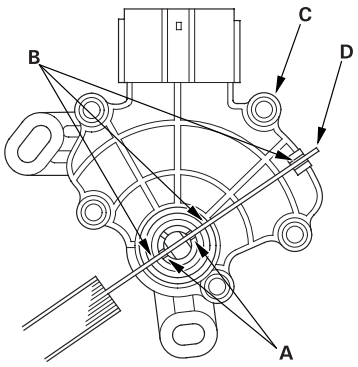
22. Set the control shaft (A) to [N] position by turning the control lever on the torque converter side.

NOTE: Do not squeeze the end of the control shaft tips together when turning the shaft. If the tips are squeezed together it will cause a faulty signal or position due to the play between the control shaft and the switch.



23. Align the cutouts (A) on the rotary-frame with the neutral positioning cutouts (B) on the transmission range switch (C), then put a 2.0 mm (0.08 in.) feeler gauge blade (D) in the cutouts to hold in the [N] position.

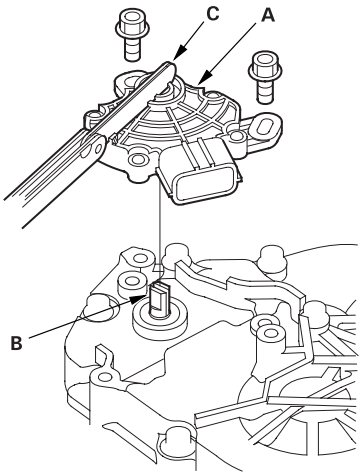
NOTE: Be sure to use a 2.0 mm (0.08 in.) blade or equivalent to hold the switch in the [N] position.



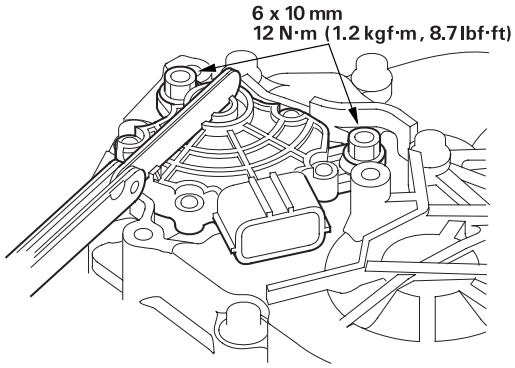
(cont'd)

End Cover Installation (cont'd)

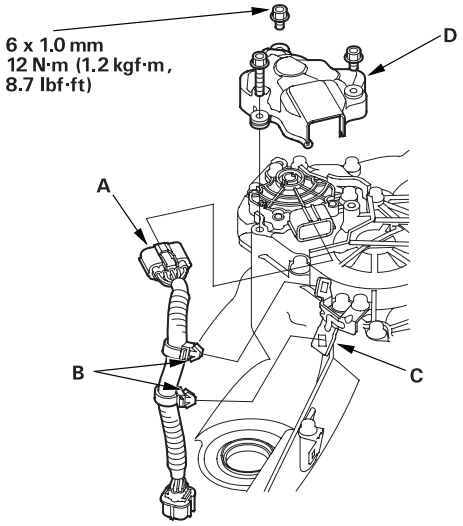
24. Install the transmission range switch (A) gently on the control shaft (B) with holding the [N] position with the 2.0 mm (0.08 in.) blade (C).



25. Tighten the bolts on the transmission range switch while you continue to hold the [N] position. Do not move the transmission range switch when tightening the bolts. Remove the feeler gauge.

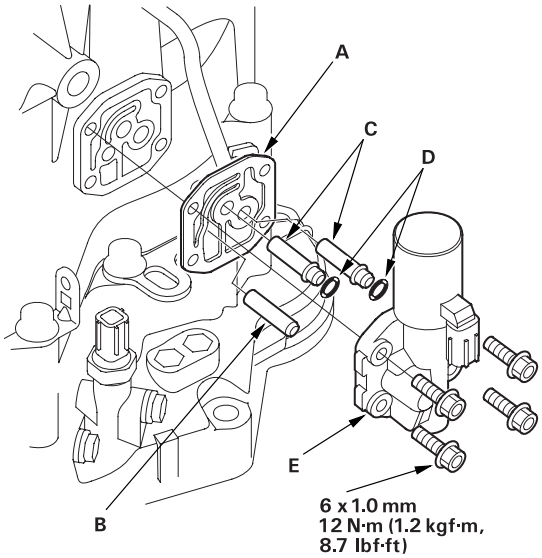


26. Connect the transmission range switch connector (A) securely, then install the harness clamps (B) on the clamp bracket (C).



27. Install the transmission range switch cover (D).

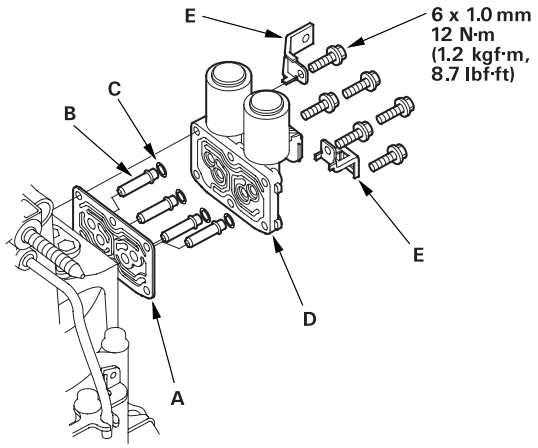
28. Install the new gasket (A) on the transmission housing, and install the ATF pipe (B) and ATF joint pipes (C).



29. Install the new O-rings (D) over the ATF joint pipes.

30. Install the A/T clutch pressure control solenoid valve A (E).

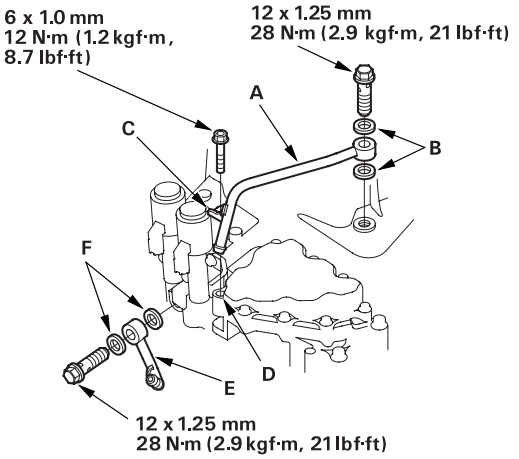
31. Install the new gasket (A) on the transmission housing, and install the ATF joint pipes (B).



32. Install the new O-rings (C) over the ATF joint pipes.

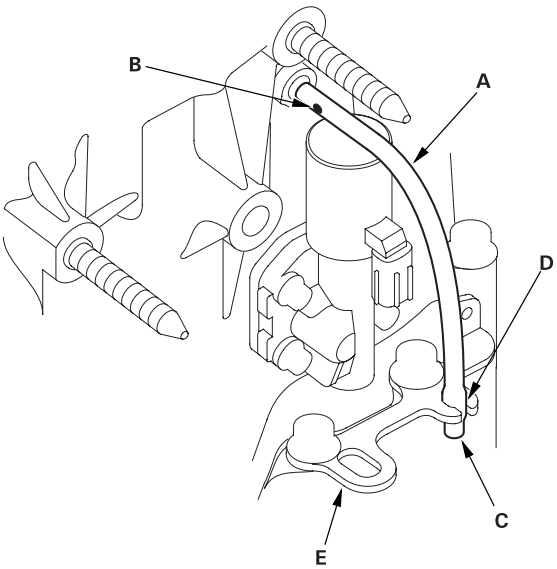
33. Install the A/T clutch pressure control solenoid valves B and C (D), and harness clamp brackets (E).

34. Install the ATF cooler inlet line (A) with the new sealing washers (B), and install the bracket (C) of the ATF cooler inlet line on the shift solenoid valve cover hole (D) (described in step 22 (see page 14-258) in Shaft Assemblies and ATF Strainer Installation).

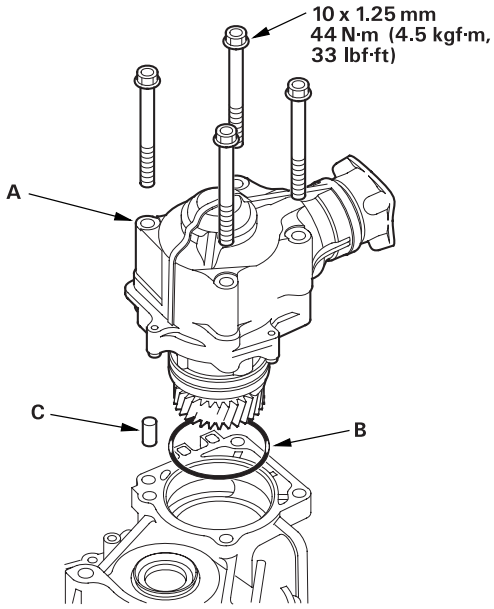


35. Install the ATF cooler outlet line (E) with the new sealing washers (F).

36. Install the breather tube (A) with facing the dot (B) on the tube in a rearward position (differential side), then install the other end (C) in the slot (D) of the transmission hanger (E).



37. For 4WD model: Install the transfer assembly (A) with the new O-ring (B) and dowel pin (C).

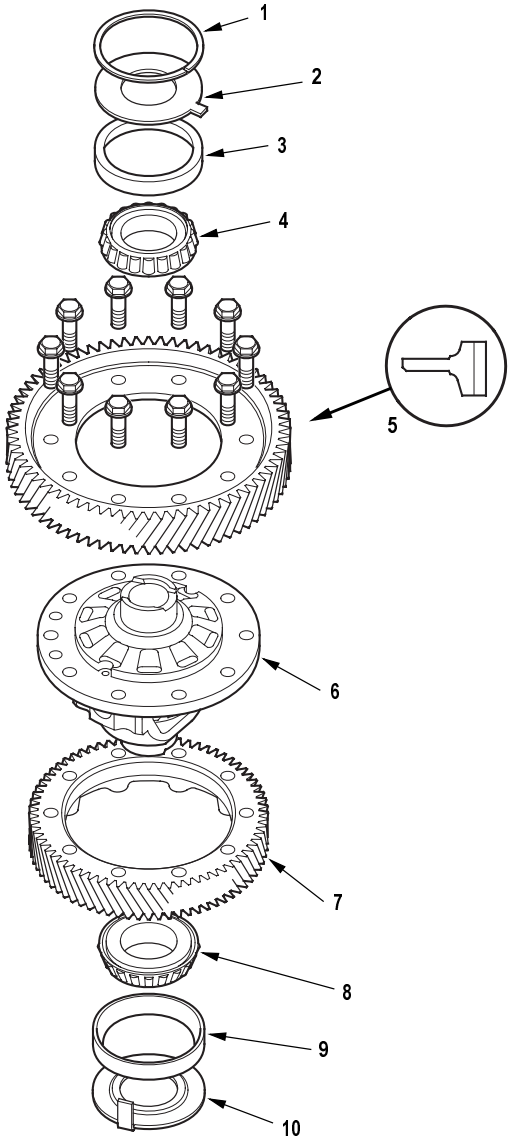


38. Install the ATF dipstick.

A/T Differential

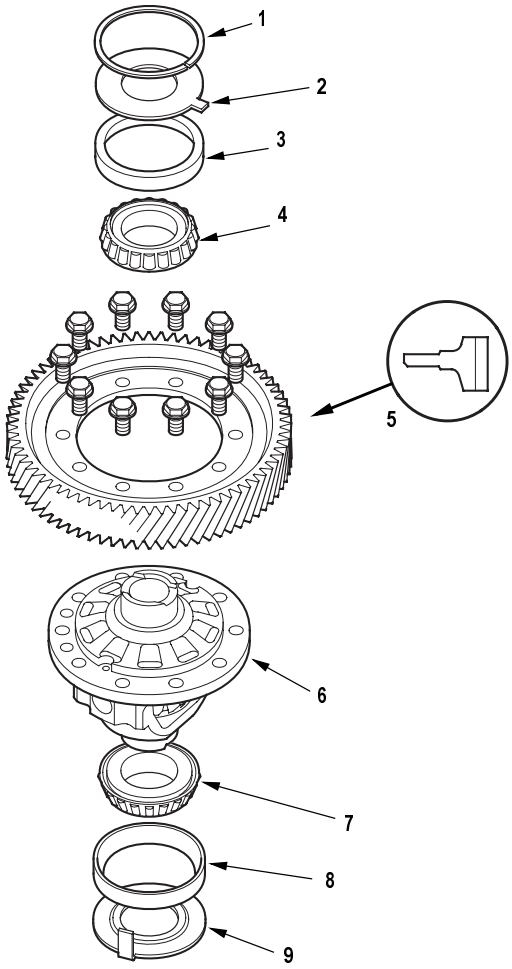
Component Location Index

4WD:



1	THRUST SHIM, 75 mm	Preload Inspection, page 14-270
2	THRUST WASHER, 76.2 mm	
3	BEARING OUTER RACE	Replacement, page 14-268
4	CARRIER BEARING	Replacement, page 14-265
5	FINAL DRIVEN GEAR	Replacement, page 14-266
6	DIFFERENTIAL CARRIER	Backlash Inspection, page 14-265 Replacement, page 14-266
7	TRANSFER DRIVE GEAR	Replacement, page 14-266
8	CARRIER BEARING	Replacement, page 14-265
9	BEARING OUTER RACE	Replacement, page 14-268
10	THRUST WASHER, 80 mm	

2WD:

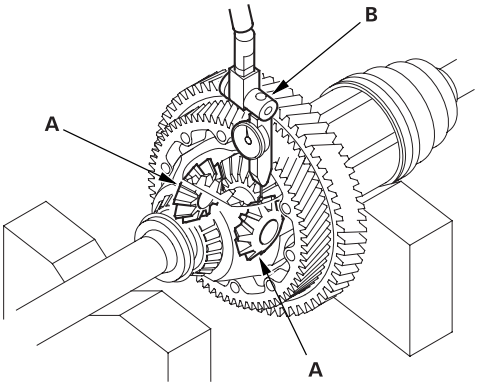


1	THRUST SHIM, 76 mm	Preload Inspection, page 14-270
2	THRUST WASHER, 76.2 mm	
3	BEARING OUTER RACE	Replacement, page 14-268
4	CARRIER BEARING	Replacement, page 14-265
5	FINAL DRIVEN GEAR	Replacement, page 14-266
6	DIFFERENTIAL CARRIER	Backlash Inspection, page 14-265 Replacement, page 14-266
7	CARRIER BEARING	Replacement, page 14-265
8	BEARING OUTER RACE	Replacement, page 14-268
9	THRUST WASHER, 80 mm	

Backlash Inspection

NOTE: The illustration shows the 4WD model; 2WD is similar.

1. Install the driveshaft and intermediate shaft on the differential, then place the axles on V-blocks.



2. Check the backlash of the pinion gears (A) with a dial indicator (B).

   STANDARD: 0.05 - 0.15 mm (0.002 - 0.006 in.)

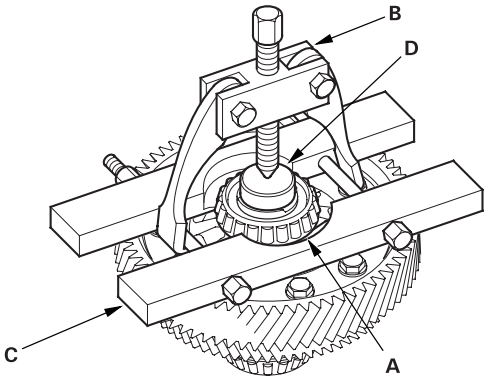
3. If the backlash is out of standard, replace the differential carrier.

Carrier Bearing Replacement

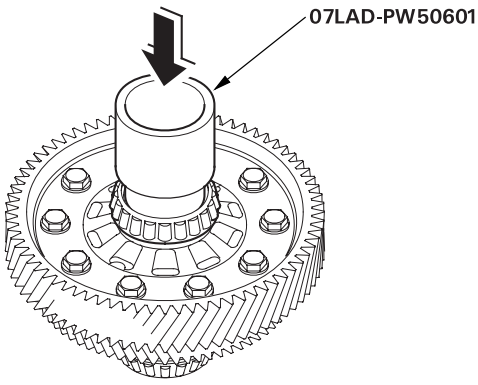
Special Tools Required
Attachment, 40 x 50 mm 07LAD-PW50601

NOTE:
- The bearing and bearing outer race should be replaced as a set.
- Inspect and adjust the carrier bearing preload whenever bearing is replaced.
- Check the bearing for wear and rough rotation. If the bearing is OK, removal is not necessary.
- The illustration shows the 4WD model; 2WD is similar.

1. Remove the carrier bearing (A) with a commercially available puller (B), bearing separator (C), and stepper adapter (D).



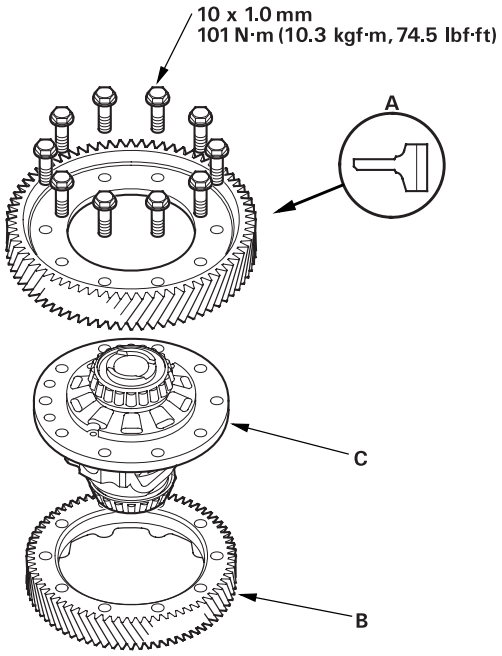
2. Install the new bearings with the special tool and a press. Press the bearing on securely so there is no clearance between the bearing and the differential carrier.



Differential Carrier/Final Driven Gear Replacement

4WD:

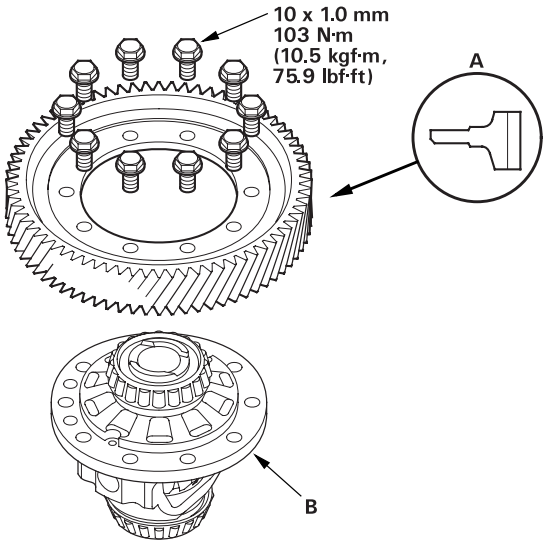
1. Remove the final driven gear (A) and transfer drive gear (B) from the differential carrier (C).
   NOTE: The final driven gear bolts have left-hand threads.



2. Install the final driven gear with the chamfered side on the inner bore facing the differential carrier.
3. Tighten the bolts to the specified torque in a crisscross pattern.

2WD:

1. Remove the final driven gear from the differential carrier, and replace the differential carrier or final driven gear.
2. Install the final driven gear (A) in the direction shown on the differential carrier (B).
   NOTE: Differential carrier bolts have left-hand threads.

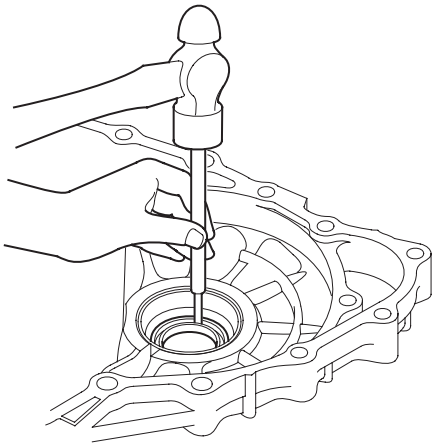


Oil Seal Replacement

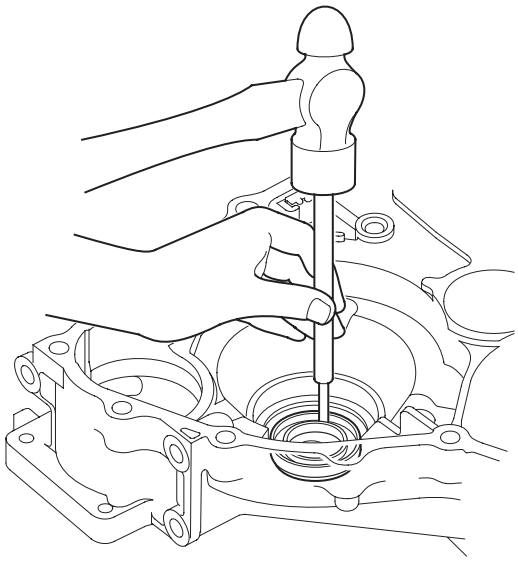
Special Tools Required
- Handle driver 07749-0010000
- Oil seal driver attachment 07947-SD90101
- Oil seal driver attachment 07JAD-PH80101

NOTE: The illustration shows the 4WD model; 2WD is similar.

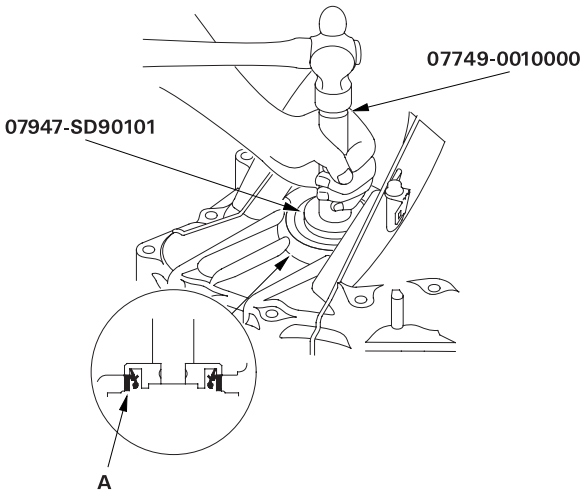
1. Remove the oil seal from the transmission housing.



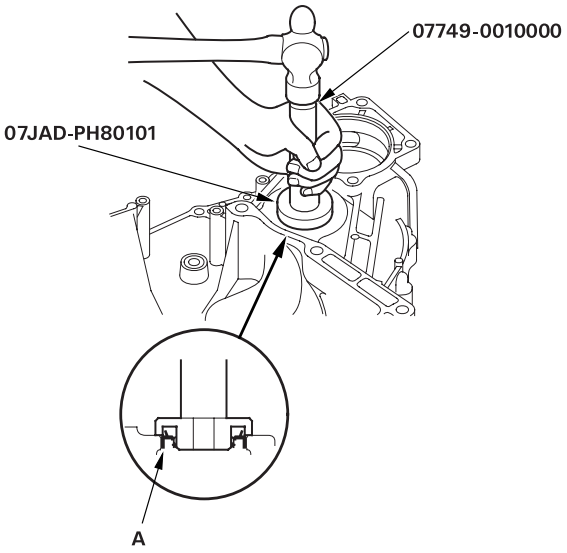
2. Remove the oil seal from the torque converter housing.



3. Install the new oil seal (A) in the transmission housing with the special tools.



4. Install the new oil seal (A) in the torque converter housing with the special tools.



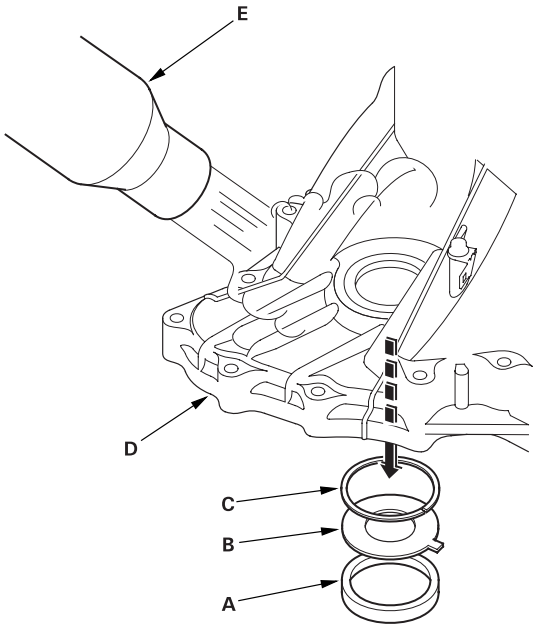
Carrier Bearing Outer Race Replacement

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 78 x 90 mm 07GAD-SD40101
- Driver attachment, 72 x 75 mm 07746-0010600

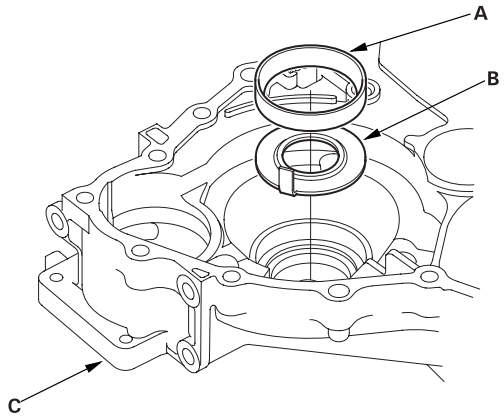
NOTE:
- The bearing and bearing outer race should be replaced as a set.
- Replace the bearing with a new one whenever the outer race is replaced.
- Do not use the thrust shim on the torque converter housing.
- Adjust bearing preload after replacing the bearing and outer race.
- Coat all parts with ATF during installation.
- The illustration shows the 4WD model; 2WD is similar.

1. Remove the bearing outer race (A), 76.2 mm thrust washer (B), and 76 mm thrust shim (C) from the transmission housing (D) by heating the housing to about 212°F (100°C) with heat gun (E). Do not heat the housing in excess of 212°F (100°C).

NOTE: Let the transmission housing cool to room temperature before installing the bearing outer race.

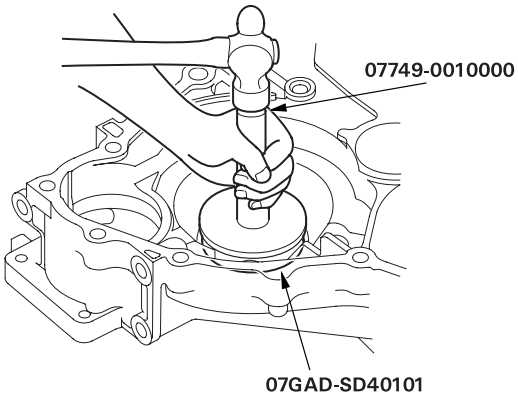


2. Remove the bearing outer race (A) and 80 mm thrust washer (B) from the torque converter housing (C).

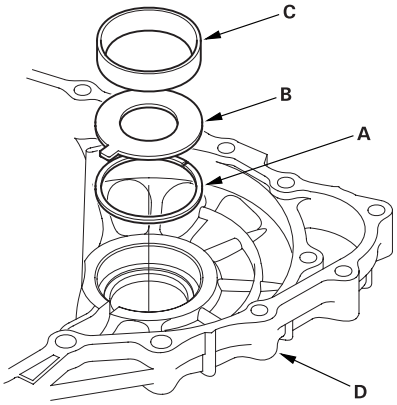


3. Install the 80 mm thrust washer and the new bearing outer race in the torque converter housing.

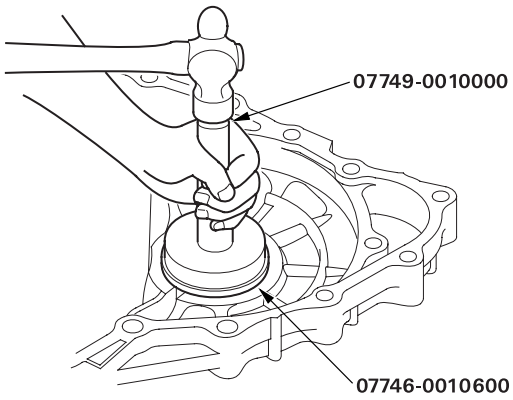
4. Drive the bearing outer race to install securely in the housing with the special tools.



5. Install the 76 mm thrust shim (A), 76.2 mm thrust washer (B), and the new bearing outer race (C) in the transmission housing (D).



6. Drive the bearing outer race to install securely so there is no clearance between the outer race, thrust washer, shim and housing with the special tools.



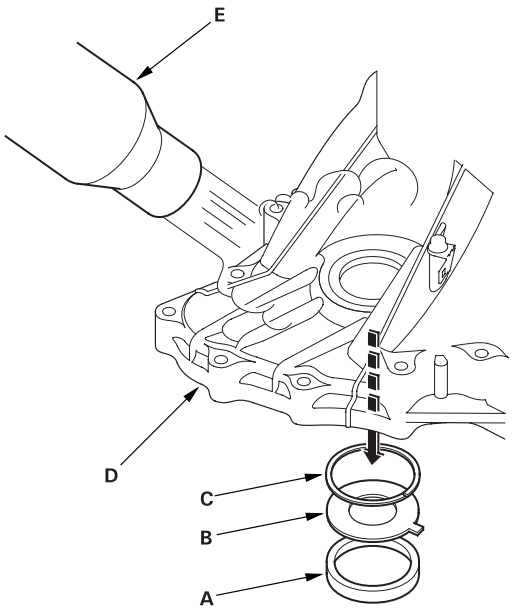
Carrier Bearing Preload Inspection

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 72 x 75 mm 07746-0010600
- Preload inspection tool 07HAJ-PK40201

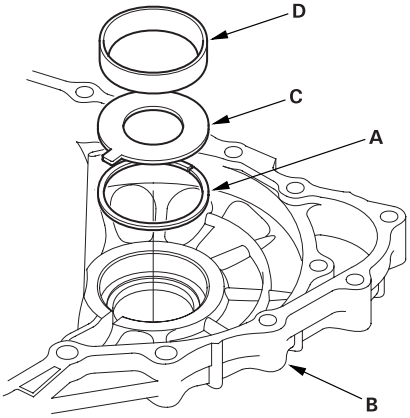
NOTE:
- If the transmission housing, torque converter housing, differential carrier, carrier bearing and outer race, or thrust shim were replaced, the bearing preload must be adjusted.
- Coat all parts with ATF during installation.
- Do not use the thrust shim in the torque converter housing.
- The illustration shows the 4WD model; 2WD is similar.

1. Remove the bearing outer race (A), 76.2 mm thrust washer (B), and 76 mm thrust shim (C) from the transmission housing (D) by heating the housing to about 212°F (100)°C) with heat gun (E). Do not heat the housing in excess of 212°F (100°C).

NOTE: Let the transmission housing cool to room temperature before adjusting the bearing preload.

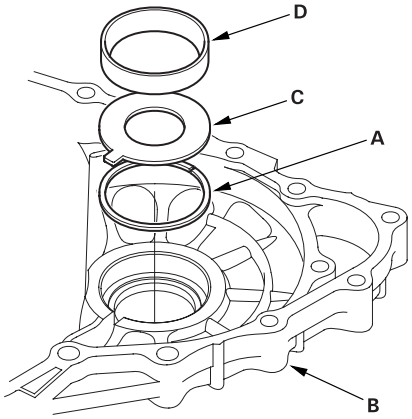


2. Install the 76 mm thrust shim (A) in the transmission housing (B).
If you replace the 76 mm thrust shim with new one, use the same thickness shim as the old one.

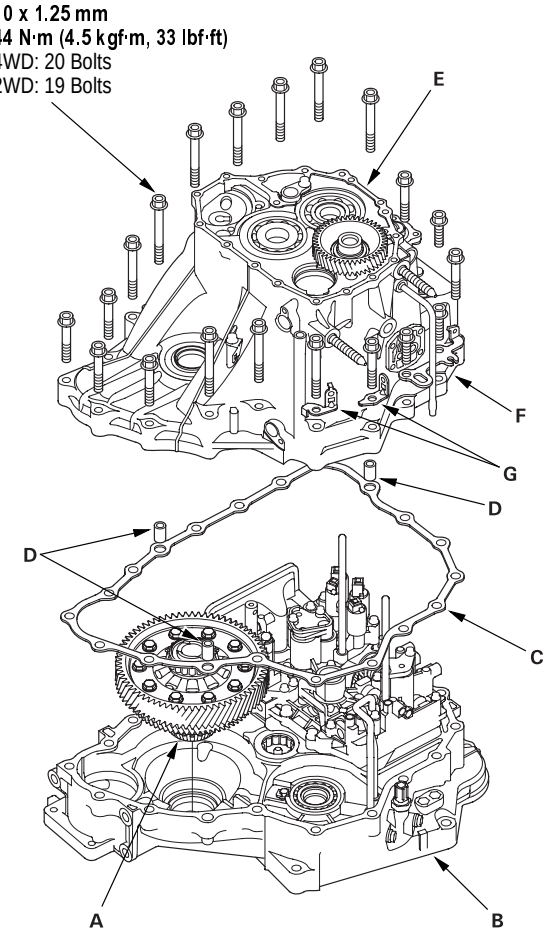


3. Install the 76.2 mm thrust washer (C) and the bearing outer race (D) in the transmission housing.

4. Drive the bearing outer race to install securely so there is no clearance between the outer race, thrust washer, shim and housing with the special tools.



5. Install the differential assembly (A) in the torque converter housing (B), and install the gasket (C) and dowel pins (D) on the housing.



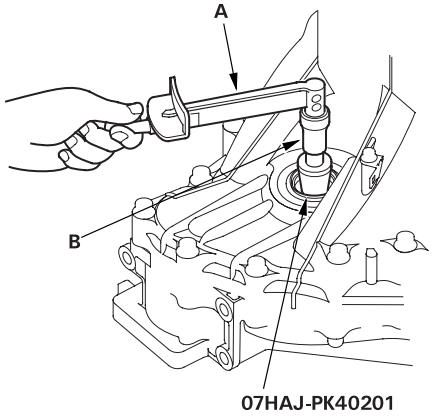
6. Install the transmission housing (E) with the transmission hanger (F) and harness clamp brackets (G), then tighten the bolts.

7. Rotate the differential assembly in both directions to seat the bearings.

8. Measure the starting torque of the differential assembly with the special tool, a torque wrench (A) and socket (B). Measure the starting torque at normal room temperature in both directions.

STANDARD:

New Bearing:	**2.7 - 3.9 N·m (28 - 40 kgf·cm, 24 - 35 lbf·in)**
Reused Bearing:	**2.5 - 3.6 N·m (25 - 37 kgf·cm, 22 - 32 lbf·in)**



(cont'd)

Carrier Bearing Preload Inspection (cont'd)

9. If the measurement is out of standard, remove the thrust shim and select the thrust shim from table below. Install the new thrust shim and recheck. To increase the starting torque, increase the thickness of the thrust shim. To decrease the starting torque, decrease the thickness of the shim. Changing the shim to the next size will increase or decrease starting torque about 0.3 - 0.4 N·m (3 - 4 kgf·cm, 3 - 3 lbf·in).

THRUST SHIM, 76 mm

No.	Part Number	Thickness
S	41438-PX4-700	2.05 mm (0.080 in.)
T	41439-PX4-700	2.10 mm (0.082 in.)
U	41440-PX4-700	2.15 mm (0.084 in.)
A	41441-PK4-000	2.20 mm (0.086 in.)
B	41442-PK4-000	2.25 mm (0.088 in.)
C	41443-PK4-000	2.30 mm (0.090 in.)
D	41444-PK4-000	2.35 mm (0.092 in.)
E	41445-PK4-000	2.40 mm (0.094 in.)
F	41446-PK4-000	2.45 mm (0.096 in.)
G	41447-PK4-000	2.50 mm (0.098 in.)
H	41448-PK4-000	2.55 mm (0.099 in.)
I	41449-PK4-000	2.60 mm (0.101 in.)
J	41450-PK4-000	2.65 mm (0.103 in.)
K	41451-PK4-000	2.70 mm (0.105 in.)
L	41452-PK4-000	2.75 mm (0.107 in.)
M	41453-PK4-000	2.80 mm (0.109 in.)
N	41454-PK4-000	2.85 mm (0.111 in.)
O	41455-PK4-000	2.90 mm (0.113 in.)
P	41456-PK4-000	2.95 mm (0.115 in.)
Q	41457-PK4-000	3.00 mm (0.117 in.)
R	41458-PK4-000	3.05 mm (0.119 in.)
0A	41428-PRP-000	1.55 mm (0.061 in.)
0B	41429-PRP-000	1.60 mm (0.063 in.)
0C	41430-PRP-000	1.65 mm (0.065 in.)
0D	41431-PRP-000	1.70 mm (0.067 in.)
0E	41432-PRP-000	1.75 mm (0.069 in.)
0F	41433-PRP-000	1.80 mm (0.071 in.)
0G	41434-PRP-000	1.85 mm (0.073 in.)
0H	41435-PRP-000	1.90 mm (0.075 in.)
0I	41436-PRP-000	1.95 mm (0.077 in.)
0J	41437-PRP-000	2.00 mm (0.079 in.)

(cont'd)

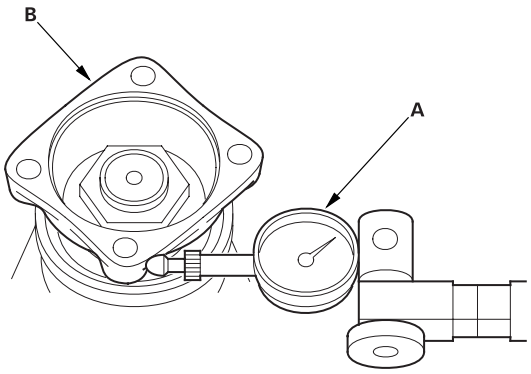
THRUST SHIM, 76 mm (cont'd)

No.	Part Number	Thickness
A	41428-PAX-000	1.575 mm (0.062 in.)
B	41429-PAX-000	1.625 mm (0.064 in.)
C	41430-PAX-000	1.675 mm (0.066 in.)
D	41431-PAX-000	1.725 mm (0.068 in.)
E	41432-PAX-000	1.775 mm (0.070 in.)
F	41433-PAX-000	1.825 mm (0.072 in.)
G	41434-PAX-000	1.875 mm (0.074 in.)
H	41435-PAX-000	1.925 mm (0.076 in.)
I	41436-PAX-000	1.975 mm (0.078 in.)
J	41437-PAX-000	2.025 mm (0.080 in.)
K	41438-PAX-000	2.075 mm (0.082 in.)
L	41439-PAX-000	2.125 mm (0.084 in.)
M	41440-PAX-000	2.175 mm (0.086 in.)
N	41441-PAX-000	2.225 mm (0.088 in.)
O	41442-PAX-000	2.275 mm (0.090 in.)
P	41443-PAX-000	2.325 mm (0.092 in.)
Q	41444-PAX-000	2.375 mm (0.094 in.)
R	41445-PAX-000	2.425 mm (0.095 in.)
S	41446-PAX-000	2.475 mm (0.097 in.)
T	41447-PAX-000	2.525 mm (0.099 in.)
U	41448-PAX-000	2.575 mm (0.101 in.)
V	41449-PAX-000	2.625 mm (0.103 in.)
W	41450-PAX-000	2.675 mm (0.105 in.)
X	41451-PAX-000	2.725 mm (0.107 in.)
Y	41452-PAX-000	2.775 mm (0.109 in.)
Z	41453-PAX-000	2.825 mm (0.111 in.)
0A	41454-PAX-000	2.875 mm (0.113 in.)
0B	41455-PAX-000	2.925 mm (0.115 in.)
0C	41456-PAX-000	2.975 mm (0.117 in.)
0D	41457-PAX-000	3.025 mm (0.119 in.)

Transfer Assembly

Inspection

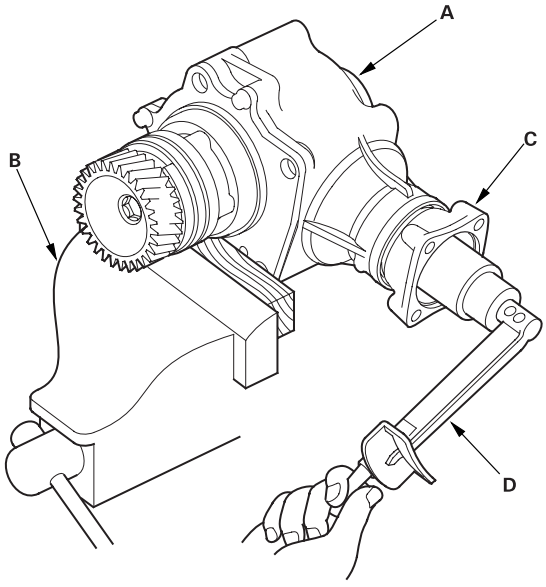
1. Set a dial indicator (A) on the companion flange (B).



2. Measure the transfer gear backlash.

   STANDARD: 0.06 - 0.16 mm (0.02 - 0.06 in.)

3. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer and the vise.



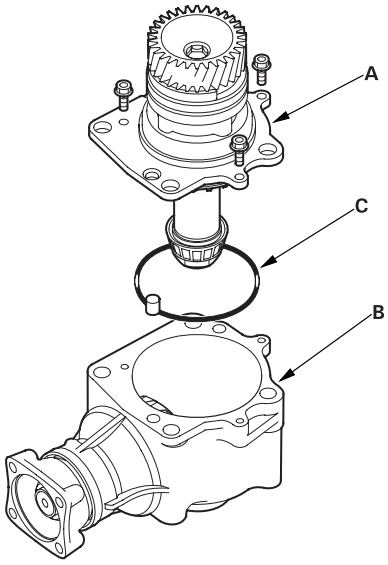
4. Rotate the companion flange several times to seat the tapered roller bearings.

5. Measure the staring torque at the companion flange (C) using a torque wrench (D).

   STANDARD: 2.16 - 3.57 N·m (22.0 - 36.4 kgf·cm, 19.1 - 31.6 lbf·in)

6. Remove the transfer from the vise.

7. Remove the transfer holder (A) from the transfer housing (B), then remove the O-ring (C) from the transfer holder.

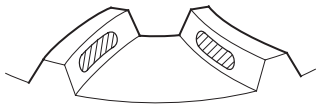


8. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.

9. Install the transfer holder, and tighten the bolts. Do not install the O-ring on the transfer holder.

10. Rotate the companion flange in both directions until the transfer gear rotate one full turn in both directions.

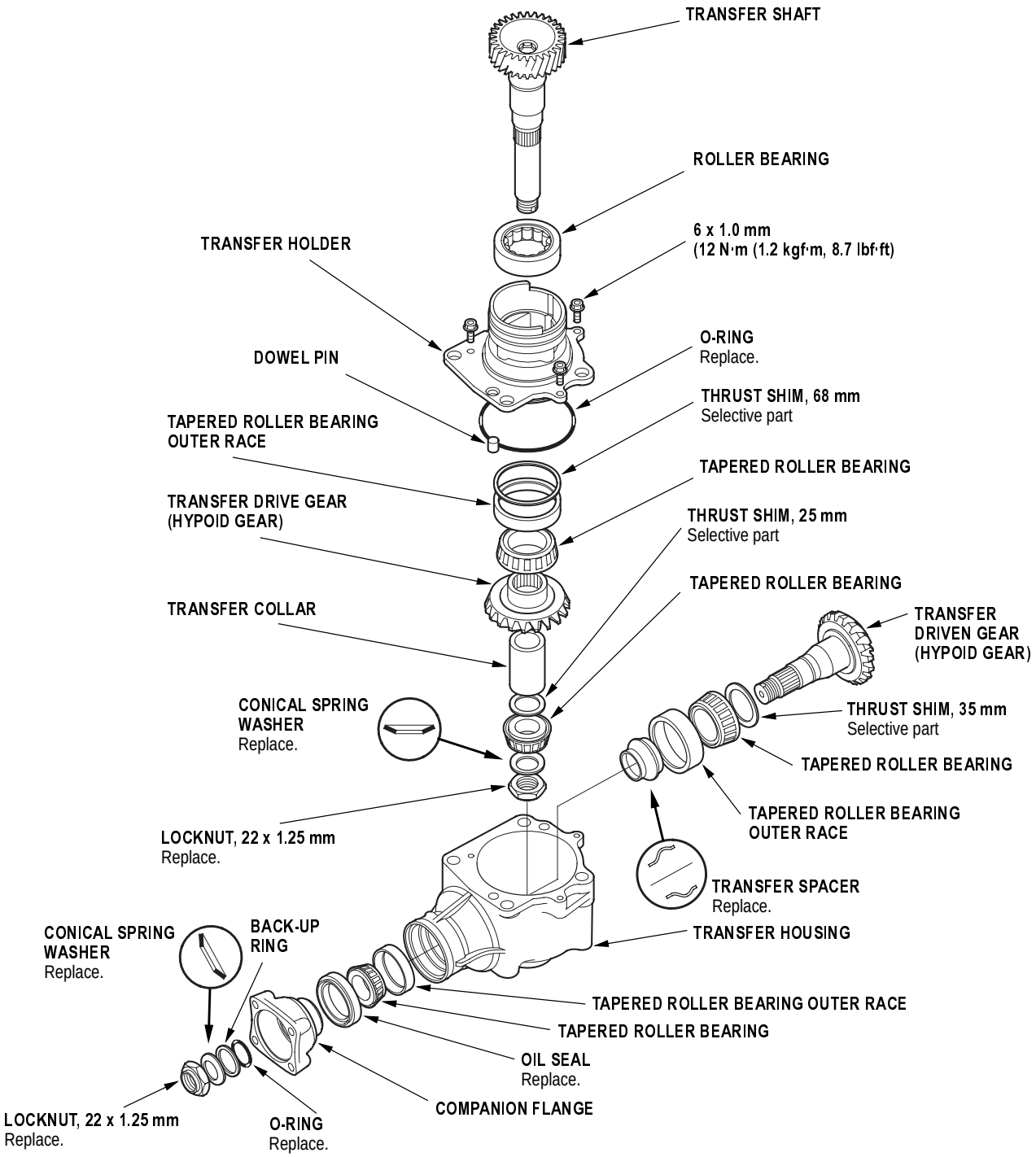
11. Remove the transfer holder, and check the transfer drive gear tooth contact pattern. The pattern should be centered on the gear teeth as shown.



12. If the measurements are out of standard or the tooth contact pattern are incorrect, disassemble the transfer assembly and repair it.

Disassembly

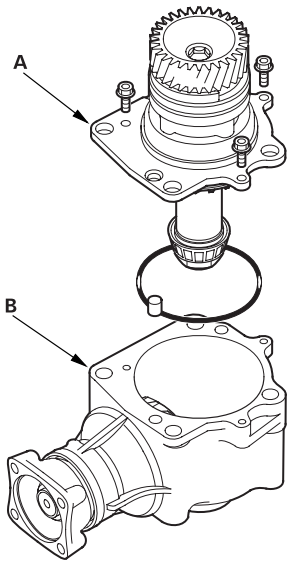
Exploded View



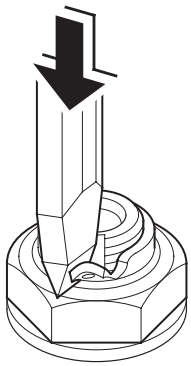
Special Tools Required
Companion flange holder 07PAB-0020000

NOTE: Refer to the Exploded View as needed during the following procedure.

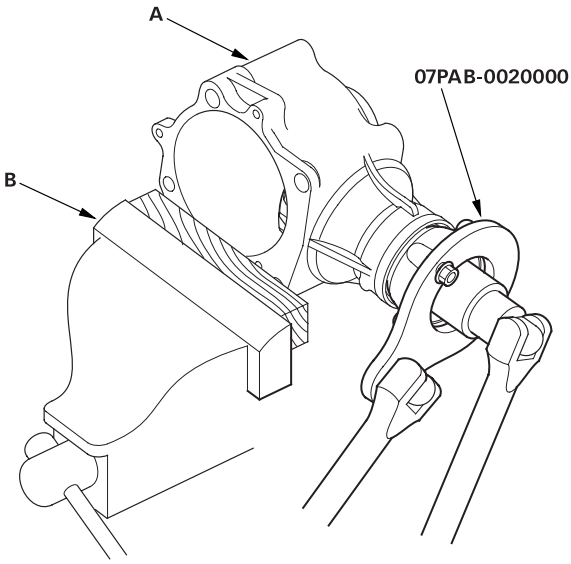
1. Remove the transfer holder (A) from the transfer housing (B).



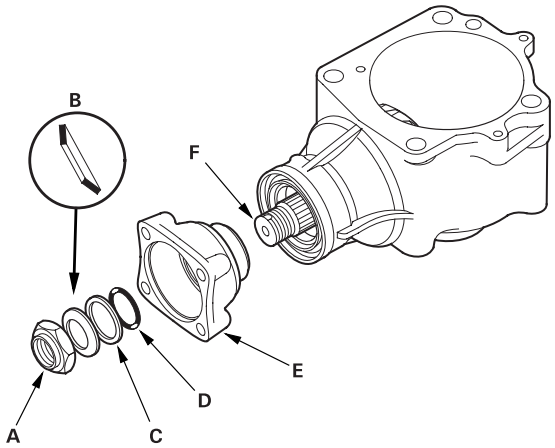
2. Cut the lock tab on the locknut using a chisel.



3. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



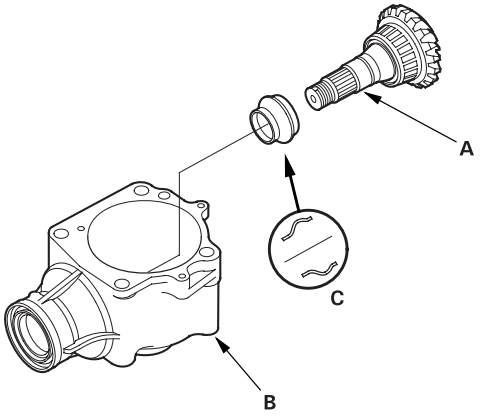
4. Install the special tool on the companion flange, then loosen the locknut.
5. Remove the special tool.
6. Remove the locknut (A), conical spring washer (B), back-up ring (C), O-ring (D), and companion flange (E) from the transfer driven gear (F).



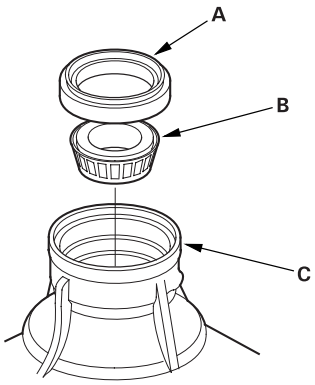
(cont'd)

Disassembly (cont'd)

7. Remove the transfer driven gear (A) from the transfer housing (B), then remove the transfer spacer (C) from the transfer driven gear.

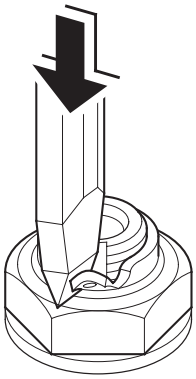


8. Remove the oil seal (A) and tapered roller bearing (B) from the transfer housing (C).

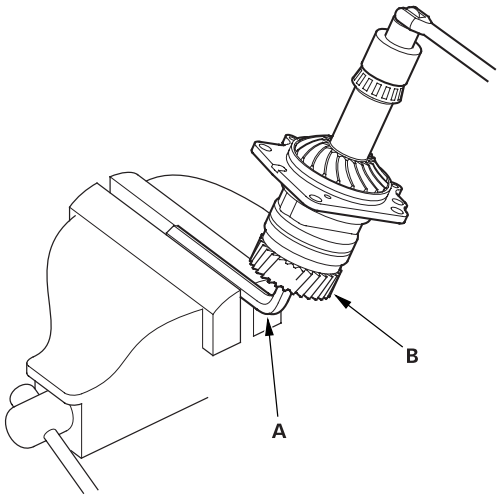


Transfer Holder Disassembly

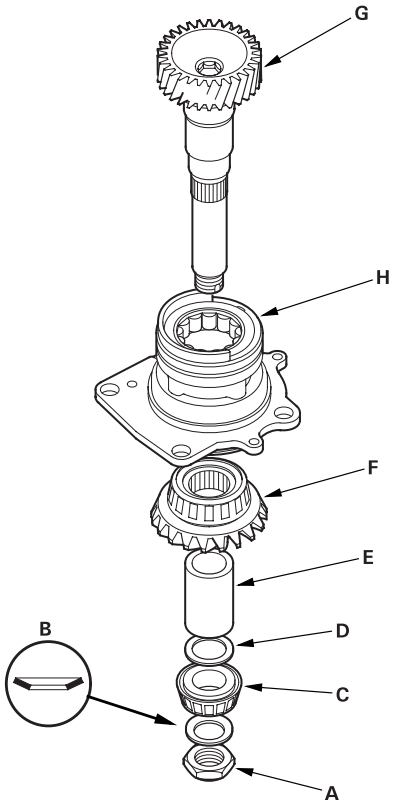
1. Cut the lock tab on the locknut of the transfer shaft using a chisel.



2. Put a 14 mm Allen wrench (A) in the transfer shaft (B), then secure the Allen wrench in a bench vise.



3. Remove the locknut (A) and conical spring washer (B).

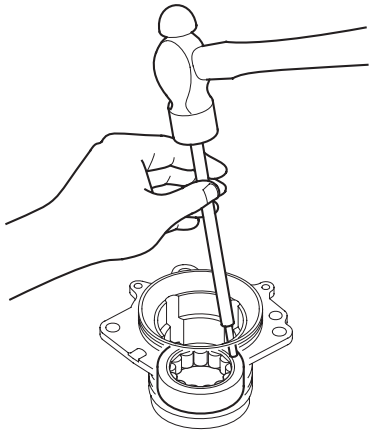


4. Remove the tapered roller bearing (C), 25 mm thrust shim (D), transfer collar (E), transfer drive gear (F), and transfer shaft (G) from the transfer holder (H).

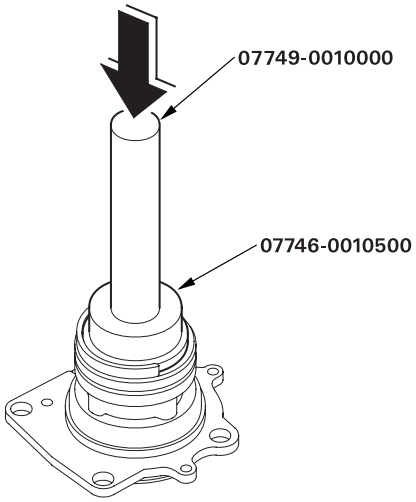
Transfer Holder Roller Bearing Replacement

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 62 x 68 mm 07746-0010500

1. Remove the roller bearing from the transfer holder.



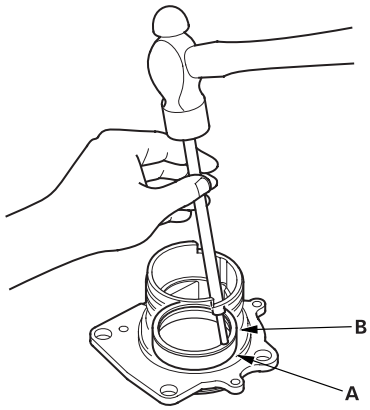
2. Install the new roller bearing in the transfer holder with the special tools.



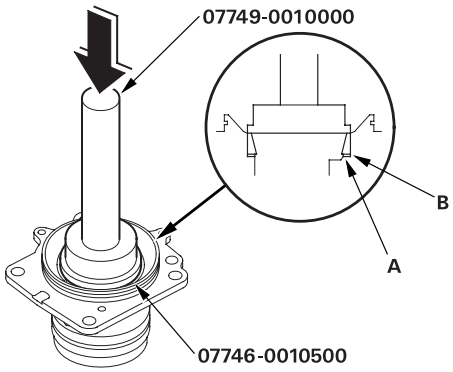
Transfer Holder Tapered Roller Bearing Outer Race Removal/Installation

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 62 x 68 mm 07746-0010500

1. Remove the tapered roller bearing outer race (A) and 68 mm thrust shim (B) form the transfer holder.



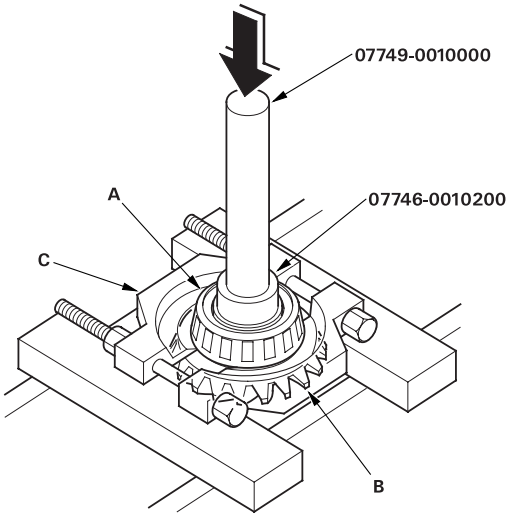
2. Install the 68 mm thrust shim (A) in the transfer holder, then install the tapered roller bearing outer race (B) with the special tools.



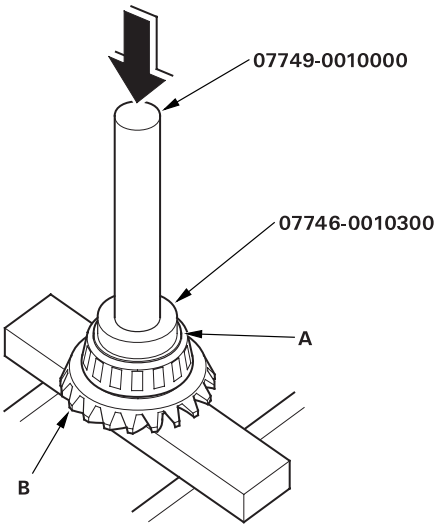
Transfer Drive Gear Bearing Replacement

Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 37 x 40 mm 07746-0010200
- Driver attachment, 42 x 47 mm 07746-0010300

1. Remove the tapered roller bearing (A) from the transfer drive gear (B) with the special tools, bearing separator (C) and a press.



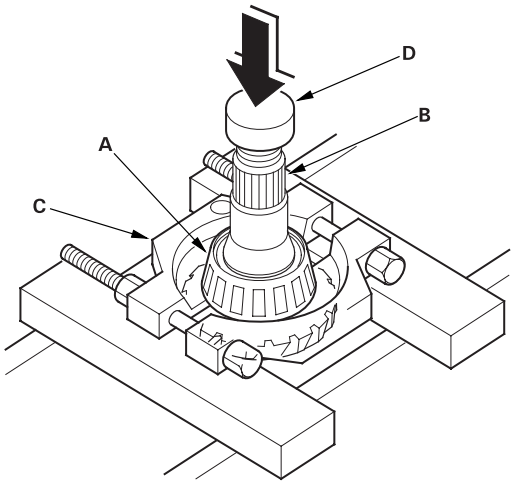
2. Install the new tapered roller bearing (A) on the transfer drive gear (B) with the special tools and a press.



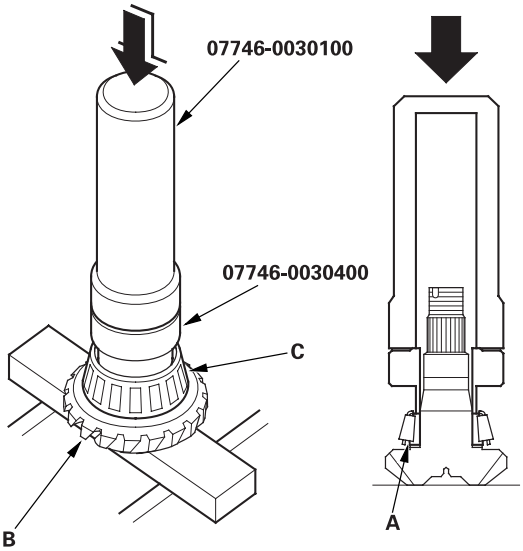
Transfer Driven Gear Bearing Removal/ Installation

Special Tools Required
- Driver 40 mm I.D. 07746-0030100
- Driver attachment, 35 mm I.D. 07746-0030400

1. Remove the tapered roller bearing (A) from the transfer driven gear (B) with a bearing separator (C) and a press. Place a shaft protector (D) between the transfer driven gear and a press to prevent damaging the transfer driven gear.



2. Install the 35 mm thrust shim (A) on the transfer driven gear (B).
3. Install the tapered roller bearing (C) on the transfer driven gear with the special tools and a press.



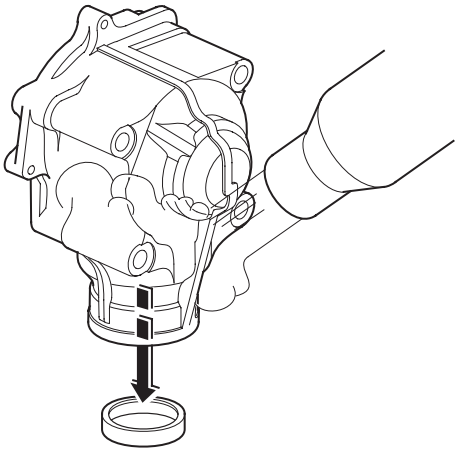
Transfer Housing Tapered Roller Bearing Outer Race Replacement

Special Tools Required
- Handle driver 07749-0010000
- Oil seal driver attachment 07947-SD90101
- Bearing installer attachment 07KAF-PS30120
- Bearing installer attachment 07LAF-PZ70110
- Installer shaft 14 x 165 mm 07JAF-SJ80110
- Installer nuts 14 mm 07JAF-SJ80120

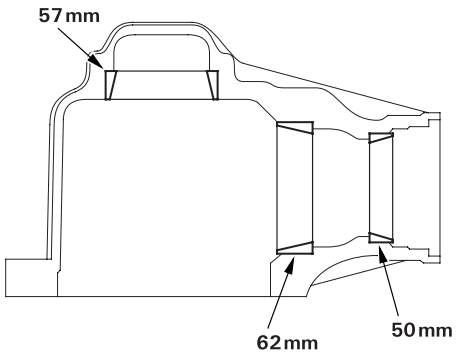
NOTE: Replace the bearing with a new one whenever the outer race is replaced.

1. Remove the bearing outer races from the transfer housing by heating the housing to about 212°F (100°C) with a heat gun. Do not heat the housing more than 212°F (100°C).

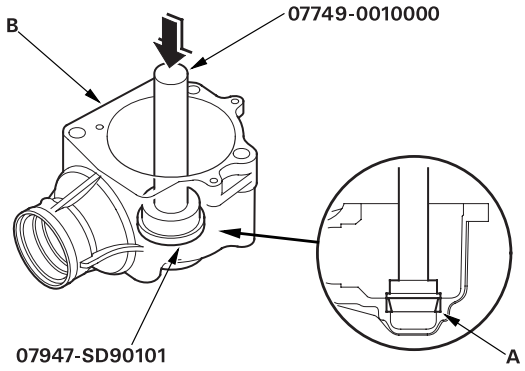
   NOTE: Some 57 mm bearing outer races are not press-fitted, and can be removed without heating the housing.



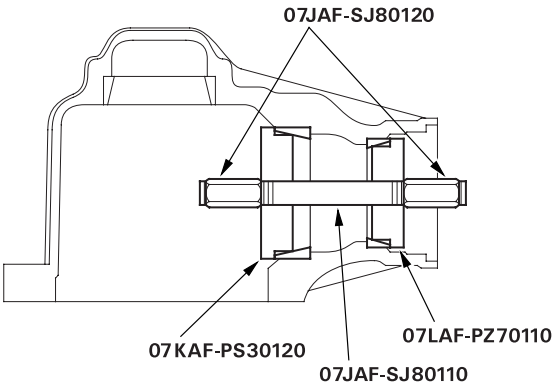
Bearing Outer Race Locations



2. Install the 57 mm bearing outer race (A) in the housing (B) with the special tools.



3. Install the 62 mm bearing outer race and 50 mm bearing outer race in the housing with the special tools.



Reassembly

Special Tools Required

- Driver 40 mm I.D. 07746-0030100
- Driver attachment, 35 mm I.D. 07746-0030400
- Handle driver 07749-0010000
- Oil seal driver attachment 07JAD-PH80101
- Companion flange holder 07PAB-002000
- Driver attachment, 62 x 68 mm 07746-0010500

NOTE:

- While reassembling the transfer assembly:
  - Check and adjust the transfer gear tooth contact.
  - Measure and adjust the transfer gear backlash.
  - Check and adjust the tapered roller bearing starting torque.
- Coat all parts with ATF during reassembly.
- Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.
- Replace the transfer drive gear and the transfer driven gear as a set if either part is replaced.

1. Select the 35 mm thrust shim if the transfer driven gear is replaced. Calculate the thickness of the 35 mm thrust shim using the formula below, and select the shim from the table below.

NOTE: The number on the transfer driven gear is shown in 1/100 mm.

$$\text{FORMULA: } X = \frac{A}{100} - \frac{B}{100} + C$$

A: Number on the existing transfer driven gear

B: Number on the replacement transfer driven gear

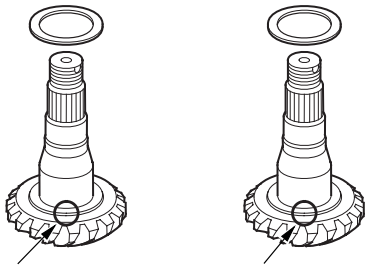
C: Thickness of the existing 35 mm thrust shim

X: Thickness needed for the replacement 35 mm thrust shim

Example:

C: EXISTING 35 mm THRUST SHIM Thickness: C = 1.05 mm

X: REPLACEMENT 35 mm THRUST SHIM Thickness: X = ? ? mm



A: EXISTING TRANSFER DRIVEN GEAR Number: A = + 2

A: REPLACEMENT TRANSFER DRIVEN GEAR Number: B = - 1

$$X = \frac{A}{100} - \frac{B}{100} + C = \frac{2}{100} - \frac{-1}{100} + 1.05$$

$$= 0.02 + 0.01 + 1.05 = 1.08 \text{ mm}$$

Select No. M 35 mm thrust shim of 1.08 mm in this case.

THRUST SHIM, 35 mm

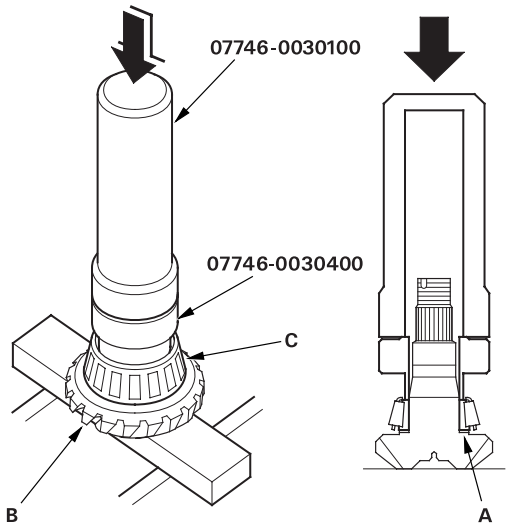
Shim No.	Part Number	Thickness
A	41361-PS3-000	0.72 mm (0.028 in.)
B	41362-PS3-000	0.75 mm (0.030 in.)
C	41363-PS3-000	0.78 mm (0.031 in.)
D	41364-PS3-000	0.81 mm (0.032 in.)
E	41365-PS3-000	0.84 mm (0.033 in.)
F	41366-PS3-000	0.87 mm (0.034 in.)
G	41367-PS3-000	0.90 mm (0.035 in.)
H	41368-PS3-000	0.93 mm (0.037 in.)
I	41369-PS3-000	0.96 mm (0.038 in.)
J	41370-PS3-000	0.99 mm (0.039 in.)
K	41371-PS3-000	1.02 mm (0.040 in.)
L	41372-PS3-000	1.05 mm (0.041 in.)
M	41373-PS3-000	1.08 mm (0.043 in.)
N	41374-PS3-000	1.11 mm (0.044 in.)

2. Select the 35 mm thrust shim if the tapered roller bearing on the transfer driven gear is replaced. Measure the thickness of the replacement bearing and the existing bearing, and calculate the difference of the bearing thickness. Adjust the thickness of the existing 35 mm thrust shim by the amount of the difference in bearing thickness, and select the replacement 35 mm thrust shim from the above table.

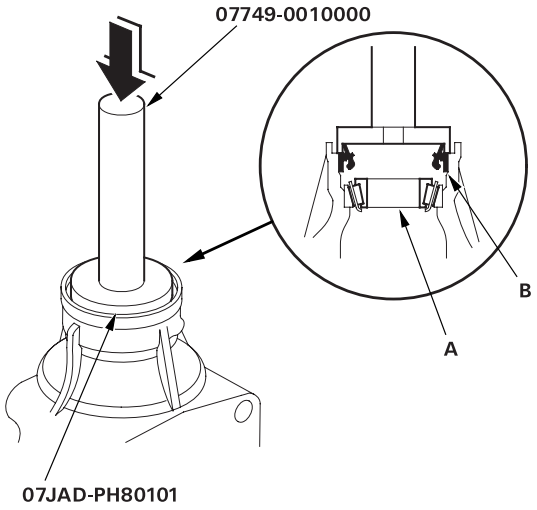
(cont'd)

Reassembly (cont'd)

3. Install the 35 mm thrust shim (A) on the transfer driven gear (B), then install the tapered roller bearing (C) with the special tools and a press.

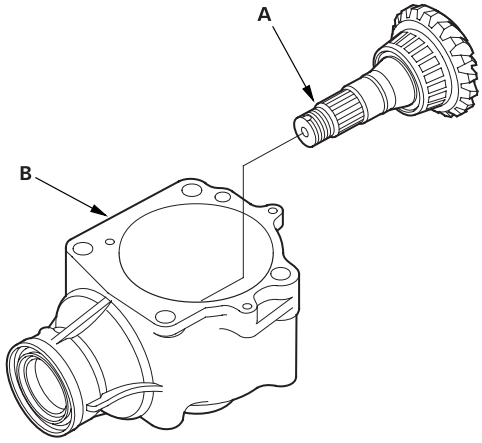


4. Place the tapered roller bearing (A) on the bearing outer race of the companion flange side of the transfer housing.

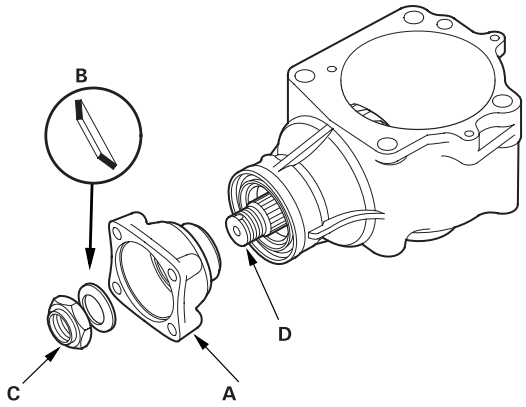


5. Install the new oil seal (B) on the transfer housing with the special tools and a press.

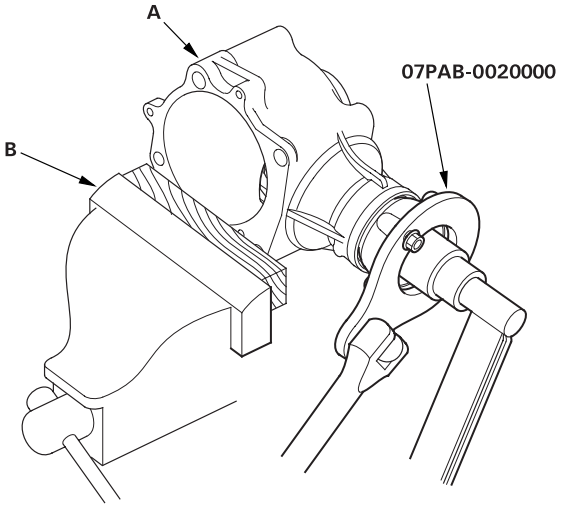
6. Install the transfer driven gear (A) in the transfer housing (B). Do not install the transfer spacer on the transfer driven gear.



7. Install the companion flange (A), conical spring washer (B), and locknut (C) on the transfer driven gear (D). Do not install the O-ring and back-up ring.



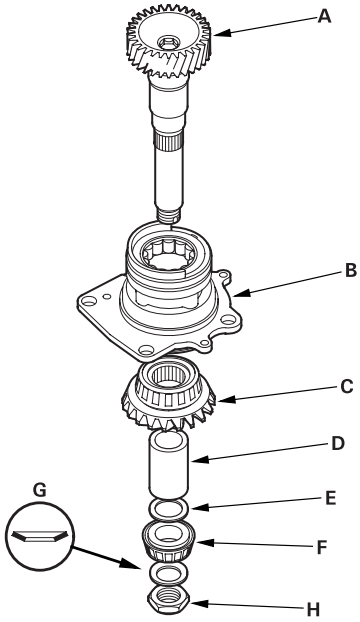
8. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



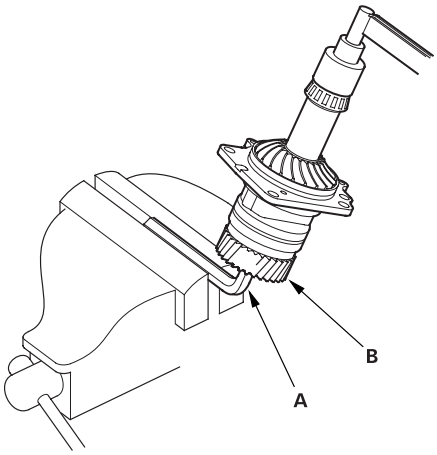
9. Install the special tool on the companion flange.

10. Tighten the locknut while measuring the starting torque so the starting torque is within 0.98 - 1.39 N·m (10.0 - 14.2 kgf·cm, 8.7 - 12.3 lbf·in). Do not stake the locknut in this step.

11. Install the transfer shaft (A) in the transfer holder (B), and install the transfer drive gear (C), transfer collar (D), 25 mm thrust shim (E), tapered roller bearing (F), conical spring washer (G), and locknut (H).



12. Put a 14 mm Allen wrench (A) in the transfer shaft (B), then secure the Allen wrench in a bench vise.



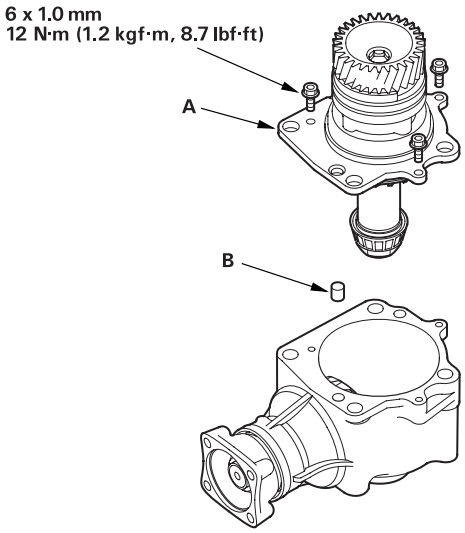
13. Tighten the locknut 118 N·m (12.0 kgf·m, 86.8 lbf·ft). Do not stake the locknut in this step.

(cont'd)

Reassembly (cont'd)

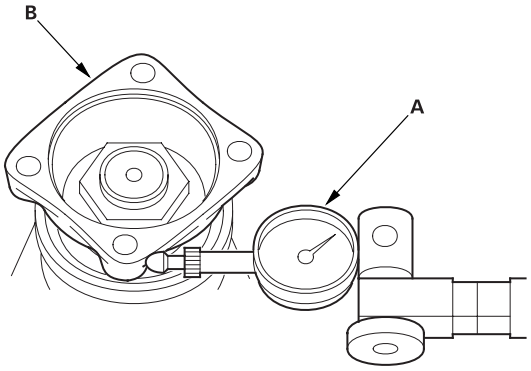
14. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.

15. Temporarily install the transfer holder (A) and dowel pin (B) without O-ring, and tighten the bolts.



16. Rotate the companion flange in both directions until the transfer gear rotate one full turn in both directions.

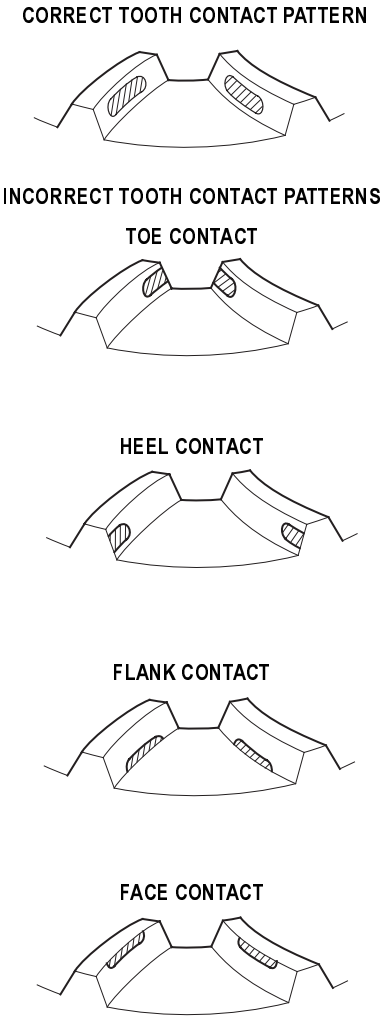
17. Set a dial indicator (A) on the companion flange (B).



18. Measure the transfer gear backlash.

STANDARD: 0.06 - 0.16 mm (0.02 - 0.06 in.)

19. Remove the transfer holder, and check the transfer drive gear tooth contact pattern.



20. If the measurement of the backlash is out of standard, adjust the transfer gear backlash with the 35 mm thrust shim and recheck. Do not use more than two 35 mm thrust shims to adjust the transfer gear backlash.

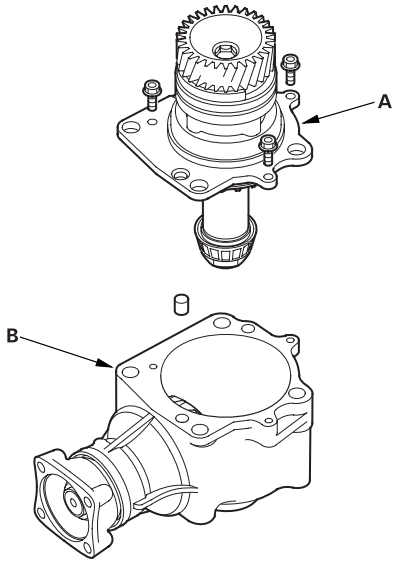
21. If the transfer gear tooth contact is incorrect, adjust the transfer gear tooth contact with the 25 mm or 35 mm thrust shim. Do not use more than two shims of each thrust shim to adjust the tooth contact.

- **Toe Contact**
  Use a thicker 35 mm thrust shim to move the transfer driven gear toward the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear away from the transfer driven gear to adjust the transfer gear backlash as follows:
  – Increase the thickness of the 25 mm thrust shim.
  – Reduce the thickness of the 68 mm thrust shim by the amount of increase of the 25 mm thrust shim.
- **Heel Contact**
  Use a thinner 35 mm thrust shim to move the transfer driven gear away from the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear toward the transfer driven gear to adjust the transfer gear backlash as follows:
  – Reduce the thickness of the 25 mm thrust shim.
  – Increase the thickness of the 68 mm thrust shim by amount of reduce thickness of the 25 mm thrust shim.
- **Flank Contact**
  Use a thinner thrust shim to move the transfer drive gear toward the transfer driven gear. Flank contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Heel Contact.
- **Face Contact**
  Use a thicker thrust shim to move the transfer drive gear away from the transfer driven gear. Face contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Toe Contact.

THRUST SHIM, 25 mm

Shim No.	Part Number	Thickness
1.70	29411-P1C-000	1.70 mm (0.067 in.)
1.73	29412-P1C-000	1.73 mm (0.068 in.)
1.76	29413-P1C-000	1.76 mm (0.069 in.)
1.79	29414-P1C-000	1.79 mm (0.070 in.)
1.82	29415-P1C-000	1.82 mm (0.072 in.)
1.85	29416-P1C-000	1.85 mm (0.073 in.)
1.88	29417-P1C-000	1.88 mm (0.074 in.)
1.91	29418-P1C-000	1.91 mm (0.075 in.)
1.94	29419-P1C-000	1.94 mm (0.076 in.)
1.97	29420-P1C-000	1.97 mm (0.078 in.)
2.00	29421-P1C-000	2.00 mm (0.079 in.)
2.03	29422-P1C-000	2.03 mm (0.080 in.)
2.06	29423-P1C-000	2.06 mm (0.081 in.)
2.09	29424-P1C-000	2.09 mm (0.082 in.)
2.12	29425-P1C-000	2.12 mm (0.083 in.)
2.15	29426-P1C-000	2.15 mm (0.085 in.)
2.18	29427-P1C-000	2.18 mm (0.086 in.)
2.21	29428-P1C-000	2.21 mm (0.087 in.)
2.24	29429-P1C-000	2.24 mm (0.088 in.)

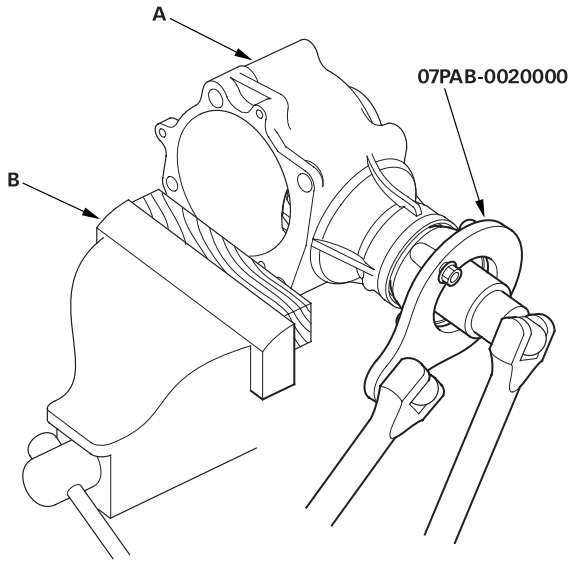
22. Remove the transfer holder (A) from the transfer housing (B) after adjusting the transfer gear backlash or transfer gear tooth contact.



(cont'd)

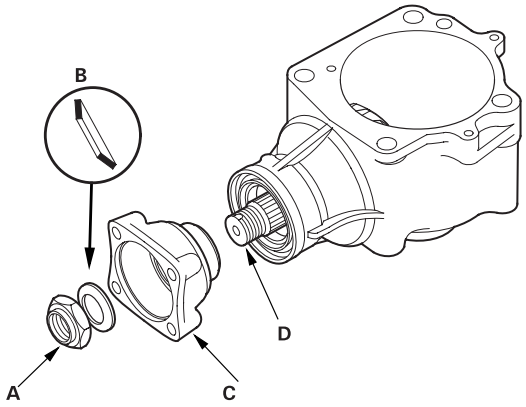
Reassembly (cont'd)

23. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

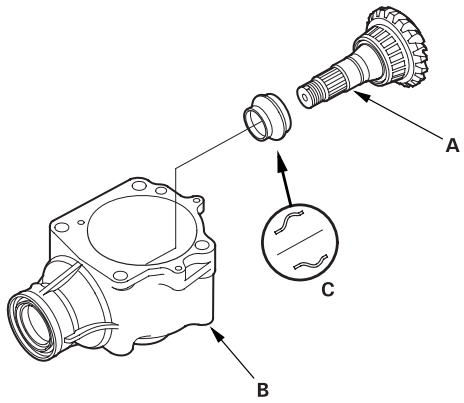


24. Install the special tool on the companion flange, then loosen the locknut.

25. Remove the locknut (A), conical spring washer (B), and companion flange (C) from the transfer driven gear (D).



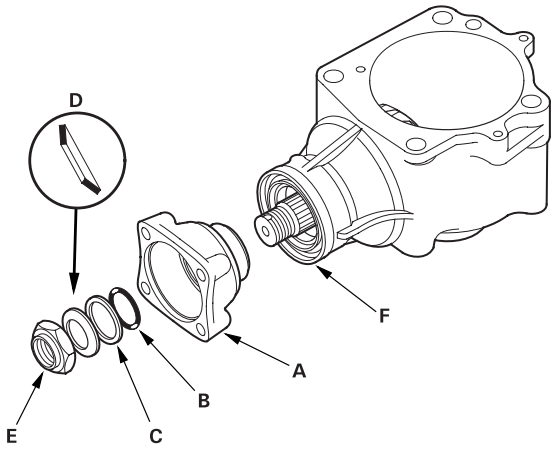
26. Remove the transfer driven gear (A) from the transfer housing (B).



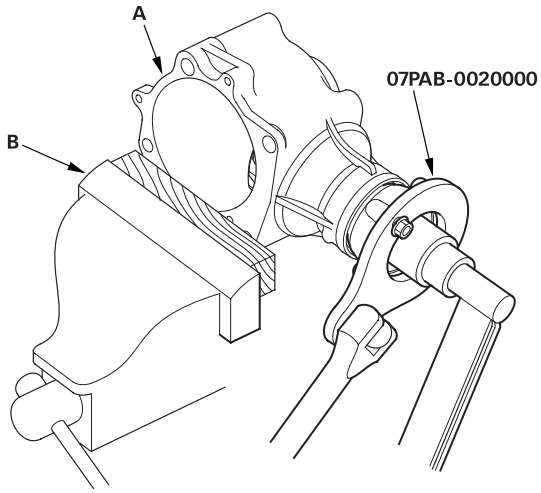
27. Install the new transfer spacer (C) on the transfer driven gear in the direction shown, and install them in the transfer housing.

28. Coat the threads of the locknut and transfer driven gear with ATF.

29. Install the companion flange (A), new O-ring (B), back-up ring (C), new conical spring washer (D), and new locknut (E) on the transfer driven gear (F). Install the conical spring washer in the direction shown.



30. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



31. Install the special tool on the companion flange.

32. Tighten the locknut while measuring the starting torque of the transfer driven gear.

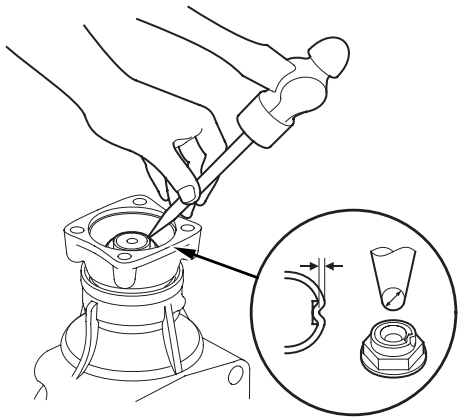
STARTING TORQUE:
0.98 - 1.39 N·m (10.0 - 14.2 kgf·cm, 8.7 - 12.3 lbf·in)

TIGHTENING TORQUE:
132 - 260 N·m (13.5 - 26.5 kgf·m, 97.6 - 192 lbf·ft)

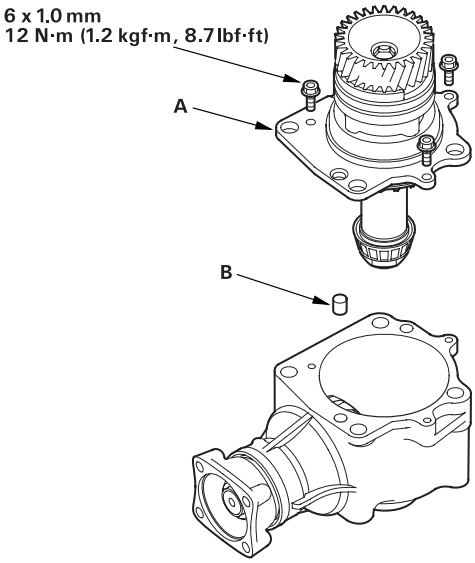
NOTE:
- Rotate the companion flange several turns to seat the tapered roller bearings, then measure the starting torque.
- If the starting torque exceeds 1.39 N·m (14.2 kgf·cm, 12.3 lbf·in), replace the transfer spacer and reassemble the parts. Do not adjust the starting torque with the locknut loose.
- If the tightening torque exceeds 260 N·m (26.5 kgf·m, 192 lbf·ft), replace the transfer spacer and reassemble the parts.

33. Remove the special tool.

34. Stake the locknut using a 3.5 mm punch.



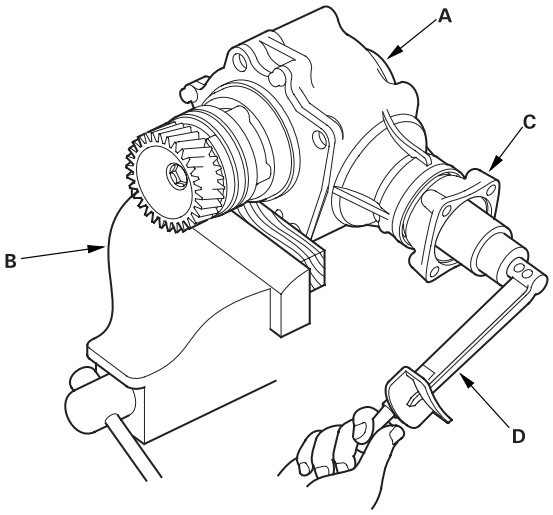
35. Temporarily install the transfer holder (A) and dowel pin (B) without the O-ring, and tighten the bolts.



(cont'd)

Reassembly (cont'd)

36. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer and the vise.



37. Rotate the companion flange several times to seat the tapered roller bearings.

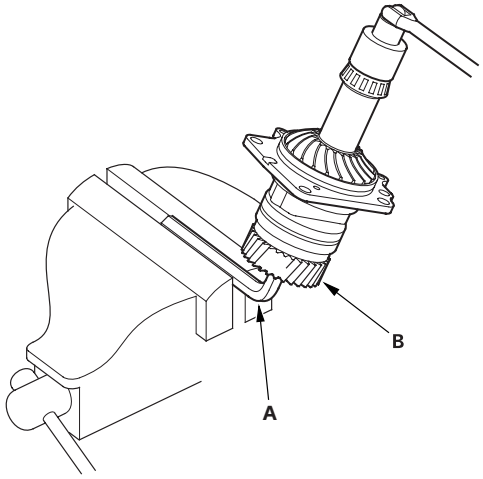
38. Measure the staring torque at the companion flange (C) using a torque wrench (D).

STANDARD: 2.16 - 3.57 N·m (22.0 - 36.4 kgf·cm, 19.1 - 31.6 lbf·in)

39. Remove the transfer holder from the transfer housing.

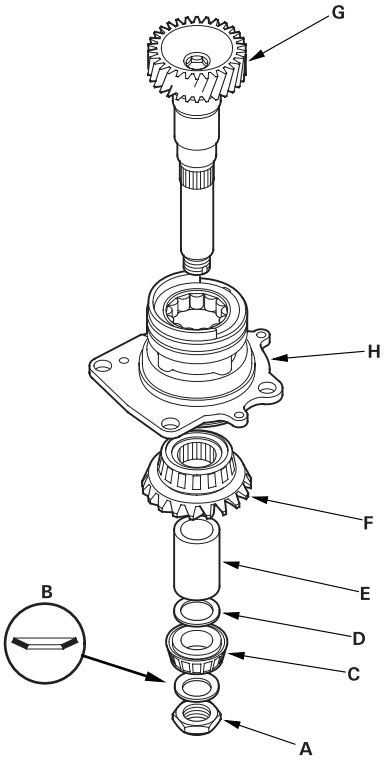
40. If the measurement is within the standard, go to step 53.

41. If the measurement is out of standard, put a 14 mm Allen wrench (A) in the transfer shaft (B), then secure the Allen wrench in a bench vise.



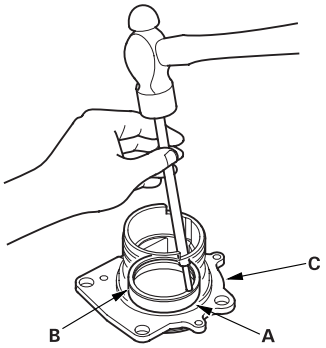
42. Loosen the locknut.

43. Remove the locknut (A) and conical spring washer (B).



44. Remove the tapered roller bearing (C), 25 mm thrust shim (D), transfer collar (E), transfer drive gear (F), and transfer shaft (G) from the transfer holder (H).

45. Remove the tapered roller bearing outer race (A) and the 68 mm thrust shim (B) from the transfer holder (C).



46. Measure the thickness of the 68 mm thrust shim, and select the new 68 mm thrust shim.

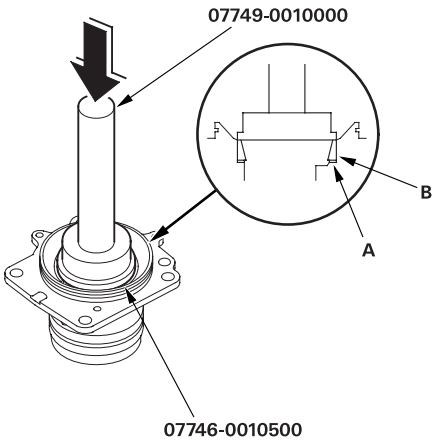
THRUST SHIM, 68 mm

Shim No.	Part Number	Thickness
ZV	23974-P1C-020	1.41 mm (0.056 in.)
ZW	23975-P1C-020	1.44 mm (0.057 in.)
ZX	23976-P1C-020	1.47 mm (0.058 in.)
ZY	23977-P1C-020	1.50 mm (0.060 in.)
ZZ	23978-P1C-020	1.53 mm (0.060 in.)
A	23941-PW5-000	1.56 mm (0.061 in.)
B	23942-PW5-000	1.59 mm (0.063 in.)
C	23943-PW5-000	1.62 mm (0.064 in.)
D	23944-PW5-000	1.65 mm (0.065 in.)
E	23945-PW5-000	1.68 mm (0.066 in.)
F	23946-PW5-000	1.71 mm (0.067 in.)
G	23947-PW5-000	1.74 mm (0.069 in.)
H	23948-PW5-000	1.77 mm (0.070 in.)
I	23949-PW5-000	1.80 mm (0.071 in.)
J	23950-PW5-000	1.83 mm (0.072 in.)
K	23951-PW5-000	1.86 mm (0.073 in.)
L	23952-PW5-000	1.89 mm (0.074 in.)
M	23953-PW5-000	1.92 mm (0.076 in.)
N	23954-PW5-000	1.95 mm (0.077 in.)
O	23955-PW5-000	1.98 mm (0.078 in.)
P	23956-PW5-000	2.01 mm (0.079 in.)
Q	23957-PW5-000	2.04 mm (0.080 in.)
R	23958-PW5-000	2.07 mm (0.081 in.)
S	23959-PW5-000	2.10 mm (0.083 in.)
T	23960-PW5-000	2.13 mm (0.084 in.)
U	23961-PW5-000	2.16 mm (0.085 in.)
V	23962-PW5-000	2.19 mm (0.086 in.)
W	23963-PW5-000	2.22 mm (0.087 in.)
X	23964-PW5-000	2.25 mm (0.089 in.)
Y	23965-PW5-000	2.28 mm (0.090 in.)
Z	23966-PW5-000	2.31 mm (0.091 in.)
AA	23967-PW5-000	2.34 mm (0.092 in.)
AB	23968-PW5-000	2.37 mm (0.093 in.)
AC	23969-PW5-000	2.40 mm (0.094 in.)
AD	23970-PW5-000	2.43 mm (0.096 in.)
AZ	23941-PW8-000	2.46 mm (0.097 in.)
BZ	23942-PW8-000	2.49 mm (0.098 in.)
CZ	23943-PW8-000	2.52 mm (0.099 in.)
DZ	23944-PW8-000	2.55 mm (0.100 in.)
EZ	23945-PW8-000	2.58 mm (0.102 in.)

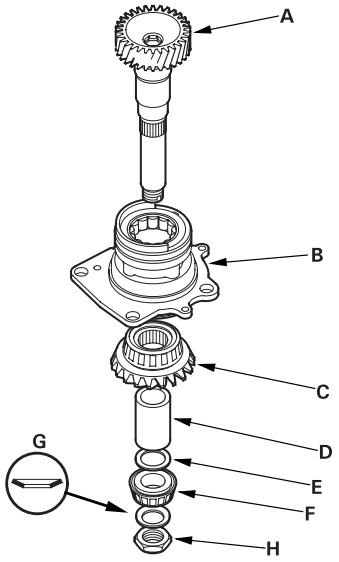
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Reassembly (cont'd)

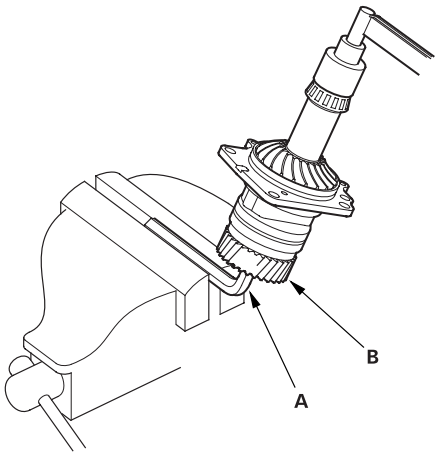
47. Install the new 68 mm thrust shim (A) in the transfer holder, then install the tapered roller bearing outer race (B) with the special tools.



48. Install the transfer shaft (A) in the transfer holder (B), and install the transfer drive gear (C), transfer collar (D), 25 mm thrust shim (E), tapered roller bearing (F), conical spring washer (G), and locknut (H). Install the conical spring washer in the direction shown.

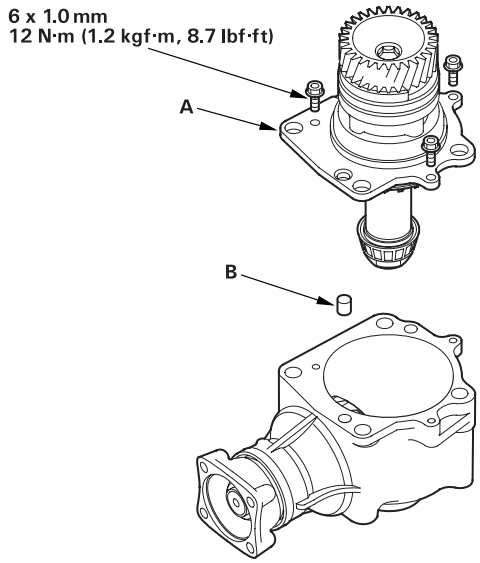


49. Put a 14 mm Allen wrench (A) in the transfer shaft (B), then secure the Allen wrench in a bench vise.



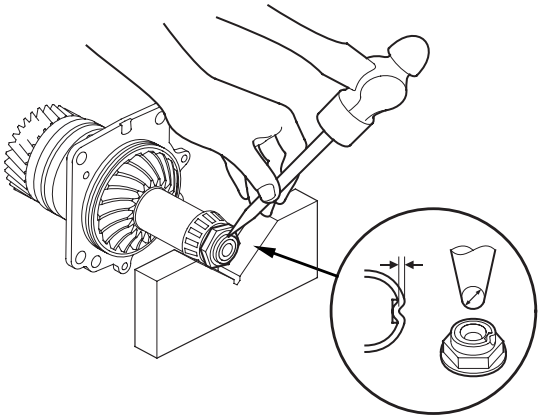
50. Tighten the locknut 118 N·m (12.0 kgf·m, 86.8 lbf·ft). Do not stake the locknut in this step.

51. Temporarily install the transfer holder (A) and dowel pin (B) without the O-ring, and tighten the bolts.

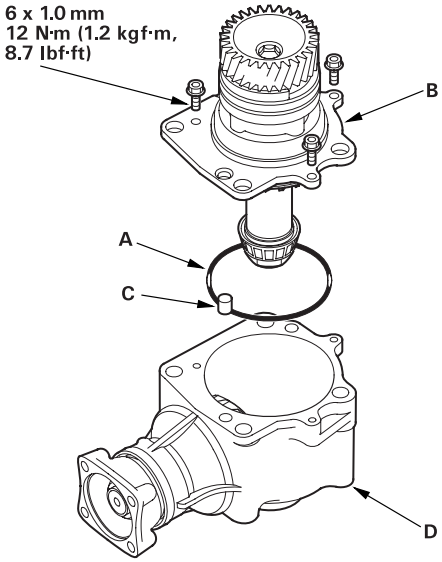


52. Rotate the companion flange several turns to seat the tapered roller bearings, and recheck the starting torque. Remove the transfer holder after adjusting the starting torque.

53. Stake the locknut of the transfer shaft using a 3.5 mm punch.



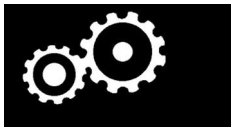
54. Install the new O-ring (A) on the transfer holder (B), then install the transfer holder with the dowel pin (C) on the transfer housing (D).



15

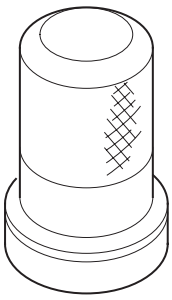
Rear Differential

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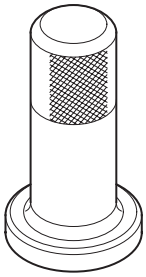


Special Tools

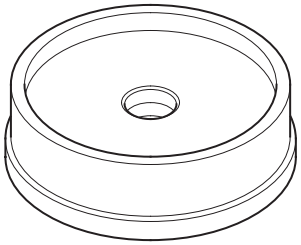
Ref. No.	Tool Number	Description	Qty
1	07GAD-PH70201	Oil Seal Driver 64	
2	07JAD-PL90100	Oil Seal Driver 65	
3	07NAD-PX40100	Attachment, 78 x 80 mm	
4	07PAB-0020000	Companion Flange Holder	
5	07749-0010000	Driver 15 x 135L	



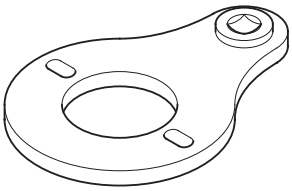
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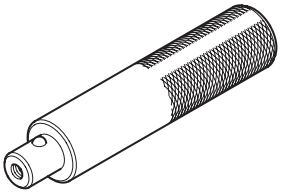
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3



4



5

System Description

Outline

The Real-time 4WD-Dual Pump System model has a hydraulic clutch and a differential mechanism in the rear differential assembly. Under normal conditions, the vehicle is driven by the front wheels. However, depending on to the driving force of the front wheels and the road conditions, the system instantly transmits appropriate driving force to the rear wheels without requiring the driver to switch between 2WD (front wheel drive) and 4WD (four wheel drive). The switching mechanism between 2WD and 4WD is integrated into the rear differential assembly to make the system light and compact.
In addition, the dual-pump system switches off the rear-wheel-drive force when braking in a forward gear. This allows the braking system to work properly on models equipped with an Anti-lock Braking System (ABS).

Construction

The rear differential assembly consists of the torque control differential case assembly and the rear differential carrier assembly. The torque control differential case assembly consists of the differential clutch assembly, the companion flange, and the oil pump body assembly. The rear differential carrier assembly consists of the differential mechanism. The differential drive and driven gears are hypoid gears.
The oil pump body assembly consists of the front oil pump, the rear oil pump, the hydraulic control mechanism, and the clutch piston. The clutch piston has a disc spring that constantly provides the differential clutch assembly with a preset torque to prevent abnormal sound.
The clutch guide in the differential clutch assembly is connected to the propeller shaft via the companion flange, and it receives the driving force from the transfer assembly. The clutch guide rotates the clutch plate and the front oil pump in the oil pump body.
The clutch hub in the differential clutch assembly has a clutch disc that is splined with the hypoid drive pinion gear. The hypoid drive gear drives the rear oil pump.
The front and rear oil pumps are trochoidal pumps. The rear oil pump capacity is 2.5 percent larger that the front oil pump to handle the rotation difference between the front and rear wheels caused by worn front tires and tight corner braking. The oil pumps are designed so the fluid intake works as a fluid discharge when the oil pumps rotate in reverse. Honda DPSF (Dual Pump System Fluid) is used instead of differential fluid.

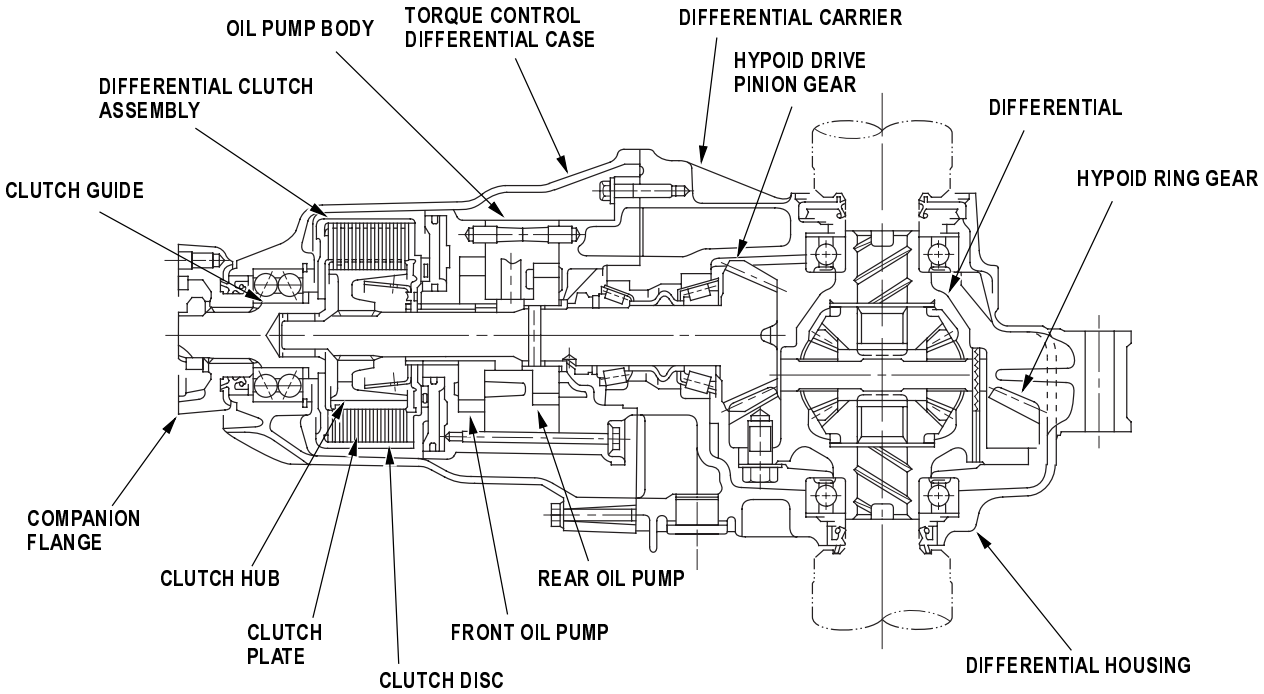
Operation

When there is a difference in rotation speed between the front wheels (clutch guide) and rear wheels (hypoid driven gear), hydraulic pressure from the front and rear oil pumps engages the differential clutch, and drive force from the transfer assembly is applied to the rear wheels.
The hydraulic pressure control mechanism in the oil pump body selects 4WD mode when the vehicle is started abruptly, or when accelerating in a forward or reverse gear (causing rotation difference between the front and rear wheels), or when braking in reverse gear (when decelerating). It switches to 2WD mode when the vehicle is driven at a constant speed in forward or reverse gear (when there is no rotation difference between the front and rear wheels), or when braking in a forward gear (when decelerating).
To protect the system, the differential clutch assembly is lubricated by hydraulic pressure generated by the oil pumps in both 4WD and 2WD modes. Also, the thermal switch relieves the hydraulic pressure on the clutch piston and cancels 4WD mode if the temperature of the differential fluid rises above normal.

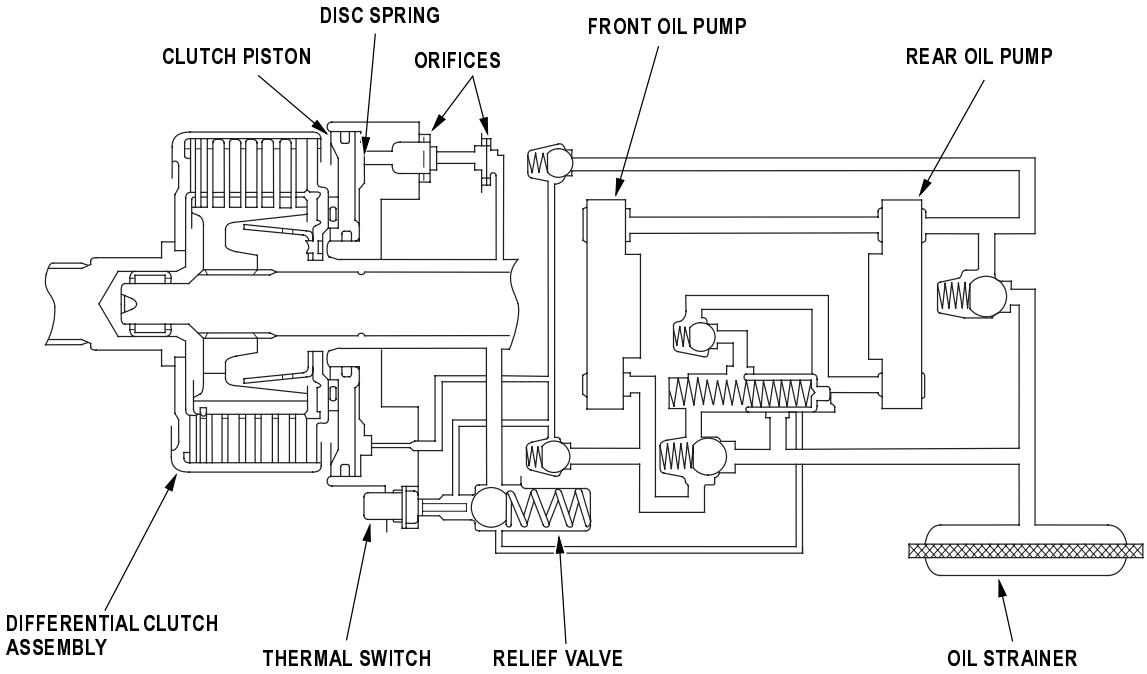
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System Description (cont'd)

REAR DIFFERENTIAL ASSEMBLY

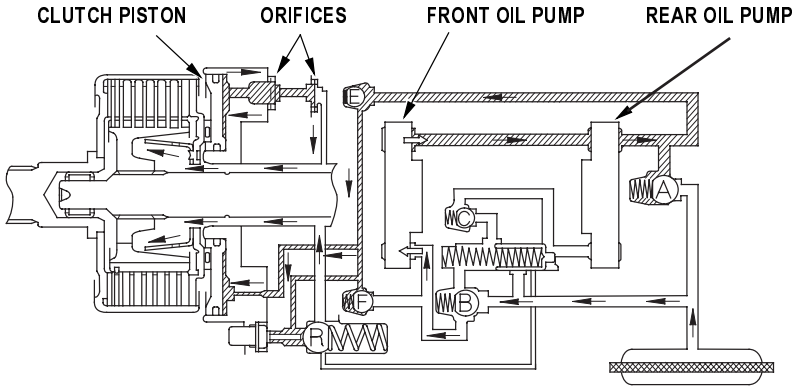


HYDRAULIC CONTROL SYSTEM



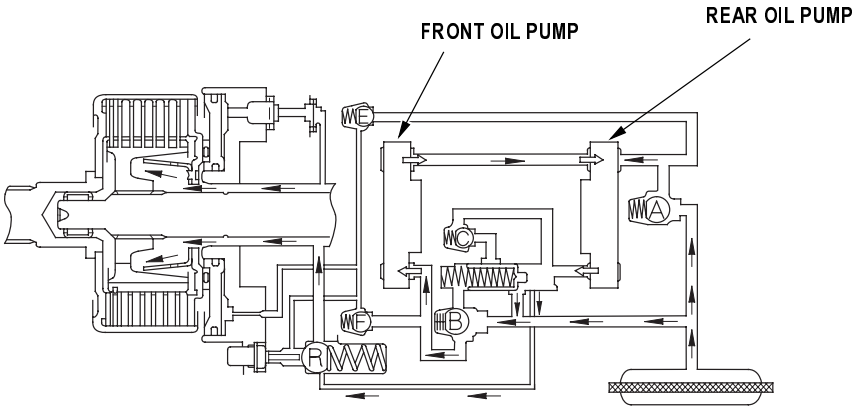
Forward Start and Acceleration (4WD)

During a forward start and forward acceleration, the dual pump system can engage four wheel drive.
If the front wheels spin faster than the rear wheels, the front oil pump spins faster than the rear oil pump. The front pump draws fluid through check valve B and discharges it. Some of the discharged fluid is drawn in the by the rear oil pump. The remaining fluid will pass through check valve E into the clutch piston. There, hydraulic pressure is regulated by two orifices. The regulated hydraulic pressure at the clutch piston pushes the plates and discs of the clutch together to form a connection. The engaged clutch then passes driving force from the transfer assembly to the rear wheels, producing 4WD.



Forward Driving at Constant Speed (2WD)

When driving forward at a constant speed (cruising), the dual pump system functions in two wheel drive mode.
The rotation speed of the front and rear wheels is the same, so the speed of the front and rear pumps is also the same. Fluid discharged by the front oil pump is drawn in by the rear oil pump and is circulated through the system. Because there is no pressure built up at the clutch piston, the clutch does not engage, and the vehicle remains in 2WD (front wheel drive).

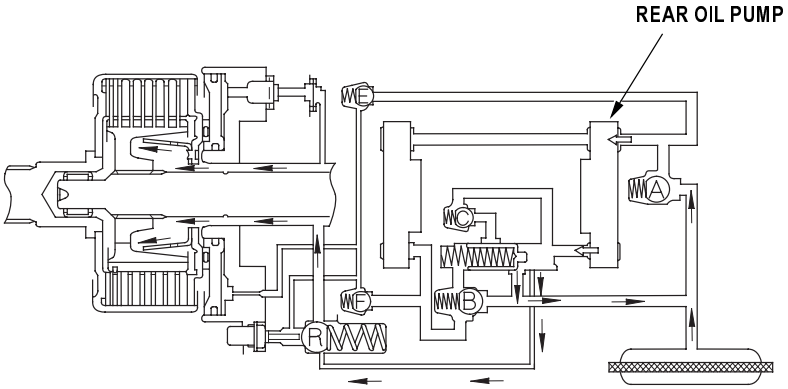


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System Description (cont'd)

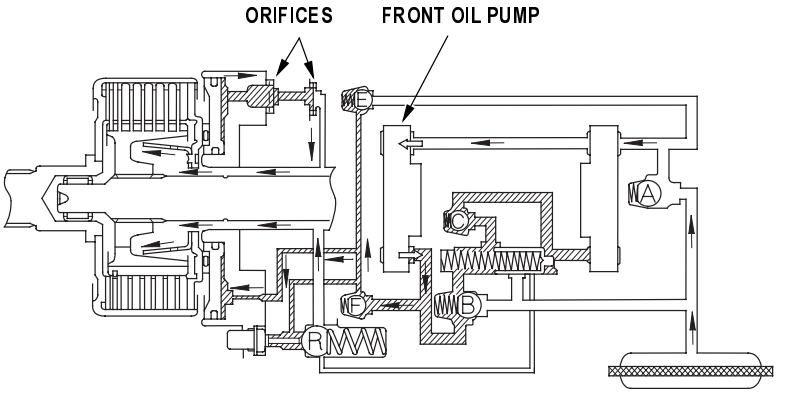
Forward Deceleration (2WD)

During forward deceleration, the dual pump system functions in two wheel drive mode.
Because of braking characteristics, the speed of the rear wheels may exceed the speed of the front wheels during deceleration. If so, the rear oil pump spins faster than the front oil pump.
Fluid discharged by the rear oil pump is simply drawn in again by the rear pump and recirculated. Because there is no pressure built up at the clutch piston, the clutch piston does not engage, and the vehicle remains in 2WD (front wheel drive).



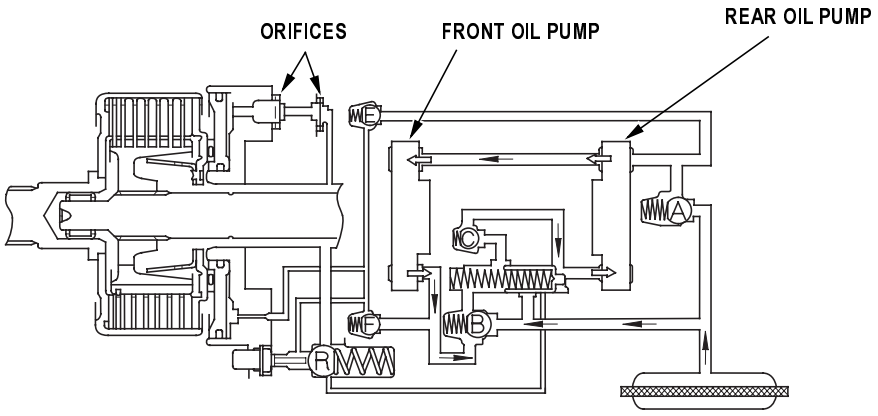
Reverse Start and Acceleration (4WD)

During reverse start and reverse acceleration, the dual pump system can engage four wheel drive.
If the front wheels spin faster than the rear wheels, the front oil pump spins faster than the rear oil pump. The front oil pump draws in fluid through check valve A and discharges it. (Note that in reverse, the direction of the pumps is the opposite of that during forward driving.)
Some of the fluid that is discharged by the front oil pump is drawn in by the rear oil pump. The remaining fluid passes through check valve F into the cylinder of the clutch piston, where it is regulated by two orifices.
The regulated hydraulic pressure at the clutch piston may force the plates and discs of the clutch together to form a connection. The engaged clutch passes driving force from the transfer assembly to the rear wheels, producing 4WD.



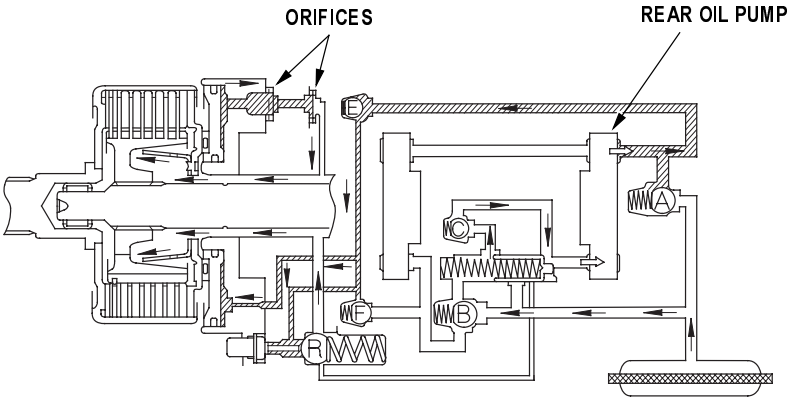
Reverse Driving at Constant Speed (2WD)

When driving in reverse at a constant speed, the dual pump system functions in two wheels drive mode.
The rotation speed of the front and rear wheels is the same, so the speed of the front and rear pumps is also the same.
Fluid discharged by the front oil pump is drawn in by the rear oil pump and is circulated through the system. But, because the there is a difference in the capacity between the two pumps, fluid flows through check valve E, and then through orifices.
This fluid lubricates and cools the clutch assembly and bearings.
Is this condition, only a low pressure is built up at the clutch piston. Therefore the clutch does not engage, and the vehicle remains in 2WD (front wheel drive).



Reverse Deceleration (4WD)

During reverse deceleration, the dual pump system can engage four wheel drive.
When decelerating in reverse direction, the speed of the rear wheels may exceed the speed of the front wheels (due to engine braking). In this condition, the rear oil pump draws fluid through check valves B and C. Fluid discharged from the rear oil pump then flows through check valve E to the clutch piston. There, pressure is regulated by two orifices.
The regulated hydraulic pressure at the clutch piston may force the plates and discs of the clutch together to form a connection. The engaged clutch passes driving force from the transfer assembly to the rear wheels, producing 4WD.

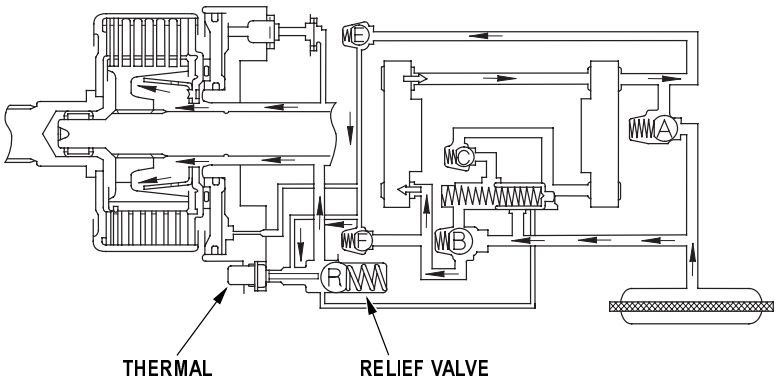


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System Description (cont'd)

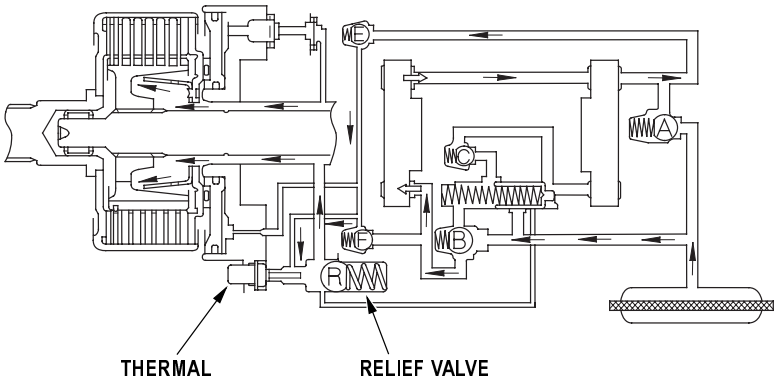
Thermal Switch Operation (2WD)

During 4WD operation, pressure-regulated fluid is in contact with the clutch piston and the thermal switch.
If the temperature of the fluid in the differential goes too high, the thermal switch pushes open the relief valve R. This causes the pressure in the clutch piston to drop, and 4WD mode is disengaged.



Relief Valve Operation

When the fluid pressure goes higher than the relief valve spring force, check valve R opens. Pressure applied at the clutch piston is held constant. This feature adds stability by preventing the rear wheel drive system from experiencing excessive torque.

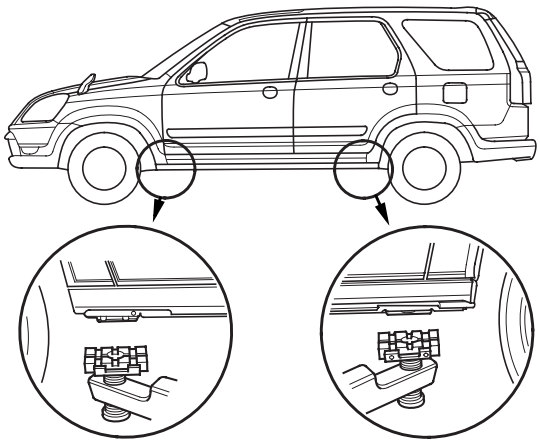


Dual Pump System Function Test

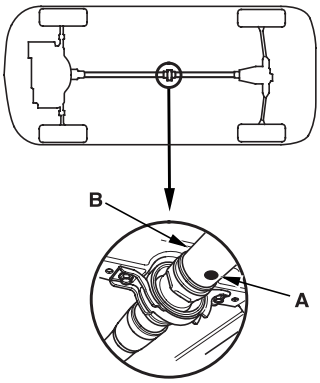
Automatic Transmission

When starting and accelerating in forward gears (4WD mode)

1. Lift up the vehicle so all four wheels are off the ground (see page 01-7).



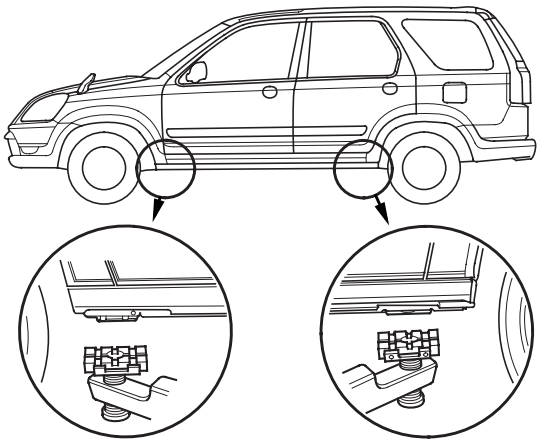
2. Make a mark (A) on either No. 1 or No. 2 propeller shaft (B).



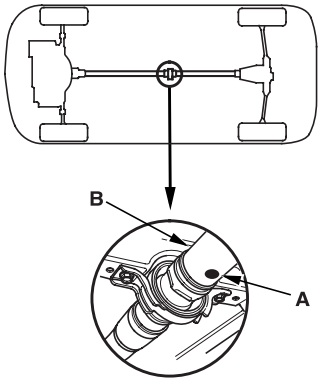
3. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
4. With the engine at idle, shift to the [1] position.
5. Apply the parking brake firmly, and measure the time it takes the propeller shaft to rotate 10 times.
   - If the measured time is more than 10 seconds, the 4WD system is normal.
   - If the time is less than 10 seconds, there is a problem in 4WD system. Check the differential fluid. If the differential fluid is normal, replace the torque control differential (TCD) case kit.

When starting and accelerating in reverse gear (4WD mode)

1. Lift up the vehicle so all four wheels are off the ground (see page 01-7).



2. Make a mark (A) on either No. 1 or No. 2 propeller shaft (B).



3. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
4. With the engine at idle, shift to the [R] position.
5. Apply the parking brake firmly, and measure the time it takes the propeller shaft to rotate 10 times.
   - If the measured time is more than 10 seconds, the 4WD system is normal.
   - If the time is less than 10 seconds, there is a problem in 4WD system. Check the differential fluid. If the differential fluid is normal, replace the torque control differential (TCD) case kit.

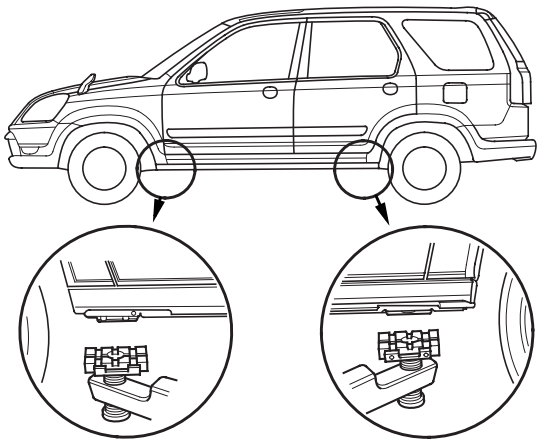
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Troubleshooting (cont'd)

Manual Transmission

When starting and accelerating in forward gears (4WD mode)

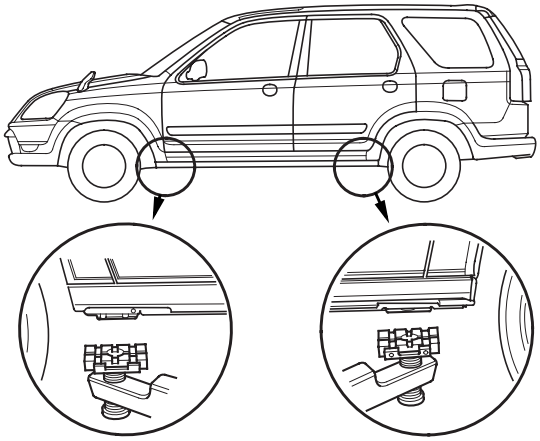
1. Lift up the vehicle so all four wheels are off the ground (see page 01-7).



2. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
3. With the engine at idle, shift into 1st gear and release the clutch.
4. Apply the parking brake firmly.
   - If the engine stalls, the 4WD system is normal.
   - If the engine continues running, there is a problem in 4WD system. Check the differential fluid. If the differential fluid is normal, replace the torque control differential (TCD) case kit.

When starting and accelerating in reverse gears (4WD mode)

1. Lift up the vehicle so all four wheels are off the ground (see page 01-7).

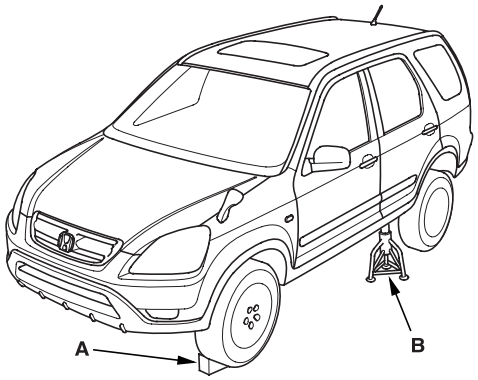


2. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
3. With the engine at idle, shift into reverse gear and release the clutch.
4. Apply the parking brake firmly.
   - If the engine stalls, the 4WD system is normal.
   - If the engine continues running, there is a problem in 4WD system. Check the differential fluid. If the differential fluid is normal, replace the torque control differential (TCD) case kit.

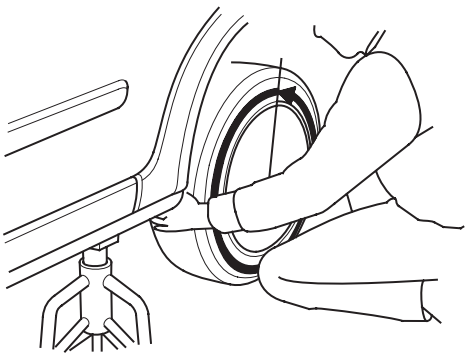
Automatic Transmission/Manual Transmission

When decelerating in a forward gears (2WD mode)

1. Block the front wheels (A) raise the left rear wheel, and support it with a safety stand (B) as shown.

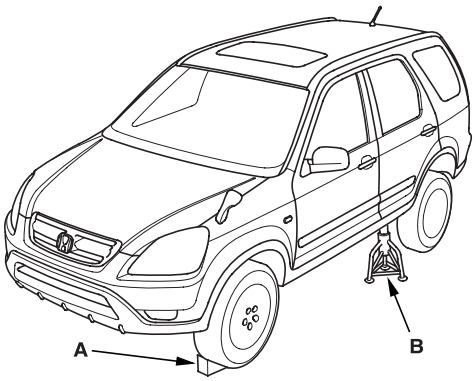


2. Hold the tire and turn it counterclockwise continuously for more than one rotation.
   - If the rotation of the wheel does not gradually feel heavy while rotating, the 2WD system when decelerating in a forward gear is normal.
   - If the rotation of the wheel gradually feels heavy, there is a problem in the system. Check the differential fluid. If the fluid is normal, replace the torque control differential (TCD) case kit.

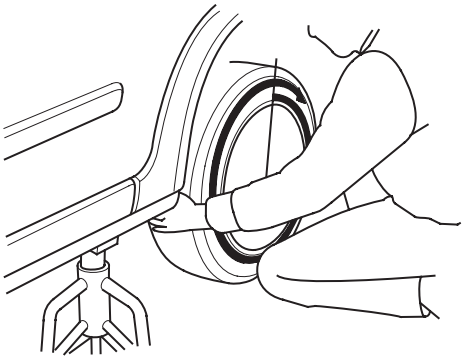


When decelerating in reverse gears (4WD mode)

1. Block the front wheels (A), raise the left rear wheel, and support it with a safety stand (B) as shown.



2. Hold the tire and turn it clockwise continuously for more than one rotation.
   - If the rotation of the wheel gradually feels heavy, the 4WD system when decelerating in reverse gear is normal.
   - If the rotation of the wheel does not gradually feel heavy, there is a problem in the system. Check the differential fluid. If the fluid is normal, replace the torque control differential (TCD) case kit.



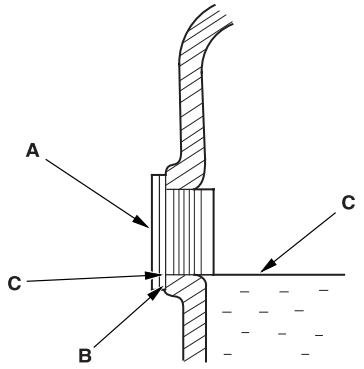
Symptom Troubleshooting Index

Most problems in the unit are to be diagnosed by identifying noises from the gears or bearings.
Care should be taken during diagnosis not to confuse differential noises with those from other drivetrain components.

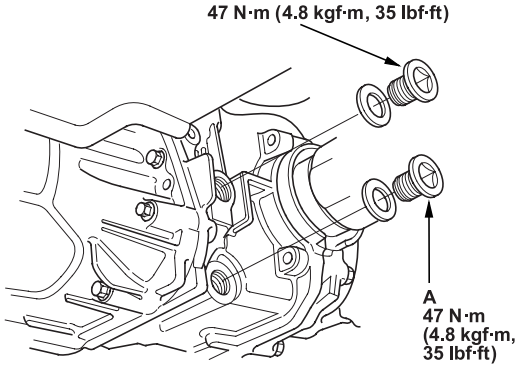
Symptom	Probable Cause	Remedy
Will not go into 4WD mode	• Fluid level too low • Incorrect fluid type	• Add fluid • Replace
Will not return to 2WD mode	Incorrect fluid type	Drain and fill the differential
Gear or bearing noises	• Fluid level too low • Incorrect or worn out fluid • Damaged or chipped gears	• Add fluid • Drain and fill the differential • Replace the differential carrier assembly
Overheating	• Fluid level too low • Incorrect fluid type	• Add fluid • Drain and fill the differential
Fluid leak	• Fluid level too high • Clogged breather hose • Worn or damaged oil seal • Damaged sealing washer • Loose mounting bolts or inadequate sealing	• Lower to proper level • Clean or replace • Replace • Replace • Recheck torque or apply sealant

Differential Fluid Inspection and Replacement

1. With the vehicle on level ground, inspect the differential fluid with engine OFF.
2. Remove the oil filler plug (A) and sealing washer (B), then check the condition of the fluid, and make sure the fluid is at the proper level (C).



3. The fluid level must be up to the fill hole. If it is below the hole, add the recommended fluid until it runs out, then reinstall the oil filler plug with a new sealing washer.
4. If the differential fluid is dirty, remove the drain plug (A), and drain the fluid.



5. Clean the drain plug, then reinstall it with a new sealing washer, and refill the differential with the recommended fluid to the proper level.

   NOTE: If you disassembly the differential, check the fluid level again after the 4WD system check is finished. Add fluid if necessary.

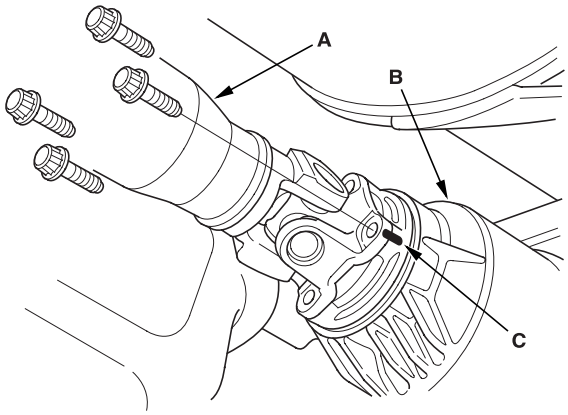
   Fluid Capacity
   1.0 l (1.1 US qt, 0.9 Imp qt) at fluid change
   1.2 l (1.3 US qt, 1.1 Imp qt) at overhaul

   Recommended fluid:
   Honda DPSF (Dual Pump System Fluid)

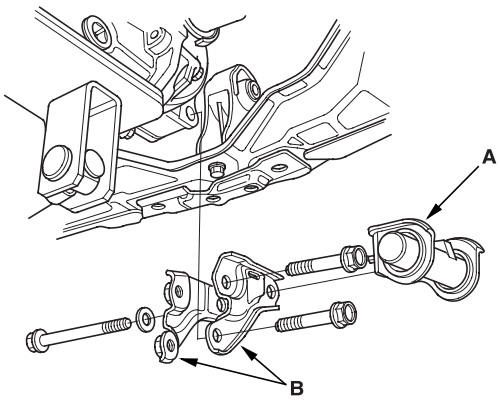
6. Reinstall the oil filler plug with a new sealing washer.

Differential Removal

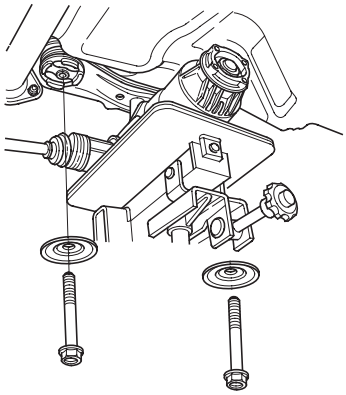
1. Drain the differential fluid (see page 15-13).
2. Mark the propeller shaft (A) and companion flange of the rear differential assembly (B) so they can be reinstalled in their original positions (C).



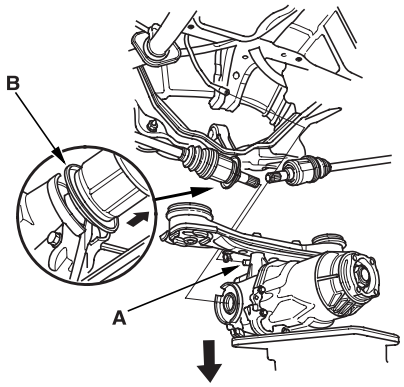
3. Remove the propeller shaft from the rear differential assembly.
4. Remove the EVAP canister assembly with bracket (see page 11-199).
5. Remove the rear differential damper (A).
6. Place a transmission jack under the rear differential assembly, then remove the right mounting bracket B (B) and the left mounting bracket B (B).



7. Remove the mounting bolts and the plate.



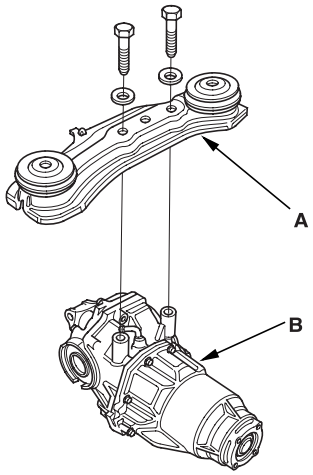
8. Remove the breather tube (A) from the breather tube fitting.



9. Lower the rear differential assembly while pulling both driveshaft inner joints out of the rear differential assembly.

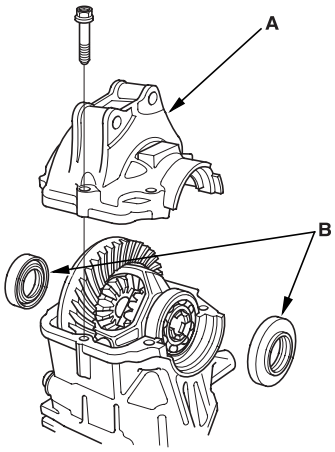
   NOTE: Be careful not to damage the driveshaft ring (B) when prying out the differential inboard joints.

10. Remove the rear differential mount assembly A (A) from the rear differential assembly (B).



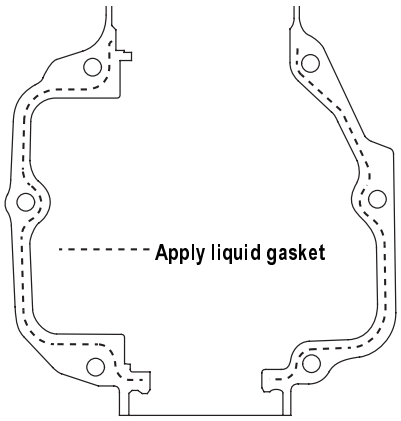
Differential Housing Assembly Removal and Installation

1. Remove the six mounting bolts in a crisscross pattern in several steps, then remove the differential housing assembly (A) and oil seals (B).

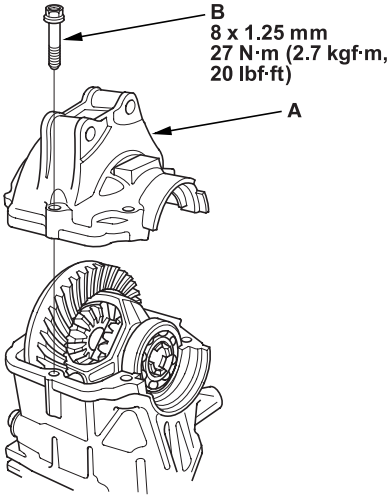


2. Remove the dirt and oil from the sealing surfaces. Apply liquid gasket (P/N08C70-K0234M) to the sealing surface. Be sure to seal the entire circumference of the bolt holes to prevent oil leakage.

   NOTE:
   - If 5 minutes have passed after applying liquid gasket, reapply it and assemble the housings.
   - Allow it to cure at least 20 minutes after assembly before filling the differential with fluid.



3. Install the differential housing assembly (A), then torque the six mounting bolts (B) in a crisscross pattern in several steps.



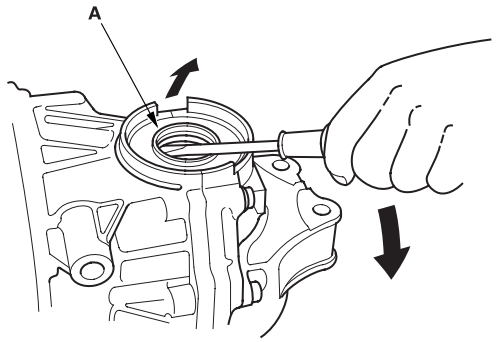
4. Install the oil seals.

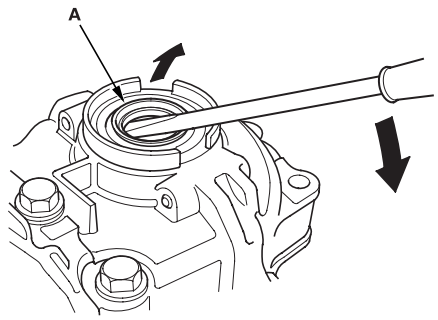
Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100

1. Remove the oil seals (A) from the differential housing.

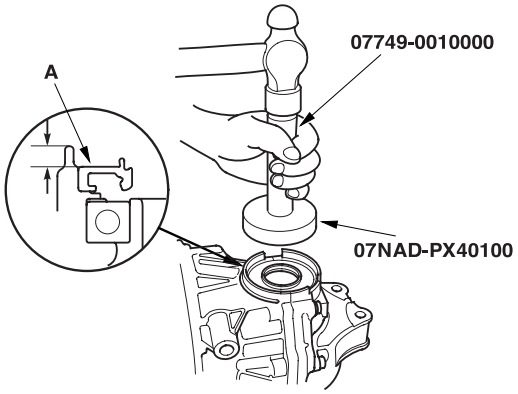
NOTE: Be careful not to damage the differential carrier while prying out the seals.



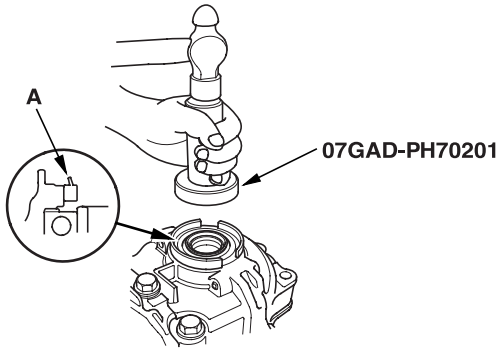


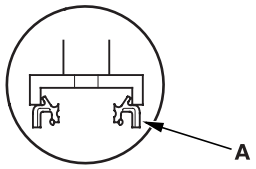
2. Install the oil seals (A) squarely using the special tools. Be careful not to damage the lip of the oil seals.

Right side: Installation depth of the oil seal is 9 mm (0.35 in.) below the edge of the differential carrier assembly.



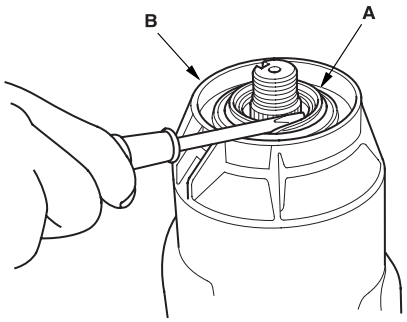
Left side: Install the oil seal (A) flush with the edge of the differential carrier assembly.



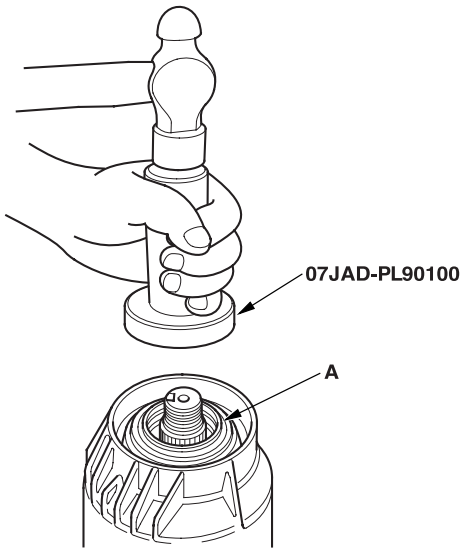


3. Remove the oil seal (A) from the torque control differential case (B).

NOTE: Be careful not to damage the shaft or case while prying out the seal.



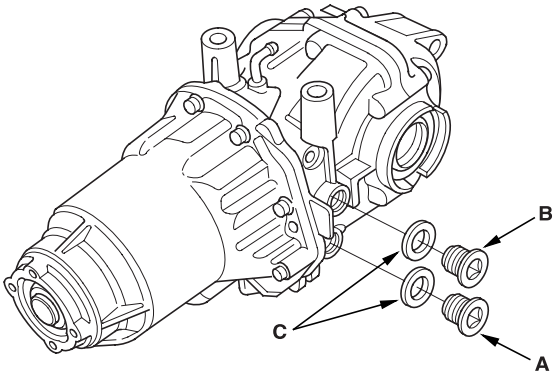
4. Install the oil seal (A) squarely using the special tool. Be careful not to damage the lip of the oil seal.



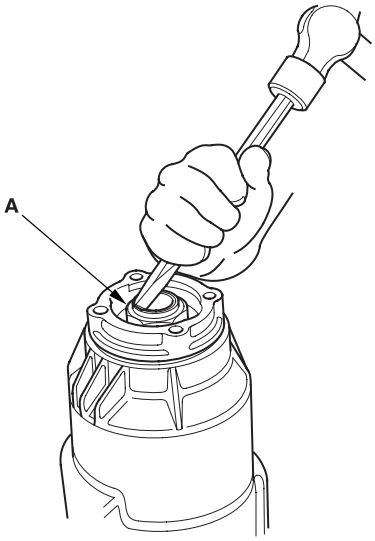
Differential Disassembly

Special Tools Required
Companion Flange Holder 07PAB-0020000

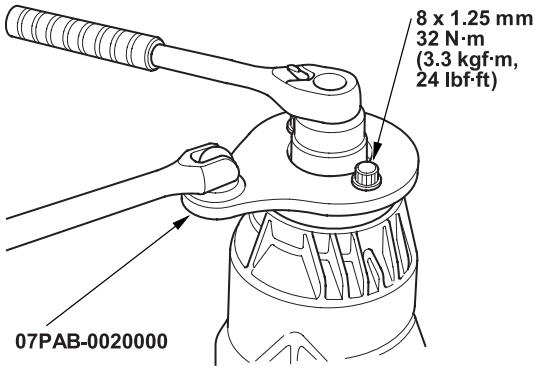
1. Remove the drain plug (A) and the oil filler plug (B) with sealing washers (C).



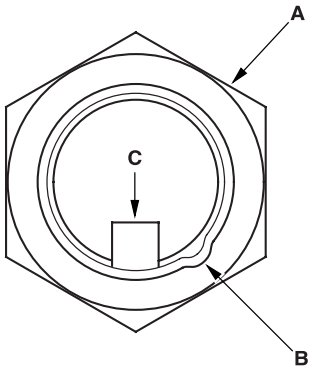
2. Raise the locknut tub (A) from the groove of the clutch guide, making sure that the tab completely clears the groove to prevent damaging the clutch guide.



3. Install the special tools on the companion flange.

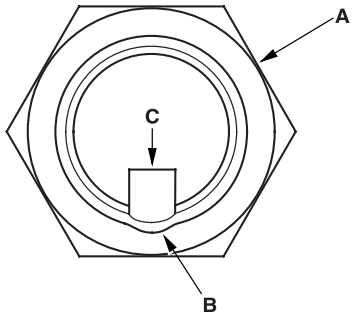


4. Loosen the locknut (A) counterclockwise so that its tab (B) comes out from the groove (C) in the clutch guide.

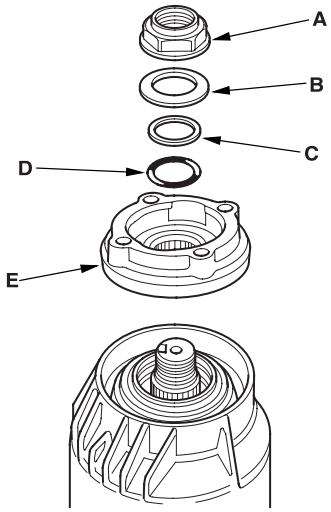


5. Tighten the locknut (A) until its tab (B) aligns with the groove (C).

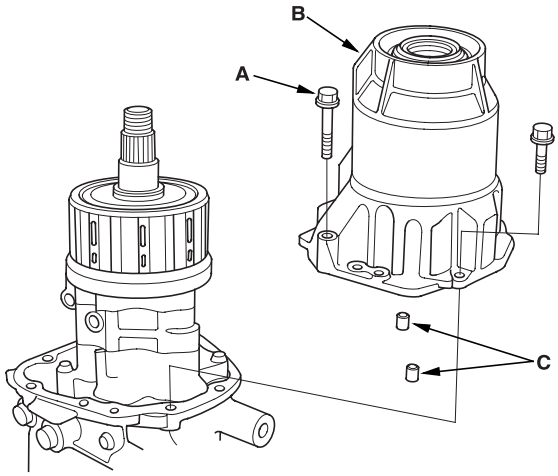
6. Remove any dirt from inside of the groove in the clutch guide, then loosen the locknut.



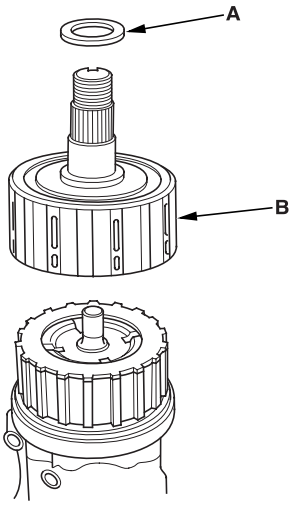
7. Remove the locknut (A), the disc spring washer (B), the back-up ring (C), the O-ring (D) and the companion flange (E).



8. Remove the eight mounting bolts (A) in a crisscross pattern in several steps, then remove the torque control differential case (B) and the dowel pin (C).



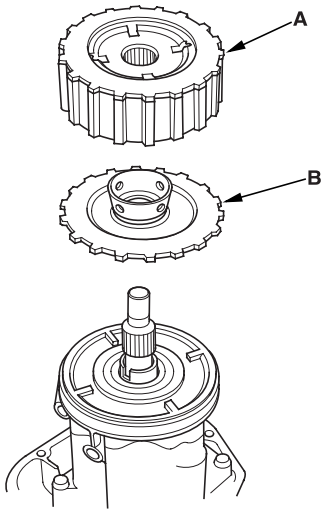
9. Remove the shim (A) and the clutch guide (B).



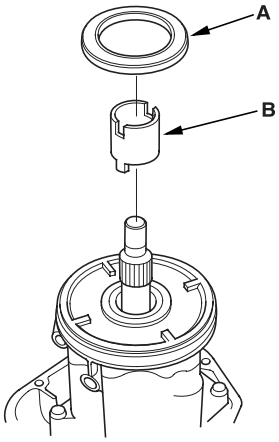
(cont'd)

Differential Disassembly (cont'd)

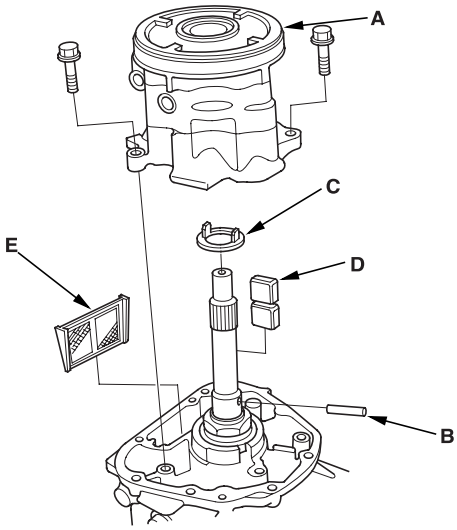
10. Remove the clutch hub/plates/discs (A) and the pressure plate (B).



11. Remove the thrust needle bearing (A) and the oil pump driveshaft (B).

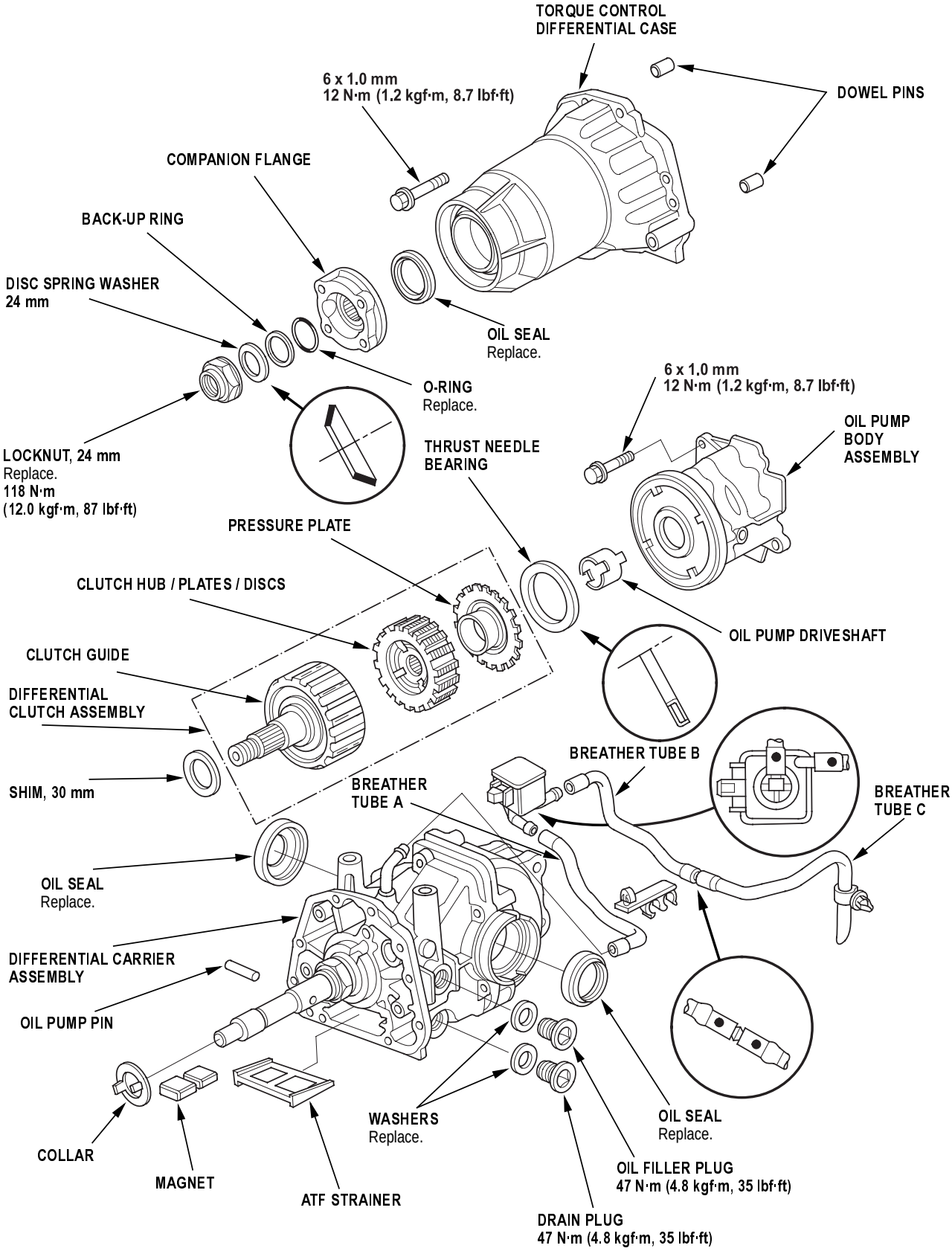


12. Remove the oil pump body assembly (A), the oil pump pin (B), the collar (C), the magnet (D), and the ATF strainer (E).



Differential Reassembly

Exploded View

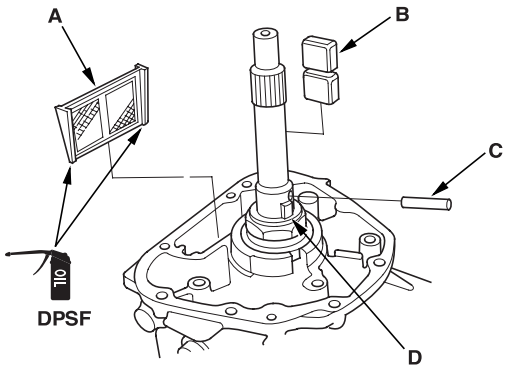


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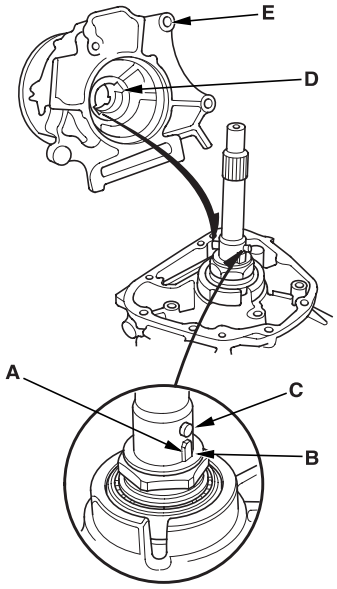
Differential Reassembly (cont'd)

Special Tools Required
Companion Flange Holder 07PAB-0020000

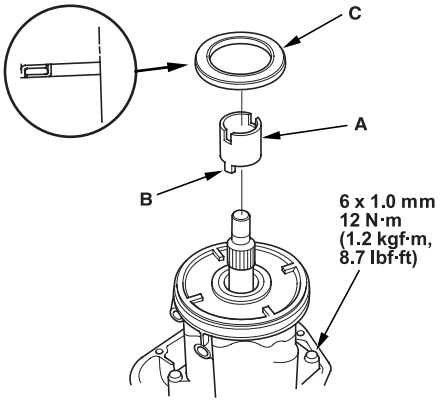
1. Apply DPSF to the rubber of the ATF strainer (A), then install the ATF strainer, the magnet (B), and the oil pump pin (C), and the collar (D) to the differential carrier assembly.



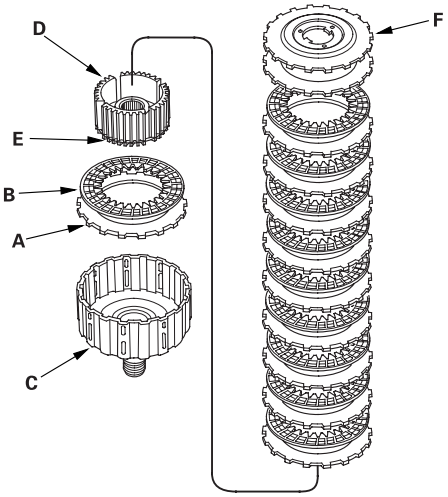
2. Align the tabs (A) of the collar (B) with the oil pump pin (C). Align the grooves (D) of the rear oil pump with the oil pump pin and collar tabs, then install the oil pump body assembly (E) to the differential carrier assembly.



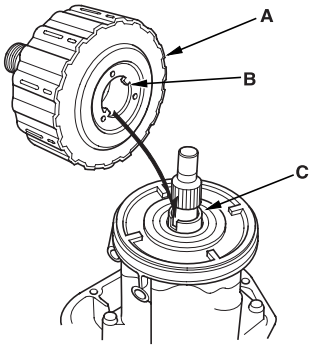
3. Tighten the oil pump body assembly mounting bolts.
4. Install the oil pump driveshaft (A) by aligning the projection (B) of the oil pump driveshaft with the groove of the front oil pump in the oil pump body assembly.



5. Install the thrust needle bearing (C).
6. If necessary, reassemble the differential clutch, and note these items:
   - Install on metal clutch plate (A) and one fiber clutch disc (B) in the clutch guide (C), then install the clutch hub with snap ring (D) into the clutch guide.
   - Make sure the splines of the clutch hub and fiber clutch disc line up below the snap ring (E).
   - Install the remaining metal clutch plates and fiber clutch discs alternately until you installed a total of eleven plates and ten discs, then install the pressure plate (F).

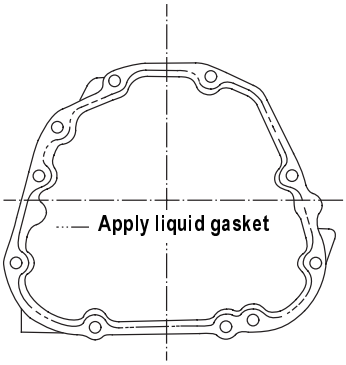


7. Install the differential clutch assembly (A) by aligning the tabs of the pressure plate (B) with the grooves in the oil pump driveshaft (C).

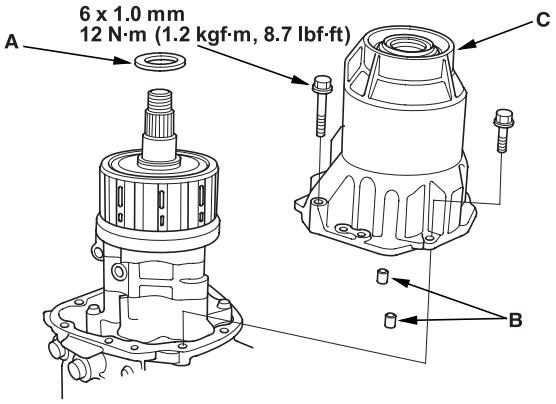


8. Remove the dirt and oil from the sealing surfaces. Apply liquid gasket (P/N08C70-K0234M) to the sealing surface. Be sure to seal the entire circumference of the bolt holes to prevent oil leakage.

NOTE:
- If 5 minutes have passed after applying liquid gasket, reapply it and assemble the housings.
- Allow it to cure at least 20 minutes after assembly before filling the differential with oil.

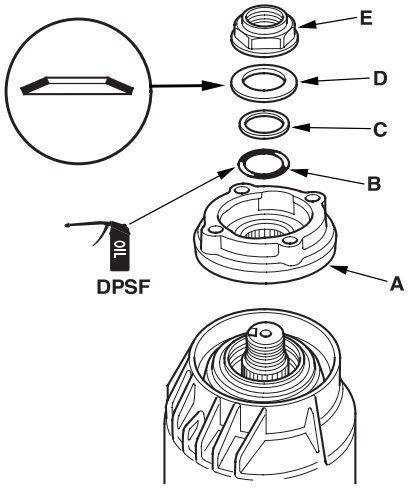


9. Install the 30 mm shim (A), the 6 x 1.0 mm dowel pins (B), and the torque control differential case (C). Torque the eight mounting bolts in a crisscross pattern in several steps.



10. Install the companion flange (A), O-ring (B), back-up ring (C), disc spring washer (D), and the locknut (E).

NOTE: Apply DPSF to the O-ring.

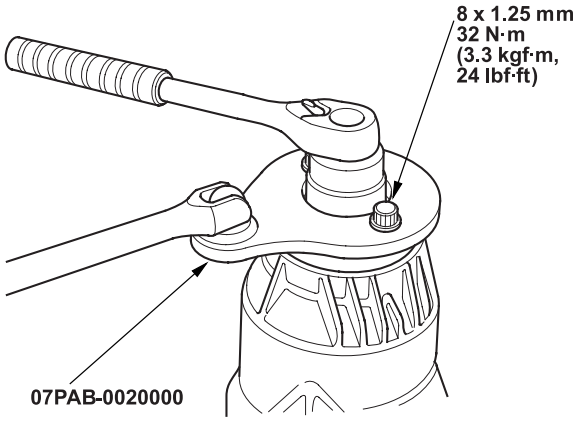


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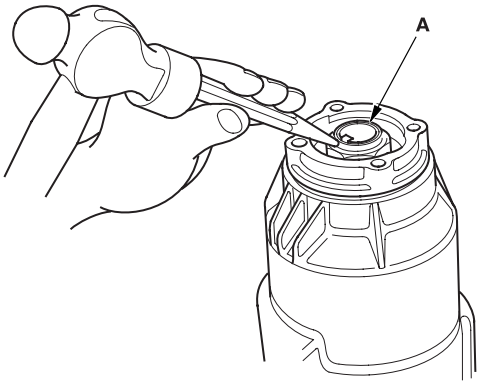
Differential Reassembly (cont'd)

11. Install the special tools to the companion flange, then tighten the new locknut to specified torque.

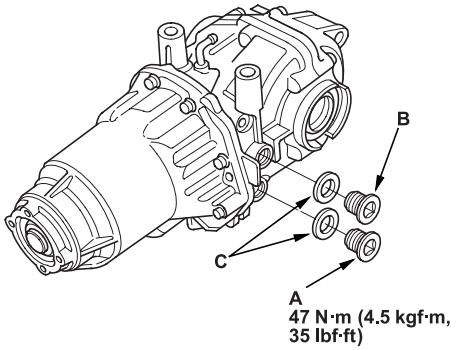
TORQUE: 118 N·m (12.0 kgf·m, 87 lbf·ft)



12. Stake the locknut tab (A) into the groove in the clutch guide.

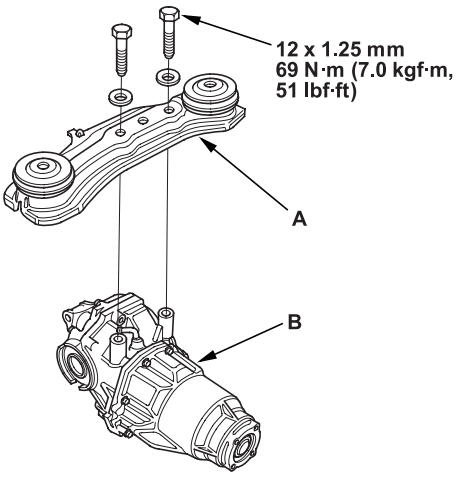


13. Install the drain plug (A) and the oil filler plug (B) with new washers (C).

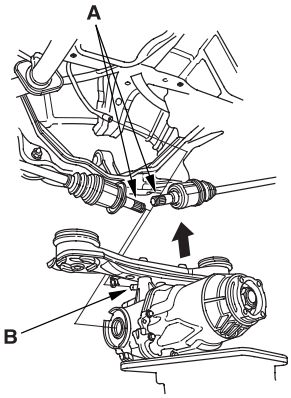


Differential Installation

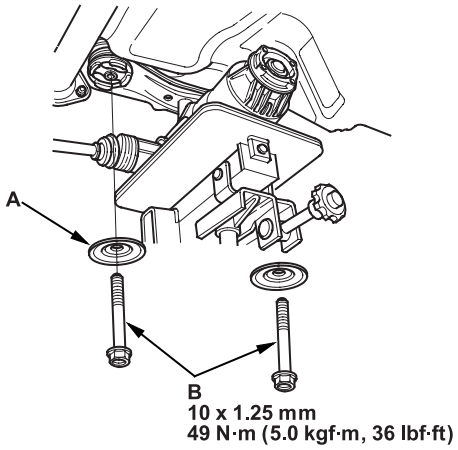
1. Install the rear differential mount assembly A (A) to the rear differential assembly (B).



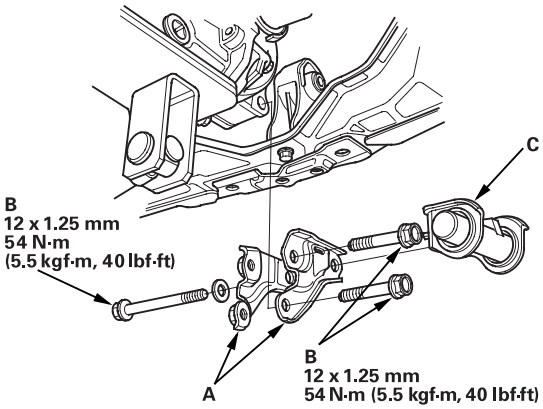
2. Jack up the rear differential.
3. Install the new set rings (A) on to the driveshafts, then install the driveshaft into the rear differential.



4. Lift the rear differential up into position, then push on both driveshafts to lock the set rings into place. Connect the breather tube (B).
5. Install the plates (A) and torque the rear differential mount assembly mounting bolts (B).



6. Install the right and left rear differential mount brackets B (A) then torque the bolts (B) and damper (C).

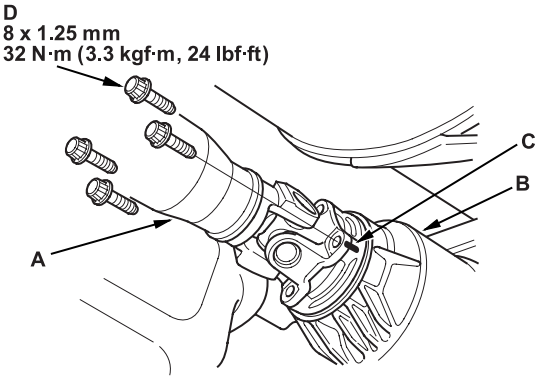


7. Install the EVAP canister assembly with bracket (see page 11-199).

(cont'd)

Differential Installation (cont'd)

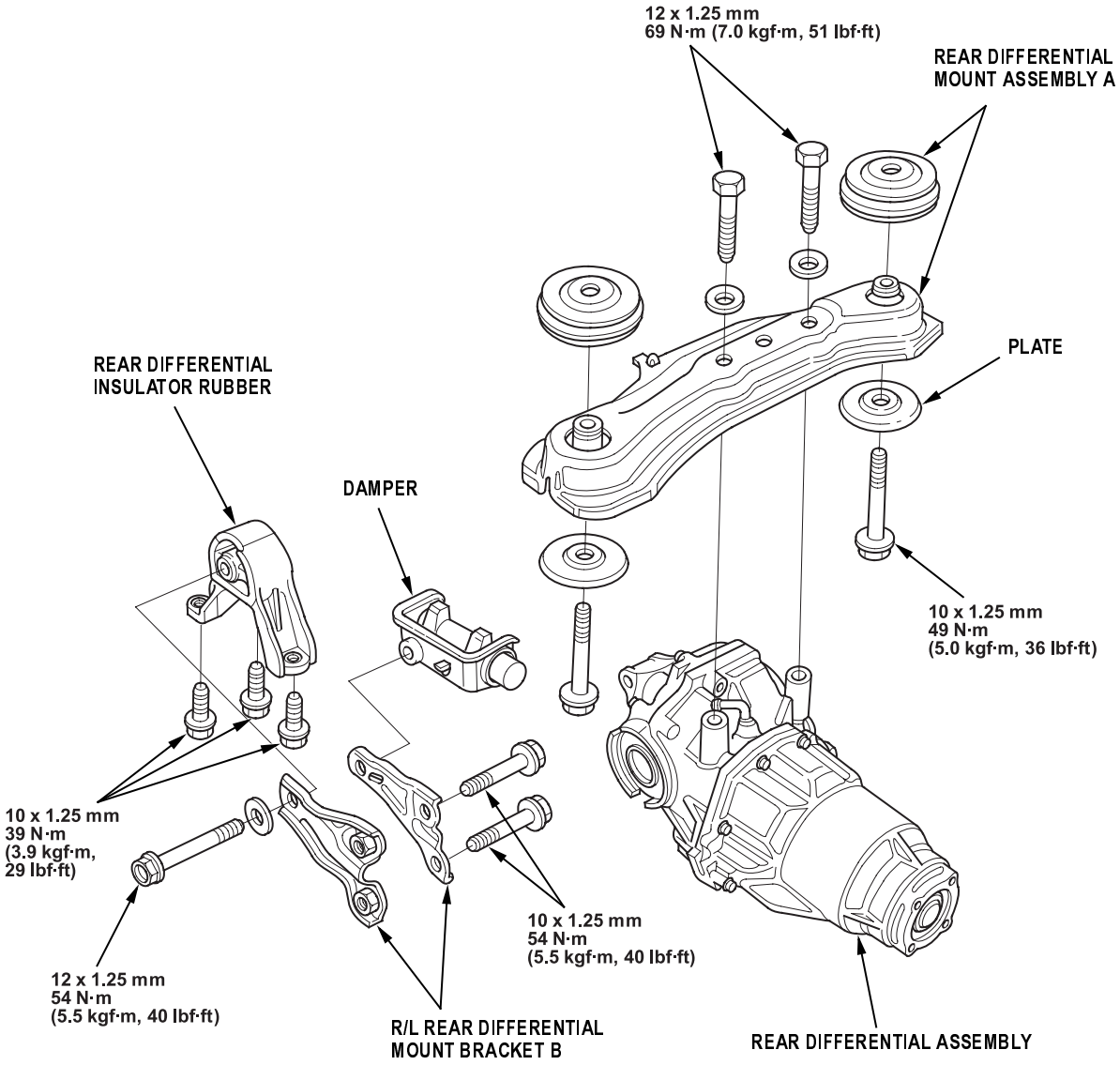
8. Install the No. 2 propeller shaft (A) onto the rear differential (B) by aligning the reference mark (C). Be sure to use new mounting bolts (D).



9. Fill the rear differential with the specified amount of DPSF (see page 15-13).

Differential Mount Replacement

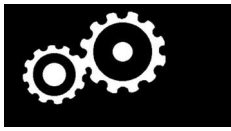
Exploded View



16

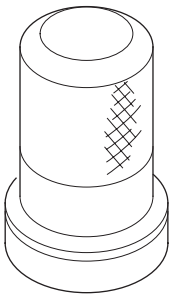
Driveline/Axle

Special Tools 16-2
Driveshaft Inspection 16-3
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Dynamic Damper Replacement 16-8
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Intermediate Shaft Reassembly 16-21
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Rear Driveshafts Reassembly 16-27
Rear Driveshafts Installation 16-31
Propeller Shaft Inspection 16-32
Propeller Shaft Removal 16-33
Propeller Shaft Installation 16-34

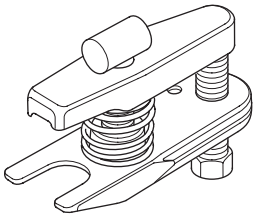


Special Tools

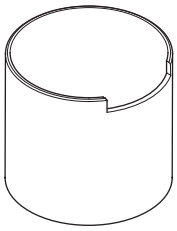
Ref. No.	Tool Number	Description	Qty
1	07GAD-PH70201	Oil Seal Driver	1
2	07MAC-SL00200	Ball Joint Remover, 28 mm	1
3	07NAF-SR30101	Half Shaft Base	1
4	07XAC-0010200	Threaded Adapter, 24 x 1.5 mm	1
5	07746-0010400	Attachment, 52 x 55 mm	1
6	07746-0030400	Attachment, 35 mm I.D.	1
7	07749-0010000	Driver	1
8	07936-5790001	Sliding Hammer Set	1
9	07947-SB00100	Oil Seal Driver	1



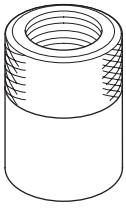
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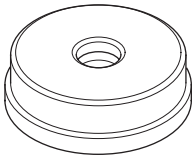
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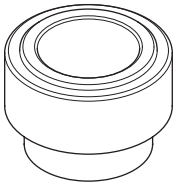
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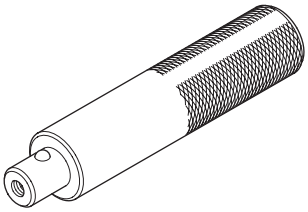
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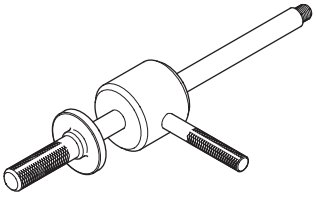
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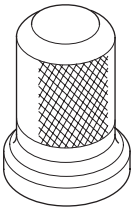
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7



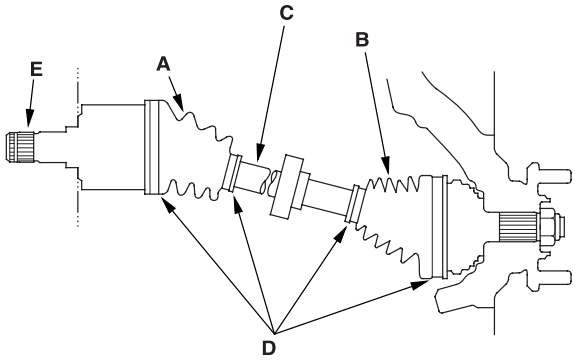
8



9

Driveshaft Inspection

1. Check the inboard boot (A) and the outboard boot (B) on the driveshaft (C) for cracks, damage, leaking grease, and loose boot bands (D). If any damage is found, replace the boot and boot bands.

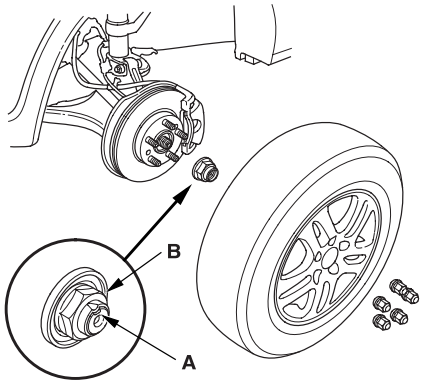


2. Turn the driveshaft by hand, and make sure the splines (E) and joint are not excessively loose.
3. Make sure the driveshaft is not twisted or cracked; if it is, replace it.

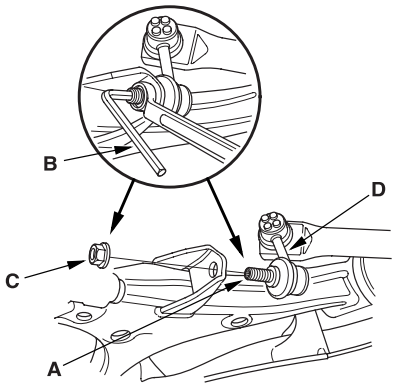
Front Driveshafts Removal

Special Tool Required
Ball joint remover, 28 mm 07MAC-SL00200

1. Loosen the wheel nuts slightly.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 01-7).
3. Remove the wheel nuts and front wheels.



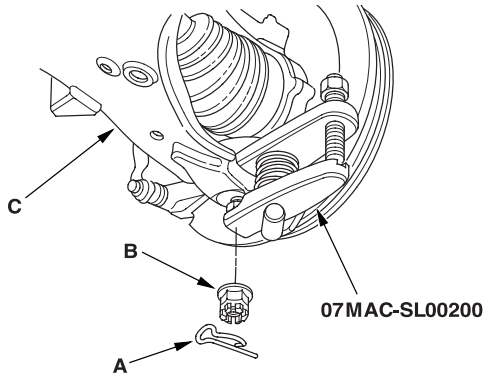
4. Lift up the locking tab (A) on the spindle nut (B), then remove the nut.
5. If the left driveshaft is removed, drain the manual transmission fluid (see page 13-4) or automatic transmission fluid (see page 14-131). It is not necessary to drain the transmission fluid when the right driveshaft is removed (for vehicles with intermediate shaft).
6. Hold the stabilizer ball joint pin (A) with a hex wrench (B), and remove the flange nut (C). Separate the front stabilizer link (D) from the lower arm.



(cont'd)

Front Driveshafts Removal (cont'd)

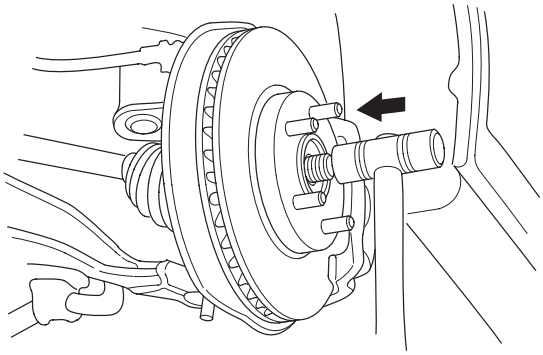
7. Remove the cotter pin (A) from the lower arm ball joint castle nut (B), and remove the nut.



8. Separate the ball joint from the lower arm (C) with the special tool (see page 18-10).

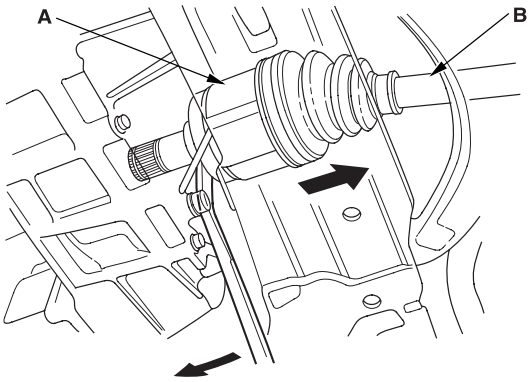
9. Pull the knuckle outward, and remove the driveshaft outboard joint from the front wheel hub.

10. Remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.

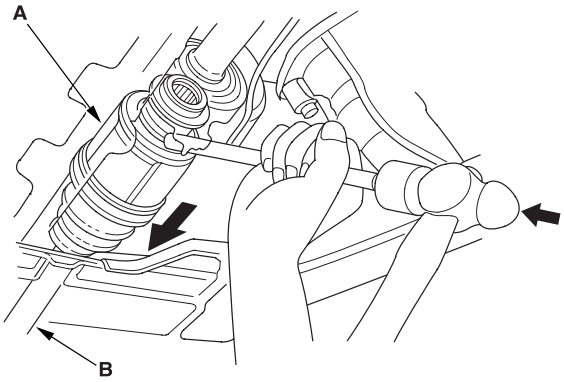


11. Pry (left driveshaft)/tap (right driveshaft), the inboard joint (A) with a prybar, and remove the driveshaft from the differential case or bearing support as an assembly. Do not pull on the driveshaft (B), because the inboard joint may come apart. Draw the driveshaft straight out to avoid damaging the differential oil seal.

Left driveshaft



Right driveshaft

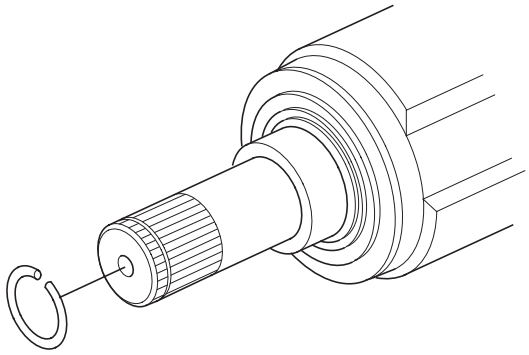


Front Driveshafts Disassembly

Special Tools Required
- Threaded adapter, 24 x 1.5 mm 07XAC-0010200
- Sliding hammer set 07936-5790001
- Boot band pincers, commercially available

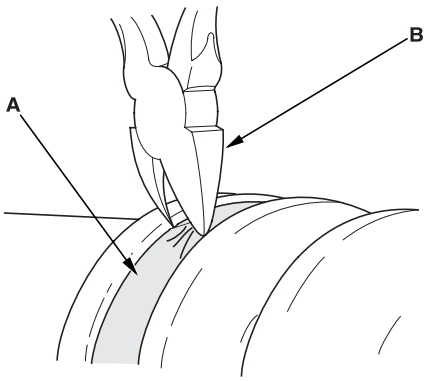
Inboard Joint Side:

1. Remove the set ring from the inboard joint.

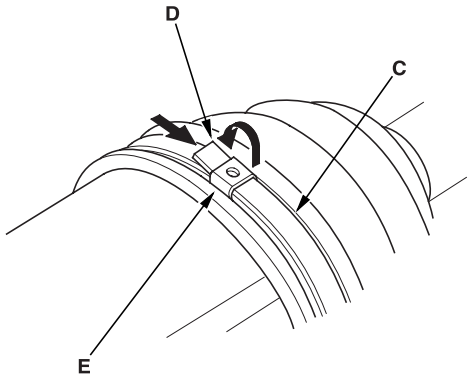


2. Remove the boot bands. Be careful not to damage the boot and dynamic damper.
- If the boot band is a welded type (A), cut the boot band (B).
- If the boot band is a double loop type (C), lift up the band bend (D), and push it into the clip (E).
- If the boot band is a low profile type (F), pinch the boot band using a commercially available boot band pincers (G).

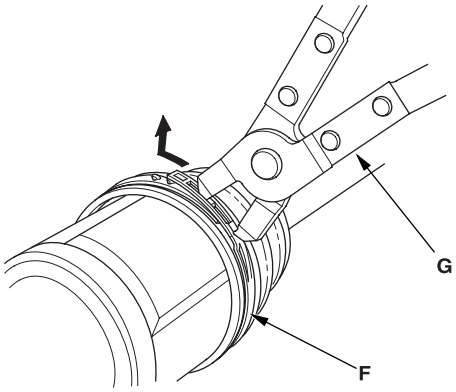
Welded Type



Double Loop Type



Low Profile Type

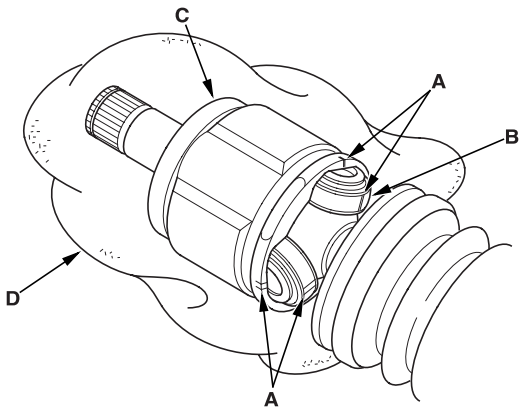


(cont'd)

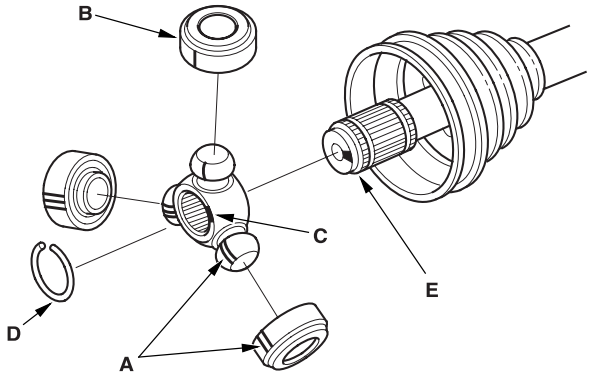
Front Driveshafts Disassembly (cont'd)

Inboard Joint Side: (cont'd)

3. Make a mark (A) on each roller (B) and inboard joint (C) to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel (D). Be careful not to drop the rollers when separating them from the inboard joint.



4. Make a mark (A) on the rollers (B) and spider (C) to identify the locations of the rollers on the spider, then remove the rollers.

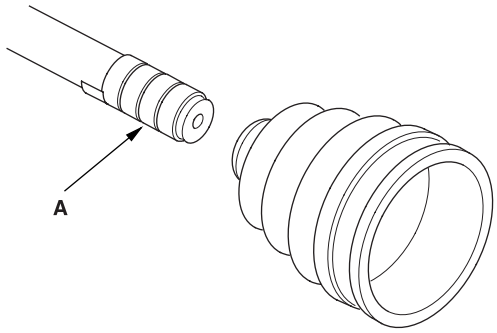


5. Remove the circlip (D).

6. Mark the spider (C) and driveshaft (E) to identify the position of the spider on the shaft.

7. Remove the spider (C).

8. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



9. Remove the inboard boot. Be careful not to damage the boot.

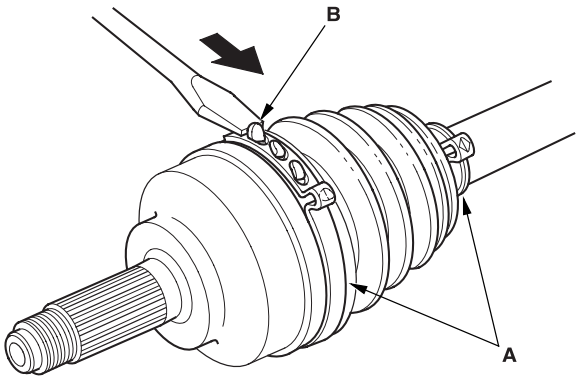
10. Remove the vinyl tape.

Outboard Joint Side:

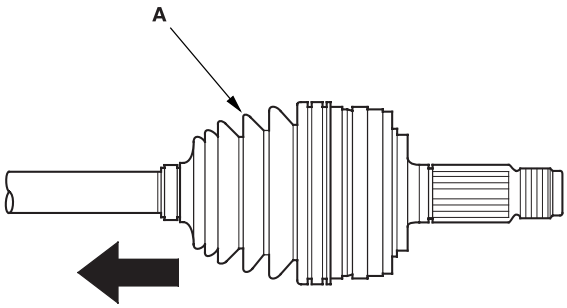
1. Remove the boot bands. Be careful not to damage the boot and dynamic damper.

   If the boot band is an ear clamp type (A), lift up the three tabs (B) with a screwdriver.

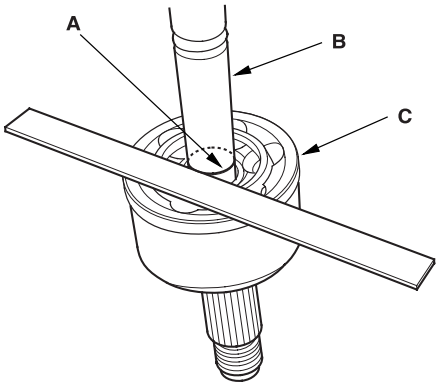
Ear Clamp Type



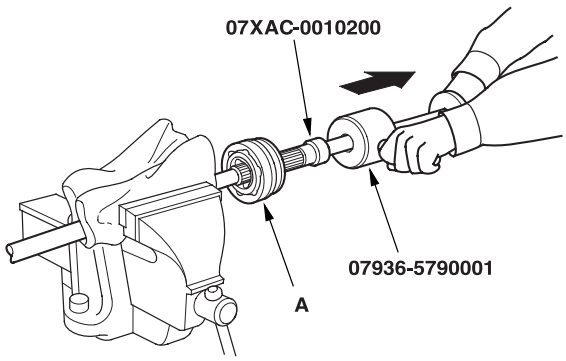
2. Slide the outboard boot (A) to the inboard joint side. Be careful not to damage the boot.



3. Wipe off the grease to expose the driveshaft and the outboard joint inner race.
4. Make a mark (A) on the driveshaft (B) at the same position of the outboard joint end (C).



5. Carefully clamp the driveshaft in a vise.



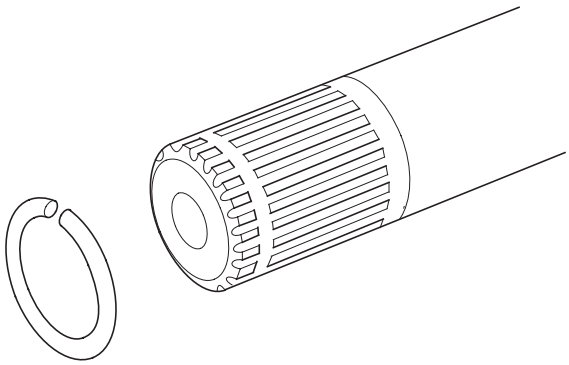
6. Remove the outboard joint (A) using the special tool as shown.
7. Remove the driveshaft from the vise.

(cont'd)

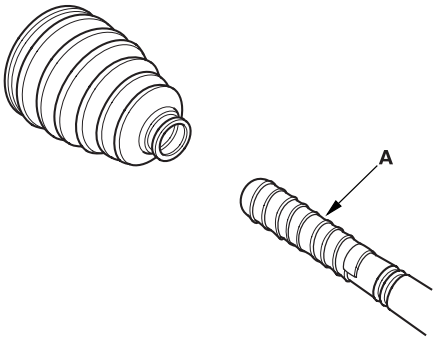
Front Driveshafts Disassembly (cont'd)

Outboard Joint Side: (cont'd)

8. Remove the stop ring from the driveshaft.



9. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



10. Remove the outboard boot. Be careful not to damage the boot.

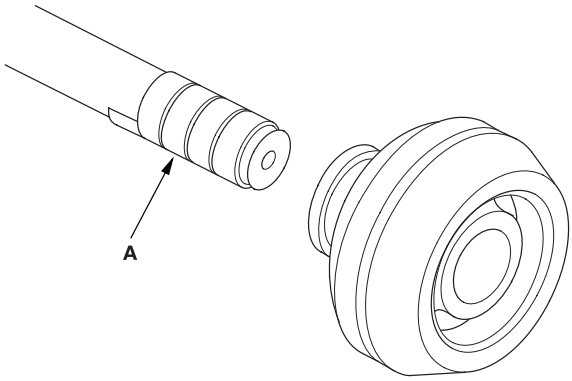
11. Remove the vinyl tape.

Dynamic Damper Replacement

1. Remove the inboard joint (see page 16-5).

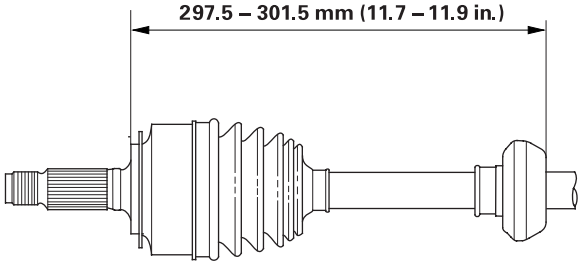
2. Remove the dynamic damper bands. Be careful not to damage the dynamic damper (see page 16-5).
- If the boot band is a welded type, cut the boot band.
- If the boot band is a double loop type, lift up the band bend, and push it into the clip.
- If the boot band is a low profile type, pinch the boot band using the commercially available boot band pincers.

3. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the dynamic damper.



4. Remove the dynamic damper. Be careful not to damage the dynamic damper.

5. Adjust the length of the dynamic damper to the figure below.

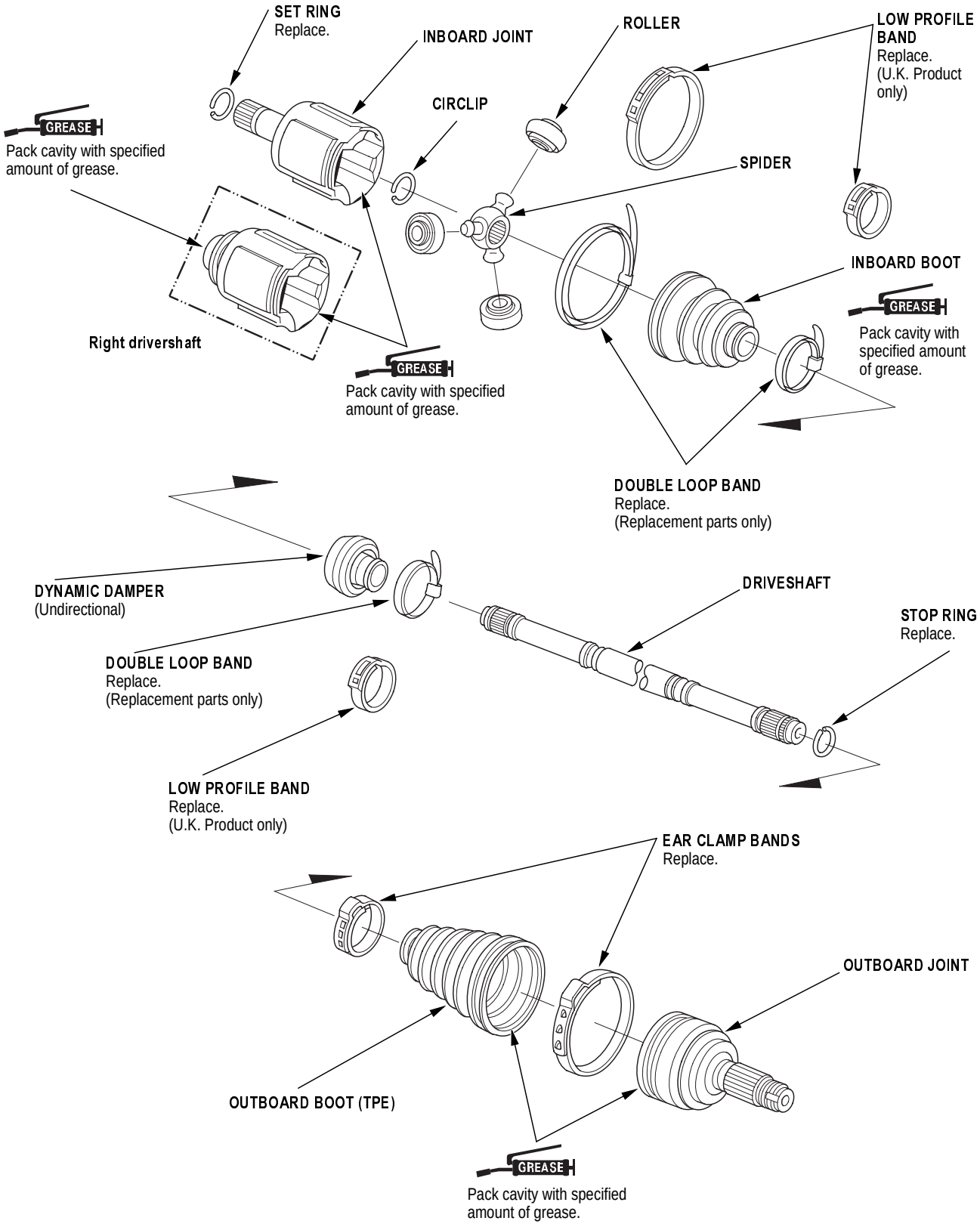


6. Install the dynamic damper band (see step 9 on page 16-11).

7. Install the inboard joint (see step 1 on page 16-10).

Front Driveshafts Reassembly

Exploded View



(cont'd)

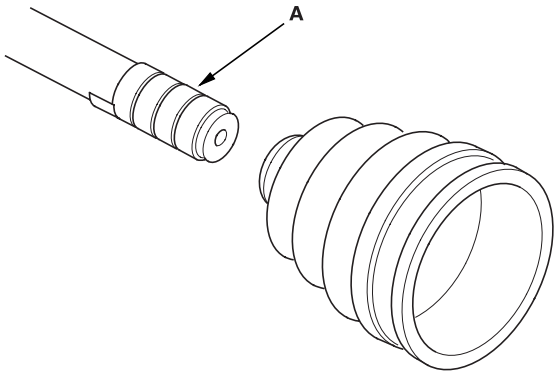
Front Driveshafts Reassembly (cont'd)

Special Tools Required
- Boot band tool, KD-3191 or equivalent, commercially available
- Boot band pincers, Kent-Moore J-35910 or equivalent, commercially available

NOTE: Refer to the Exploded View as needed during this procedure.

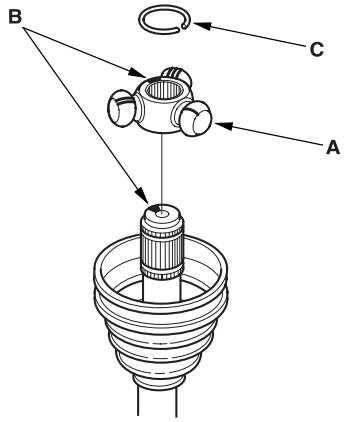
Inboard Joint Side:

1. Wrap the splines with vinyl tape (A) to prevent damage to the inboard boot.



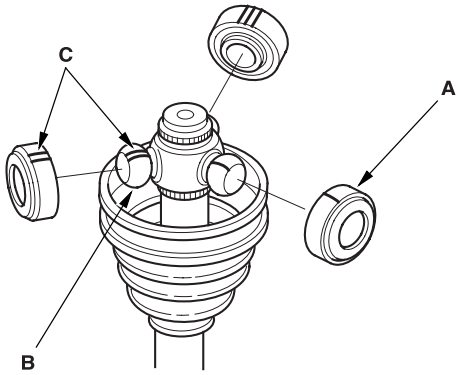
2. Install the inboard boot onto the driveshaft then remove the vinyl tape. Be careful not to damage the inboard boot.

3. Install the spider (A) onto the driveshaft by aligning the marks (B) on the spider and the end of the driveshaft.



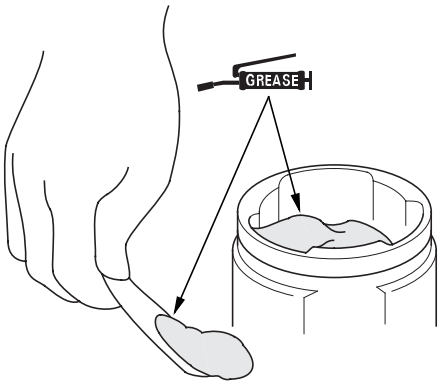
4. Fit the circlip (C) into the driveshaft groove. Always rotate the circlip in its groove to make sure it is fully seated.

5. Fit the rollers (A) onto the spider (B) with their high shoulders facing outward, and note these items:
- Reinstall the rollers in their original positions on the spider by aligning the marks (C).
- Hold the driveshaft pointed up to prevent the rollers from falling off.



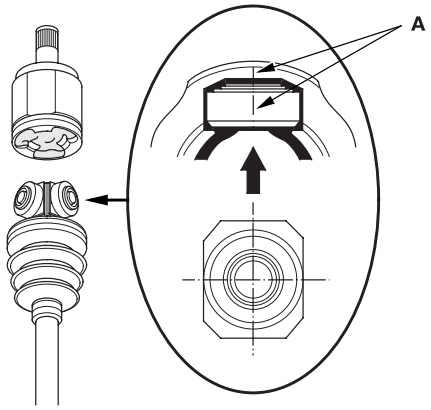
6. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity
Inboard joint: 150 - 160 g (5.3 - 5.7 oz)



7. Fit the inboard joint onto the driveshaft, and note these items:

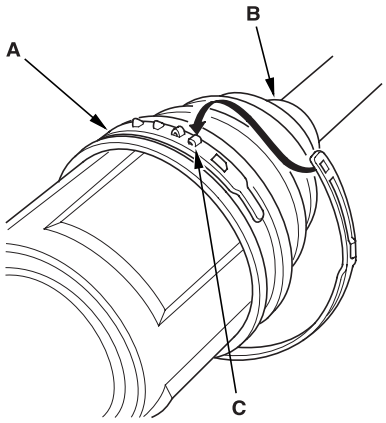
- Reinstall the inboard joint onto the driveshaft by aligning the marks (A) on the inboard joint and the rollers.
- Hold the driveshaft with the inboard joint pointing up to prevent it from falling off.



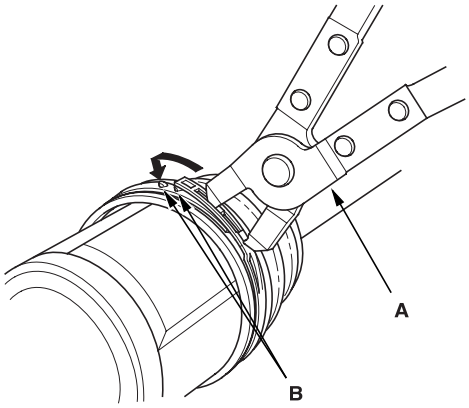
8. Make sure the ends of the boot are seated in the grooves in the driveshaft and joint, then install the boot bands.

- For the double loop type, go to step 12. (Replacement boot bands only)
- For the low profile type, go to step 9. (U.K. Product only)

9. Install the new low profile band (A) onto the boot (B), then hook the tab (C) of the band.



10. Close the hook portion of the band with a commercially available boot band pincers (A), then hook the tabs (B) of the band.



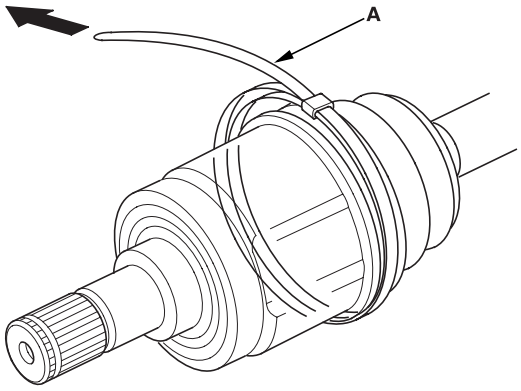
11. Install the boot band on the other end of the boot, and repeat steps 9 and 10.

(cont'd)

Front Driveshafts Reassembly (cont'd)

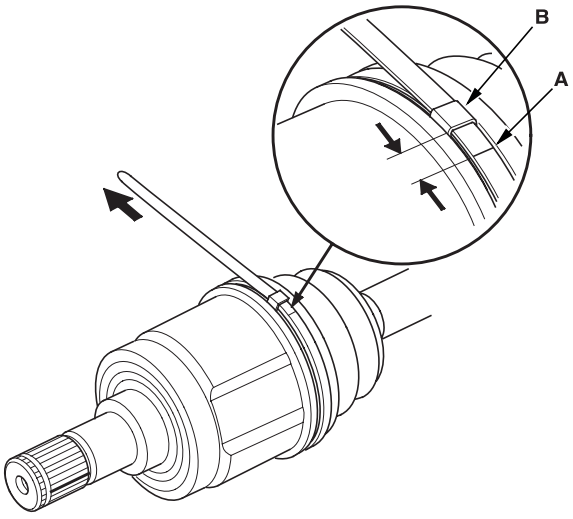
Inboard Joint Side: (cont'd)

12. Set the new double loop band (A) onto the boot with the band end toward the front of the vehicle.

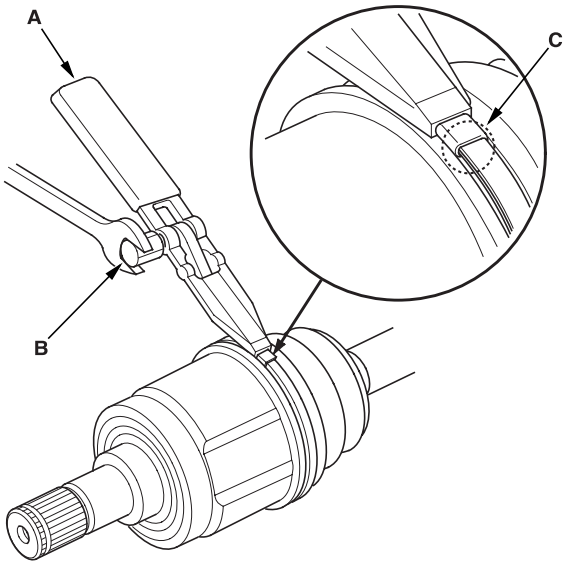


13. Pull up the slack in the band by hand.

14. Make a mark (A) on the band 10 - 14 mm (0.4 - 0.6 in.) from the clip (B).

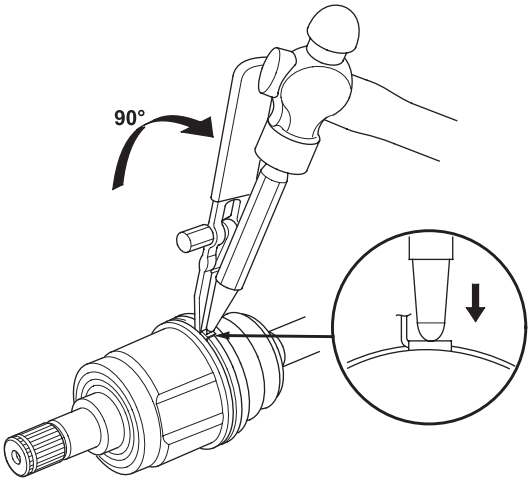


15. Thread the free end of the band through the nose section of the commercially available boot band tool KD-3191 or equivalent (A), and into the slot on the winding mandrel (B).

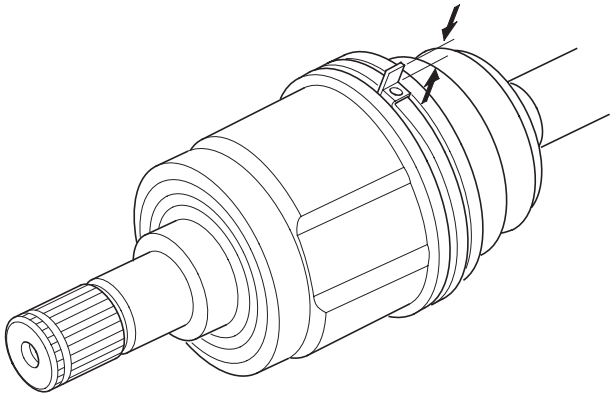


16. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot (C) on the band meets the edge of the clip.

17. Lift up the boot band tool to bend the free end of the band 90° to the clip. Center-punch the clip, then fold over the remaining tail onto the clip.



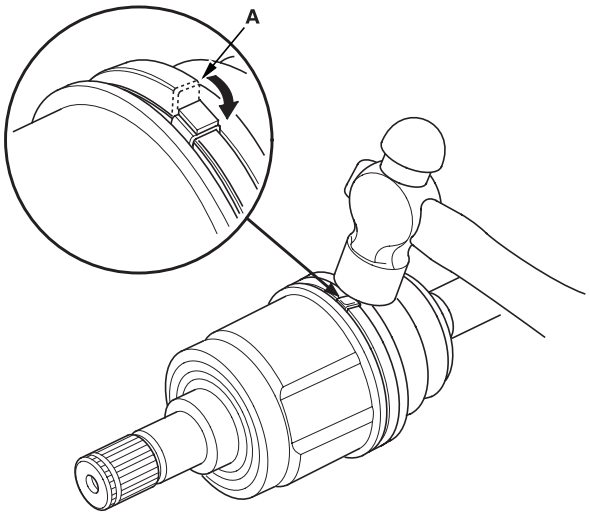
18. Unwind the boot band tool, and cut off the excess free end of the band to leave a 5 - 10 mm (0.2 - 0.5 in.) tail protruding from the clip.



19. Bend the band end (A) by tapping it down with a hammer.

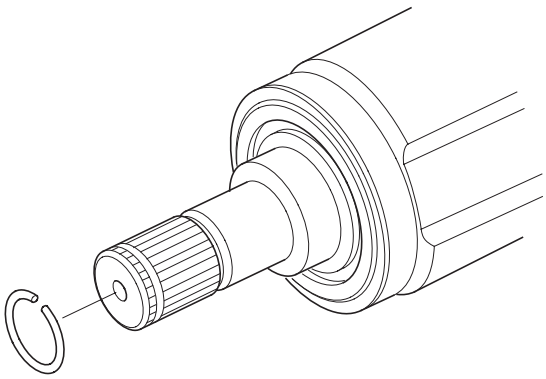
NOTE:

- Make sure the band and clip do not interfere with anything, and the band does not move.
- Remove any grease remaining on the surrounding surfaces.



20. Install the boot band on the other end of the boot, and repeat steps 12 through 19.

21. Install the new set ring.

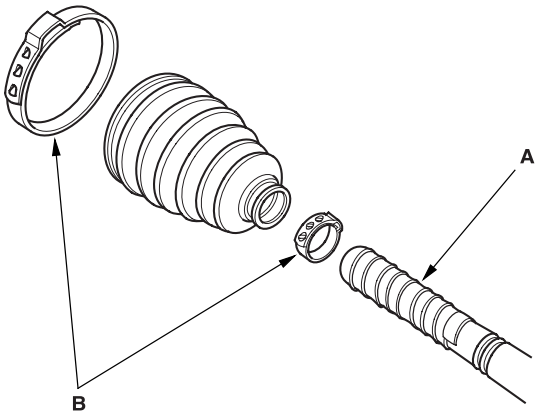


(cont'd)

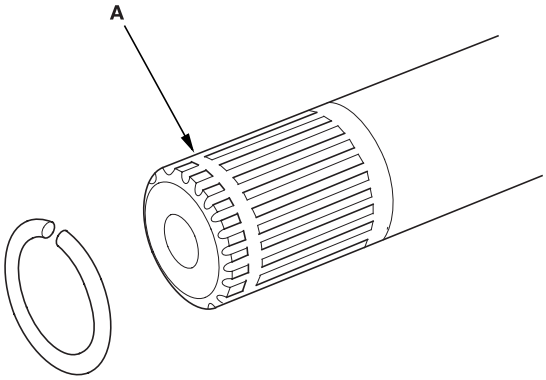
Front Driveshafts Reassembly (cont'd)

Outboard Joint Side:

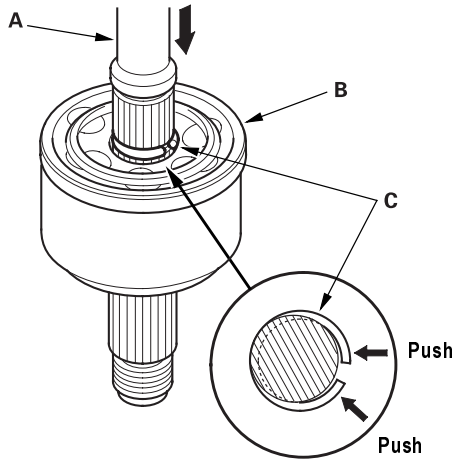
1. Wrap the splines with vinyl tape (A) to prevent damage to the outboard boot.



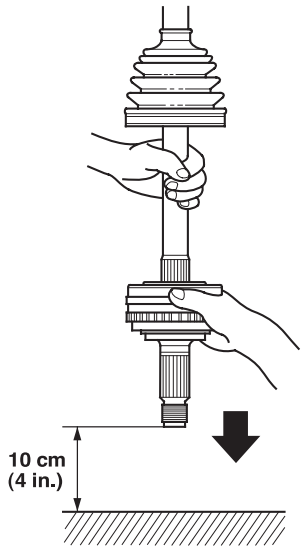
2. Install the new boot bands (B).
3. Install the outboard boot. Be careful not to damage the outboard boot.
4. Remove the vinyl tape.
5. Install the new stop ring into the driveshaft groove (A).



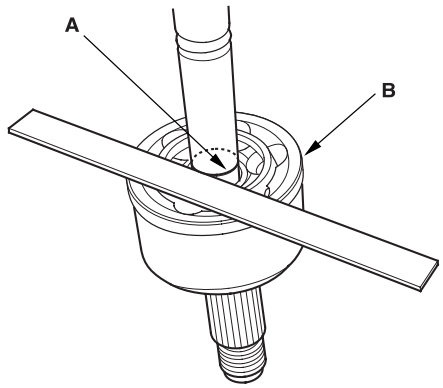
6. Insert the driveshaft (A) into the outboard joint (B) until the stop ring (C) is close to the joint.



7. To completely seat the outboard joint, pick up the driveshaft and joint, and drop them from about 10 cm (4 in.) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft.

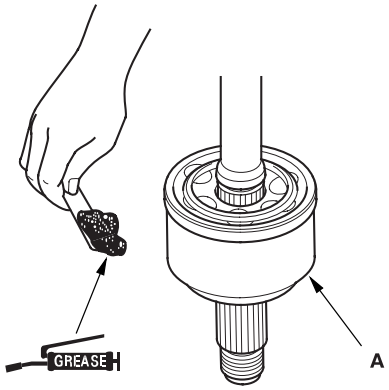


8. Check the alignment of the paint mark (A) with the outboard joint end (B).

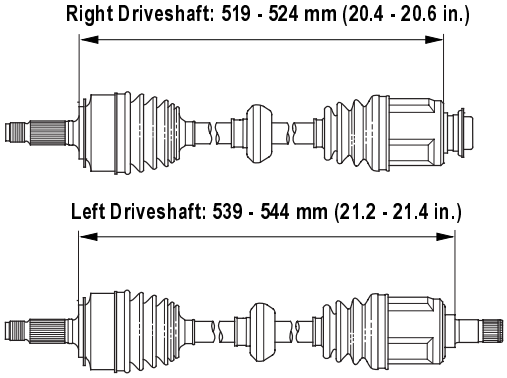


9. Pack the outboard joint (A) with the joint grease included in the new joint boot set.

Grease quantity
Outboard joint: 140 - 150 g (4.9 - 5.3 oz)



10. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension. Make sure the ends of the boots seat in the groove of the driveshaft and joint.

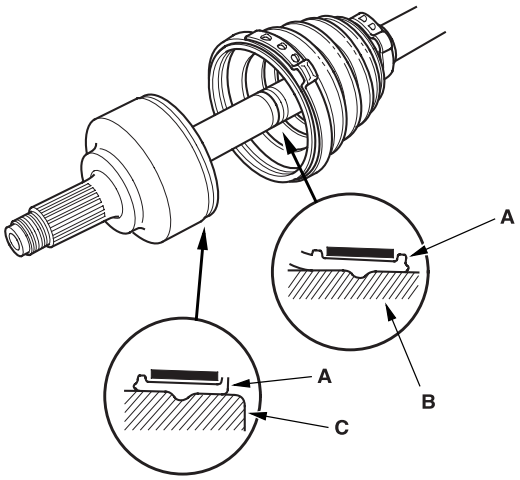


(cont'd)

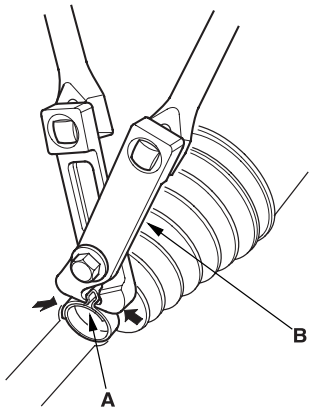
Front Driveshafts Reassembly (cont'd)

Outboard Joint Side: (cont'd)

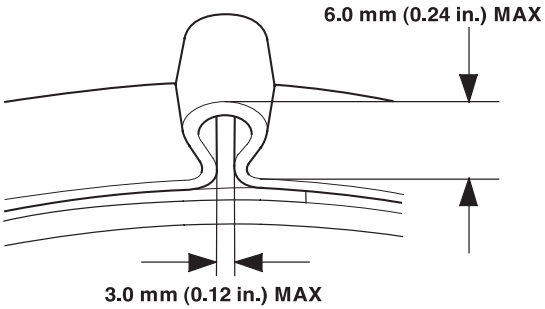
11. Fit the boot (A) ends onto the driveshaft (B) and outboard joint (C).



12. Close the ear portion (A) of the band with a commercially available boot band pincers (B).



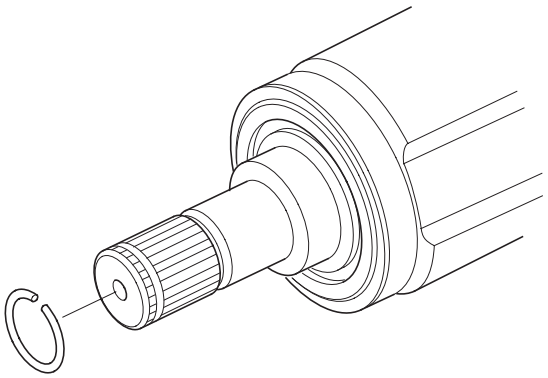
13. Check the clearance between the closed ear portion of the band. If the clearance is not within the standard, close the ear portion of the band further.



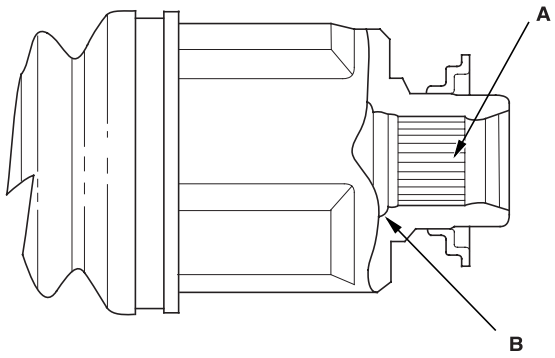
14. Repeat steps 13 and 14 for the band on the other end of the boot.

Front Driveshafts Installation

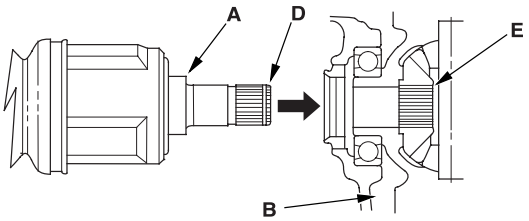
1. Install a new set ring onto the set ring groove of the driveshaft (left driveshaft).

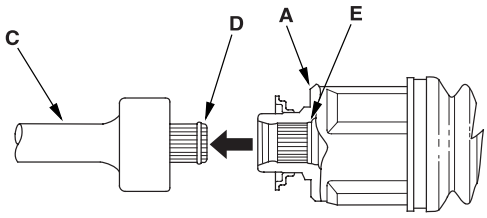


2. Apply 0.5 - 1.0 g (0.02 - 0.04 oz) of specified grease to the whole splined surface (A) of the right driveshaft. After applying grease, remove the grease from the splined grooves at intervals of 2 - 3 splines and from the set ring groove (B) so that air can bleed from the intermediate shaft.

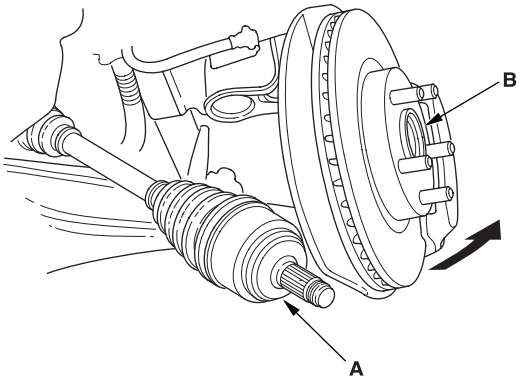


3. Clean the areas where the driveshaft contacts the differential thoroughly with solvent or carburetor cleaner, and dry with compressed air. Insert the inboard end (A) of the driveshaft into the differential (B) or intermediate shaft (C) until the set ring (D) locks in the groove (E).





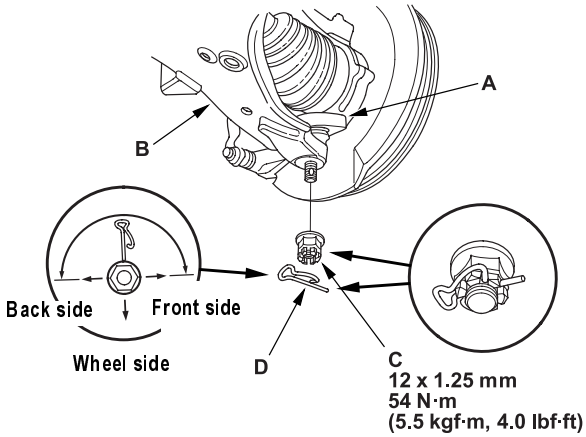
4. Install the outboard joint (A) into the front hub (B).



(cont'd)

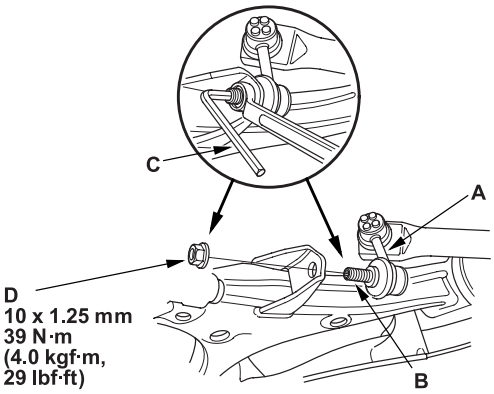
Front Driveshafts Installation (cont'd)

5. Install the knuckle (A) onto the lower arm (B). Wipe off the grease before tightening the nut at the ball joint. Torque the castle nut (C) to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.

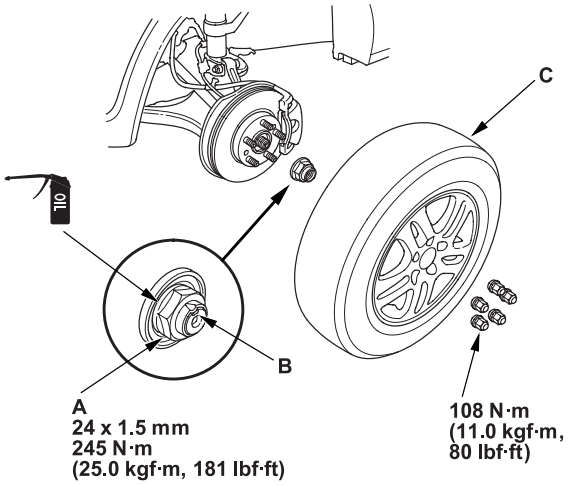


6. Install the new lock pin (D) into the pin hole as shown.

7. Connect the front stabilizer link (A) to the lower arm. Hold the stabilizer link ball ball pin (B) with a hex wrench (C), and tighten the new flange nut (D).



8. Install a new spindle nut (A), then tighten the nut. After tightening, use a drift to stake the spindle nut shoulder (B) against the driveshaft.



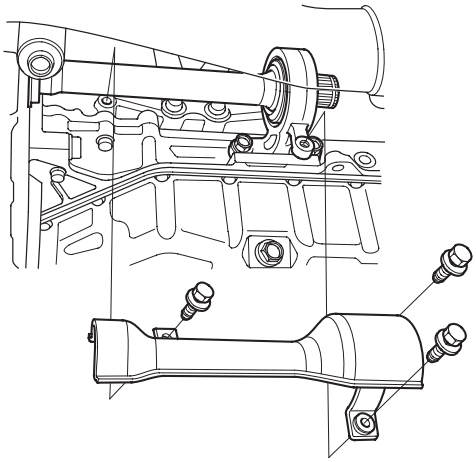
9. Clean the mating surfaces of the brake disc and the front wheel, then install the front wheel with the wheel nuts.

10. Refill the transmission with recommended manual transmission fluid (see page 13-4), or automatic transmission fluid (see page 14-131).

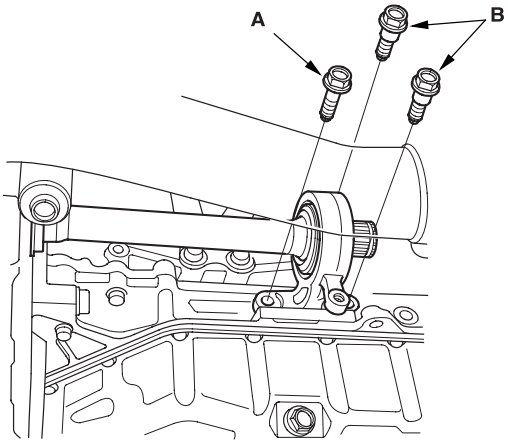
11. Check the front wheel alignment, and adjust it if necessary (see page 18-4).

Intermediate Shaft Removal

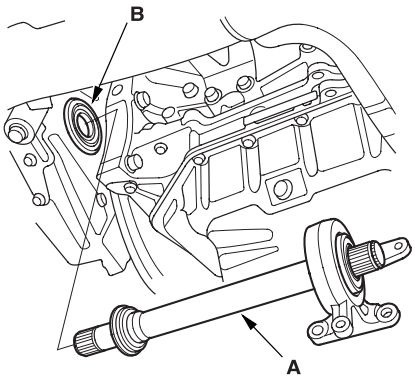
1. Remove the right driveshaft (see page 16-3)
2. Remove the heat cover.



3. Remove the flange bolt (A) and two dowel bolts (B).



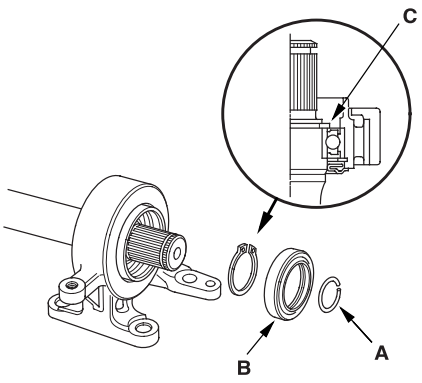
4. Remove the intermediate shaft (A) from the differential. Hold the intermediate shaft horizontal until it is clear of the differential to prevent damage to the differential oil seal (B).



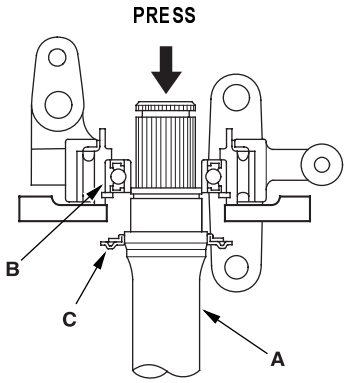
Intermediate Shaft Disassembly

Special Tools Required
- Oil seal driver 07947-SB00100
- Half shaft base 07NAF-SR30101

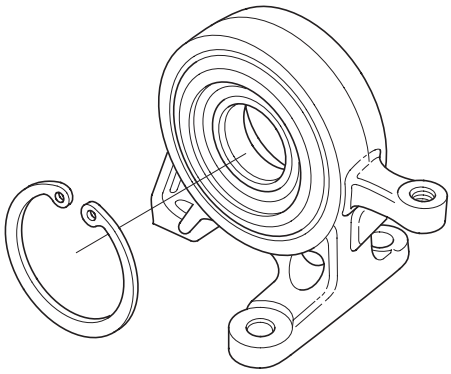
1. Remove the set ring (A), outer seal (B), and external snap ring (C).



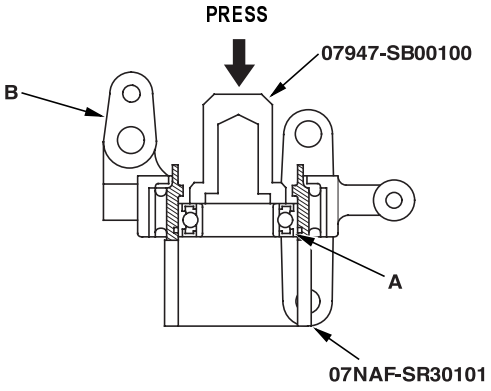
2. Press the intermediate shaft (A) out of the intermediate shaft bearing (B) using a press. Be careful not to damage the metal rings (C) on the intermediate shaft during disassembly.



3. Remove the internal snap ring.

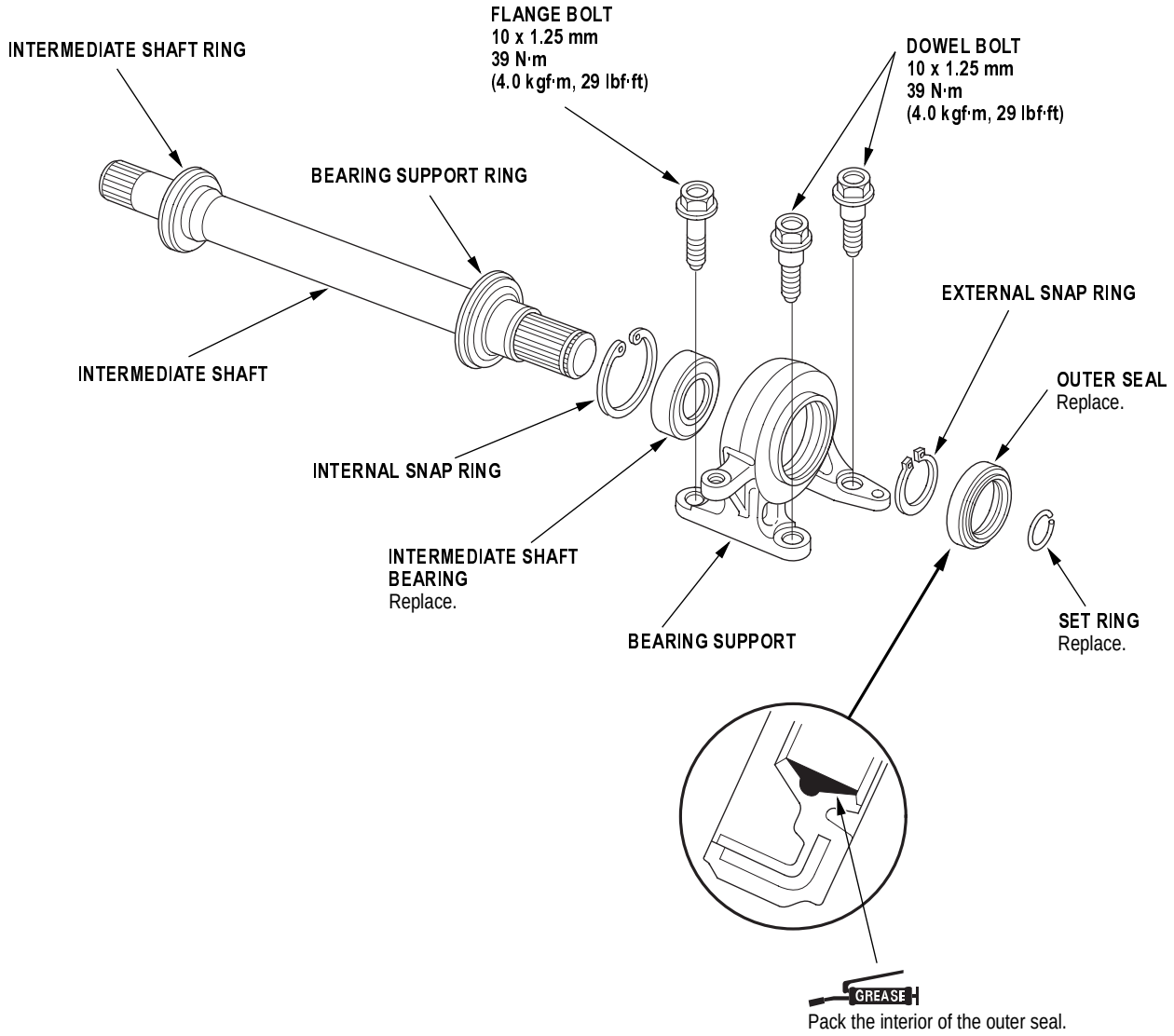


4. Press the intermediate shaft bearing (A) out of the bearing support (B) using the special tools and a press.



Intermediate Shaft Reassembly

Exploded View



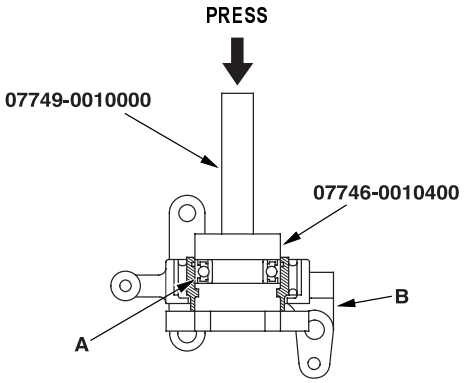
(cont'd)

Intermediate Shaft Reassembly (cont'd)

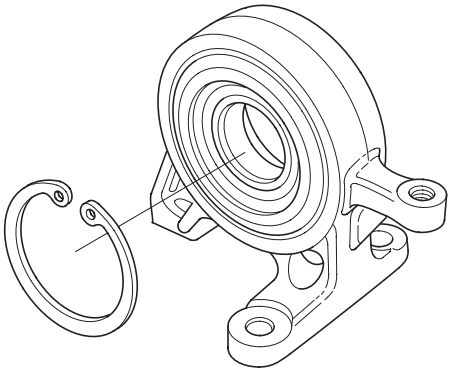
Special Tools Required
- Driver 07749-0010000
- Attachment, 52 x 55 mm 07746-0010400
- Attachment, 35 mm I.D. 07746-0030400
- Oil seal driver 07GAD-PH70201

NOTE: Refer to the Exploded View as needed during this procedure.

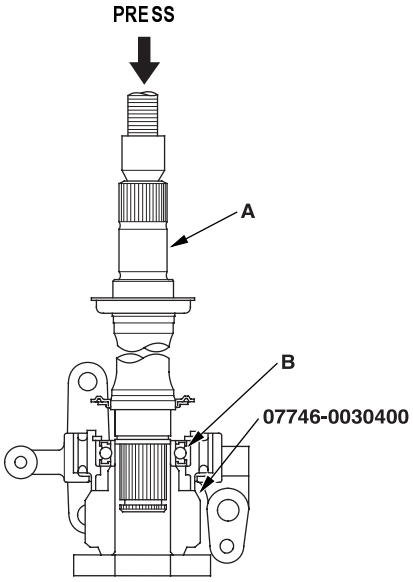
1. Clean the disassembled parts with solvent, and dry them with compressed air. Do not wash the rubber parts with solvent.
2. Press the intermediate shaft bearing (A) into the bearing support (B) using the special tools and a press.



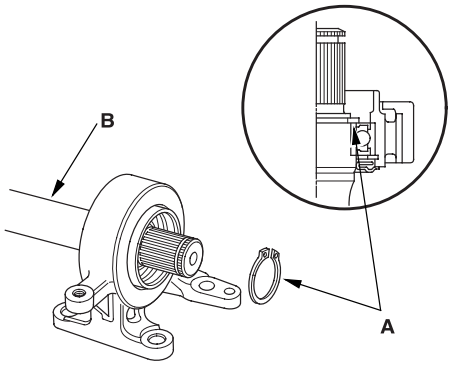
3. Seat the internal snap ring into the groove of the bearing support.



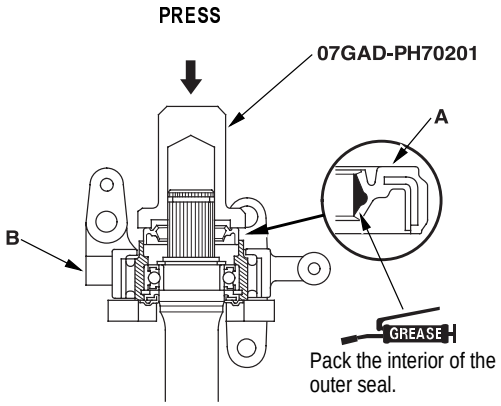
4. Press the intermediate shaft (A) into the shaft bearing (B) using the special tool and a press.



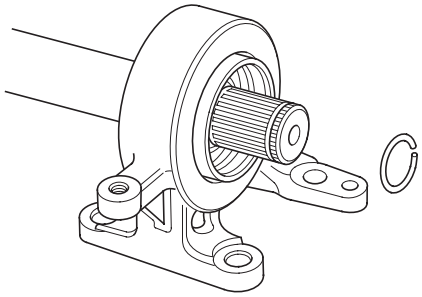
5. Seat the external snap ring (A) into the groove of the intermediate shaft (B).



6. Install the outer seal (A) into the bearing support (B) using the special tool and a press.

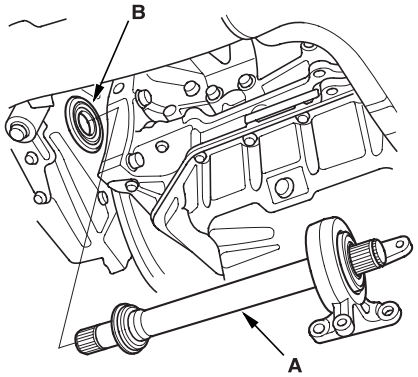


7. Install the set ring.

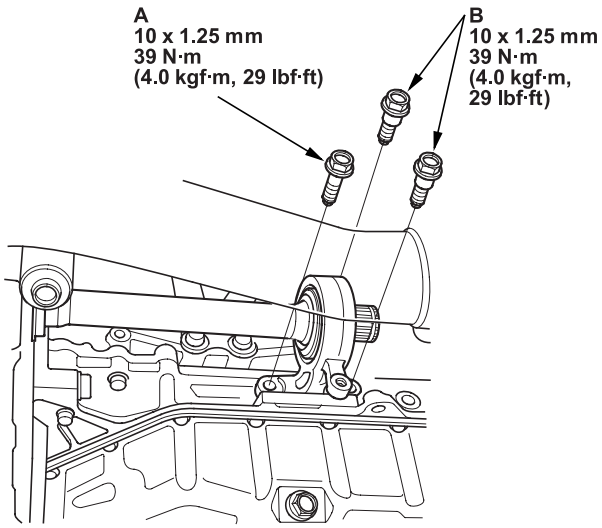


Intermediate Shaft Installation

1. Use solvent or carburetor cleaner to thoroughly clean the areas where the intermediate shaft (A) contacts the transmission (differential), and dry with compressed air. Insert the intermediate shaft assembly into the differential. Hold the intermediate shaft horizontal to prevent damage to the differential oil seal (B).



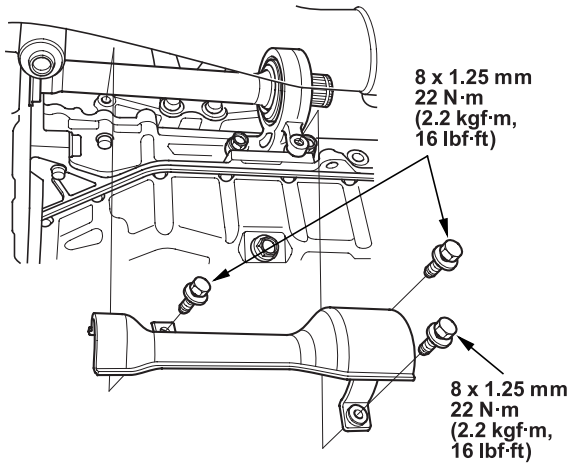
2. Install the flange bolt (A) and two dowel bolts (B).



(cont'd)

Intermediate Shaft Installation (cont'd)

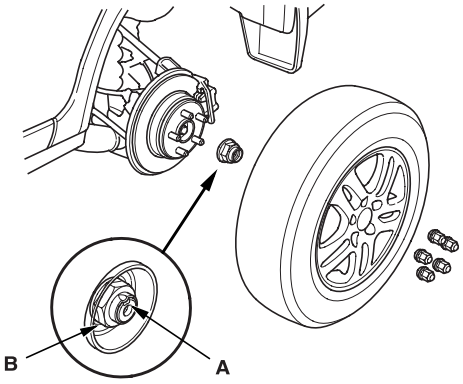
3. Install the heat cover, and tighten the three bolts.



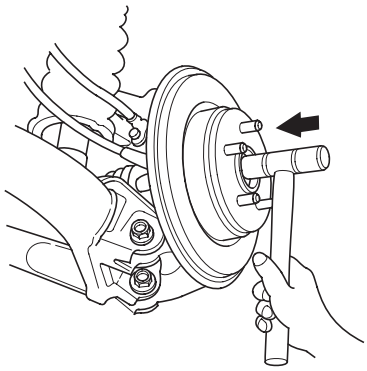
4. Install the right driveshaft (see page 16-17).

Rear Driveshafts Removal

1. Loosen the wheel nuts slightly.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 01-7).
3. Remove the wheel nuts and front wheels.

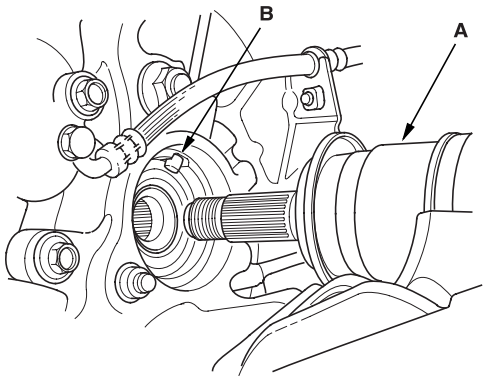


4. Lift up the locking tab (A) on the spindle nut (B), then remove the nut.
5. Remove the rear driveshafts from the rear differential assembly (see step 9 on page 15-14).
6. Remove the rear driveshaft outboard joint from the trailing arm and rear hub using a plastic hammer or a puller if necessary.



7. Remove the rear driveshaft (A).

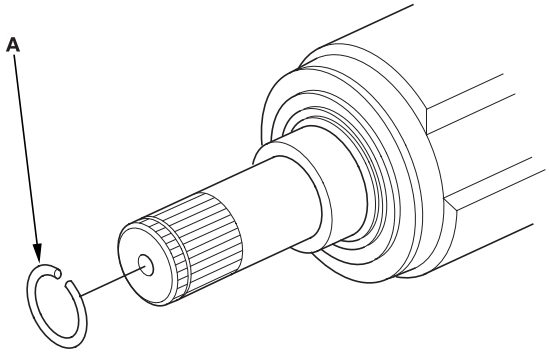
NOTE:
- Be careful not to damage the ABS wheel sensor (B).
- Pull on the outer joint. Do not pull on the driveshaft because the joint may come apart.



Rear Driveshafts Disassembly

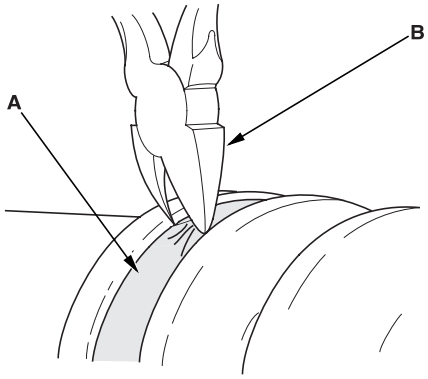
NOTE:
- Due to the amount of work required to replace one damaged boot, it is best to replace both boots at the same time.
- These instructions are for the inboard joint. The same procedure applies to the outboard joint.

1. Remove the set ring (A) from the inboard joint.



2. Remove the boot bands. Be careful not to damage the boot and dynamic damper.
- If the boot band is a welded type (A), cut the boot band (B).
- If the boot band is a double loop type (C), lift up the band bend (D), and push it into the clip (E).
- If the boot band is a low profile type (F), pinch the boot band using a commercially available boot band pincers (G).

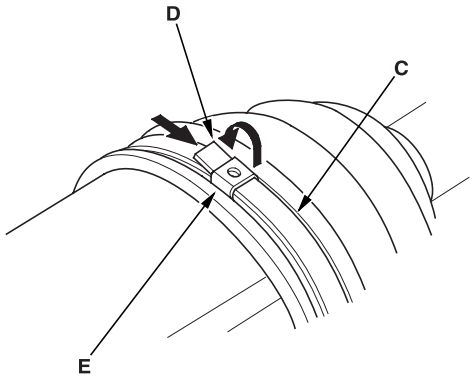
Welded Type



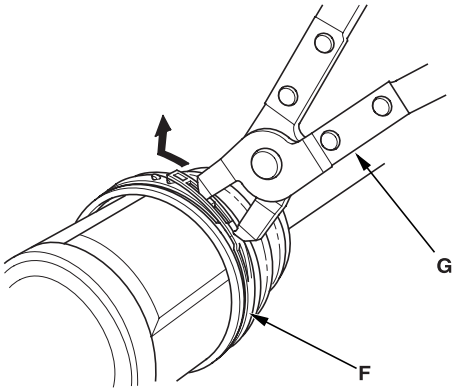
(cont'd)

Rear Driveshafts Disassembly (cont'd)

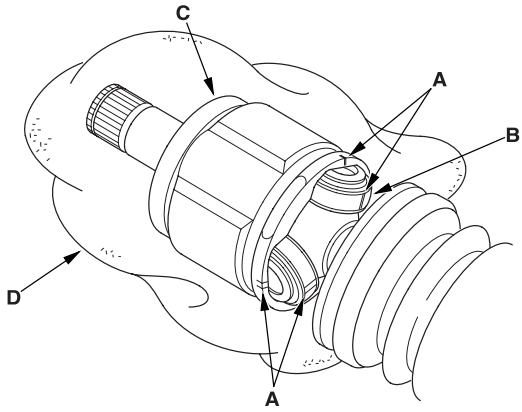
Double Loop Type



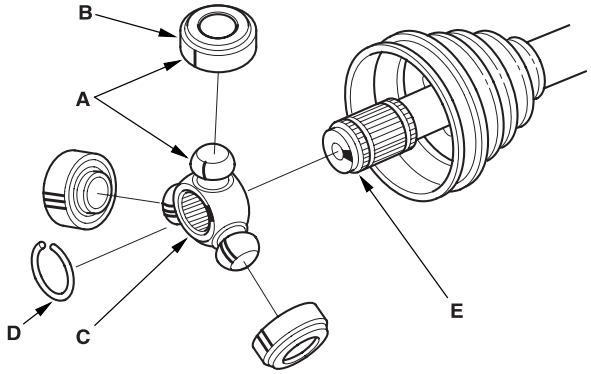
Low Profile Type



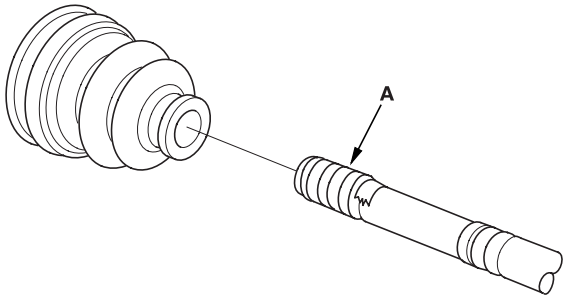
3. Make a mark (A) on each roller (B) and inboard joint (C) to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel (D). Be careful not to drop the rollers when separating them from the inboard joint.



4. Make a mark (A) on the rollers (B) and spider (C) to identify the locations of the rollers on the spider, them remove the rollers.



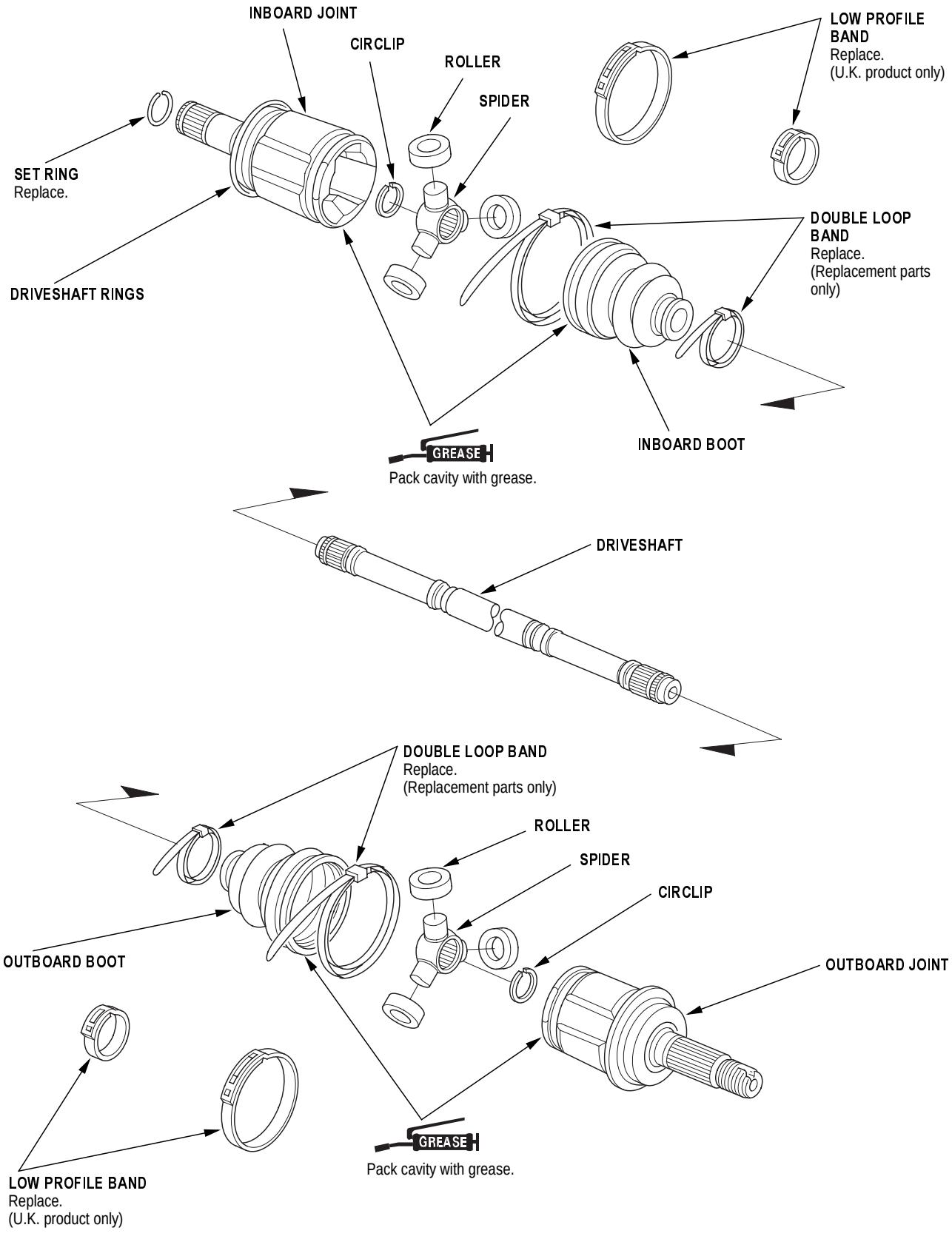
5. Remove the circlip (D).
6. Mark the spider (C) and driveshaft (E) to identify the position of the spider on the shaft.
7. Remove the spider (C).
8. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



9. Remove the inboard boot. Be careful not to damage the boot.
10. Remove the vinyl tape.

Rear Driveshafts Reassembly

Exploded View



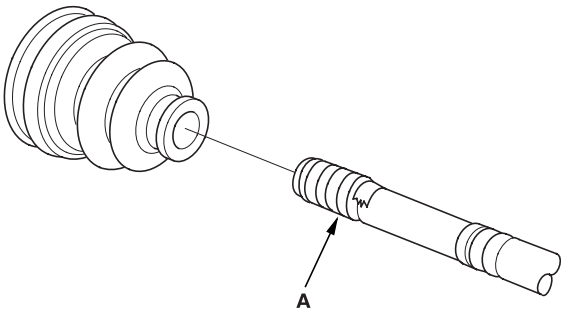
(cont'd)

Rear Driveshafts Reassembly (cont'd)

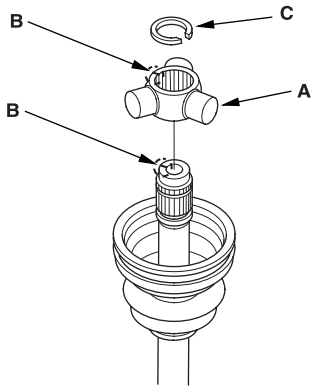
Special Tools Required
- Boot band tool, KD-3191 or equivalent, commercially available
- Boot band pincers, commercially available

NOTE: Refer to the Exploded View as needed during this procedure.

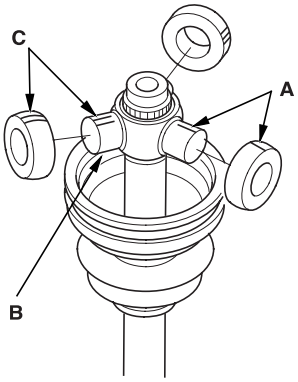
1. Wrap the splines with vinyl tape (A) to prevent damage to the inboard boot.



2. Install the inboard boot onto the driveshaft, then remove the vinyl tape. Be careful not to damage the inboard boot.
3. Install the spider (A) onto the driveshaft by aligning the marks (B) on the spider and the end of the driveshaft.

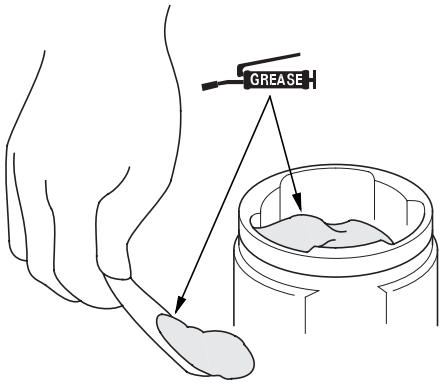


4. Fit the circlip (C) into the driveshaft groove. Always rotate the circlip in its groove to make sure it is fully seated.
5. Fit the rollers (A) onto the spider (B) with their high shoulders facing outward, and note these items:
   - Reinstall the rollers in their original positions on the spider by aligning the marks (C).
   - Hold the driveshaft pointed up to prevent the rollers from falling off.



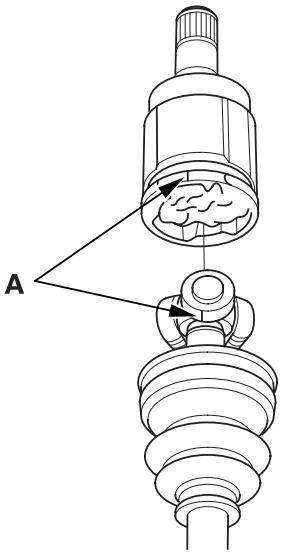
6. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity
Inboard joint: 80 - 90 g (2.8 - 3.2 oz)



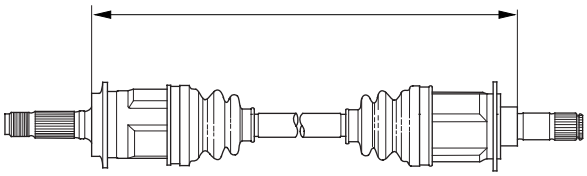
7. Fit the inboard joint onto the driveshaft, and note these items:

- Reinstall the inboard joint onto the driveshaft by aligning the marks (A) on the inboard joint and the rollers.
- Hold the driveshaft so the inboard joint points up to prevent it from falling off.



8. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension. Make sure the ends of the boots seat in the grooves of the driveshaft and joint.

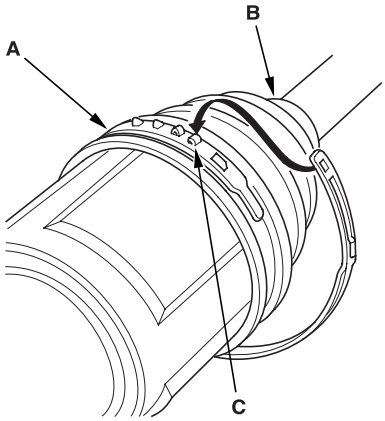
Left driveshaft: 633 - 637 mm (24.9 - 25.1 in.)
Right driveshaft: 690 - 694 mm (27.2 - 27.3 in.)



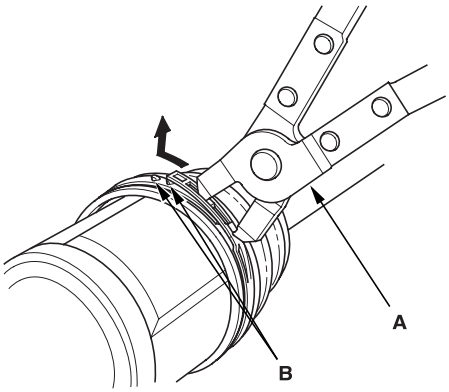
9. Make sure the ends of the boot are seated in the grooves in the driveshaft and joint, then install the boot bands.

- For the double loop type, go to step 13. (Replacement boot bands only)
- For the low profile type, go to step 10. (U.K. Product only)

10. Install the new low profile band (A) onto the boot (B), then hook the tab (C) of the band.



11. Close the hook portion of the band with a commercially available boot band pincers (A), then hook the tabs (B) of the band.

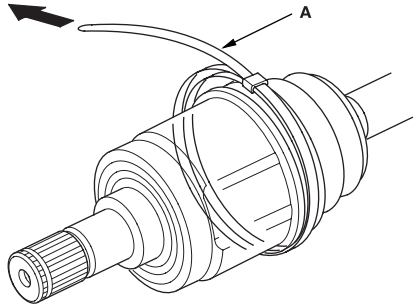


12. Install the boot band on the other end of the boot, and repeat steps 10 and 11.

(cont'd)

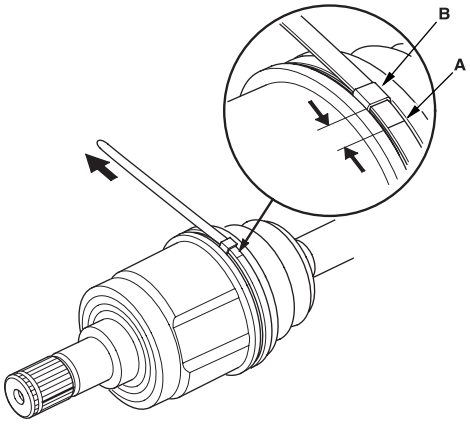
Rear Driveshafts Reassembly (cont'd)

13. Fit the boot ends onto the driveshaft and the inboard joint, then install the new double loop band (A) onto the boot.

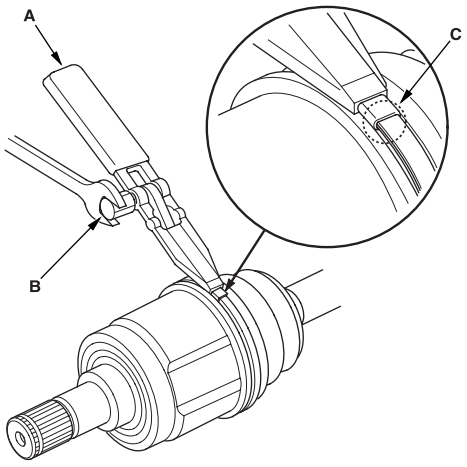


14. Pull up the slack in the band by hand.

15. Mark a position (A) on the band 10 -14 mm (0.4 - 0.6 in.) from the clip (B).

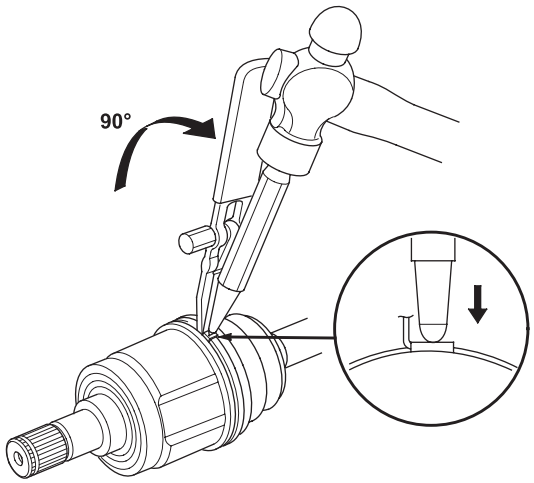


16. Thread the free end of the band through the nose section of the commercially available boot band tool KD-3191 or equvialent (A), and into the slot on the winding mandrel (B).

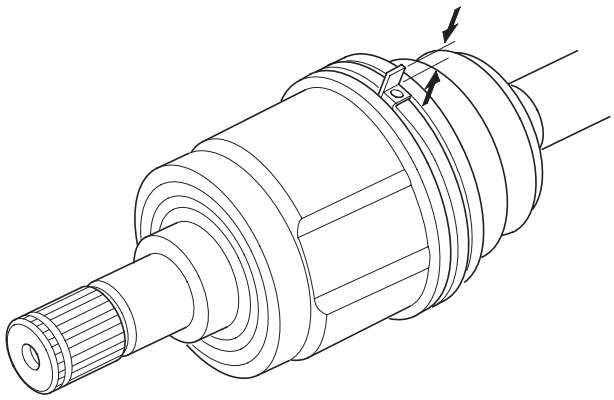


17. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot (C) on the band meets the edge of the clip.

18. Lift up the boot band tool to bend the free end of the band 90° to the clip. Center-punch the clip, then fold over the remaining tail onto the clip.



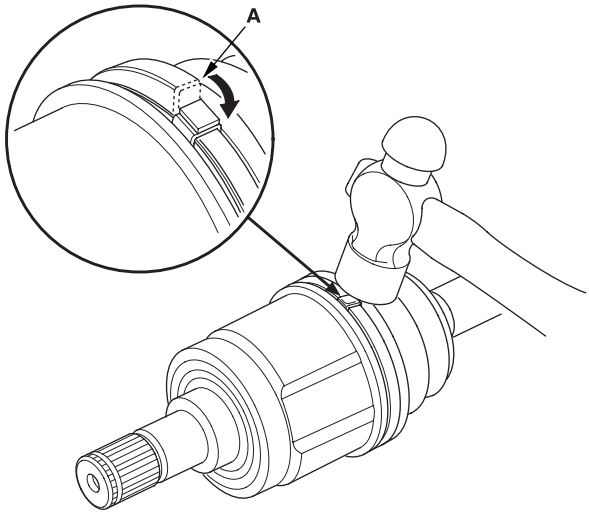
19. Unwind the boot band tool, and cut off the excess free end of the band to leave a 5 - 10 mm (0.2 - 0.4 in.) tail protruding from the clip.



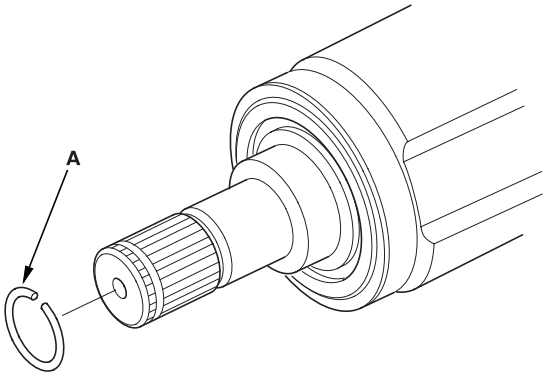
20. Bend the band end (A) by tapping it down with a hammer.

NOTE:

- Make sure the band and clip do not interfere with anything and the band does not move.
- Remove any grease remaining on the surrounding surfaces.



21. Install the new set ring (A).

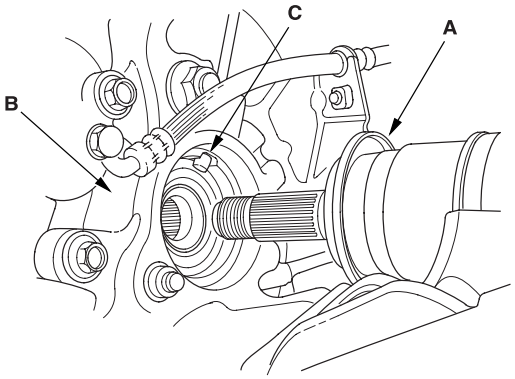


Rear Driveshafts Installation

NOTE: Before starting installation, make sure the wating surfaces of the joint and the spline section are free from dirt or dust.

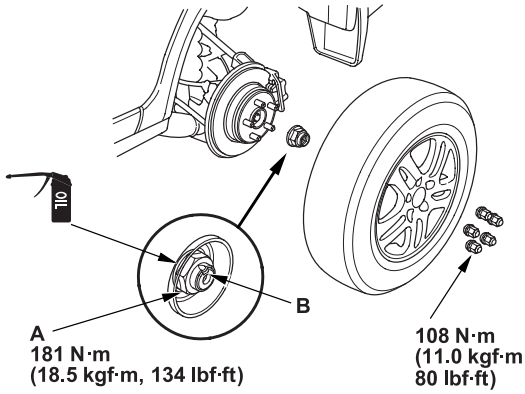
1. Install the outboard joint (A) into the rear hub (B).

NOTE: Be careful not to damage the ABS wheel sensor (C).



2. Install the rear driveshafts into the rear differential assembly (see step 3 on page 15-25).

3. Apply a small amount of engine oil to the seating surface of the new spindle nut (A).



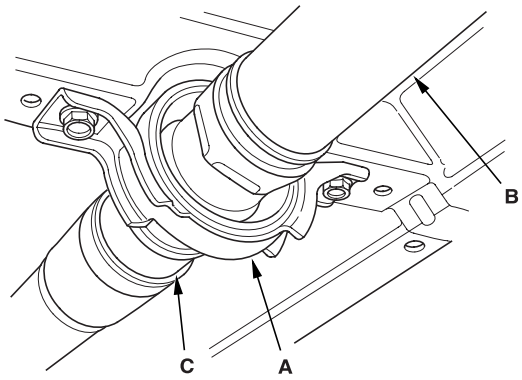
4. Install a new spindle nut, then torque the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft (B).

5. Clean the mating surfaces of the brake disc and the wheel, then install the rear wheel and torque the wheel nuts.

Propeller Shaft Inspection

Universal Joint and Boots

1. Shift the transmission to Neutral.
2. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see page 01-7).
3. Check the center support bearing (A) for excessive play or rattle. If the center support has excessive play or rattle, replace the propeller shaft assembly (B).

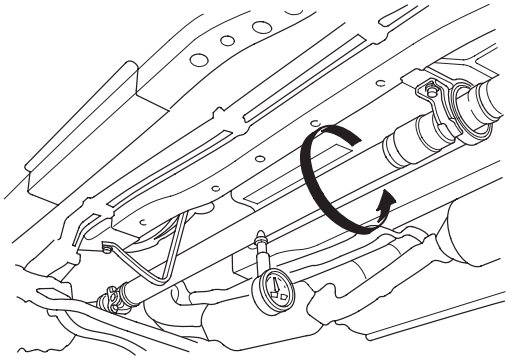


4. Check the universal joint boots (C) for damage and deterioration. If the boots are damaged or deteriorated, replace the propeller shaft assembly.
5. Check the universal joints for excessive play or rattle. If the universal joints have excessive play or rattle, replace the propeller shaft assembly.

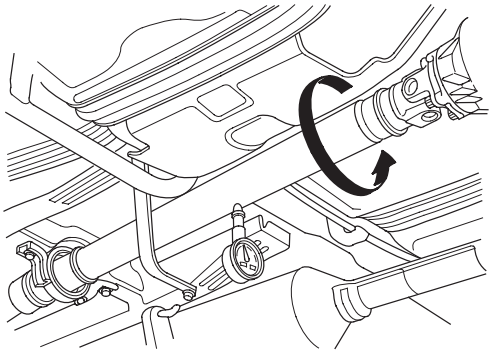
Propeller Shaft Runout

6. Install a dial indicator with its needle on the center of the No. 1 or No. 2 propeller shaft.
7. Turn the other propeller shaft slowly, and check the runout. Repeat this procedure for the other propeller shaft.

No. 1 Propeller Shaft Runout:
Service Limit: 1.5 mm (0.06 in.)



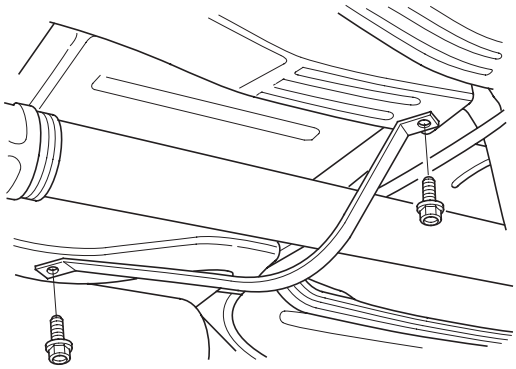
No. 2 Propeller Shaft Runout:
Service Limit: 1.5 mm (0.06 in.)



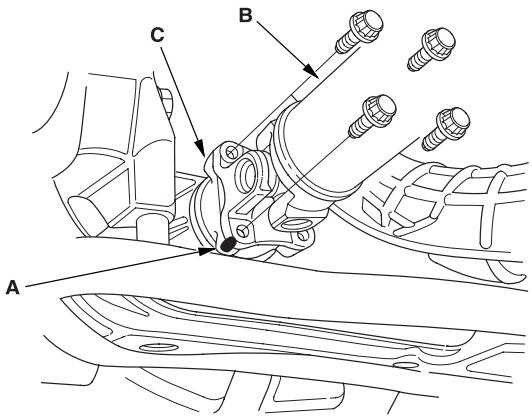
8. If the runout on either propeller shaft exceeds the service limit, replace the propeller shaft assembly.

Propeller Shaft Removal

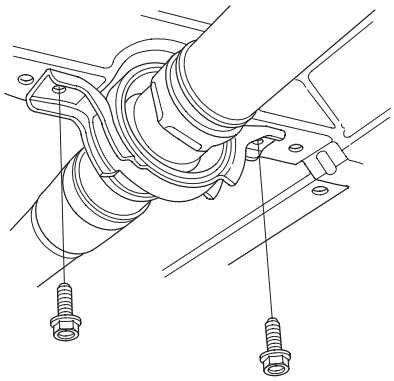
1. Raise the vehicle off the ground, and support it with safety stands in the proper location (see page 01-7).
2. Remove the No. 2 propeller shaft protector.



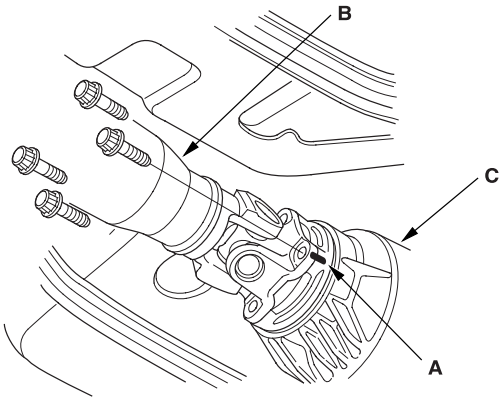
3. Make a reference mark (A) across the propeller shaft (B) and transfer companion flange (C).



4. Separate the propeller shaft from the transfer assembly.
5. Remove the center support bearing mounting bolts.



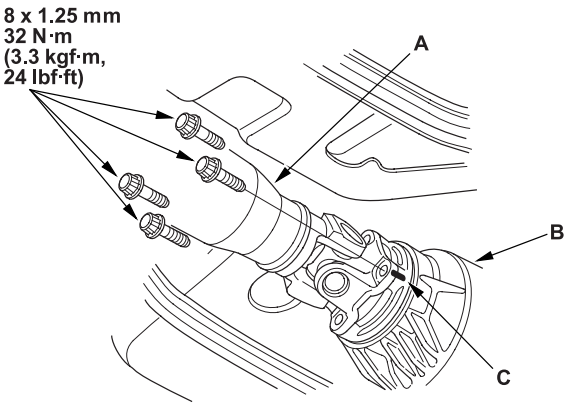
6. Make a reference mark (A) across the propeller shaft (B) and rear differential companion flange (C).



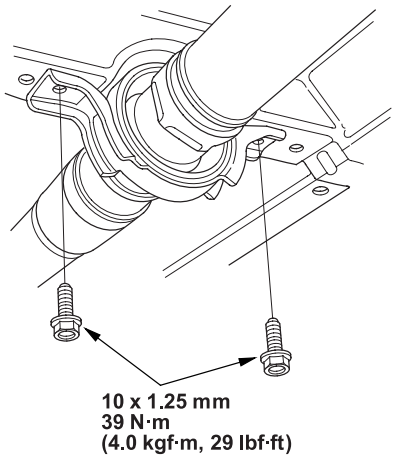
7. Separate the propeller shaft from the rear differential, then remove the propeller shaft.

Propeller Shaft Installation

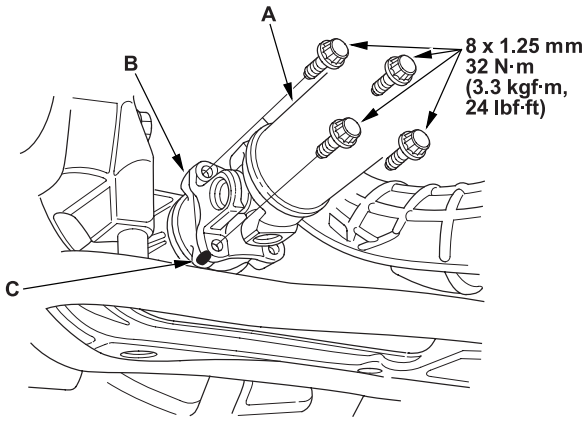
1. Install the propeller shaft (A) onto the rear differential (B) by aligning the reference mark (C).



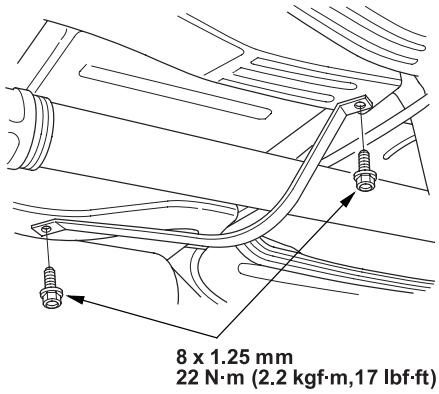
2. Install the center support bearing mounting bolt. Make sure you use a new bolt.



3. Install the propeller shaft (A) onto the transfer (B) by aligning the reference mark (C).



4. Install the No. 2 propeller shaft protector.



17

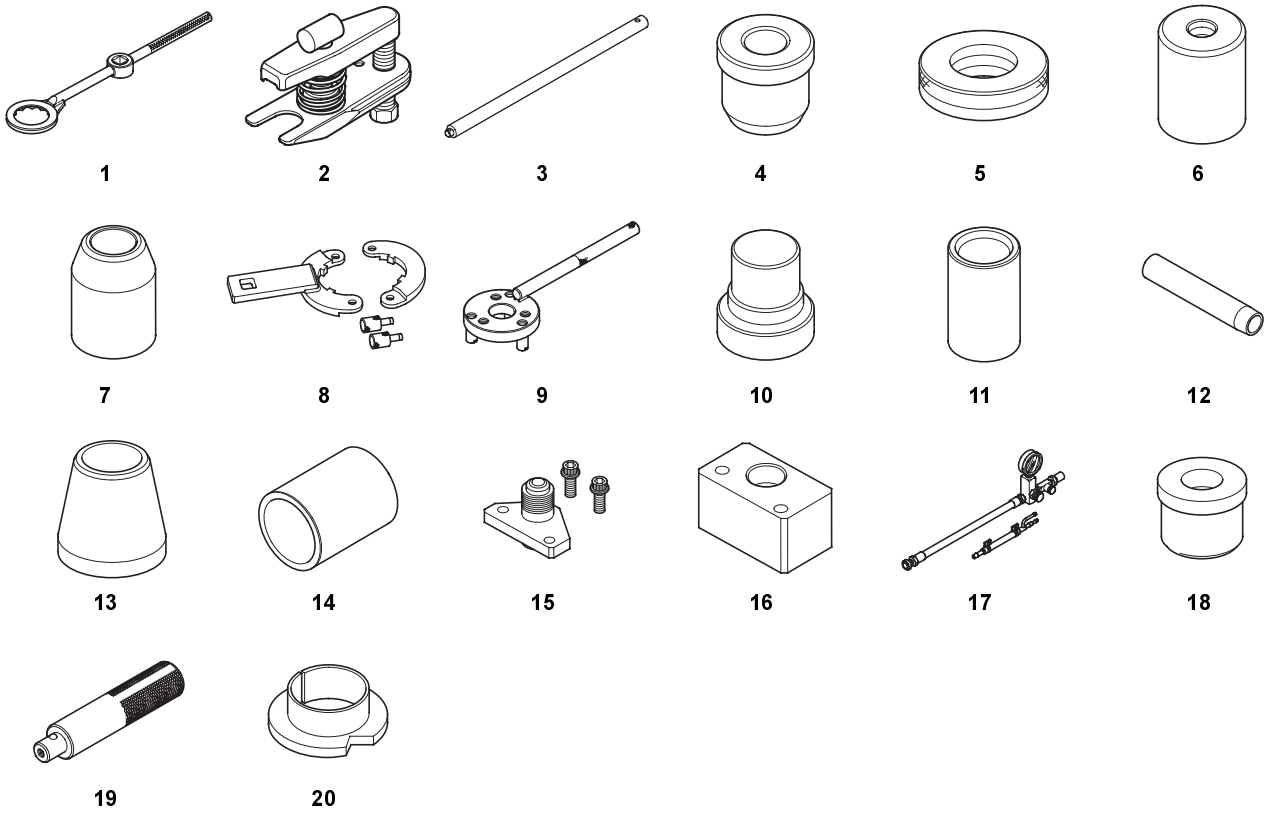
Steering

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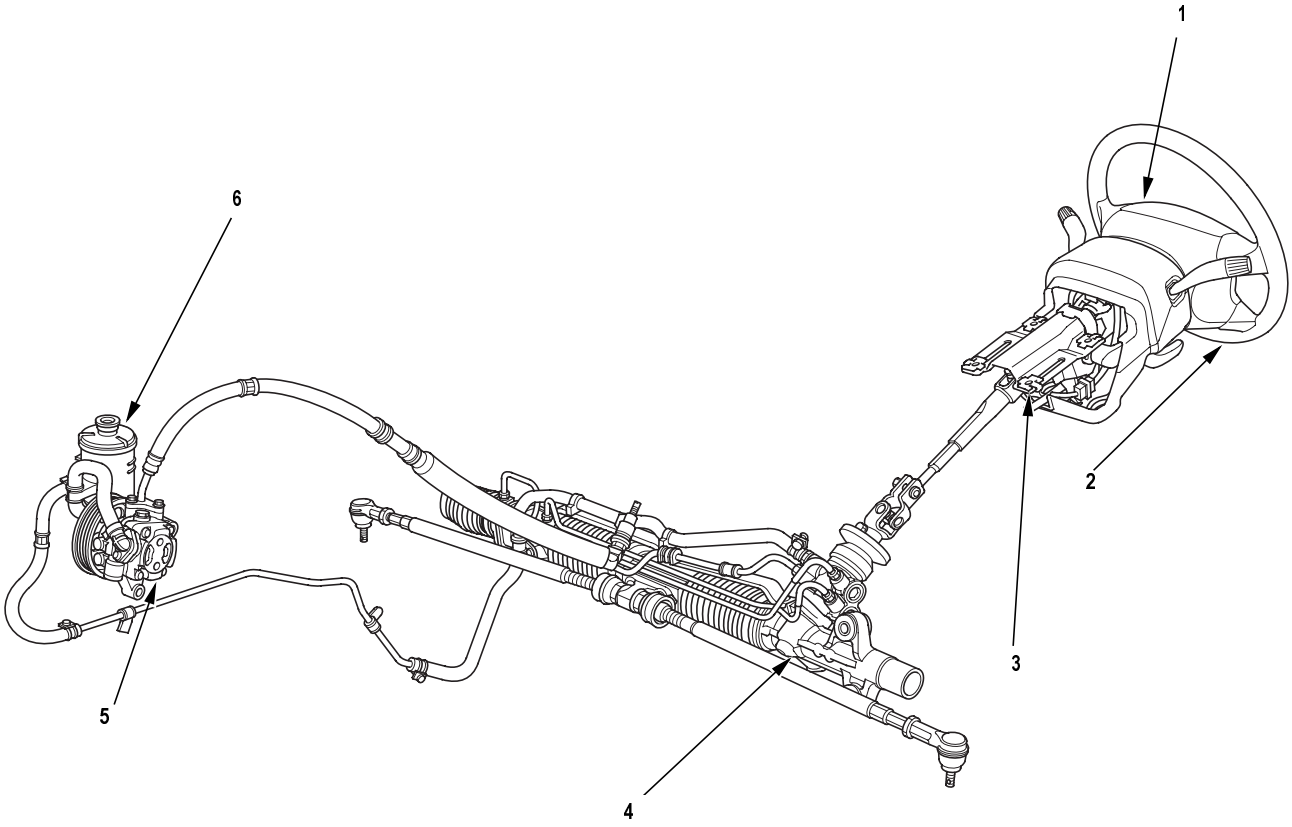
Power Steering

Special Tools

Ref. No.	Tool Number	Description	Qty
1	07MAA-SL00100	Locknut Wrench, 40 mm	1
2	07MAC-SL00200	Ball Joint Remover, 28 mm	1
3	07NAD-SR30101	Driver Handle	1
4	07NAD-SR30200	Cylinder End Seal Remover Attachment	1
5	07NAG-SR30900	Valve Seal Ring Sizing Tool	1
6	07QAD-P0A0100	Attachment, 42 mm	1
7	07YAG-S2X0100	Sleeve Seal Ring Guide	1
8	07ZAA-S5A0100	Locknut Wrench	1
9	07ZAB-S5A0100	Pulley Holder	1
10	07ZAF-S5A0100	Driver, 27 mm	1
11	07ZAG-SA50100	Sleeve Seal Ring Sizing Tool, 36 mm	1
12	07ZAG-S5A0200	Valve Seal Ring Guide	1
13	07ZAG-S7A0100	Piston Seal Ring Guide, 42 mm	1
14	07ZAG-S7A0200	Piston Seal Ring Sizing Tool, 42 mm	1
15	07ZAK-S7C0101	P/S Joint Adapter (Pump)	1
16	07ZAK-S7C0200	P/S Joint Adapter (Hose)	1
17	07406-0010001	P/S Pressure Gauge	1
18	07446-0010100	Attachment, 32 x 35 mm	1
19	07749-0010000	Driver	1
20	07974-6890801	Cylinder End Seal Slider, 23 mm	1



Component Location Index



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3	STEERING COLUMN	Steering Column Tilt Operation Check, page 17-25; Steering Column Removal and Installation, page 17-24; Steering Column / Tilt Lever Inspection / Adjustment, page 17-26; Steering Lock Replacement, page 17-27
4	POWER STEERING GEARBOX	Rack Guide Adjustment, page 17-28; Steering Gearbox Removal, page 17-29; Steering Gearbox Overhaul, page 17-33; Steering Gearbox Installation, page 17-51; Tie Rod Ball Joint Boot Replacement, page 17-55
5	POWER STEERING PUMP	Pump Pressure Test, page 17-9; Drive Belt Inspection and Replacement, page 04-29; Pump Replacement, page 17-13; Pump Overhaul, page 17-14
6	POWER STEERING FLUID RESERVOIR	Fluid Replacement, page 17-11; Hoses and Lines Replacement, page 17-12; Fluid Leakage Inspection, page 17-10

Symptom Troubleshooting Index

Find the symptom in the chart below, and do the related procedures in the order listed until you find the cause.

Symptom	Procedure(s)	Also check for:
Hard steering	Troubleshoot the system (see page 17-6).	• Modified suspension • Damaged suspension • Tire sizes, tire varieties, and air pressure
Assist (excessively light steering at high speed)	Check the rack guide adjustment (see page 17-28).	Front wheel alignment (see page 18-4).
Shock or vibration when the wheel is turned to full lock	1. Check the rack guide adjustment (see page 17-28). 2. Check the drive belt for slippage (see page 04-29). 3. Overhaul the steering gearbox (see page 17-33).	
Steering wheel will not return smoothly	1. Check cylinder lines for deformation. 2. Check wheel alignment (see page 18-4). 3. Overhaul the steering gearbox (see page 17-33).	
Uneven or rough steering	1. Check the rack guide adjustment (see page 17-28). 2. Check the drive belt (see page 04-29). 3. Check low or erratic engine idle speed (see page 11-148). 4. Check for air in the power steering system due to low fluid level. 5. Check for low fluid level in the power steering reservoir due to possible leaks in system. 6. Overhaul the steering gearbox (see page 17-33).	
Steering wheel kicks back during wide turns	1. Check the drive belt (see page 04-29). 2. Check the power steering pump fluid pressure (see page 17-9).	
Humming	1. Check when the noise occurs • If the noise is heard 2 - 3 minutes after starting the engine in cold weather, this is normal. • If the noise is heard when the wheel is turned with the vehicle stopped, this is normal due to the fluid pulsation. 2. Check for the high-pressure hose touching the subframe or body. 3. Check for automatic transmission converter noise. 4. Check for air bubble in the power steering fluid.	Pump pressure.

Rattle or chattering (Rack rattle)	1. Check for loose steering components (tie-rod and ball joints). Tighten or replace as necessary. 2. Check the steering column shaft for wobbling. If the steering column wobbles, replace the steering column assembly (see page 17-24). 3. Check the rack guide adjustment (see page 17-28). 4. Check the power steering pump pulley. • If the pulley is loose, tighten it (see step 47 on page 17-20). • If the pump shaft is loose, replace the pump page 17-13.	
Hissing	• Check the fluid level. If low, fill the reservoir to the proper level and check for leaks. • Check the reservoir for leaks. • Check for crushed inlet hose or loose hose clamp allowing air into the suction side of the system. • Check the power steering pump shaft oil seal for leaks.	Air in the P/S fluid
Pump noise	• Compare the pump noise at normal operating temperature to another like vehicle (pump noise up to 2 - 3 minutes after starting the engine in cold weather is normal). • Remove and inspect the pump for wear and damage (see page 17-14).	• P/S pump pressure • Air in the P/S fluid
Squeaking	Check the drive belt (see page 04-29).	
Fluid leaks from the steering gearbox	• Fluid leaks from the top of the valve body unit: Overhaul the valve body unit (see step 24 on page 17-38). • Fluid leaks from the boot A: Replace the valve oil seal on the pinion shaft. • Replace the cylinder end seal on the gearbox side. • Fluid leaks from the boot B: Replace the right (RHD: left) cylinder end seal. • Fluid leaks from pinion shaft near the lower steering joint bolt: Overhaul the valve body unit.	
Fluid leaks from line	• Fluid leaks from the cylinder line connections (flare nuts): Tighten the connection and retest. • Fluid leaks from a damaged cylinder lines: Replace the cylinder line. • Fluid leaks from the pump outlet hose or return line fitting on the valve body unit (flair nuts): Tighten the fitting and retest. If it still leaks, replace the hose, the line, or valve body unit as necessary.	
Fluid leaks from pump	• Fluid leaks from the front oil seal: Replace the front oil seal. • Fluid leaks from the power steering pump housing: Replace the leaking O-rings or seals (see page 17-14), and if necessary replace the power steering pump (see page 17-13).	
Fluid leaks from reservoir	• Fluid leaks from around the reservoir cap: Fluid level is too high: drain the reservoir to the proper level. Aerated fluid: check for an air leak on the inlet side of pump. • Fluid leaks from reservoir: Check for the reservoir for cracks and replace as necessary.	
Fluid leaks from pump outlet hose (high-pressure)	• Check the fitting for loose bolts. If the bolts are tight, replace the fitting O-ring. • Fluid leaks at the swagged joint: Replace the outlet hose.	
Fluid leaks from pump inlet hose (low-pressure)	Check the hose for damage, deterioration, or improper assembly. Replace or repair as necessary.	

Hard Steering Troubleshooting

Hard Steering

1. Check the power assist (see page 17-7).

   Is the starting load more than 29 N (3.0 kgf, 6.6 lbf)?

   Yes Go to step 2.

   No Power assist is OK.■

2. Measure steady-state fluid pressure from the pump at idle (see page 17-9).

   Is the pressure 1,500 kPa (15 kgf/cm^2, 213 psi) or less?

   Yes Go to step 3.

   No Go to step 7.

3. Measure the pump relief pressure at idle (see page 17-9).

   K20A4 and K20A5 Engine models:
   Is the pressure 6,900 - 7,500 kPa (70 - 77 kgf/cm^2, 1,000 - 1,100 psi) or less?
   K24A1 Engine models:
   Is the pressure 7,500 - 8,100 kPa (76 - 83 kgf/cm^2, 1,080 - 1,180 psi) or less?

   Yes Go to step 4.

   No Faulty pump assembly.■

4. With a spring scale, measure the power assist in both directions, to the left and to the right.

   Are the two measurements within 2.9 N (0.3 kgf, 0.66 lbf) of each other?

   Yes Go to step 5.

   No Go to step 8.

5. Measure the fluid pressure with shut-off valve and pressure gauge valve open, while turning the steering wheel fully to the left and fully to the right.

   K20A4 and K20A5 Engine models:
   Is the pressure 6,900 - 7,500 kPa (70 - 77 kgf/cm^2, 1,000 - 1,100 psi) or less?
   K24A1 Engine models:
   Is the pressure 7,500 - 8,100 kPa (76 - 83 kgf/cm^2, 1,080 - 1,180 psi) or less?

   Yes Go to step 6.

   No Faulty gearbox.■

6. Adjust the rack guide (see page 17-28), and retest.

   Is the steering OK?

   Yes Repair is completed.■

   No Faulty gearbox.■

7. Check the feed and return lines between the pump and the gearbox for clogging and deformation.

   Are the lines clogged or deformed?

   Yes Repair or replace the lines.■

   No Faulty valve body unit or pump.■

8. Check the cylinder lines for deformation (see page 17-10).

   Are the lines deformed?

   Yes Replace the lines.■

   No Go to step 9.

9. Check for a bent rack shaft or misadjusted rack guide (too tight).

   Is the rack shaft bent or the rack guide adjusted too tight?

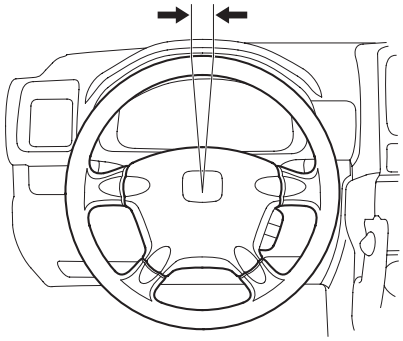
   Yes Replace the rack shaft or readjust the rack guide.■

   No Faulty valve body unit.■

Steering Wheel Rotational Play Check

1. Turn the front wheels to the straight ahead position.
2. Measure how far you can turn the steering wheel left and light without moving the front wheels.
   - If the play is within the limit, the gearbox and linkages are OK.
   - If the play exceeds the limit, adjust the rack guide (see page 17-28). If the play is still excessive after rack guide adjustment, inspect the steering linkage and gearbox (see page 17-8).

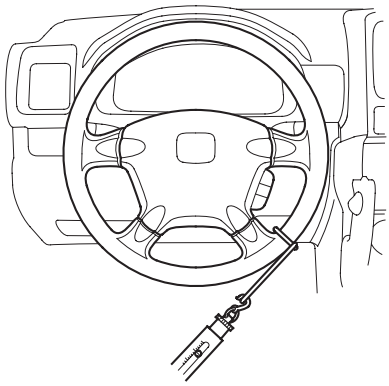
ROTATIONAL PLAY: 0 - 10mm (0 - 0.39 in.)



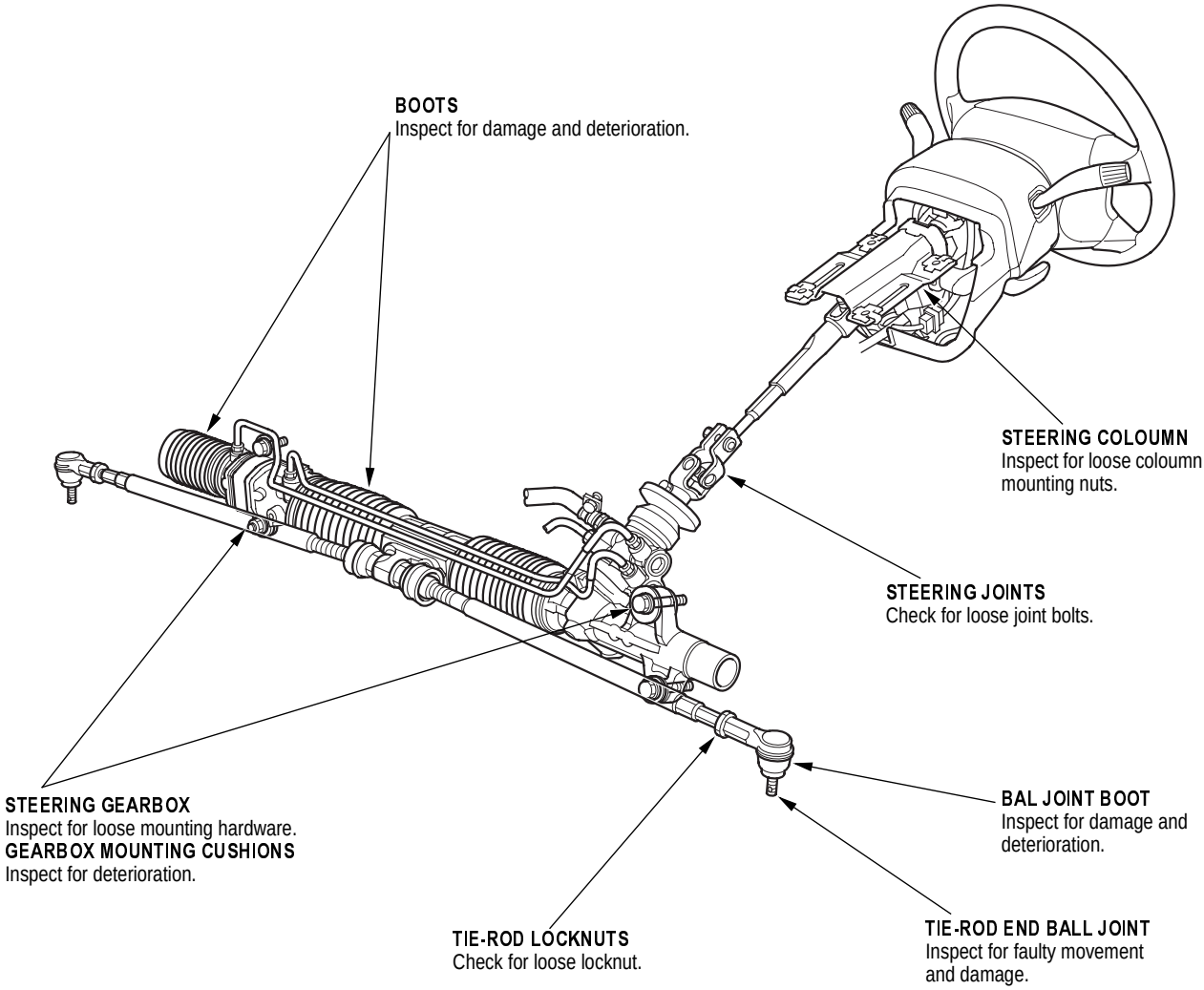
Power Assist Check

1. Check the power steering fluid level (see page 17-11).
2. Start the engine, let it idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a commercially available spring scale to the steering wheel. With the engine idling and the vehicle on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.
   - If the scale reads no more than specifications, the gearbox and pump are OK.
   - If the scale reads more than specifications, troubleshoot the steering system (see page 17-6).

INITIAL TURNING LOAD: **29 N (3.0 kgf, 6.6 lbf)**



Steering Linkage and Gearbox Inspection

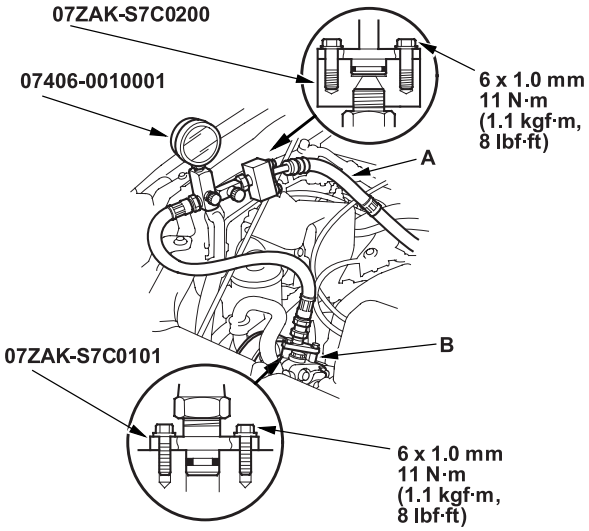


Pump Pressure Test

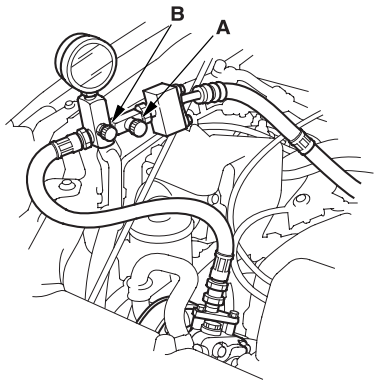
Special Tools Required
- P/S joint adapter (pump) 07ZAK-S7C0101
- P/S joint adapter (hose) 07ZAK-S7C0200
- P/S pressure gauge 07406-0010001

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-11).
2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the frame and other parts. Install the P/S joint adapter (pump) on the pump outlet (B).



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose (A) to the P/S joint adapter (hose).
4. Install the P/S pressure gauge to the P/S joint adapter (pump).
5. Fully open the shut-off valve (A).



6. Fully open the pressure control valve (B).
7. Start the engine and let it idle.
8. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature at 158°F (70°).
9. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the pressure should be no more than 1,500 kPa (15 kgf/cm^2, 214 psi). If the pressure is too high, check the outlet hose or valve body unit (see Steering System Troubleshooting).
   Raise the engine speed to 3,000 rpm, and measure the fluid pressure. If the pump is in good condition, the pressure should be at least 1,500 kPa (15 kgf/cm^2, 214 psi). If the pressure is too high, repair or replace the pump.
10. Lower the engine speed and let it idle. Close the shut-off valve, then close the pressure control valve gradually until the pressure gauge needle is stable. Read the pressure.

    NOTICE

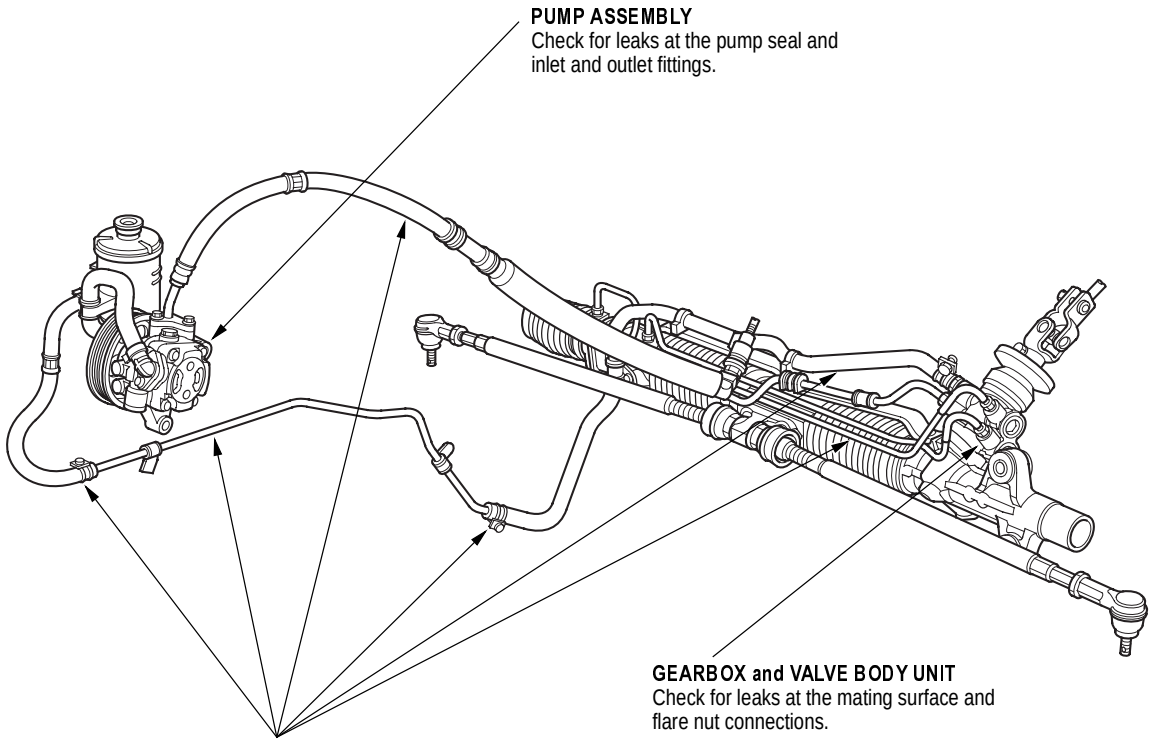
    Do not keep the shut-off valve closed more than 5 seconds or the pump could be damaged by over-heating.

11. Immediately open the pressure control valve fully. If the pump is in good condition, the gauge should read at least this specification:

    K20A4 and K20A5 Engine models:
    6,900 - 7,500 kPa (70 - 77 kgf/cm^2, 1,000 - 1,100 psi)
    K24A1 Engine models:
    7,500 - 8,100 kPa (76 - 83 kgf/cm^2, 1,080 - 1,180 psi)

    A low reading means pump output is too low for full assist. Repair or replace the pump.

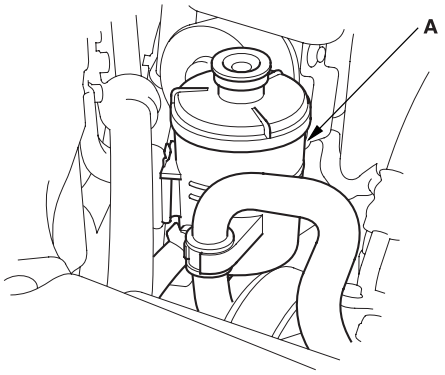
Fluid Leakage Inspection



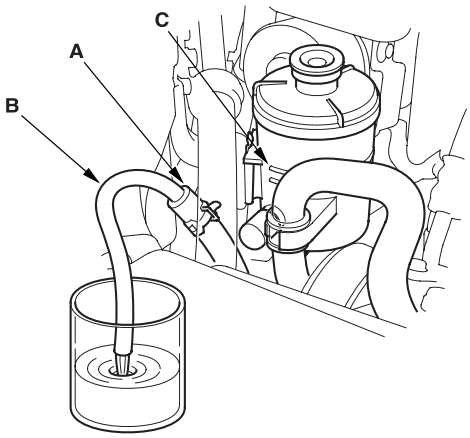
Fluid Replacement

Check the reservoir (A) at regular intervals, and add the recommended fluid as necessary. Always use Genuine Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

SYSTEM CAPACITY:
RHD models:
0.72 *l* (0.76 US. qt, 0.63 Imp.qt) at disassembly
LHD models:
0.75 *l* (0.79 US. qt, 0.66 Imp.qt) at disassembly
RESERVOIR CAPACITY:
0.26 *l* (0.27 US. qt, 0.23 Imp.qt)



1. Raise the reservoir, then disconnect the return hose (A) to drain the reservoir. Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.

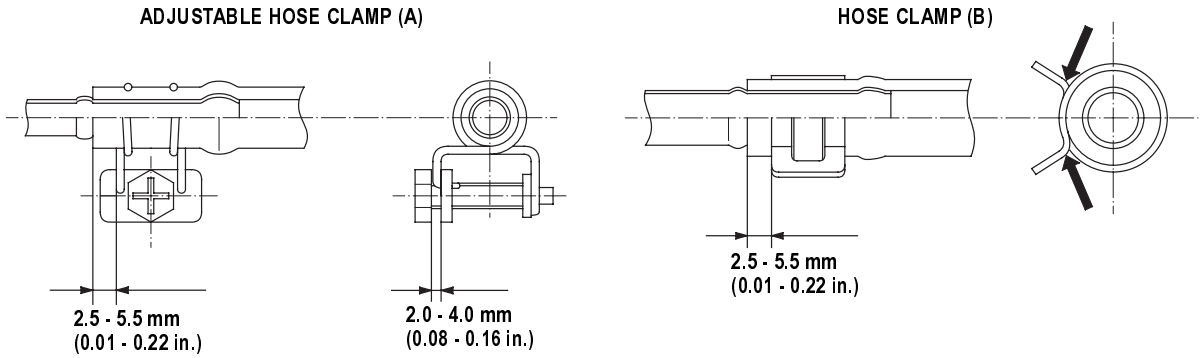


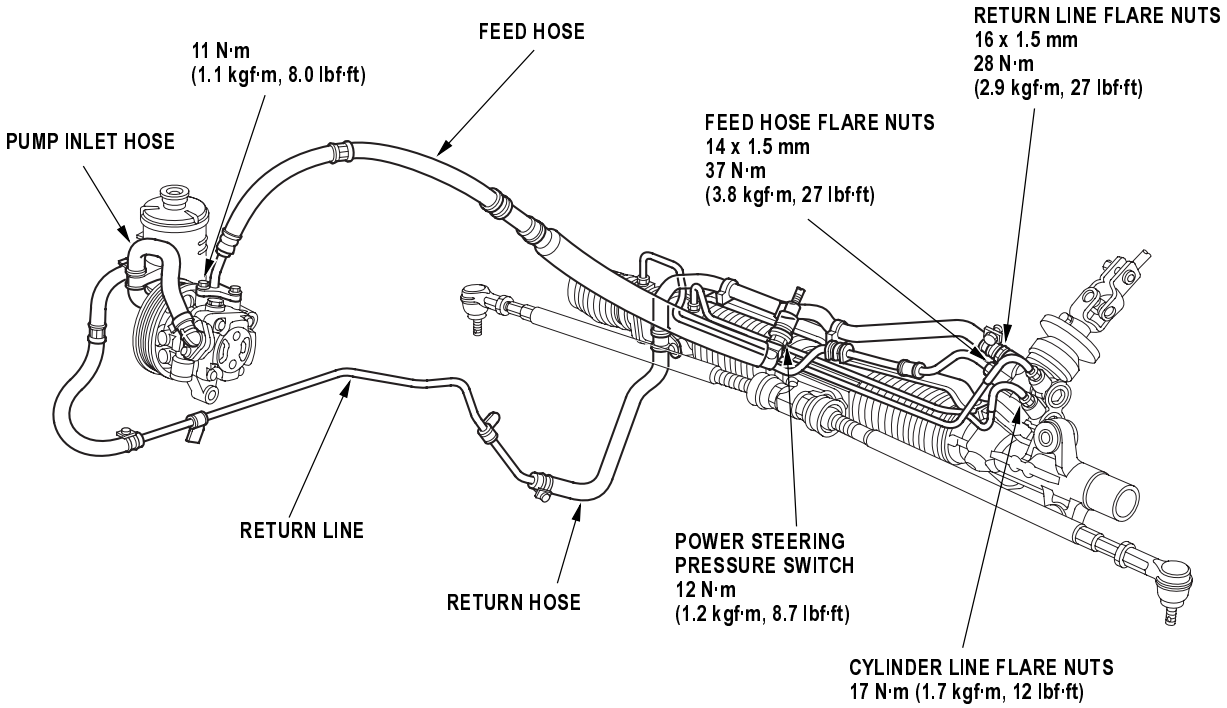
2. Connect a hose (B) of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.
3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.
4. Reinstall the return hose on the reservoir.
5. Fill the reservoir to the upper level line (C).
6. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add more if necessary. Do not fill the reservoir beyond the upper level line.

Hoses and Lines Replacement

Note these items during installation:

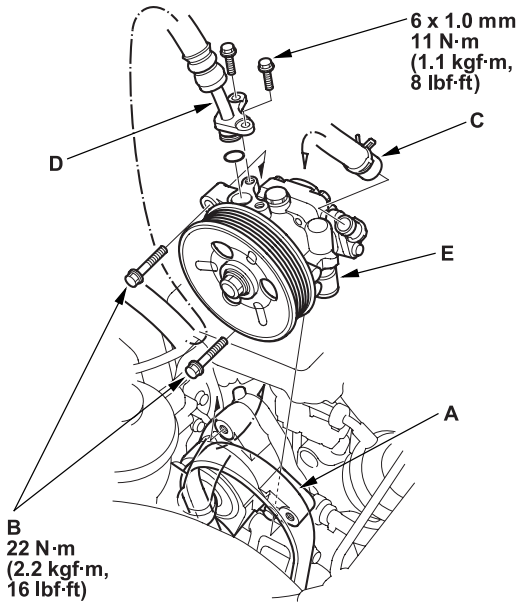
- Connect each hose to the corresponding line securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- Check all clamps for deterioration or deformation; replace with the clamps new ones if necessary.
- Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.





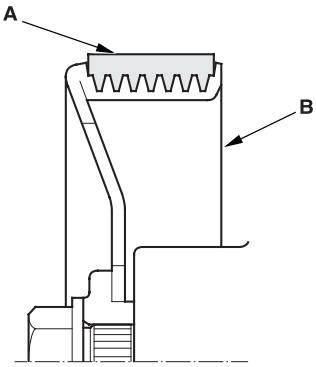
Pump Replacement

1. Place a suitable container under the vehicle.
2. Drain the power steering fluid from the reservoir.
3. Remove the drive belt (A) from the pump pulley (see page 04-30).



4. Remove the pump mounting bolts (B).
5. Cover the auto-tensioner, alternator and A/C compressor with several shop towels to protect it from spilled power steering fluid. Disconnect the pump inlet hose (C) and pump outlet hose (D) from the pump (E), and plug them. Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once. Do not turn the steering wheel with the pump removed.
6. Cover the opening of the pump with a piece of tape to prevent foreign material from entering the pump.
7. Connect the pump inlet hose and pump outlet hose.
8. Loosely install the pump in the pump bracket with the mounting bolts, then tighten the pump fittings securely.
9. Install the drive belt (A).

   Note these item during belt installation:
   - Make sure that the belt is properly positioned on the pulleys (B).
   - Do not get power steering fluid or grease on the auto-tensioner, alternator, A/C compressor and drive belt or pulley faces. Clean off any fluid or grease before installation.

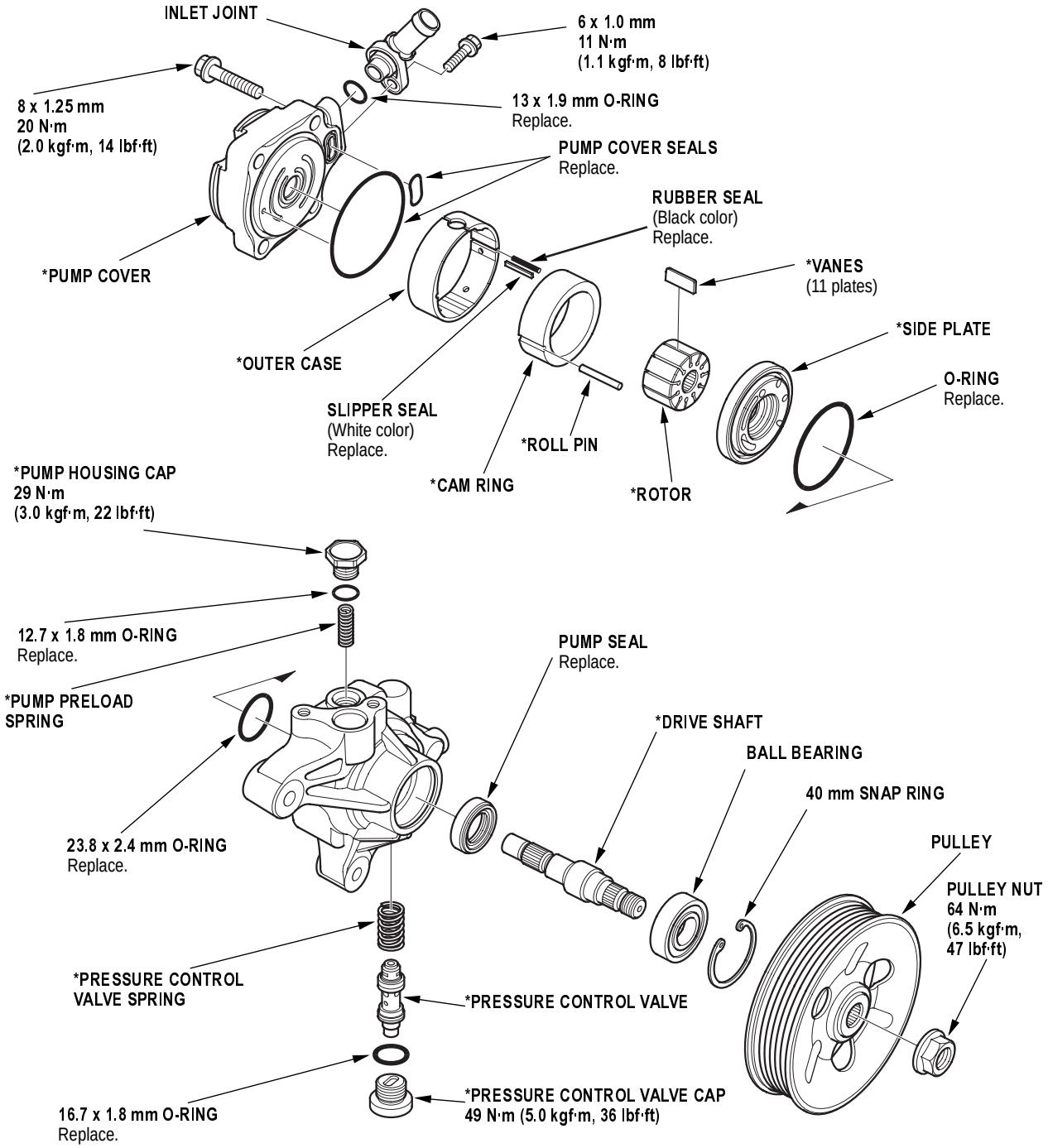


10. Tighten the pump mounting bolts to the specified torque.
11. Fill the reservoir to the upper level line (see page 17-11).

Pump Overhaul

Exploded View

Replace the pump as an assembly if the parts indicated with asterisk (*) are worn or damaged.



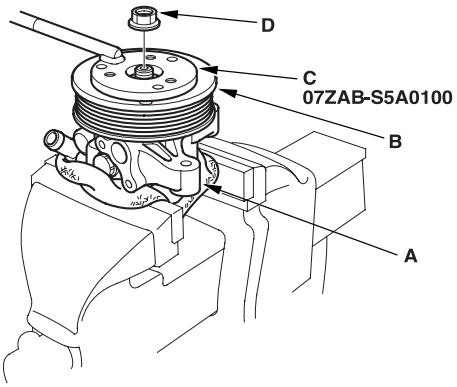
Special Tools Required

- Attachment, 32 x 35 mm 07746-0010100
- Driver 07749-0010000
- Pulley holder 07ZAB-S5A0100

Disassembly

NOTE: Refer to the Exploded View as needed during the following procedure.

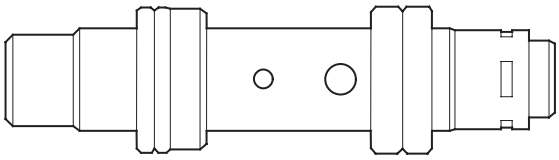
1. Remove the power steering pump (see page 17-13).
2. Drain the fluid from the pump.
3. Hold the steering pump (A) a vise with soft jaws, hold the pulley (B) with the special tool (C), and remove the pulley nut (D) and pulley. Be careful not to damage the pump housing with the jaws of the vise.



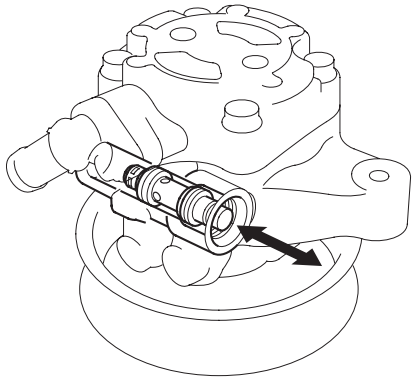
4. Remove the inlet joint and O-ring.
5. Remove the pressure control valve cap, O-ring, valve spring, and pressure control valve.
6. Remove the pump housing cap, O-ring, and pump preload spring.
7. Remove the pump cover and pump cover seals.
8. Pull out the roll pin.
9. Remove the outer case, cam ring, rotor, vanes, and side plate.
10. Remove the rubber seal and slipper seal from the outer case.
11. Remove the O-rings from the bottom of the housing.
12. Remove the snap ring, then remove the drive shaft by tapping the shaft end with the plastic hammer.
13. Remove the seal from the pump housing.

Inspection

14. Check the pressure control valve for wear, burrs, and other damage to the edges of the grooves in the valve.



15. Inspect the bore of the pressure control valve on the pump housing for scratches and wear.
16. Slip the pressure control valve back in the pump housing, and check that it moves in and out smoothly. If OK, go to step 17; if not, replace the pump as an assembly. The pressure control valve is not available separately.



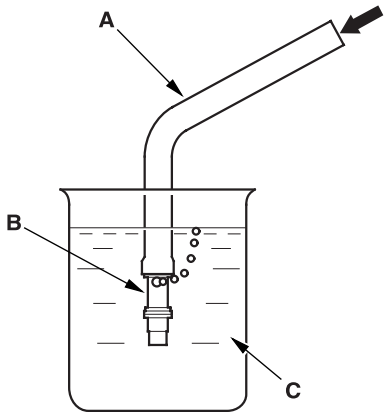
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Pump Overhaul (cont'd)

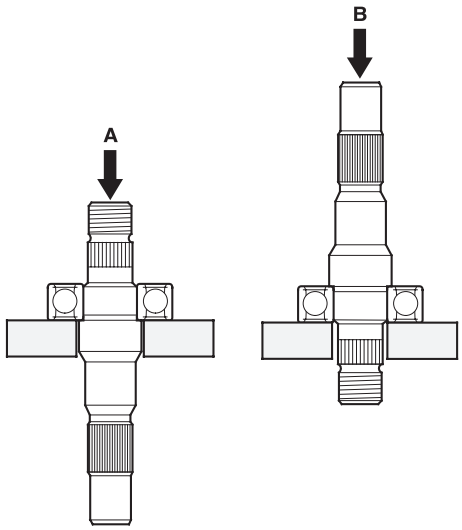
Inspection (cont'd)

17. Attach a hose (A) to the end of the pressure control valve (B) as shown. Then submerge the pressure control valve in a container of power steering fluid or solvent (C), and blow in the hose.

- If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm^2, 14.2 psi), replace the pump as an assembly. The pressure control valve is not available separately.
- If the pressure control valve is OK, set it aside for reassembly later.



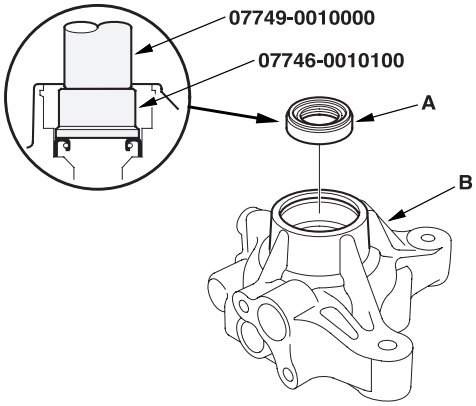
18. Inspect the ball bearing by rotating the outer race slowly. If you feel any play (axial or radial) or roughness, remove the faulty ball bearing (A), and install a new one (B).



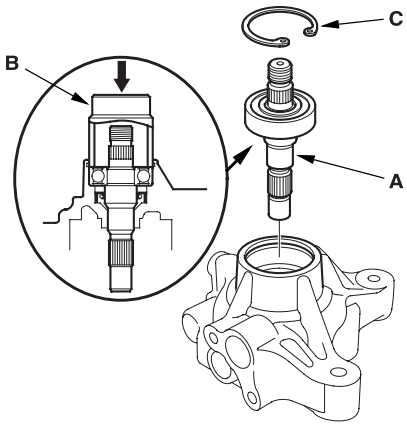
19. Inspect each part shown with an asterisk in the Exploded View; if any of them are worn or damaged, replace the pump as an assembly.

Reassembly

20. Install the new pump seal (A) (with its grooved side facing in) into the pump housing (B) by hand first, then drive it in using the special tools with until there is no step at the top of the pump seal, and the seal is fully seated in the pump housing.

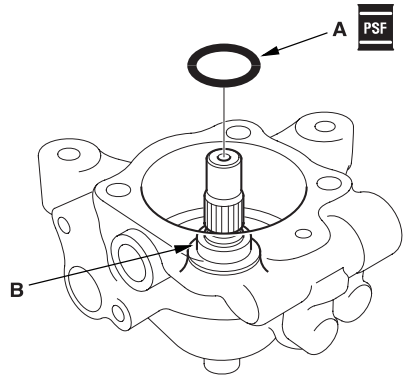


21. Position the pump drive shaft (A) in the pump housing, then press it in with the appropriate size socket wrench (B) as shown. Do not apply more than 1,370 N (140 kgf, 308 lbf) of pressure.

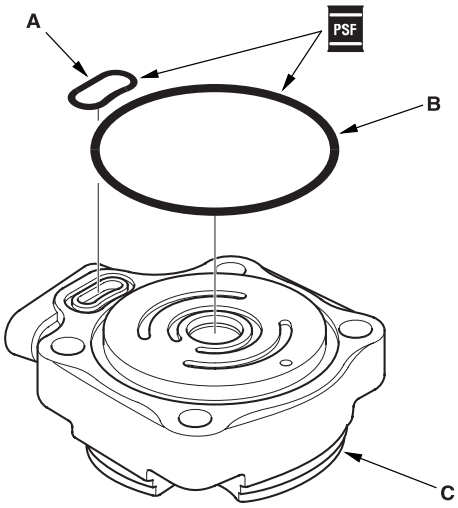


22. Install the 40 mm snap ring (C) with its radiused side facing out.

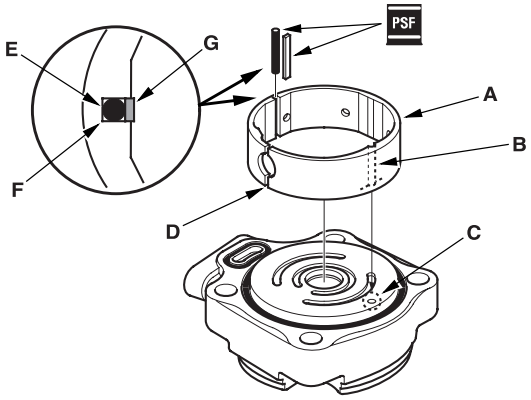
23. Coat the new 23.8 mm O-ring (A) with the power steering fluid, then position it on the bottom (B) of the pump housing.



24. Coat the new cover seals (A) and (B) with the power steering fluid, then position them into the grooves on the cover (C).



25. Install the outer case (A) by aligning the slot (B) inside the outer case with the cover roll pin hole (C). Be sure that the slit (D) on the outer case is to direction shown.



26. Apply the power steering fluid to the rubber seal (E) (black), and install it in the slot (F) of the outer case.

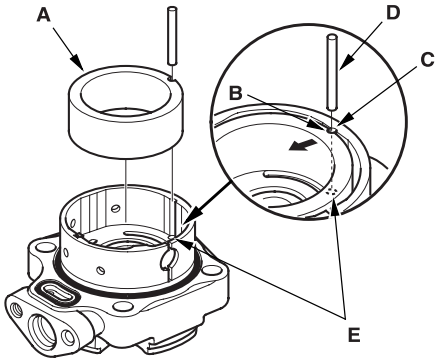
27. Apply power steering fluid to the slipper seal (G) (white), and install it on top of the rubber seal you just installed.

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Pump Overhaul (cont'd)

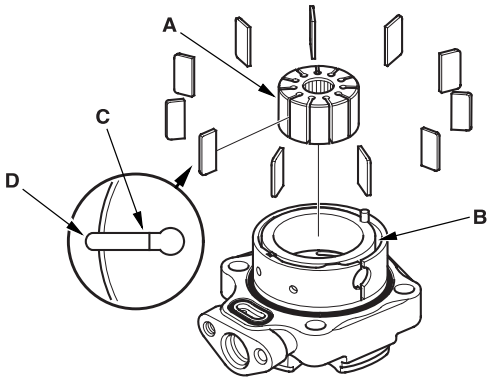
Reassembly (cont'd)

28. Install the cam ring (A) with the "•" mark on it up ward. Align the slot (B) with the slot (C) in the outer case.



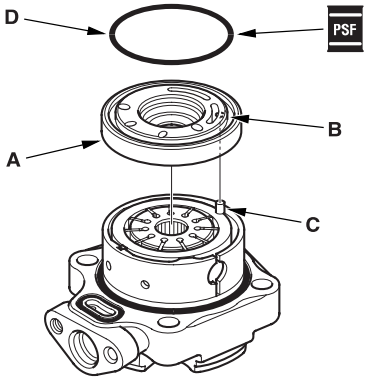
29. Insert the roll pin (D) into the slots between the cam ring and outer case, then push roll pin into the set hole (E).

30. Install the rotor (A) in the cam ring (B).



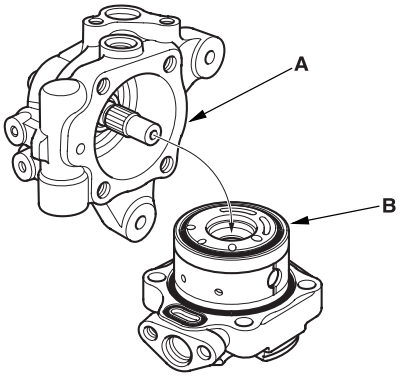
31. Set the 11 vanes (C) in the grooves in the rotor. Make sure that the round ends (D) of the vanes are in contact with the sliding surface of the cam ring.

32. Place the side plate (A) on the cam ring, and aligning the roll pin set hole (B) in the side plate with the roll pin end (C).

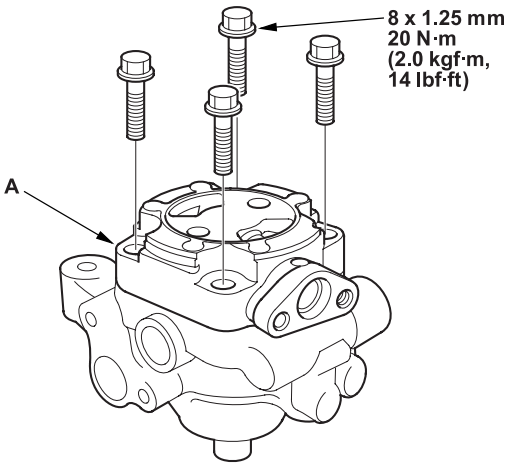


33. Coat the new O-ring (D) with the power steering fluid, then position it into the groove on the side plate.

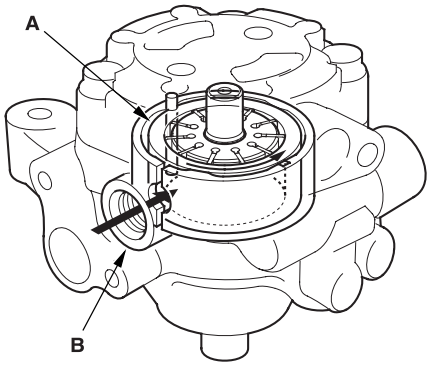
34. Install the pump housing (A) over the cover assembly (B).



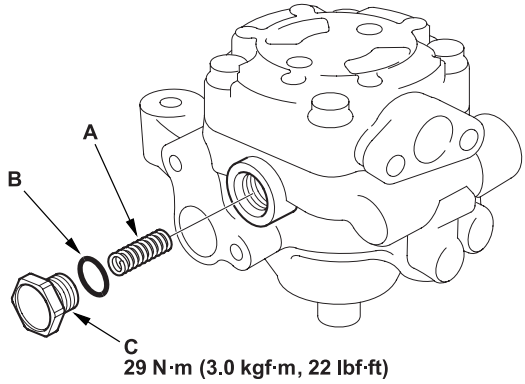
35. Align the bolt holes in the cover (A) with the threaded holes in the pump housing. Install the flange bolts loosely first, then torque the flange bolts in a criss cross pattern in two or more steps.



36. Push in the cam ring (A) from the pump housing cap hole (B) with a flat blade screwdriver, to make sure the cam ring is fully seated against the outer case.



37. Install the pump preload spring (A) in the pump housing.

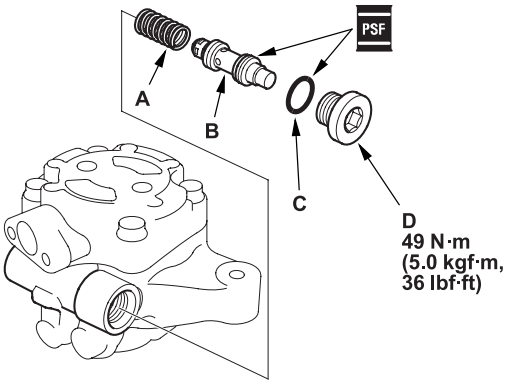


38. Coat the new 12.7 mm O-ring (B) with power steering fluid, and install it on the pump housing cap (C).

39. Install the pump housing cap on the pump housing, and tighten it to specified torque.

40. Install the pressure control valve spring (A) in the pump housing.

41. Coat the pressure control valve (B) with power steering fluid, and install it on the pump housing.



42. Coat the new 16.7 mm O-ring (C) with power steering fluid, and install it on the pressure control valve cap (D).

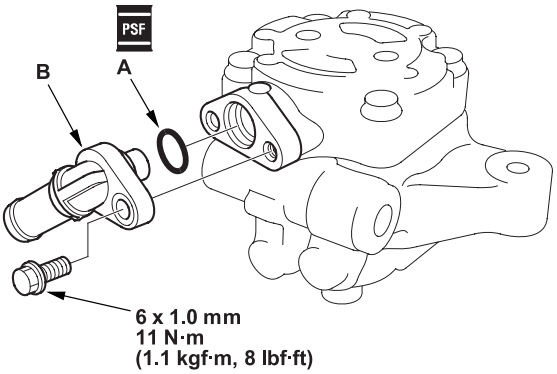
43. Install the pressure control valve cap on the pump housing, and tighten it to the specified torque.

(cont'd)

Pump Overhaul (cont'd)

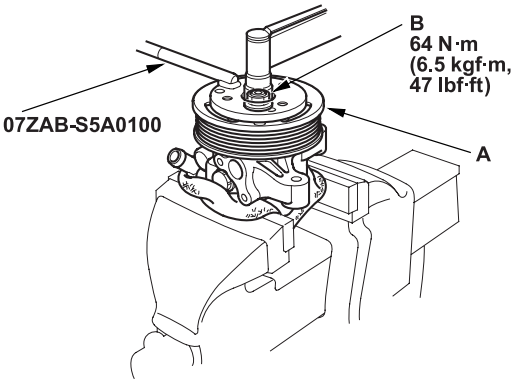
Reassembly (cont'd)

44. Coat the new O-ring (A) with power steering fluid, and install it on the inlet joint (B).



45. Install the inlet joint on the pump housing.

46. Install the pulley (A), then loosely install the pulley nut (B). Hold the steering pump in a vise with soft jaws. Be careful not to damage the pump housing with the jaws of the vise.



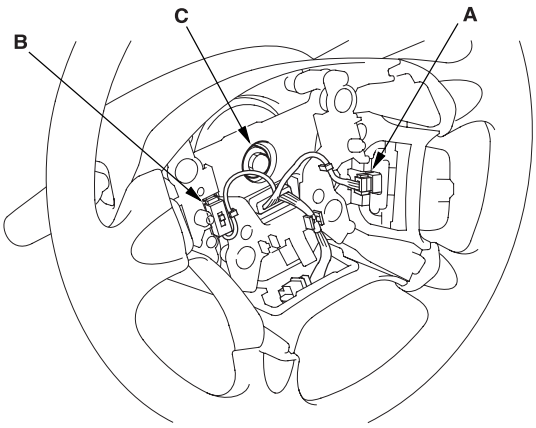
47. Hold the pulley with the special tool, and tighten the pulley nut to specified torque.

48. Check that the pump turns smoothly by turning the pulley. If it turns hard, loosen the four flange bolts on the cover, then retightening them try again in the same manner as in the step 35.

Steering Wheel Removal

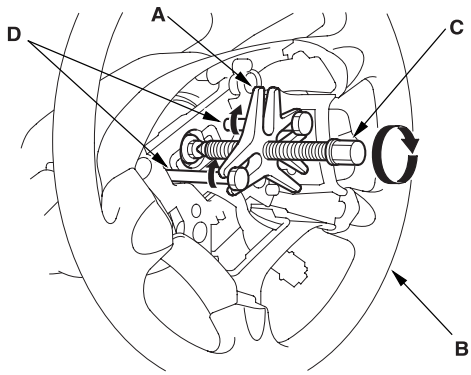
SRS components are located in this area. Review the SRS component locations (see page 23-14) and precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

1. Align the front wheels straight ahead, then remove the driver's airbag from the steering wheel (see page 23-135).
2. Disconnect the cruise control set/resume switch connector (if equipped) (A) and horn switch connector (B).

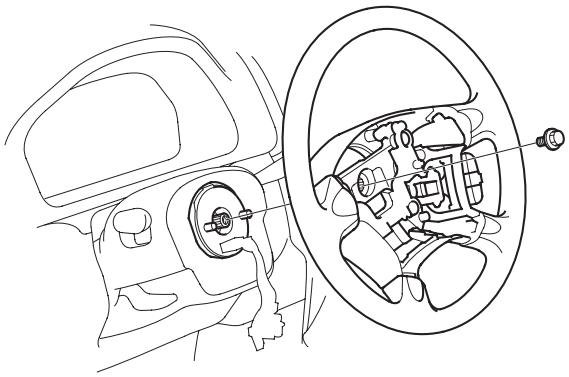


3. Loosen the steering wheel bolt (C).
4. Install a commercially available steering wheel puller (A) on the steering wheel (B). Free the steering wheel from the steering column shaft by turning the pressure bolt (C) of the puller.

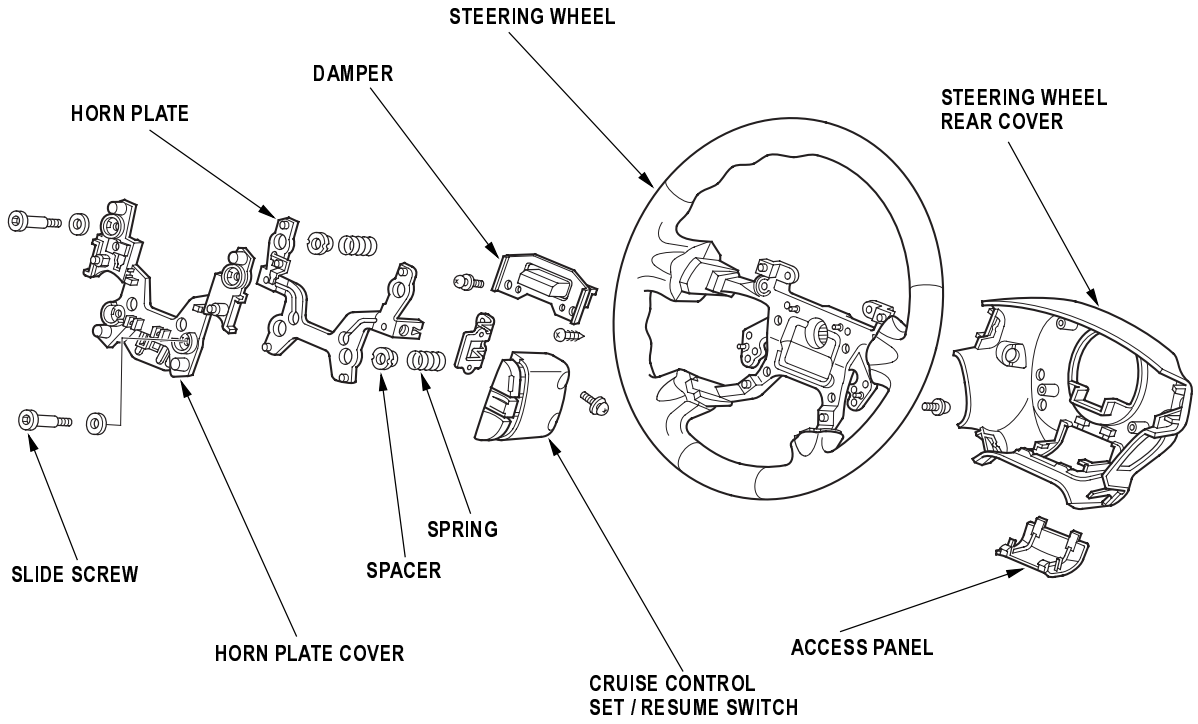
   Note these items when removing the steering wheel:
   - Do not tap on the steering wheel or the steering column shaft when removing the steering wheel.
   - If you thread the puller bolts (D) into the wheel hub more than five threads, the bolts will hit the cable reel and damage it. To prevent this, install a pair of jam nuts five threads up on each puller bolt.



5. Remove the steering wheel puller, then remove the steering wheel bolt and steering wheel from the steering column.

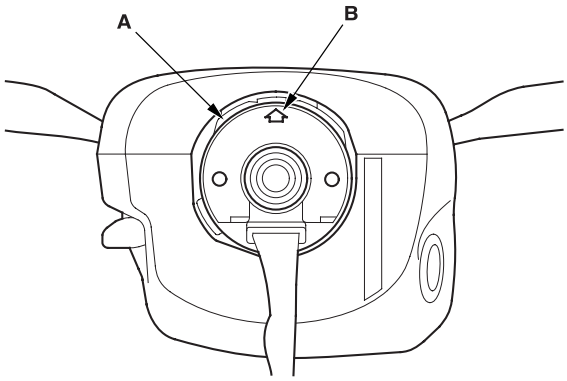


Steering Wheel Disassembly/Reassembly

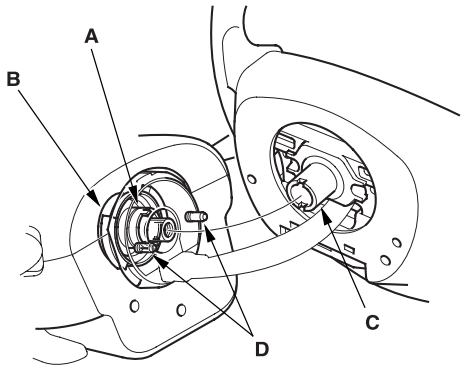


Steering Wheel Installation

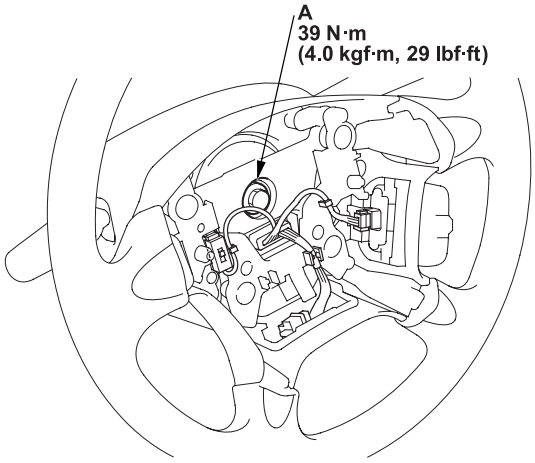
1. Before installing the steering wheel, make sure the front wheels are aligned straight ahead, then center the cable reel (A). Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise about two and a half turns. The arrow mark (B) on the cable reel label point should point straight up.



2. Position the two tabs (A) of the turn signal cancelling sleeve (B) as shown. Install the steering wheel on to the steering column shaft, making sure the steering wheel hub (C) engages the pins (D) of the cable reel and tabs of the canceling sleeve. Do not tap on the steering wheel or steering column shaft when installing the steering wheel.



3. Install the steering wheel bolt (A) and tighten it to the specified torque. Connect the horn and cruise control set/resume switch connectors. Make sure the wire harness is routed and fastened properly.



4. Install the driver's airbag, and confirm that the system is operating properly (see page 23-135).

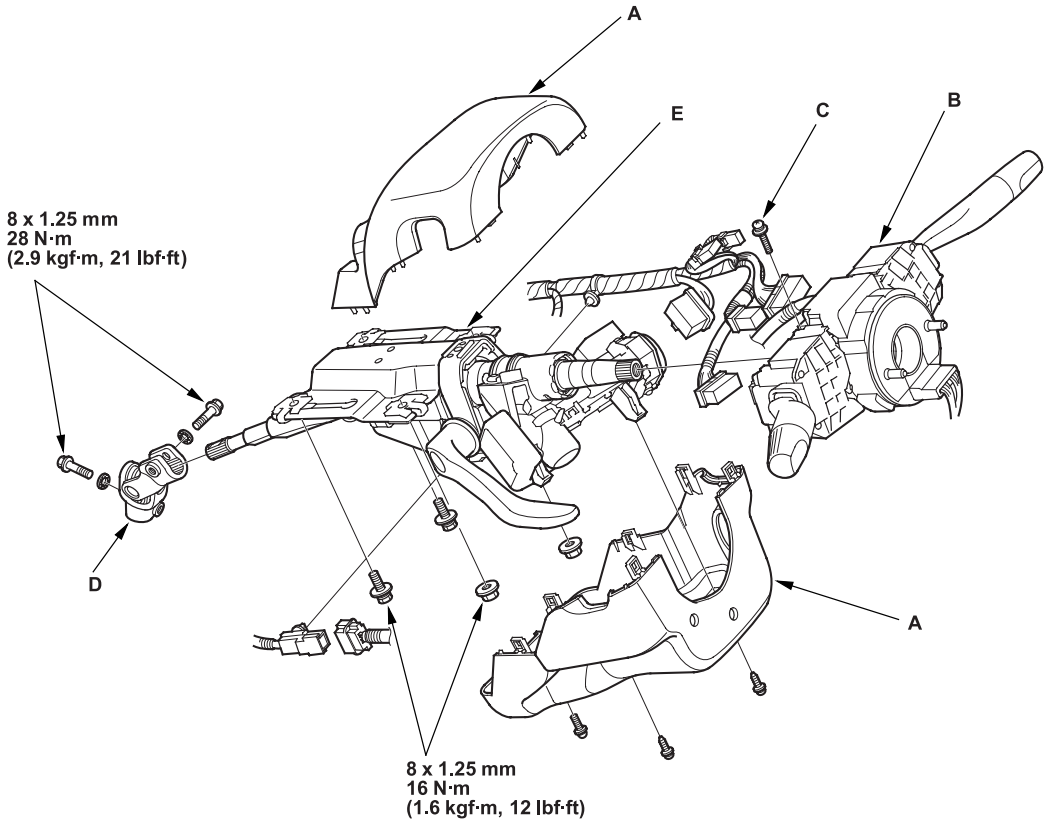
5. Check the horn and turn signal cancelling for proper operation.

Steering Column Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-14) and precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

Removal

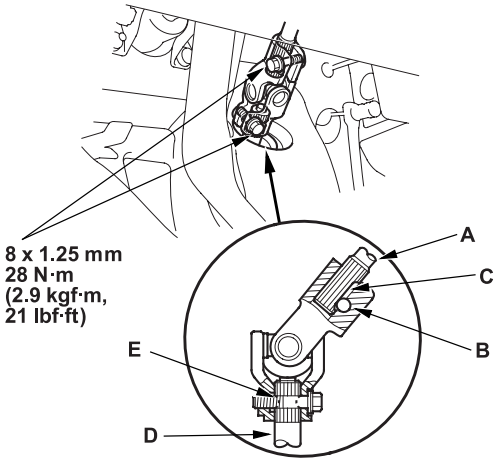
1. Record the radio station presets, and disconnect the battery.
2. Remove the driver's airbag assembly and the steering wheel (see page 17-21).
3. Remove the driver's dashboard lower covers (see page 20-88).
4. Remove the column covers (A).



5. Disconnect the wire harness connectors from the combination switch assembly (B).
6. Remove the combination switch assembly from the steering column shaft by removing the screw (C) on the top of the combination switch.
7. Disconnect the connectors from the ignition switch, and release the wire harness clips from the steering column.
8. Disconnect the steering joint (D), and remove it from the column shaft.
9. Remove the steering column (E) by removing the attaching nuts and bolts.

Installation

1. Install the steering column in the reverse order of removal, and note these items:
   - Take care not to let the sliding capsules fall out of the position during column installation.
   - Make sure the wires are not caught or pinched by any parts.
2. Insert the upper end of the steering joint onto the steering shaft (A) (line up the bolt hole (B) with the flat portion (C) on the shaft).

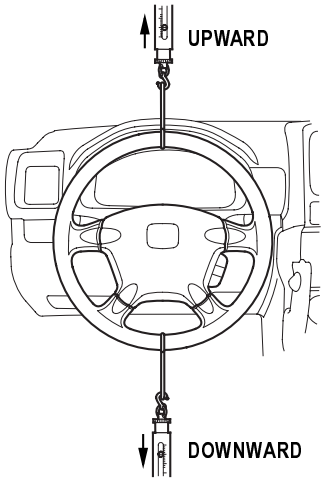


3. Slip the lower end of the steering joint onto the pinion shaft (D) (line up the bolt hole with the groove (E) around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.
4. Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it. Tighten the lower joint bolt to specified torque.
5. Finish the installation, and note these items:
   - Make sure the wire harness is routed and fastened properly.
   - Make sure the connectors are properly connected.
   - Reinstall the steering wheel (see page 17-23).
   - Reconnect the battery.
   - Verify horn and turn signal switch operation.
   - Check wheel alignment, if necessary (see page 18-4).

Steering Column Tilt Operation Check

1. Set the steering wheel in the straight driving position, and loosen the tilt lever fully.
2. Attach the spring scale to the highest point of the steering wheel, and set the tilting position at the lowest.
3. Pull the spring scale straight up, and read the operation load during tilting.
4. Attach the spring scale to the lowest point of the steering wheel.
5. Pull the spring scale straight down, and read the operation load during tilting.

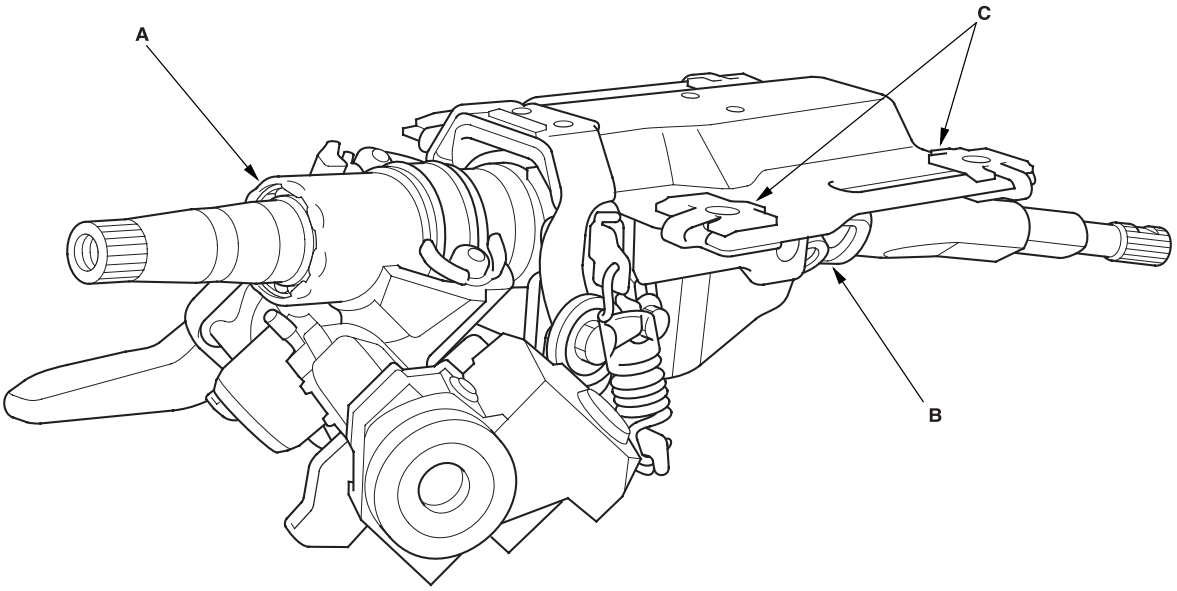
   Tilting Load (Upward/Downward):
   Standard: 68 N (7.0 kgf, 15 lbf) or below



6. If the measurement is more than the specification, adjust the tilt lever preload (see page 17-27).

Steering Column/Tilt Lever Inspection/Adjustment

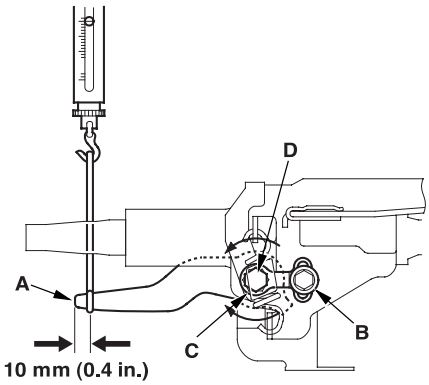
- Check the steering column ball bearing (A) and the steering joint bearings (B) for play and proper movement. If any bearing is noisy or has excessive play, replace the steering column as an assembly.
- Check the sliding capsules (C) for distortion and breakage. If there is distortion or breakage replace the steering column as an assembly.



Tilt Lever Preload Inspection

1. Move the tilt lever (A) from the loose position to the lock position three to 5 times; then measure the tilt lever preload 10 mm (0.4 in.) from the end of the tilt lever.

   Preload: 70 - 90 N (7 - 9 kgf, 15 - 20 lbf)

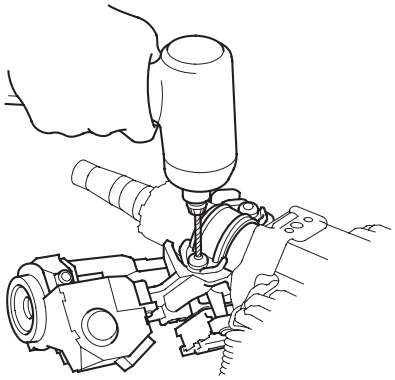


2. If the measurement is out of the specification, adjust the preload using the following procedures.

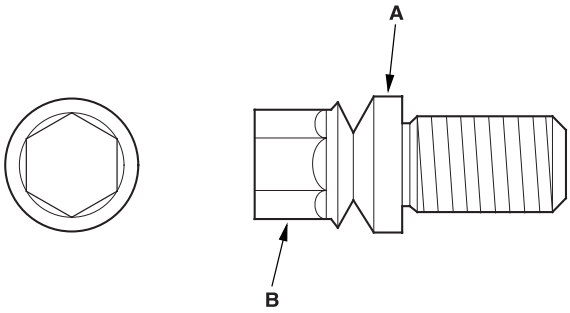
   - Loosen the tilt lever, and set the steering column in the neutral position.
   - Remove the 6 mm lock bolt (B), and remove the stop (C). Be careful not to loosen the tilt lever when installing the stop or tightening the 6 mm lock bolt.
   - Adjust the preload by turning the tilt lock bolt (D) left bolt.
   - Pull up the tilt lever to the uppermost position, and install the stop. Check the preload again. If the measurement is still out of specification, repeat the above procedures to adjust.

Steering Lock Replacement

1. Remove the steering column (see page 17-24).
2. Center punch each of the two shear bolts, and drill their heads off with a 5 mm (3/16 in.) drill bit. Be careful not to damage the switch body when removing the shear bolts.



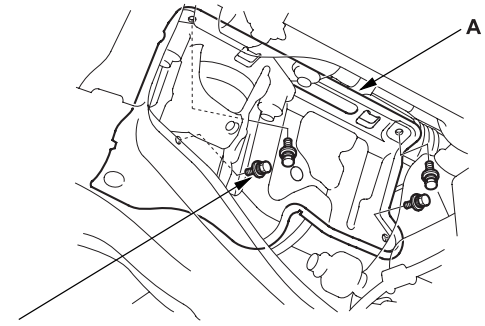
3. Remove the shear bolts from the switch body.
4. Install the switch body without the key inserted.
5. Loosely tighten the new shear bolts.
6. Insert the ignition key, and check for proper operation of the steering wheel lock and that the ignition key turns freely.
7. Tighten the shear bolts (A) until the hex heads (B) twist off.



Rack Guide Adjustment

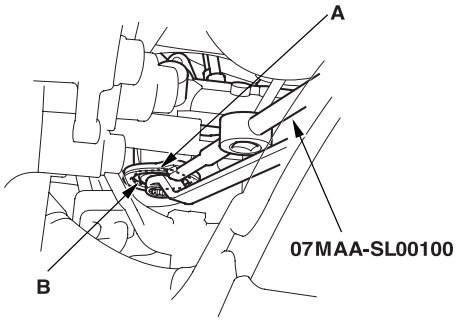
Special Tools Required
Locknut wrench, 40 mm 07MAA-SL00100

1. Set the wheels in the straight ahead position.
2. Vehicle's with RHD; remove the air cleaner. Then remove the heat shield (A) to upward. Be carefuly not to damage the heater hoses.

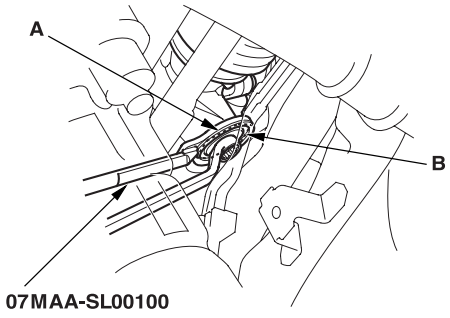


3. Loosen the rack guide screw locknut (A) with the special tool, then remove the rack guide screw (B).

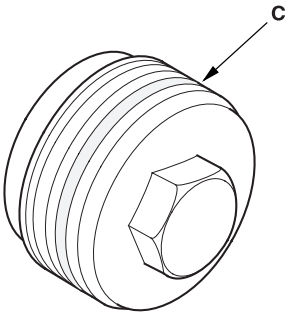
LHD:



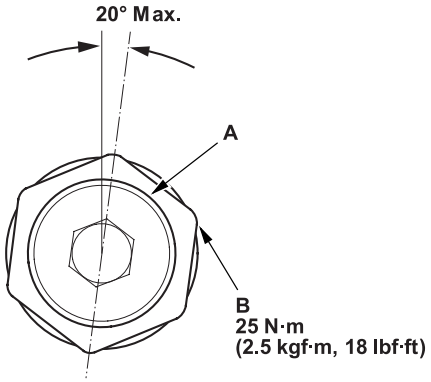
RHD:



4. Remove the old sealant from rack guide screw, and apply new sealant to the middle of the threads (C). Loosely install the rack guide screw on the steering gearbox.



5. Tighten the rack guide screw (A) to 25 N·m (2.5 kgf·m, 18 lbf·ft), then loosen it.



6. Retighten the rack guide screw to 6 N·m (0.6 kgf·m, 4 lbf·ft), then back it off to specified angle.

   Specified Return Angle: 20° Max.

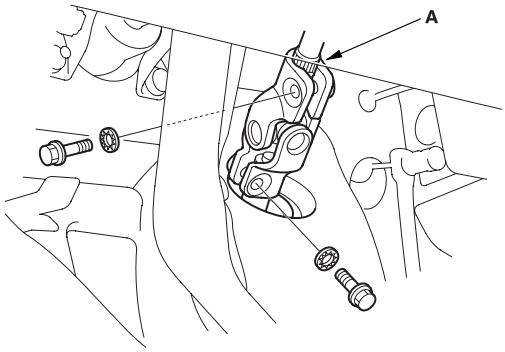
7. Hold the rack guide screw stationary with a wrench, and tighten the locknut by hand until it's fully seated.
8. Install the special tool on the locknut (B), and hold the rack guide screw (A) stationary with a wrench. Tighten the locknut an additional 30° with the special tool.
9. Vehicle's with RHD; reinstall the heat shield and air cleaner.
10. Check for unusual steering effort through the complete turning travel.
11. Check the steering wheel rotation play and the power assist (see page 17-7).

Steering Gearbox Removal

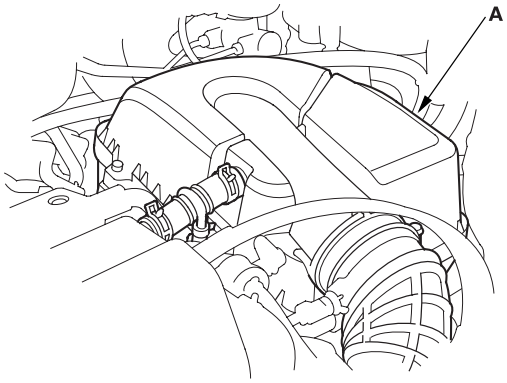
Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

Note these items during removal:
- Using solvent and a brush, wash any oil and dirt off the valve body unit, its lines, and the end of the gearbox. Blow dry with compressed air.
- Be sure to remove the steering wheel before disconnecting the steering joint. Damage to the cable reel can occur.

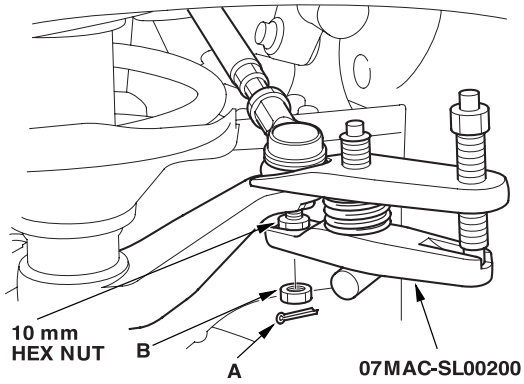
1. Raise the front of vehicle, and make sure it is securely supported.
2. Remove the front wheels.
3. Remove the driver's airbag and the steering wheel (see page 17-21).
4. Remove the driver's dashboard lower cover and under cover (see page 20-89).
5. Remove the steering joint bolts, and disconnect the steering joint by moving the steering joint (A) toward the column.



6. Remove the air cleaner (A).



7. Remove the cotter pin (A) from the tie-rod ball joint nut (B), and loosen the nut.



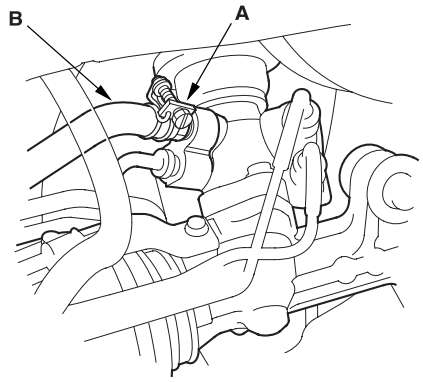
8. Separate the tie-rod ball joint and damper steering arm using the special tool (see page 18-10).

(cont'd)

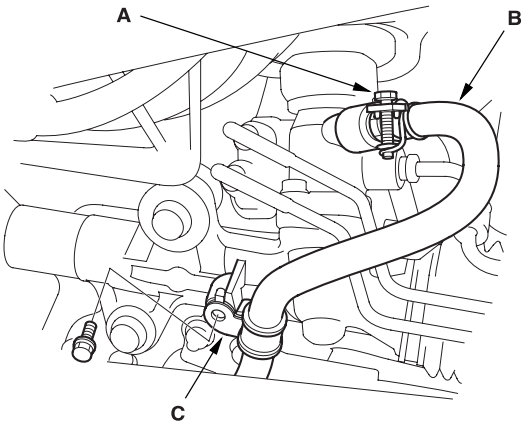
Steering Gearbox Removal (cont'd)

9. Loosen the adjustable hose clamp (A) and disconnect the return hose (B), and return line clamp (RHD model) (C).

LHD:

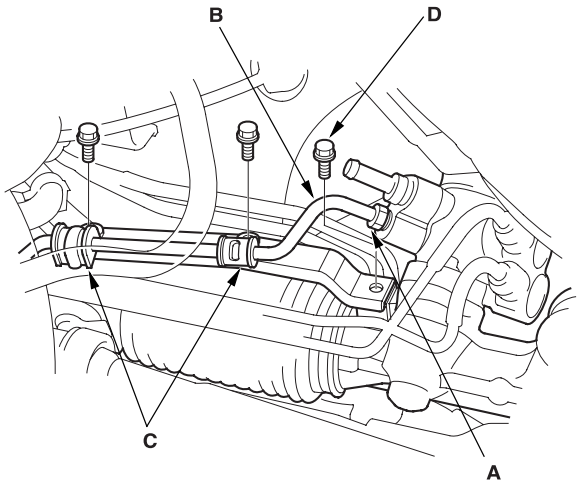


RHD:

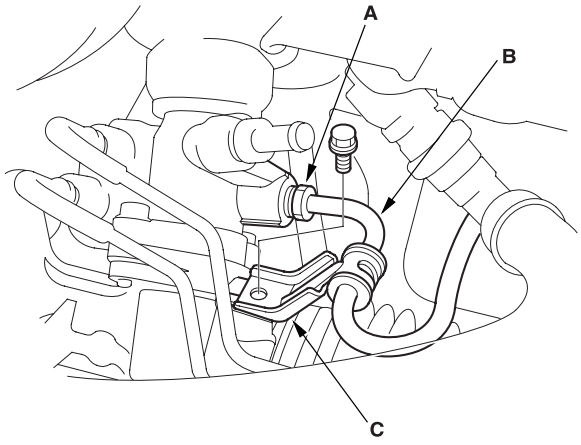


10. On the driver's side, loosen the 14 mm flare nut (A) and disconnect the feed line (B), and feed line clamps (C).
Remove the P/S return line bracket attaching bolt (LHD model) (D).

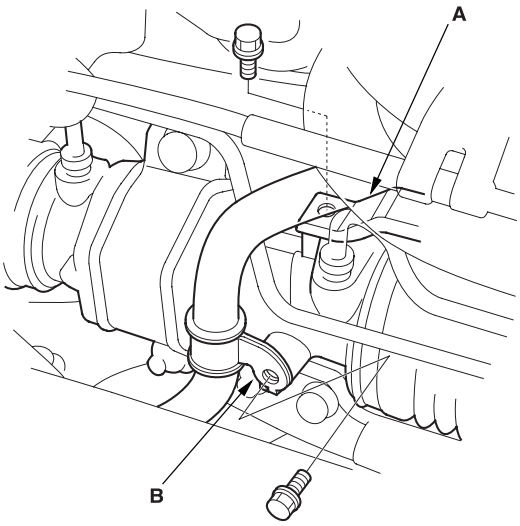
LHD:



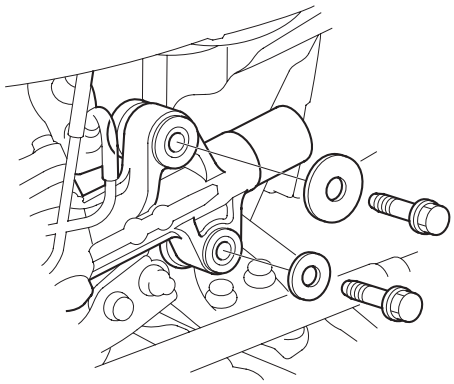
RHD:



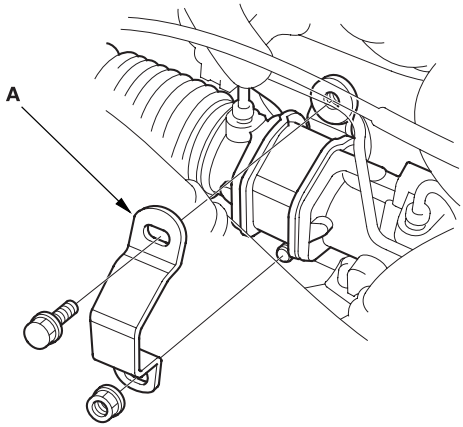
11. On the passenger's side, remove the P/S return line bracket (A) and return line clamp (B).



12. Remove the two 10 mm flange bolts and washers from the left side (RHD: right side) of gearbox.

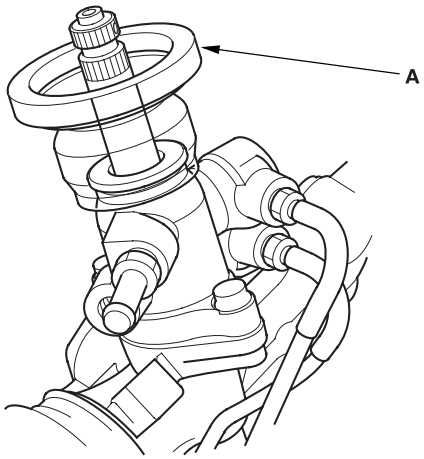


13. Remove the 10 mm flange bolt and nut from the right side (RHD: left side) of the gearbox, then remove the mounting bracket (A).



14. Lower the steering gearbox, and rotate it so the pinion shaft points upward.

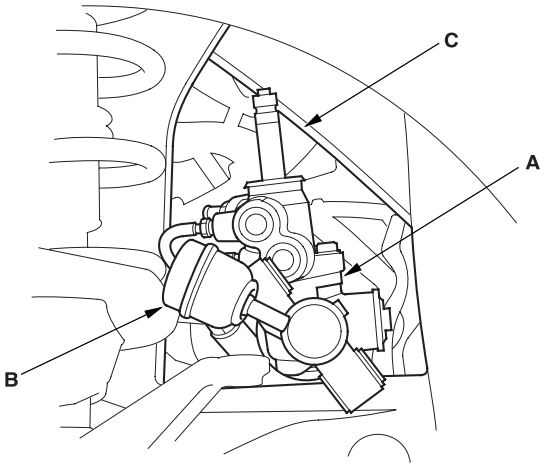
15. Remove the pinion shaft grommet (A) from the top of the valve body unit.



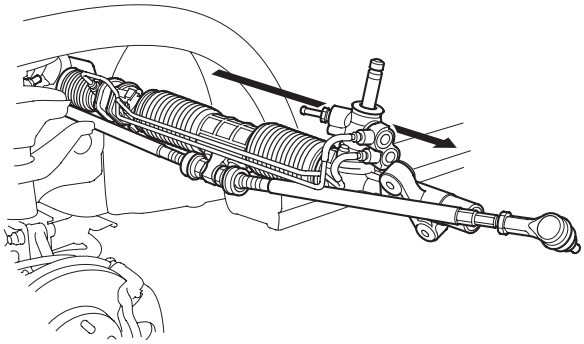
(cont'd)

Steering Gearbox Removal (cont'd)

16. Carefully move the steering gearbox (A) and tie-rods (B) as an assembly toward the driver's side until the pinion shaft clears the wheelwell opening (C) on the frame.

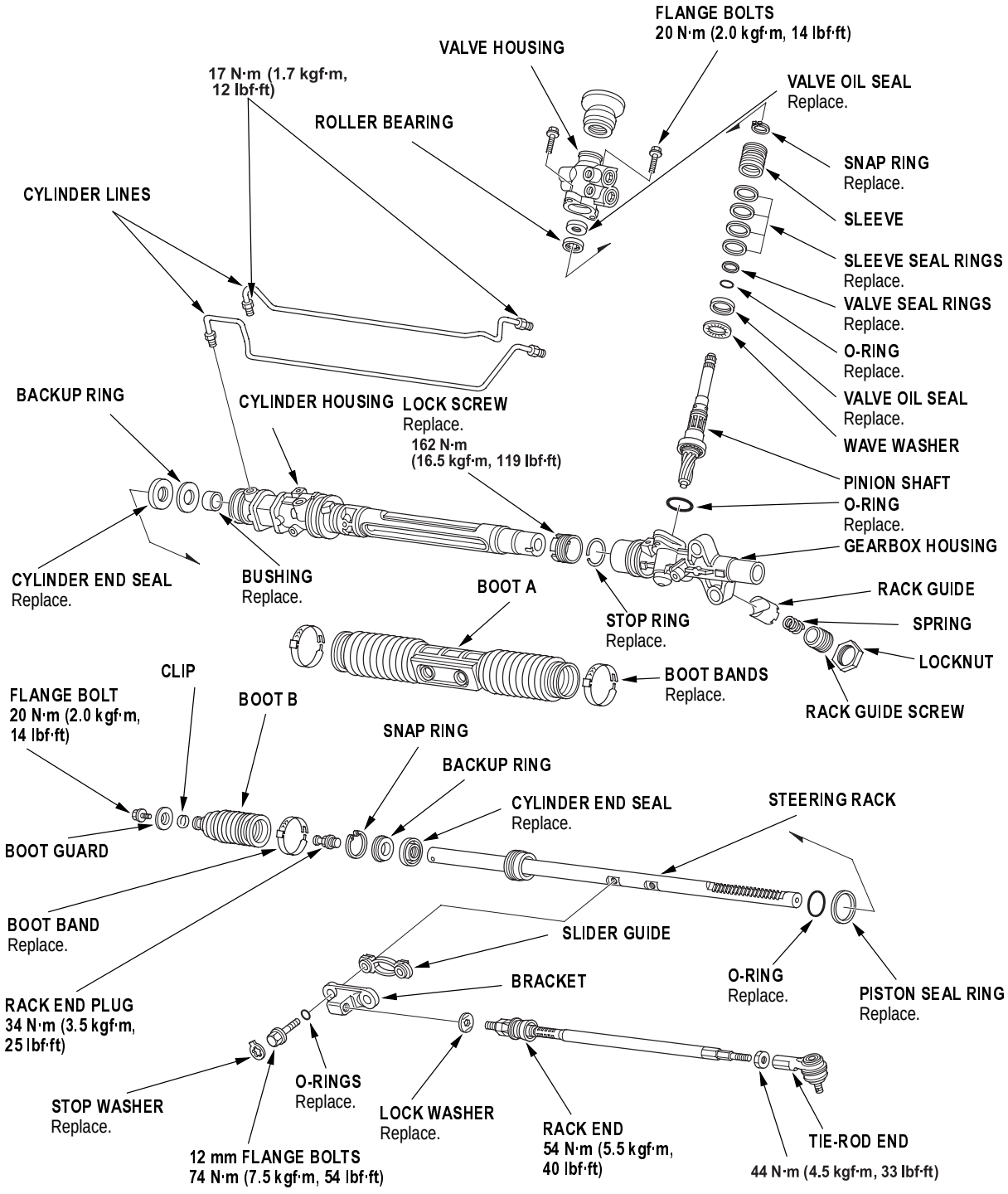


17. Remove the steering gearbox through the wheelwell opening on the driver's side.



Steering Gearbox Overhaul

Exploded View



(cont'd)

Steering Gearbox Overhaul (cont'd)

Special Tools Required
- Cylinder end seal remover attachment 07NAD-SR30200
- Driver, 27 mm 07ZAF-S5A0100
- Valve seal ring sizing tool 07NAG-SR30900
- Sleeve seal ring guide 07YAG-S2X0100
- Sleeve seal ring sizing tool 07ZAG-S5A0100
- Attachment, 32 x 35 mm 07746-0010100
- Driver 07749-0010000
- Piston seal ring guide, 42 mm 07ZAG-S7A0100
- Piston seal ring sizing tool, 42 mm 07ZAG-S7A0200
- Locknut wrench 07ZAA-S5A0100
- Driver handle 07NAD-SR30101
- Cylinder end seal slider, 23 mm 07974-6890801
- Valve seal ring guide 07ZAG-S5A0200
- Pincers, Oetiker 1098 or equivalent, commercially available.

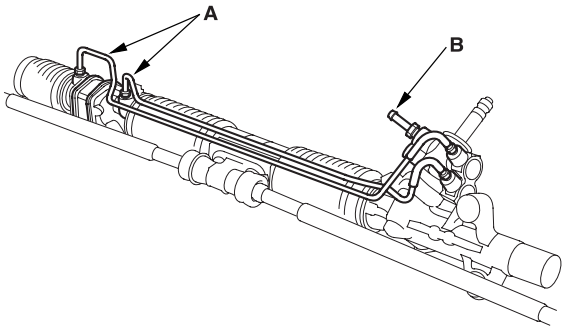
NOTE: Refer to the Exploded View as needed during this procedure.

Removal

1. Remove the steering gearbox (see page 17-29).

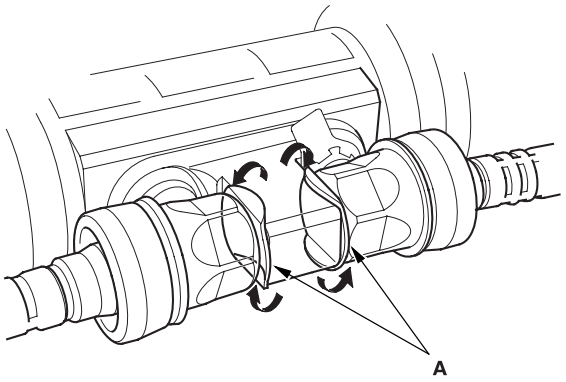
Disassembly

2. Remove cylinder lines (A) and return line joint (B) from the gearbox.

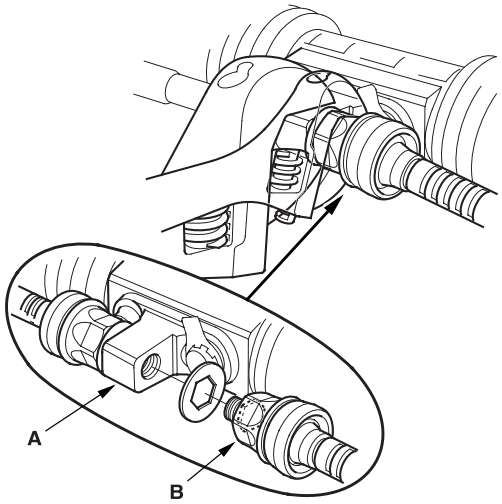


3. Drain the fluid from the cylinder fittings by slowly moving the steering rack back and forth.

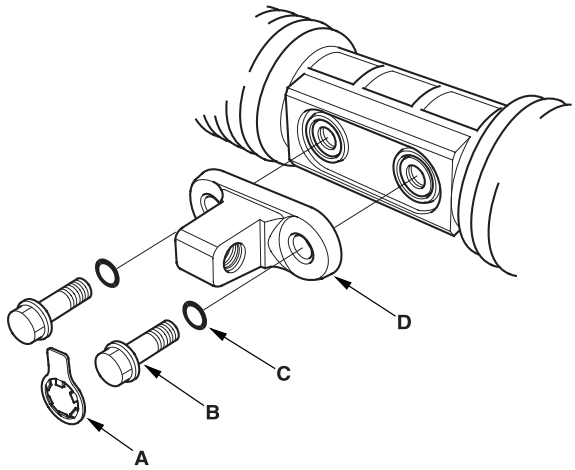
4. Unbend the lock washer (A).



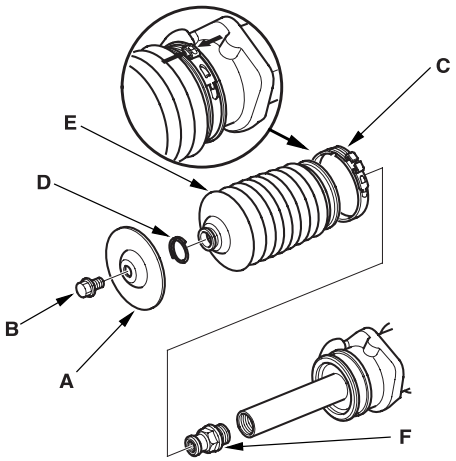
5. Hold the bracket (A) with one wrench, and unscrew both rack ends (B) with another wrench. Remove the lock washers.



6. Remove the stop washer (A), the 12 mm flange bolts (B), O-rings (C), and bracket (D) from the steering gearbox.

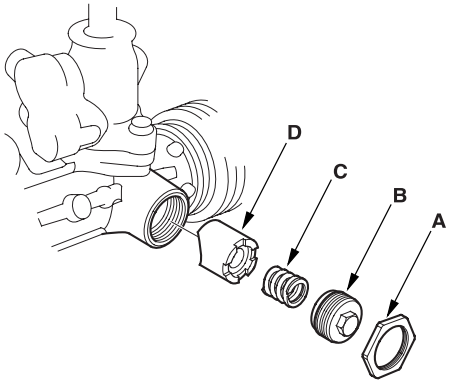


7. Remove the boot guard (A) by removing the 8 mm flange bolt (B) on the rack end.

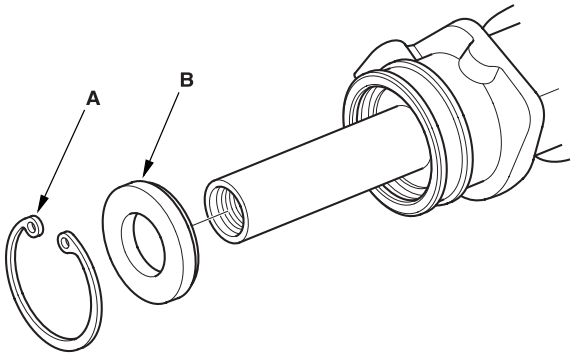


8. Remove the boot band (C) and clip (D). Pull the boot (E) away from the end of the steering gearbox. Remove the rack end plug (F).

9. Loosen the locknut (A), then remove the rack guide screw (B), spring (C), and rack guide (D) from the steering gearbox.



10. Remove the snap ring (A) and backup ring (B) from the cylinder housing.

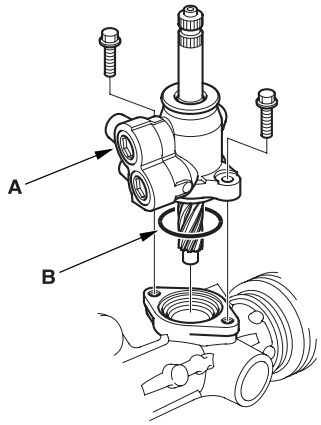


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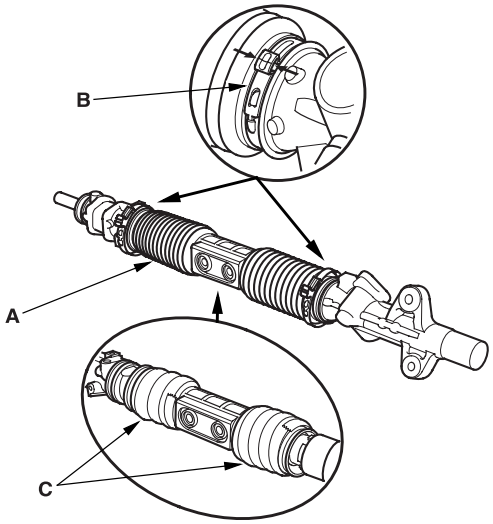
Steering Gearbox Overhaul (cont'd)

Disassembly (cont'd)

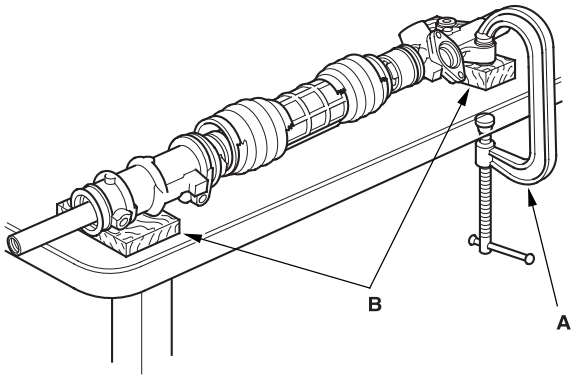
11. Remove the valve body unit (A) from the steering gearbox. Remove the O-ring (B) and discard it.



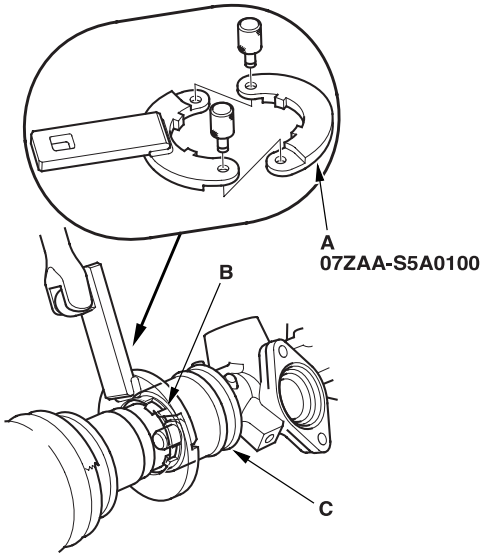
12. Remove the two boot bands (B) from boot A. Compress boot A by hand, and apply vinyl tape (C) so the boots stay collapsed and pulled back.



13. Hold the gearbox housing using a C-clamp (commercially available) (A) and the wooden blocks (B) as shown. Do not clamp the cylinder housing or gearbox housing in the vise.

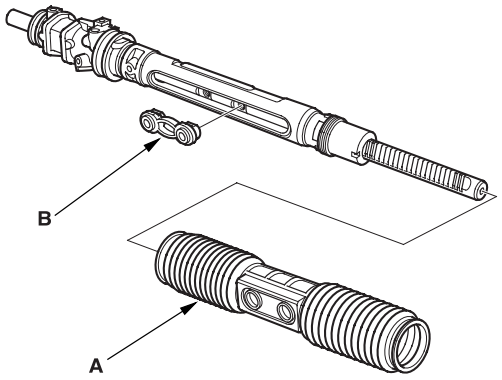


14. Install the special tool (A) on the lock screw (B), then loosen and remove the lock screw from inside of the gearbox housing (C).

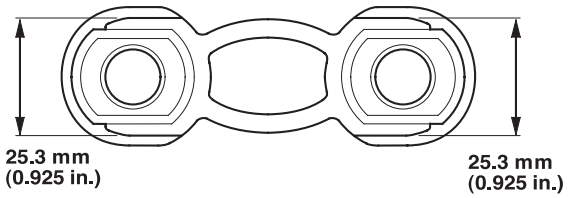


15. Remove the special tool.

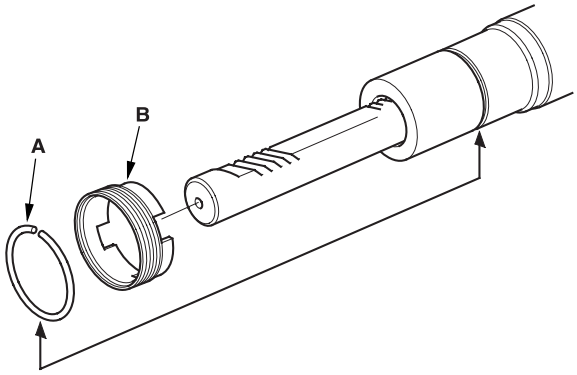
16. Pull on the cylinder to remove it from the gearbox housing. Remove boot A and the slider guide (B) from the cylinder.



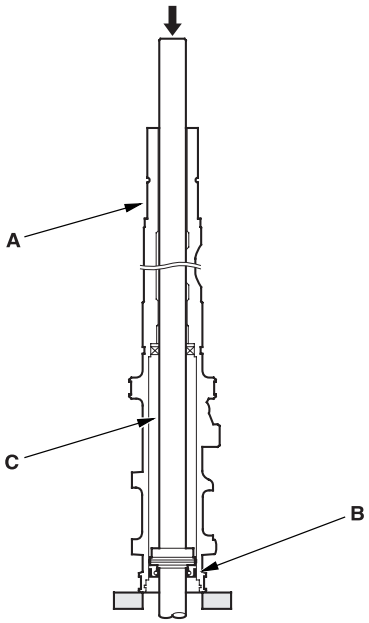
17. Check the slider guide for damage and cracks. Use vernier calipers to measure the thickness of the slider guide. If the thickness is less than the service limit, replace the slider guide.



18. Remove and discard the stop ring (A) on the cylinder by expanding it with snap ring pliers. Remove and discard the lock screw (B).



19. Set the cylinder housing (A) in a press so the cylinder side points downward, then press the cylinder end seal (B) and steering rack (C) out of the cylinder. Hold the rack to keep it from falling when pressed clear.



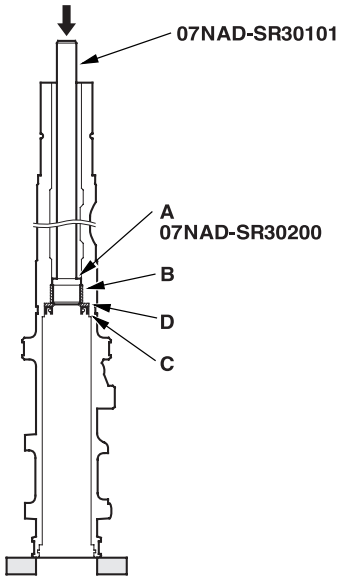
20. Remove the cylinder end seal from the steering rack.

(cont'd)

Steering Gearbox Overhaul (cont'd)

Disassembly (cont'd)

21. Insert the special tools into the cylinder. Make sure the attachment (A) of the special tools is securely positioned on the bushing edges (B).

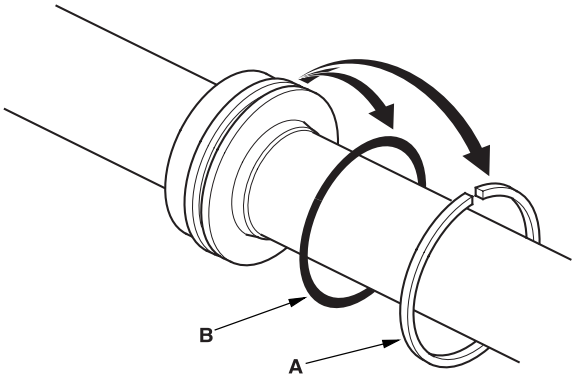


22. Place the cylinder in a press, then remove the cylinder end seal (C), backup ring (D), and bushing (B) from the cylinder by pressing on the special tool end.

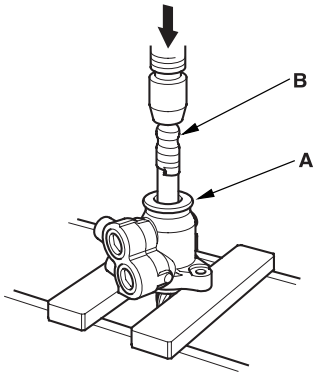
Note the items when pressing the cylinder end seal:

- Keep tool straight to avoid damaging the cylinder wall. Check the tool angle, and correct it if necessary, when removing the cylinder end seal.
- Use a press to remove the cylinder end seal. Do not try to remove the seal by striking the tool; striking the tool would break the cylinder end seal, and the seal would remain in the cylinder.

23. Carefully pry the piston seal ring (A) and O-ring (B) off the rack piston. Be careful not to damage the inside of the seal ring groove and piston edges when removing the seal ring.



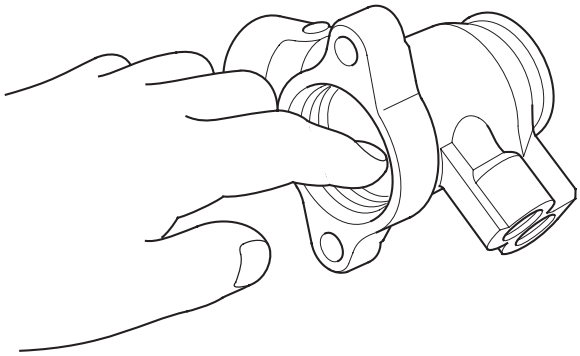
24. Before removing the valve housing (A), apply vinyl tape (B) to the splines on the pinion shaft.



25. Separate the valve housing from the pinion shaft/ valve using a press.

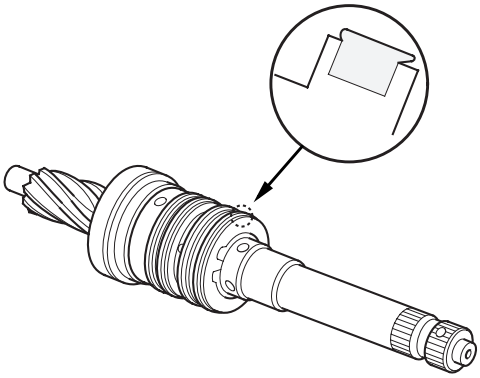
26. With your finger, check the inner wall of the valve housing where the seal ring slides. If there is a step in the wall, the housing is worn. Replace it.

NOTE: There may be sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.

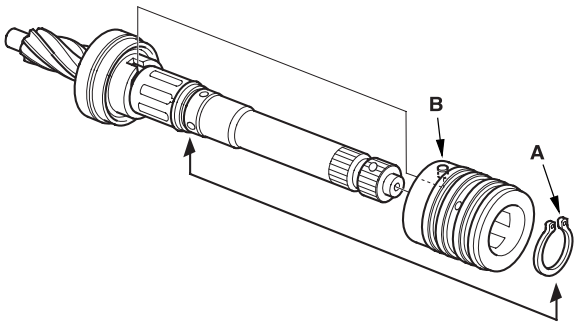


27. Check for wear, burrs, and other damage to the edges of the grooves in the sleeve.

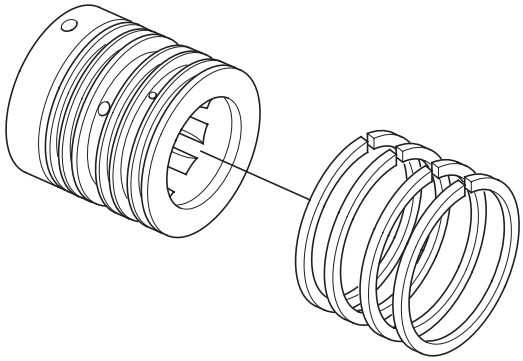
NOTE: The pinion shaft and sleeve are a precision matched set. If either the pinion shaft or sleeve must be replaced, replace both parts as a set.



28. Remove the snap ring (A) and sleeve (B) from the pinion shaft.



29. Using a cutter or an equivalent tool, cut and remove the four seal rings from the sleeve. Be careful not to damage the edges of the sleeve grooves and the outer surface when removing the seal rings.

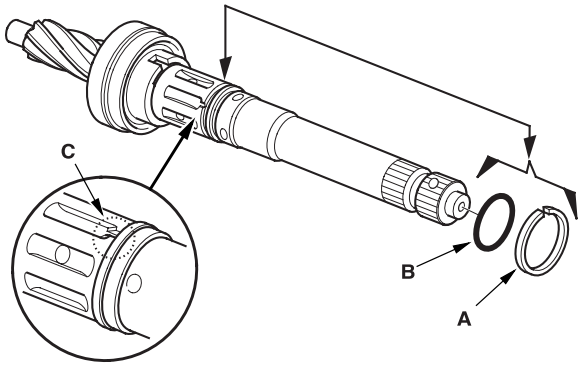


(cont'd)

Steering Gearbox Overhaul (cont'd)

Disassembly (cont'd)

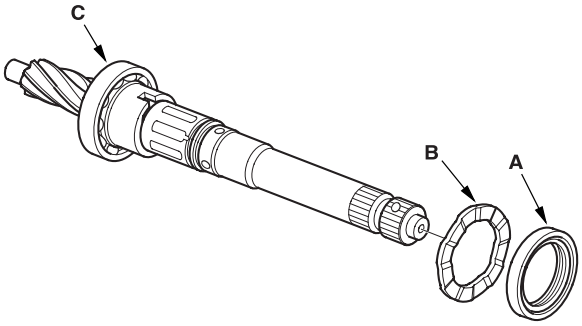
30. Using a cutter or an equivalent tool, cut the valve seal ring (A) and O-ring (B) at the groove (C) in the pinion shaft. Remove the valve seal ring and O-ring. Be careful not to damage the edges of the pinion shaft groove and outer surface when removing the valve seal ring and O-ring.



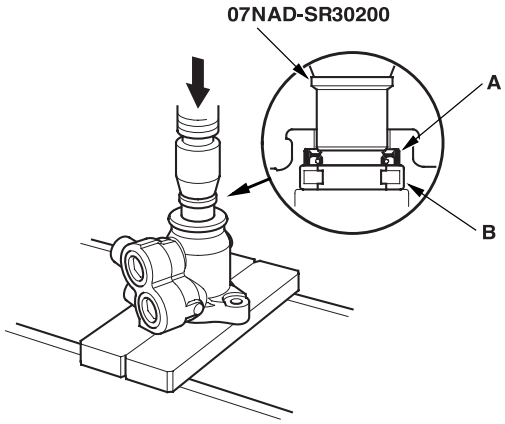
31. Remove the valve oil seal (A) and wave washer (B) from the pinion shaft.

Note these items during disassembly:

- Inspect the ball bearing (C) by rotating the outer race slowly. If there is any excessive play, replace the pinion shaft and sleeve as an assembly.
- The pinion shaft and sleeve are a precise fit; do not intermix old and new pinion shafts and sleeves.

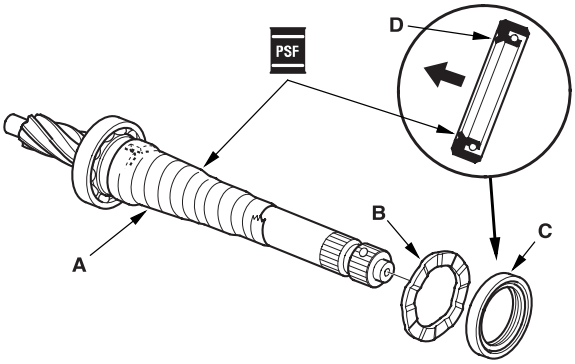


32. Press the valve oil seal (A) and roller bearing (B) out of the valve housing using a hydraulic press and special tool.



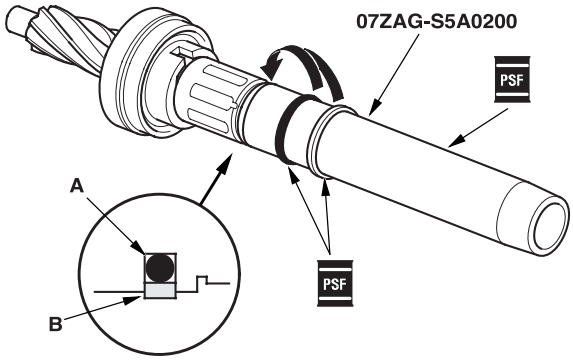
Reassembly

33. Apply vinyl tape (A) to the stepped portion of the pinion shaft, and coat the surface of the vinyl tape with the power steering fluid.



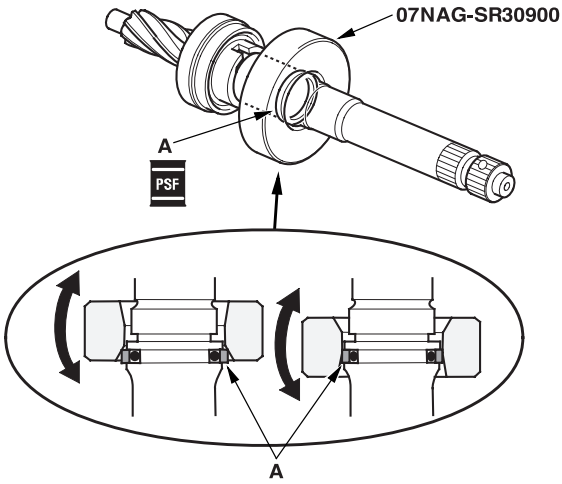
34. Install the wave washer (B). Coat the inside surface of the new valve oil seal (C) with power steering fluid, and install the seal with its grooved side facing opposite the bearing, then slide it over the pinion shaft, being careful not to damage its sealing lip (D). Remove the vinyl tape.

35. Install the special tool over the pinion, and coat the surface of the tool with the power steering fluid. Slip the new O-ring (A) and new valve seal ring (B) over the special tool, and expand them.



36. Fit the O-ring and in the groove of the pinion shaft. Then slide the valve seal ring over the shaft and in the groove on the pinion shaft.

37. Remove the special tool, and apply power steering fluid to the surface of the valve seal ring (A).



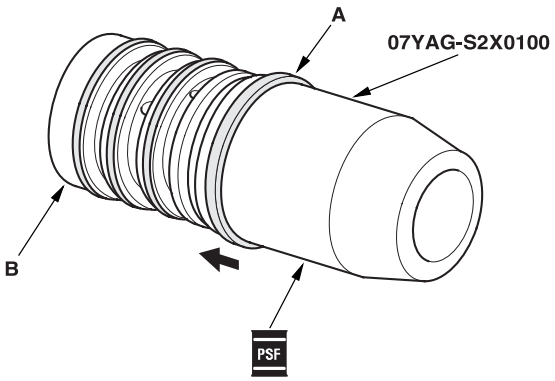
38. Apply power steering fluid to the inside of the special tool. Set the larger diameter end of the special tool over the valve seal ring, and move the special tool up and down several times to make the valve seal ring fit in the pinion shaft groove.

39. Remove the special tool, turn it over, slide the smaller diameter end over the valve seal ring. Move it up and down several times to make the valve seal ring fit snugly in the pinion shaft groove.

40. Apply power steering fluid to the surface of the special tool. Slip two new seal rings (A) over the special tool from the smaller diameter end, and expand them. Install only two rings at a time from each end of the pinion shaft sleeve (B).

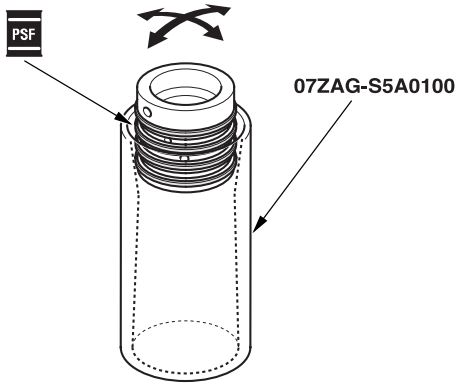
Note these items when installing the seal ring:

- Do not over-expand the seal ring. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal rings using the special tool (sizing tool).
- There are two types of sleeve seal rings: black and brown. Do not mix the different types of rings as they are not compatible.



41. Align the special tool with each groove in the sleeve, and slide a sleeve seal ring into each groove. After installation, compress the seal rings with your fingers temporarily.

42. Apply power steering fluid to the seal rings on the sleeve, and to the entire inside surface of the special tool, then slowly insert the sleeve into the special tool.



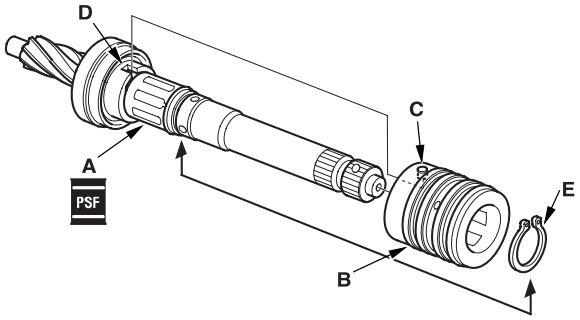
43. Move the sleeve back and forth several times to make the seal rings snugly fit in the sleeve. Be sure that the seal rings are not twisted.

(cont'd)

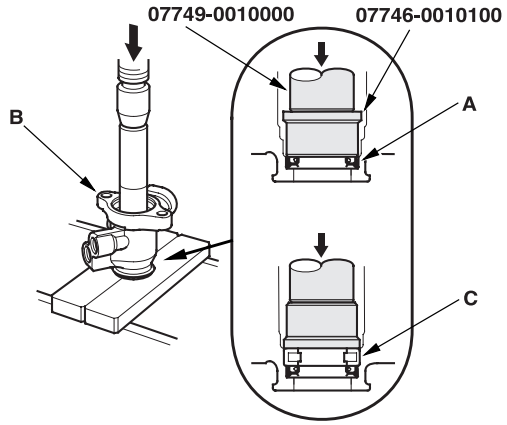
Steering Gearbox Overhaul (cont'd)

Reassembly (cont'd)

44. Apply power steering fluid to the surface of the pinion shaft (A). Slide the sleeve (B) onto the pinion shaft by aligning the locating pin (C) on the inside of the sleeve with the cutout (D) in the shaft. Then install the new snap ring (E) securely in the pinion shaft groove. Be careful not to damage the valve seal ring when inserting the sleeve.

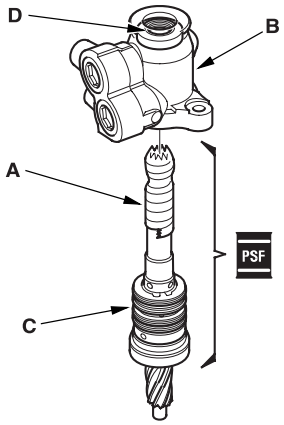


45. Apply power steering fluid to the seal ring lip of the new valve oil seal (A), then install the seal in the valve housing (B) using a hydraulic press and special tools. Install the seal with its grooved side facing the tool.



46. Press the roller bearing (C) into the valve housing with a hydraulic press and special tool.

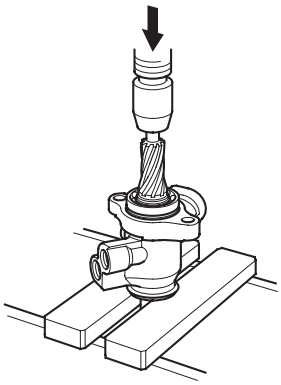
47. Apply vinyl tape (A) to the pinion shaft, then coat the vinyl tape with power steering fluid.



48. Insert the pinion shaft into the valve housing (B). Be careful not to damage the valve seal rings (C) and valve oil seal sealing lip (D).

49. Remove the vinyl tape from the pinion shaft, then remove any residue from the tape adhesive.

50. Press the pinion shaft/sleeve into the valve housing with a hydraulic press. Check that the pinion shaft/ sleeve turns smoothly by hand after installing it.

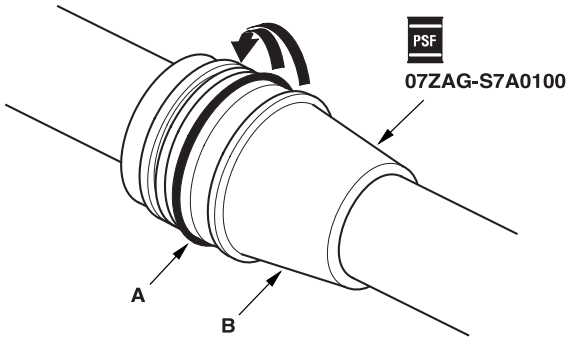


51. Coat the special tool with power steering fluid, then slide it onto the rack, big end first.

52. Position the new O-ring (A) and new piston seal ring (B) on the special tool, then slide them down toward the big end of the tool.

Note these items during reassembly:

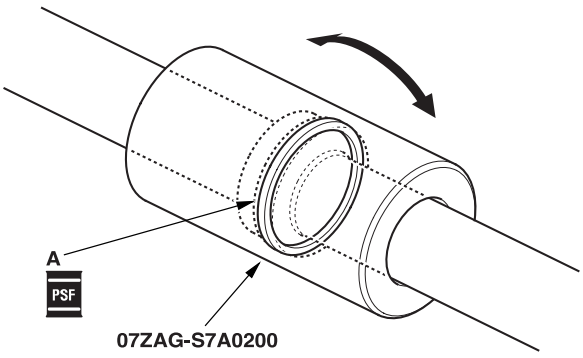
- Do not over expand the resin seal rings. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal ring using the special tool (sizing tool).
- Replace piston's O-ring and seal ring as a set.



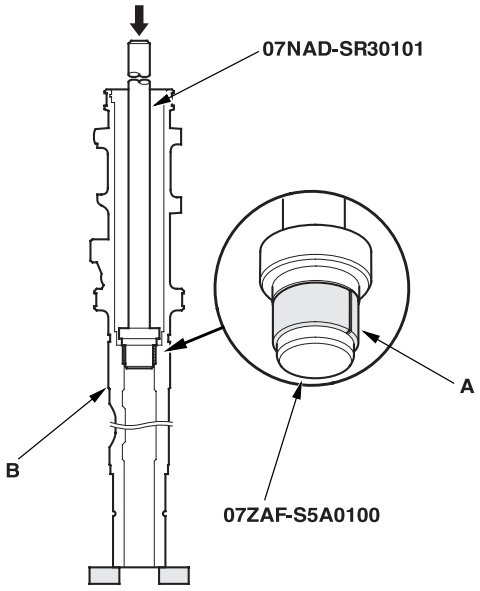
53. Pull the O-ring off into the piston groove, then pull the piston seal ring off into the piston groove on top of the O-ring.

54. Coat the piston seal ring (A) and the inside of the special tool with power steering fluid, then carefully slide the tool onto the rack and over the piston seal ring.

55. Move the special tool back and forth several times to make the piston seal ring fit snugly in the piston.

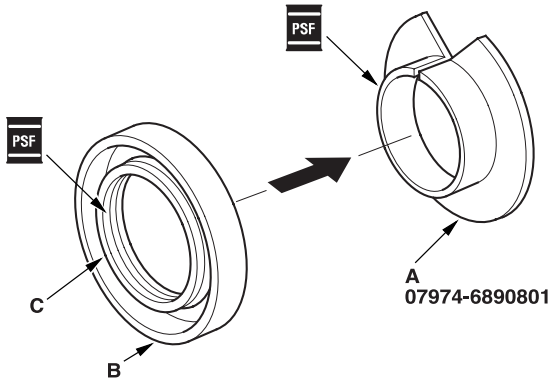


56. Set the new bushing (A) on the special tool, and insert the special tools into the cylinder housing (B).



57. Set the cylinder in a press, and install the bushing (A) into the bottom of the cylinder by pressing on the tool with press. Do not push on the tool with excessive force as it may damage the new bushing.

58. Coat the sliding surface of the special tool (A) and new cylinder end seal (B) with power steering fluid. Place the seal on the special tool with its grooved side (C) facing opposite the special tool.



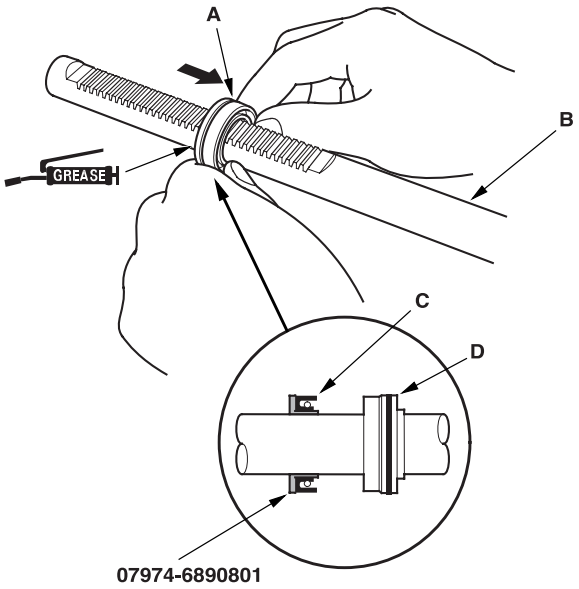
(cont'd)

Steering Gearbox Overhaul (cont'd)

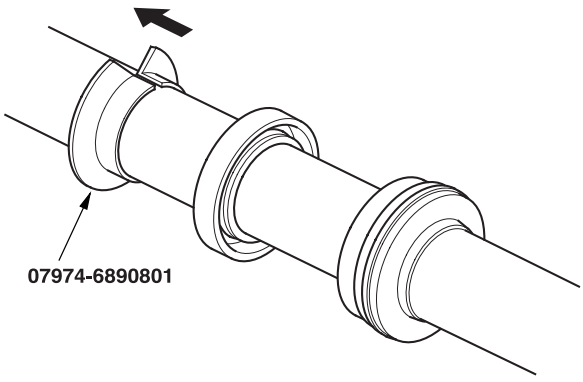
Reassembly (cont'd)

59. Apply a thin coat of grease to the inside of the special tool.

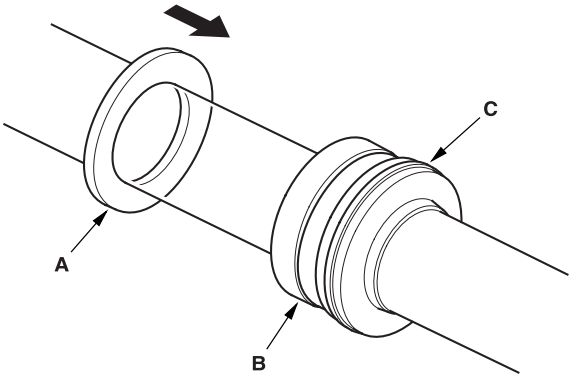
60. Install the cylinder end seal (A) onto the steering rack (B) with its grooved side (C) toward the piston (D). Make sure the gap in special tool is opposite of rack teeth.



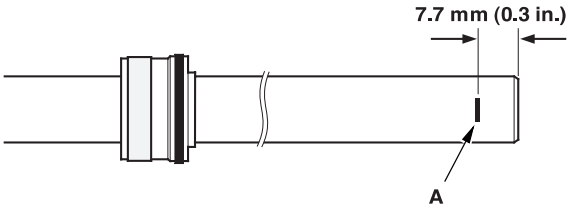
61. Separate the cylinder end seal from the special tool, then remove the special tool.



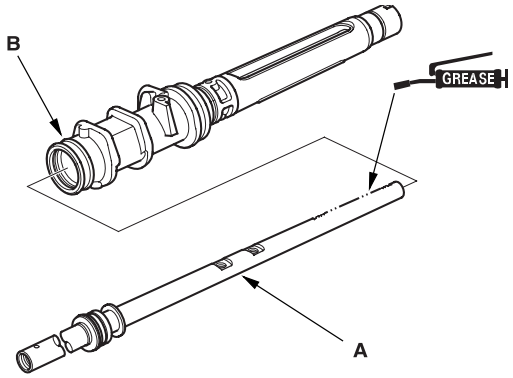
62. Install the new backup ring (A) on the steering rack, then place the backup ring and cylinder end seal (B) against the piston (C).



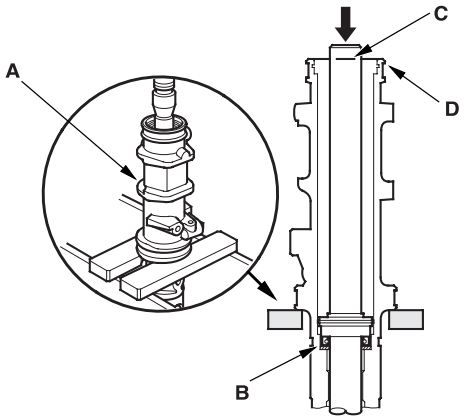
63. Mark (A) a position on the steering rack surface with a felt-tip marker, 7.7 mm (0.3 in.) from the rack end edges.



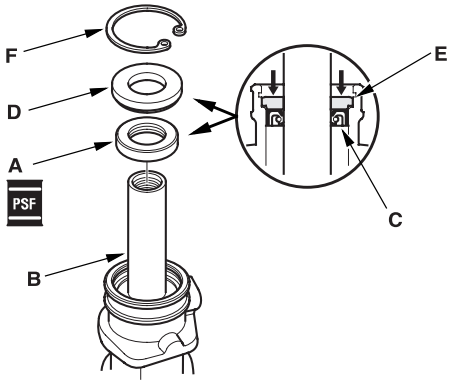
64. Grease the steering rack teeth, then insert the steering rack (A) into the cylinder (B). Be careful not to damage to inner surface of the cylinder wall and bushing with the rack edges.



65. Set the cylinder (A) in a press, then press the cylinder end seal (B) into the bottom of the cylinder until the mark (C) on the rack meets the edges (D) of the cylinder.



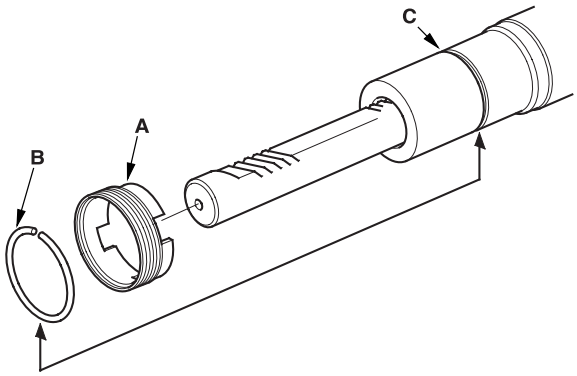
66. Coat the inside and outside surfaces of the new cylinder end seal (A) with power steering fluid.



67. Install the cylinder end seal onto the steering rack (B) with its grooved side (C) toward the piston. Push in the cylinder end seal with your finger.

68. Place the backup ring (D) on the cylinder end seal with its flat side facing upward. Then drive the backup ring in with the appropriate size socket wrench until the its surface is below the snap ring groove (E). Install the snap ring (F) in the groove.

69. Install the new lock screw (A) on the cylinder.



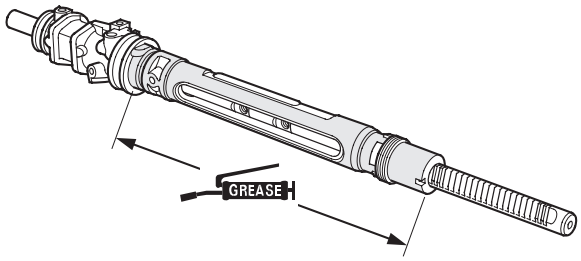
70. Install the new stop ring (B) in the groove (C) on the cylinder by expanding it with snap ring pliers. Be careful not to scratch or damage on the cylinder surface with the stop ring edges.

(cont'd)

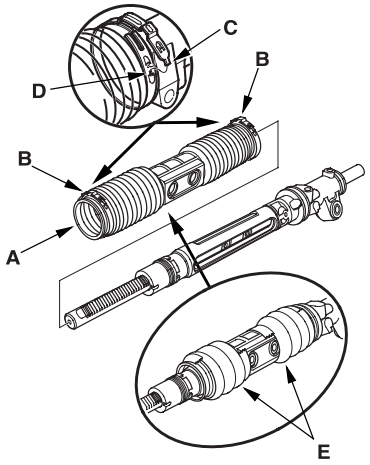
Steering Gearbox Overhaul (cont'd)

Reassembly (cont'd)

71. Coat the housing surface with multipurpose grease as shown.

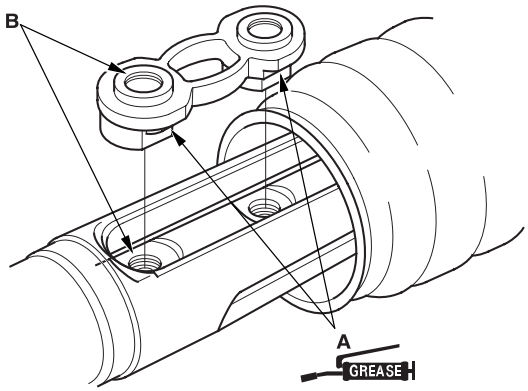


72. Set the new boot bands (B) on the band installation grooves of boot A by aligning the tabs (C) with the holes (D) of the band. Do not close the ear portion of the boot band yet.

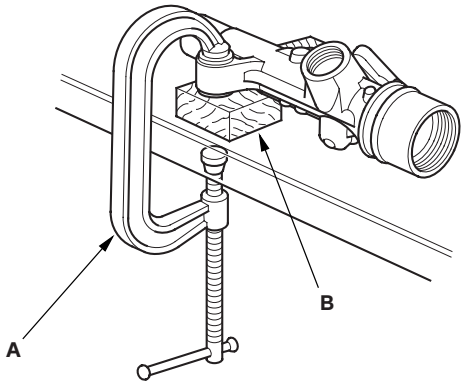


73. Compress boot A by hand, and apply vinyl tape (E) to the bellows so the boots stay collapsed and pulled back. Pass boot A over the cylinder so the smaller diameter end of the boot faces the gearbox housing.

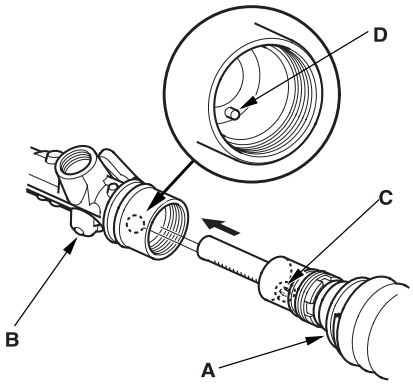
74. Apply multipurpose grease to the sliding surface of the slider guide (A). Keep grease off of the rack-to-slider guide matching surfaces and the boot-to-slider guide matching surfaces.
Slide the steering rack all the way to left, and place the slider guide on the steering rack by aligning the bolt holes (B).



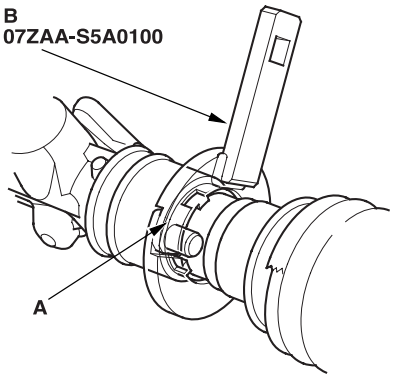
75. Hold the gearbox housing using a C-clamp (A) and the wooden block (B) as shown.



76. Push the cylinder (A) into the gearbox housing (B) so the notch (C) is aligned with the pin (D) inside of the gearbox housing.

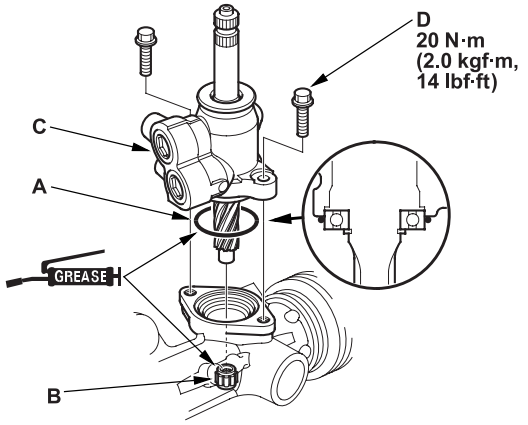


77. Tighten the lock screw (A) by hand first, then install the special tool (B) on the lock screw. Lightly tighten the lock screw. Do not tighten the lock screw to specified torque yet.



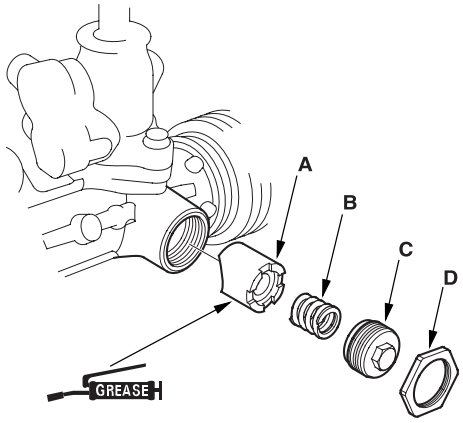
78. Remove the special tool.

79. Coat the new O-ring (A) with grease, and carefully fit it on the valve housing.



80. Apply grease to the needle bearing (B) in the gearbox housing, then install the valve body unit (C) by engaging the gears. Note the valve body unit installation position (direction of the line connections). Tighten the flange bolts (D) to the specified torque.

81. Grease the sliding surface and circumference of the rack guide (A), and install it onto the gearbox housing. Wipe the grease off the threaded section of the housing.



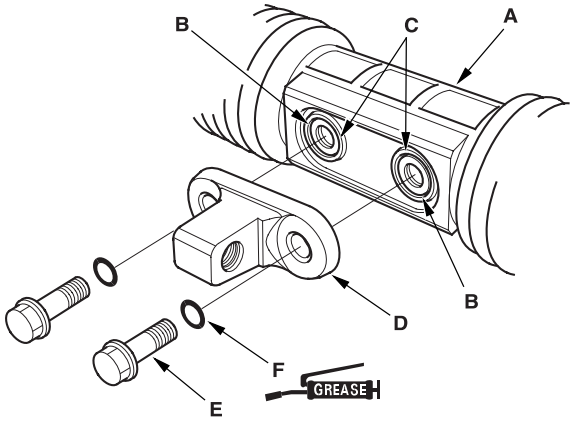
82. Install the spring (B). Apply sealant to the middle of the threads on the rack guide screw (C), then install and tighten it to 25 N·m (2.5 kgf·m, 18 lbf·ft). Loosely install the locknut (D).

(cont'd)

Steering Gearbox Overhaul (cont'd)

Reassembly (cont'd)

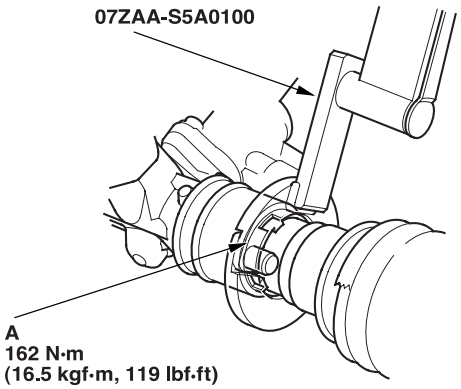
83. Center the steering rack within its stroke, and align the slider guide (B) with the holes (C) in boot A. Fit the slider guide to boot A by pressing around the edges of the holes securely.



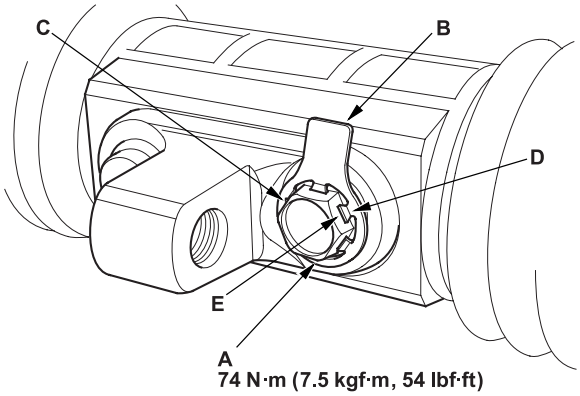
84. Before installing the bracket (D), clean the mating surface of the 12 mm flange bolts (E) and bracket. Coat the new O-rings (F) with grease, and install them on the 12 mm flange bolts.

85. Loosely install the bracket on the steering rack by tightening the 12 mm flange bolts to 25 N·m (2.5 kgf·m, 18 lbf·ft).

86. Hold the gearbox housing using a C-clamp, then install the special tool on the lock screw (A). Retighten the lock screw to specified torque values. Remove the special tool.



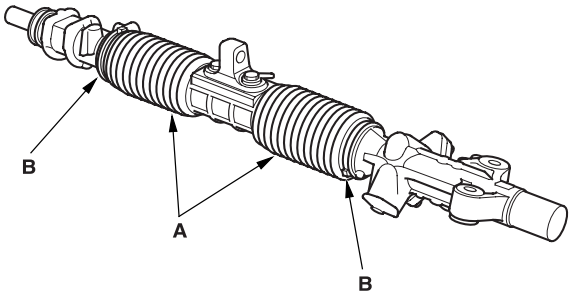
87. Retighten the 12 mm flange bolts (A) to specified torque values.



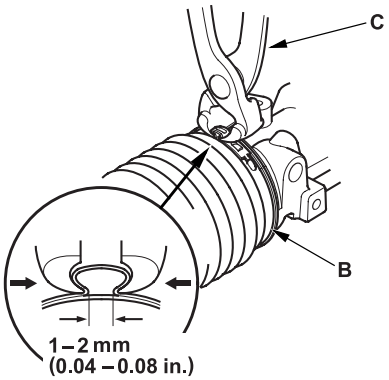
88. After tightening the 12 mm flange bolts, install a new stop washer (B) over one of bolt the heads (C). Be sure the tabs (D) of the stop washer are aligned with the flat surfaces (E) of the bolt head.

89. Clean off any grease or contamination from the boot installation grooves around on the housing.

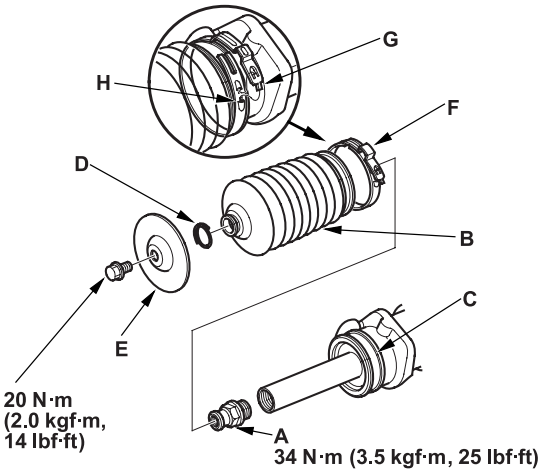
90. Expand boot (A) by removing the vinyl tape, and fit the boot ends (B) in the installation grooves on the cylinder housing.



91. Close the ear portion (A) of the bands (B) with a commercially available pincers, Oetiker 1098 or equivalent (C).



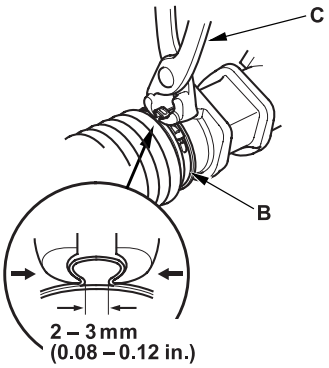
92. Install the rack end plug (A).



93. Clean off any grease or contamination from the boot installation grooves (C) around on the housing.

94. Slide the steering rack, and adjust the distance between the cylinder housing end and the rack end plug end in the dimension to 70.5 mm (2.8 in.). Install boot B, and set the boot end in the installation grooves in the cylinder housing and rack end plug properly. Install the clip (D) and boot guard (E). Install the new boot band (F) in the band grooves of boot B by aligning the tabs (G) with the holes (H) in the band.

95. Close the ear poriton (A) of the band (B) with a commercially available pincers, Oetiker 1098 or equivalent (C). Slide the rack right and left to be certain that the boots are not deformed or twisted.

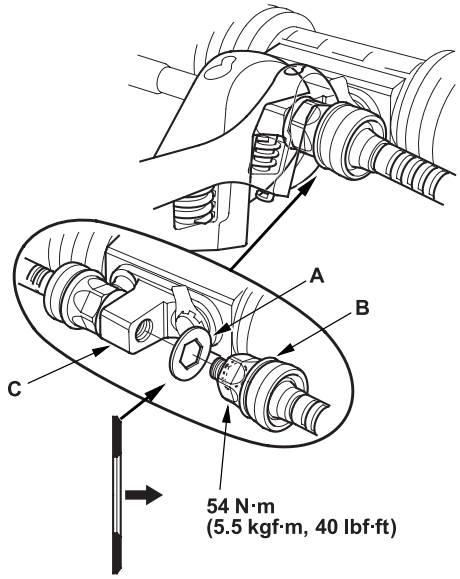


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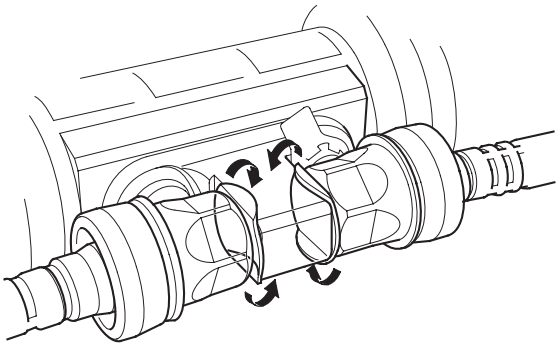
Steering Gearbox Overhaul (cont'd)

Reassembly (cont'd)

96. Install a new lock washer (A) on the tie-rod (B) with the radiused side of the washer toward the tie-rod, and screw the tie-rod on the bracket (C). Repeat this step for the other tie-rod. Hold the bracket with one wrench, and tighten both tie-rods to the specified torque with another wrench.



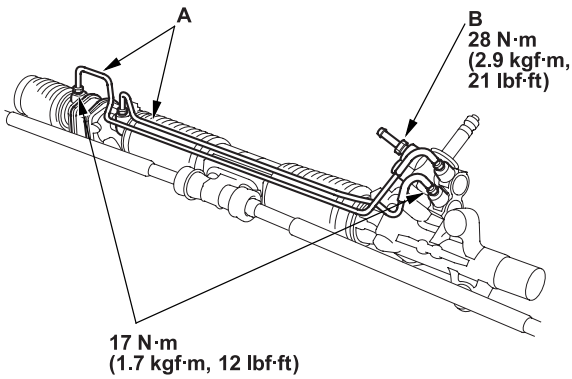
97. Bend the lock washer against the flat spots on the bracket with a large pair of pliers.



98. Install the cylinder lines (A) and return line joint (B).

Note these items during reassembly:

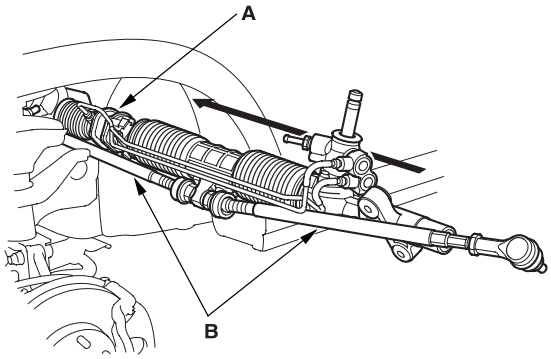
- Thoroughly clean the joints of the cylinder lines. The joints must be free of foreign material.
- Install the cylinder lines by tightening the flare nuts by hand first, then tighten the flare nuts to the specified torque.



99. Adjust the rack guide screw (see page 17-28). After adjusting, check that the rack moves smoothly by sliding it right and left.

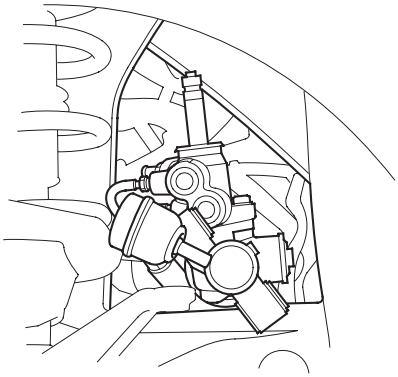
Steering Gearbox Installation

1. Pass the cylinder of the steering gearbox (A) together with the tie-rods (B) through the wheelwell opening on the driver's side.

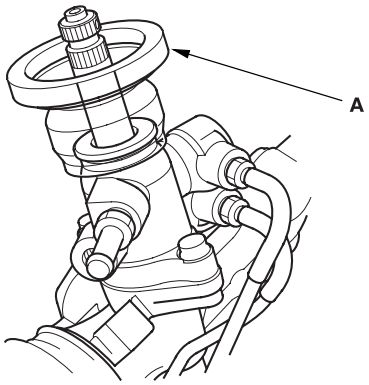


2. Carefully move the steering gearbox toward the passenger's side until the pinion shaft clears the wheelwell opening on the frame. Continue moving the gearbox toward the passenger's side until the steering gearbox is in position.

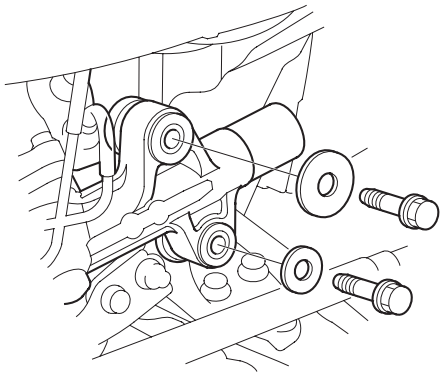
   NOTE: Make sure the power steering return hose is routed between the gearbox and right tie-rod.



3. Install the pinion shaft grommet (A).



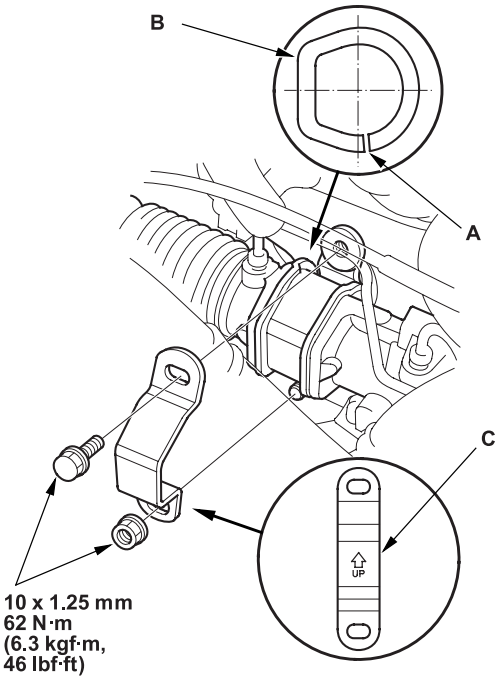
4. Install the mounting cushion on the cylinder side of the gearbox.
5. Insert the pinion shaft up through the bulkhead, and place the steering gearbox on the mounting brackets. Be sure that the pinion shaft grommet is in place securely.
6. Loosely install the two 10 mm flange bolts and washers on the left side (RHD: right side) of the gearbox.



(cont'd)

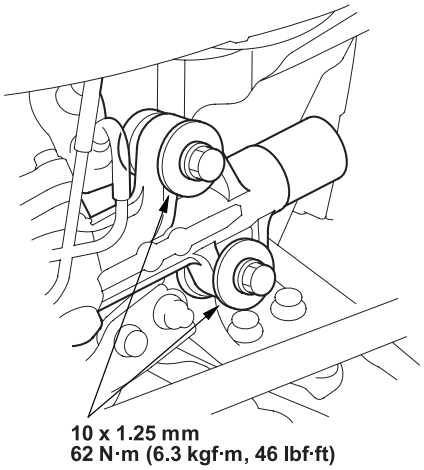
Steering Gearbox Installation (cont'd)

7. Position the cutout (A) on the mounting cushion (B) as shown, and install it on the housing of the gearbox securely fitted. Install the mounting bracket (C) over the mounting cushion.



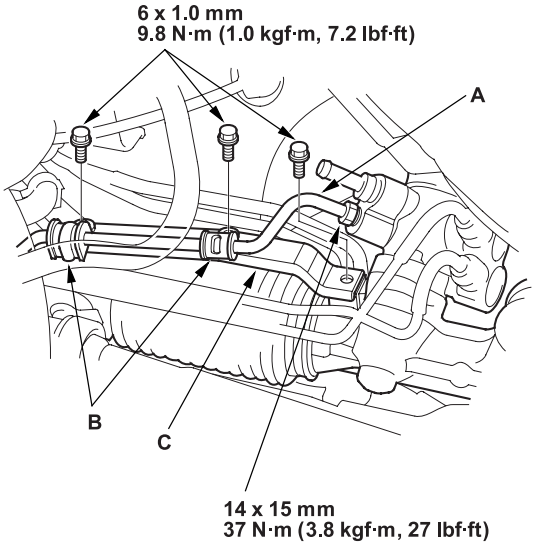
8. Install the 10 mm flange bolt and nut loosely first, then torque the flange bolt and nut alternately in two or more steps.

9. Tighten the left side (RHD: right side) of the flange bolts to the specified torque value.

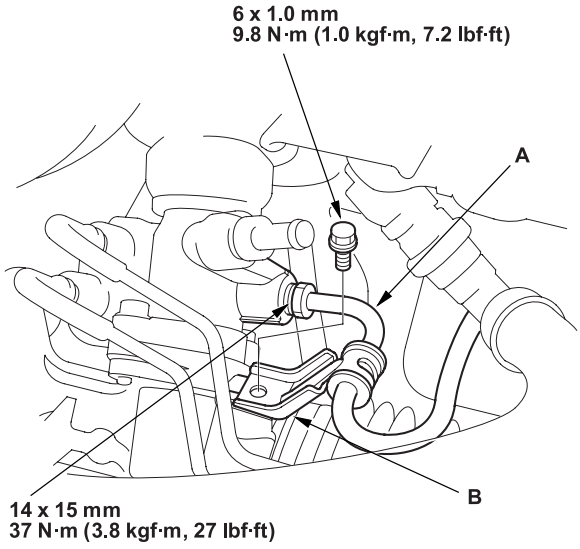


10. On the driver's side, connect feed line (A) securely, and tighten the 14 mm flare nut to specified torque.

LHD:



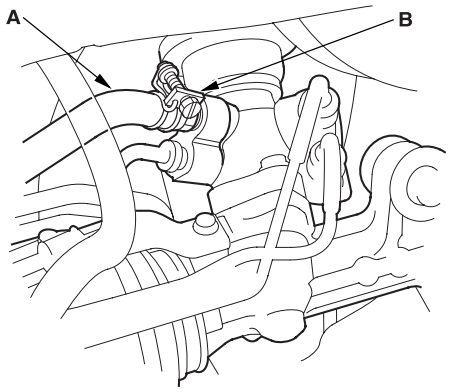
RHD:



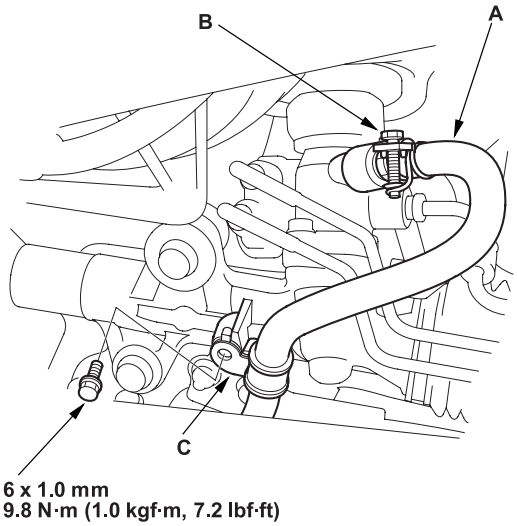
11. Install the feed line clamps (B) and P/S return line bracket (LHD model) (C) on the gearbox.

12. Connect the return hose (A) securely, and tighten the adjustable hose clamp (B) (see page 17-12). Install the return line clamp (C) (RHD model) on the gearbox.

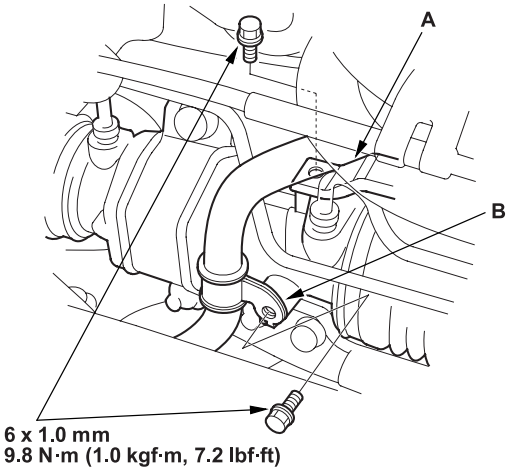
LHD:



RHD:



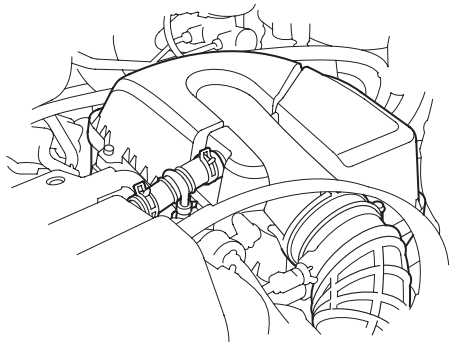
13. Install the P/S return line bracket (LHD model) (A) and return line clamp (B) on the gearbox. Make sure that there is no interference between the feed and return lines any other parts.



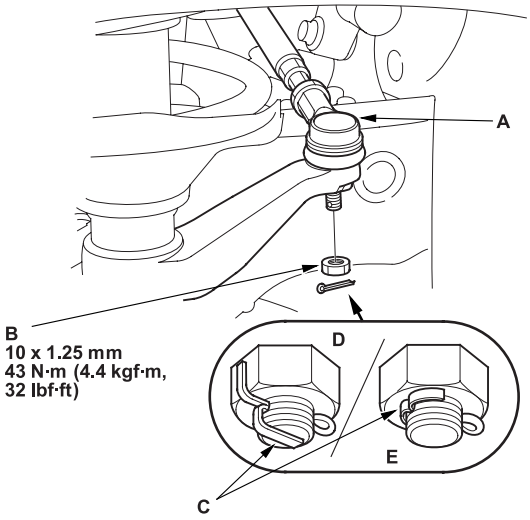
(cont'd)

Steering Gearbox Installation (cont'd)

14. Reinstall the air cleaner.



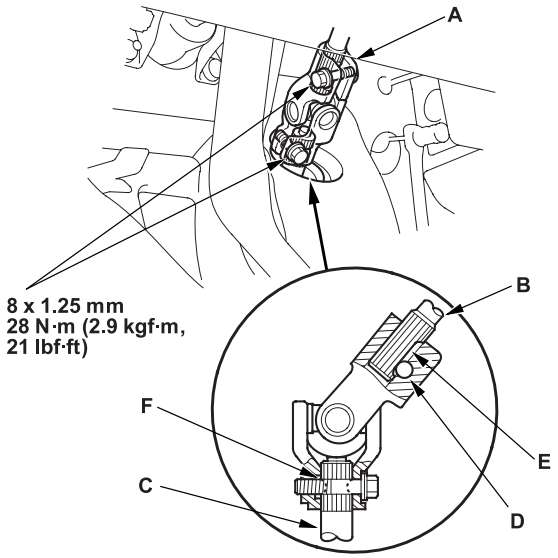
15. Wipe off any grease contamination from the ball joint tapered section and threads. Then reconnect the tie-rod end (A) to the damper steering arms.Install the 10 mm nut (B) and tighten it to the specified torque.



16. Install a new cotter pin (C), and bend it as shown (D) or (E).

17. Install the steering joint (A), and reconnect the steering shaft (B) and pinion shaft (C). Make sure the steering joint is connected as follows:

- Insert the upper end of the steering joint onto the steering shaft (line up the bolt hole (D) with the flat portion (E) on the shaft).
- Slip the lower end of the steering joint onto the pinion shaft (C) (line up the bolt hole with the groove (F) around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.
- Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it. Tighten the steering joint bolts to specified torque.



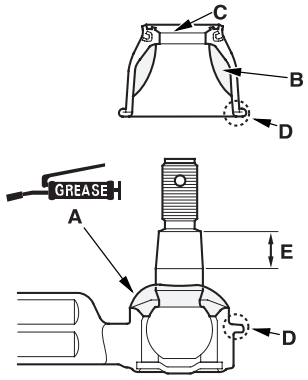
18. Install the driver's dashboard lower covers.

19. Install the front wheels, then set the wheels in the straight ahead position.
20. Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (about two and half turns) until the arrow mark on the label points straight up. Reinstall the steering wheel (see page 17-23).
21. Fill the system with power steering fluid, and bleed air from the system (see page 17-11).
22. After installation, perform the following checks.
    - Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid. Check the gearbox for leaks (see page 17-10).
    - Perform the front toe inspection (see page 18-7).
    - Check the steering wheel spoke angle.
      If steering spoke angles to the right and left are not equal (steering wheel and rack are not centered), correct the engagement of the joint/pinion shaft serrations, then adjust the front toe by turning the tie-rods, if necessary.

Tie-rod Ball Joint Boot Replacement

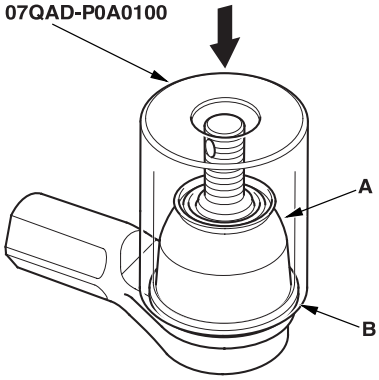
Special Tools Required
Attachment, 42 mm 07QAD-P0A0100

1. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.
2. Pack the lower area of the ball pin (A) with fresh multipurpose grease.



3. Pack the interior of the new boot (B) and lip (C) with fresh multipurpose grease.

   Note these items when installing new grease:
   - Keep grease off the boot mounting area (D) and the tapered section (E) of the ball pin.
   - Do not allow dust, dirt, or other foreign materials to enter the boot.
4. Install the new boot (A) using the special tool. The boot must not have a gap at the boot installation sections (B). After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.



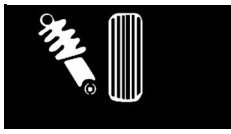
18

Suspension

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- Lower Arm Replacement 18-20
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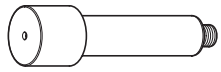
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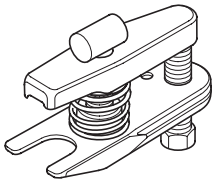
Front and Rear Suspension

Special Tools

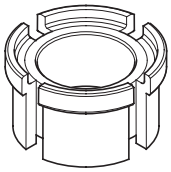
Ref. No.	Tool Number	Description	Qty
1	07GAF-SD40100	Hub Dis/Assembly Tool 42 mm	1
2	07MAC-SL00200	Ball Joint Remover, 28 mm	1
3	07MGK-0010100	Wheel Alignment Gauge Attachment	1
4	07746-0010500	Attachment, 62 x 68 mm	1
5	07749-0010000	Driver	1
6	07965-SA50500	Front Hub Dis/Assembly Tool	1
7	07965-SA70100	Hub Dis/Assembly Tool 34 mm	1
8	07965-SD90100	Support Base	1



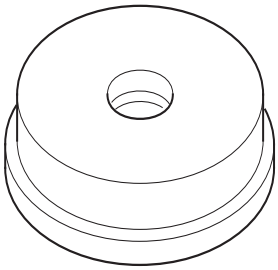
1, 7



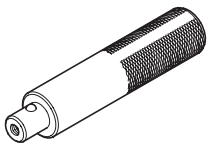
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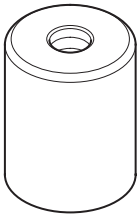
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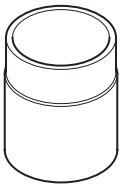
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5



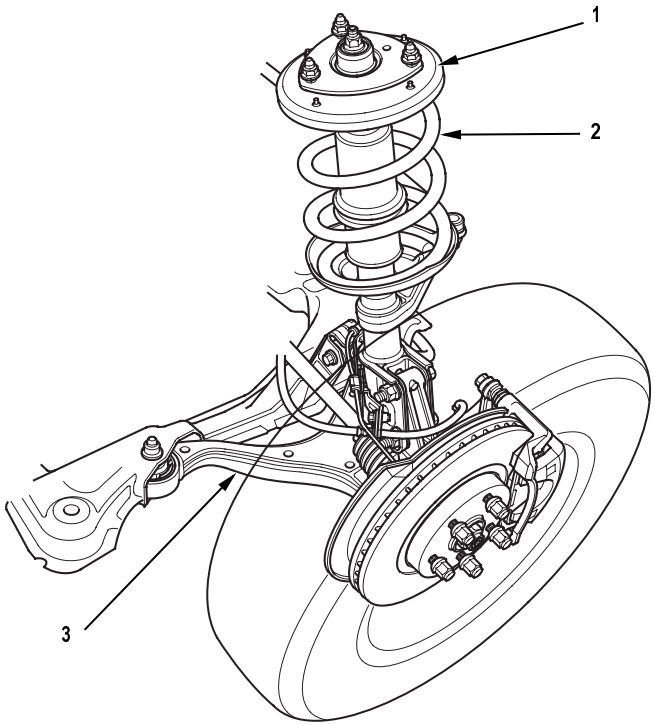
6



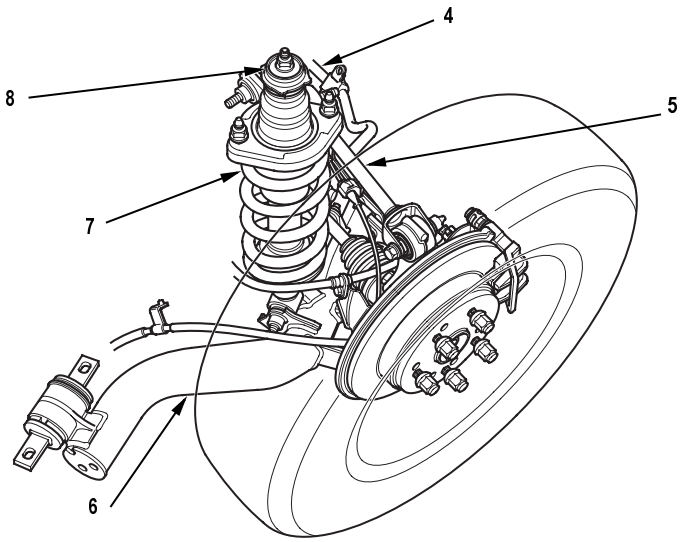
8

Component Location Index

Front Suspension:



Rear Suspension:



1	DAMPER	Disposal, page 18-11; Replacement, page 18-21
2	SPRING	Replacement, page 18-21
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4	STABILIZER BAR	Replacement, page 18-32
5	UPPER ARM	Replacement, page 18-34
6	TRAILING ARM	Replacement, page 18-35
7	SPRING	Replacement, page 18-36
8	DAMPER	Disposal, page 18-11; Replacement, page 18-36

Wheel Alignment

Special Tool Required
Wheel alignment gauge attachment 07MGK-0010100

The suspension can be adjusted for front camber, front toe, and rear toe. However, each of these adjustments are interrelated to each other. For example, when you adjust toe, the camber changes. Therefore, you must adjust the front wheel alignment whenever you adjust camber or toe.

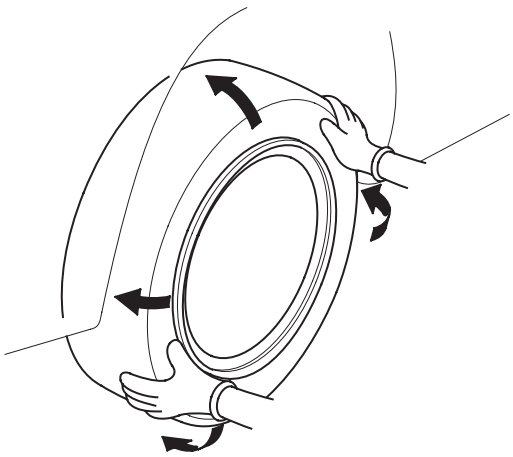
Pre-Alignment Checks

For proper inspection and adjustment of the wheel alignment, do these checks:

1. Release the parking brake to avoid an incorrect measurement.
2. Make sure the suspension is not modified.
3. Check the tire size and tire pressure.

   Tire size:
   Front/rear:
   15 inch wheel disc: 205/70R15 96T
   16 inch wheel disc: 205/65R16 95T

   Tire pressure:
   Front/rear:
   180 kPa (1.8 kgf/cm², 26 psi)
4. Check the runout of the wheels and tires.
5. Check the suspension ball joints. (Hold a wheel with your hands, and move it up and down and right and left to check for wobbling).

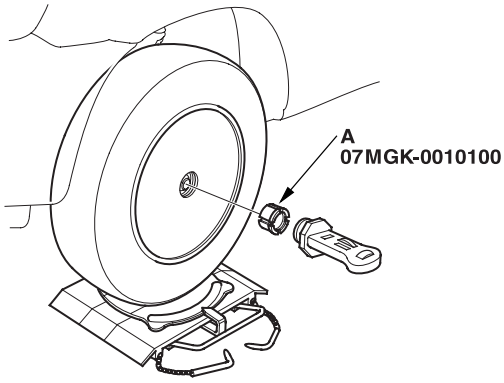


6. Bounce the vehicle up and down several times to stabilize the suspension.

Front Caster Inspection

1. Raise the vehicle and set the turning radius gauges beneath the front wheels, and place boards under the rear wheels the same thickness as the turning radius gauges, then lower the vehicle.

   NOTE: Be sure that the vehicle is level with the wheels on the turning radius gauges and boards.
2. Remove the wheel cap, and install the wheel alignment gauge attachment (A) and camber/caster gauge on the wheel hub, and apply the front brake.

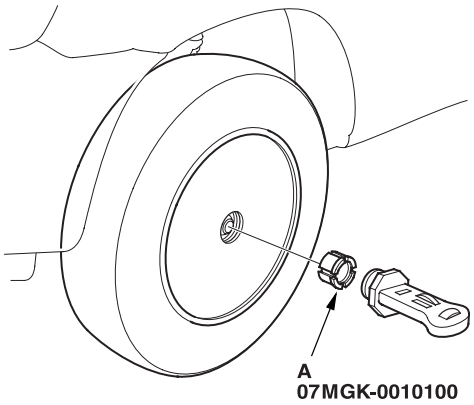


3. Turn the front wheel 20° outward, then turn the adjusting screw of the camber/caster gauge to set the bubble at 0°.
4. Turn the wheel 20° inward and read the caster on the gauge with the bubble at the center of the gauge. If the caster angle is not within the specification, check for bent or damaged suspension components.

   Front Caster angle: 1°45' ± 1°

Front Camber Inspection

1. Turn the front wheels to the straight ahead position.
2. Remove the wheel cap, and install the wheel alignment gauge attachment (A) and camber/ caster gauge on the wheel hub.

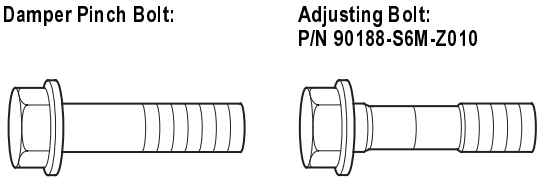


3. Read the camber angle on the gauge with the bubble at the center of the gauge. If the camber angle is not within the specification, adjust the camber (see the right column).

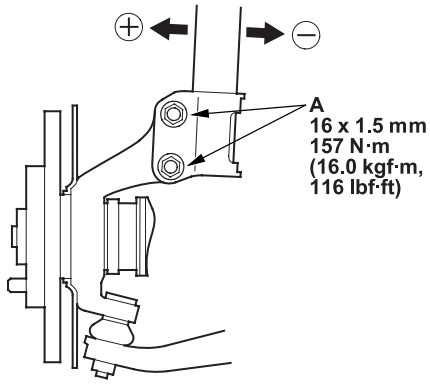
Front camber angle: 0°00' ± 45'

Front Camber Adjustment

The front camber can be adjusted by exchanging one or both of the damper pinch bolts with the smaller diameter adjusting bolt(s). The difference between the adjusting bolt diameter and the pinch bolt hole diameter allows a small range of adjustment.



1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Loosen the damper pinch nuts and bolts (A), and adjust the camber by moving the bottom of the damper within the range of the damper pinch bolt free play.



3. Tighten the nuts to the specified torque. Make sure the damper pinch bolts tightening torque.
4. Reinstall the front wheels. Lower the front of the vehicle to the ground, and bounce the vehicle several times to stabilize the suspension.
5. Check the camber angle. If it is within the specification, check the front toe. If it is not within the specification, go to step 6.

(cont'd)

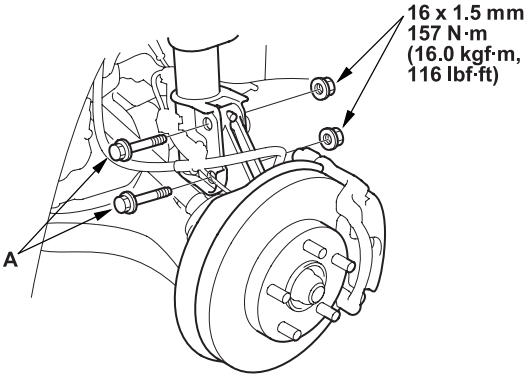
Wheel Alignment (cont'd)

Front Camber Adjustment (cont'd)

6. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.

7. Replace the damper pinch bolts with the adjusting bolts (A), and adjust the camber angle.

NOTE: The camber angle can be adjusted up to ± 15' (center of tolerance) by replacing one damper pinch bolt with the adjusting bolt. The camber angle can be adjusted up to ± 30' by replacing both upper and lower damper pinch bolts with the adjusting bolts.



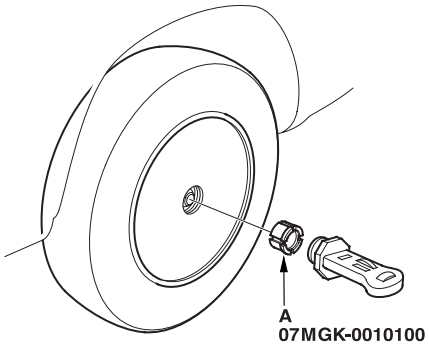
8. Tighten the bolts to the specified torque.

9. Reinstall the front wheels. Lower the front of the vehicle to the ground, and bounce the vehicle several times to stabilize the suspension.

10. Check the camber angle. If it is within the specification, check the front toe, and adjust it if necessary. If it is not within the specification, readjust it, and recheck. If the camber angle cannot be adjusted to the specification, check for bent or damaged suspension components.

Rear Camber Inspection

1. Remove the wheel cap, and install the wheel alignment gauge attachment (A) and camber/caster gauge on the wheel hub.



2. Read the camber angle on the gauge with the bubble at the center of the gauge. If the camber angle is not within the specification, check for bent or damaged suspension components.

Rear camber angle: - 0°45' ± 45'

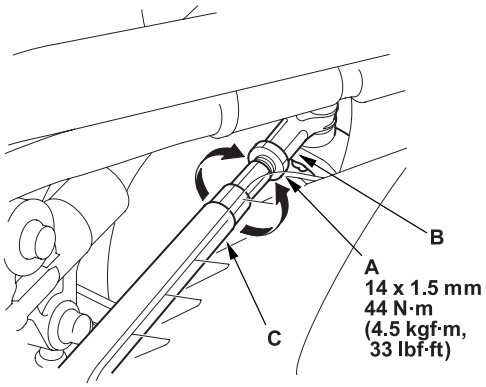
NOTICE

Do not loosen the special bolts on the trailing arm.

Front Toe Inspection/Adjustment

1. Center the steering wheel spokes.
2. Check the toe. If it is not within the specification, go to step 3.

   Front toe-in: 0 ± 2 mm (0 ± 0.08 in.)
3. Loosen the locknut (A) while holding the tie-rod end (B).



4. Turn the tie-rod end (C) until the toe is correct.

   NOTE: Adjust both the right and left wheels at the same time by the same amount in opposite directions to obtain the correct toe and to keep the steering wheel straight.
5. After adjusting, tighten the locknut while holding the tie-rod arm. Make sure the toe setting does not change.

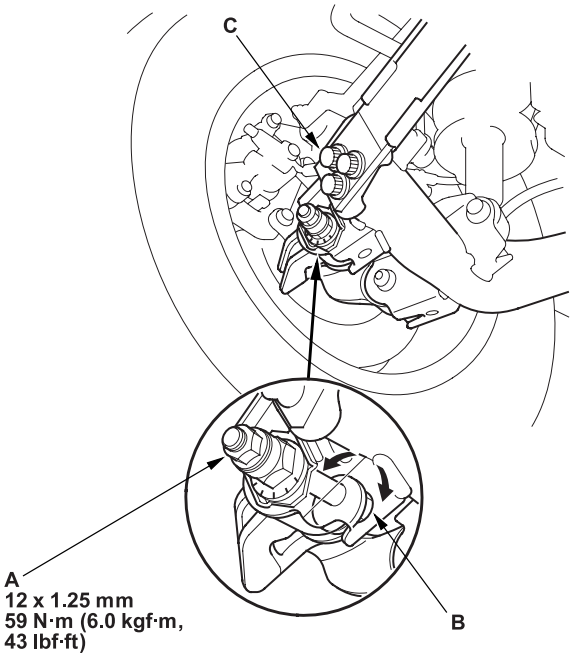
Rear Toe Inspection/Adjustment

1. Release the parking brake.
2. Check the toe. If it is not within the specification, go to step 3.

   Rear toe-in: 2 ± 2 mm (0 ± 0.08 in.)
3. Loosen the self-locking nut (A) while holding the adjusting bolt (B).

   NOTICE

   Do not loosen the special bolts (C) on the trailing arm.



4. Replace the self-locking nut with a new one, and lightly tighten it.

   NOTE: Always use a new self-locking nut whenever it has been loosened.
5. Turn the adjusting bolt until the toe is correct.

   Rear toe-in:
   0 (from -1 to +2) mm (0 (from -0.04 to +0.08) in.)
6. Tighten the self-locking nut to the specified torque while holding the adjusting bolt.

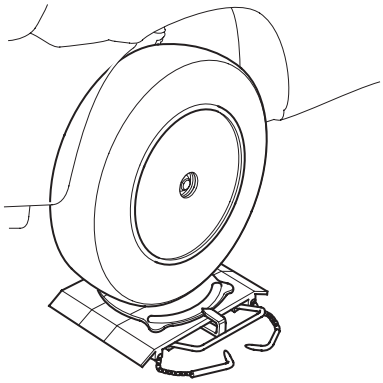
(cont'd)

Wheel Alignment (cont'd)

Turning Angle Inspection

1. Raise the vehicle and set the turning radius gauges beneath the front wheels, and place boards under the rear wheels the same thickness as the turning radius gauges, then lower the vehicle.

   NOTE: Be sure that the vehicle is level with the wheels on the turning radius gauges and boards.



2. Turn the steering wheel fully to the right and left while applying the brakes, and check the turning angles of both front wheels. If the turning angle is not within the specification or the inward turning angles differ between the right and left, go to step 3.

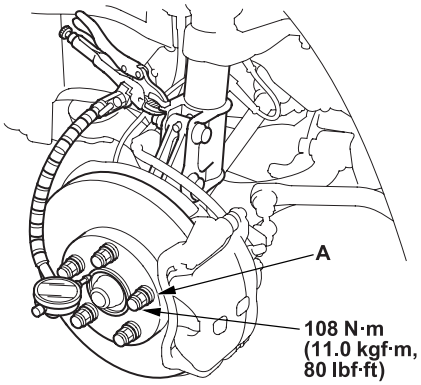
   Turning angle:
   Inward: 39°45' ± 2°
   Outward: 32°30' (reference)

3. Check the toe. If it is correct but the turning angle is not within the specification, check for bent or damaged suspension components.

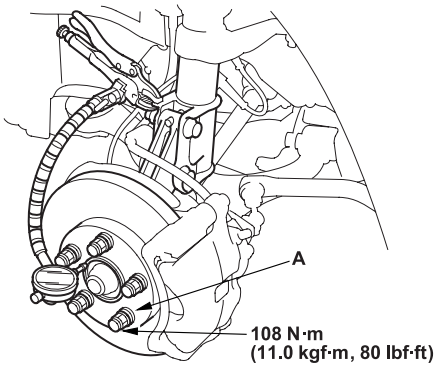
Wheel Bearing End Play Inspection

1. Raise the vehicle, and make sure it is securely supported. Remove the wheels.
2. Install suitable flat washers (A) and wheel nuts, and tighten the nuts to the specified torque to hold the brake disc securely against the hub.

   Front:



   Rear:



3. Set up the dial gauge against the hub cap or hub flange as shown, and measure the bearing end play by moving the brake disc inward and outward.

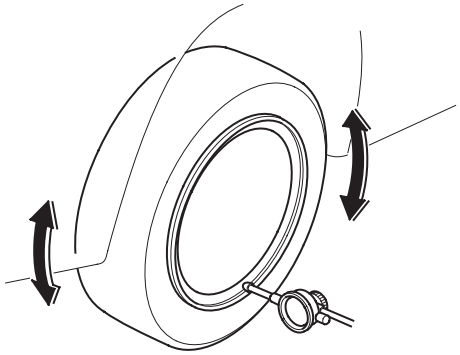
   Bearing end play:
   Standard:
   Front/rear: 0 - 0.05 mm (0 - 0.002 in.)

4. If the bearing end play is more than the standard, replace the wheel bearing.

Wheel Runout Inspection

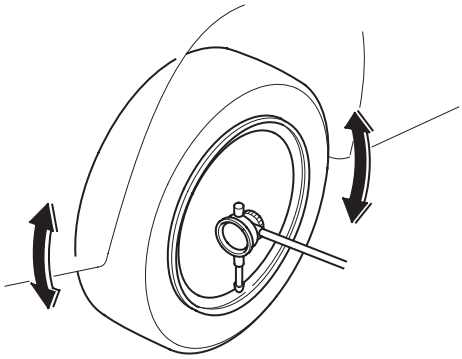
1. Raise the vehicle, and make sure it is securely supported.
2. Check for a bent or deformed wheel.
3. Set up the dial gauge as shown, and measure the axial runout by turning the wheel.

Front and rear wheel axial runout:
Standard:
Aluminum wheel: 0 - 0.7 mm (0 - 0.03 in.)
Steel wheel: 0 - 1.0 mm (0 - 0.04 in.)
Service limit: 2.0 mm (0.08 in.)



4. Reset the dial gauge to the position shown, and measure the radial runout.

Front and rear wheel radial runout:
Standard:
Aluminum wheel: 0 - 0.7 mm (0 - 0.03 in.)
Steel wheel: 0 - 1.0 mm (0 - 0.04 in.)
Service limit: 1.5 mm (0.06 in.)



5. If the wheel runout is not within the specification, check the wheel bearing end play (see page 18-8), and make sure the mating surfaces on the brake disc and the inside of the wheel are clean.
6. If the bearing end play is within the specification but the wheel runout is more than the service limit, replace the wheel.

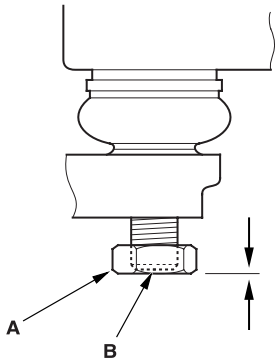
Ball Joint Removal

Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

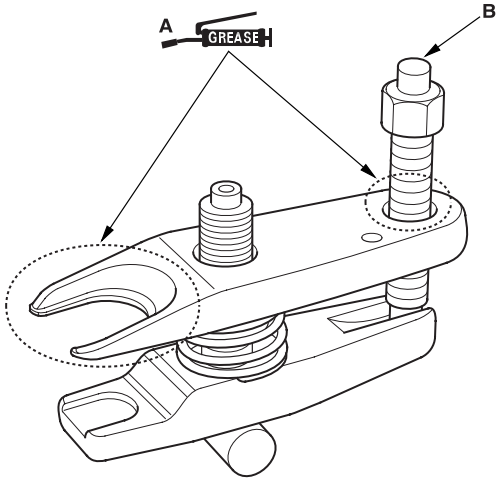
NOTICE

Always use a ball joint remover to disconnect a ball joint. Do not strike the housing or any other part of the ball joint connection to disconnect it.

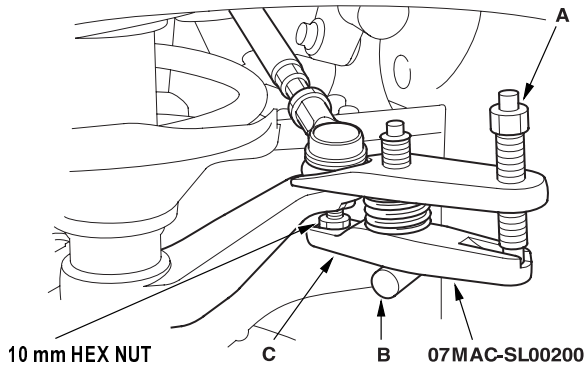
1. Install a hex nut (A) onto the threads of the ball joint (B). Make sure the nut is flush with the ball joint pin end to prevent damage to the thread end of the ball joint pin.



2. Apply grease to the special tool on the areas shown (A). This will ease installation of the tool and prevent damage to the pressure bolt (B) threads.



3. Install the special tool as shown. Insert the jaws carefully, making sure not to damage the ball joint boot. Adjust the jaw spacing by turning the pressure bolt (A).



4. After adjusting the adjusting bolt, make sure the head of the adjusting bolt (B) is in the position shown to allow the jaw (C) to pivot.

5. With a wrench, tighten the pressure bolt until the ball joint pin pops loose from the steering arm or knuckle. If necessary, apply penetrating type lubricant to loosen the ball joint pin.

   NOTE: Do not use pneumatic or electric tools on the pressure bolt.

6. Remove the tool, then remove the nut from the end of the ball joint pin, and pull the ball joint out of the steering arm or knuckle. Inspect the ball joint boot, and replace it if damaged.

Damper Disposal

WARNING

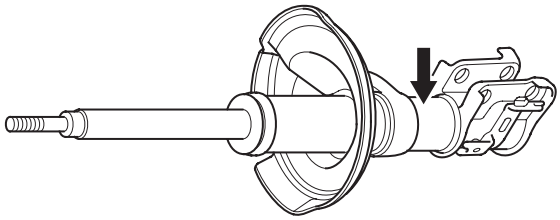
The dampers contain nitrogen gas and oil under pressure. The pressure must be relieved before disposal to prevent explosion and possible injury when scrapping.

WARNING

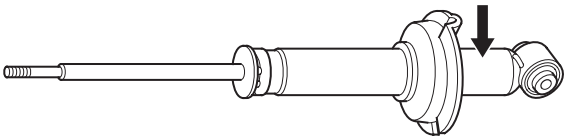
Always wear eye protection to avoid getting metal shavings in your eyes when the damper pressure is relieved.

Place the damper on a level surface with its shaft extended and drill a hole of 2 - 3 mm (0.078 - 0.118 in.) diameter in the body to release the gas.

Front damper:



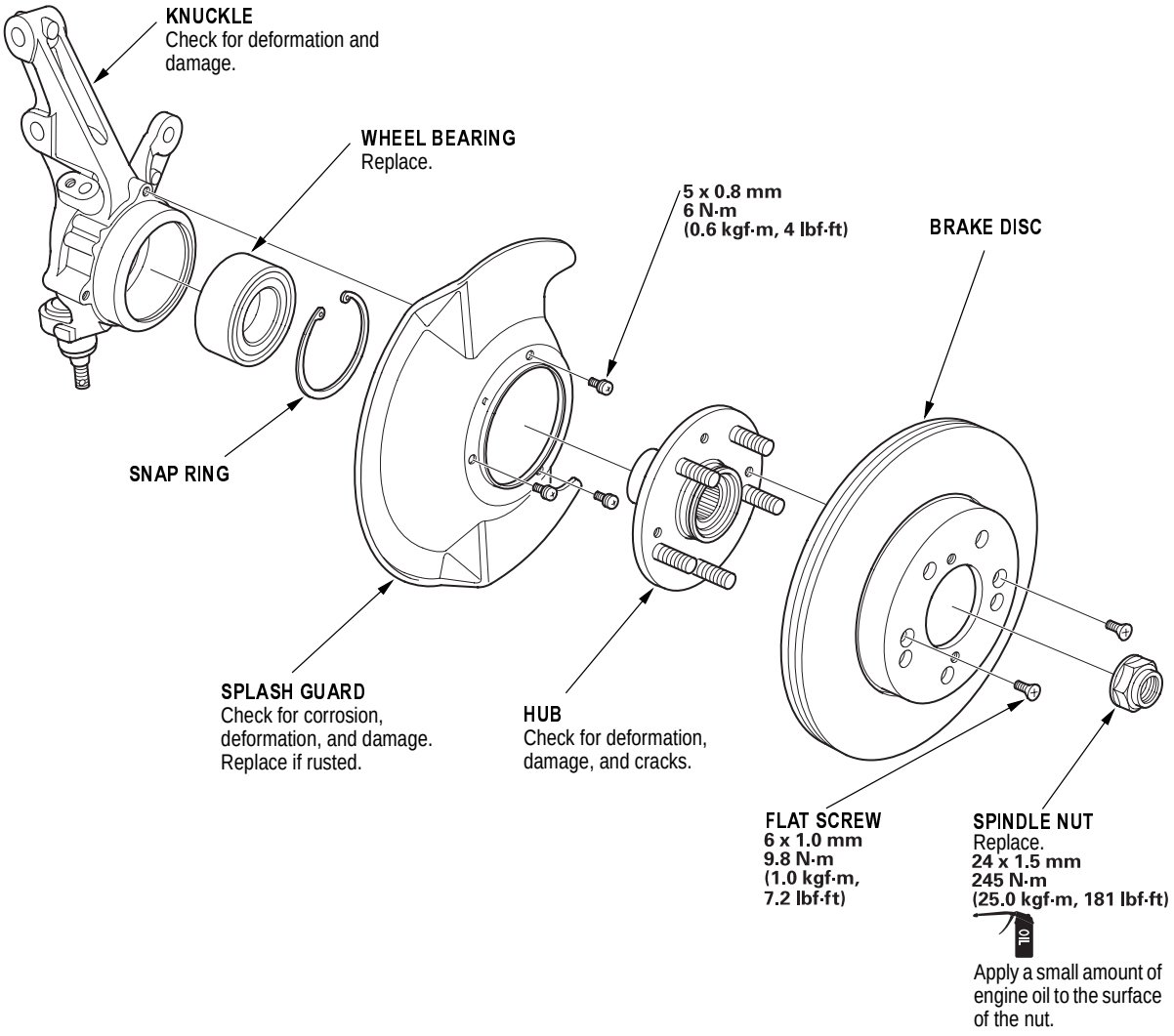
Rear damper:



Front Suspension

Knuckle/Hub/Wheel Bearing Replacement

Exploded View

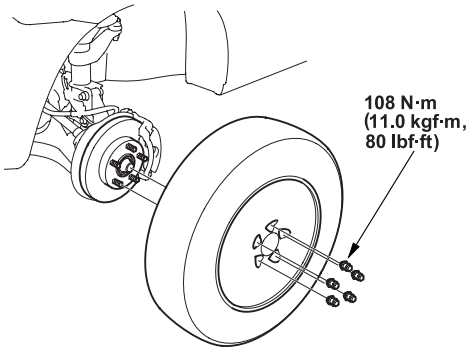


Special Tools Required
- Hub dis/assembly tool 07GAF-SD40100
- Ball joint remover, 28 mm 07MAC-SL00200
- Attachment 62 x 68 mm 07746-0010500
- Driver 07749-0010000
- Support base 07965-SD90100

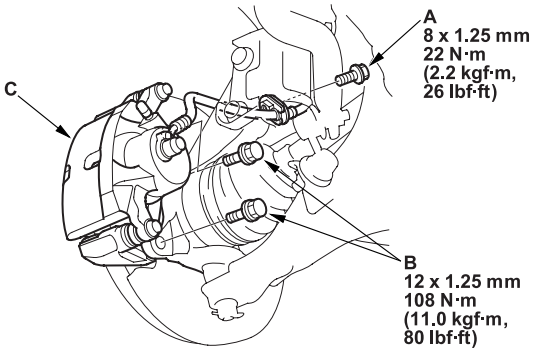
Knuckle/Hub Replacement

1. Raise the front of the vehicle, and make sure it is securely supported.

2. Remove the wheel cap, wheel nuts, and front wheel.

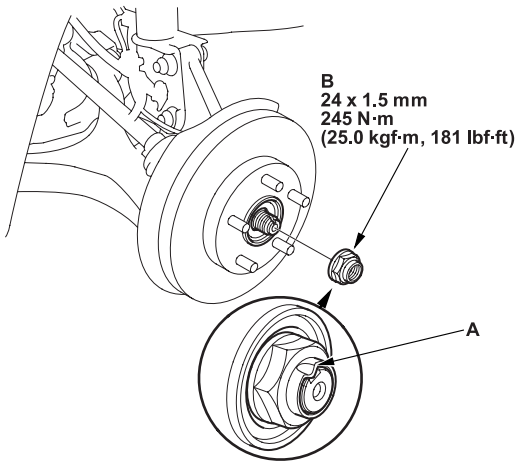


3. Remove the brake hose bracket mounting bolt (A).

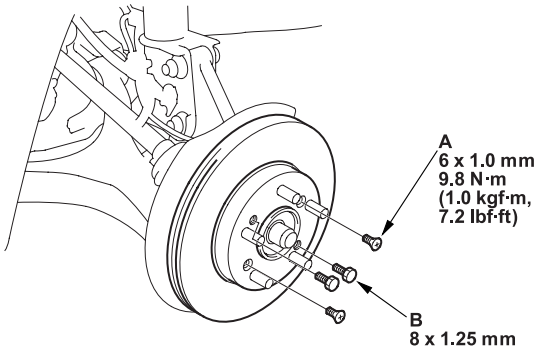


4. Remove the caliper bracket mounting bolts (B), and remove the caliper assembly (C) from the knuckle. To prevent damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper assembly from the undercarriage. Do not twist the brake hose with force.

5. Raise the stake (A), and remove the spindle nut (B).



6. Remove the brake disc retaining flat screws (A).



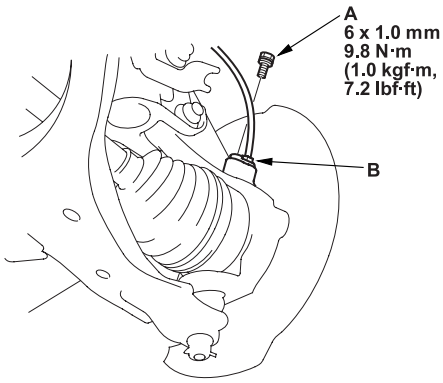
7. Screw two 8 ×1.25 mm bolts (B) into the disc to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the disc excessively.

(cont'd)

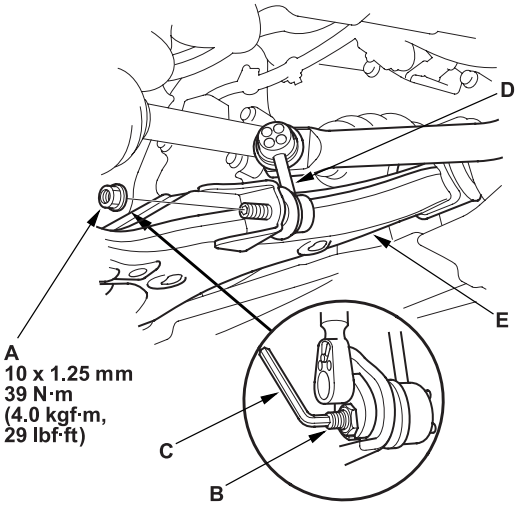
Knuckle/Hub/Wheel Bearing Replacement (cont'd)

Knuckle/Hub Replacement (cont'd)

8. Remove the flange bolt (A) and wheel sensor (B) from the knuckle. Do not disconnect the wheel sensor connector.

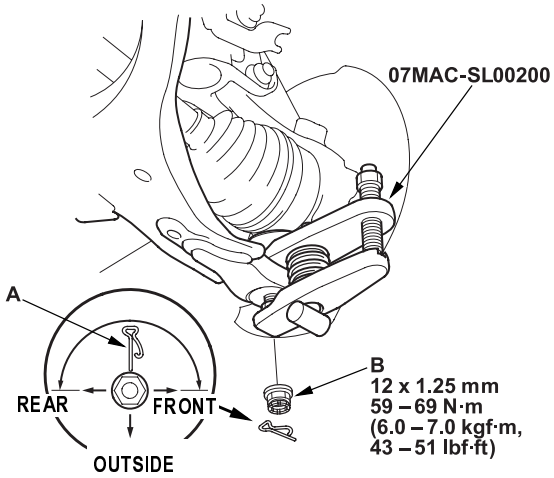


9. Remove the flange nut (A) while holding the joint pin (B) with a hex wrench (C), and disconnect the stabilizer link (D) from the lower arm (E).



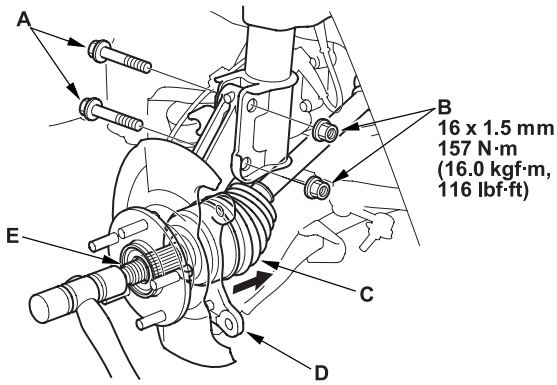
10. Remove the clip (A) from the lower arm ball joint, and remove the castle nut (B).

NOTE: During installation, insert the clip into the ball joint pin from the inside to the outside of the vehicle. The closed end of the clip must be in the range shown.



11. Disconnect the lower arm from the knuckle using the special tool (see page 18-10).

12. Loosen the damper pinch bolts (A) while holding the nuts (B), and remove the bolts and nuts.



13. Remove the driveshaft outboard joint (C) from the knuckle (D) by tapping the driveshaft end (E) with a plastic hammer while drawing the knuckle outward, then remove the knuckle.

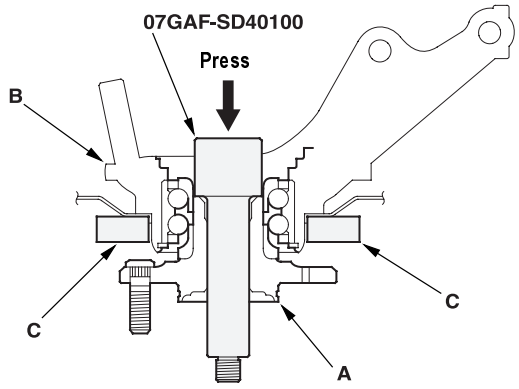
NOTE: Do not pull the driveshaft end outward. The driveshaft joint may come off.

14. Install the knuckle/hub/in the reverse order of removal, and note these items:

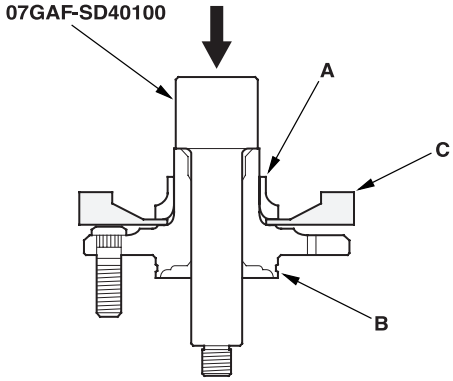
- Be careful not to damage the ball joint boot when installing the knuckle.
- Tighten all mounting hardware to the specified torque values.
- First install all the components and lightly tighten the bolts and nuts, then raise the suspension to load it with the vehicle's weight before fully tightening to the specified torques. Do not place the jack against the ball joint pin of the lower arm.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the clip hole. Do not align the castle nut by loosening it.
- Install a new clip on the castle nut after torquing.
- Use a new spindle nut on reassembly.
- Before installing the spindle nut, apply a small amount of engine oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.
- Replace the self-locking nuts, damper pinch bolts and nuts with new ones.
- Before installing the brake disc, clean the mating surface of the front hub and the inside of the brake disc.
- Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
- Check the front wheel alignment, and adjust it if necessary (see page 18-4).

Wheel Bearing Replacement

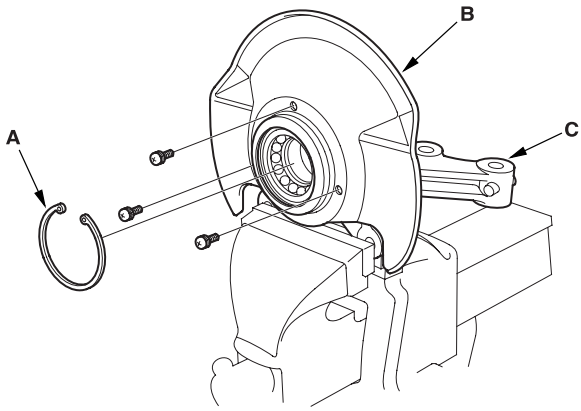
1. Separate the hub (A) from the knuckle (B) using the special tool and a hydraulic press. Hold the knuckle with the attachment (C) of the hydraulic press or equivalent tool. Be careful not to deform the splash guard. Hold onto the hub to keep it from falling when pressed clear.



2. Press the wheel bearing inner race (A) off of the hub (B) using the special tool, a commercially available bearing separator (C), and a press.



3. Remove the snap ring (A) and the splash guard (B) from the knuckle (C).

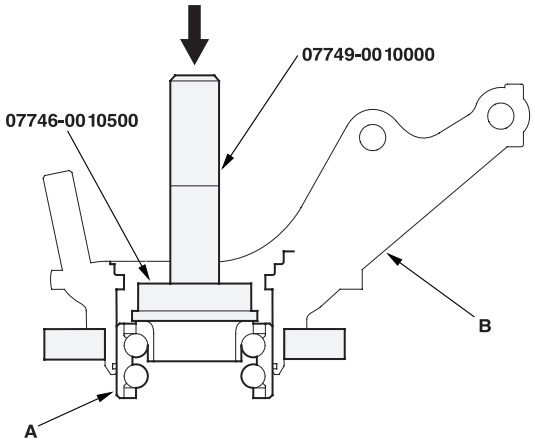


(cont'd)

Knuckle/Hub/Wheel Bearing Replacement (cont'd)

Wheel Bearing Replacement (cont'd)

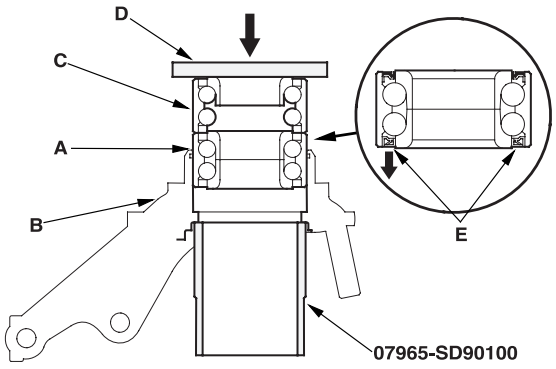
4. Press the wheel bearing (A) out of the knuckle (B) using the special tool and a press.



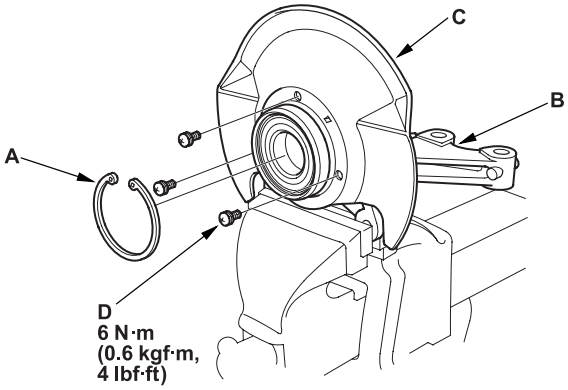
5. Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

6. Press a new wheel bearing (A) into the knuckle (B) using the old bearing (C), a steel plate (D), the special tool, and a press.

NOTE:
- Install the wheel bearing with the magnetic encoder (E) (brown color), toward the inside of the knuckle.
- Remove any oil, grease, dust and other foreign material from the encoder surface.
- Keep any magnetic tools away from the encoder surface.
- Be careful not to damage the encoder surface when you insert wheel bearing.

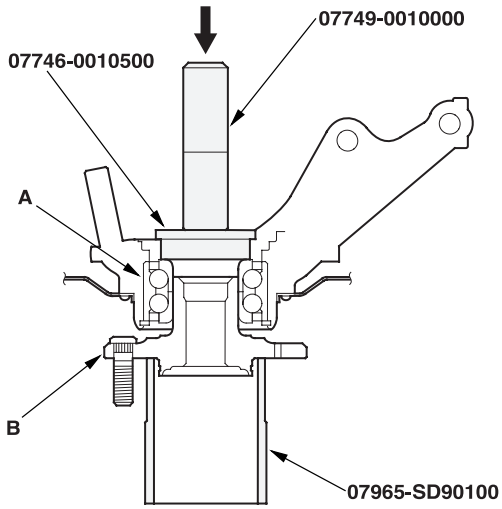


7. Install the snap ring (A) securely in the knuckle (B).



8. Install the splash guard (C), and tighten the screws (D) to the specified torque.

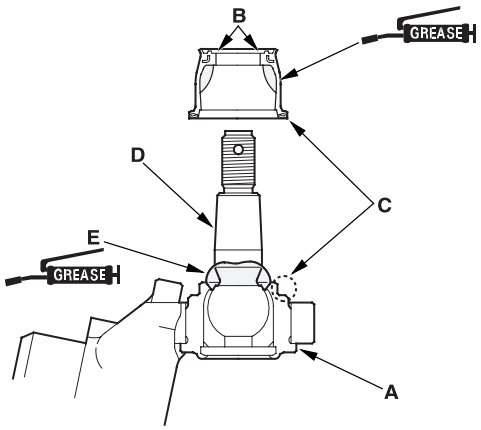
9. Press a wheel bearing (A) onto the hub (B) using the special tools and a press.



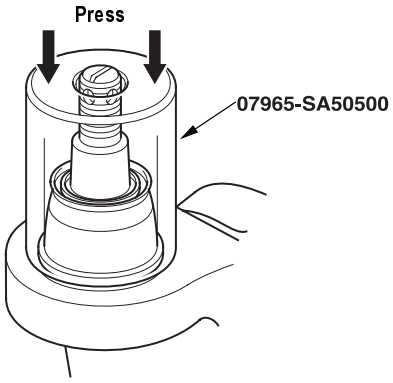
Ball Joint Boot Replacement

Special Tools Required
Front hub dis/assembly tool 07965-SA50500

1. Remove the boot. Check for a gap (A) between the ball joint and the knuckle. If there is a gap, replace the knuckle assembly. Do not press the ball joint back into the knuckle.
2. Pack the interior and lip (B) of a new boot with fresh grease. Keep the grease off of the boot-to-knuckle mating surfaces (C).



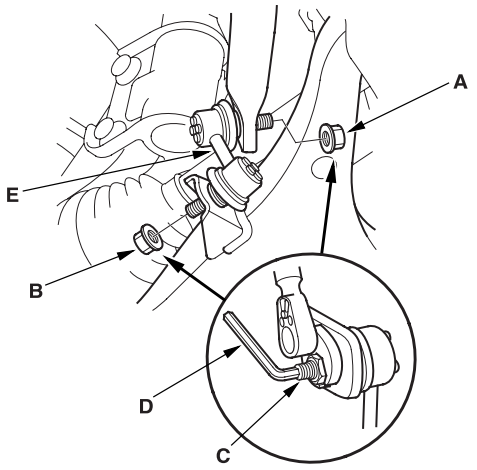
3. Wipe the grease off the tapered section of the pin (D), and pack fresh grease onto the base (E).
4. Install the boot onto the ball joint pin, then squeeze it gently to force out any air. Do not let dirt or other foreign materials get into the boot.
5. Press the boot with the special tool until the bottom seats on the knuckle (A) evenly around.



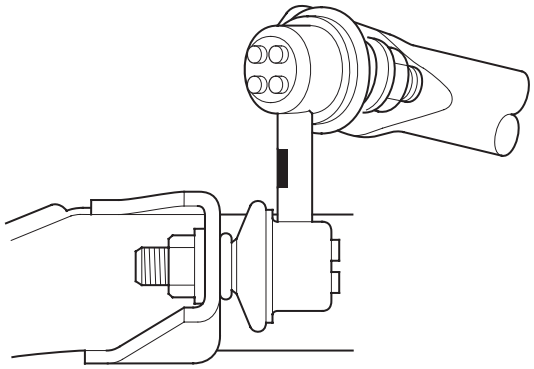
6. After installing a boot, wipe any grease off the exposed portion of the ball joint pin.

Stabilizer Link Replacement

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the self-locking nut (A) and flange nut (B) while holding the respective joint pin (C) with a hex wrench (D), and remove the stabilizer link (E).



3. Install the stabilizer link on the stabilizer bar and lower arm with the joint pins set at the center of each moving range.



4. Install the self-locking nut and flange nut, and lightly tighten them.

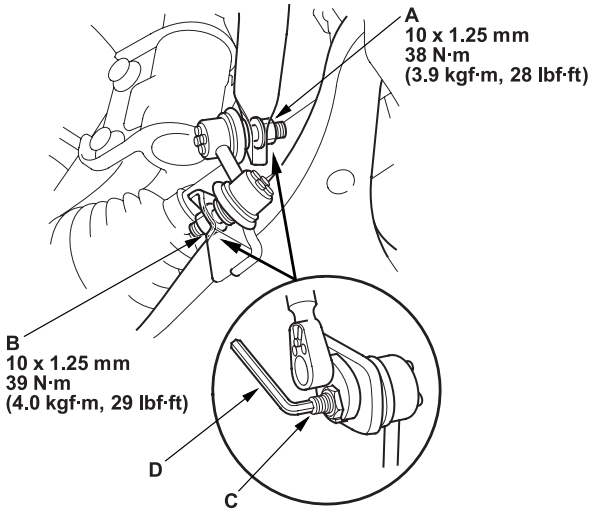
   NOTE: Use a new self-locking nut on reassembly.

5. Place the floor jack under the lower arm ball joint, and raise the suspension to load it with the vehicle's weight.

   NOTICE

   Do not place the jack against the ball joint pin of the lower arm.

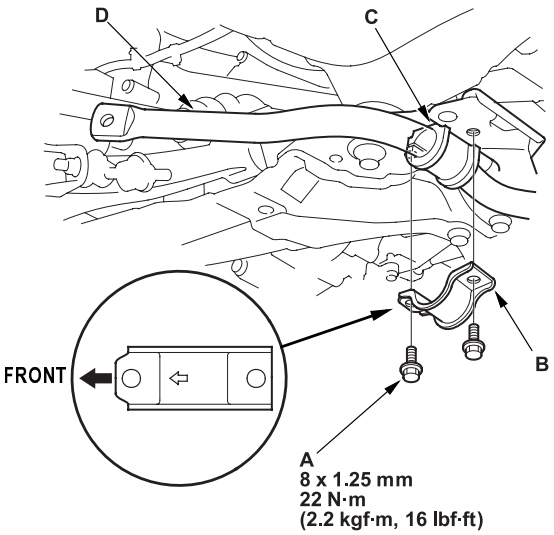
6. Tighten the new self-locking nut (A) and flange nut (B) to the specified torque values while holding the respective joint pins (C) with a hex wrench (D).



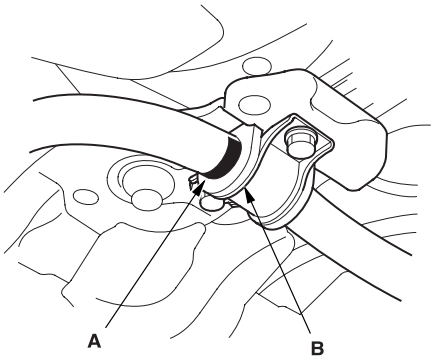
7. After 5 minutes of driving, re-tighten the self-locking nut again to the specified torque.

Stabilizer Bar Replacement

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Disconnect the stabilizer links from the stabilizer bar on the right and left (see page 18-18).
3. Remove the flange bolts (A) and bushing holders (B), then remove the bushings (C) and the stabilizer bar (D).



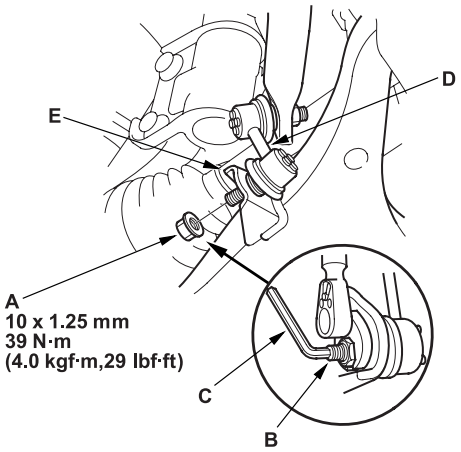
4. Install the stabilizer bar in the reverse order of removal, and note these items:
   - Use new self-locking nuts on reassembly.
   - Note the right and left direction of the stabilizer bar.
   - Align the ends of the paint marks (A) on the stabilizer bar with each end of the bushings (B).
   - Note the fore/aft direction of the bushing holders.
   - Refer to Stabilizer Link Replacement to connect the stabilizer bar to the links (see page 18-18).



Lower Arm Replacement

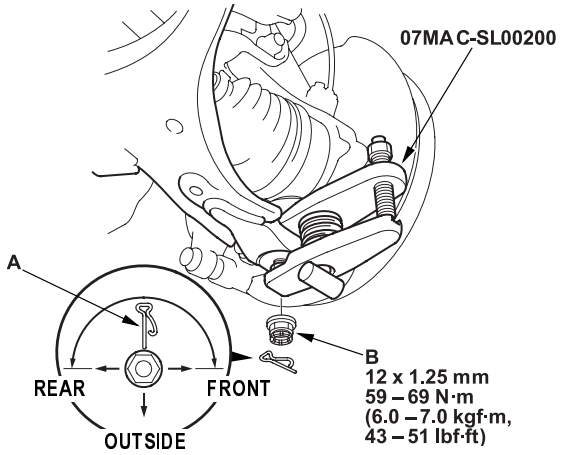
Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the flange nut (A) while holding the joint pin (B) with a hex wrench (C), and disconnect the stabilizer link (D) from the lower arm (E).

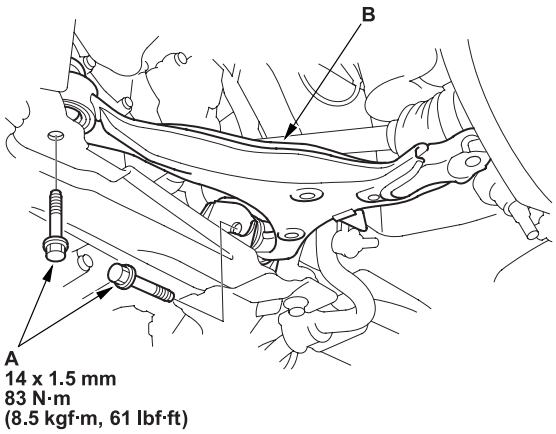


3. Remove the clip (A) from the lower arm ball joint, and remove the castle nut (B).

   NOTE: During installation, insert the clip into the ball joint pin from the inside to the outside of the vehicle. The closed end of the clip must be in the range shown.



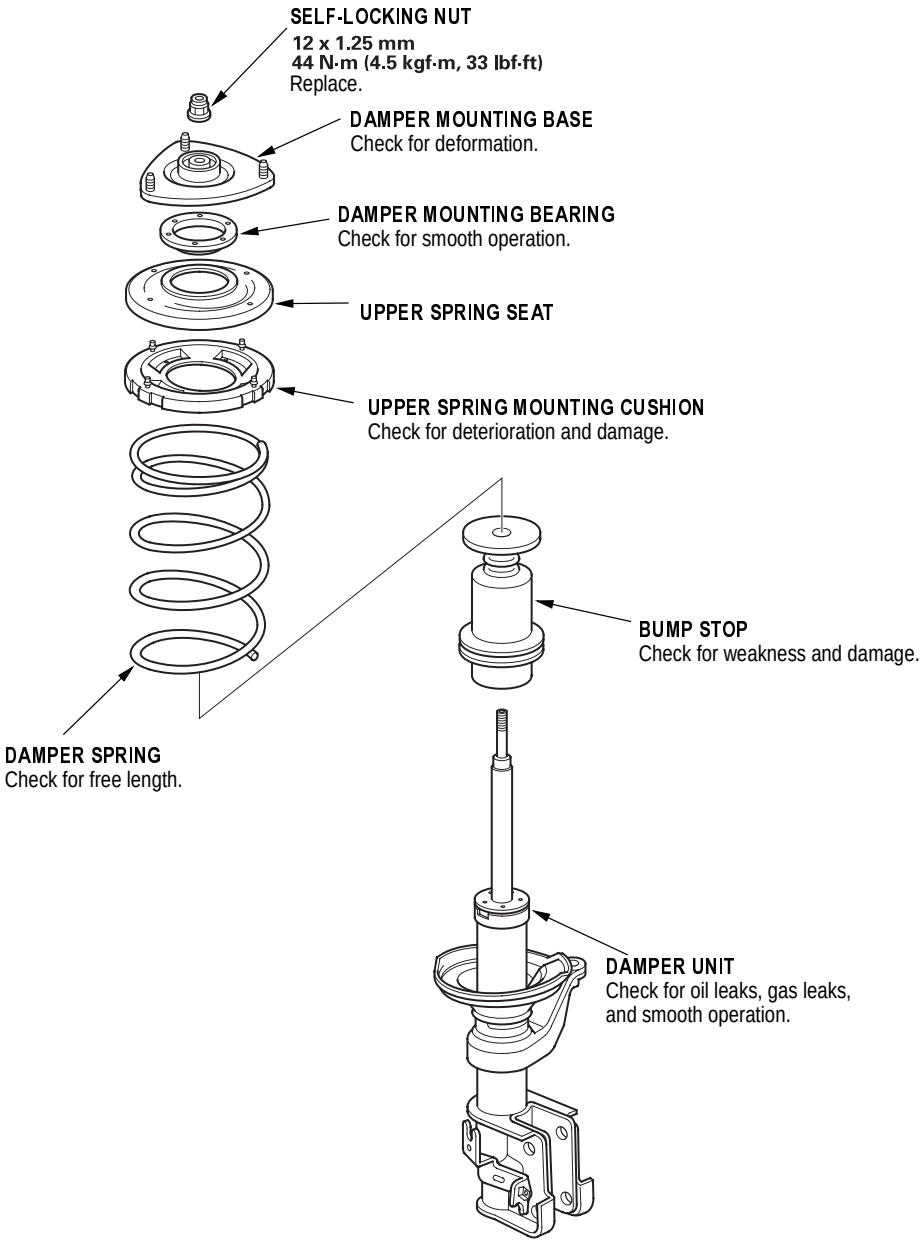
4. Disconnect the lower arm from the knuckle using the special tool (see page 18-10).
5. Remove the flange bolts (A), and remove the lower arm (B).



6. Install the lower arm in the reverse order of removal, and note these items:
   - Be careful not to damage the ball joint boot when connecting the lower arm to the knuckle.
   - Tighten all mounting hardware to the specified torque values.
   - First install all the components and lightly tighten the bolts and nuts, then raise the suspension to load it with the vehicle's weight before fully tightening it to the specified torques. Do not place the jack on the lower arm ball joint.
   - Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the clip hole. Do not align the castle nut by loosening it.
   - Install a new clip on the castle nut after torquing.
   - Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
   - Check the wheel alignment, and adjust it if necessary (see page 18-4).

Damper/Spring Replacement

Exploded View



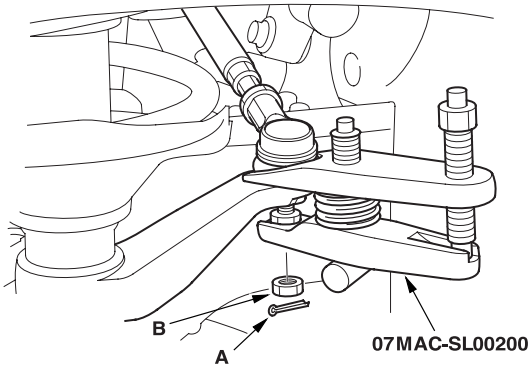
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Damper/Spring Replacement (cont'd)

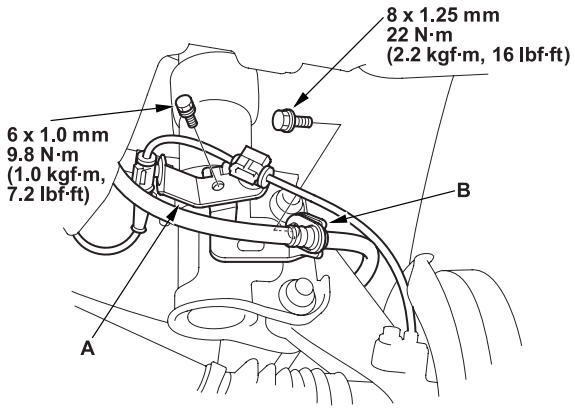
Special Tools Required
Ball joint remover, 28 mm 07MAC-SL00200

Removal

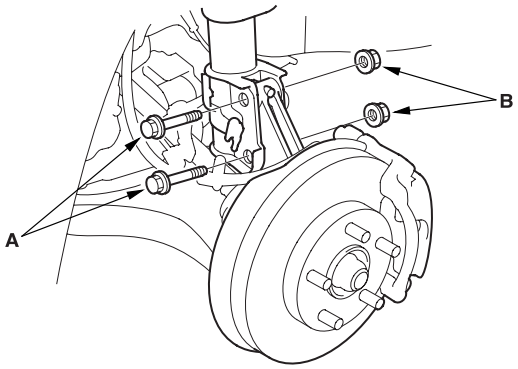
1. Raise the front of the vehicle, and make sure it is securly supported. Remove the front wheels.
2. Remove the cotter pin (A) from the tie-rod end ball joint, and remove the nut (B).



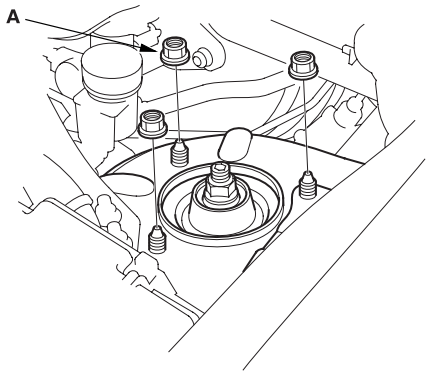
3. Disconnect the tie-rod end from the steering arm on the damper using the special tool (see page 18-10).
4. Remove the bolts, and remove the wheel sensor harness bracket (A) and brake hose bracket (B) from the damper. Do not disconnect the wheel sensor connector.



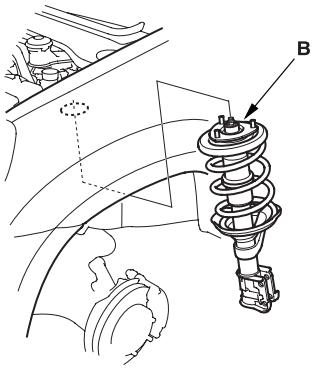
5. Remove the damper pinch bolts (A) while holding the nuts (B).



6. Remove the flange nuts (A) from the top of the damper.

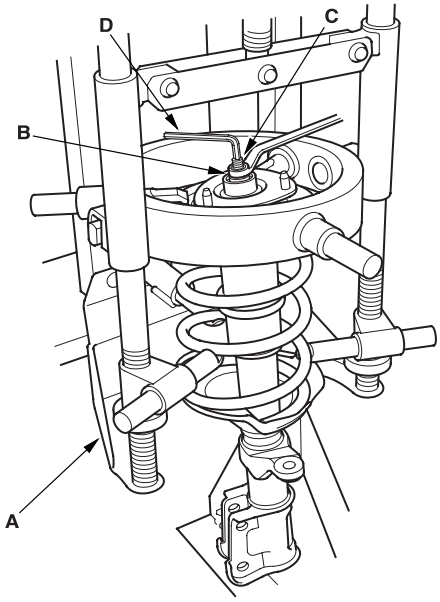


7. Lower the lower arm, and remove the damper assembly (B).



Disassembly/Inspection

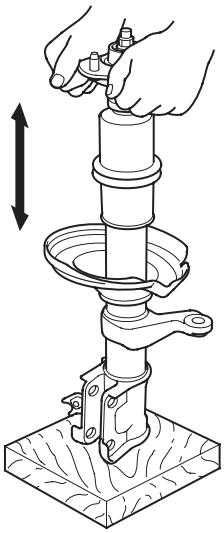
1. Compress the damper spring with the commercially available strut compressor (A) according to the manufacturer's instructions, then remove the self-locking nut (B) while holding the damper shaft (C) with a hex wrench (D). Do not compress the spring more than necessary to remove the nut.



2. Release the pressure from the strut spring compressor, then disassemble the damper as shown in the Exploded View.

3. Reassemble all the parts, except for the apper spring seat and spring.

4. Compress the damper assembly by hand, and check for smooth operation through a full stroke, both compression and extension. The damper should extend smoothly and constantly when compression is released. If it does not, the gas is leaking and the damper should be replaced.



5. Check for oil leaks, abnormal noises, and binding during these tests.

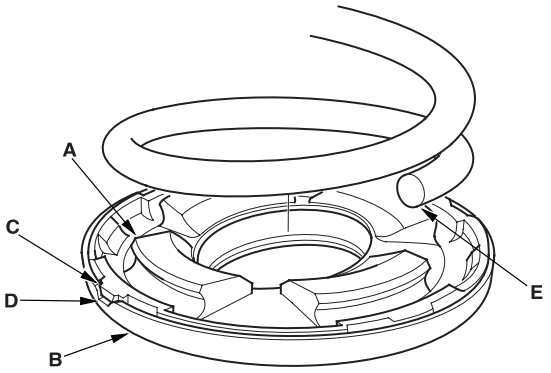
(cont'd)

Damper/Spring Replacement (cont'd)

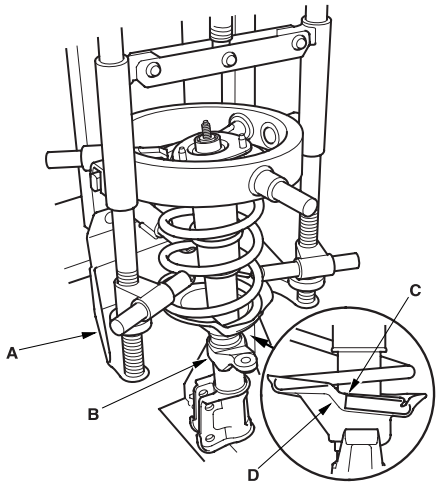
Reassembly

NOTE: Refer to the Exploded View as needed.

1. Install the upper spring mounting cushion (A) on the upper spring seat (B) by aligning the log portion (C) on cushion with cutout (D) in the seat.

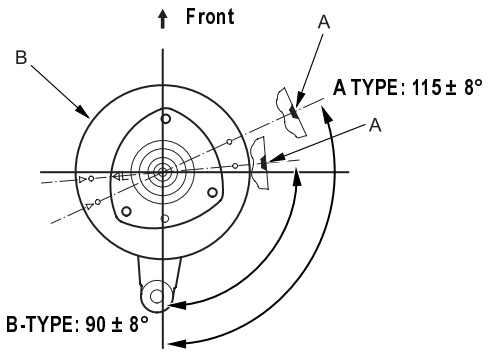


2. Install the spring (E) in the groove of the cushion securely fitted.
3. Install the damper mounting bearing and damper mounting base on the upper spring seat.
4. Install the upper spring seat and the spring on a commercially available strut spring compressor (A), and compress the spring lightly.

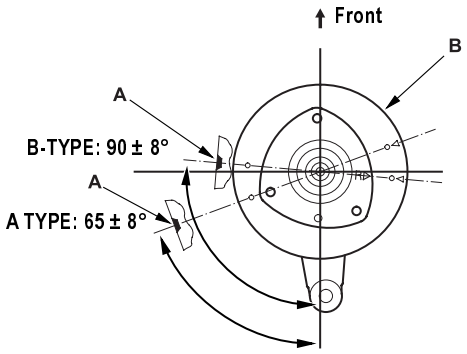


5. Insert the damper unit (B) up through the compressed spring.
6. Align the bottom of the spring (C) and the stepped part (D) of the lower spring seat.
7. Check that the cutout (A) in the side of the upper spring seat (B) is in position shown. Note that there are two types of the damper, A type and B type, and the cutout position is different from type to type.
   A type damper: P/N 51601/51602-S9A-G02
   B type damper: P/N 51601/51602-S9A-G12
   The part No. is shown on the damper unit label. If the cutout is out of position, repeat to the step 1 and reassemble the spring and upper spring seat accordingly.

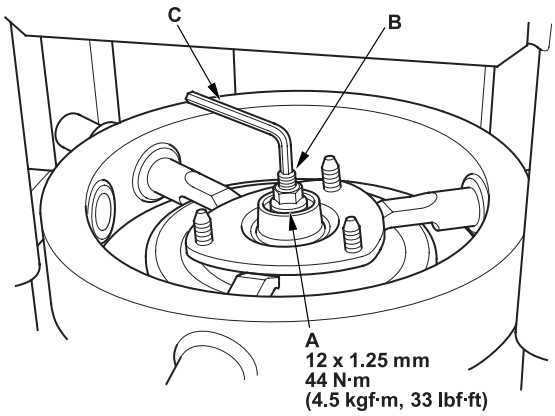
Left side:



Right side:



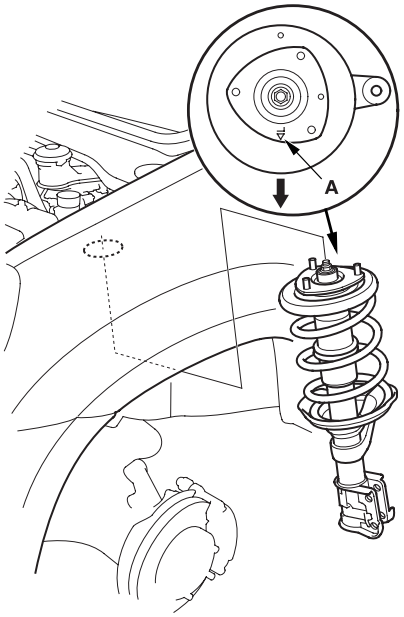
8. Hold the bottom of the damper with your hand, and compress the spring. Do not compress the spring excessively.
9. Install the 12 mm nut (A) on the damper shaft (B). Hold the damper shaft with a hex wrench (C), and tighten the 12 mm nut to the specified torque.



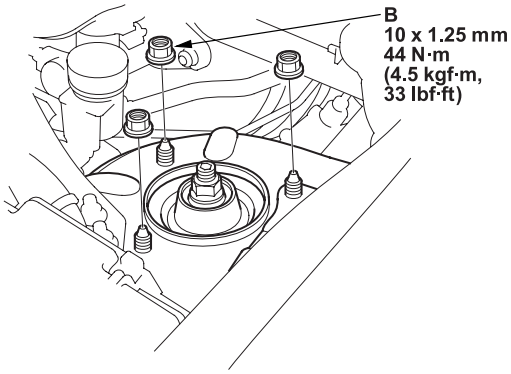
10. Remove the damper assembly from the strut spring compressor.

Installation

1. Lower the lower arm, and position the damper assembly in the body. Turn the damper mounting base so that the " ◁L" mark (A) faces toward the outside of the vehicle.



2. Loosely install flange nuts (B) onto the top of the damper.

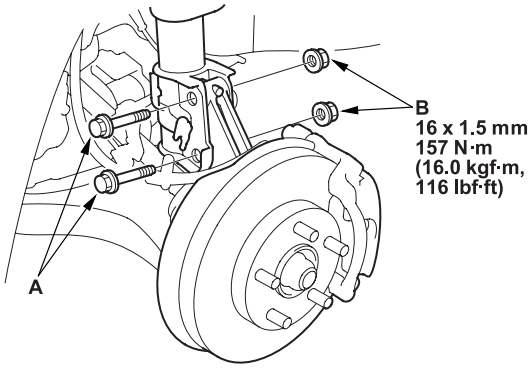


(cont'd)

Damper/Spring Replacement (cont'd)

Installation (cont'd)

3. Position the damper on the knuckle, and install the new damper pinch bolts (A) and nuts (B), and lightly tighten the nuts.

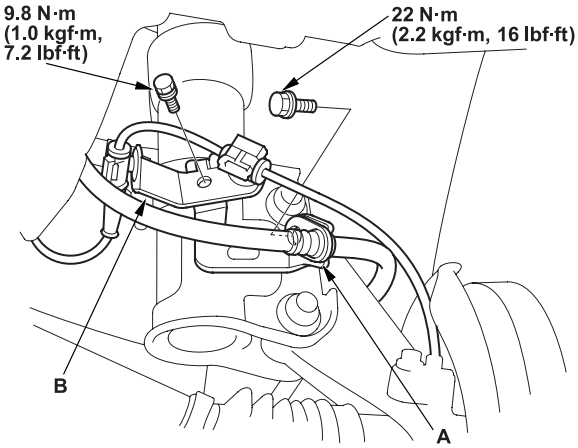


4. Place the floor jack under the lower arm ball joint, and raise the suspension to load it with the vehicle's weight.

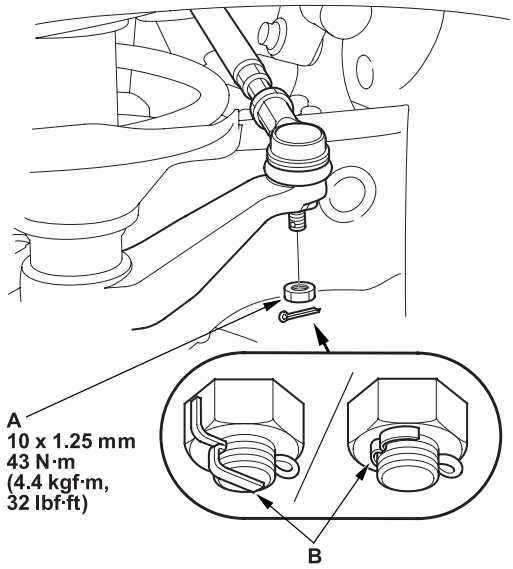
   NOTICE

   Do not place the jack against the lower arm ball joint.

5. Tighten the flange nuts on the top of the damper to the specified torque.
6. Tighten the damper pinch nuts to the specified torque.
7. Install the brake hose bracket (A) and the wheel sensor harness bracket (B) onto the damper, and tighten the bolt to the specified torque.



8. Connect the tie-rod end to the steering arm, and tighten the nut (A) to the specified torque. Install the cotter pin (B) after tightening, and bend its end as shown.

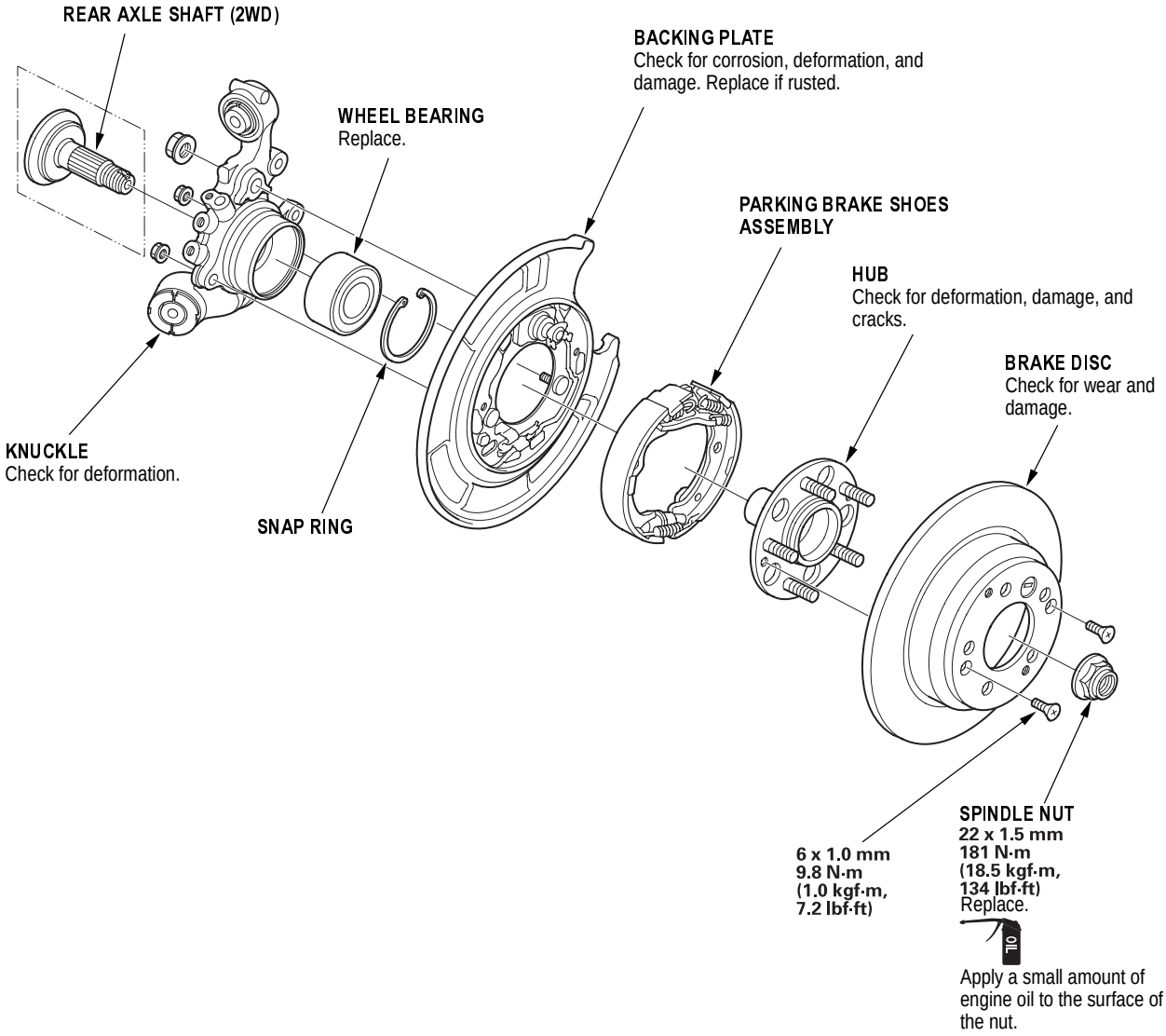


9. Clean the mating surface of the brake disc and the inside of the wheel, then install the front wheels.
10. Check the wheel alignment, and adjust it if necessary (see page 18-4).

Rear Suspension

Knuckle/Hub/Wheel Bearing Replacement

Exploded View



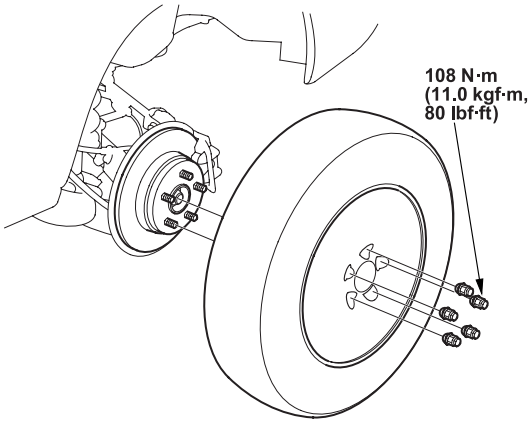
(cont'd)

Knuckle/Hub/Wheel Bearing Replacement (cont'd)

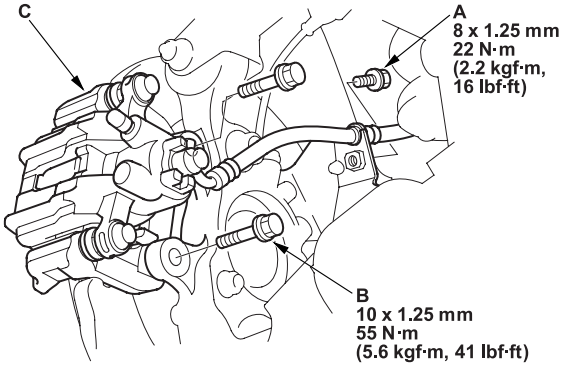
Special Tools Required
- Hub dis/assembly tool 34 mm 07965-SA70100
- Ball joint remover, 28 mm 07MAC-SL00200
- Attachment 62 × 68 mm 07746-0010500
- Driver 07749-0010000
- Support base 07965-SD90100

Knuckle Replacement

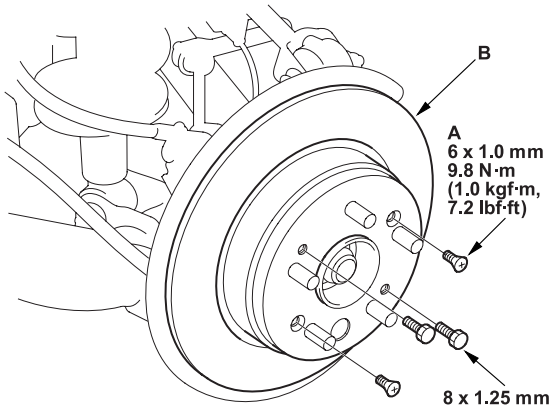
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Release the parking brake lever.



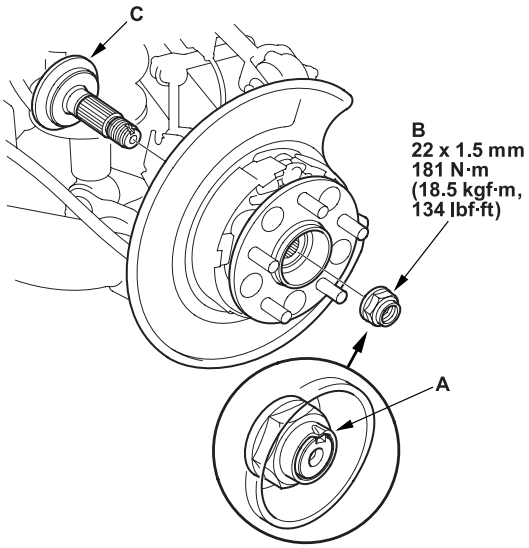
3. Remove the brake hose mounting bolt (A).
4. Remove the caliper bracket mounting bolts (B), and hang the caliper (C) to one side. To prevent damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.



5. Remove the brake disc retaining screw (A), screw two 8 × 1.25 mm bolts into the brake disc/drum (B) to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the brake disc/drum excessively. Remove the brake disc/drum.



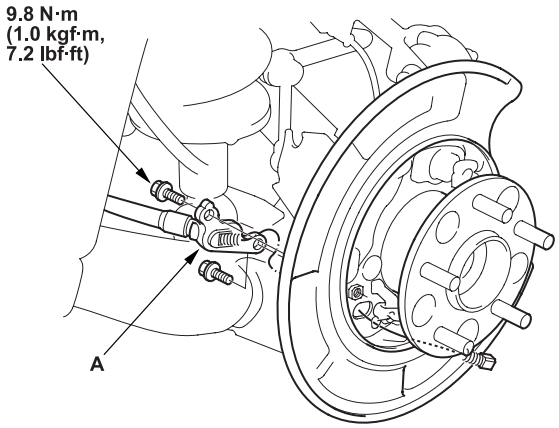
6. Raise the stake (A), and remove the spindle nut (B) and rear axle shaft (vehicles with 2WD) (C).



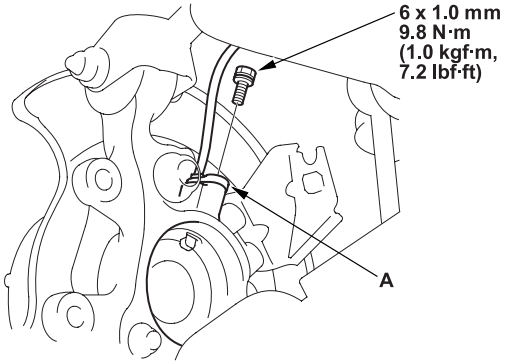
7. Remove the parking brake shoes (see page 19A-36).

8. Remove the parking brake cable (A) from the backing plate.

   NOTE: The parking brake cable must not be bent or distorted. This will lead to stiff operation and premature cable failure.

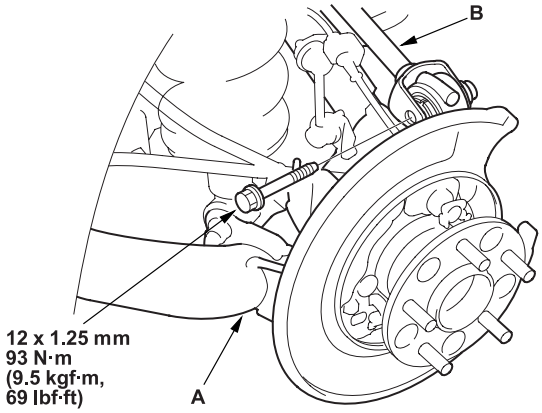


9. Remove the wheel sensor (A) from the knucke (if equipped with ABS).



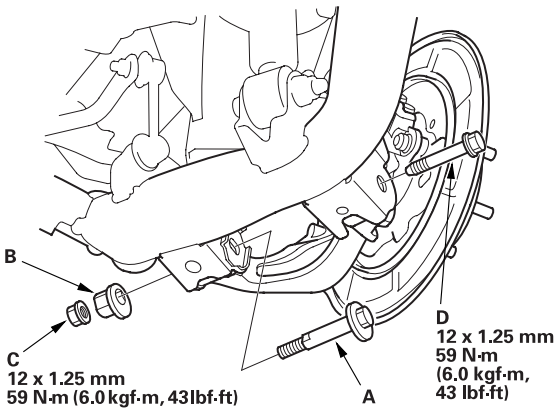
10. Place a floor jack under the trailing arm (A) to support it.

    NOTE: Do not place the jack against the plate section of the lower arm. Be careful not to damage any suspension components.



11. Remove the flange bolt, and disconnect the upper arm (B) from the knuckle.

12. Mark the cam positions of the adjusting bolt (A) and adjusting cam (B), then remove the self-locking nut (C), adjusting cam, and adjusting bolt. Discard the self-locking nut.

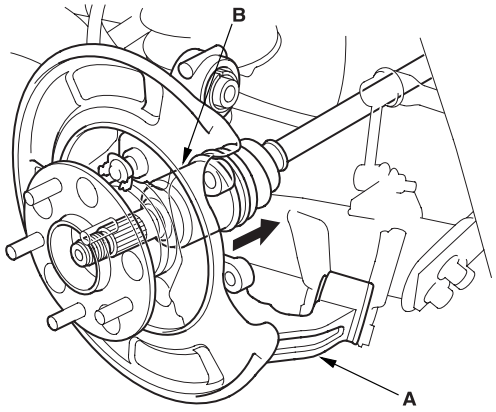


(cont'd)

Knuckle/Hub/Wheel Bearing Replacement (cont'd)

Knuckle Replacement (cont'd)

13. Remove the knuckle (A) while pushing in the driveshaft and holding the driveshaft outboard joint (B). (4WD only)

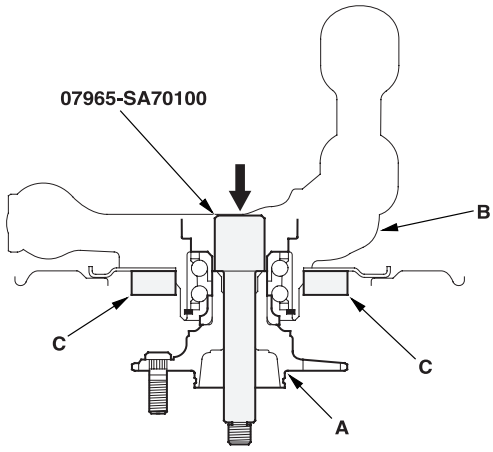


14. Install the knuckle in the reverse order of removal, and note these items:

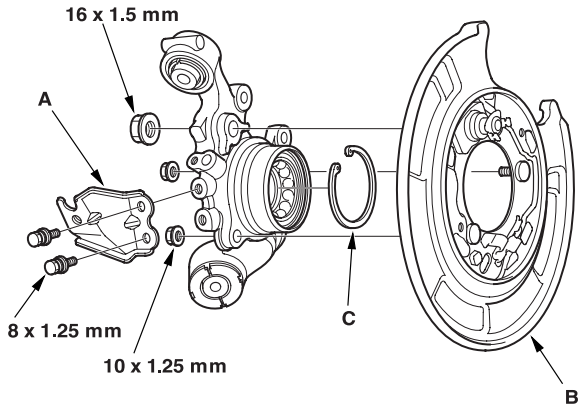
- First install all the suspension components, and lightly tighten the bolts and nuts, then place a floor jack under the lower arm, and raise the suspension to load it with the vehicle's weight before fully tightening the bolts and nuts to the specified torque values.
- Align the cam positions of the adjusting bolt (A) and adjusting cam (B) with the marked positions when tightening.
- Use a new self-locking nut on reassembly.
- Use a new spindle nut on reassembly.
- Before installing the spindle nut, apply a small amount of engine oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.
- Before installing the brake disc/drum,clean the mating surfaces of the rear hub and the inside of the brake disc/drum.
- Before installing the wheel, clean the mating surfaces of the brake disc/drum and the inside of the wheel.
- Check the rear wheel alignment, and adjust it if necessary (see page 18-4).

Wheel Bearing Replacement

1. Separate the hub (A) from the knuckle (B) using the special tool and a hydraulic press. Hold the knuckle with a press attachment (C) or equivalent tool. Be careful not to deform the splash guard. Hold onto the hub to keep it from falling when pressed clear.

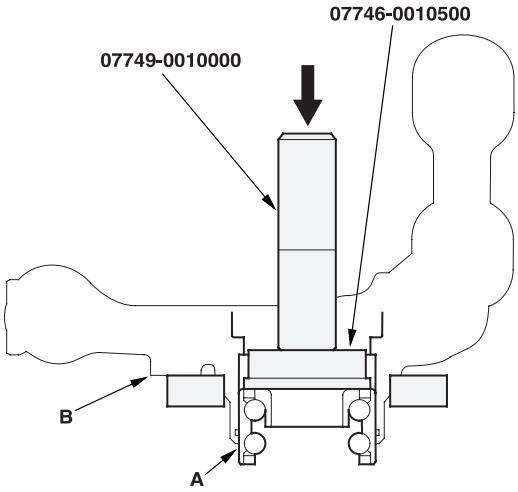


2. Remove the brake hose mounting bracket (A).

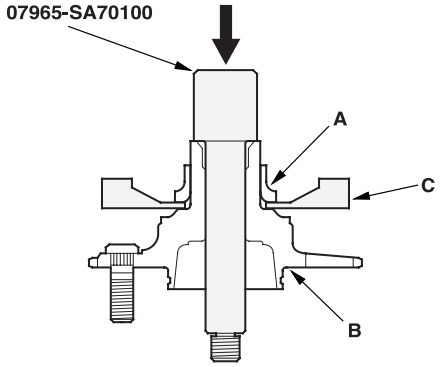


3. Remove the backing plate (B), and snap ring (C).

4. Press the wheel bearing (A) out of the knuckle (B) using the special tools and a press.



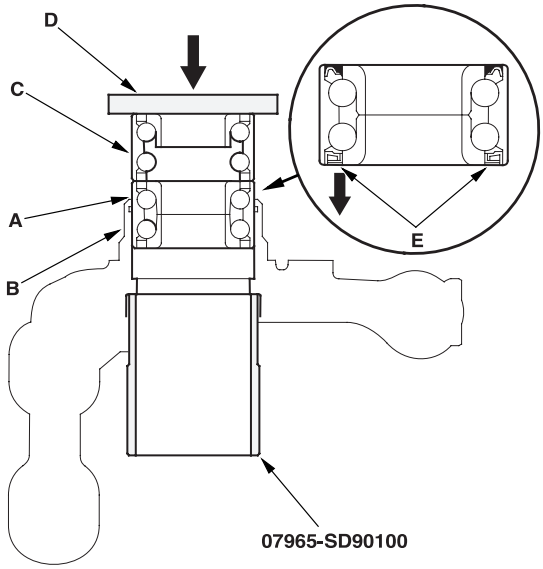
5. Press the wheel bearing inner race (A) from the hub (B) using the special tool, a commercially available bearing separator (C), and a press.



6. Wash the knuckle and hub thoroughly in high flesh point solvent before reassembly.

7. Press a new wheel bearing (A) into the knuckle (B) using the old bearing (C), a steel plate (D), the special tool, and a press. Be careful not to damage the sleeve of the pack seal.

   NOTE:
   - Install the wheel bearing with the magnetic encorder (E) (brown color), toward the inside of the knuckle.
   - Remove any oil, grease, dust and other foreign material from the encoder surface.
   - Keep any magnetic tools away from the encoder surface.
   - Be careful not to damage the encoder surface when you insert wheel bearing.

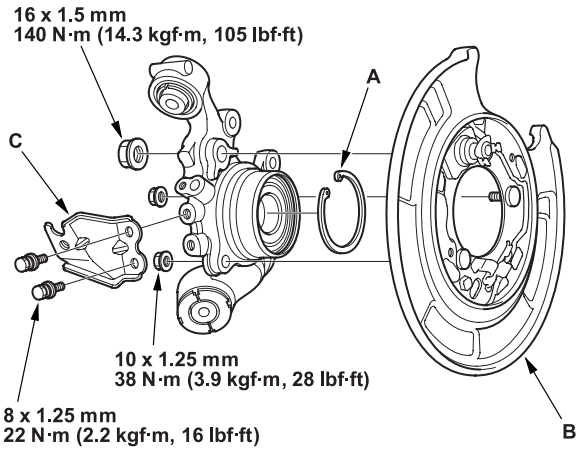


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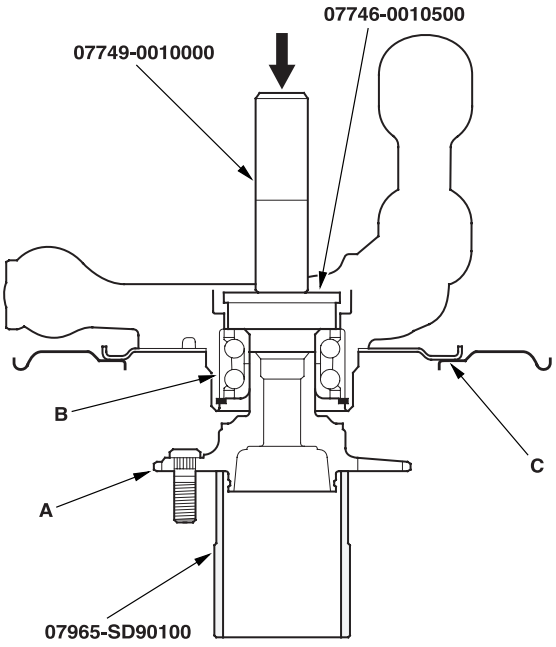
Knuckle/Hub/Wheel Bearing Replacement (cont'd)

Wheel Bearing Replacement (cont'd)

8. Install the snap ring (A), backing plate (B), and brake hose mounting bracket (C). Tighten the flange nuts and bolts to the specified torque.



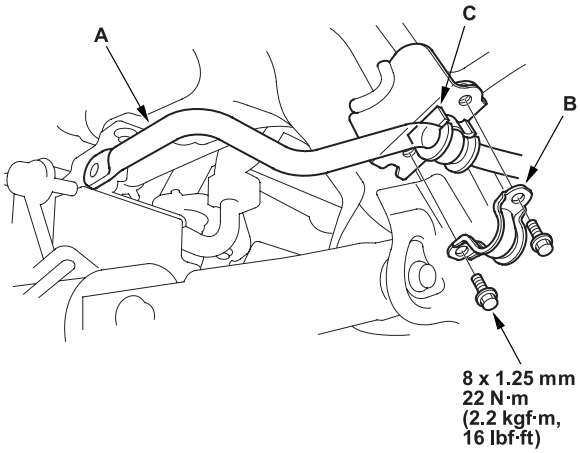
9. Install the hub (A) on the knuckle (B) using the special tools and a hydraulic press. Be careful not to deform the backing plate (C).



Stabilizer Bar Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.

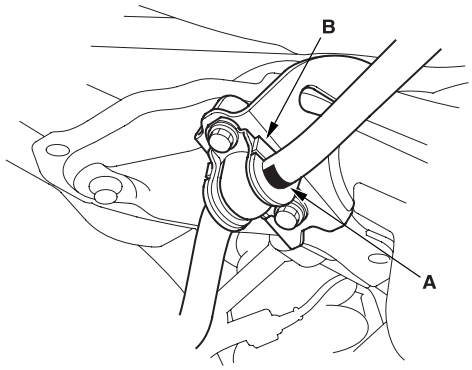
2. Disconnect the stabilizer links from the stabilizer bar (A) on the right and left (see page 18-33).



3. Remove the flange bolts and bushing holders (B), then remove the bushings (C) and the stabilizer bar.

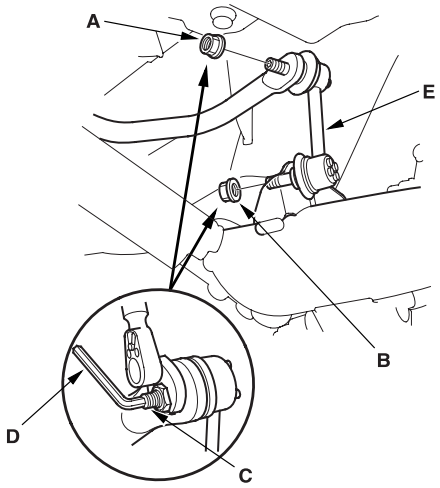
4. Install the stabilizer bar in the reverse order of removal, and note these items:

- Use new self-locking nuts on reassembly.
- Make sure the right and left ends of the stabilizer bar are installed on their respective sides of the vehicle.
- Align the ends of the paint marks (A) on the stabilizer bar with the bushings (B).
- Refer to Stabilizer Link Replacement to connect the stabilizer bar to the links (see page 18-33).

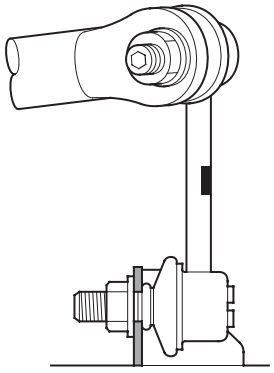


Stabilizer Link Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Remove the self-locking nut (A) and flange nut (B) while holding the respective joint pin (C) with a hex wrench (D), and remove the stabilizer link (E).



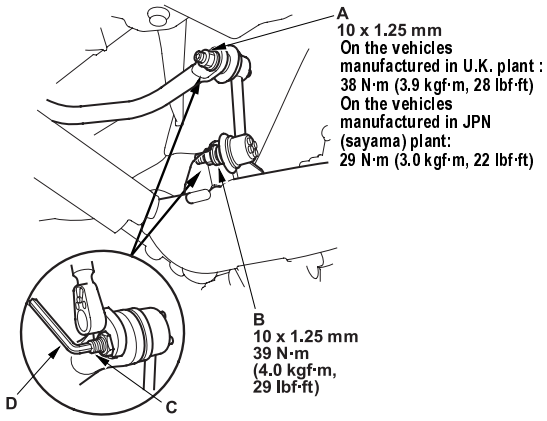
3. Install the stabilizer link on the stabilizer bar and trailing arm with the joint pins set at the center of each moving range.



4. Install the self-locking nut and flange nut, and lightly tighten them.

   NOTE: Use a new self-locking nut on reassembly.

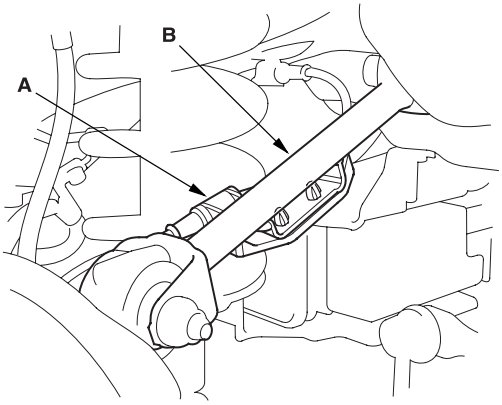
5. Place a jack under the trailing arm at the knuckle side end, and raise the suspension to load it with the vehicle's weight.
6. Tighten the new self-locking nut (A) and flange nut (B) to the specified torque values while holding the respective joint pins (C) with a hex wrench (D).



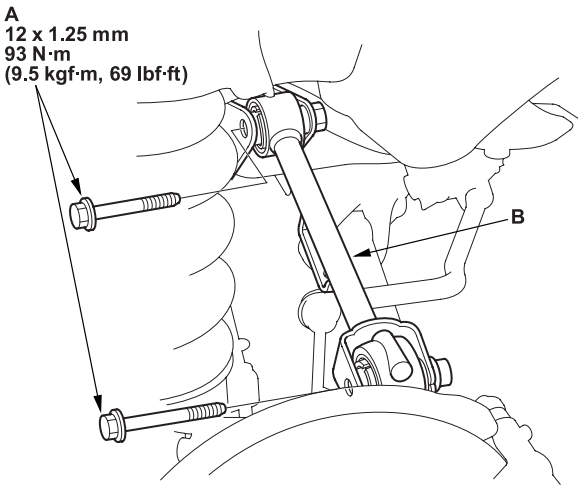
7. After 5 minutes of driving, re-tighten the self-locking nut again to the specified torque.

Upper Arm Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Place a floor jack under the trailing arm, and support the suspension.
3. Remove the wheel sensor harness bracket (A) from the upper arm (B).



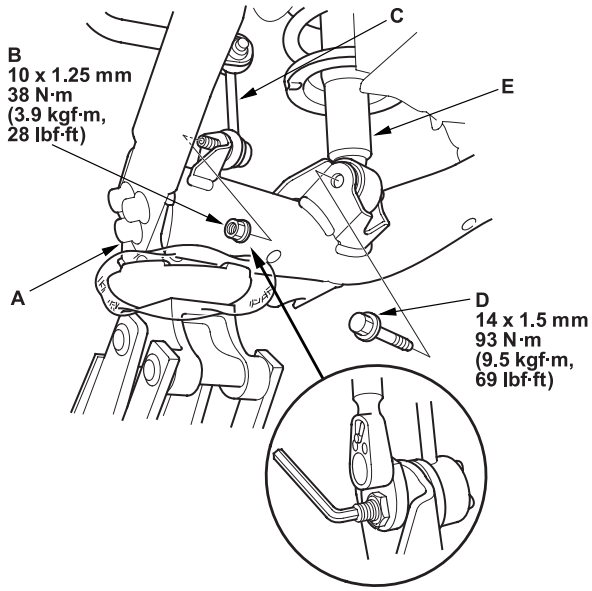
4. Remove the flange bolts (A), and remove the upper arm (B).



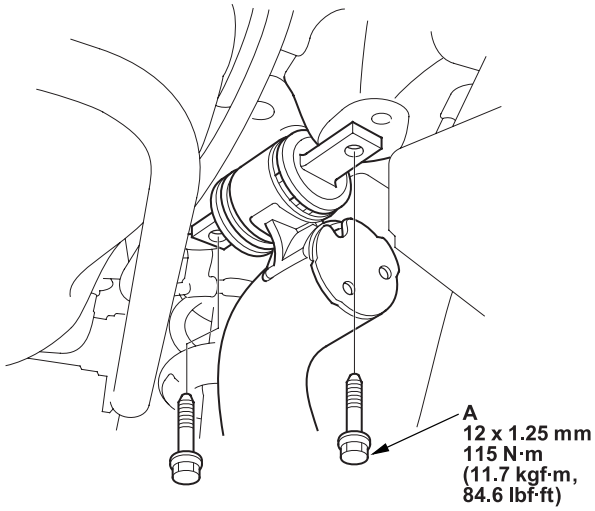
5. Install the upper arm in the reverse order of removal, and note these items:
   - First install all the suspension components and lightly tighten the bolts and nuts, then place a jack under the trailing arm, and raise the suspension to load it with the vehicle's weight before fully tightening the bolts and nuts to the specified torque values.
   - Tighten all the mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
   - Check the wheel alignment, and adjust it if necessary (see page 18-4).

Trailing Arm Replacement

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Remove the knuckle (see page 18-28).
3. Place the floor jack under the trailing arm (A) to support it.



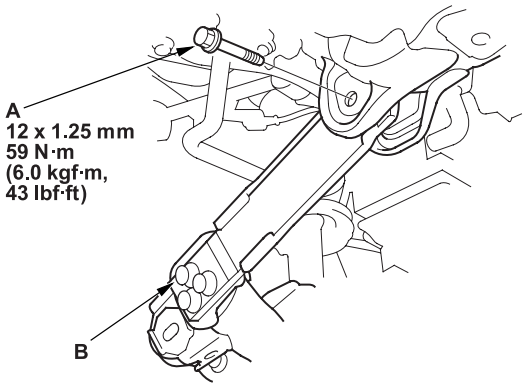
4. Remove the flange nut (B), and disconnect the stabilizer link (C) from the trailing arm.
5. Remove the flange bolt (D), and disconnect the damper (E) from the trailing arm.
6. Remove the trailing arm front mounting bolts (A).



7. Remove the trailing arm rear mounting bolt (A).

NOTICE

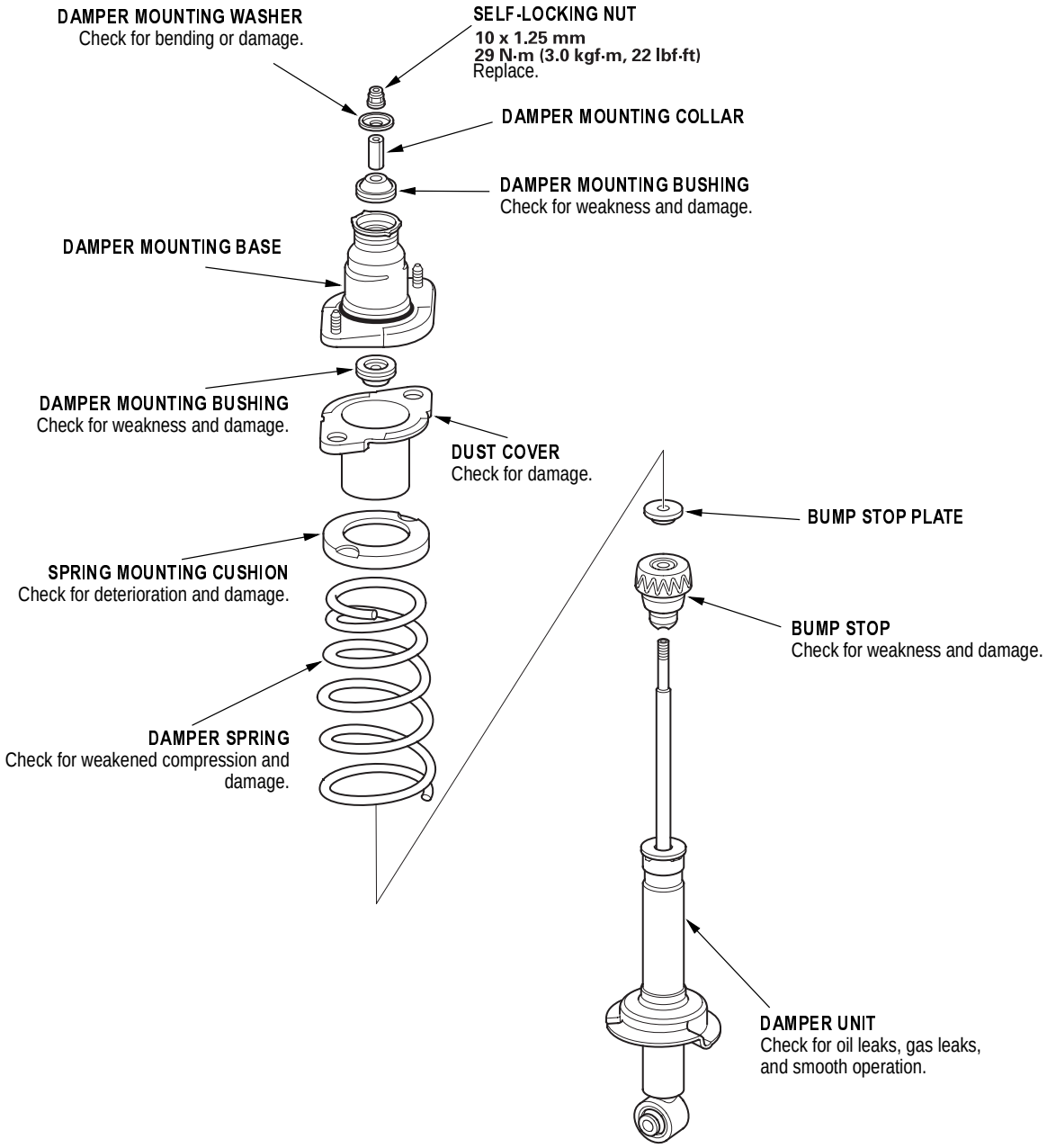
Do not loosen the special bolts (B) on the trailing arm.



8. Lower the jack, and remove the trailing arm.
9. Install the trailing arm in the reverse order of removal, and note these items:
   - First install all the suspension components and lightly tighten the bolts and nuts, then place a jack under the trailing arm, and raise the suspension to load it with the vehicle's weight before fully tightening the bolts and nuts to the specified torque values.
   - Tighten all the mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
   - Check the wheel alignment, and adjust it if necessary (see page 18-4).

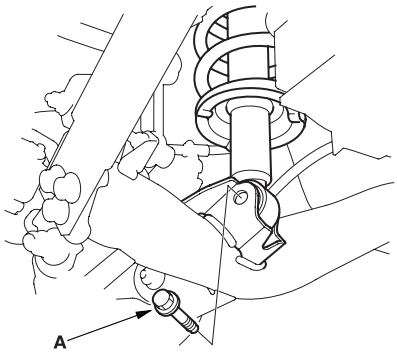
Damper/Spring Replacement

Exploded View

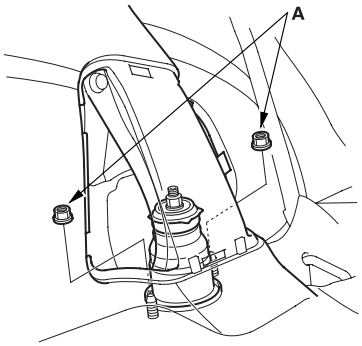


Removal

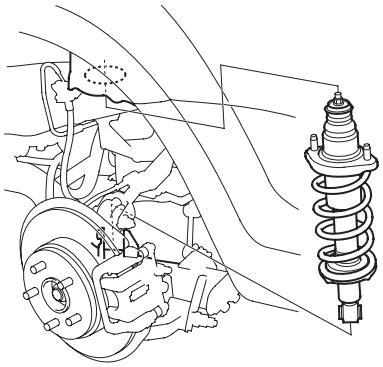
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Remove the flange bolt (A) from the bottom of the damper.



3. Remove the flange nuts (A) from the top of the damper in the cargo area.



4. Remove the damper assembly from the body.

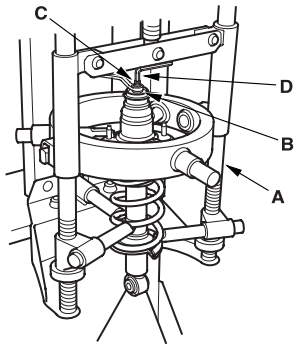


(cont'd)

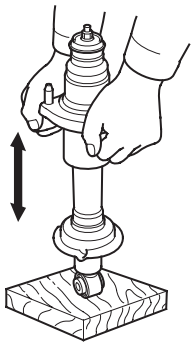
Damper/Spring Replacement (cont'd)

Disassembly/Inspection

1. Compress the damper spring with the commercially available strut compressor (A) according to the manufacturer's instructions, then remove the self-locking nut (B) while holding the damper shaft (C) with a hex wrench (D). Do not compress the spring more than necessary to remove the nut.



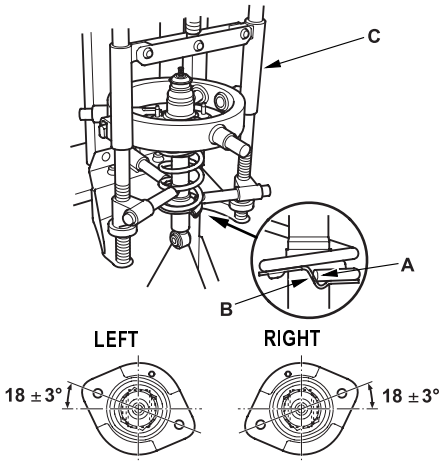
2. Release the pressure from the strut spring compressor, then disassemble the damper as shown in the Exploded View.
3. Reassemble all the parts, except for the spring.
4. Compress the damper assembly by hand, and check for smooth operation through a full stroke, both compression and extension. The damper should extend smoothly and constantly when compression is released. If it does not, the gas is leaking and the damper should be replaced.



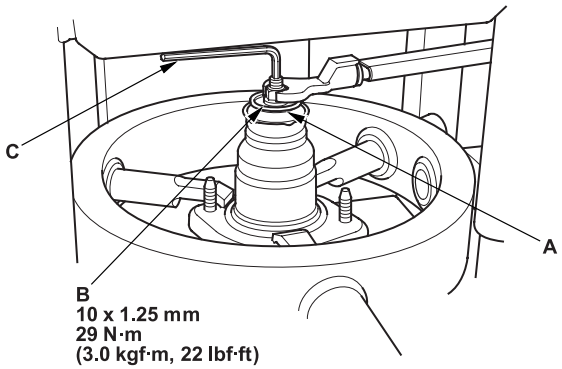
5. Check for oil leaks, abnormal noises, or binding during these tests.

Reassembly

1. Install all the parts except the damper mounting washer and self-locking nut onto the damper unit by referring to the Exploded View. Align the bottom of the spring (A) and the stepped part of the lower spring seat (B), and align the damper mounting base as shown.



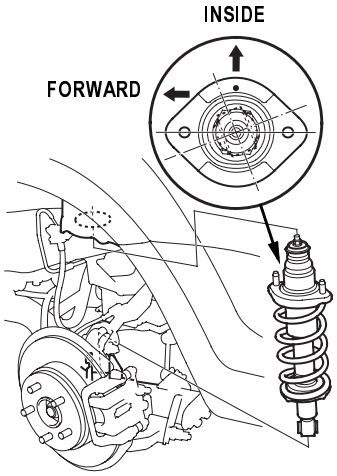
2. Install the damper assembly on a commercially available strut spring compressor (C).
3. Compress the damper spring with the spring compressor.
4. Install the washer (A) and a new self-locking nut (B) on the damper shaft.



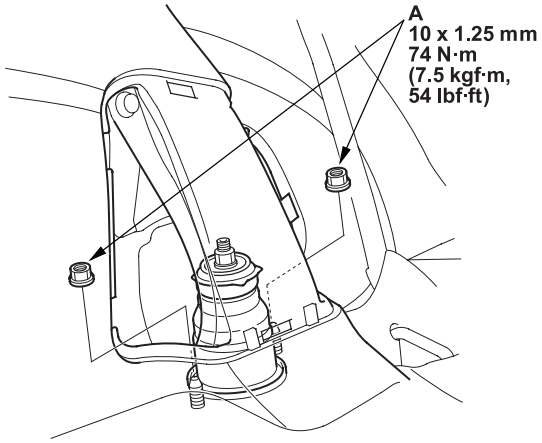
5. Hold the damper shaft with a hex wrench (C), and tighten the self-locking nut to the specified torque.

Installation

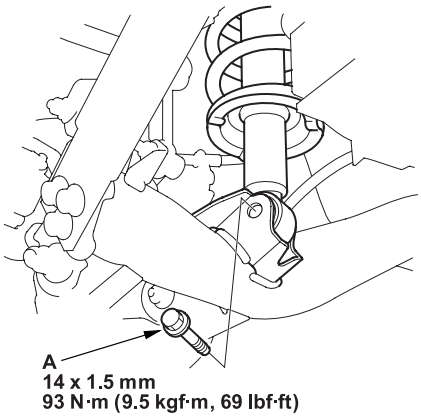
1. Position the damper assembly in the body. Note the direction of the damper mounting base so that the small hole dot on it is toward the inside of the vehicle.



2. Loosely install the flange nuts (A) onto the top of the damper.



3. Loosely install the flange bolt (A) on the bottom of the damper.



4. Raise the suspension with a floor jack to load the vehicle weight, and tighten the nuts and bolt to the specified torque values.
5. Clean the mating surface of the brake disc and the inside of the wheel, then install the rear wheel.
6. Check the wheel alignment, and adjust it if necessary (see page 18-4).

19A

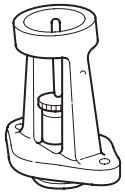
Brakes

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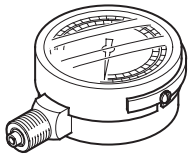
Conventional Brake Components

Special Tools

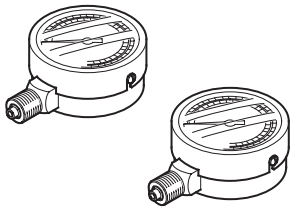
Ref. No.	Tool Number	Description	Qty
1	07JAG-SD40100	Pushrod Adjustment Gauge	1
2	07404-5790301	Vacuum Gauge	1
3	07406-5790201	Pressure Gauges	2
4	07410-5790101	Attachment	1
5	07410-5790501	Tube Joint Adaptor	1
6	07510-6340101	Pressure Gauge Joint Pipes	2



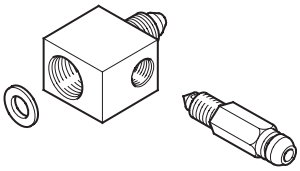
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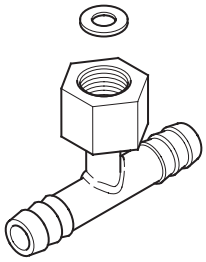
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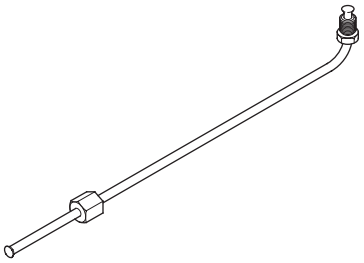
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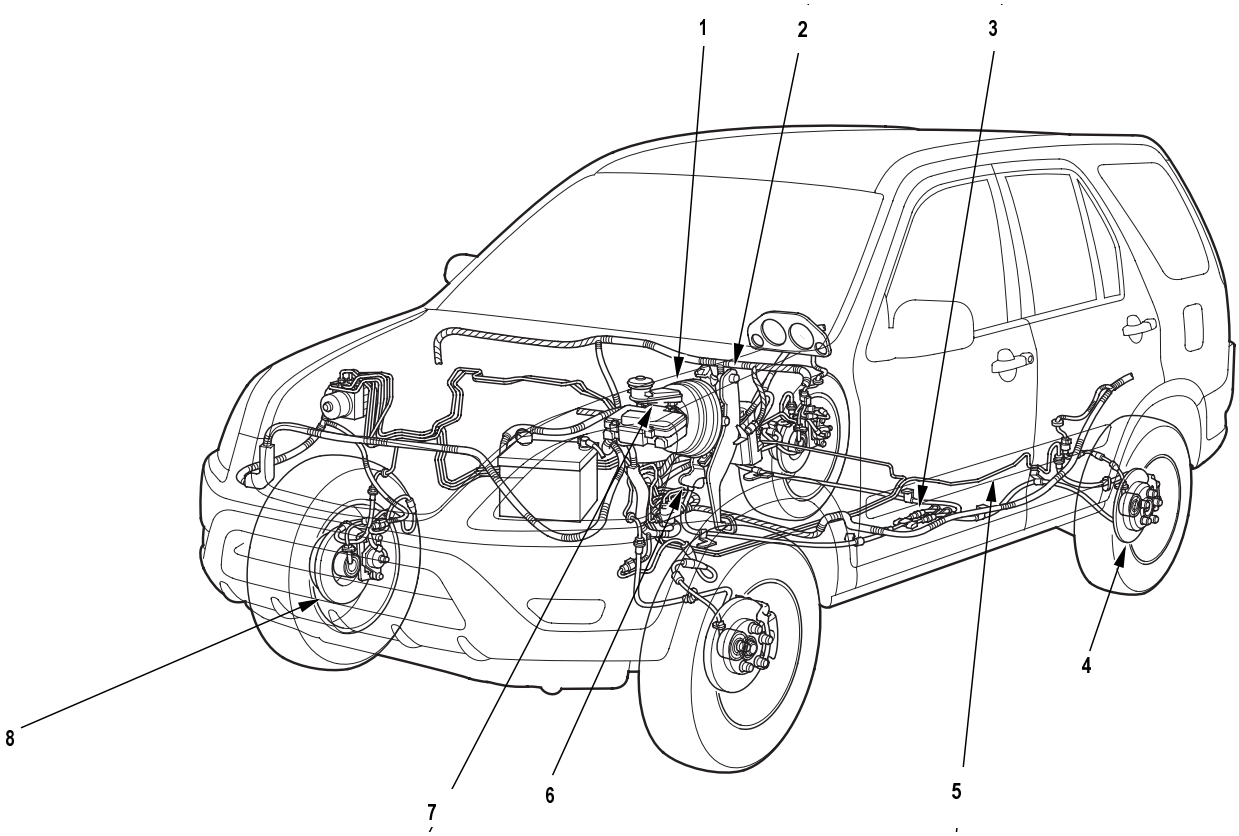


5



6

Component Location Index

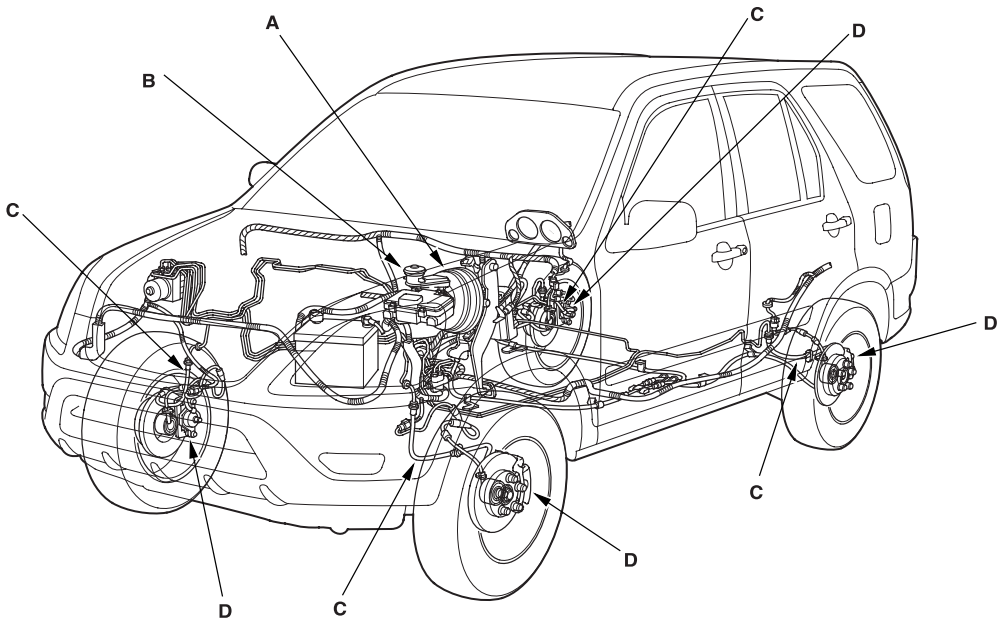


1	BRAKE BOOSTER	Brake Booster Inspection, page 19A-27; Brake Booster Replacement, page 19A-29
2	BRAKE PEDAL	Brake Pedal and Brake Pedal Position Switch Adjustement, page 19A-5
3	PARKING BRAKE CABLE	Parking Brake Cable Replacement, page 19A-42
4	REAR DISC BRAKE	Rear Brake Pads Inspection and Replacement, page 19A-30; Rear Brake Disc Inspection, page 19A-32; Rear Brake Caliper Overhaul, page 19A-33; Parking Brake Drum Inspection, page 19A-34; Parking Brake Shoes Replacement, page 19A-36; Lining Surface Break-in, page 19A-39
5	BRAKE HOSES and LINES	Brake Hoses and Lines Inspection, page 19A-40; Break Hoses Replacement, page 19A-41
6	PARKING BRAKE LEVER	Parking Brake Check and Adjustment, page 19A-6; Parking Brake Switch Test, page 19A-11; Brake System Indicator Circuit Diagram, page 19A-10
7	MASTER CYLINDER	Brake Fluid Level Switch Test, page 19A-11; Master Cylinder Replacement, page 19A-21; Disassembly, page 19A-22; Reassembly, page 19A-23; Brake Booster Pushrod Clearance Adjustment, page 19A-26; Brake System Bleeding, page 19A-9
8	FRONT BRAKES	Front Brake Pads, Inspection and Replacement, page 19A-12; Front Brake Disc Inspection, page 19A-18; Front Brake Caliper Overhaul, page 19A-19

Brake System Operation and Leakage Check

Check all the following items:

Component	Procedure
Brake Booster (A)	Check brake operation by applying the brakes during a test drive. If the brakes do not work properly, check the brake booster. Replace the brake booster as an assembly if it does not work properly or if there are signs of leakage.
Piston Cup and Pressure Cup Inspection (B)	• Check brake operation by applying the brakes. Look for damage or signs of fluid leakage. Disassembly and inspect the master cylinder if the pedal does not work properly or if there is damage or signs of fluid leakage. Replace the secondary piston and primary piston as an assembly whenever the master cylinder is disassembled. • Check for a difference in brake pedal stroke between quick and slow brake applications. Disassembly and inspect the master cylinder if there is a difference in pedal stroke. Replace the secondary piston and primary piston as an assembly whenever the master cylinder is disassembled.
Brake Hoses (C)	Look for damage or signs of fluid leakage. Replace the brake hose with a new one if it is damaged or leaking.
Caliper Piston Seal and Piston Boots (D)	Check brake operation by applying the brakes. Look for damage or signs of fluid leakage. If the pedal does not work properly, the brakes drag, or there is damage or signs of fluid leakage, disassemble and inspect the brake caliper. Replace the boots and seals with new ones whenever the brake caliper is disassembled.

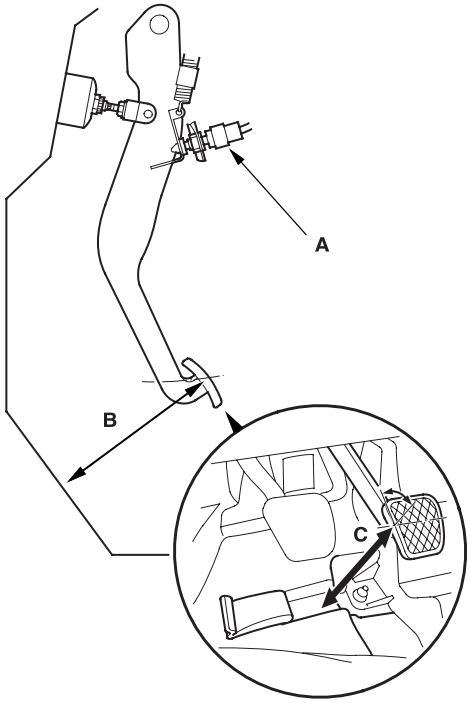


Brake Pedal and Brake Pedal Position Switch Adjustment

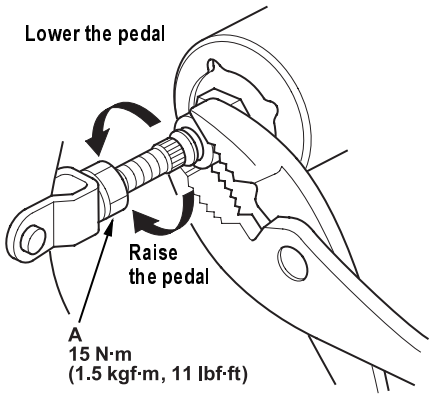
Pedal Height

1. Turn the brake pedal position switch (A) counterclockwise, and pull it back until it is no longer touching the brake pedal.
2. Lift up the carpet. At the insulator cutout, measure the pedal height (B) from the middle of the pedal pad (C).

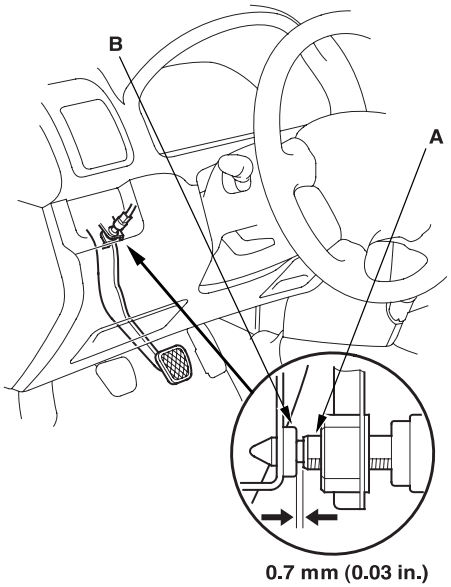
   Standard Pedal Height (with carpet removed): 173 mm (6.81 in.) Min.



3. Loosen the pushrod locknut (A), and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly. Do not adjust the pedal height with the pushrod pressed.



4. Push in the brake pedal position switch until its plunger is fully pressed (threaded end (A) touching the pad (B) on the pedal arm). Then, turn the switch 45° clockwise to lock it. The gap between the brake pedal position switch and the pad is automatically adjusted to 0.7 mm (0.03 in.) by locking the switch. Make sure the brake lights go off when the pedal is released.



5. Check the brake pedal free play as described below.

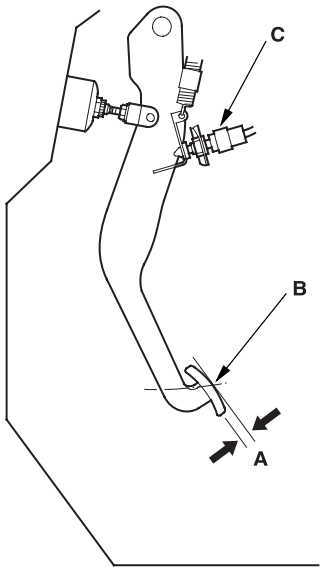
(cont'd)

Brake Pedal and Brake Pedal Position Switch Adjustment (cont'd)

Pedal Free Play

1. With the engine off, inspect the play (A) on the pedal pad (B) by pushing the pedal by hand.

   Free Play: 1 - 5 mm (0.04 - 0.2 in.)



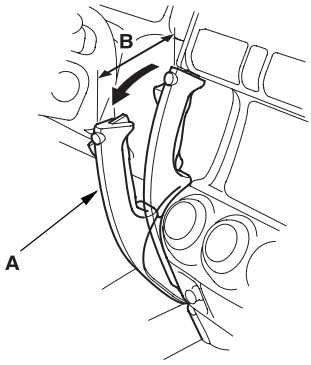
2. If the pedal free play is out of specification, adjust the brake pedal position switch (C). If the pedal free play is insufficient, it may result in brake drag.

Parking Brake Check and Adjustment

Check

1. Pull the parking brake lever (A) with 196 N (20 kgf, 44 lbf) of force to fully apply the parking brake. The parking brake lever should be locked within the specified number of clicks (B).

   Lever locked clicks: 5 - 9

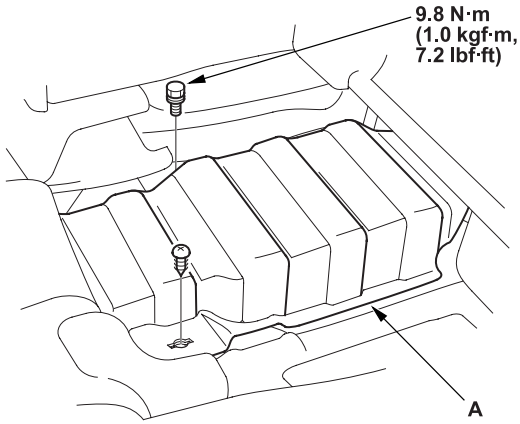


2. Adjust the parking brake if the lever clicks are not within the specification.

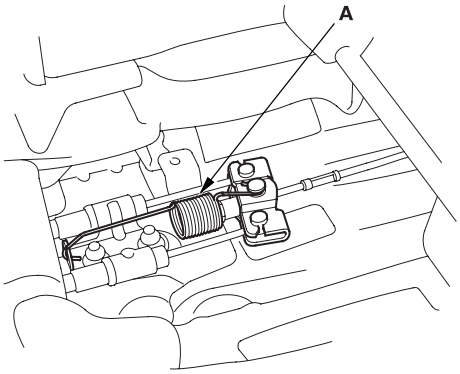
   NOTE: Minor parking brake lever adjustments (1 - 2 clicks) can be made with the adjusting nut in the equalizer.
   If a larger adjustment is required, follow the major adjustment procedure using the adjuster at the parking brake drum.
   After installing new parking brake shoes and/or new rear brake disc/drums, make sure you to drive the vehicle for "break-in" (see page 19A-39).

Minor adjustment

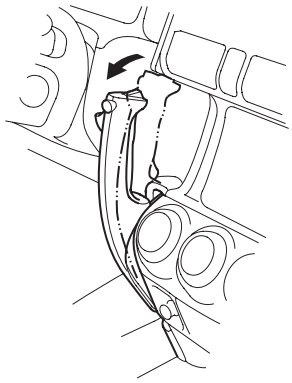
1. Raise the rear of the vehicle, and make sure it is securely supported.
2. Release the parking brake lever fully. Move the driver's seat (RHD: assistant seat) all the way forward.
3. Pull back the carpet under the seat. Remove the screw and bolt for the parking brake equalizer cover (A).



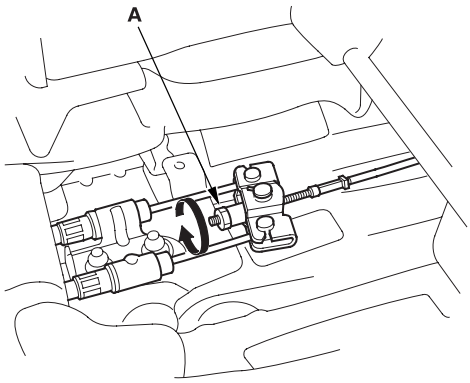
4. Remove the return spring (A).



5. Pull the parking brake lever one click.



6. Tighten the adjusting nut (A) until the parking brakes drag slightly when the rear wheels are turned.



7. Release the parking brake lever fully, and check that the parking brakes do not drag when the rear wheels are turned. Readjust if necessary.
8. Reinstall the return spring and the parking brake equalizer cover.
9. Make sure the parking brakes are fully applied when the parking brake lever is pulled all the way.

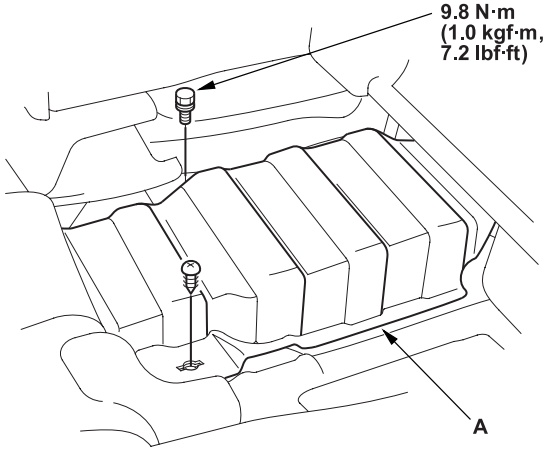
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Parking Brake Check and Adjustment (cont'd)

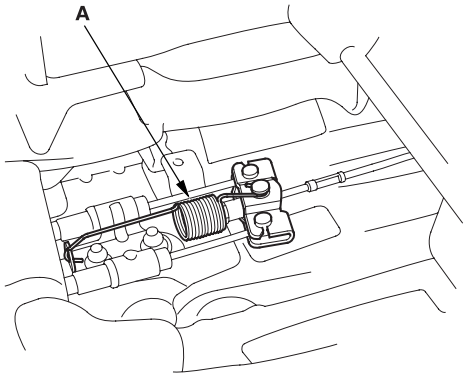
Check (cont'd)

Major adjustment (to be done when replacing brake shoes and after lining surface break-in)

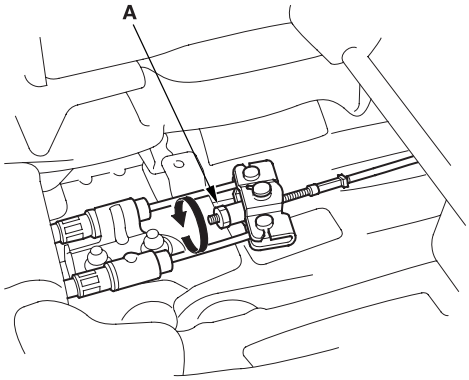
1. Raise the rear of the vehicle, and make sure it is securely supported.
2. Release the parking brake lever fully. Move the driver's seat (RHD: assistant seat) all the way forward.
3. Pull back the carpet on the floor at the under the seat. Remove the screw and bolt for the parking brake equalizer cover (A).



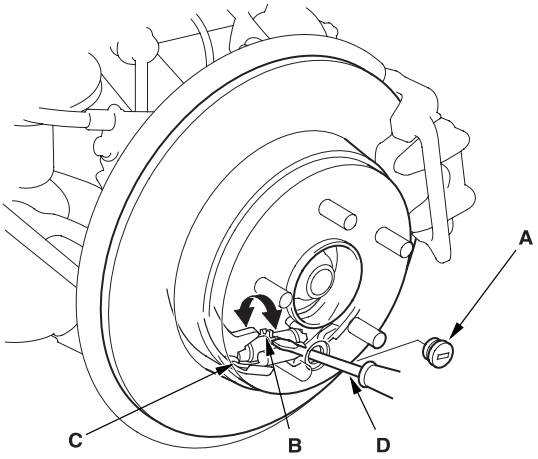
4. Remove the return spring (A).



5. Back off the adjusting nut (A) in the equalizer.



6. Remove the rear wheels.
7. Remove the access plug (A).

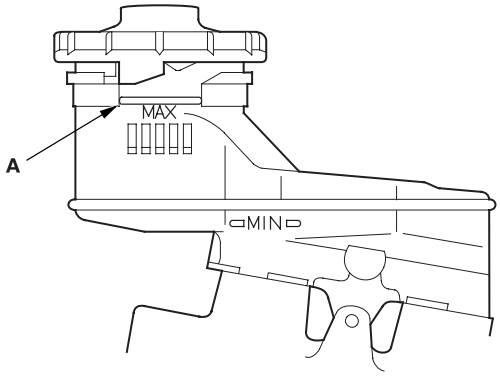


8. Turn the ratchet teeth (B) on the adjuster assembly (C) with a flat-tip screwdriver (D) until the shoes lock against the drum. Then back off eight clicks, and install the access plug.
9. Do the minor adjustment procedure.
10. Install the rear wheels.

Brake System Bleeding

NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of the bleeding procedure and checked after bleeding each brake caliper. Add fluid as required.
- Do not reuse the drained fluid.
- Always use Genuine Honda DOT 3 brake fluid. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.

1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line (A).



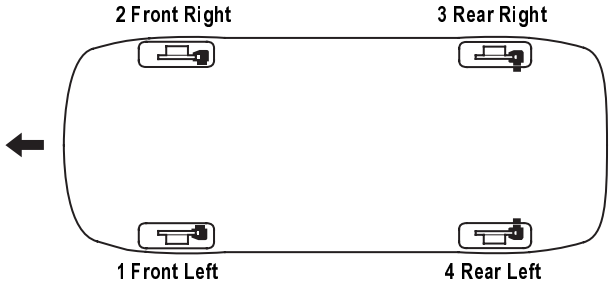
2. Slide a piece of clear plastic hose over the first bleed screw, and submerge the other end in a container of new brake fluid.

3. Have someone slowly pump the brake pedal several times, then apply steady pressure.

4. Loosen the left-front brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.

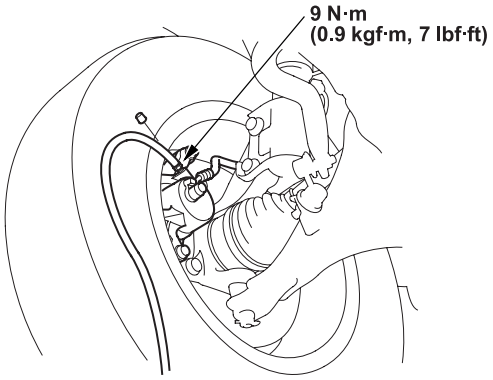
5. Repeat the procedure for each wheel in the sequence shown below until air bubbles no longer appear in the fluid.

BLEEDING SEQUENCE:

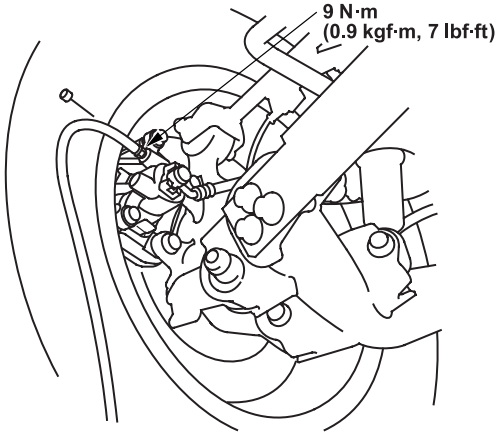


6. Refill the master cylinder reservoir to the MAX (upper) level line.

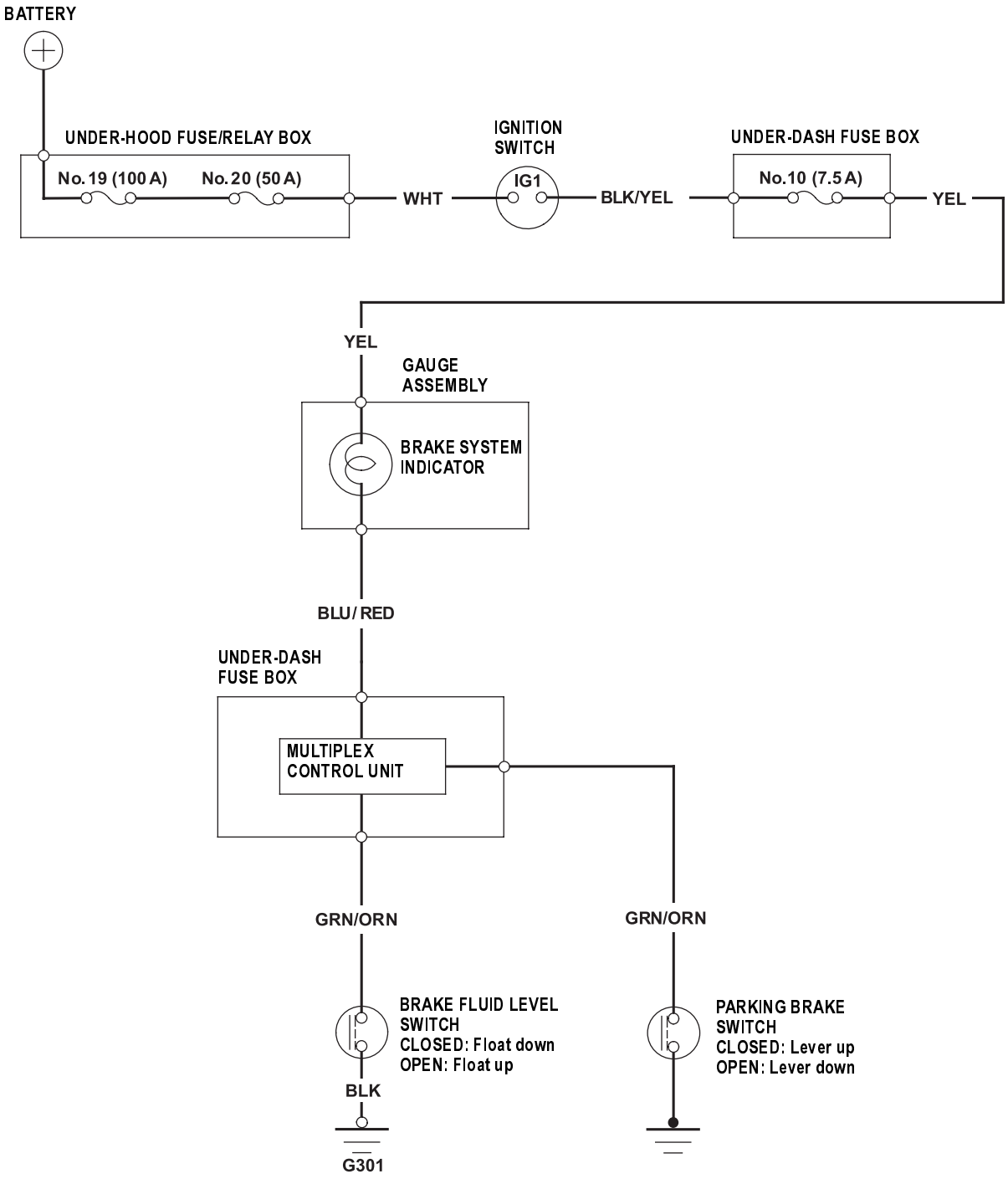
FRONT BRAKE:



REAR BRAKE:

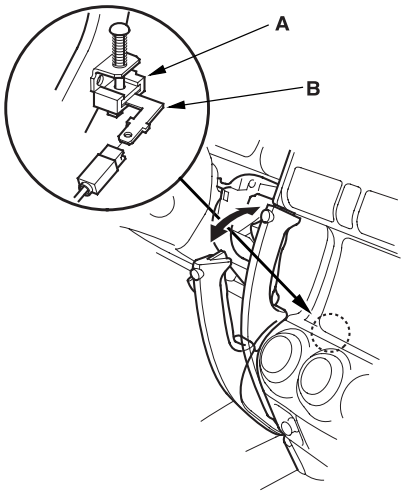


Brake System Indicator Circuit Diagram



Parking Brake Switch Test

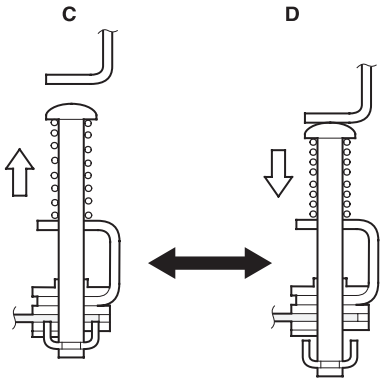
1. Remove the driver's under panel (see page 20-89).
2. Disconnect the connector from the parking brake switch (A).



3. Check for continuity between the switch terminal (B) and body ground:
   - With the parking brake lever pulled (C), there should be continuity.
   - With the parking brake lever released (D), there should be no continuity.

NOTE:

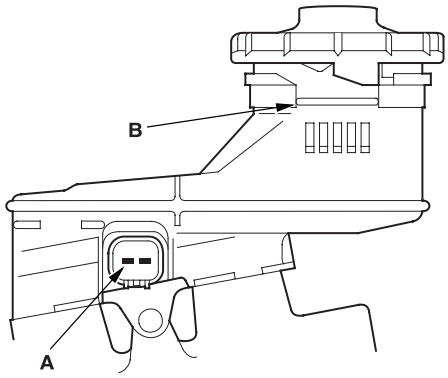
- If both the ABS indicator and the brake system indicator come on at the same time, check the ABS (see page 19B-3).
- If the parking brake switch/brake fluid level switch is OK, but the brake system indicator does not work, check the ABS.



Brake Fluid Level Switch Test

Check for continuity between the terminals (A) with the float in the down position and the up position.

- Remove the brake fluid completely from the reservoir. With the float down, there should be continuity.
- Fill the reservoir with brake fluid to MAX (upper) level (B). With the float up, there should be no continuity.



Front Brake Pads Inspection and Replacement

⚠ CAUTION ⚠

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an appropriate vacuum cleaner.

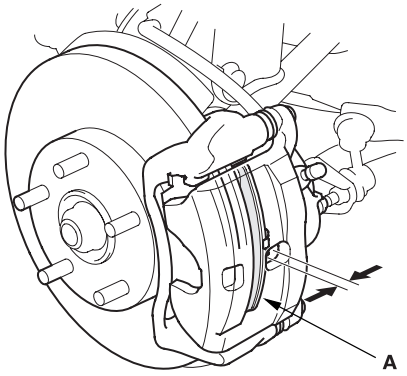
Inspection

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Check the thickness of the inner pad (A) and outer pad (B). Do not include the thickness of the brake pad backing plate.

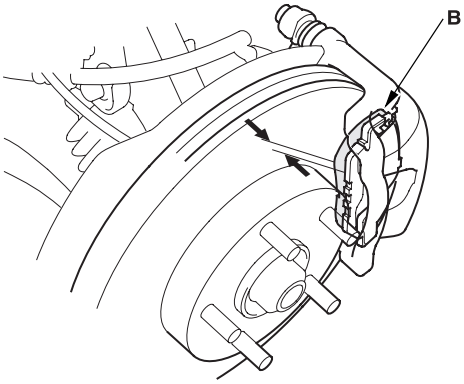
   Brake pad thickness:

Standard:	**10.5 - 11.5 mm (0.41 - 0.45 in.)**
Service Limit:	**1.6 mm (0.06 in.)**

   Inner pad:



   Outer pad:

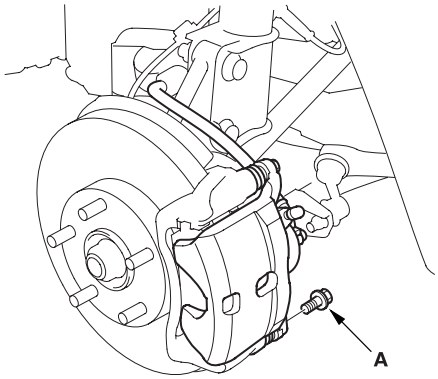


3. If the brake pad thickness is less than the service limit, replace all the pads as a set.

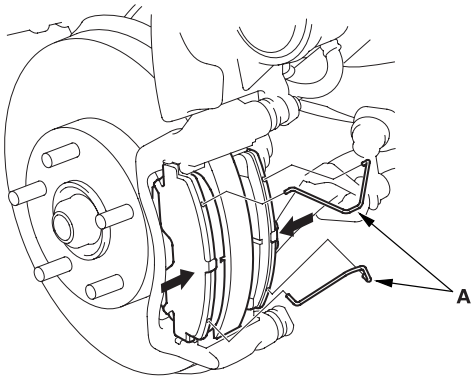
Replacement (15 inch Brake Disc Type)

1. Remove the flange bolt (A).

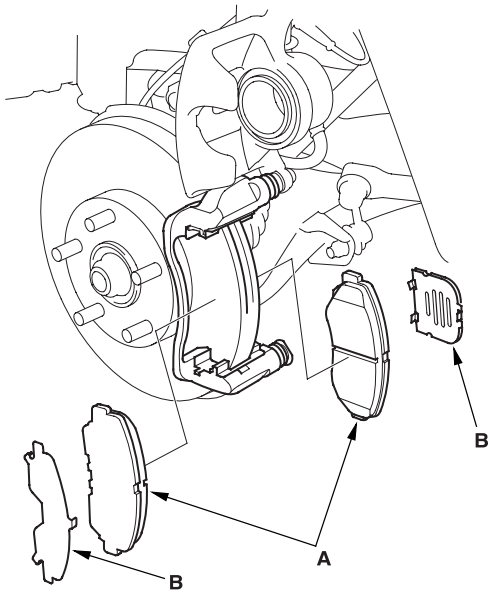
   NOTE: The pad springs are installed on the pads to prevent brake drag. Be careful when pivoting up the caliper body fully, or the spring could be flipped out of the position.



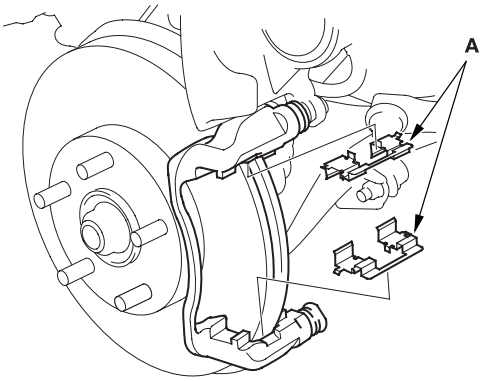
2. Pivot the caliper body slightly so the pads do not come out of position, and hold the pads on both sides firmly with your fingers. Remove the pad springs (A) from the pads.



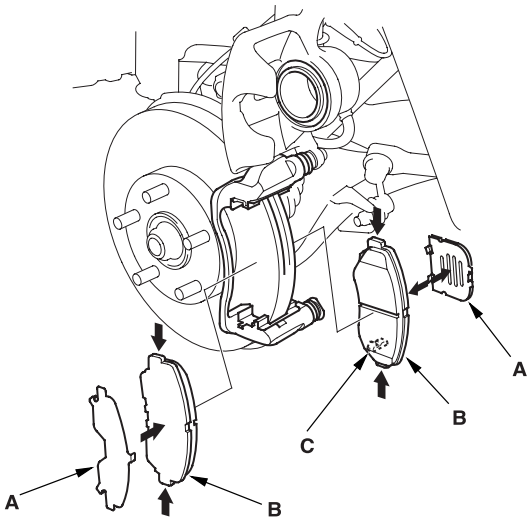
3. Pivot up the caliper up out of the way and remove the pads (A).



4. Remove the pad shims (B).
5. Check the hose and pin boots for damage and deterioration.
6. Remove the pad retainers (A).



7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the pad retainers.
10. Apply Dow Corning Molykote M77 grease to the back of the pads (B), and the other areas indicated by the arrows.
    Wipe excess grease off the shim. Contaminated brake discs and pads reduce stopping ability. Keep grease off the discs and pads.



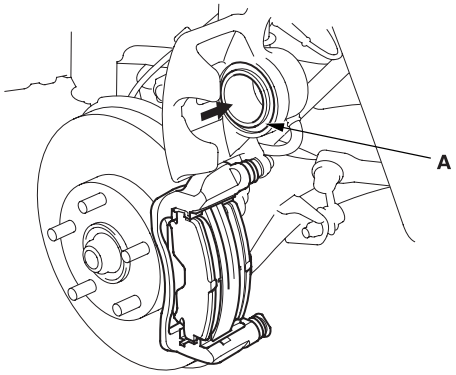
11. Install the brake pads and pad shim correctly. Install the pads with the wear indicators (C) on the inside.
    If you are reusing the pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

(cont'd)

Front Brake Pads Inspection and Replacement (cont'd)

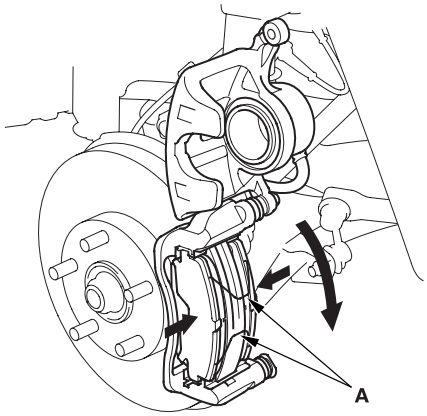
Replacement (15 inch Brake Disc Type) (cont'd)

12. Push in the piston (A) so the caliper will fit over the pads. Check the brake fluid level. The brake fluid may overflow if the reservoir is too full. Make sure the piston boot is in position to prevent damaging it when pivoting the caliper down.

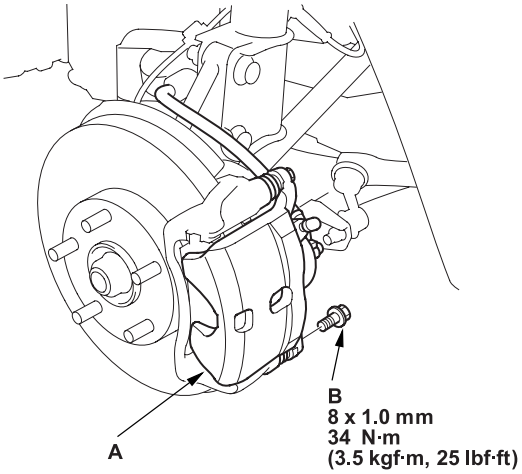


13. Hold the pads on both sides firmly with your fingers, and install the new pad springs (A) on the pads.
Holding the pads, set the caliper over the pads by pivoting it down slowly.

NOTE: Insert the pad spring ends into the pad installation holes securely.



14. Pivot the caliper (A) down into position. Be careful not to damage the pin boots.



15. Install the flange bolt (B), and tighten it to the specified torque.

16. Press the brake pedal several times to make sure the brake works, then test-drive.

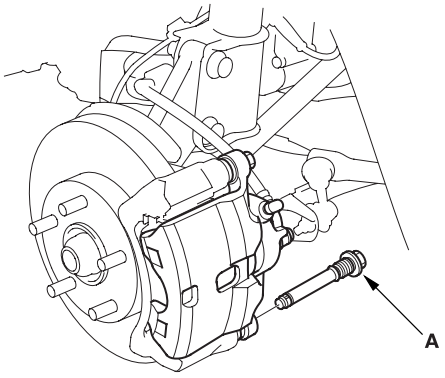
NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

17. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

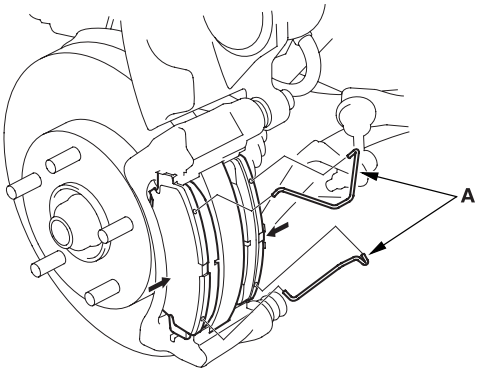
Replacement (14 inch Brake Disc Type)

1. Remove the pin bolt (A).

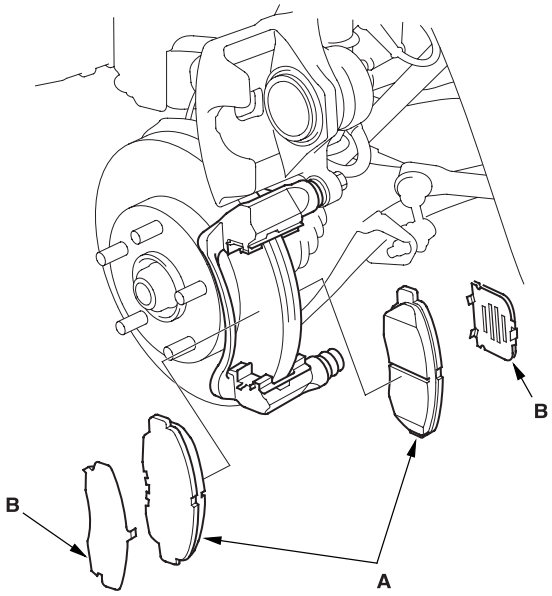
   NOTE: The pad springs are installed on the pads to prevent brake drag. Be careful when pivoting up the caliper body fully, or the spring could be flipped out of the position.



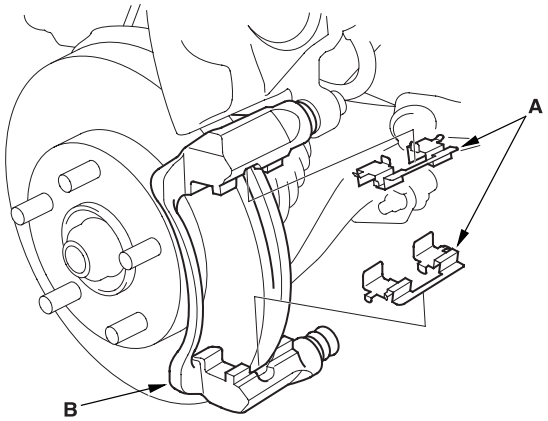
2. Pivot the caliper body slightly so the pads do not come out of position, and hold the pads on both sides firmly with your fingers. Remove the pad spring (A) from the pads.



3. Pivot up the caliper up out of the way and remove the pad (A).



4. Remove the pad shims (B).
5. Check the hose and pin boots for damage and deterioration.
6. Remove the pad retainers (A).



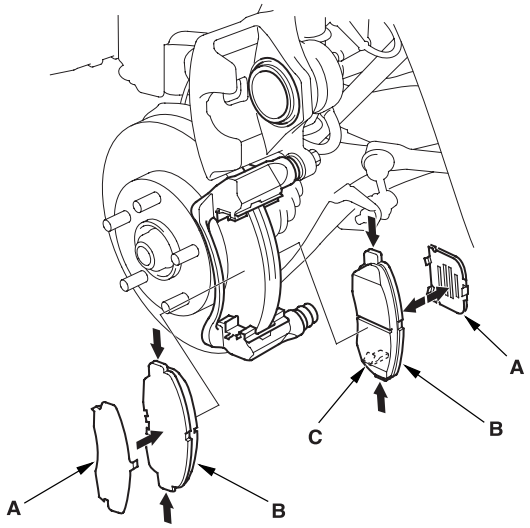
7. Clean the caliper thoroughly; remvoe any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the pad retainers.

(cont'd)

Front Brake Pads Inspection and Replacement (cont'd)

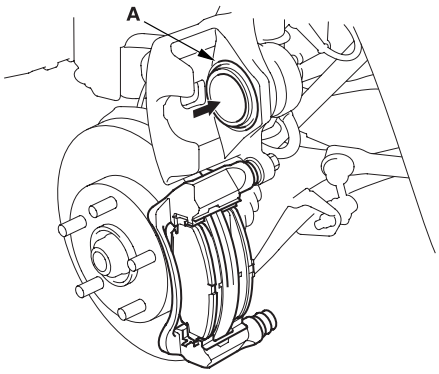
Replacement (14 inch Brake Disc Type) (cont'd)

10. Apply Dow Corning Molykote M77 grease to the back of the pads (B), and the other areas indicated by the arrows.
Wipe excess grease off the shim. Contaminated brake discs and pads reduce stopping ability. Keep grease off the discs and pads.

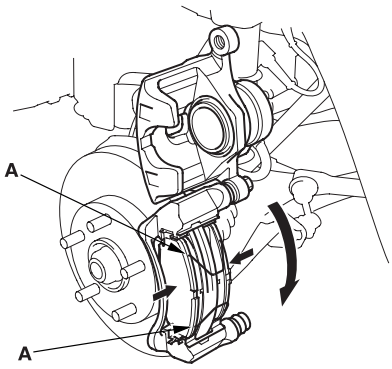


11. Install the brake pads and pad shim correctly. Install the pads with the wear indicators (C) on the inside.
If you are reusing the pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

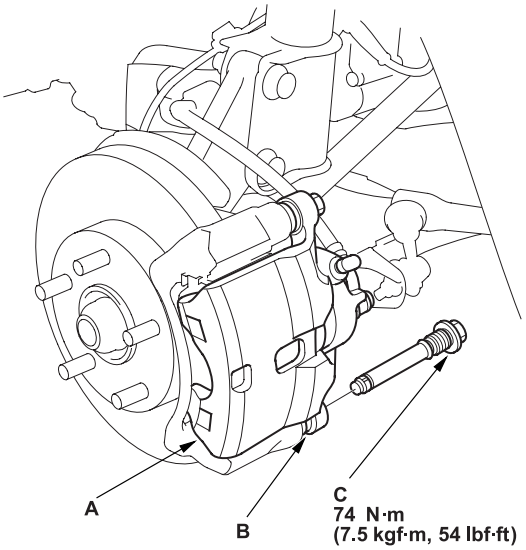
12. Push in the piston (A) so the caliper will fit over the pads. Check the brake fluid level. The brake fluid may overflow if the reservoir is too full. Make sure the piston boot is in position to prevent damaging it when pivoting the caliper down.



13. Hold the pads on both sides firmly with your fingers, and install the new pad springs (A) on the pads. Holding the pads, set the caliper body over the pads by pivoting it down slowly.
NOTE: Insert the pad spring ends into the pad installation holes securely.



14. Pivot the cliper (A) down into position. Be careful not to damage the pin boot (B), and check for the pin boot are not deformed or removed.



15. Install the pin bolt (C), and tighten it to the specified torque.

16. Press the brake pedal several times to make sure the brake works, then test-drive.

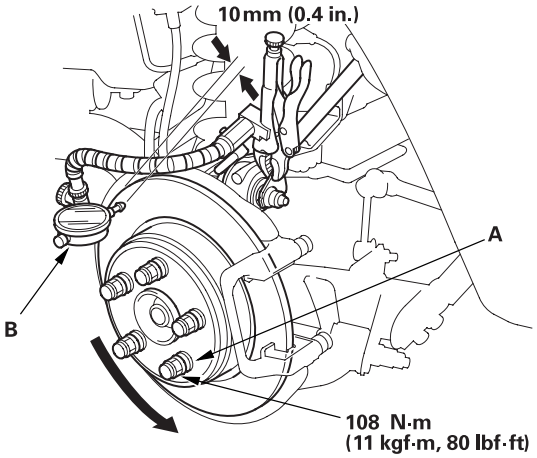
NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

17. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

Front Brake Disc Inspection

Runout

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the brake pads (see page 19A-12).
3. Inspect the disc surface for damage and cracks. Clean the disc thoroughly, and remove all rust.
4. Install suitable flat washers (A) and wheel nuts, and tighten the nuts to the specified torque to hold the brake disc securely against the hub.



5. Set up the dial gauge against the brake disc as shown, and measure the runout at 10 mm (0.4 in.) from the outer edge of the disc.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in.)

6. If the disc is beyond the service limit, refinish the brake disc.

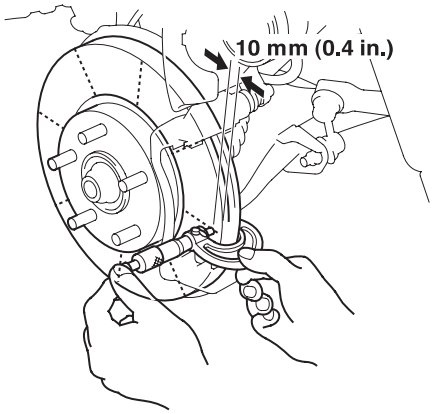
   Max. Refinish Limit: 21.0mm (0.83 in.)

   NOTE:
   - If the brake disc is beyond the service limit for refinishing, replace it (see page 18-12).
   - A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).

Thickness and Parallelism

1. Raise the front of the vehicle, and make sure it is securely supported. Remove the front wheels.
2. Remove the brake pads (see page 19A-12).
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.4 in.) in from the outer edge of the disc.

   NOTE: This is the maximum allowable difference between the thickness measurements.



Brake Disc Thickness:
Standard: 23.0 mm(0.91 in.)
Max. Refinishing Limit: 21.0 mm (0.83 in.)
Brake Disc Parallelism: 0.015 mm (0.0006 in.) max.

4. If the smallest measurement is less than the max. Refinishing limit, replace the brake disc (see page 18-12).
5. If the disc is beyond the service limit for parallelism, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

Front Brake Caliper Overhaul

CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an appropriate vacuum cleaner.

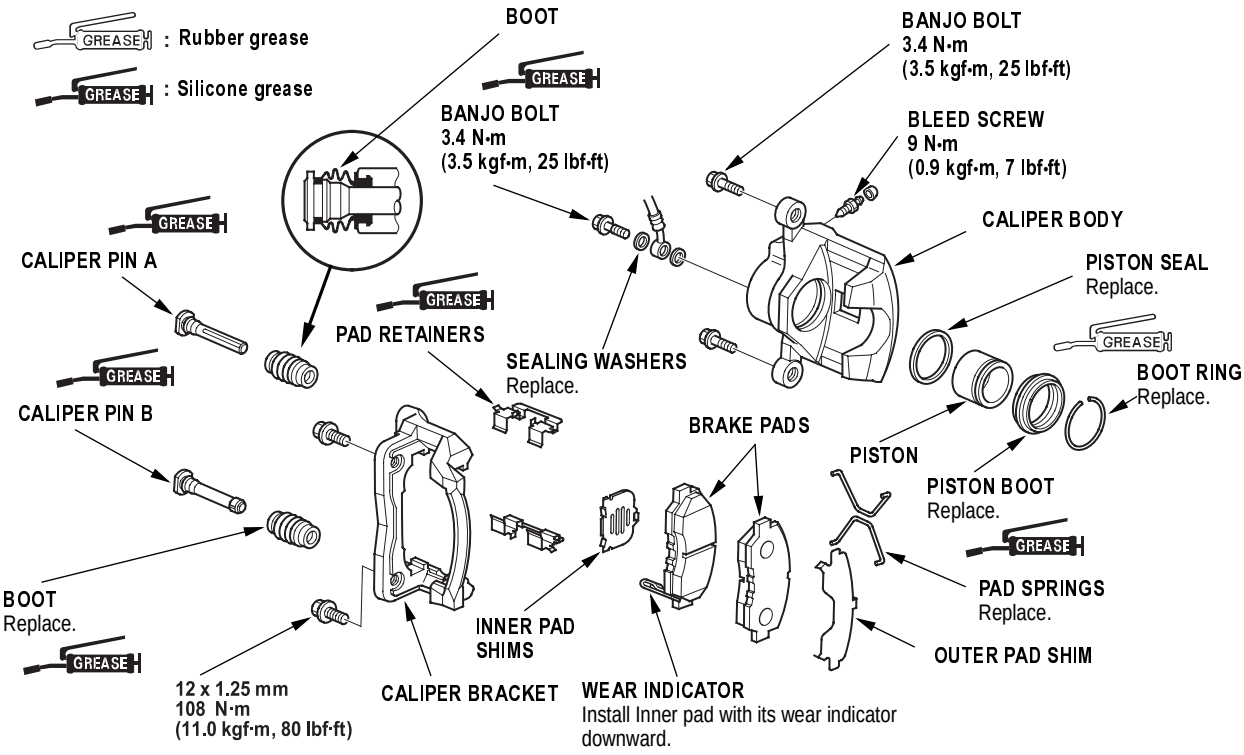
Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping, cover disconnected hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- When reusing pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid.
- Always use Genuine Honda DOT 3 brake fluid. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Do not mix different brands of brake fluid as they may not be compatible.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- Replace all rubber parts with new ones whenever disassembled.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.

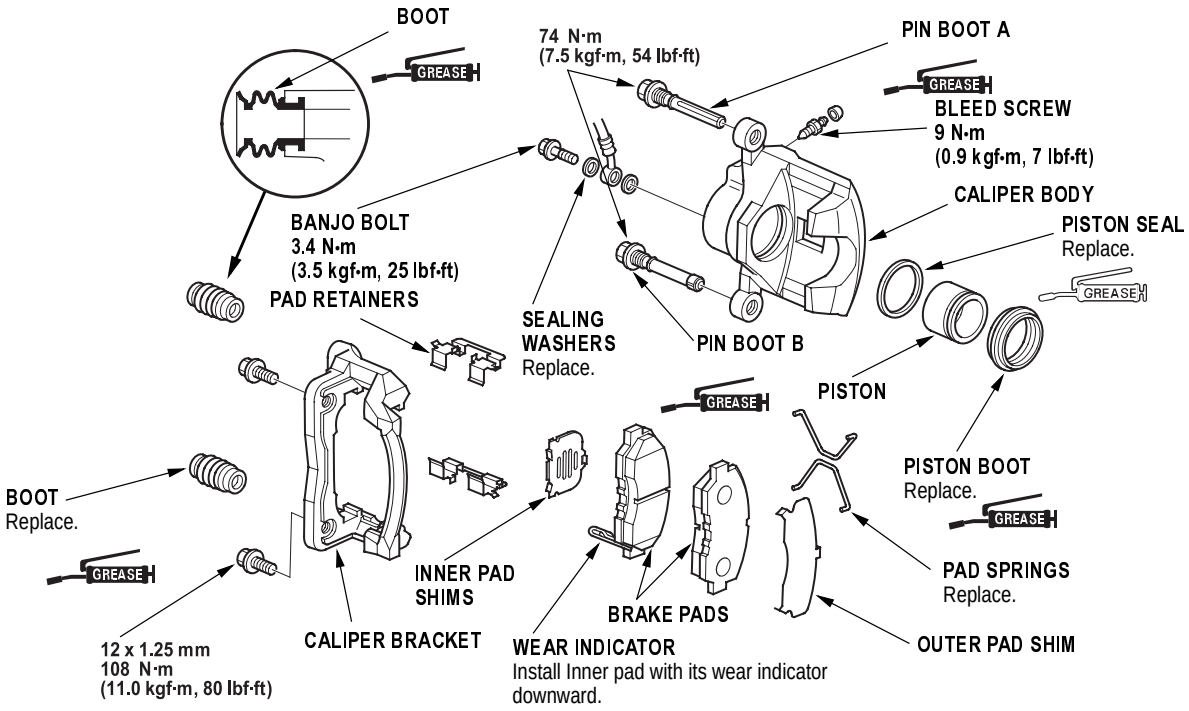
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Front Brake Caliper Overhaul (cont'd)

15 inch Brake Disc Type (AD57-15):



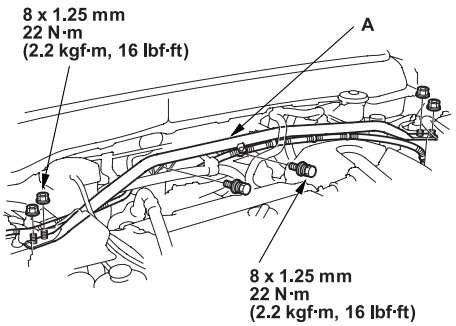
14 inch Brake Disc Type (AD57-14):



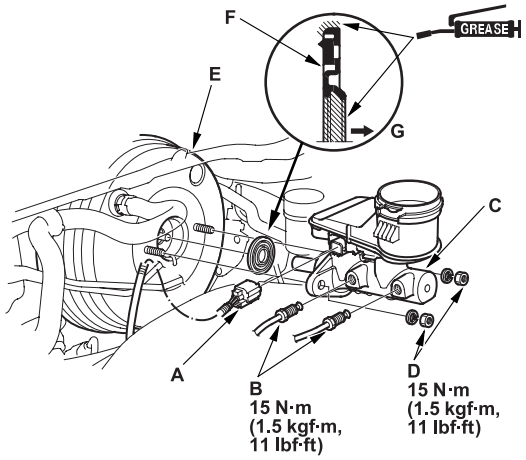
Master Cylinder Replacement

NOTE: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

1. Release the engine wire harness clips on the strut brace (A), and remove the strut brace. With M/T: Remove the clutch reservoir bracket from the strut brace, and move it aside. Do not disconnect the clutch hose from the reservoir.



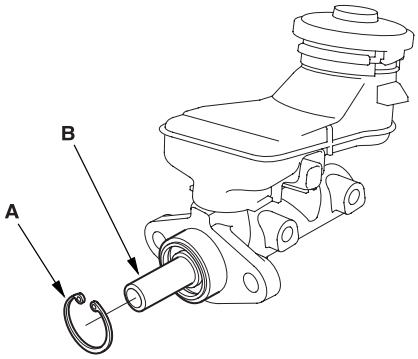
2. Remove the reservoir cap and brake fluid from the master cylinder reservoir.
3. Remove the brake fluid level sensor connector (A).



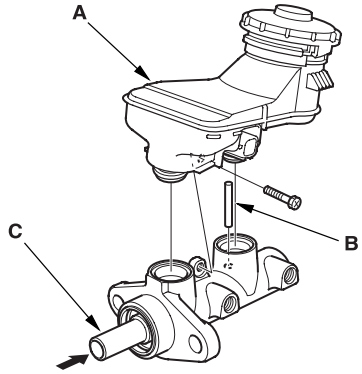
4. Disconnect the brake lines (B) from the master cylinder (C). To prevent spills, cover the hose joints with rags or shop towels.
5. Remove the master cylinder mounting nuts (D) and washers.
6. Remove the master cylinder from the brake booster (E). Be careful not to bend or damage the brake lines when removing the master cylinder.
7. Remove the rod seal (F) from the master cylinder.
8. Install the master cylinder in the reverse order of removal, and note these items:
   - Replace all the rubber parts with new ones whenever the master cylinder is removed.
   - Check the pushrod clearance before installing the master cylinder, and adjust it if necessary (see page 19A-26).
   - Use a new rod seal on reassembly.
   - Coat the inner bore lip and outer circumference of the new rod seal with the recommended seal grease in the master cylinder set.
   - Install the rod seal onto the master cylinder with its grooved side (G) toward the master cylinder.
   - Check the brake pedal height and free play after installing the master cylinder, and adjust it if necessary (see page 19A-5).

Master Cylinder Disassembly

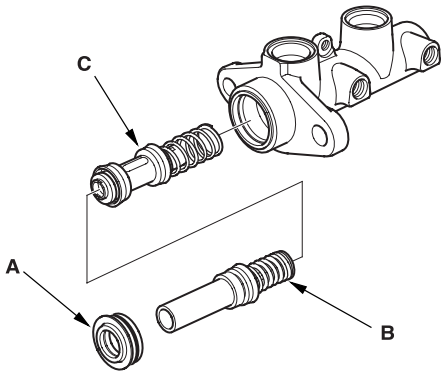
1. Remove the rod seal from the master cylinder.
2. Remove the circlip (A) while pushing in the secondary piston (B).



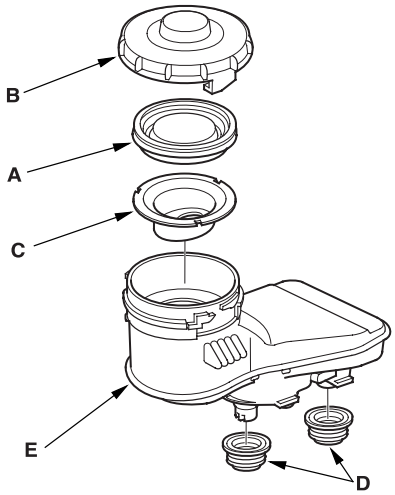
3. Remove the reservoir (A).



4. On vehicle's with ABS; remove the stop pin (B) while pushing in the secondary piston (C).
5. Remove the piston guide (A), secondary piston (B) and primary piston (C).



6. Remove the reservoir seal (A) from the reservoir cap (B).



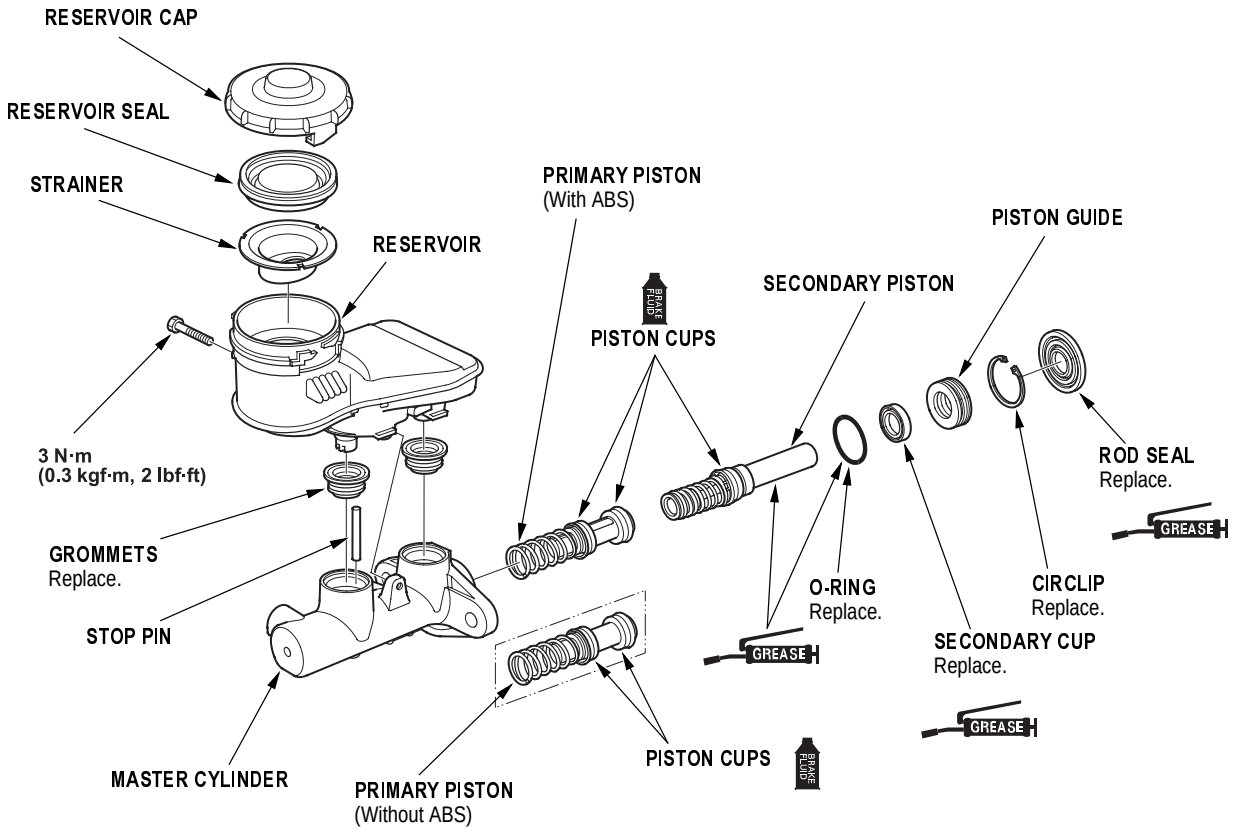
7. Remove the strainer(C) and grommets (D) from the reservoir (E).

   NOTE: When reservoir and master cylinder body are separated, replace the grommets with new ones.

Master Cylinder Reassembly

NOTE:
- If replacing the primary piston, secondary piston, or master cylinder body, check and adjust the pushrod clearance (see page 19A-26) before installing the master cylinder.
- Clean all the parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all the parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Use only genuine DOT3 Honda brake fluid. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Do not mix different brands of brake fluid as they may no be compatible.
- Replace the master cylinder if the bore is damaged or worn. Do not hone or attempt to refinish the bore.
- Coat the piston cups, pressure cup and master cylinder bore with clean brake fluid.
- Use recommended greases in the master cylinder seal set.

1. Install the reservoir seal in the groove of the reservoir cap.
2. Install the strainer, assembled reservoir cap, and new grommets on the reservoir.



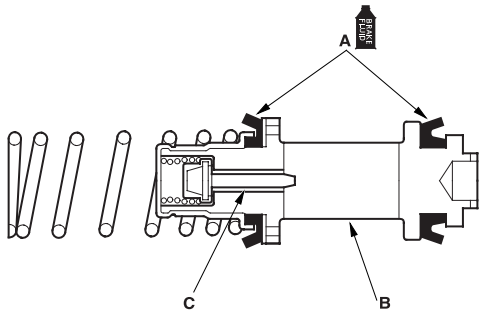
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Master Cylinder Reassembly (cont'd)

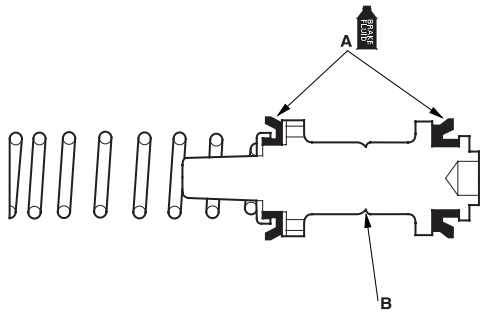
3. Coat the cups (A) of a new primary piston (B) with clean brake fluid, then install the primary piston into the master cylinder.

NOTE: On vehicle's with ABS, check that the valve stem (C) moves smoothly by lightly pushing it through the slot in the piston. Install the piston so the slot in the piston aligns with the stop pin hole in the master cylinder.

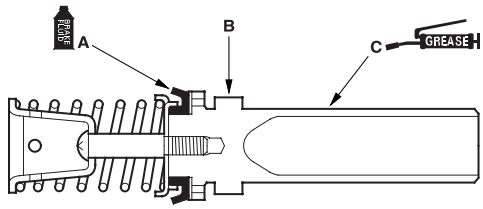
With ABS



Without ABS

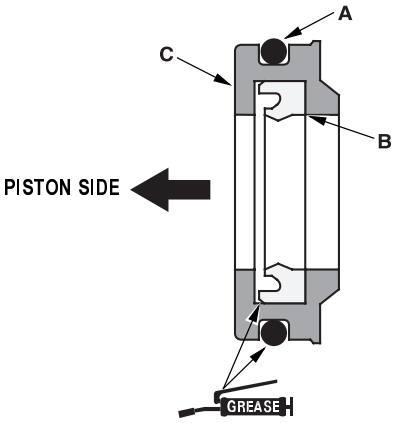


4. Coat the cup (A) of a new secondary piston (B) with clean brake fluid.

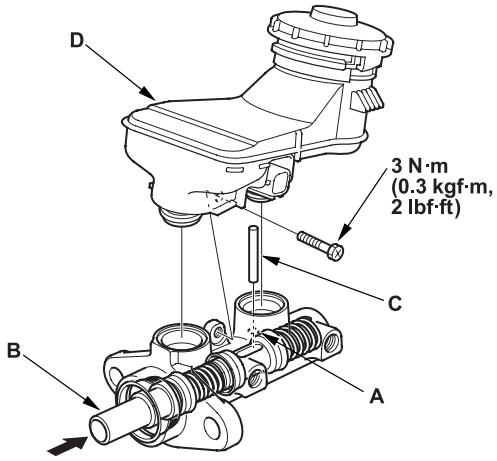


5. Apply recommended seal grease in the master cylinder seal set to the piston surface (C), then install the secondary piston into the master cylinder.

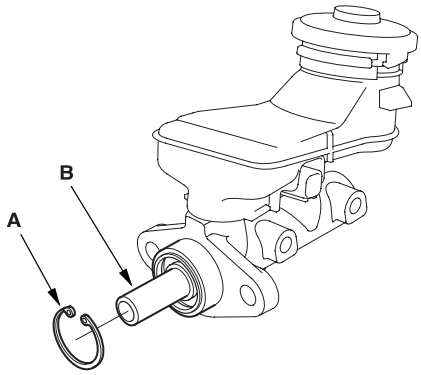
6. Apply recommended seal grease in the master cylinder seal set to a new O-ring (A) and the secondary cup (B) in a new piston guide (C), then install the piston guide into the master cylinder. Note the direction.



7. On vehicle's with ABS; align the slot in the primary piston with the stop pin hole (A) by pushing the secondary piston (B) in, and install the stop pin (C).



8. Install the reservoir (D) to the master cylinder.
9. Install the new circlip (A) while pushing in the secondary piston (B). Be careful not to scratched damage on the piston surface with the circlip edges.



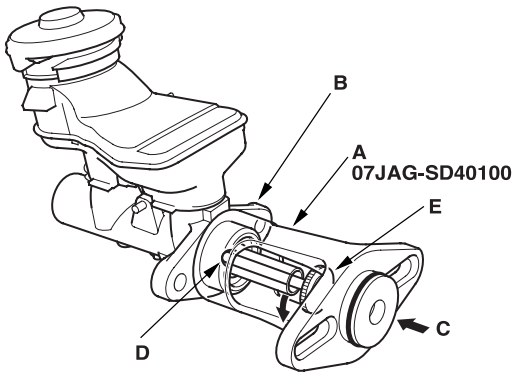
10. Adjust the pushrod clearance (see page 19A-26).
11. Apply recommended seal grease in the master cylinder seal set to a new rod seal, and install the seal onto the master cylinder (see page 19A-21).

Brake Booster Pushrod Clearance Adjustment

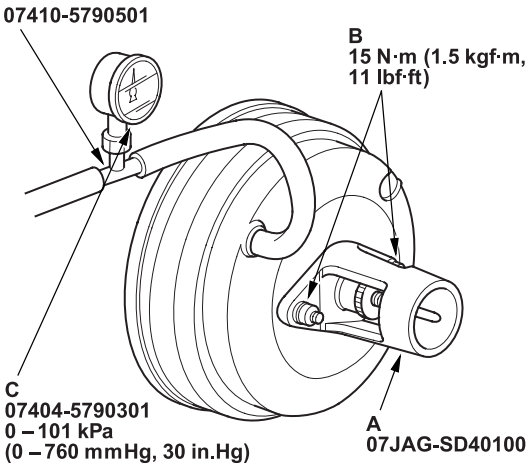
Special Tools Required
- Pushrod adjustment gauge 07JAG-SD40100
- Vacuum gauge 07404-5790301
- Tube joint adapter 07410-5790501

NOTE: Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing the master cylinder.

1. Set the special tool (A) on the master cylinder body (B), push in the center shaft (C) until the top (D) of it contacts the end of the secondary piston (E) by turning the adjusting nut (F).



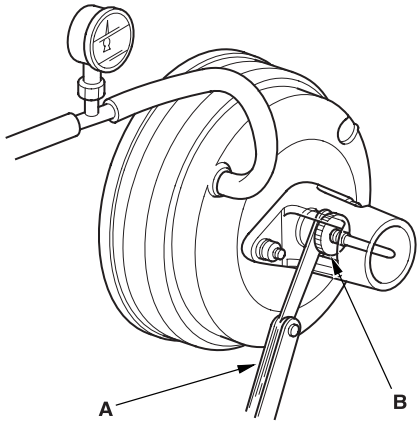
2. Without disturbing the center shaft's position, install the special tool (A) backwards on the booster.



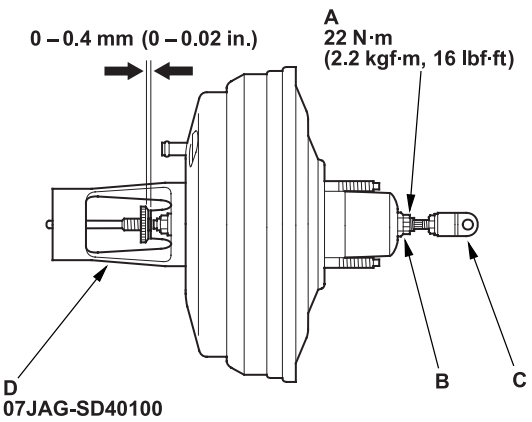
3. Install the master cylinder nuts (B), and tighten to the specified torque.
4. Connect the booster in-line with a vacuum gauge (C) 0 - 101 kPa (0 - 760 mmHg, 30 in.Hg) to the booster's engine vacuum supply, and maintain an engine speed that will deliver 66 kPa (500 mmHg, 20 in.Hg) vacuum.
5. With a feeler gauge (A), measure the clearance between the gauge body and the adjusting nut (B) as shown.

   If the clearance between the gauge body and adjusting nut is 0.4 mm (0.02 in.), the pushrod-to-piston clearance is 0 mm. However, if the clearance between the gauge body, and adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm (0.02 in.) or more. Therefore it must be adjusted and rechecked.

   Clearance: 0 - 0.4 mm (0 - 0.02 in.)

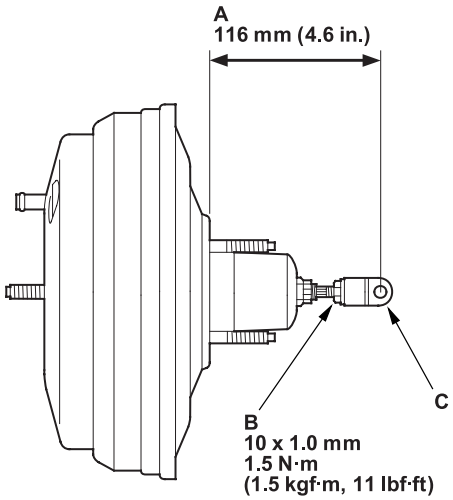


6. If the clearance is incorrect, loosen the star locknut (A) and turn the adjuster (B) in or out to adjust.
   - Adjust the clearance while the specified vacuum is applied to the booster.
   - Hold the clevis (C) while adjusting.



7. Tighten the star locknut securely.
8. Remove the special tool (D).

9. Check the pushrod length (A) as shown if the booster is removed. If the length is incorrect, loosen the pushrod locknut (B), and turn the clevis (C) in or out to adjust.



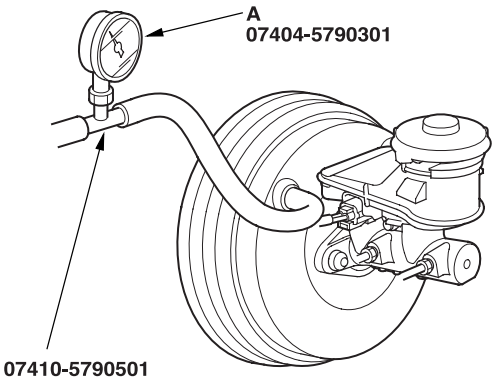
10. Install the master cylinder (see page 19A-21).

Brake Booster Inspection

Special Tools Required
- Vacuum gauge 07404-5790301
- Pressure gauge 07406-5790201
- Attachment 07410-5790101
- Tube joint adapter 07410-5790501
- Pressure gauge joint pipe 07510-6340101

Leak Test

1. Install the vacuum gauge (A) between the brake booster and check valve.



2. Start the engine, adjust the engine speed with the accelerator pedal so that the vacuum gauge readings show 40.0 - 66.7 kPa (300 - 500 mmHg, 11.8 - 19.7 in.Hg), then stop the engine.

3. Read the vacuum gauge.

   If the vacuum reading decreases 2.7 kPa (20 mmHg, 0.8 in.Hg) or more after 30 seconds, check following parts for leaks.
   - Check valve
   - Vacuum hose, pipe
   - Seals
   - Brake booster
   - Master cylinder

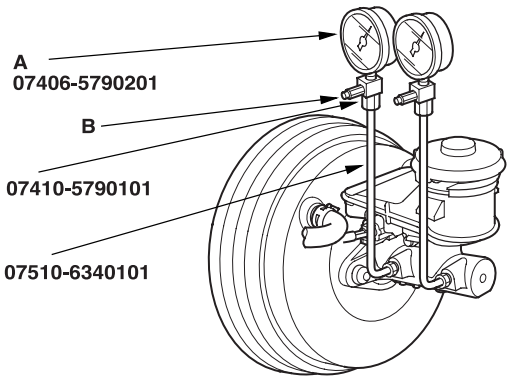
   NOTE: Do not try to disassemble the brake booster. Replace the brake booster as an assembly with a new one.

(cont'd)

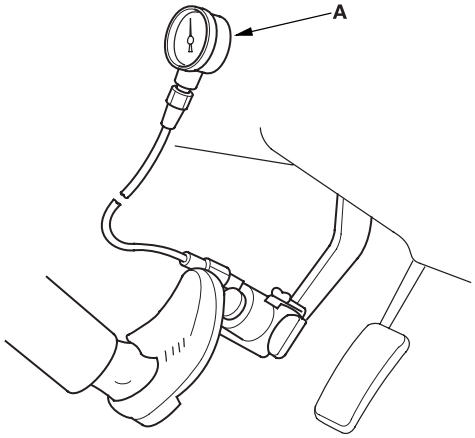
Brake Booster Inspection (cont'd)

Function Test

1. Install the vacuum gauge as same as the leak test.
2. Connect the oil pressure gauges (A) to the master cylinder using the attachments (special tools) as shown.
3. Bleed air through the valves (B).



4. Start the engine and let it idle.
5. Have an assistant depress the brake pedal with a 98 N (10 kgf, 22 lbf) and 294 N (30 kgf, 66 lbf) of pressure measuring with a commerciallly available pressure gauge (A).



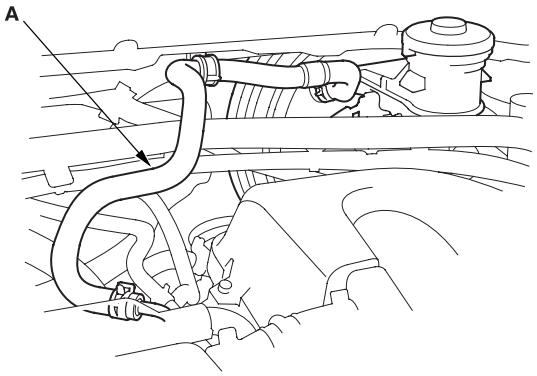
6. The following pressures should be obseved at the pressure gauges in each vacuum.

Vacuum booster Vacuum kPa (mmHg, in.Hg)	Brake pedal pressure N (kgf, lbf)	Master cylinder oil pressure kPa (kgf/cm², psi)	
		With ABS	Without ABS
0 (0, 0)	98 (10, 22)	0 (0, 0)	
	294 (30, 66)	1,920 (19.6, 280)	
66.7 (500, 19.7)	98 (10, 22)	6,330 (64.5, 920)	
	294 (30, 66)	12,130 (123.7, 1,760)	

7. Inspect the master cylinder for leaks if the readings do not fall within the limits shown above.

Booster Check Valve Test

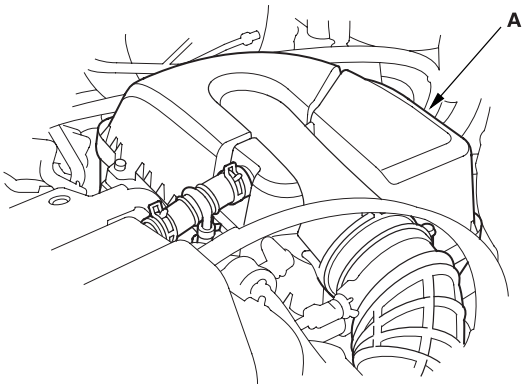
1. Disconnect the brake booster vacuum hose (check valve built in) (A) at the booster side.



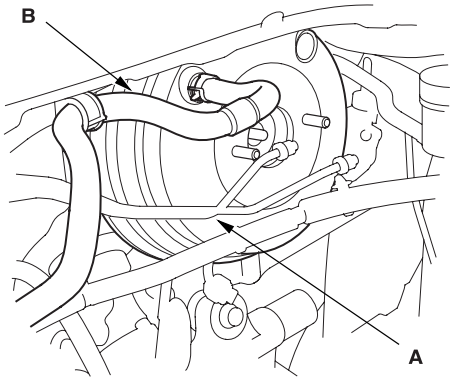
2. Start the engine, and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve, and retest.

Brake Booster Replacement

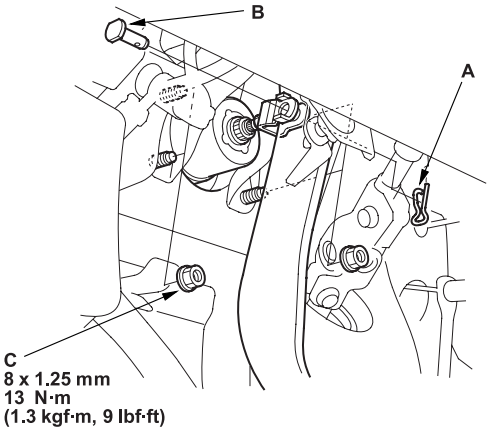
1. Remove the master cylinder (see page 19A-21).
2. Remove the air cleaner assembly (A).



3. Remove the master cylinder brake lines (A) from the brake line clip.



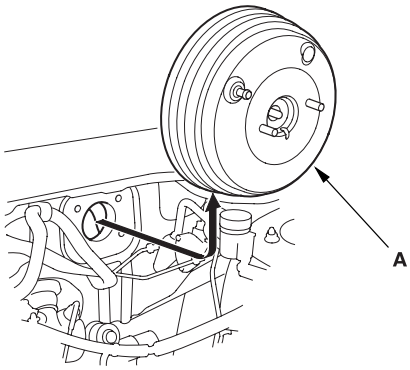
4. Disconnect the vacuum hose (B) from the brake booster.
5. Remove the clip (A) and the joint pin (B), and disconnect the yoke from the brake pedal.



6. Remove the brake booster mounting nuts (C).
7. Remove the brake booster (A) from the engine compartment.

NOTICE

- Be careful not to damage the booster surfaces and threads of the booster stud bolts.
- Be careful not to bent or damage the brake lines.



8. Install the brake booster in the reverse order of removal, and note these items:
   - Adjust the pushrod clearance before installing the brake booster (see page 19A-26).
   - Use a new clip whenever installing.
   - After installing the brake booster and master cylinder, fill the reservoir with new brake fluid, bleed the brake system (see page 19A-9), and adjust the brake pedal height and free play (see page 19A-5).

Rear Brake Pads Inspection and Replacement

CAUTION

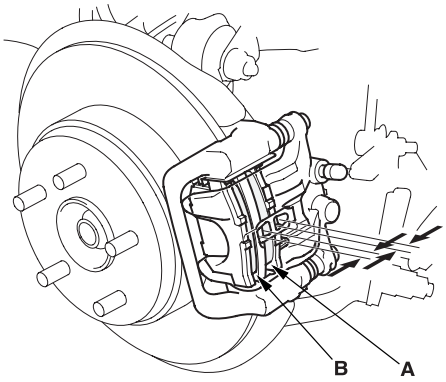
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an appropriate vacuum cleaner.

Inspection

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Check the thickness of the inner (A) and outer pads (B). Do not include the thickness of the brake pad backing plate.

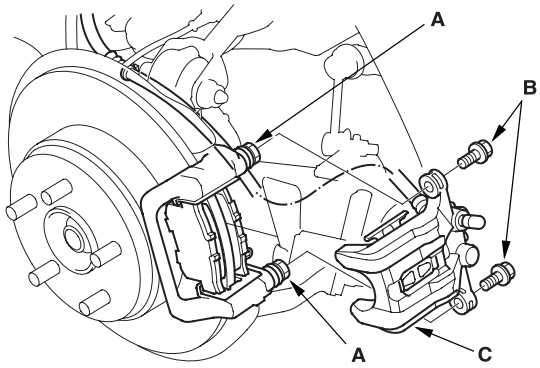
   Brake pad thickness
   Standard: 8.5 - 9.5 mm (0.33 - 0.37 in.)
   Service limit: 1.6 mm (0.06 in.)



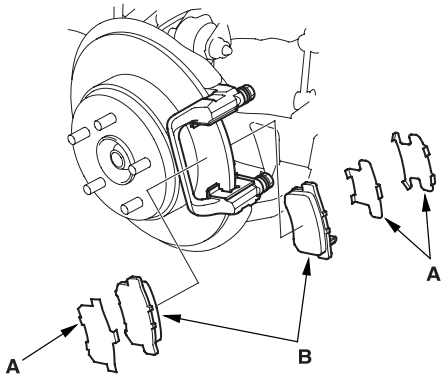
3. If the brake pad thickness is less than the service limit, replace all the pads as a set.

Replacement

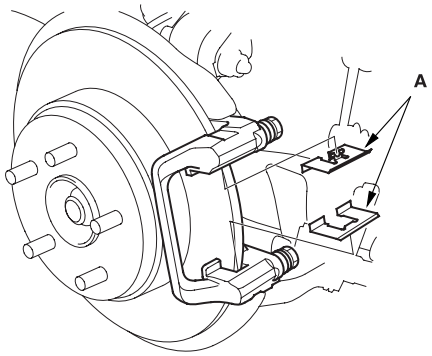
1. Hold the pins (A) with a wrench, being careful not to damage the pin boots. Remove the caliper bolts (B) and remove the caliper (C) from the caliper bracket.



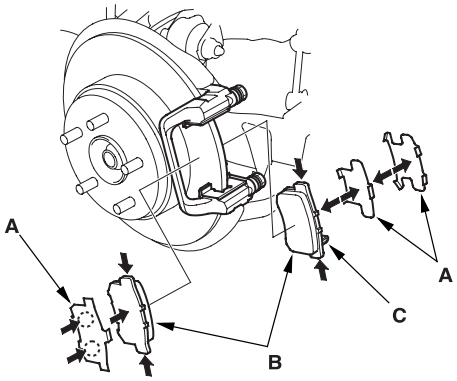
2. Remove the pad shims (A) and pads (B).



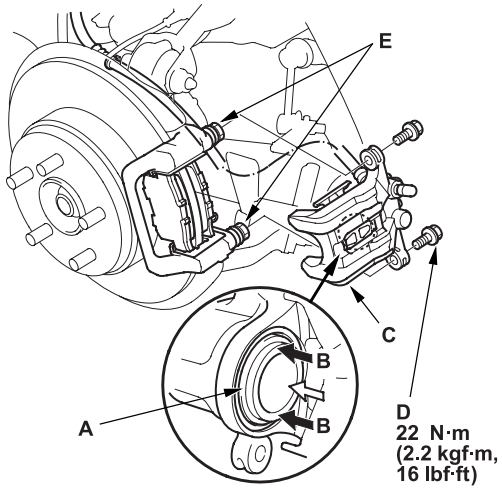
3. Remove the pad retainers (A).



4. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
5. Check the brake disc for damage and cracks.
6. Install the pad retainers.
7. Apply Dow Corning Molykote M77 grease to both sides of the pad shims (A), the back of the pads (B), and the other areas indicated by the arrows. Wipe excess grease off the shim. Contaminated brake discs and pads reduce stopping ability. Keep grease off the discs and pads.



8. Install the brake pads and pad shims correctly. Install the pads with the wear indicators (C) on the inside.
   If you are reusing the pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.
9. Push in the piston (A) so that the caliper will fit over the pads.Check the brake fluid level. The brake fluid may overflow if the reservoir is too full. Make sure that the piston boot is in position to prevent damaging it when installing the caliper.



10. Apply Dow Corning Molykote M77 grease to the piston edges (B) on their mating surfaces against the inner pad shim.
11. Install the brake caliper (C) and caliper bolts (D), and torque them to the specified torque while holding the pin (E). Be careful not to damage the pin boots.
12. Press the brake pedal several times to make sure the brake works then test-drive.

    NOTE: Engagement of the brake may require a greeter pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

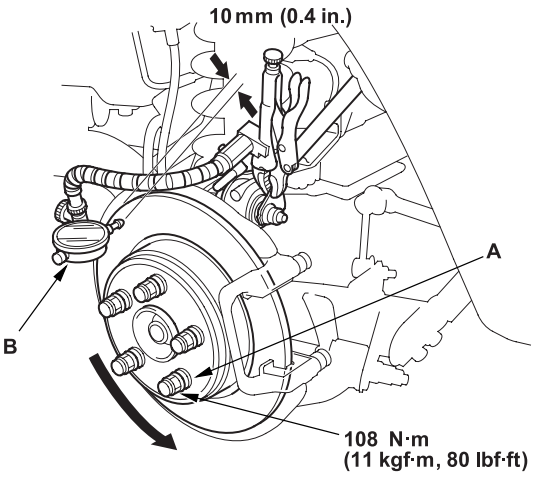
13. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

Rear Brake Disc Inspection

Runout

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Remove the brake pads (see page 19A-30).
3. Inspect the disc surface for damage and cracks. Clean the disc thoroughly and remove all rust.
4. Use wheel nuts and suitable flat washers (A) to hold the disc securely against the hub, then mount a dial indicator (B) as shown, and measure the runout at 10 mm (0.4 in.) from the outer edge of the disc.

   Brake Disc Runout:
   Service limit: 0.10 mm (0.004 in.)



5. If the disc is beyond the service limit, refinish the brake disc.

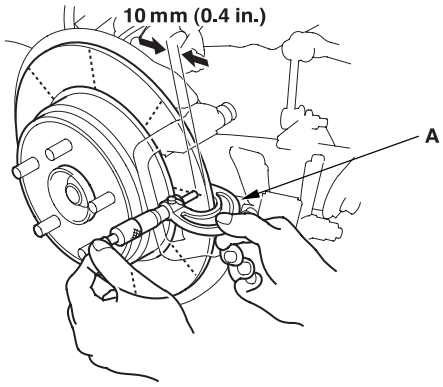
   Max. Refinishing Limit: 8.0 mm (0.31 in.)

   NOTE: A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).

Thickness and parallelism

1. Loosen the rear wheel nuts slightly, then raise the vehicle and make sure it is securely supported. Remove the rear wheels.
2. Remove the brake pads (see page 19A-30).
3. Using a micrometer (A), measure disc thickness at eight points, approximately 45° apart and 10 mm (0.4 in.) in from the outer edge of the disc.

   This is the maximum allowable difference between the thickness measurements.



   Brake Disc thickness:
   Standard: 8.9 - 9.1 mm (0.350 - 0.358 in.)
   Max. Refinishing Limit: 8.0 mm (0.31 in.)

   Brake Disc Parallelism: 0.015 mm (0.0006 in.) max.

4. If the smallest measurement is less than the max. Refinishing limit, replace the brake disc (see page 18-27).
5. If the disc is beyond the service limit for parallelism, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

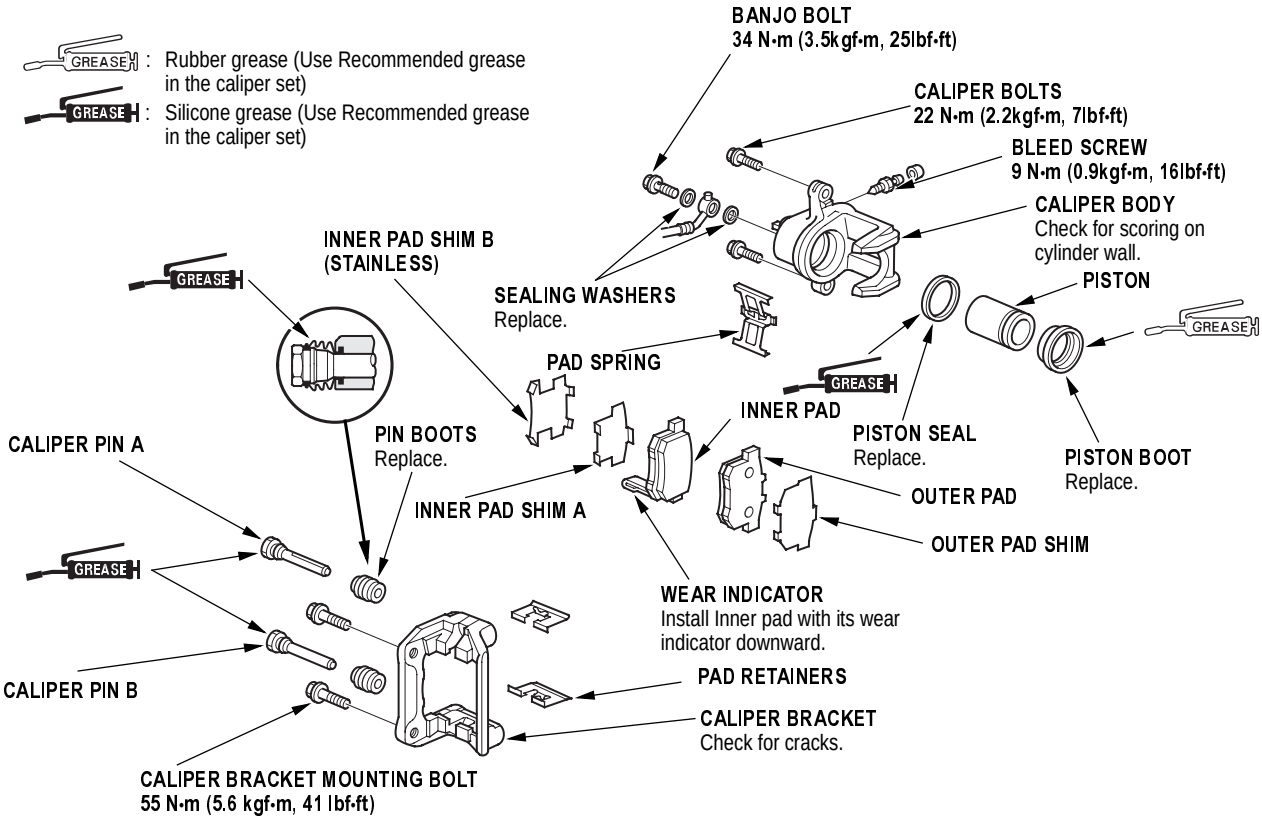
Rear Brake Caliper Overhaul

CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an approved vacuum cleaner.

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter gets in the brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- When reusing pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid.
- Always use Genuine Honda DOT 3 Brake Fluid. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.

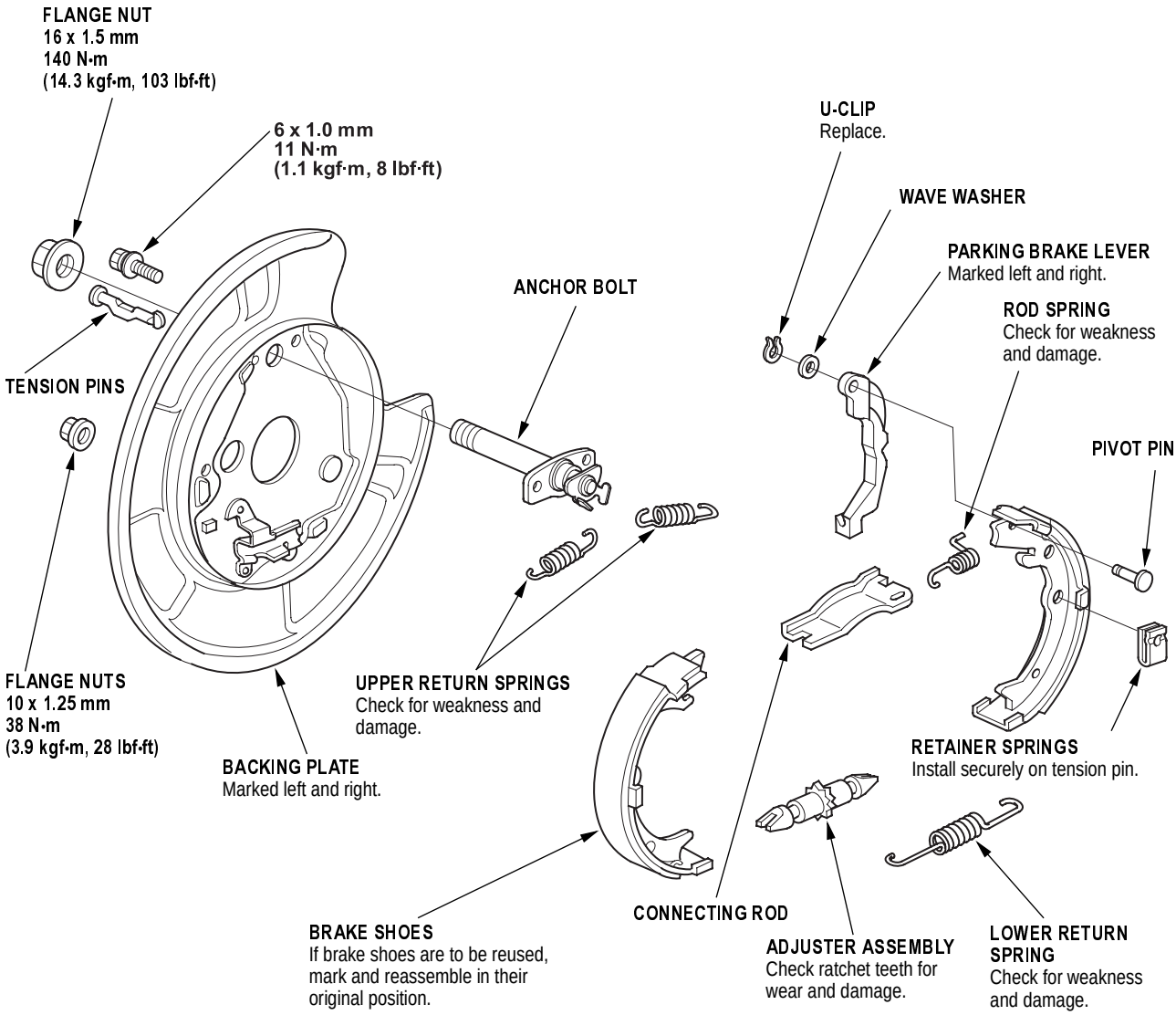


Parking Brake Drum Inspection

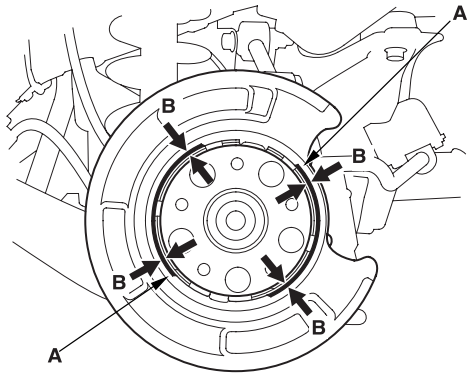
CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air 4hose or brush to clean brake assemblies. Use an approprite vacuum cleaner.

1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Release the parking brake, and remove the rear brake caliper and disc/drum (see page 18-27).



3. Check the parking brake linings (A) for cracking, glazing, wear, and contamination.



4. Measure the parking brake lining thickness (B). Measurement does not include brake shoe thickness.

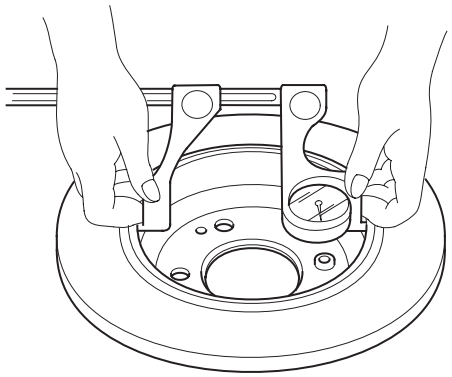
Parking brake lining thickness:
Standard: 3.2 mm (0.126 in.)
Service limit: 1.0 mm (0.04 in.)

5. If the brake lining thickness is less than the service limit, replace all the parking brake shoes as a set.

6. Check the bearings in the hub unit for smooth operation.

7. Measure the inside diameter of the parking brake drum with inside vernier calipers.

Parking brake drum inside diameter:
Standard: 169.9 - 170.0 mm (6.689 - 6.693 in.)
Service limit: 171.0 mm (6.732 in.)



8. If the inside diameter of the parking brake drum is more than service limit, replace the rear brake disc/ drum.

9. Check the parking brake drum for scoring, grooves, and cracks.

Parking Brake Shoes Replacement

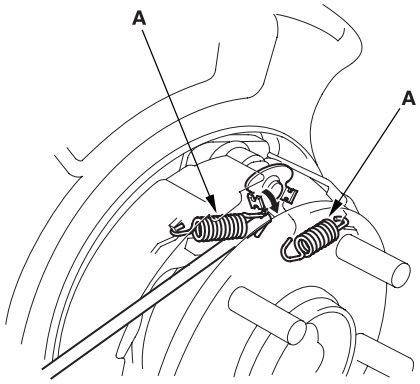
CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.

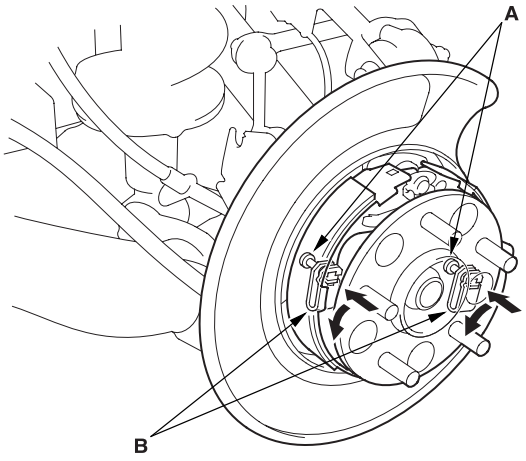
- Avoid breathing dust particles
- Never use an air hose or brush to clean brake assemblies. Use an appropriate vacuum cleaner.

Disassembly

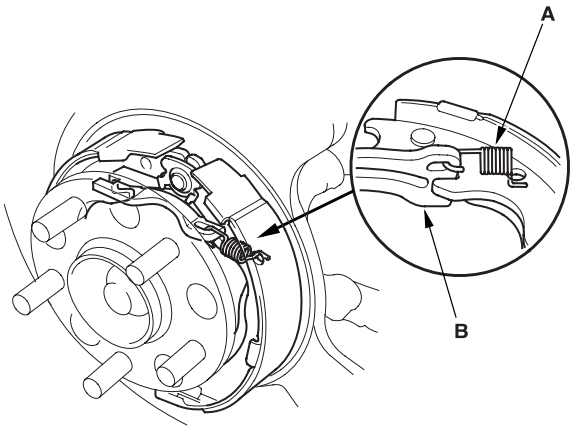
1. Raise the rear of the vehicle, and make sure it is securely supported. Remove the rear wheels.
2. Release the parking brake and remove the rear brake caliper and brake disc/drum (see page 18-27).
3. Disconnect and remove the upper return springs (A).



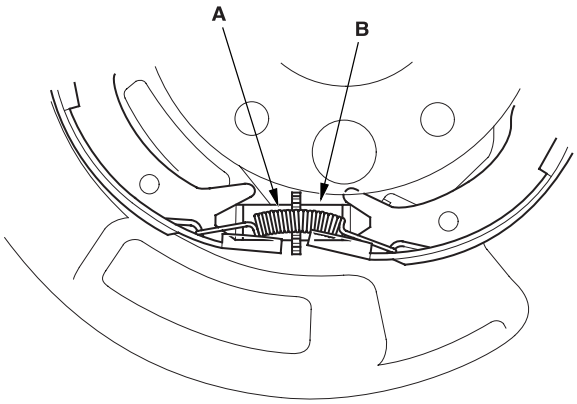
4. Remove the tension pins (A) by pushing the retainer springs (B) and turning the pins.



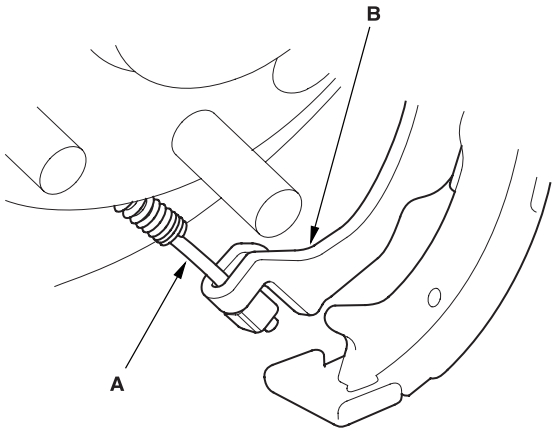
5. Disconnect the rod spring (A), and remove the connecting rod (B).



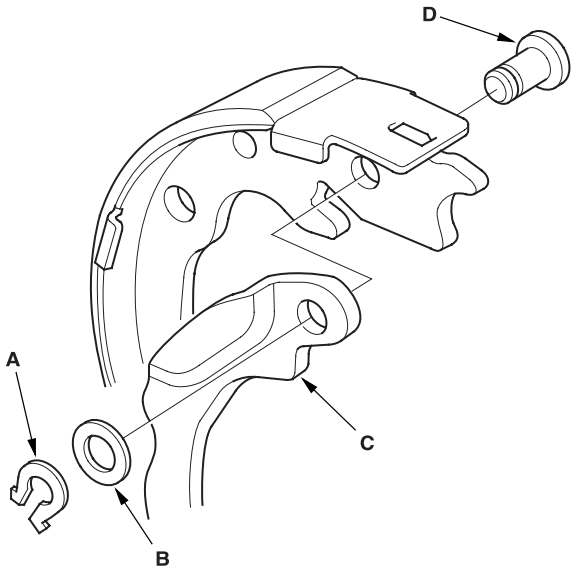
6. Lower the parking brake shoe assembly.
7. Remove the forward brake shoe by removing the lower return spring (A) and adjuster assembly (B).



8. Remove the rearward brake shoe by disconnecting the parking brake cable (A) from the parking brake lever (B).

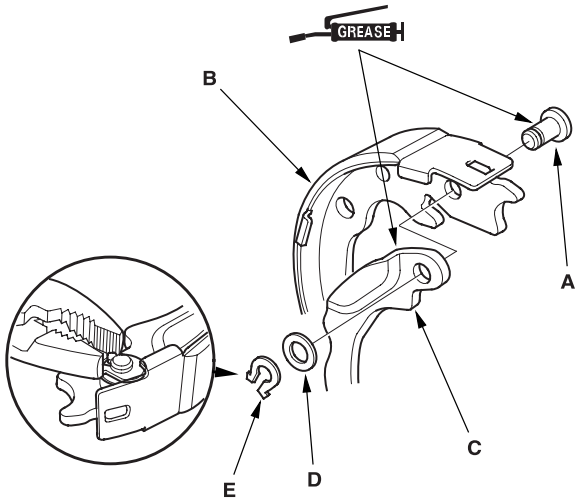


9. Remove the U-clip (A), wave washer (B), parking brake lever (C) and pivot pin (D) from the brake shoe.



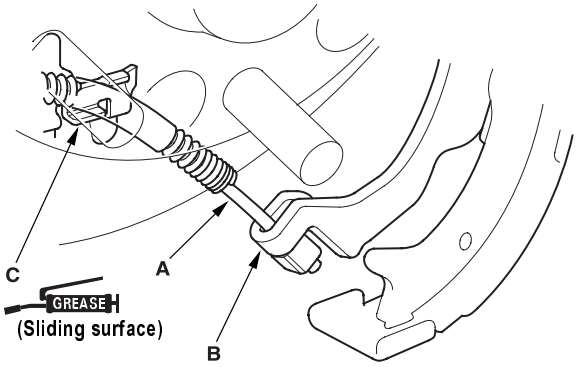
Reassembly

1. Apply Molykote 44 MA grease to the sliding surface of the pivot pin (A), and insert the pin into the rearward brake shoe (B).



2. Install the parking brake lever (C) and washer (D) on the pivot pin, and secure with a new U-clip (E).
- Install the wave washer with its convex side facing out.
- Pinch the U-clip securely to prevent the pivot pin from coming out from the brake shoe.

3. Connect the parking brake cable (A) to the parking brake lever (B). Apply silicone grease to the cable contact surface (C) on the backing plate.

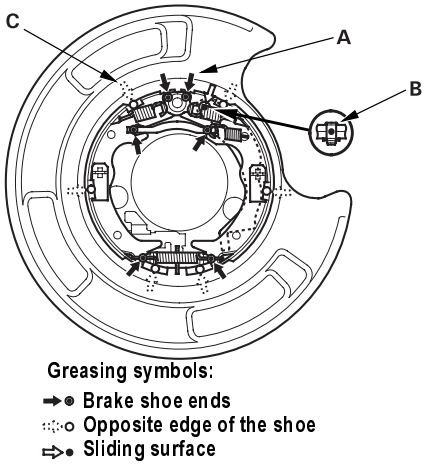


(cont'd)

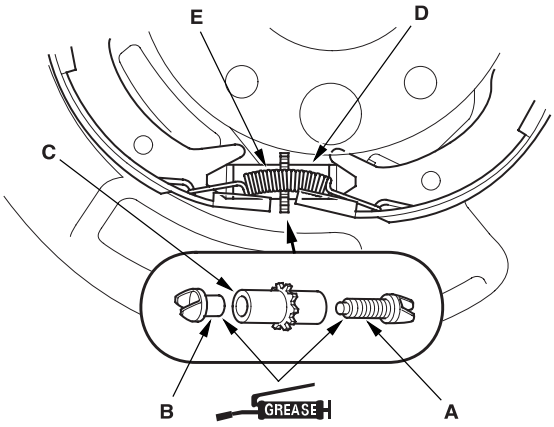
Parking Brake Shoes Replacement (cont'd)

Reassembly (cont'd)

4. Apply Molykote 44 MA grease to the shoe ends (A), sliding surfaces (B), and opposite edges of the parking brake shoe (C) as shown. Wipe off any excess. Don't get grease on the brake linings.

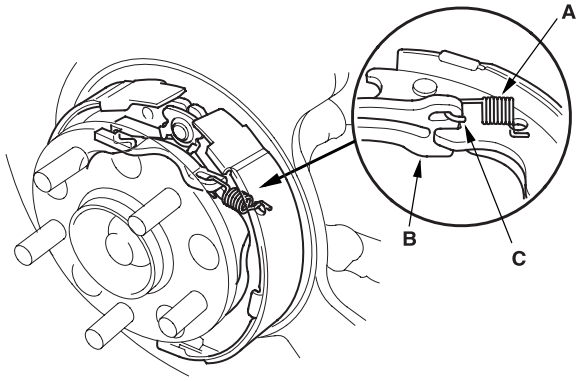


5. Clean the threaded portions of the clevis (A), and coat the threads of the clevis with grease. Clean the sliding surface of the clevis (B), and coat the sliding surface of the clevis (B) with grease. Install the clevis (A) and (B) on the adjuster (C), and shorten the clevis (A) by turning the adjuster.

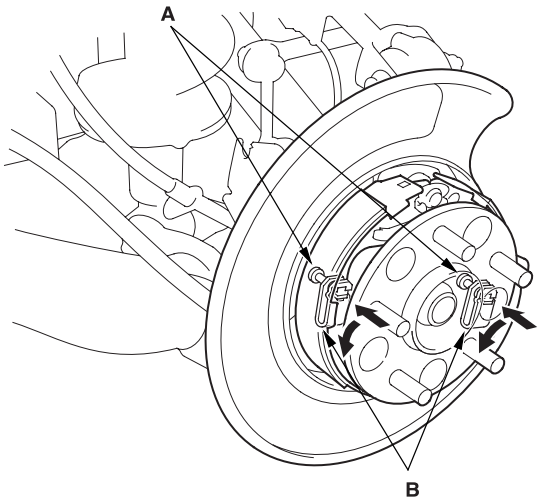


6. Reinstall the brake shoe adjuster assembly (D), and hook the lower return spring (E) on the parking brake shoes.

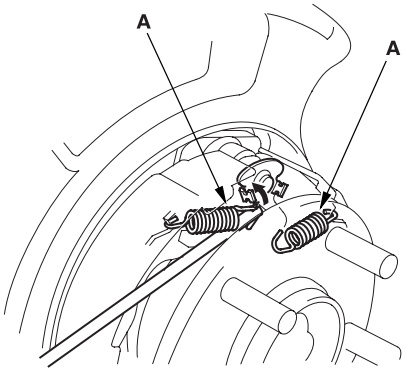
7. Hook the rod spring (A) to the connecting rod (B) first with the spring end (C) pointing downward. Then hook the rod spring to the parking brake shoe, and install the connecting rod on the parking brake shoes.



8. Reinstall the tension pins (A) and retainer springs (B). Make sure the tension pin does not contact the parking brake lever.



9. Reinstall the upper return springs (A).



10. Install the rear brake disc/drum and rear brake caliper (see page 18-28).
11. Do the major adjustment for parking brake (see page 19A-6).

Lining Surface Break-in

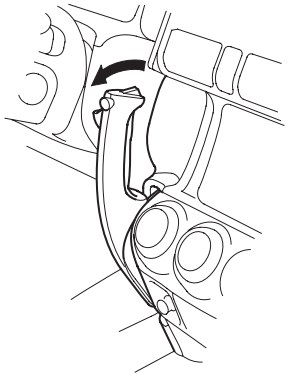
NOTE:

- Do brake linings surface break-in when replacing shoes with new linings and/or new rear brake disc/drum.

WARNING

Perform this operation in a safe area.

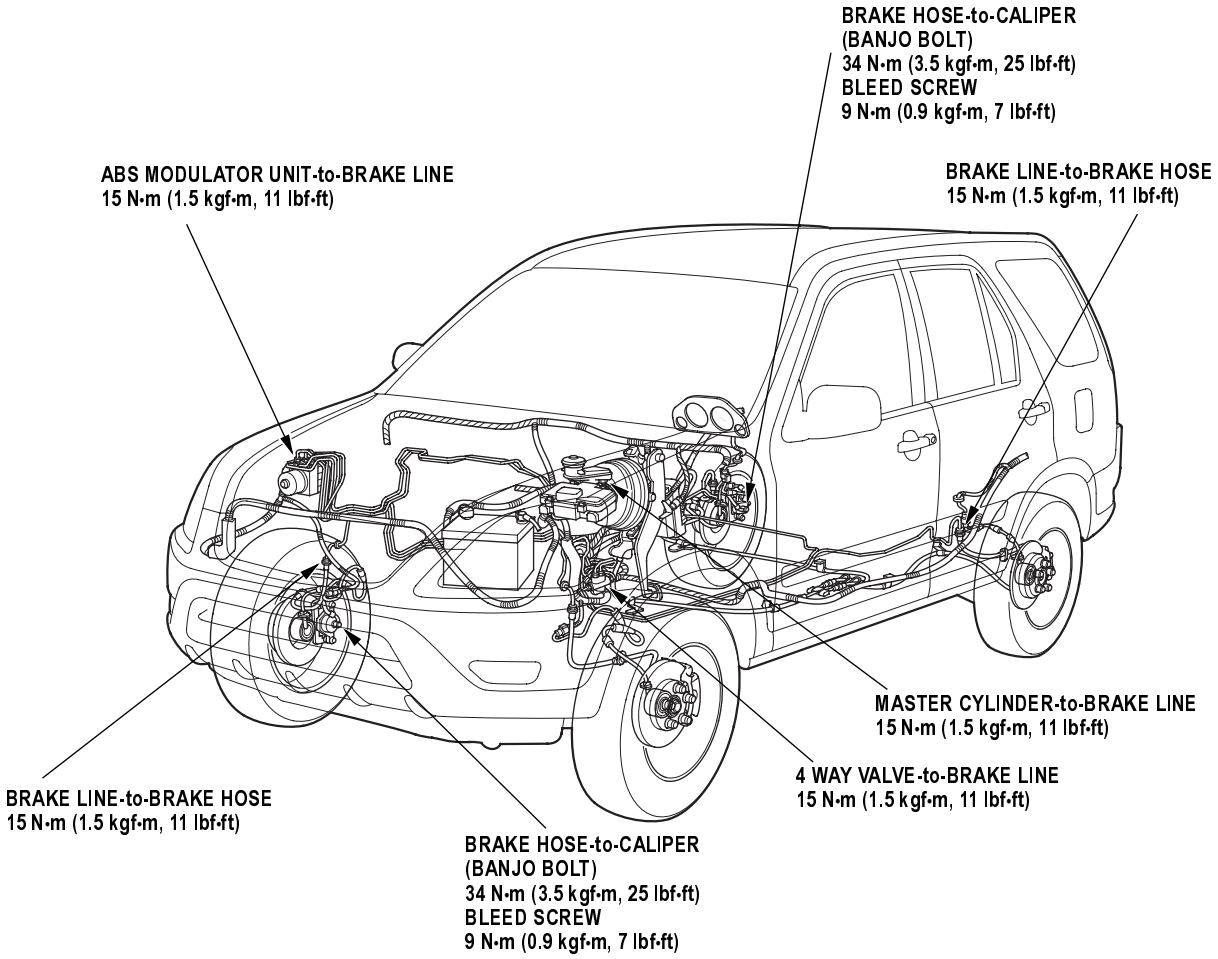
1. Park the vehicle on a firm, level surface.
2. Do the major parking brake adjustment.
3. Do the minor parking brake adjustment.
4. Drive the vehicle at no more than 31 mph (50 km/h).
5. Pull the parking brake lever two to four clicks while driving the vehicle for 400 m (1/4 mile).



6. Stop the vehicle, and release the parking brake lever for 5 - 10 minutes to allow the drums to cool. Repeat steps 4 through 6 three more times.
7. Do the major parking brake adjustment (see page 19A-6).

Brake Hoses and Lines Inspection

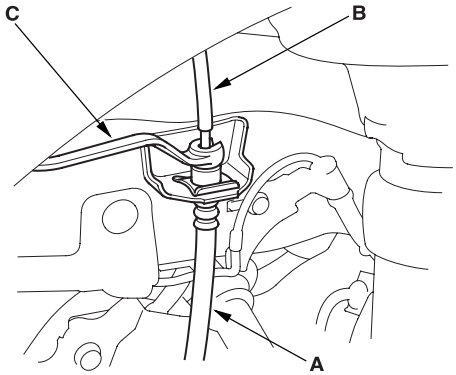
1. Inspect the brake hoses, for damage, deterioration, leaks, interference, and twisting.
2. Check the brake lines for damage, rusting, and leakage. Also check for bent brake lines.
3. Check for leaks at hose and line joints or connections, and retighten if necessary.
4. Check the master cylinder and ABS modulator unit (if equipped) for damage and leakage.
   NOTE: Replace the brake hose clip whenever the brake hose is serviced.



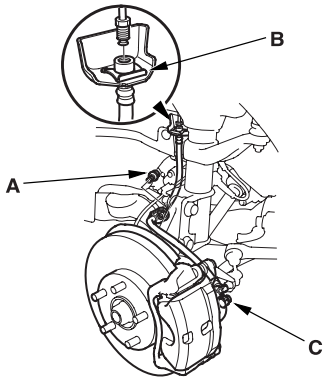
Brake Hose Replacement

NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping, cover disconnected line joints with rags or shop towels.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.

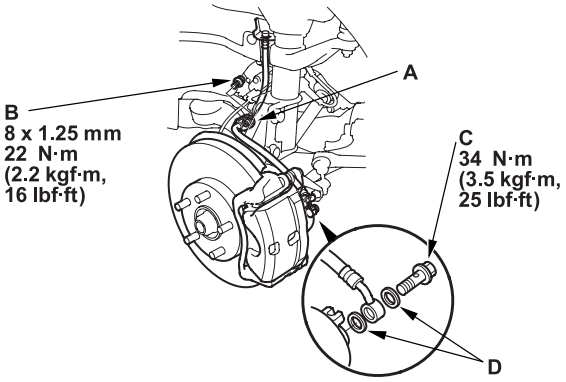
1. Replace the brake hose (A) if the hose is twisted, cracked, or if it leaks.



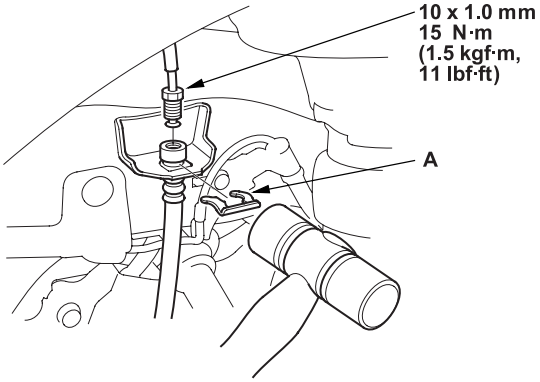
2. Disconnect the brake hose from the brake line (B) using a 10 mm flare nut wrench (C).
3. Remove the flange bolt (A), and remove the brake hose brackets from the damper.



4. Remove and discard the hose clip (B).
5. Remove the banjo bolt (C), and remove the brake hose from the caliper.
6. Install the brake hose bracket (A) on the damper with the flange bolt (B) first, then connect the brake hose to the caliper with the banjo bolt (C) and new sealing washers (D).



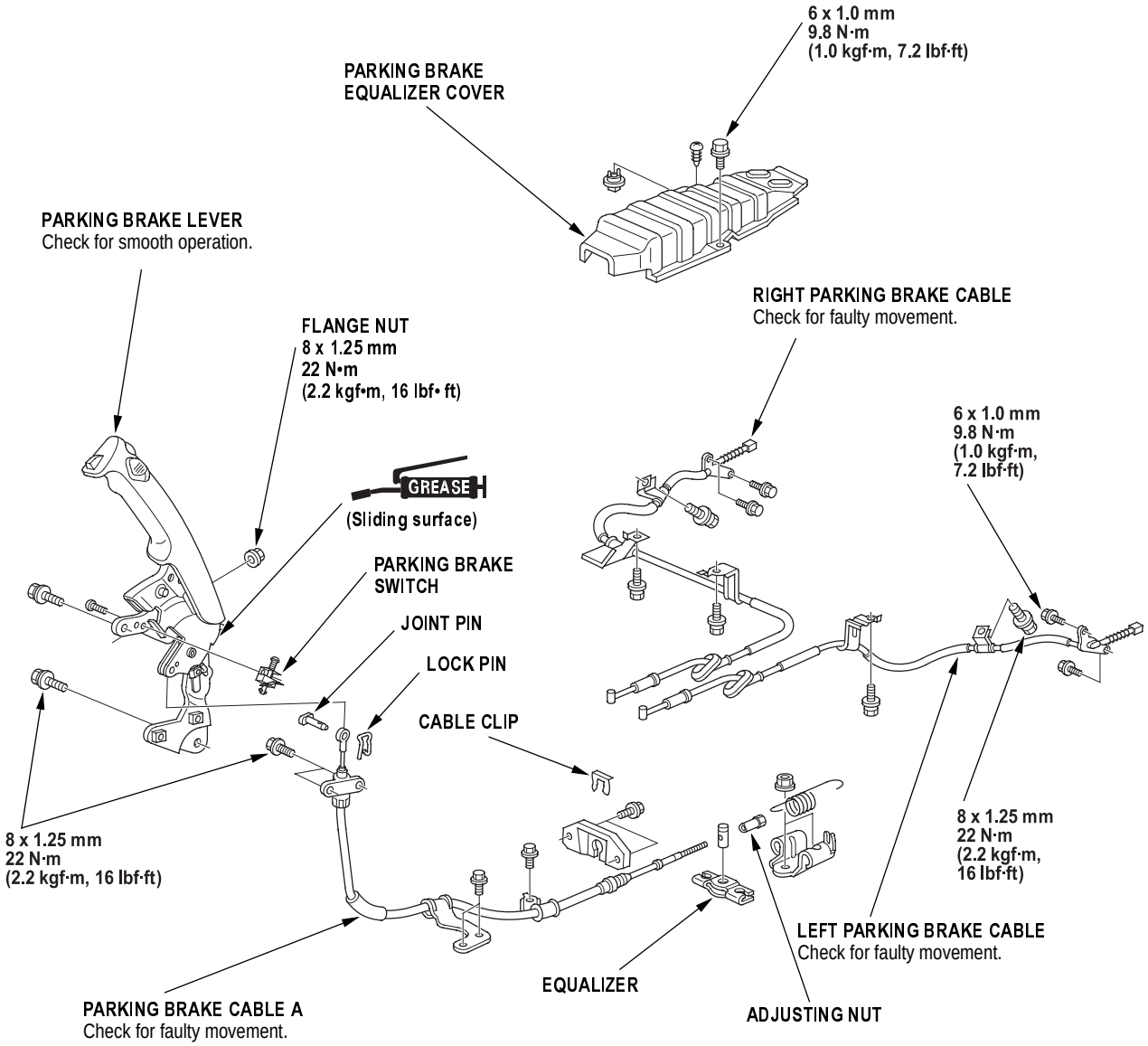
7. Install the hose onto the hose bracket on the body with a new hose clip (A).



8. Connect the brake line to the brake hose.
9. After installing the brake hose, bleed the brake system (see page 19A-9).
10. Do the following checks:
    - Check the brake hose and line joint for leaks, and tighten if necessary.
    - Check the brake hoses for interference and twisting.

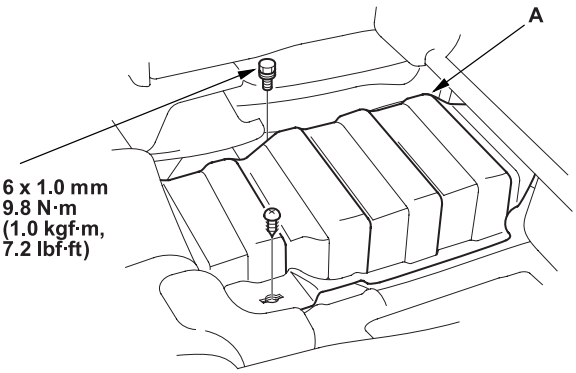
Parking Brake Cable Replacement

Exploded View

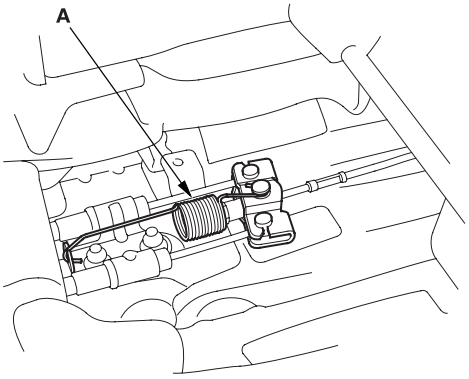


NOTE:
- The parking brake cables must not be bent or distorted. This will lead to stiff operation and premature failure.
- Refer to the Exploded View as needed during this procedure.

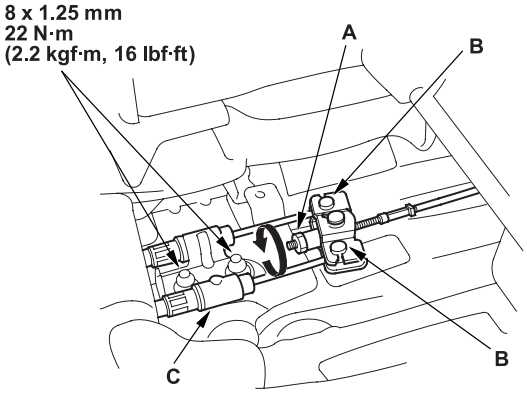
1. Raise the rear of the vehicle, and make sure it is securely supported.
2. Release the parking brake lever fully. Move the driver's seat (RHD: assistant seat) all the way forward.
3. Pull back the carpet on the floor at the under the seat. Remove the screw and bolt for the parking brake equalizer cover (A).



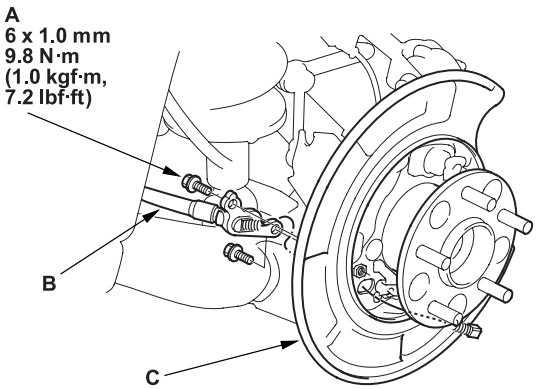
4. Remove the return spring (A).



5. Back off the adjusting nut (A) in the equalizer, and disconnect the parking brake cable ends (B) from the equalizer.



6. Remove the cable guide base (C).
7. Remove the rear brake shoes (see page 19A-36), and disconnect the parking brake cable from the shoe.
8. Remove the flange bolts (A) and parking brake cable (B) from the backing plate (C).



9. Reinstall the parking brake cable in revers order of removal, and note these item.
   - Be careful not to bend or distort the cable.
   - Do the major parking brake adjustment (see page 19A-6).

19B

Brakes

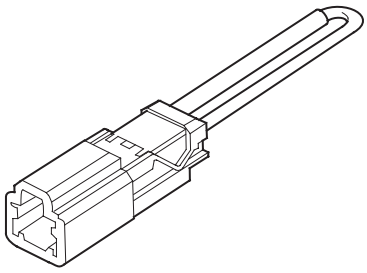
ABS Components 19B-2
Special Tools 19B-2
Component Location Index 19B-3
General Troubleshooting Information 19B-4
DTC Troubleshooting Index 19B-10
Symptom Troubleshooting Index 19B-11
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Brake System Indicator Circuit Troubleshooting 19B-34
ABS Modulator-Control Unit Removal and Installation 19B-36
Wheel Sensor Inspection 19B-38
Wheel Sensor Replacement 19B-39



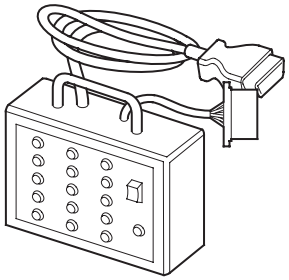
ABS Components

Special Tools

Ref. No.	Tool Number	Description	Qty
1	07PAZ-0010100	SCS Short Connector (EU model)	1
2	07WAJ-0010100	DLC Pin Box (Except EU model)	1

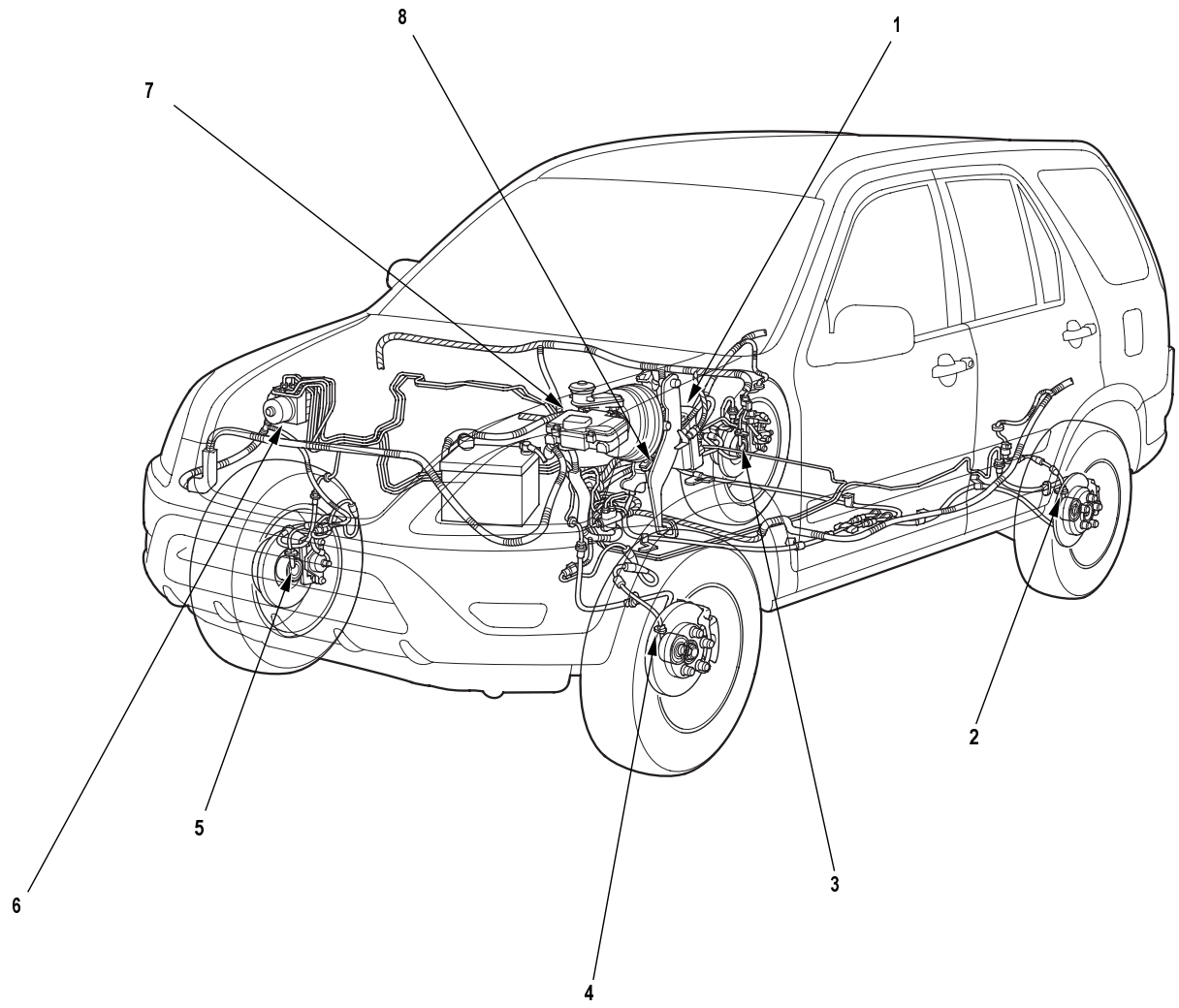


1



2

Component Location Index



1	UNDER-DASH FUSE/RELAY BOX	
2	LEFT-REAR WHEEL SENSOR	Inspection, page 19B-38 Replacement, page 19B-39
3	RIGHT-REAR WHEEL SENSOR	Inspection, page 19B-38 Replacement, page 19B-39
4	LEFT-FRONT WHEEL SENSOR	Inspection, page 19B-38 Replacement, page 19B-39
5	RIGHT-FRONT WHEEL SENSOR	Inspection, page 19B-38 Replacement, page 19B-39
6	ABS MODULATOR-CONTROL UNIT	Removal and installation, page 19B-36
7	UNDER-HOOD FUSE/RELAY BOX	
8	DATA LINK CONNECTOR (16P)	

General Troubleshooting Information

ABS Indicator

- If the system is OK, the ABS indicator goes off 2 seconds after turning the ignition switch ON (II) without starting the engine, and then comes on again and goes off 2 seconds later after starting the engine. This occurs because the ABS control unit is turned on by the IG1 power source.
- The ABS indicator comes on when the ABS control unit detects a problem in the system. However, even though the system is operating properly, the indicator will come on under these conditions:
  - Only the drive wheels rotate
  - One drive wheel is stuck
  - The vehicle goes into a spin
  - The ABS continues to operate for a long time.
  - The vehicle is subjected to an electrical signal disturbance

To determine the actual cause of the problem, question the customer about the problem, taking the above conditions into consideration.

- When a problem is detected and the ABS indicator comes on, there are cases when the indicator stays on until the ignition switch is turned OFF, and cases when the indicator goes off automatically when the system returns to normal.
  - DTC 61, 62:
    The ABS indicator goes off automatically when the system returns to normal.
  - DTC 11, 13, 15, 17, 31, 32, 33, 34, 35, 36, 37, 38, 54, or 81:
    The ABS indicator stays on until the ignition switch is turned OFF whether or not the system returns to normal.
  - DTC 12, 14, 16, 18, 21, 22, 23, 24, 51, 52, or 53:
    The ABS indicator goes off when the vehicle is driven again and the system is OK after the ignition switch is turned from OFF to ON (II).

Diagnostic Trouble Code (DTC)

- The memory can hold three DTCs. However, when the same DTC is detected more than once, the more recent DTC is written over the earlier one.
  Therefore, when the same problem is detected repeatedly, it is memorized as a single DTC.
- The DTCs are indicated in the order they occurred, beginning with the most recent.
- The DTCs are memorized in the EEPROM (non-volatile memory). Therefore, the memorized DTCs are not cleared when the battery is disconnected, the ignition switch is turned off, or the system returns to normal. Perform the specified procedures to clear the DTCs.

Self-diagnosis

- Self-diagnosis can be classified into two categories:
  - Initial diagnosis:
    Done right after the engine starts and until the ABS indicator goes off
  - Regular diagnosis:
    Done right after the initial diagnosis until the ignition switch is turned OFF
- When a problem is detected by self-diagnosis, the system does the following:
  - Turns the ABS indicator on
  - Memorizes the DTC
  - Stops ABS control

Kickback

The pump motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback at the brake pedal.

Pump Motor

- The pump motor operates when the ABS is functioning.
- The ABS control unit checks the pump motor operation when the vehicle is started the first time after the ignition switch is turned ON (II). You may hear the motor operate at this time, but it is normal.

How to Troubleshoot ABS DTCs

The troubleshooting flowchart procedures assume that the cause of the problem is still present and the ABS indicator is still on. Following the flowchart when the ABS indicator does not come on can result in incorrect diagnosis.

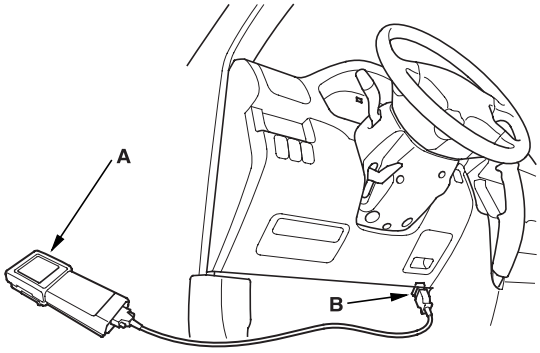
The connector illustrations show the female terminal connectors with a single outline and the male terminal connectors with a double outline.

1. Question the customer about the conditions when the problem occured, and try to reproduce the same conditions for troubleshooting. Find out when the ABS indicator came on, such as during ABS control, after ABS control, when the vehicle was at a certain speed, etc.
2. When the ABS indicator does not come on during the test-drive, but troubleshooting is done based on the DTC, check for loose connectors, poor terminal contact, etc., before you start troubleshooting.
3. After troubleshooting, clear the DTC and test-drive the vehicle. Be sure the ABS indicator does not come on.

How to Retrieve ABS DTCs

Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) right side of the under-dash fuse/relay box.

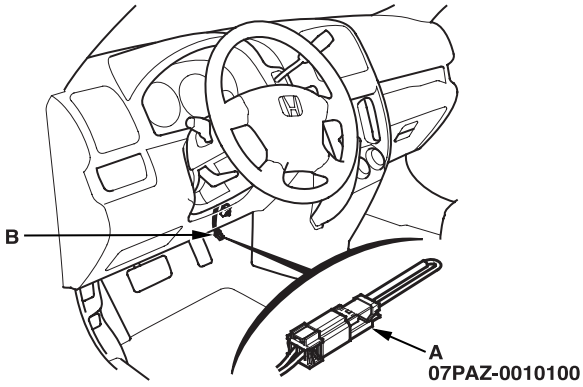


2. Turn the ignition switch ON (II), and follow the prompts on the PGM Tester to display the DTC(s) on the screen. After determining the DTC, refer to the DTC Troubleshooting Index.

   NOTE: See the Honda PGM Tester user's manual for specific instructions.

SCS Short Connector Method (EU Model):

1. With the ignition switch OFF, connect the SCS short connector (A) to the service check connector (2P) (B) right side of the under-dash fuse/relay box.



2. Turn the ignition switch ON (II) without pressing the brake pedal.

   NOTE: If you press the brake pedal when turning the ignition switch ON (II), the system shifts to the DTC clearing mode.

(cont'd)

General Troubleshooting Information (cont'd)

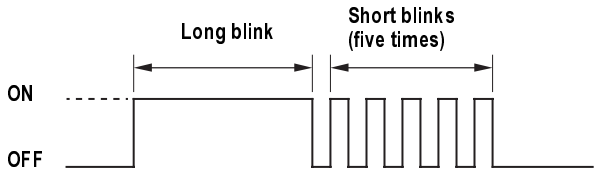
How to Troubleshoot ABS DTCs (cont'd)

3. The blinking frequency indicates the DTC. DTCs are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the DTC. After determining the DTC, refer to the DTC Troubleshooting Index.

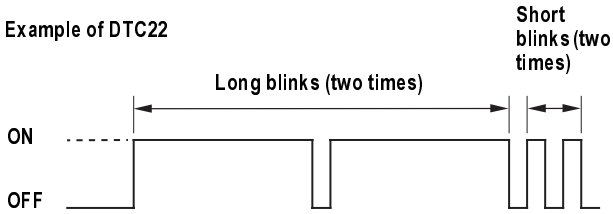
   NOTE:
   - If the DTC is not memorized, the ABS indicator will go off for 3.6 seconds, and then come back on.
   - If the ABS indicator continues on, troubleshoot for "ABS indicator does not go off" (see step 1 on page 19B-33).

   The system will not indicate the DTC unless these conditions are met:
   - The ignition switch is turned ON (II).
   - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).

Example of DTC15



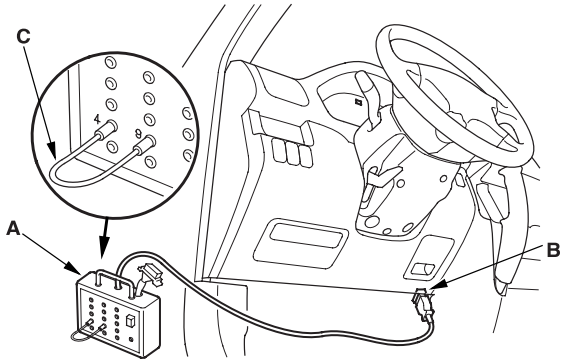
Example of DTC22



4. Turn the ignition switch OFF.
5. Disconnect the SCS short connector from the service check connector.

DLC Pin Box Method (Except EU Model):

1. With the ignition switch OFF, connect the DLC pin box (A) to the 16P Data Link Connector (DLC) (B) right side of the under-dash fuse/relay box.



2. Insert the plugs of the jumper wire (C) to No. 4 and No. 9 plug holes of the DLC terminal box, then push the switch.
3. Turn the ignition switch ON (II) without pressing the brake pedal.

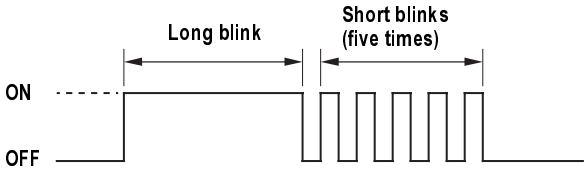
   NOTE: If you press the brake pedal when turning the ignition switch ON (II), the system shifts to the DTC clearing mode.

4. The blinking frequency indicates the DTC. DTCs are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the DTC. After determining the DTC, refer to the DTC Troubleshooting Index.

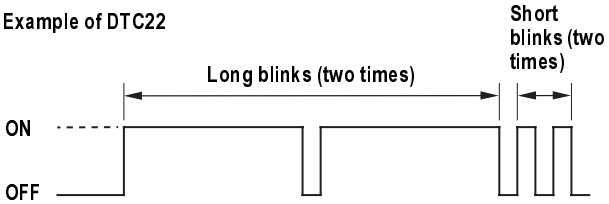
   NOTE:
   - If the DTC is not memorized, the ABS indicator will go off for 3.6 seconds, and then come back on.
   - If the ABS indicator stays on, troubleshoot for "ABS indicator does not go off" (see step 1 on page 19B-33).

   The system will not indicate the DTC unless these conditions are met:
   - The brake pedal is not pressed.
   - The ignition switch is turned ON (II).
   - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).

Example of DTC15



Example of DTC22

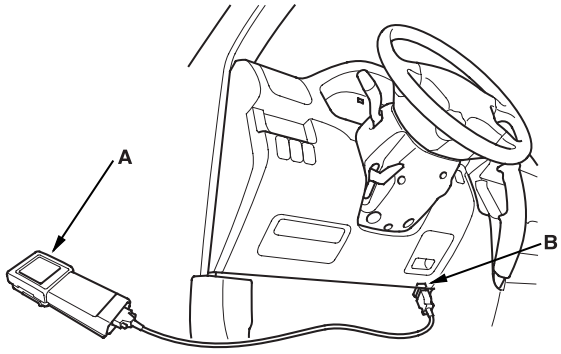


5. Turn the ignition switch OFF.
6. Disconnect the DLC pin box from the DLC.

How to Clear ABS DTCs

Honda PGM Tester Method:

1. With the ignition switch OFF, connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC) (B) under the driver's side of the dashboard.



2. Turn the ignition switch ON (II), and clear the DTC(s) by following the screen prompts on the PGM Tester.

   NOTE: See the Honda PGM Tester user's manual for specific instructions.

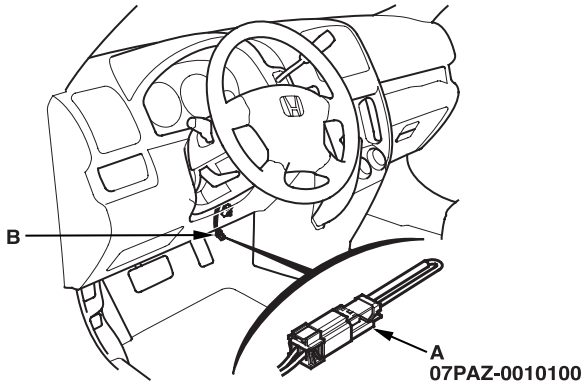
(cont'd)

General Troubleshooting Information (cont'd)

How to Clear ABS DTCs (cont'd)

SCS Short Connector Method (Except EU Model):

1. With the ignition switch OFF, connect the SCS short connector (A) to the service check connector (2P) (B) right side of the under-dash fuse/relay box.

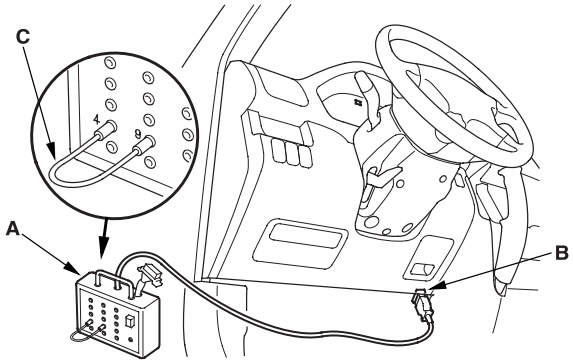


2. Press the brake pedal.
3. Turn the ignition switch ON (II) while continuing to press the brake pedal.
4. After the ABS indicator goes off, release the brake pedal.
5. After the ABS indicator comes on, press the brake pedal again.
6. After the ABS indicator goes off, release the brake pedal.

   You cannot clear the DTC unless these conditons are met:
   - The vehicle speed is 6 mph (10 km/h) or less.
   - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).
   - The brake pedal is press before the ignition switch is turned ON (II).
7. After a few seconds, the ABS indicator blinks twice and the DTC is cleared. If the indicator does not blink twice, repeat steps 1 thru 6. If the ABS indicator stays on after it blinks twice, check the DTC, because a problem was detected during initial diagnosis before shifting to DTC clearing mode.
8. Turn the ignition switch OFF.
9. Disconnect the SCS short connector from the service check connector.

DLC pin Box Method (Except EU Model):

1. With the ignition switch OFF, connect the DLC pin box (A) to the 16P Data Link Connector (DLC) (B) right side of the under-dash fuse/relay box.



2. Insert the plugs of the jumper wire (C) to No. 4 and No. 9 plug holes of the DLC pin box, then push the switch.
3. Press the brake pedal.
4. Turn the ignition switch ON (II) while continuing to press the brake pedal.
5. After the ABS indicator goes off, release the brake pedal.
6. After the ABS indicator comes on, press the brake pedal again.
7. After the ABS indicator goes off, release the brake pedal.

   You cannot clear the DTC unless these conditions are met:
   - The vehicle speed is 6 mph (10 km/h) or less.
   - The SCS circuit is shorted to body ground before the ignition switch is turned ON (II).
   - The brake pedal is pressed before the ignition switch is turned ON (II).
8. After a few seconds, the ABS indicator blinks twice and the DTC is cleared. If the indicator does not blink twice, repeat steps 1 thru 7. If the ABS indicator stays on after it blinks twice, check the DTC, because a problem was detected during initial diagnosis before shifting to DTC clearing mode.
9. Turn the ignition switch OFF.
10. Disconnect the DLC pin box from the DLC.

DTC Troubleshooting Index

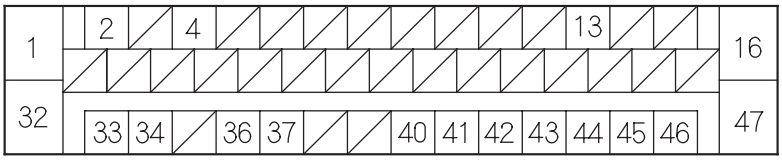
DTC	Detection Item	Note
DTC:11	Right-front wheel sensor (open/short to body ground/short to power)	(see page 19B-23)
DTC:12	Right-front wheel sensor (electrical noise/intermittent interruption)	(see page 19B-26)
DTC:13	Left-front wheel sensor (open/short to body ground/short to power)	(see page 19B-23)
DTC:14	Left-front wheel sensor (electrical noise/intermittent interruption)	(see page 19B-26)
DTC:15	Right-rear wheel sensor (open/short to body ground/short to power)	(see page 19B-23)
DTC:16	Right-rear wheel sensor (electrical noise/intermittent interruption)	(see page 19B-26)
DTC:17	Left-rear wheel sensor (open/short to body ground/short to power)	(see page 19B-23)
DTC:18	Left-rear wheel sensor (electrical noise/intermittent interruption)	(see page 19B-26)
DTC:21	Right-front pulser	(see page 19B-27)
DTC:22	Left-front pulser	(see page 19B-27)
DTC:23	Right-rear pulser	(see page 19B-27)
DTC:24	Left-rear pulser	(see page 19B-27)
DTC:31	Solenoid	(see page 19B-27)
DTC:32	Solenoid	(see page 19B-27)
DTC:33	Solenoid	(see page 19B-27)
DTC:34	Solenoid	(see page 19B-27)
DTC:35	Solenoid	(see page 19B-27)
DTC:36	Solenoid	(see page 19B-27)
DTC:37	Solenoid	(see page 19B-27)
DTC:38	Solenoid	(see page 19B-27)
DTC:51	Motor lock	(see page 19B-28)
DTC:52	Motor stuck OFF	(see page 19B-29)
DTC:53	Motor stuck ON	(see page 19B-30)
DTC:54	ABS fail-safe relay	(see page 19B-30)
DTC:61	Low IG1 voltage	(see page 19B-31)
DTC:62	High IG1 voltage	(see page 19B-31)
DTC:81	Central Processing Unit (CPU) diagnosis, and ROM/RAM diagnosis	(see page 19B-31)

Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
ABS indicator does not come on	ABS Indicator Circuit Troubleshooting (see page 19B-32)	
ABS indicator does not go off and no DTC is stored	ABS Indicator Circuit Troubleshooting (see step 1 on page 19B-33)	
Brake system indicator does not come on	Brake Sytem Indicator Circuit Troubleshooting (see page 19B-34)	
Brake system indicator does not go off and no DTC is stored	Brake Sytem Indicator Circuit Troubleshooting (see step 1 on page 19B-35)	

System Description

ABS Control Unit Inputs and Outputs for 47P Connector



Wire side of female terminals

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement (Disconnect the ABS control unit connector)			
				Terminals	Conditions		Voltage
1	WHT/ RED	+B -P	Power source for the pump motor relay	1 - GND	At all times		Battery Voltage
2	GRY	DIAG-II	Communicates with Honda PGM Tester	——	——		——
4	YEL	IG1	Power source for activating the system	4 - GND	Ignition switch ON (II)		Battery Voltage
13	BRN/ YEL	EBD	Drives brake system indicator	13 - GND	Engine running, parking brake	Pulled	Below 0.3 V
						Released	Battery Voltage
16	BLK	GND-V	Ground for the system/solenoid valve	——	——		——

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement (Disconnect the ABS control unit connector)			
				Terminals	Conditions		Voltage
32	WHT/ BLU	+B -V	Power source for the system/solenoid valve	32 - GND	At all times		Battery Voltage
33	BLU	FR -GND	Detects right-front wheel sensor signal	——	——		——
34	GRN/ BLK	FR +B					
36	YEL/ RED	RL +B	Detects left-rear wheel sensor signal	——	——		——
37	GRY/ RED	RL -GND					
40	BRN	SCS	Use for DTC indication or clearing	——	——		——
41	WHT/ BLK	STOP	Detects brake switch signal	41 - GND	Brake pedal	Pressed	Battery Voltage
						Released	Below 0.3 V
42	BLU/ YEL	RR -GND	Detects right-rear wheel sensor signal	——	——		——
43	GRN/ YEL	RR +B					
44	BLU/ RED	ABS	Drives ABS indicator	44 - GND	Ignition switch ON (II)		About 6 V
45	BLU/ ORN	FL +B	Detects left-front wheel sensor signal	——	——		——
46	BRN/ WHT	FL -GND					
47	BLK	GND -P	Ground for the pump motor	——	——		——

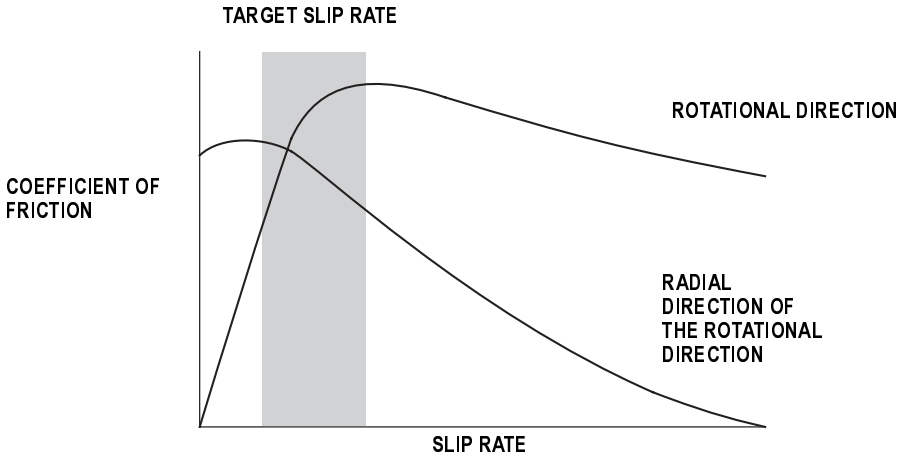
(cont'd)

System Description (cont'd)

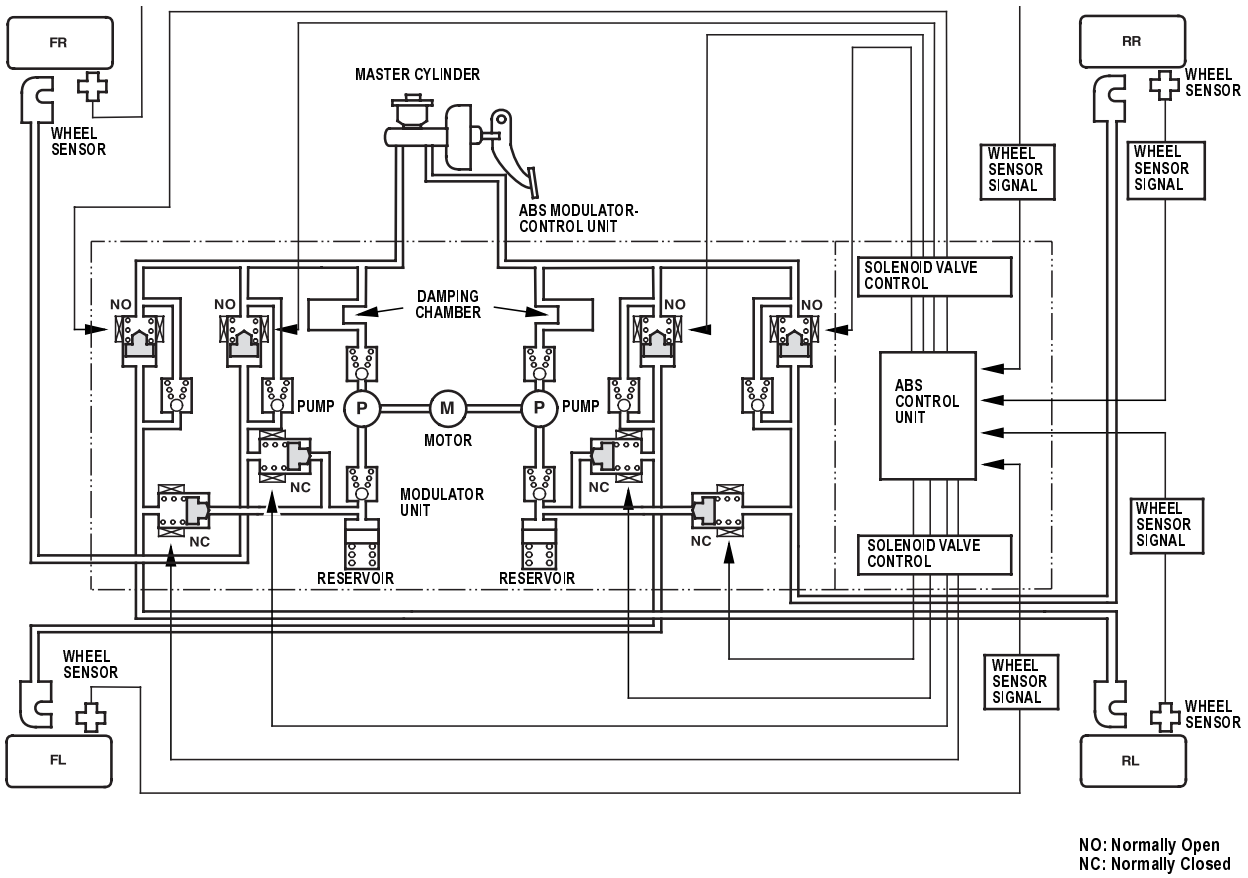
Features

When the brake pedal is pressed during driving, the wheels can lock before the vehicle comes to a stop. In such an event, the maneuverability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced if the rear wheels are locked, creating an extremely unstable condition. The ABS precisely controls the slip rate of the wheels thereby ensuring the maneuverability and stability of the vehicle.
The ABS calculates the slip rate of the wheels based on the wheel speed, then it controls the brake fluid pressure to reach the target slip rate.

Grip Force of Tire and Road Surface



COMPONENTS		MAIN FUNCTION
Wheel sensor		The wheel sensor outputs the speed signal to the ABS control unit according to the magnetic encoder's rotation speed.
Modulator-control unit	ABS control unit	The ABS control unit processes the signal from the wheel sensor, then outputs the ABS control signal to the modulator unit.
	Modulator unit	The modulator unit receives the control signal, then controls brake fluid pressure for each wheel.



(cont'd)

System Description (cont'd)

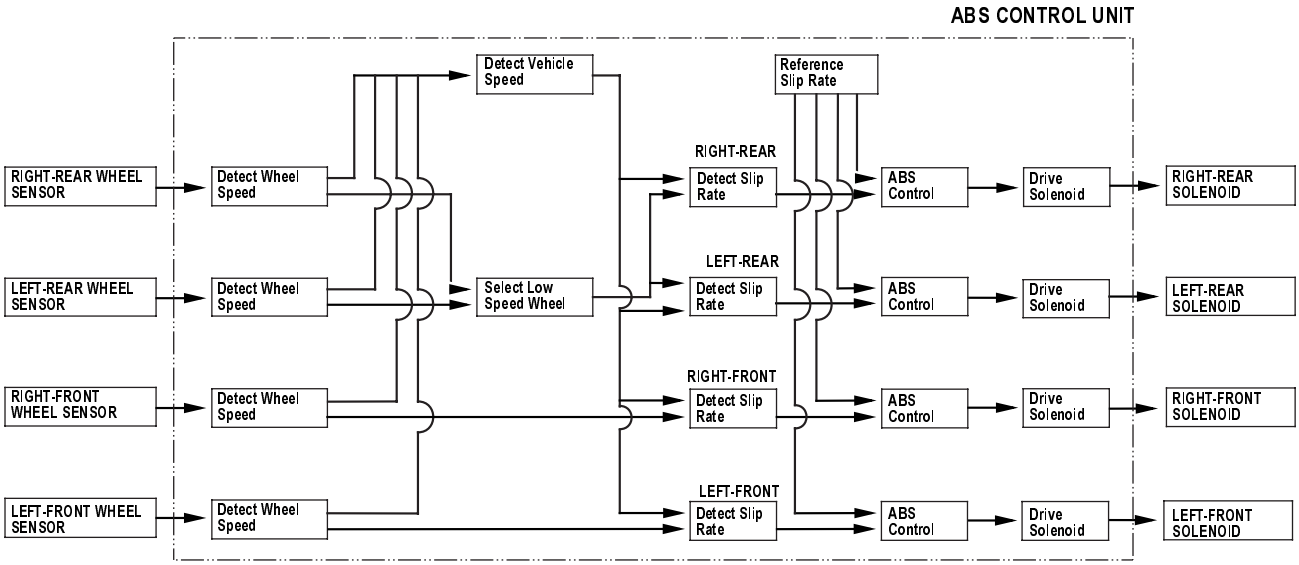
ABS Control Unit

Main Control

The ABS control unit detects the wheel speed based on the wheel sensor signal it received, then it calculates the vehicle speed based on the detected wheel speed. The control unit detects the vehicle speed during deceleration based on the rate of deceleration.

The ABS control unit calculates the slip rate of each wheel, and transmits the control signal to the modulator unit solenoid valve when the slip rate is high.

The pressure reduction control has three modes: pressure reducing, pressure retaining, and pressure intensifying.



Electronic Brake Distribution (EBD) Control

The electronic brake distribution (EBD) function helps control vehicle braking by adjusting the rear brake force before the ABS operates. Based on wheel sensor signals, the ABS control unit uses the modulator to control the rear brakes individually. When the rear wheel speed is less than the front wheel speed, the ABS control unit retains the current rear brake fluid pressure by closing the inlet valve in the modulator. As the rear wheel speed increases and approaches the front wheel speed, the control unit increases the rear brake fluid pressure by momentarily opening the inlet valve. This whole process is repeated very rapidly. While this is happening, there is kickback at the brake pedal.

During self-diagnosis. if the ABS control unit detects a problem that affects the EBD, it turns on the brake system indicator and the ABS indicator.

Self-diagnosis Function

1. The ABS control unit is equipped with a main CPU and a sub-CPU. Each CPU checks the other for problems.
2. The CPUs check the circuit of the system.
3. The ABS control unit turns on the ABS indicator when the unit detects a problem and the unit stops the system.
4. The self-diagnosis can be classified into these two categories:
   - Initial diagnosis
   - Regular diagnosis

On-board Diagnosis Function

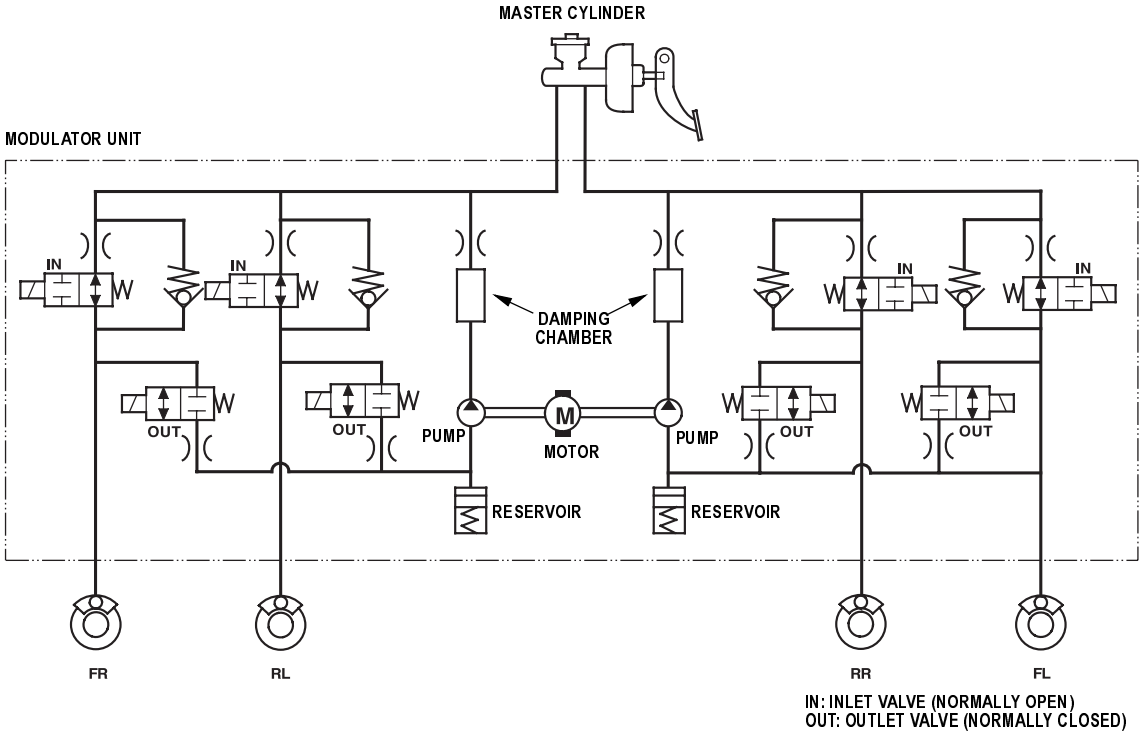
The ABS can be diagnosed with the Honda PGM Tester.
The ABS Checker cannot be used with this system. For air bleeding and checking wheel sensor signals, use the Honda PGM Tester. See the Honda PGM Tester user's manual for specific operating instructions.

(cont'd)

System Description (cont'd)

ABS Modulator

The ABS modulator consists of the inlet solenoid valve, outlet solenoid valve, reservoir, pump, pump motor, and the damping chamber. The modulator reduces the caliper fluid pressure directly. It is a circulating-type modulator because the brake fluid circulates through the caliper, reservoir, and the master cylinder. The hydraulic control has three modes: pressure intensifying, pressure retaining, and pressure reducing. The hydraulic circuit is an independent four channel-type, one channel for each wheel.



Pressure intensifying mode: Inlet valve open, outlet valve closed
Master cylinder fluid is flows to the caliper.

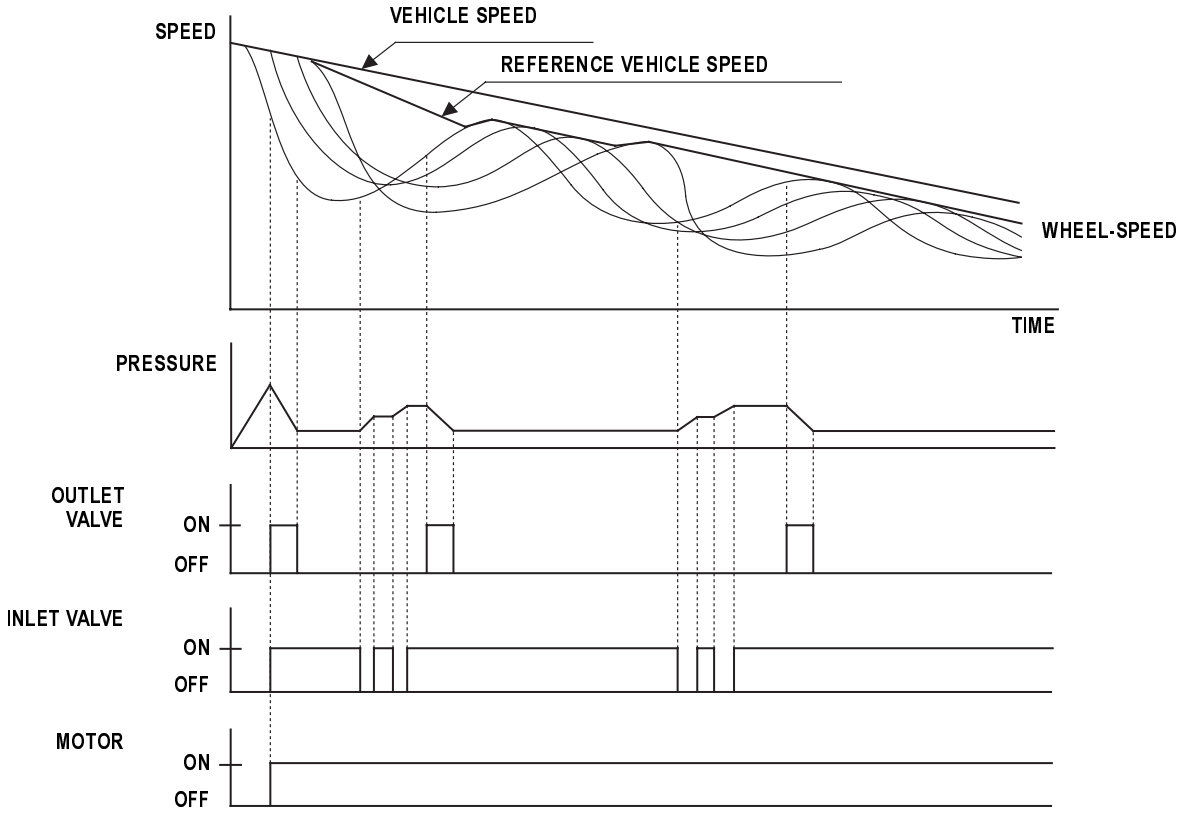
Pressure retaining mode: Inlet valve closed, outlet valve closed
Caliper fluid is retained by the inlet valve and outlet valve.

Pressure reducing mode: Inlet valve closed, outlet valve open
Caliper fluid flows through the outlet valve to the reservoir.

Motor operation mode: When starting the pressure reducing mode, the pump motor is ON.
When stopping ABS operation, the pump motor is OFF.
The reservoir fluid is pumped out by the pump, through the damping chamber, to the master cylinder.

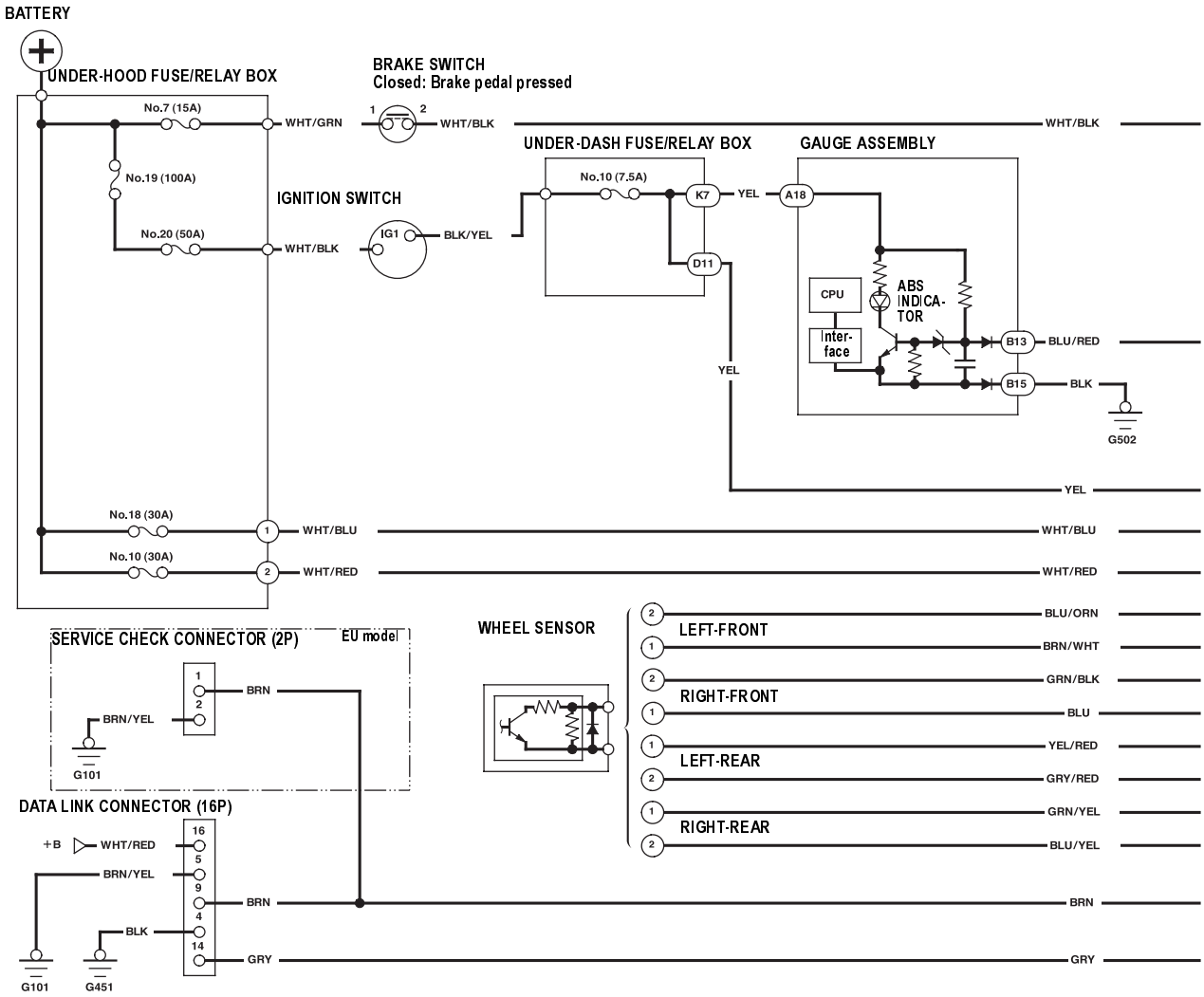
Wheel Sensors

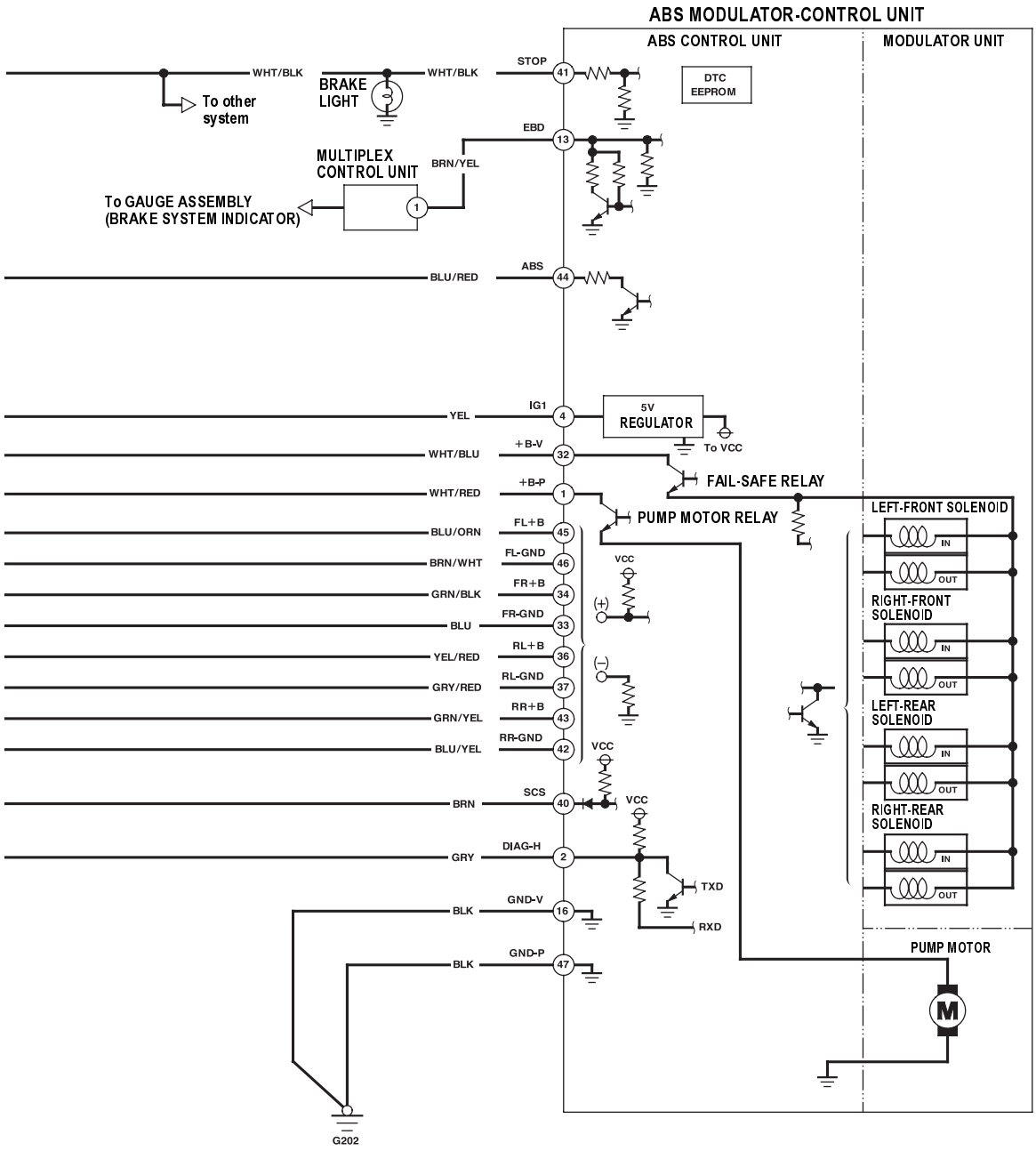
The wheel sensors are semiconductor type. The wheel sensors detect changes in magnetic polarity on the magnetic encoder in the wheel bearring. The ABS control unit calcurates the wheel speed based on signals received from the wheel sensor.



When the wheel speed drops sharply below the vehicle speed, the outlet valve opens momentarily to reduce the caliper fluid pressure. The pump motor starts at this time. As the wheel speed is restored, the inlet valve opens momentarily to increase the caliper fluid pressure.

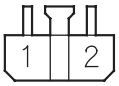
Circuit Diagram



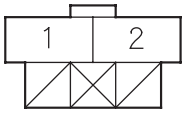

ABS MODULATOR-CONTROL UNIT
ABS CONTROL UNIT
MODULATOR UNIT
WHT/BLK
To other system
BRAKE LIGHT
WHT/BLK
STOP
41
DTC EEPROM
EBD
13
MULTIPLEX CONTROL UNIT
BRN/YEL
1
To GAUGE ASSEMBLY (BRAKE SYSTEM INDICATOR)
BLU/RED
ABS
44
YEL
IG1
4
5V REGULATOR
To VCC
WHT/BLU
+B-V
32
WHT/RED
+B-P
1
FAIL-SAFE RELAY
PUMP MOTOR RELAY
BLU/ORN
FL+B
45
BRN/WHT
FL-GND
46
GRN/BLK
FR+B
34
BLU
FR-GND
33
YEL/RED
RL+B
36
GRY/RED
RL-GND
37
GRN/YEL
RR+B
43
BLU/YEL
RR-GND
42
VCC
(+)
(−)
BRN
SCS
40
GRY
DIAG-H
2
TXD
RXD
BLK
GND-V
16
BLK
GND-P
47
G202
LEFT-FRONT SOLENOID
RIGHT-FRONT SOLENOID
LEFT-REAR SOLENOID
RIGHT-REAR SOLENOID
IN
OUT
PUMP MOTOR
M

System Connectors

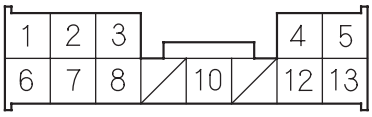
UNDER-HOOD
FUSE/RELAY BOX
2P CONNECTOR



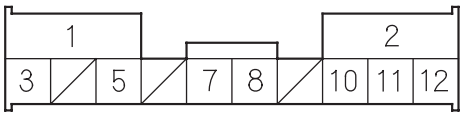
BRAKE SWITCH
4P CONNECTOR



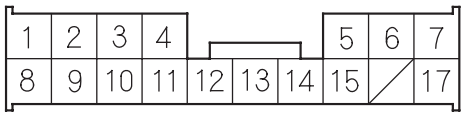
MULTIPLEX CONTROL UNIT
13P CONNECTOR



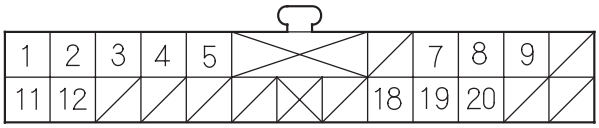
UNDER-DASH FUSE/RELAY BOX CONNECTORS
CONNECTOR D (12P)



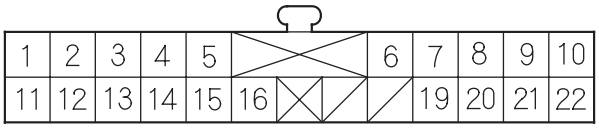
CONNECTOR K (17P)



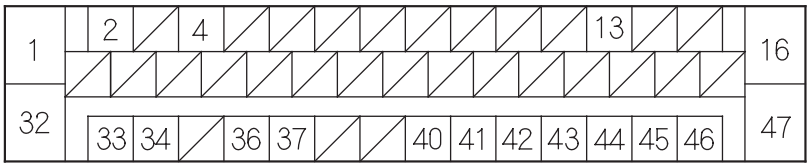
GAUGE ASSEMBLY CONNECTORS
CONNECTOR A (22P)



CONNECTOR B (22P)

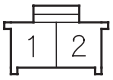


ABS CONTROL UNIT 47P CONNECTOR

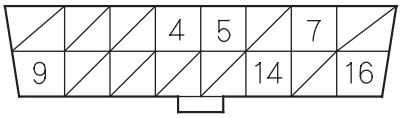


Wire side of female terminals

SERVICE CHECK CONNECTOR (2P)
(EU model)



DATA LINK CONNECTOR (16P)



Terminal side of female terminals

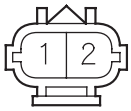
WHEEL SENSOR 2P CONNECTORS

FRONT



Wire side of female terminals

REAR



Terminal side of male terminals

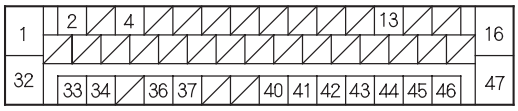
DTC Troubleshooting

DTC 11, 13, 15, 17: Wheel Sensor (Open/Short to Body Ground/Short to Power)

1. Disconnect the negative cable from the battery.
2. Disconnect the ABS control unit 47P connector.
3. Reconnect the battery cable.
4. Start the engine.
5. Measure the voltage between body ground and the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector individually (see table).

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR - GND: No. 33
13 (Left-front)	FR +B: No. 45	FL - GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR - GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL - GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there battery voltage?

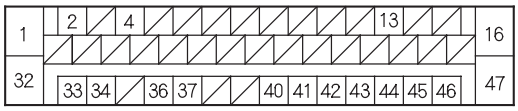
Yes Repair short to power in the wiree between the ABS modulator-control unit and the appropriate wheel sensor.■

No Go to step 6.

6. Turn the ignition switch OFF.
7. Check for continuity between body ground and the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector individually (see table).

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR - GND: No. 33
13 (Left-front)	FR +B: No. 45	FL - GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR - GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL - GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Go to step 8.

No Go to step 10.

(cont'd)

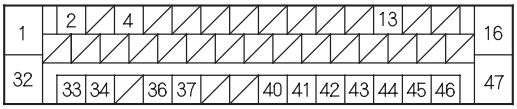
DTC Troubleshooting (cont'd)

8. Disconnect the wire harness 2P connector from the appropriate wheel sensor.

9. Check for continuity between body ground and the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector individually (see table).

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR - GND: No. 33
13 (Left-front)	FR +B: No. 45	FL - GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR - GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL - GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

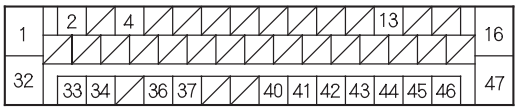
Yes Repair short to body ground in the wire between the ABS modulator-control unit and the wheel sensor.■

No Replace the wheel sensor.■

10. Measure the resistance between the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector (see table), then measure the resistance between same terminals after changing positive tester prove and negative tester probe.

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR - GND: No. 33
13 (Left-front)	FR +B: No. 45	FL - GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR - GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL - GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is the resistance infinity at both sides?

Yes Go to step 11.

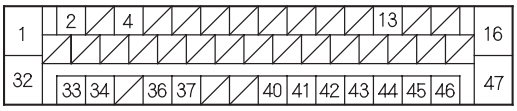
No Go to step 12.

11. Disconnect the wire harness 2P connector from the appropriate wheel sensor.

12. Measure the resistance between the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector (see table), then measure the resistance between same terminals after changing positive tester prove and negative tester probe.

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR - GND: No. 33
13 (Left-front)	FR +B: No. 45	FL - GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR - GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL - GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is the resistance infinity at both sides?

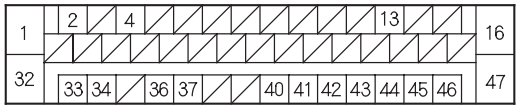
Yes Repair open in the wire between the ABS modulator-control unit and the wheel sensor.■

No Replace the wheel sensor.■

13. Check for continuity between the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector (see table), then check for continuity between same terminals after changing positive tester prove and negative tester probe.

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR - GND: No. 33
13 (Left-front)	FR +B: No. 45	FL - GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR - GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL - GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity at both sides?

Yes Repair short in the wire between the ABS modulator-control unit and the wheel sensor.■

No Check for loose ABS control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.■

DTC Troubleshooting (cont'd)

DTC 12, 14, 16, 18: Wheel Sensor (Electrical Noise/ Intermittent Interruption)

NOTE: If the ABS indicator comes on because of electrical noise, the indicator goes off when you test-drive the vehicle at 19 mph (30 km/h).

1. Check the appropriate wheel sensor and magnetic encoder (see page 19B-38).

DTC	Appropriate Wheel Sensor
12	Right-front
14	Left-front
16	Right-rear
18	Left-rear

Are they OK?

Yes Go to step 2.

No Reinstall or replace the appropriate wheel sensor or magnetic encoder.■

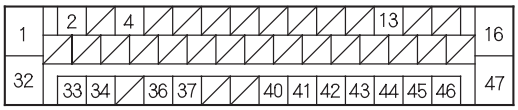
2. Disconnect the negative cable from the battery.

3. Disconnect the ABS control unit 47P connector.

4. Check for continuity between the appropriate wheel sensor GND terminal and other wheel sensor GND terminals (see table).

DTC	Appropriate Terminal	Appropriate Terminal		
12	FR-GND: No. 33	No. 46	No. 42	No. 37
14	FL-GND: No. 46	No. 33	No. 42	No. 37
16	RR-GND: No. 42	No. 33	No. 46	No. 37
18	RL-GND: No. 37	No. 33	No. 46	No. 42

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the appropriate wheel sensor and the other wheel sensor.■

No Clear the DTC, and test-drive the vehicle. If the ABS indicator comes on and the same DTC is indicated, replace the ABS modulator-control unit.■

DTC 21, 22, 23, 24: Magnetic Encoder

1. Clear the DTC (see step 1 on page 19B-7) .
2. Test-drive the vehicle at 19 mph (30 km/h) or more.

   Does the ABS indicator come on, and are DTCs 21, 22, 23, 24 indicated?

   Yes Go to step 3.

   No The system is OK at this time.■
3. Check the appropriate wheel sensor (see table) (see page 19B-38).

DTC	Appropriate Wheel Sensor
21	Right-front
22	Left-front
23	Right-rear
24	Left-rear

Is the encoder OK?

Yes Check for loose terminals in the ABS control unit 25P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.■

No Replace the magnetic encoder.■

DTC 31, 32, 33, 34, 35, 36, 37, 38: Solenoid

1. Clear the DTC (see step 1 on page 19B-7).
2. Turn the ignition switch ON (II).
3. Verify the DTC.

   Does the ABS indicator come on, and are DTCs 31, 32, 33, 34, 35, 36, 37, 38 indicated?

   Yes Check for loose terminals in the ABS control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.■

   No The system is OK at this time.■

DTC Troubleshooting (cont'd)

DTC 51: Motor Lock

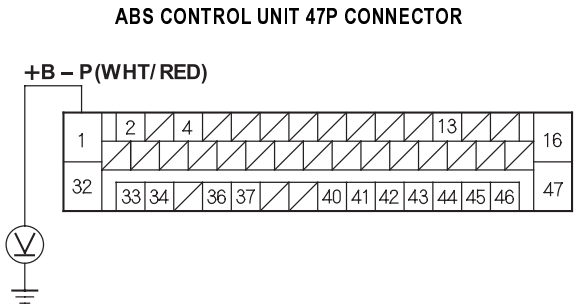
1. Check the No. 10 (30A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

   Yes Reinstall the fuse, and go to step 2.

   No Replace the fuse, and recheck.■

2. Disconnect the negative cable from the battery.
3. Disconnect the ABS control unit 47P connector.
4. Reconnect the battery cable.
5. Measure the voltage between the ABS control unit 47P connector terminal No. 1 and body ground.



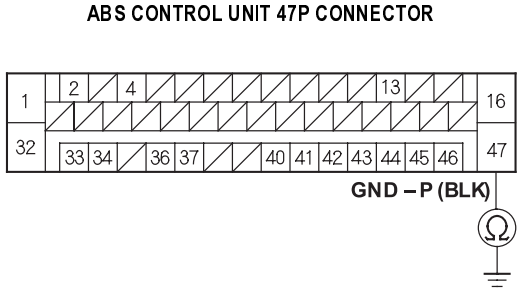
Wire side of female terminals

   Is there battery voltage?

   Yes Go to step 6.

   No Repair open in the wire between the No. 10 (30A) fuse and the ABS control unit.■

6. Check for continuity between the ABS control unit 47P connector terminal No. 47 and body ground.



Wire side of female terminals

   Is there continuity?

   Yes Go to step 7.

   No Repair open in the wire between the ABS control unit and body ground (G202).■

7. Disconnect the negative cable from the battery.
8. Reconnect the ABS control unit 47P connector.
9. Reconnect the battery cable.
10. Clear the DTC.
11. Test-drive the vehicle at 6 mph (10 km/h) or more.

    Does the ABS indicator come on, and is DTC 51 indicated?

    Yes Replace the ABS modulator-control unit.■

    No The system is OK at this time.■

DTC 52: Motor Stuck OFF

1. Check the No. 10 (30A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

Yes Reinstall the fuse, and go to step 2.

No Replace the fuse, and recheck.■

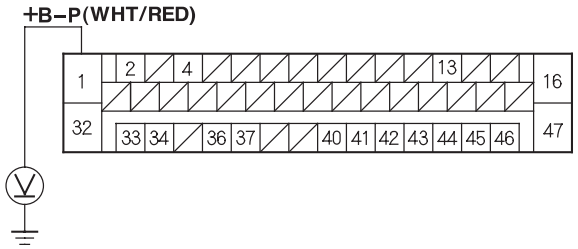
2. Disconnect the negative cable from the battery.

3. Disconnect the ABS control unit 47P connector.

4. Reconnect the battery cable.

5. Measure the voltage between the ABS control unit 47P connector terminal No. 1 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

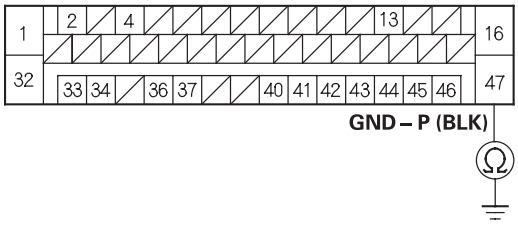
Is there battery voltage?

Yes Go to step 6.

No Repair open in the wire between the No. 10 (30A) fuse and the ABS control unit.■

6. Check for continuity between the ABS control unit 47P connector terminal No. 47 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Check for loose terminals in the ABS control unit 47P connector. If necessary, substitute a known-good ABS modulator control unit, and recheck.■

No Repair open in the wire between the ABS control unit and body ground (G202).■

DTC Troubleshooting (cont'd)

DTC 53: Motor Stuck ON

1. Clear the DTC (see step 1 on page 19B-7).
2. Test-drive the vehicle.

   Does the ABS indicator come on and is DTC 53 indicated?

   Yes Replace the ABS modulator-control unit.■

   No The system is OK at this time.■

DTC 54: ABS Fail-safe Relay

1. Clear the DTC (see step 1 on page 19B-7).
2. Test-drive the vehicle.

   Does the ABS indicator come on and is DTC 54 indicated?

   Yes Replace the ABS modulator-control unit.■

   No Intermittent failure; the vehicle is OK at this time.■

DTC 61, 62: IG1 Voltage

1. Clear the DTC (see step 1 on page 19B-7).
2. Test-drive the vehicle at 6 mph (10 km/h) or more.
   Does the ABS indicator come on?
   Yes Go to step 3.
   No The system is OK at this time.■
3. Verify the DTC.
   Is DTC 61 or 62 indicated?
   Yes Check the charging system.■
   No Perform the appropriate troubleshooting for the DTC.■

DTC 81: Central Processing Unit (CPU) Diagnosis, and ROM/RAM Diagnosis

1. Clear the DTC (see step 1 on page 19B-7).
2. Test-drive the vehicle.
   Does the ABS indicator come on and is DTC 81 indicated?
   Yes Replace the ABS modulator-control unit.■
   No Intermittent failure; the vehicle is OK at this time.■

ABS Indicator Circuit Troubleshooting

ABS indicator does not come on

1. Turn the ignition switch ON (II), and watch the ABS indicator.

Does the ABS indicator come on?

Yes The system is OK at this time.■

No Go to step 2.

2. Turn the ignition switch OFF then ON (II) again.

Does the brake system indicator come on?

Yes Go to step 3.

No Repair open in the indicator power source circuit.■
- Blown No. 10 (7.5A) fuse in the under-dash fuse/relay box.
- Open in the wire between the No. 10 (7.5A) fuse and the gauge assembly.
- Open circuit inside the fuse box.

3. Turn the ignition switch OFF.

4. Disconnect the negative cable from the battery.

5. Disconnect the ABS control unit 47P connector.

6. Reconnect the battery cable.

7. Turn the ignition switch ON (II).

Does the ABS indicator come on?

Yes Check for loose terminals in the ABS control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.■

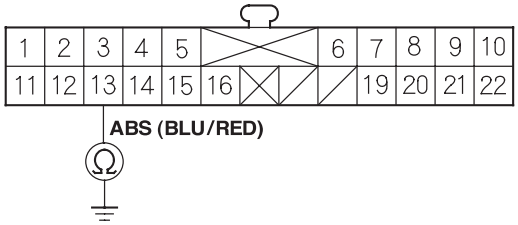
No Go to step 8.

8. Remove the gauge assembly (see page 22A-74).

9. Disconnect the gauge assembly connector B (22P).

10. Check for continuity between the gauge assembly connector B (22P) terminal No. 13 and body ground.

GAUGE ASSEMBLY CONNECTOR B (22P)



Wire side of female terminals

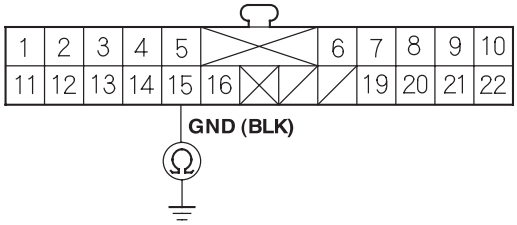
Is there continuity?

Yes Repair short to body ground in the wire between the gauge assembly and the ABS control unit.■

No Go to step 11.

11. Check for continuity between the gauge assembly connector B (22P) terminal No. 15 and body ground.

GAUGE ASSEMBLY CONNECTOR B (22P)



Wire side of female terminals

Is there continuity?

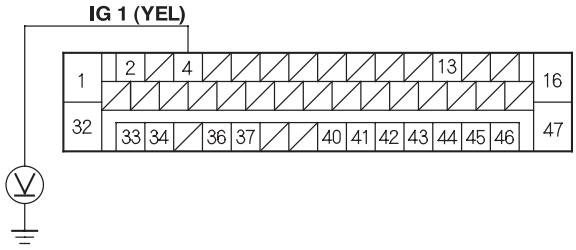
Yes Check for loose terminals in the gauge assembly connectors. If the connector is OK, replace the gauge assembly.■

No Repair open in the wire between the gauge assembly and body ground (G502).■

ABS indicator does not go off

1. Disconnect the negative cable from the battery.
2. Disconnect the ABS control unit 47P connector.
3. Reconnect the battery cable.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the ABS control unit 47P connector terminal No. 4 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

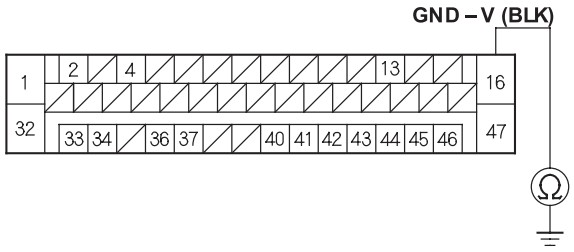
Is there battery voltage?

Yes Go to step 6.

No Repair open in the wire between the No. 10 (7.5 A) fuse in the under-dash fuse/relay box and the ABS control unit.■

6. Turn the ignition switch OFF.
7. Check for continuity between the ABS control unit 47P connector terminal No. 16 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

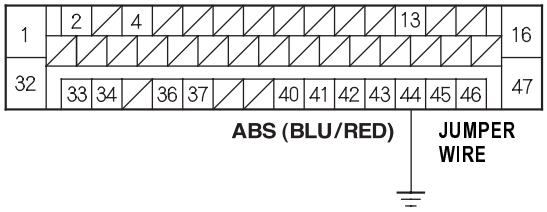
Is there continuity?

Yes Go to step 8.

No Repair open in the wire between the ABS control unit and body ground (G202).■

8. Turn the ignition switch OFF.
9. Connect the ABS control unit 47P connector terminal No. 44 and body ground with a jumper wire.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Does the ABS indicator go off?

Yes Check for loose terminals in the ABS control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck.■

No Go to step 10.

(cont'd)

ABS Indicator Circuit Troubleshooting (cont'd)

ABS indicator does not go off (cont'd)

10. Turn the ignition switch OFF.

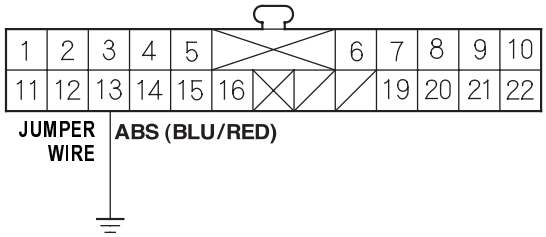
11. Remove the jumper wire from the ABS control unit 47P connector.

12. Remove the gauge assembly (see page 22A-74).

13. Turn the ignition switch ON (II).

14. Connect the gauge assembly connector B (22P) terminal No. 13 and body ground with a jumper wire.

GAUGE ASSEMBLY CONNECTOR B (22P)



Wire side of female terminals

Does the ABS indicator go off?

Yes Repair open in the wire between the gauge assembly and the ABS control unit.■

No Check for loose terminals in the gauge assembly connectors. If the connectors are OK, replace the gauge assembly.■

Brake System Indicator Circuit Troubleshooting

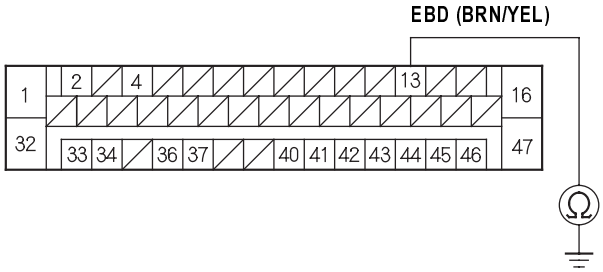
Brake system indicator does not come on

1. Disconnect the negative cable from the battery.

2. Disconnect the multiplex control unit 13P connector and the ABS control unit 47P connector.

3. Check for continuity between the ABS control unit 47P connector terminal No. 13 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

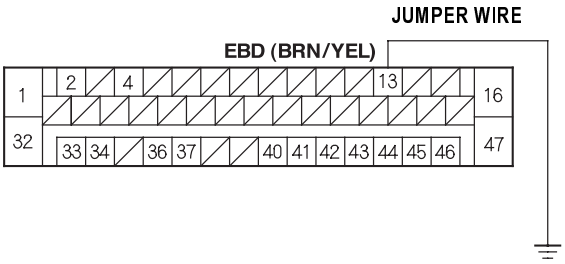
Yes Repair short to body ground in the wire between the multiplex control unit and the ABS control unit.■

No Go to multiplex control system troubleshooting (see page 22A-235).■

Brake system indicator does not go off

1. Start the engine.
2. Release the parking brake.
   Does the brake system indicator go off?
   Yes The system is OK at this time.■
   No Go to step 3.
3. Check the brake fluid level.
   Is the level OK?
   Yes Go to step 4.
   No Refill the brake fluid, and recheck.■
4. Check the ABS indicator.
   Does the ABS indicator stay on?
   Yes Read the ABS DTC (see page 19B-5), and do applicable troubleshooting for the DTC.■
   No Go to step 5.
5. Turn the ignition switch OFF.
6. Disconnect the negative cable from the battery.
7. Disconnect the ABS control unit 47P connector.
8. Reconnect the battery cable.
9. Connect the ABS control unit 47P connector terminal No. 13 and body ground with a jumper wire.

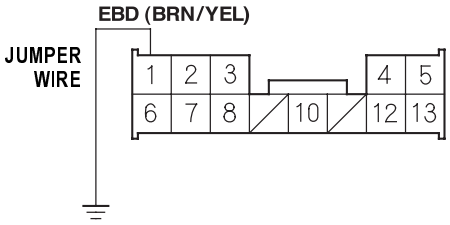
ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

10. Start the engine.
11. Check the brake system indicator.
    Does the brake system indicator go off?
    Yes Replace the ABS modulator-control unit.■
    No Go to step 12.
12. Turn the ignition switch OFF.
13. Connect the multiplex control unit 13P connector terminal No. 1 and body ground with a jumper wire.

MULTIPLEX CONTROL UNIT 13P CONNECTOR



Wire side of female terminals

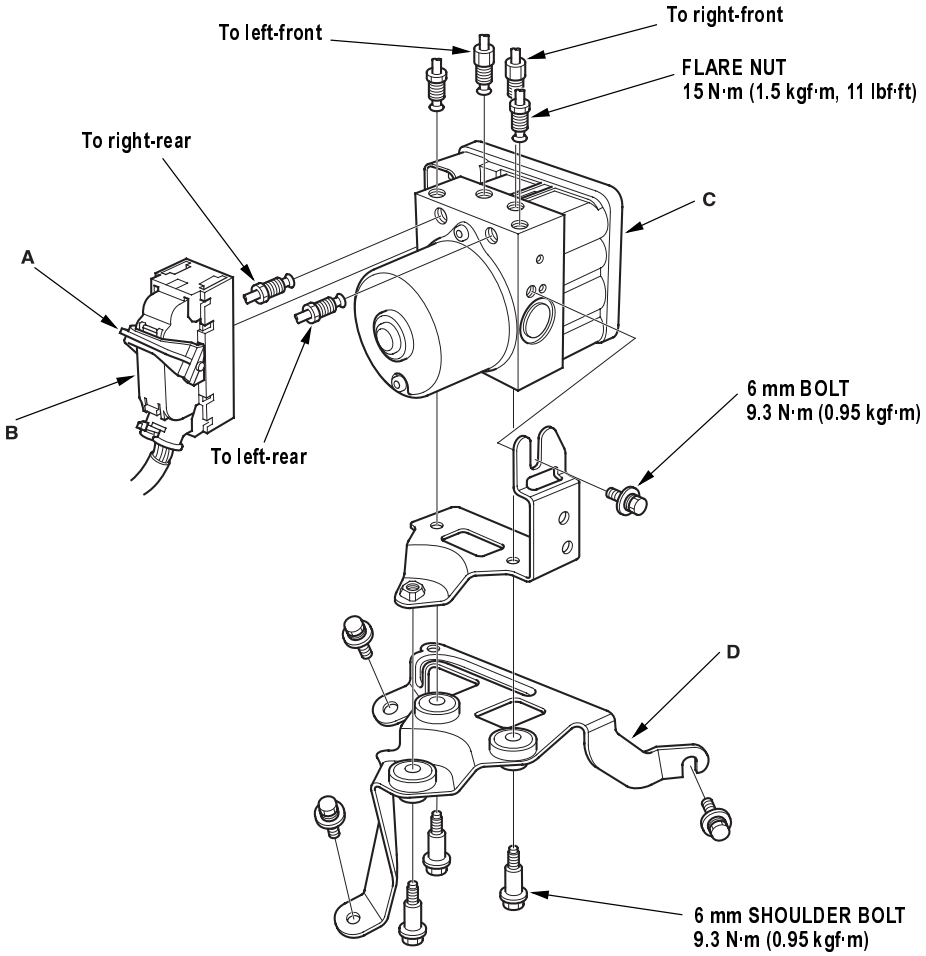
14. Start the engine.
15. Check the brake system indicator.
    Does the brake system indicator go off?
    Yes Repair open in the wire between the multiplex control unit and the ABS control unit.■
    No Go to multiplex control system troubleshooting (see page 22A-235).

ABS Modulator-Control Unit Removal and Installation

NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- Be careful not to damage or deform the brake lines during removal and installation.
- To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.

Removal

1. Turn the ignition switch.
2. Disconnect the negative cable from the battery.
3. Pull up the lock (A) of the ABS control unit 47P connector (B), then disconnect the connector.



4. Disconnect the six brake lines.
5. Remove the ABS modulator-control unit (C)/bracket (D) from the body.
6. Remove the two 6 mm shoulder bolts and the 6 mm bolt from the bracket, then remove the ABS modulator-control unit from the bracket.

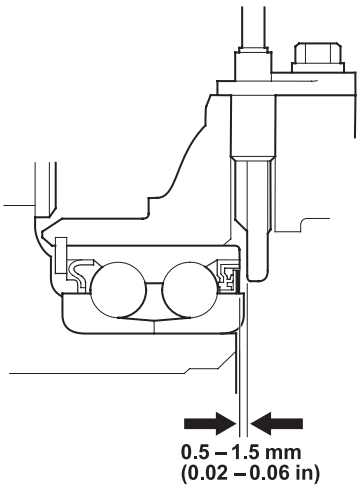
Installation

1. Install the ABS modulator-control unit to the bracket, then tighten the two 6 mm shoulder bolts and the 6 mm bolt.
2. Install the ABS modulator-control unit/bracket to the body.
3. Align the connecting surface of the ABS control unit 47P connector.
4. Push in the lock of the ABS control unit 47P connector, then connect the connector.
5. Connect the six brake lines.
6. Bleed the brake system, starting with the front wheels.
7. Start the engine, and check that the ABS indicator and brake system indicator go off.
8. Test-drive the vehicle, and check that the ABS indicator and brake system indicator do not come on.

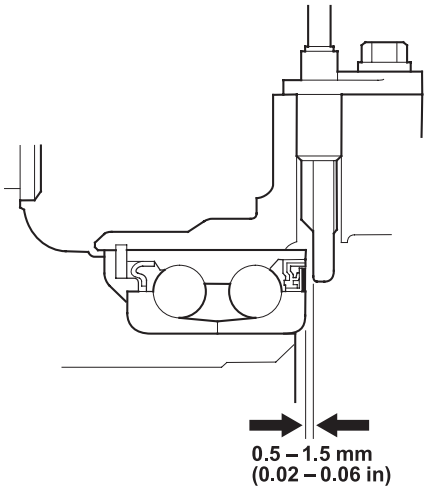
Wheel Sensor Inspection

1. Remove the knuckle.
   Front (see page 18-12).
   Rear (see page 18-27).
2. Check the magnetic encoder after cleaning the encoder. If necessary, replace the encoder.

Front



Rear



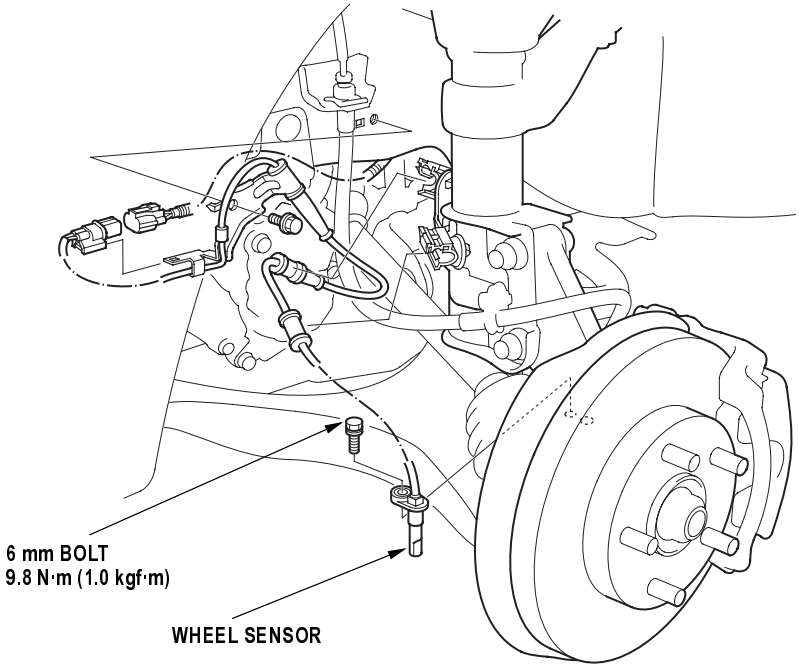
3. Measure the air gap between the wheel sensor and the magnetic encoder all the way around while rotating the encoder.

   Standard:
   Front/Rear: 0.5 - 1.5 mm (0.02-0.06 in.)
4. Install the knuckle.
   Front (see step 14 on page 18-15).
   Rear (see step 14 on page 18-30).

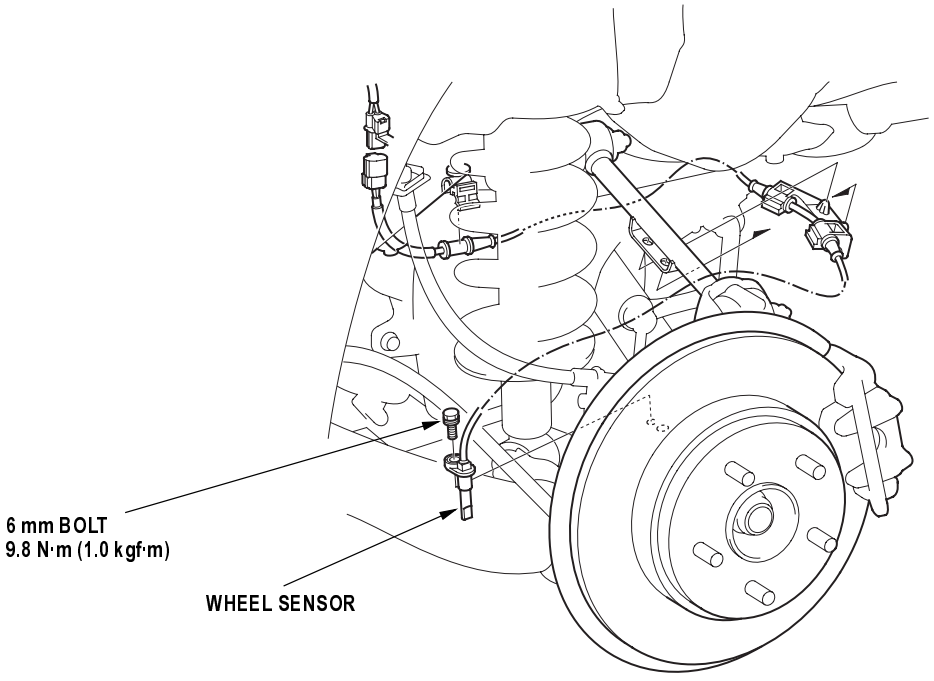
Wheel Sensor Replacement

NOTE: Install the sensors carefully to avoid twisting the wires.

Front:



Rear:



20

Body

Doors 20-2
Mirrors 20-38
Glass 20-43
Sunroof 20-63
Interior Trim 20-75
Dashboard 20-87
Seats 20-102
Bumpers 20-130
Hood 20-132
Tailgate 20-135
Fuel Fill Door 20-138
Exterior Trim 20-139
Fenderwell 20-155
Openers 20-158
Frame 20-168

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If body maintenance is required)

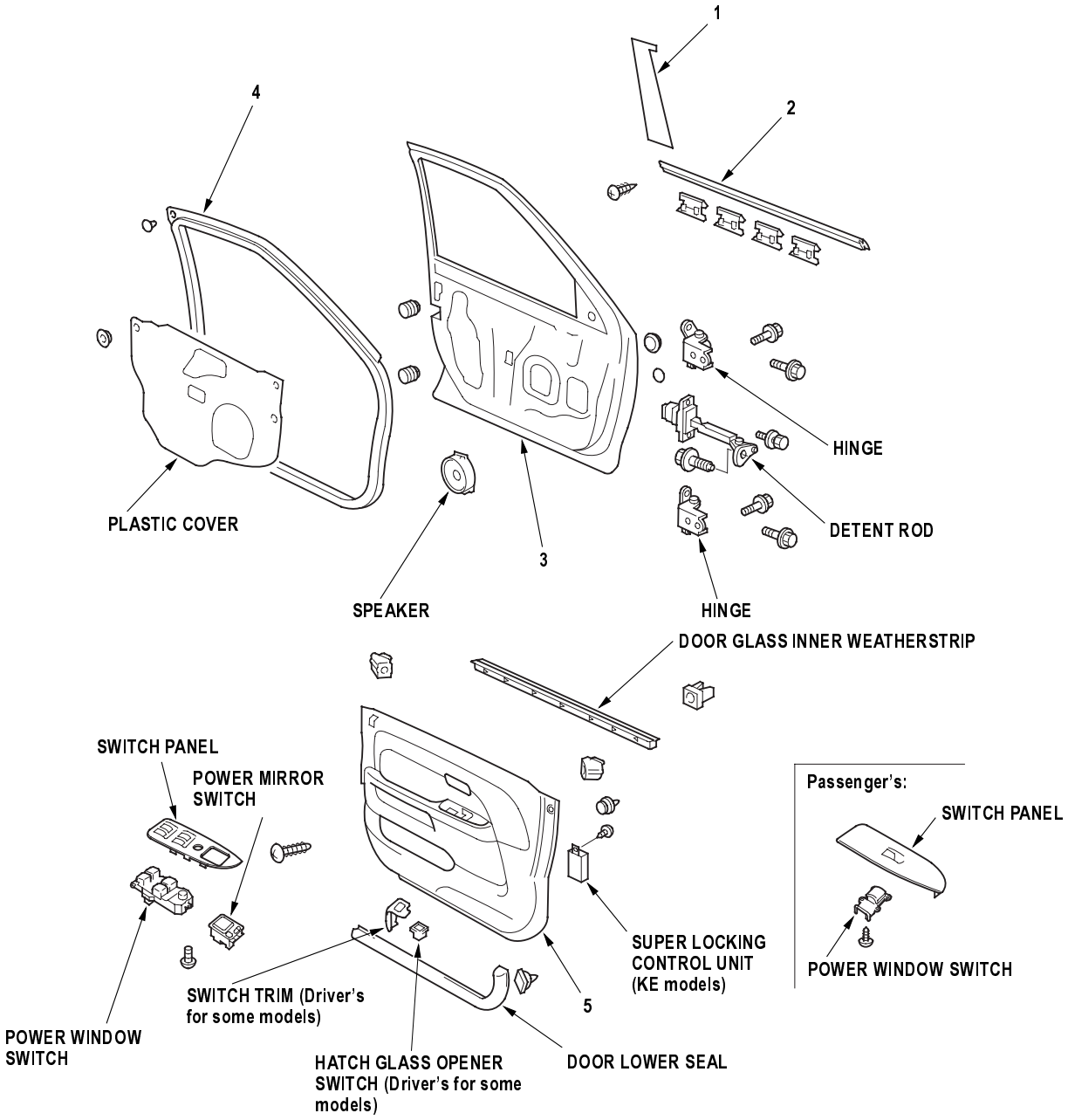
The CR-V SRS includes a driverís airbag in the steering wheel hub, a passengerís airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk ( ) on the contents page include or are located near SRS components.
Servicing, disassembling, or replacing these items will require special precautions and tools, and should be done only by an authorized Honda dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS could lead to personal injury caused by unintentional deployment of the airbags and side airbags.
- Do not bump the SRS unit. Otherwise, the systemmay fail in a collision, or the airbags may deploy when the ignition switch is ON (II).
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

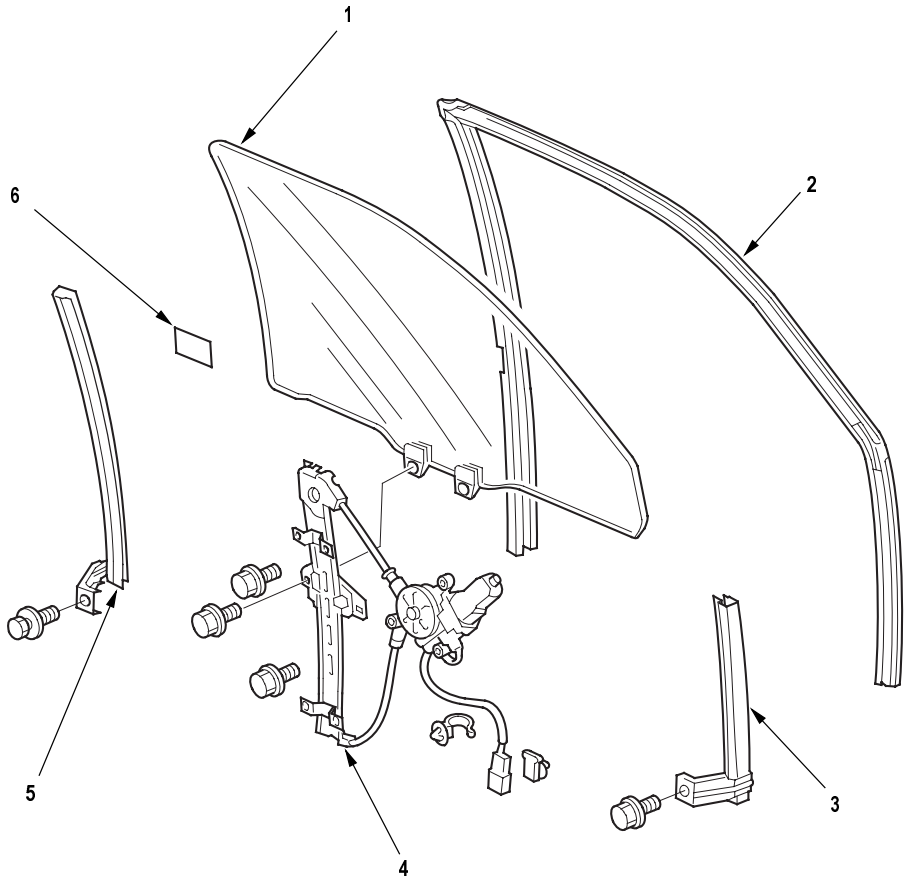


Doors

Component Location Index - Front Door



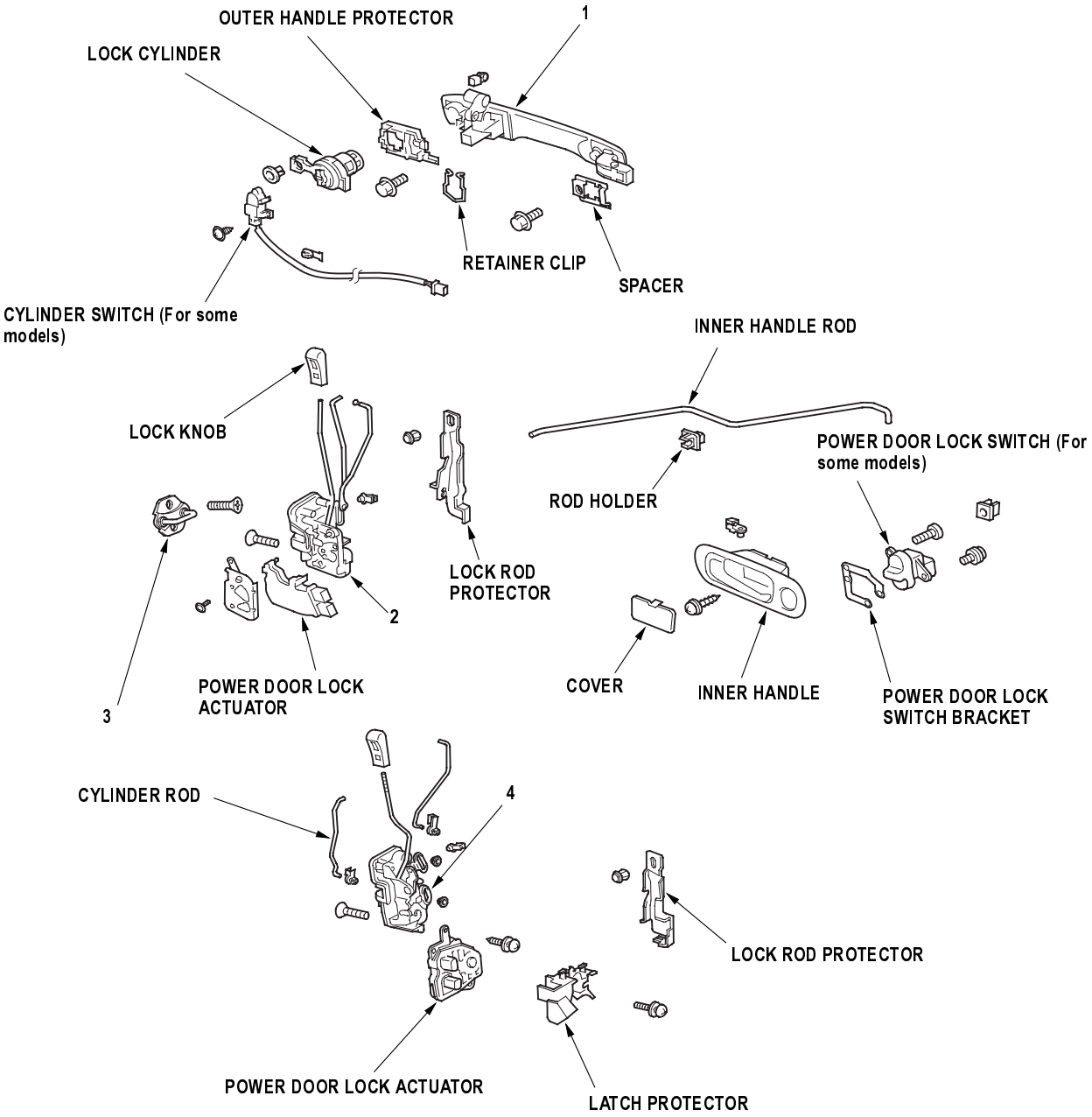
1	DOOR CHANNEL TAPE	Replacement, page 20-19
2	DOOR GLASS OUTER WEATHERSTRIP	Replacement, page 20-17
3	DOOR	Position Adjustment, page 20-36
4	DOOR WEATHERSTRIP	Replacement, page 20-18
5	DOOR PANEL	Removal/Installation, page 20-9



1	GLASS	Replacement, page 20-16; Adjustment, page 20-34
2	GLASS RUN CHANNEL	
3	FRONT LOWER CHANNEL	
4	REGULATOR	Replacement, page 20-16
5	CENTER LOWER CHANNEL	
6	IMMOBILIZER LABEL (for some models)	

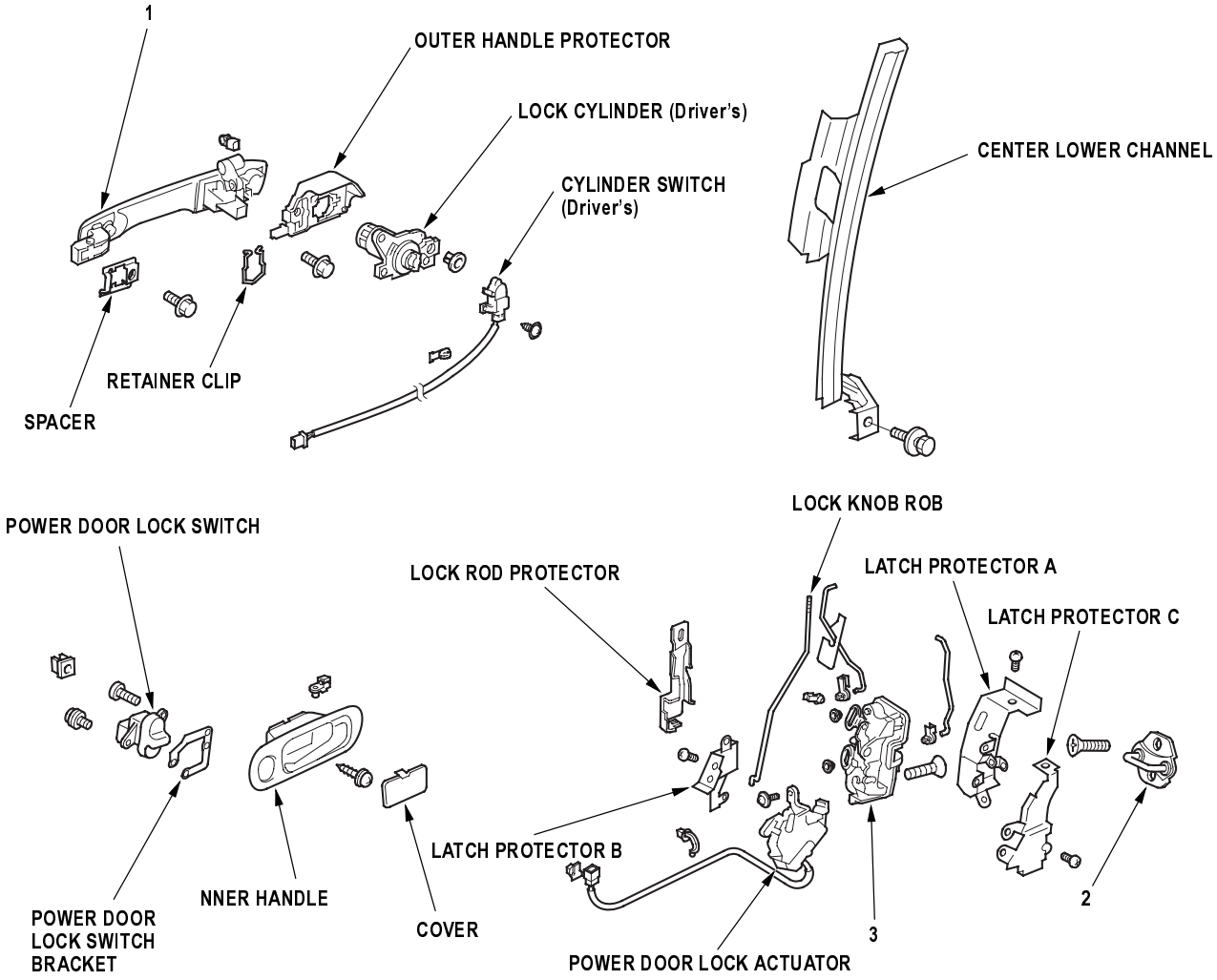
(cont'd)

Component Location Index - Front Door (cont'd)



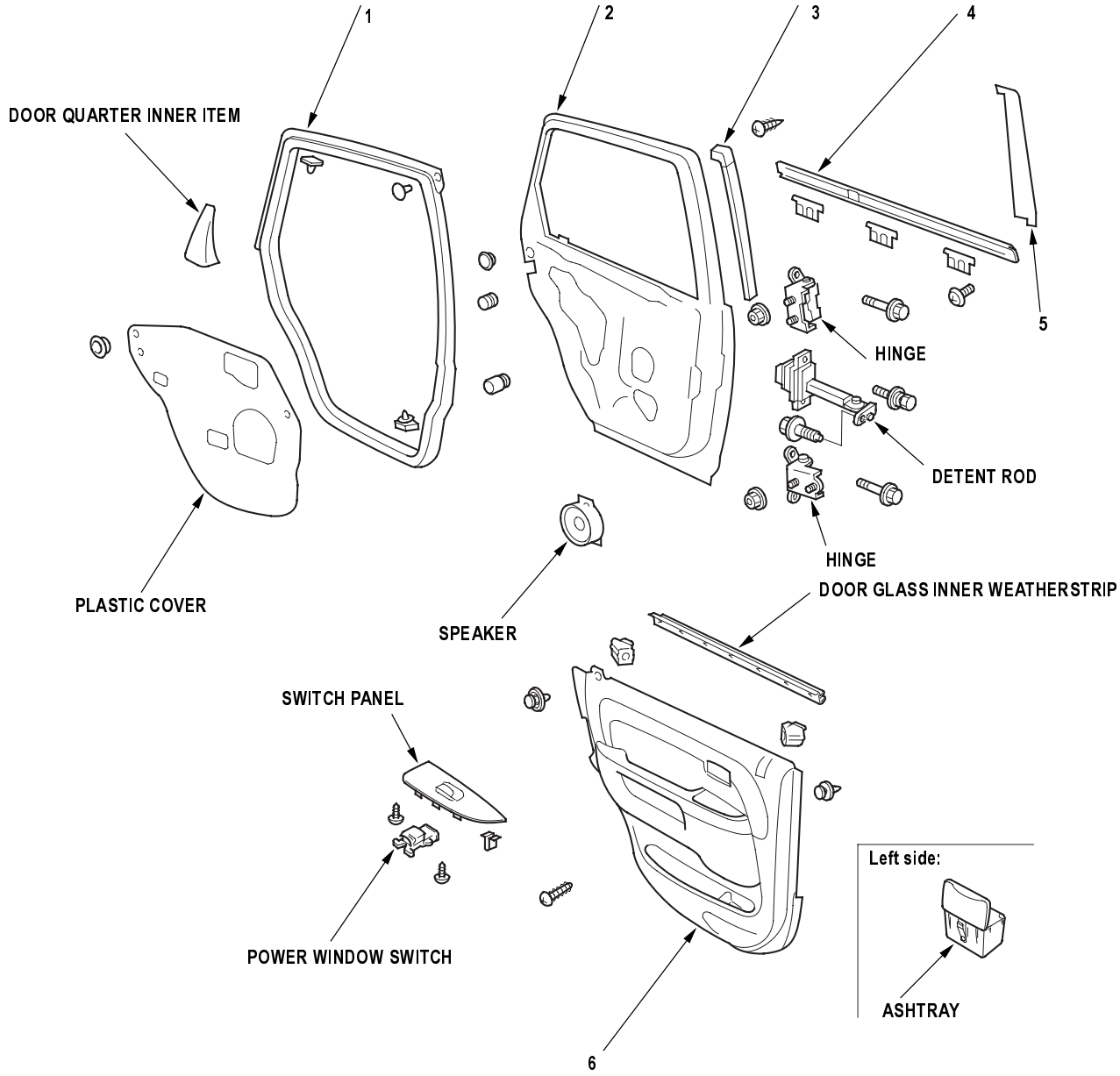
1	OUTER HANDLE	Replacement, page 20-11
2	LATCH (HONDA LOCK)	Replacement, page 20-14
3	STRIKER	Adjustment, page 20-37
4	LATCH (MITSUI)	Replacement, page 20-14

With Super Locking:

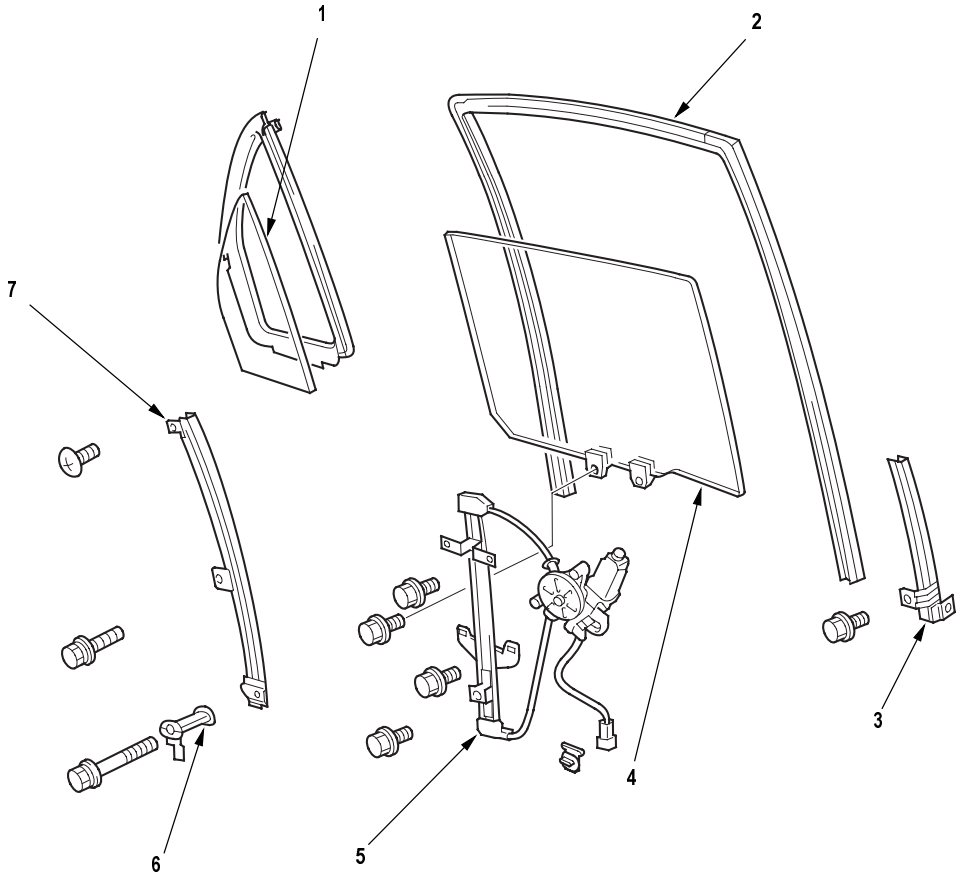


1	OUTER HANDLE	Replacement, page 20-11
2	STRIKER	Adjustment, page 20-37
3	LATCH	Replacement, page 20-14

Component Location Index - Rear Door



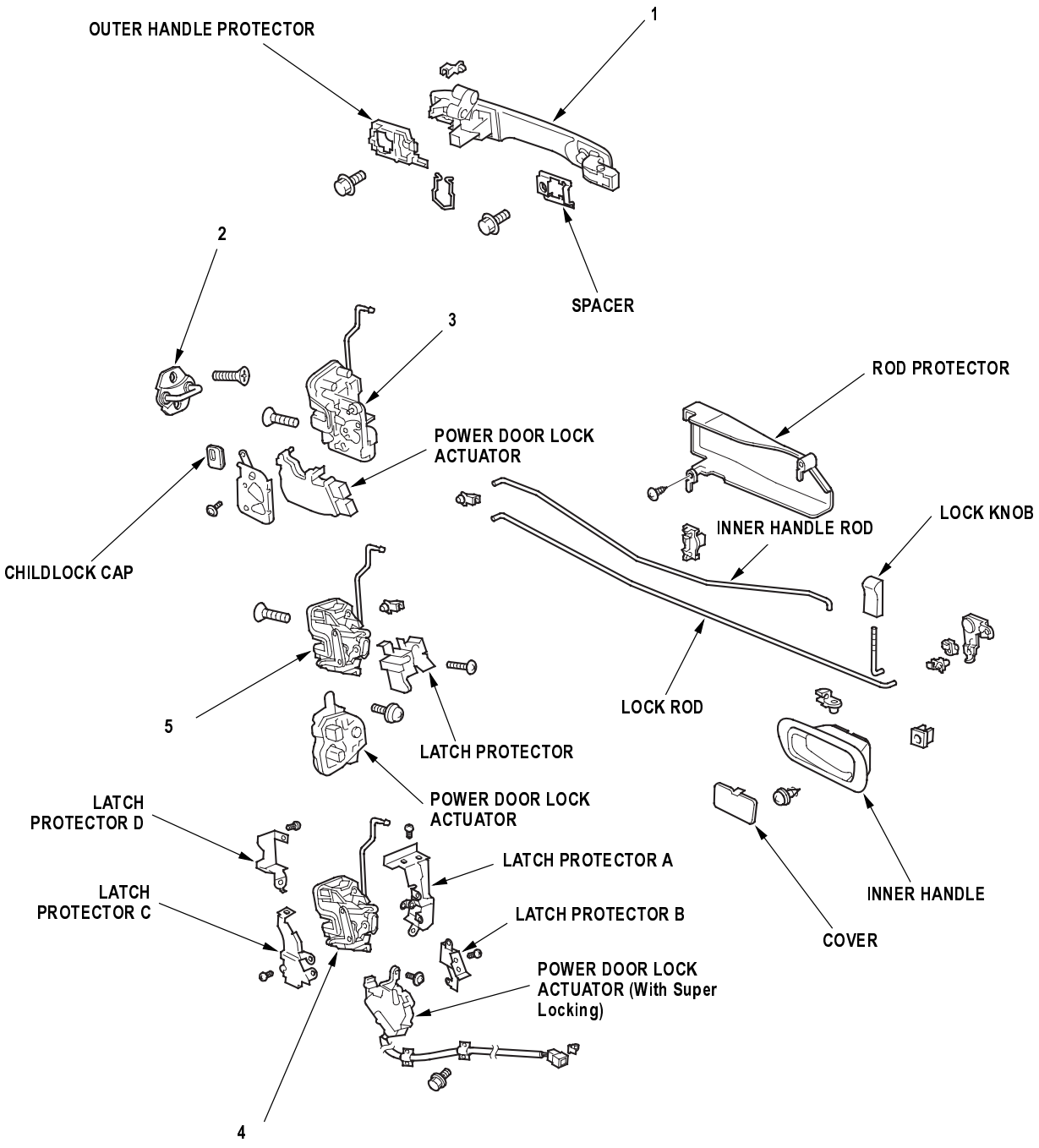
1	DOOR WEATHERSTRIP	Replacement, page 20-30
2	DOOR	Position Adjustment, page 20-36
3	DOOR CENTER PILLAR SEAL	Replacement, page 20-31
4	DOOR GLASS OUTER WEATHERSTRIP	Replacement, page 20-30
5	DOOR CHANNEL TAPE	Replacement, page 20-32
6	DOOR PANEL	Removal/Installation, page 20-21



1	QUARTER GLASS	Replacement, page 20-50
2	GLASS RUN CHANNEL	
3	FRONT LOWER CHANNEL	
4	GLASS	Replacement, page 20-27; Adjustment, page 20-34
5	REGULATOR	Replacement, page 20-27
6	COLLAR	
7	CENTER CHANNEL	

(cont'd)

Component Location Index - Rear Door (cont'd)

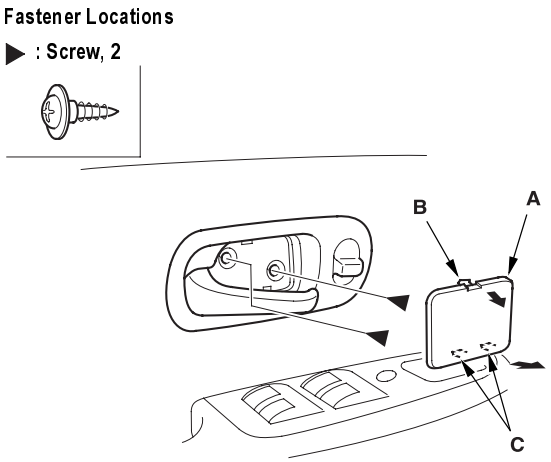


1	OUTER HANDLE	Replacement, page 20-23
2	STRIKER	Adjustment, page 20-37
3	LATCH (HONDA LOCK)	Replacement, page 20-25
4	LATCH (MITUI) (With Super Locking)	Replacement, page 20-25
5	LATCH (MITSUI)	Replacement, page 20-25

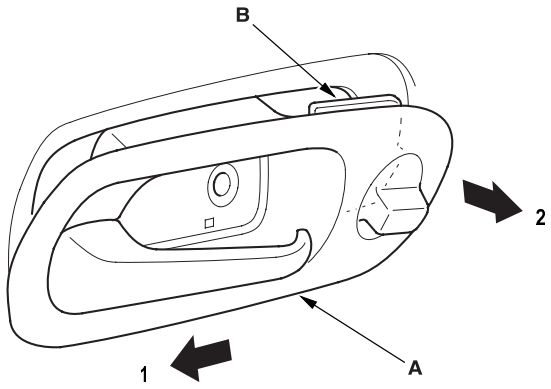
Front Door Panel Removal/Installation

Special Tools Required
Trim pad remover, Snap-on A 177A or equivalent, commercially available.

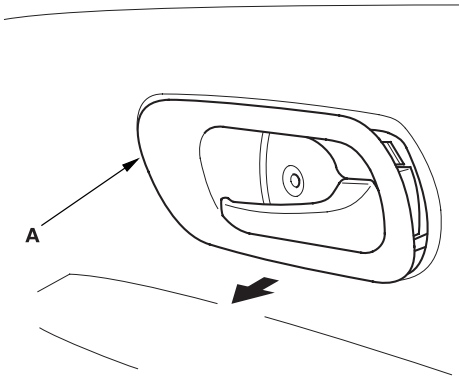
1. Using a flat-tip screwdriver wrapped with protective tape, pry out on the upper portion of the cover (A) to release the hooks (B), then remove the cover.



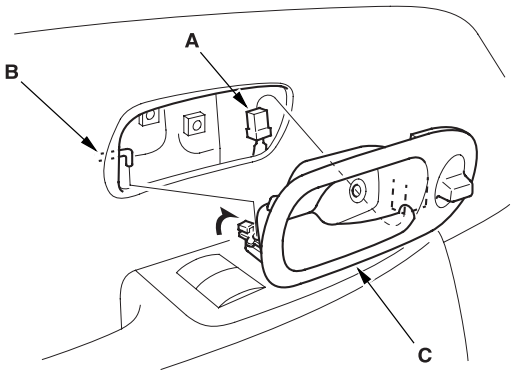
2. Remove the screws.
3. Driver's door with power door lock switch:
   Pull out the inner handle (A) rearward and out halfway to release the power door lock switch bracket (B) from the door panel (C).



4. Driver's door without power door lock switch, and passenger's door: Pull out the inner handle (A) halfway.



5. If equipped, disconnect the power door lock switch connector (A) on driver's side.
   Disconnect the inner handle rod (B), then remove the inner handle (C).

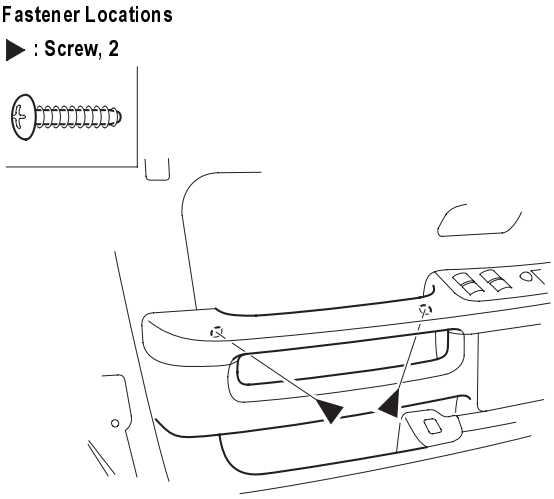


(cont'd)

Front Door Panel Removal/Installation (cont'd)

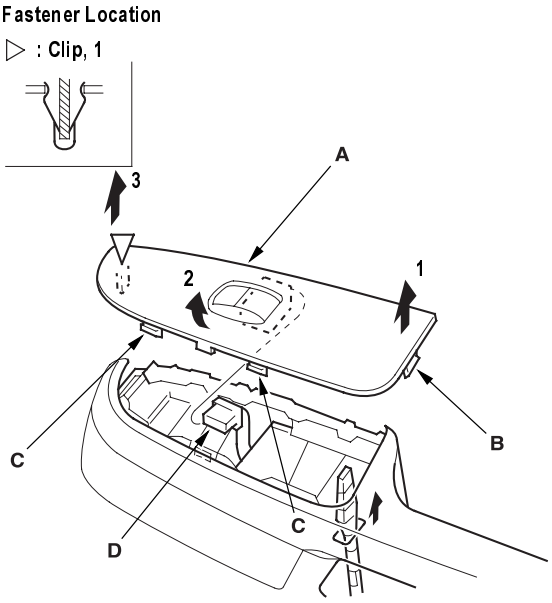
6. Lower the glass fully.

7. Remove the screws from under the armrest.



8. Passenger's door: Remove the switch panel (A).

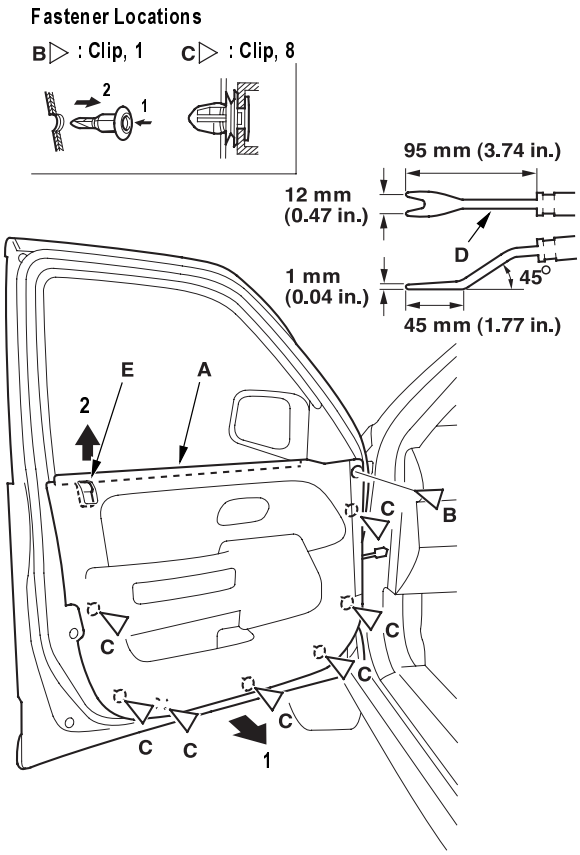
1 Insert a flat-tip screwdriver wrapped with protective tape through a hole under the armrest, and push up the back of the panel to release the rear hook (B).
2 Pull out along the edge of the panel to release the hooks (C) and clip.
3 Disconnect the power window switch connector (D).



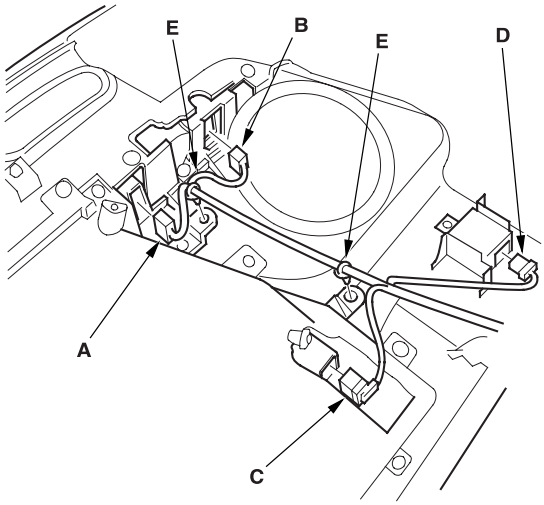
9. Remove the mirror mount cover (see step 2 on page 20-39).

10. Remove the door panel (A) with as little bending as possible to avoid creasing or breaking it.

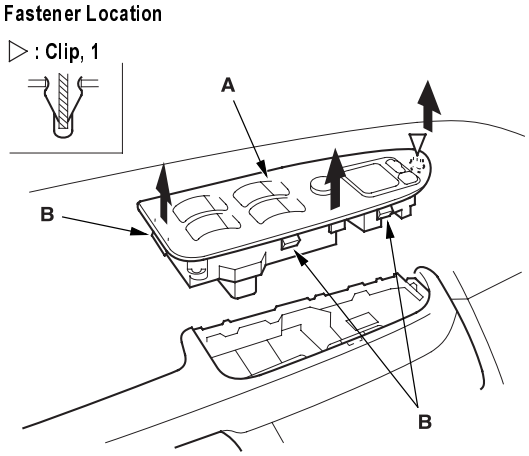
1 Release the clip (B).
2 Release the clips (C) that hold the door panel with a commercially available trim pad remover (D).
3 Starting at the rear, pull the door panel upward, then release the lock knob (E).



11. Driver's door: Disconnect the power window switch connector (A), power mirror switch connector (B), and if equipped, disconnect the hatch glass opener switch connector (C) and super locking control unit connector (D), and detach the harness clips (E) from the back of the door panel. RHD is shown, LHD is symmetrical except it has no super locking control unit.



12. Driver's door: Push up the back of the switch panel (A) to release the clip and hooks (B), then remove the panel.

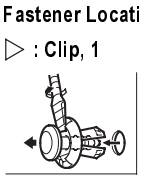


13. Install the panel in the reverse order of removal, and note these items:
    - Replace any damaged clips.
    - Make sure the connectors are plugged in properly, and the rod is connected properly.

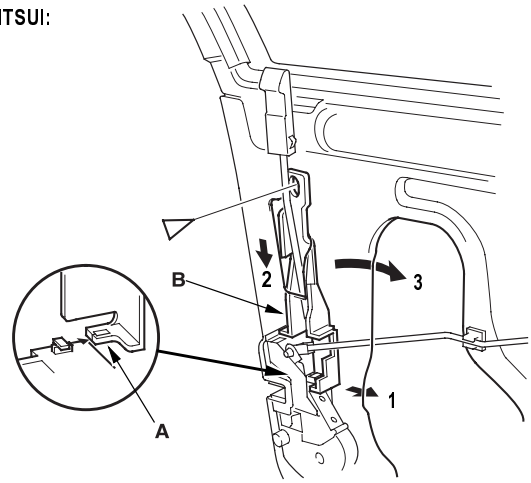
Front Door Outer Handle Replacement

NOTE: Put on gloves to protect your hands.

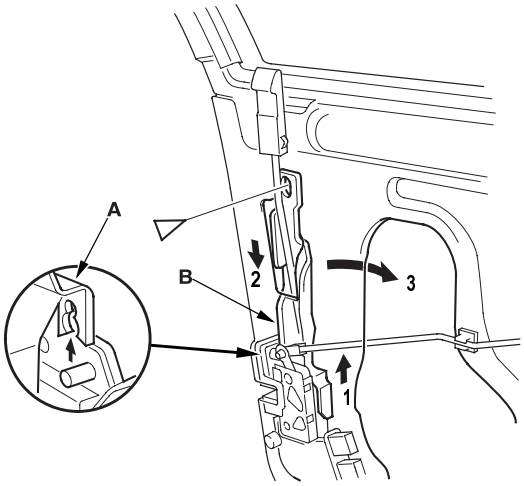
1. Remove these items:
    - Door panel (see page 20-9)
    - Plastic cover, as necessary (see page 20-2)
2. Raise the glass fully.
3. Release the clip and detach the hook (A), then remove the lock rod protector (B).



MITSUI:



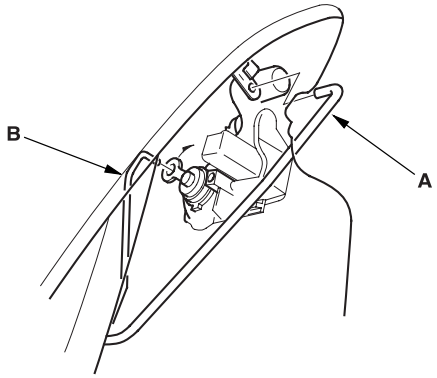
HONDA LOCK:



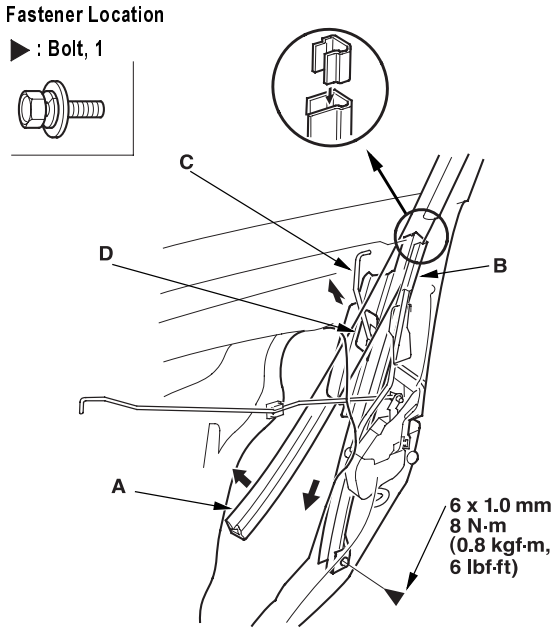
(cont'd)

Front Door Outer Handle Replacement (cont'd)

4. Disconnect the outer handle rod (A) and cylinder rod (B). Driver's with Super Locking : Disconnect the outer handle rod only. Without cylinder switch is shown (with cylinder switch is similar).



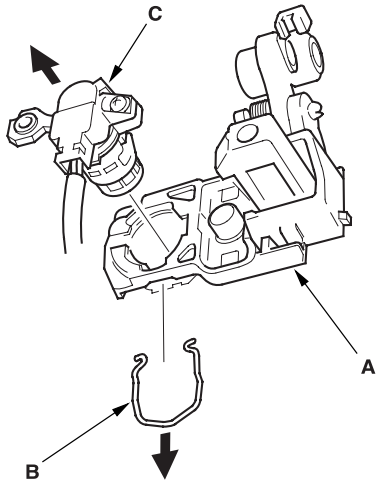
5. Driver's with Super Locking : Pull the glass run channel (A) away as necessary. Remove the bolt, then remove the center lower channel (B) by pulling it downward, and pull the channel up to remove it from the outer handle rod (C) through the hole (D) in the channel.



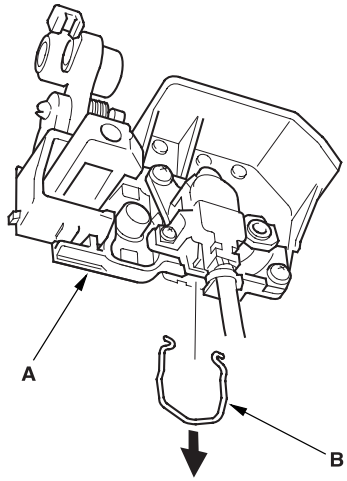
6. Driver's with Super Locking : Disconnect the cylinder rod (see step 4).

7. Release the retainer clip (B) with a hocked shaped tool. On no Super Locking models, remove the lock cylinder (C).

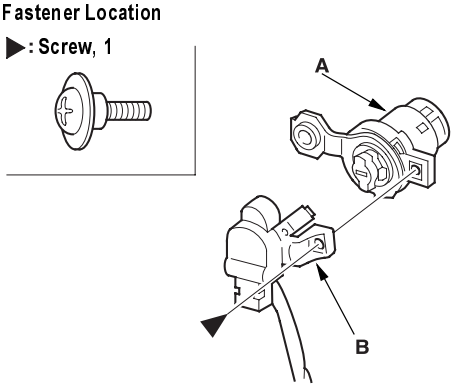
Without Super Locking:



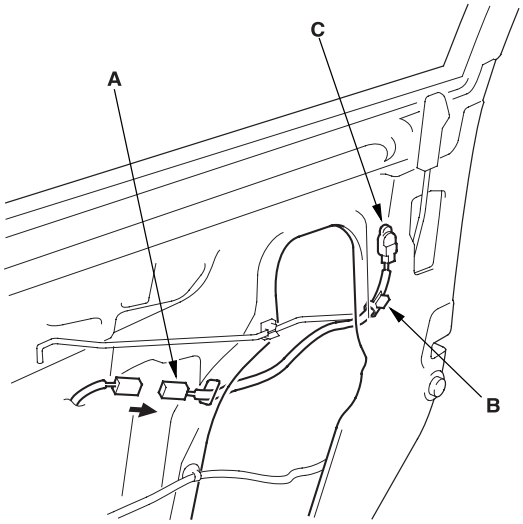
With Super Locking:



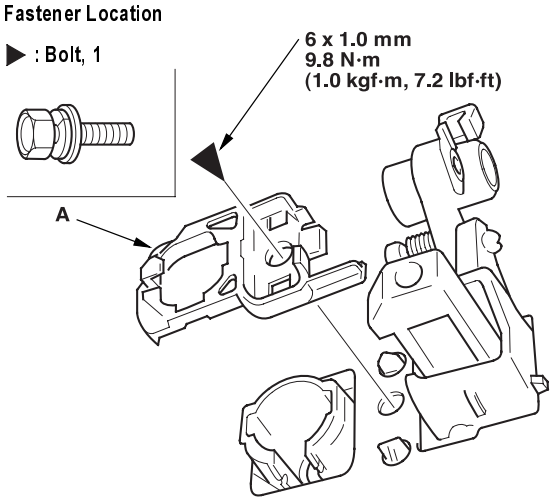
8. On no Super Locking models with cylinder switch, remove the screw, then separate the lock cylinder (A) and cylinder switch (B).



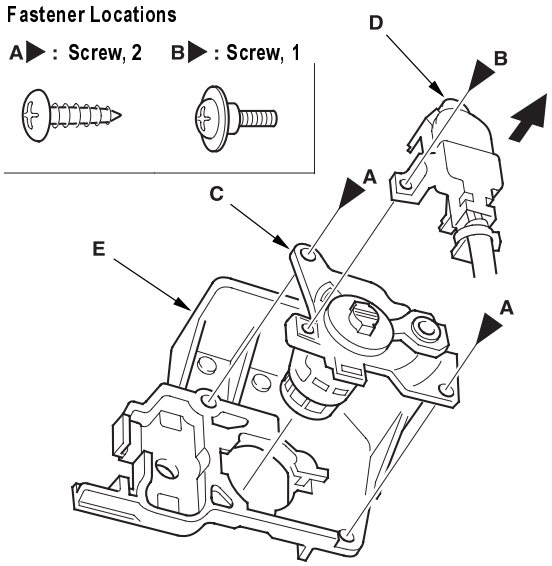
9. With cylinder switch: Disconnect the cylinder switch connector (A), and detach the harness clip (B), then remove the cylinder switch (C). With Super Locking is shown.



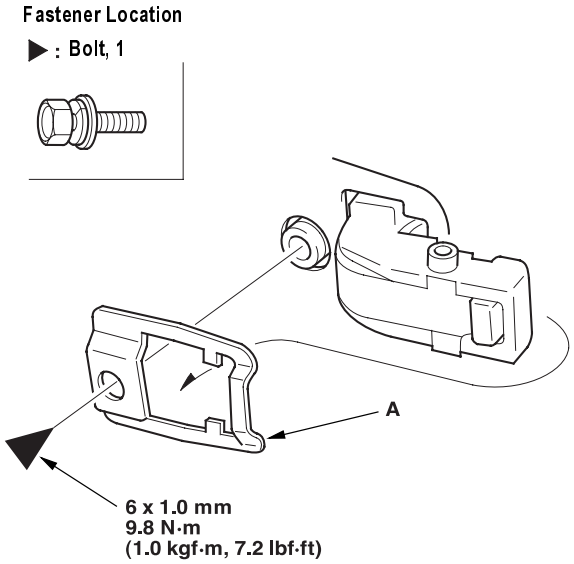
10. Remove the bolt, then remove the cylinder protector (A). Without Super Locking and with Super Locking (passengers side) are shown, with Super Locking (driver's side) is that removing the lock cylinder and cylinder protector as an assembly.



11. With Super Locking: Remove the screws (A, B), then separate the lock cylinder (C), cylinder switch (D), and cylinder protector (E).



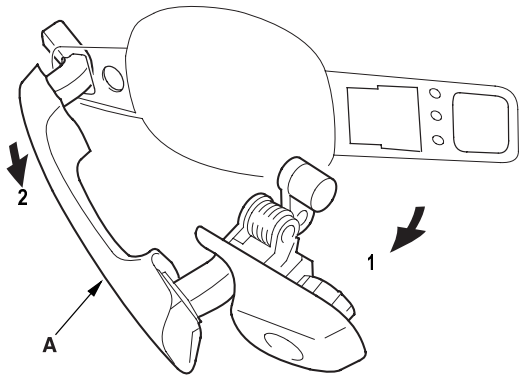
12. Remove the bolt, then remove the spacer (A).



(cont'd)

Front Door Outer Handle Replacement (cont'd)

13. While pulling the outer handle (A), remove the handle from the holes in the door panel. Take care not to scratch the door.



14. Install the handle in the reverse order of removal, and note these items:

- Make sure the cylinder switch harness is routed properly (for some models).
- Make sure the cylinder switch connector is plugged in properly (for some models), and each rod is connected securely.
- Make sure the door locks and opens properly.
- When installing the lock cylinder, leave the outer door handle bolts loose so the inner protector does not interfere with the lock cylinder, then tighten the handle bolts.
- Install the lock cylinder retaining clip on the handle, then install the lock cylinder. Be sure the clip is fully seated in the slot on the lock cylinder.

Front Door Latch Replacement

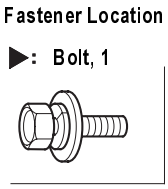
NOTE: Put on gloves to protect your hands.

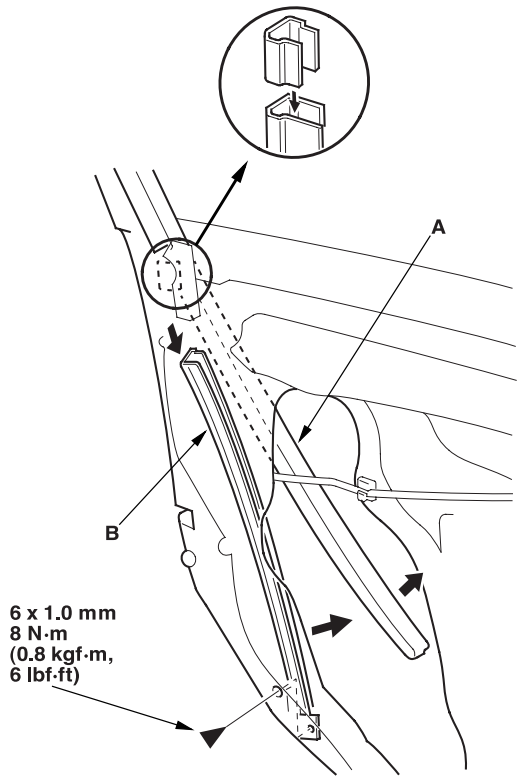
1. Remove these items:

- Door panel (see page 20-9)
- Plastic cover, as necessary (see page 20-2)
- Lock rod protector (see step 3 on page 20-11)
- Center lower channel, driver's with Super Locking (see step 5 on page 20-12)

2. Raise the glass fully.

3. Without Super locking and passenger's with Super Locking: Pull the glass run channel (A) away as necessary, and remove the bolt, then remove the center lower channel (B) by pulling it downward.

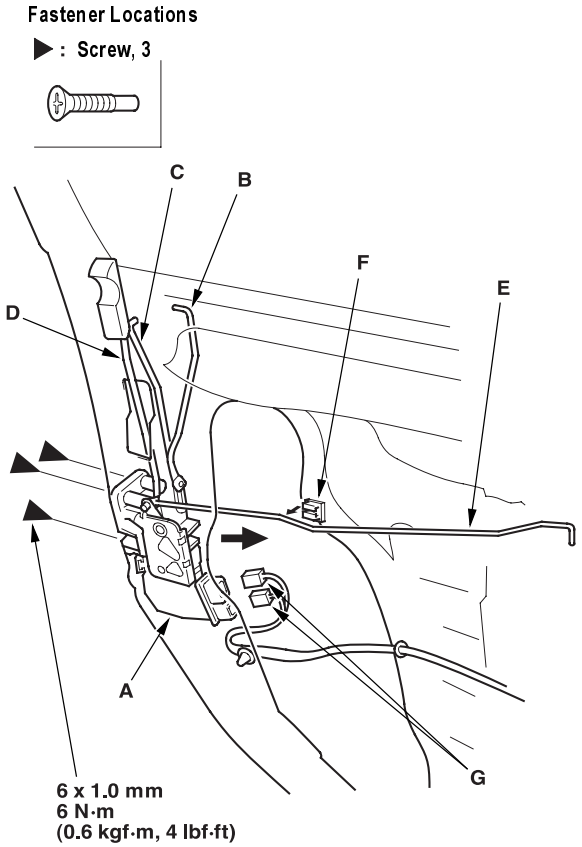




4. Disconnect the outer handle rod and cylinder rod (see step 4 on page 20-12).

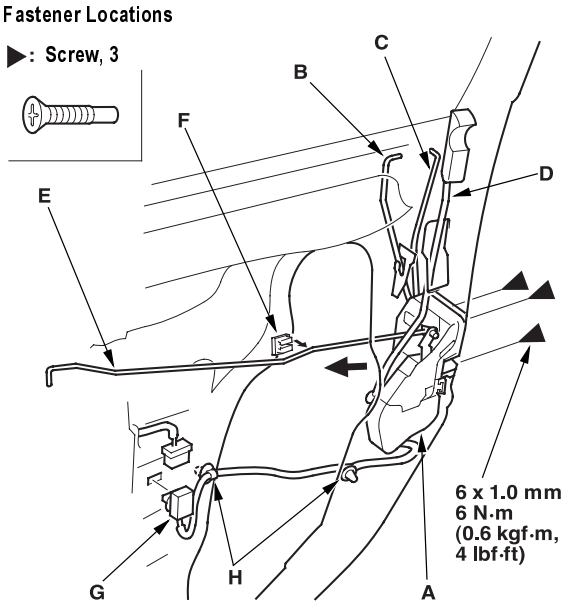
5. Without Super Locking: Remove the latch (A). Take care not to bend the outer handle rod (B), cylinder rod (C), lock rod (D), and inner handle rod (E). The Honda Lock make is shown (the Mitsui make is similar).

1 Release the inner handle rod from the rod holder (F).
2 Disconnect the connectors (G).
3 Remove the screws.
4 Remove the latch from the hole in the door.



6. With Super Locking: Remove the latch (A). Take care not to bend the outer handle rod (B), cylinder rod (C), lock rod (D), and inner handle rod (E).

1 Release the inner handle rod from the rod holder (F).
2 Disconnect the connector (G), and detach it. Detach the harness clips (H).
3 Remove the screws.
4 Remove the latch from the hole in the door.



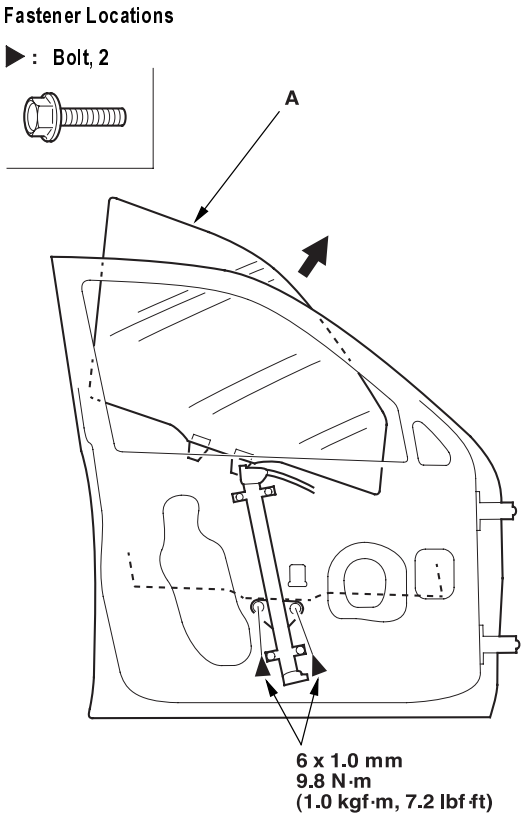
7. Install the latch in the reverse order of removal, and note these items:

- Make sure the actuator connector(s) is plugged in properly, and each rod is connected securely.
- Make sure the door locks and opens properly.

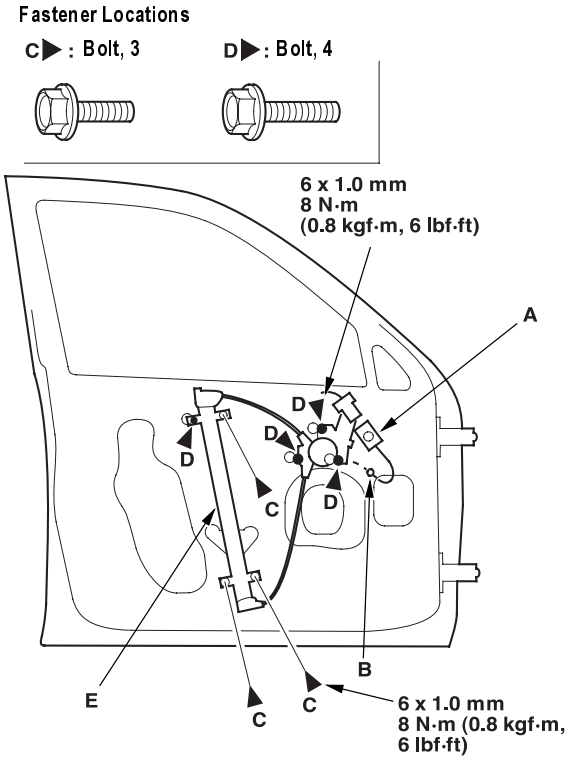
Front Door Glass and Regulator Replacement

NOTE: Put on gloves to protect your hands.

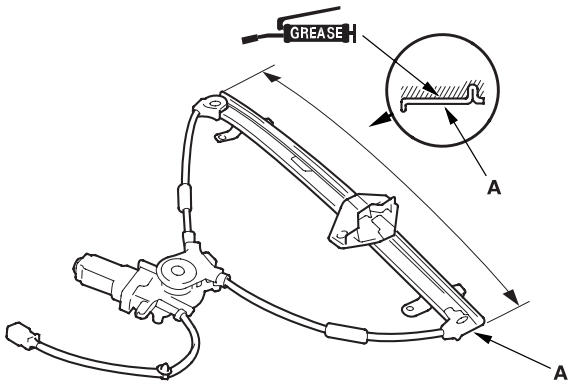
1. Remove these items:
   - Door panel (see page 20-9)
   - Plastic cover, as necessary (see page 20-2)
2. Carefully move the glass (A) until you can see the bolts, then remove them. Carefully pull the glass out through the window slot. Take care not to drop the glass inside the door.



3. Disconnect and detach the connector (A) and harness clip (B) from the door.



4. Remove the bolts (C), and loosen the bolts (D), then remove the regulator (E) through the hole in the door.
5. Grease all the sliding surfaces of the regulator (A) where shown.



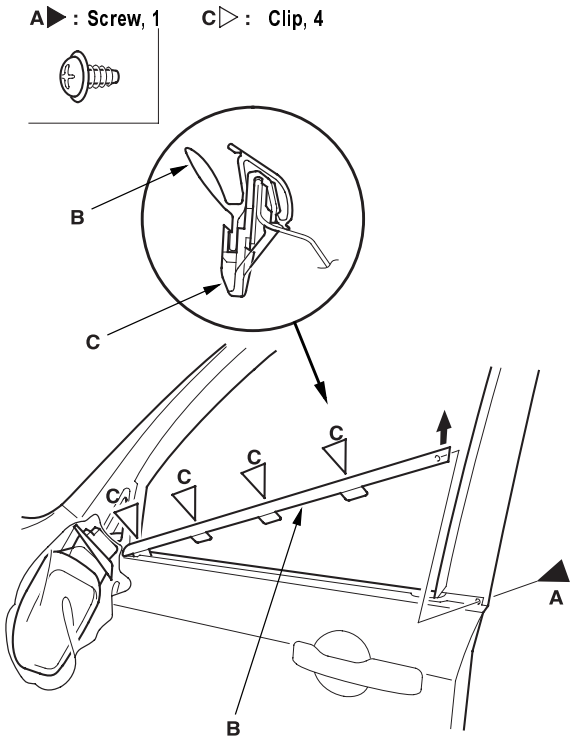
6. Install the glass and regulator in the reverse order of removal, and note these items:
   - Roll the glass up and down to see if it moves freely without binding.
   - Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
   - Adjust the position of the glass as necessary (see page 20-34).

Front Door Glass Outer Weatherstrip Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the door.

1. Remove the power mirror (see page 20-39). To prevent scratching the power mirror and door, wrap the power mirror with a shop towel. Disconnecting the power mirror connector is not required.
2. Remove the screw (A) from the rear edge of the door. Starting at the rear, pry the door glass outer weatherstrip (B) up to detach the clips (C), then remove the weatherstrip.

Fastener Locations

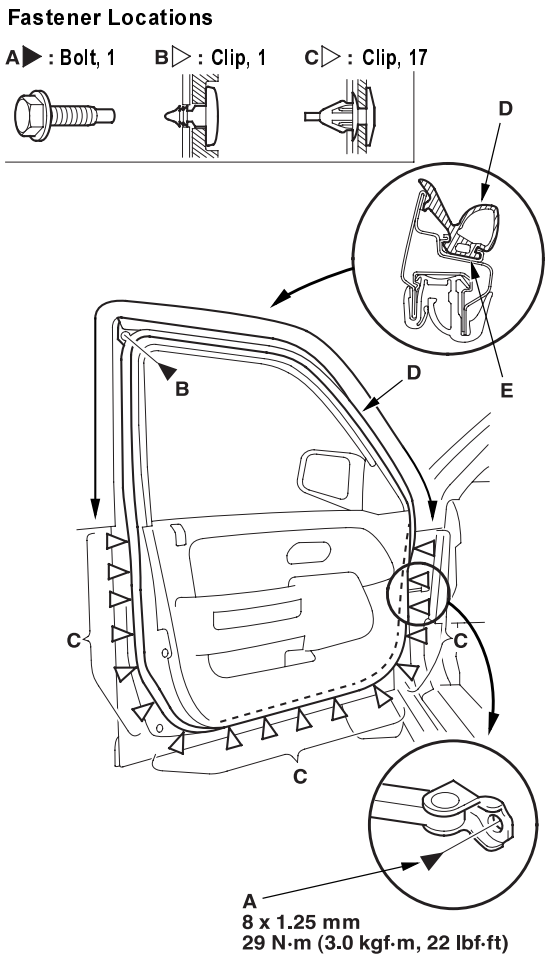


3. Install the weatherstrip in the reverse order of removal, and replace any damaged clips.

Front Door Weatherstrip Replacement

NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

1. At the front pillar, remove the door stop mounting bolt (A).



2. Detach the clips (B, C), then remove the door weatherstrip (D).
3. Install the weatherstrip in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Make sure the weatherstrip is installed in the holder (E) securely.
   - Apply liquid thread lock to door stop mounting bolt before installation.
   - Check for water leaks (see step 7 on page 20-35).

Front Door Channel Tape Replacement

NOTE:
- Keep dust away from the working area.
- When working at lower temperatures, heat the door channel and door channel tape with a hair dryer.
  Door channel: about 15°C (59°F).
  Door channel tape: about 30°C (86°F).
- When heating the door channel tape, heat it evenly and gradually to prevent deformation.
- When pressing the door channel tape, slowly press it from the corner to prevent air bubbles and wrinkles.
- If there are air bubbles in the door channel tape, release the air with your finger or a plastic squeegee.
- If the air bubble is more than 10 mm (0.4 in.) in diameter, peel up the door channel tape, then reapply it.

1. The following tools are required to replace the door channel tape:
- Plastic squeegee
- Alcohol
- Sponge or Shop towel
- Hair dryer

2. Remove these items:
- Door glass outer weatherstrip (see page 20-17)
- Glass run channel, as necessary (see page 20-2)

3. Slowly peel up the old door channel tape while heating it with a hair dryer.

4. Clean the door channel bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.

5. Attach the door channel tape.
1 Peel the edge of the adhesive backing from the channel tape.
2 Fit the door channel tape to the door channel.
3 Apply the door channel tape to the door channel while peeling the adhesive backing from it a little at a time. Check that the channel tape is parallel with the door channel.
4 Push firmly on the door channel tape with a plastic squeegee (felt side).

NOTE: To prevent air bubbles, slowly press the door channel tape around the door frame corner.

6. As necessary, repeat the preceding steps.

7. Reinstall all remaining removed parts.

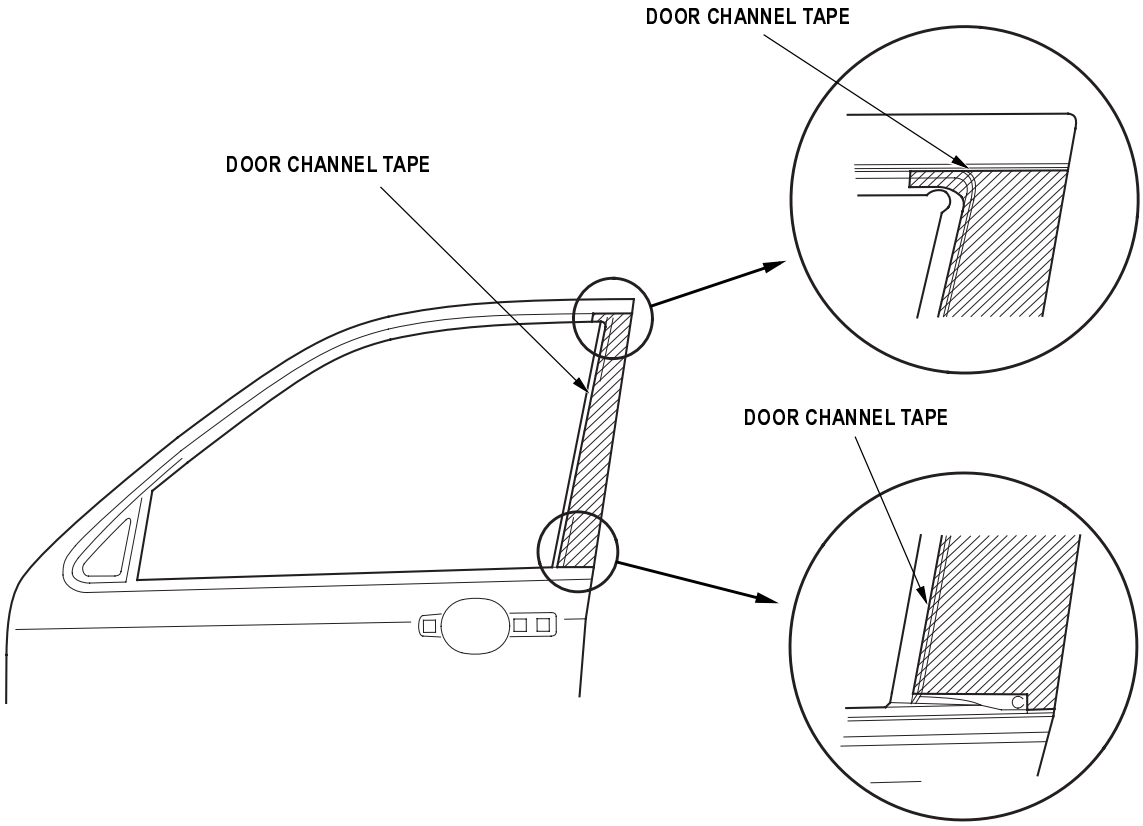
8. Check that the body color on the door channel is covered by the door channel tape.

9. Check for water leaks (see step 7 on page 20-35).

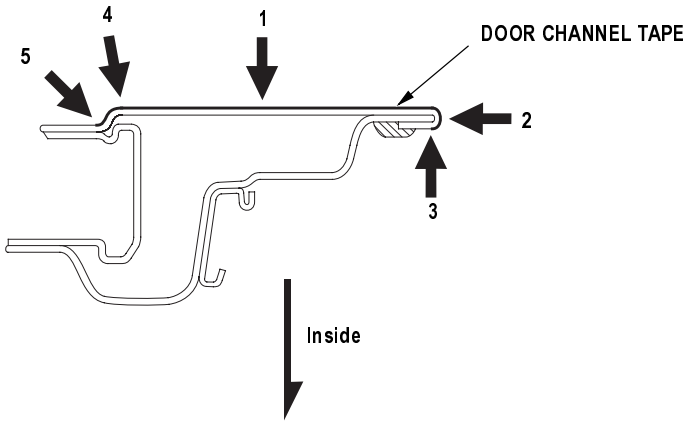
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Front Door Channel Tape Replacement (cont'd)

Attachment Point (Reference):



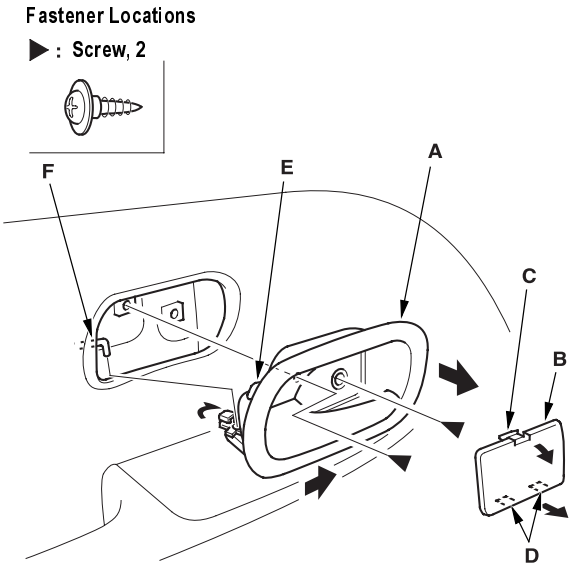
Note: Press in numbered sequence:



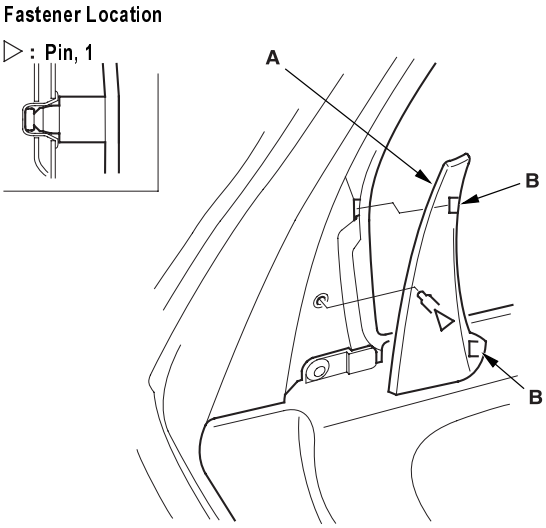
Rear Door Panel Removal/Installation

Special Tools Required
Trim pad remover, Snap-on A 177A or equivalent, commercially available.

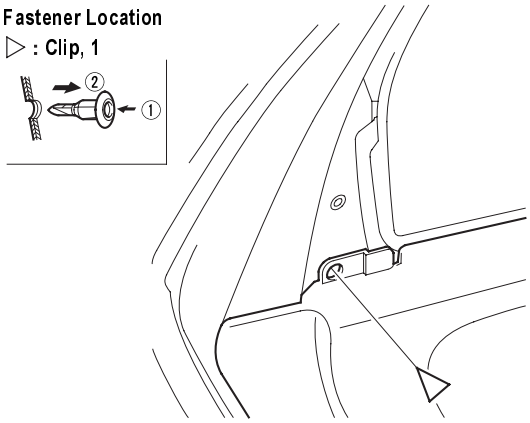
1. Lower the glass fully.
2. Remove the inner handle (A). Take care not to scratch the door panel.
   1 Using a flat-tip screwdriver wrapped with protective tape, pry out on the upper portion of the cover (B) to release the hooks (C, D), then remove the cover.
   2 Remove the screws.
   4 Pull out the inner handle forward and out half-way to release the hook (E).
   2 Disconnect the inner handle rod (F).



3. Remove the door quarter inner trim (A). Take care not to scratch the door.
   1 Using a flat-tip screwdriver wrapped with protective tape, insert it next to the pin, and detach the pin by prying on the trim while holding the hock portions. Take care not to break the hooks (B).
   2 Pull the trim forward to release the hooks.



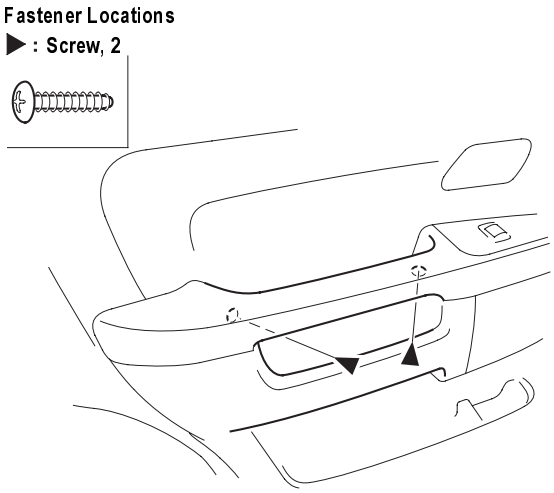
4. Remove the clip from the door quarter inner trim mounting portion.



(cont'd)

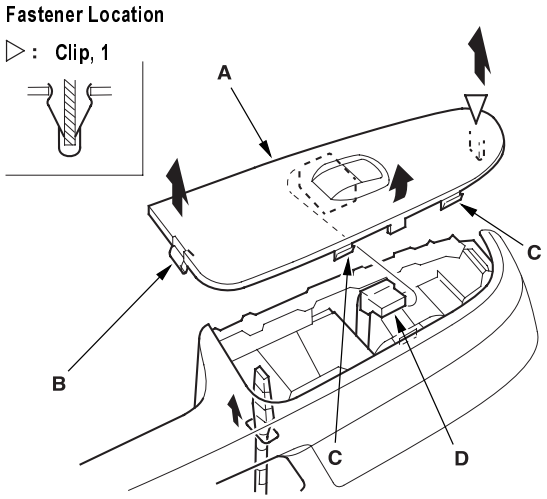
Rear Door Panel Removal/Installation (cont'd)

5. Remove the screws from under the armrest.



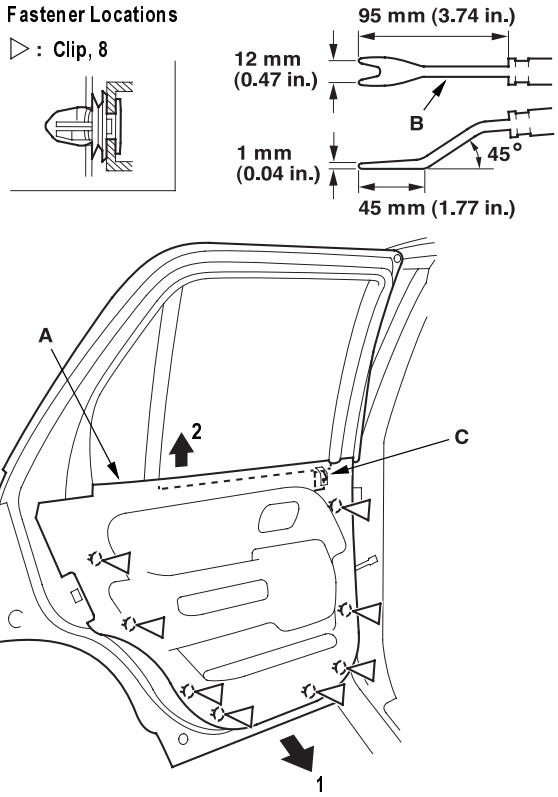
6. Remove the switch panel (A).

- Insert a flat-tip screwdriver wrapped with protective tape through a hole under the armrest, and push up the back of the panel to release the rear hook (B).
- Pull out along the edge of the panel to release the hooks (C) and clip.
- Disconnect the power window switch connector (D).

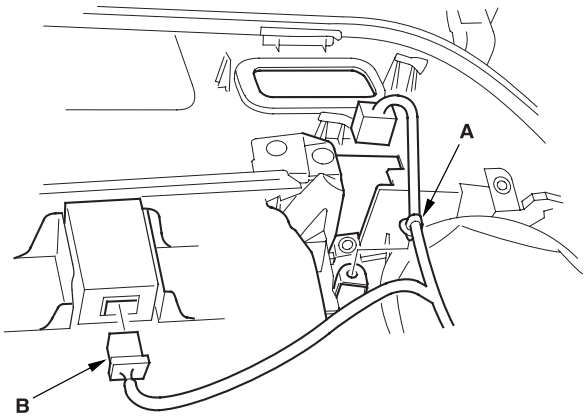


7. Remove the door panel (A) with as little bending as possible to avoid creasing or breaking it.

- Release the clips that hold the door panel with a commercially available trim pad remover (B).
- Stating at the rear, pull the door panel upward, then release the lock knob (C).



8. Form the back of the door panel, detach the harness clip (A). If equipped, disconnect the super locking control unit connector (B). RHD is shown, LHD is symmetrical except it has no super locking control unit.

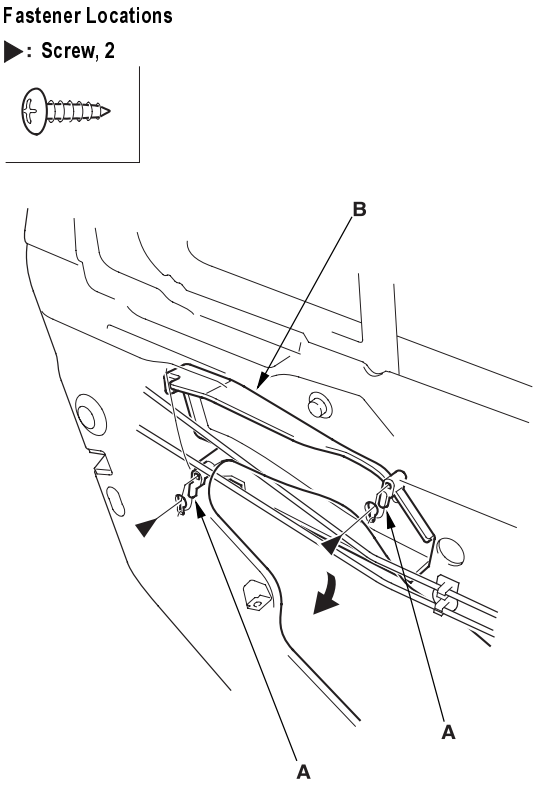


9. Install the panel in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Make sure the connector (s) is plugged in properly and the rod is connected properly.

Rear Door Outer Handle Replacement

NOTE : Put on gloves to protect your hands.

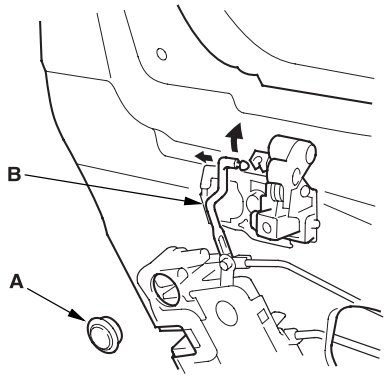
1. Remove these items:
   - Door panel (see page 20-21)
   - Plastic cover, as necessary (see page 20-6)
2. Raise the glass fully.
3. Remove the screws, and release the hooks (A), then remove the rod protector (B).



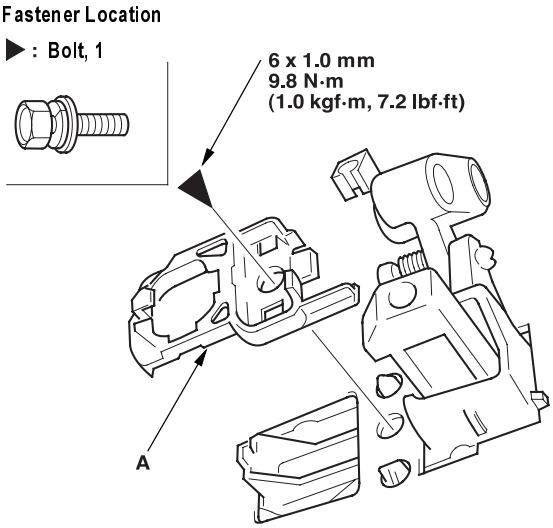
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Rear Door Outer Handle Replacement (cont'd)

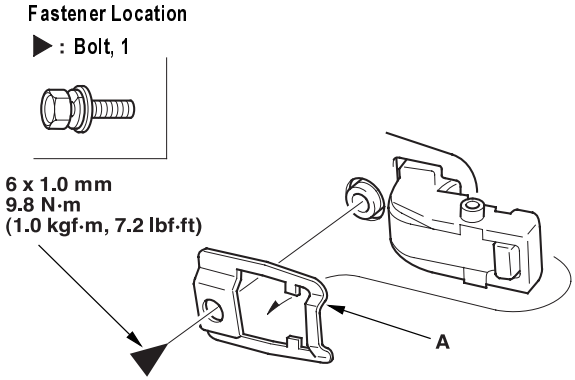
4. Remove the access cap (A), then disconnect the outer handle rod (B).



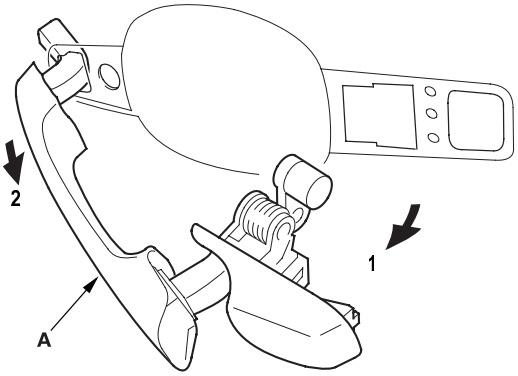
5. Remove the bolt, then remove the protector (A).



6. Remove the bolt, then remove the spacer (A).



7. While pulling the outer handle (A), remove the handle from the holes in the door panel. Take care not to scratch the door.



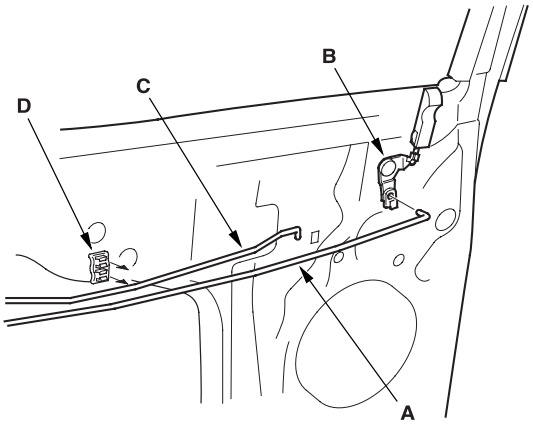
8. Install the handle in the reverse order of removal, and note these items:

- Make sure the outer handle rod is connected securely.
- Make sure the door locks and opens properly.

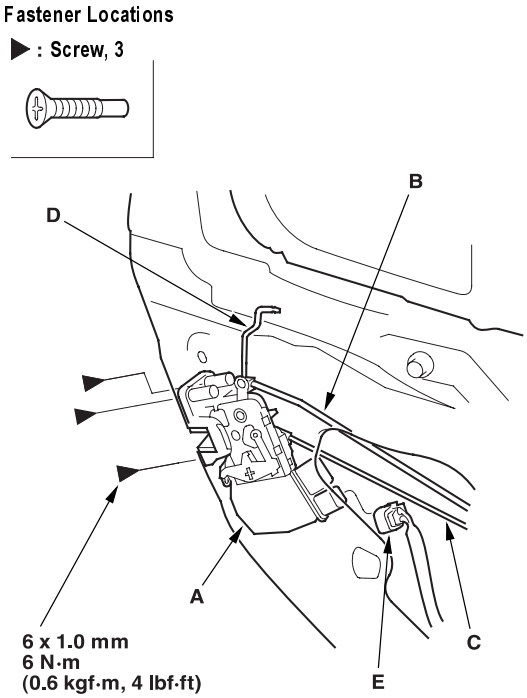
Rear Door Latch Replacement

NOTE: Put on gloves to protect your hands.

1. Remove these items:
   - Door panel (see page 20-21)
   - Plastic cover, as necessary (see page 20-6)
   - Rod protector (see step 3 on page 20-23)
2. Raise the glass fully.
3. Remove the access cap, than disconnect the outer handle rod (see step 4 on page 20-24).
4. Disconnect the lock rod (A) from the lock crank (B), and release the inner handle rod (C) and lock rod from the rod holder (D).



5. Without Super Locking: Remove the latch (A). Take care not to bend the inner handle rod (B), lock rod (C), and outer handle rod (D). The Honda Lock make is shown (the Mitsui make is similar).
   1 Disconnect the connector (E).
   2 Remove the screws.
   3 Remove the latch from the hole in the door.

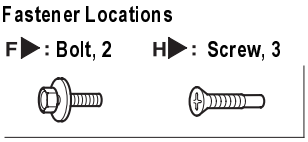


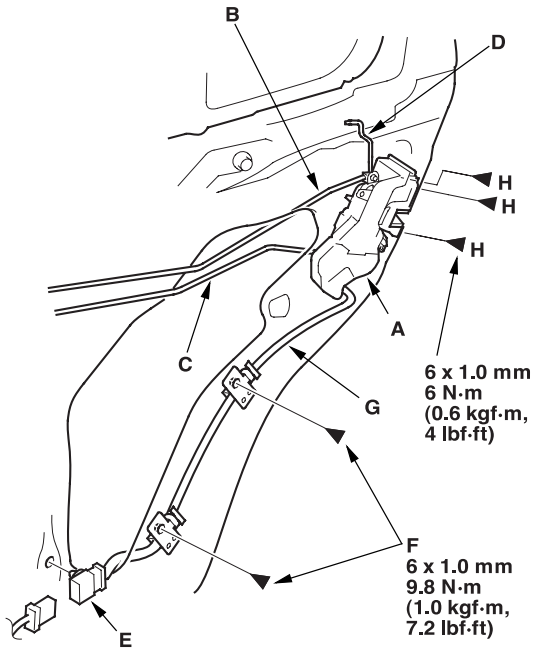
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Rear Door Latch Replacement (cont'd)

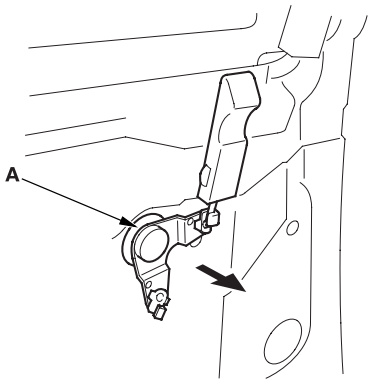
6. With Super Locking: Remove the latch (A). Take care not to bend the inner handle rod (B), lock rod (C), and outer handle rod (D).

1 Disconnect the connector (E), and detach it.
2 Remove the bolts (F), then release the wire harness (G) from the door.
3 Remove the screws (H)
4 Remove the latch from the hole in the door.





7. If necessary, remove the lock crank (A) from the door.



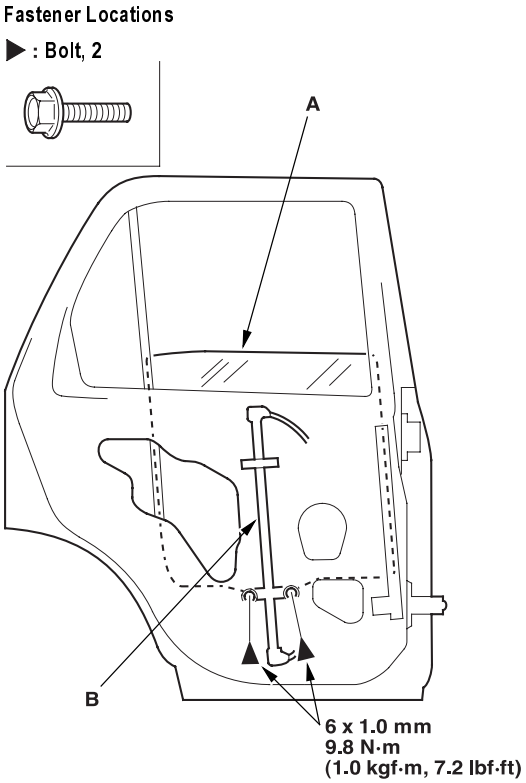
8. Install the latch in the reverse order of removal, and note these items:

- Make sure the connector is plugged in properly, and each rod is connected securely.
- Make sure the door locks and opens properly.

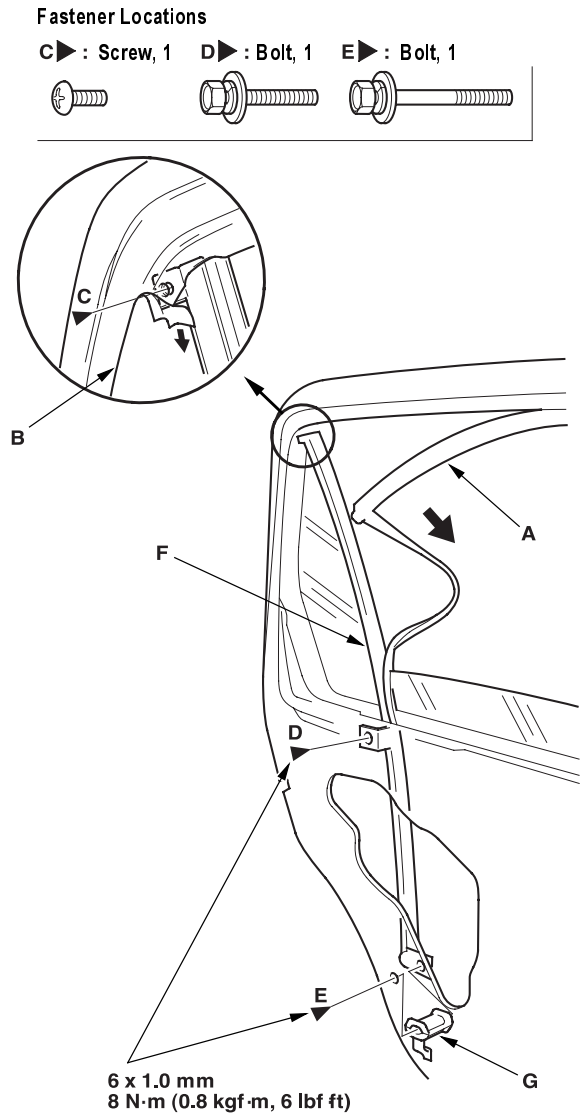
Rear Door Glass and Regulator Replacement

NOTE: Put on gloves to protect your hands.

1. Remove these items:
   - Door panel (see page 20-21)
   - Plastic cover, as necessary (see page 20-6)
   - Rod protector (see step 3 on page 20-23)
2. Carefully move the glass (A) until you can see the bolts, then remove them. Remove the glass from the regulator (B), and carefully lower the glass. Take care not to drop the glass inside the door.



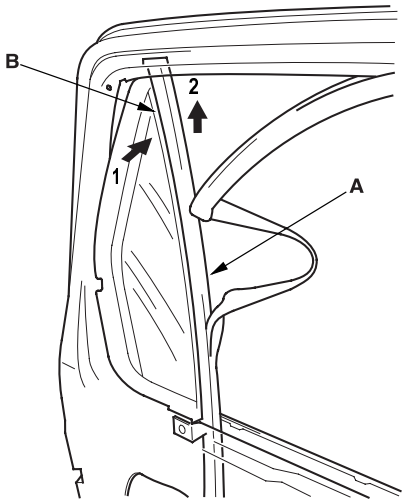
3. Pull the glass run channel (A) away as needed. Pull back the door quarter glass seal (B), then remove the screw (C). Remove the bolts (D, E) securing the center channel (F), then remove the collar (G).



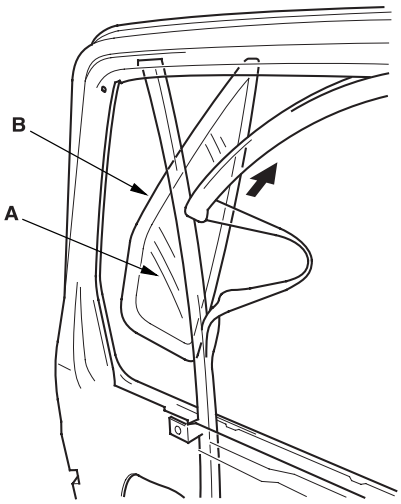
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Rear Door Glass and Regulator Replacement (cont'd)

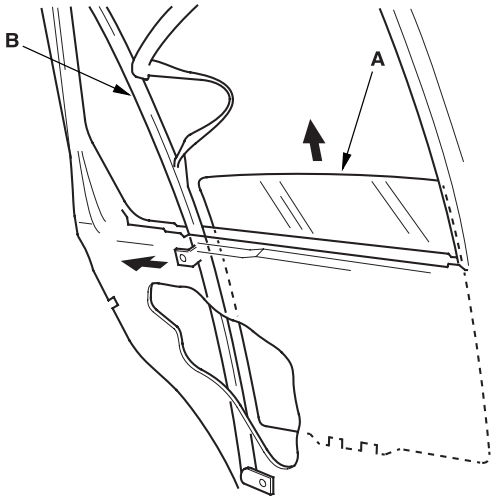
4. Pull the upper portion of the center channel (A) forward to remove it from the door quarter glass seal (B), and pull up the center channel. Take care not to scratch the door.



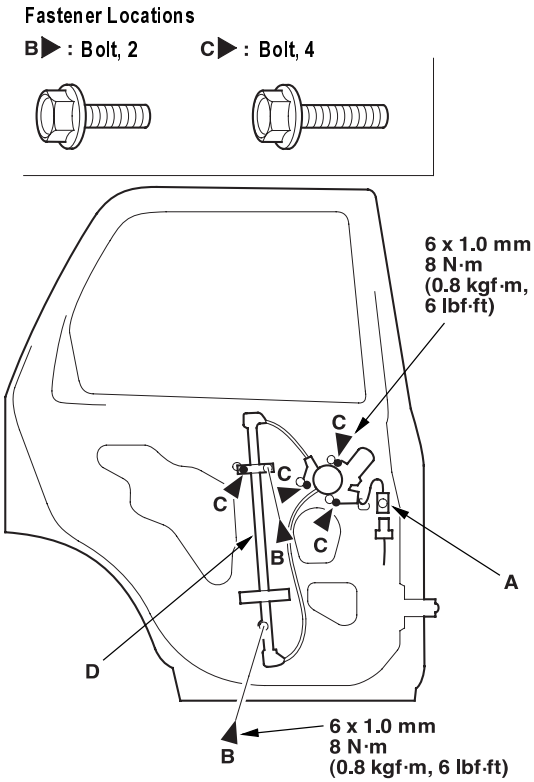
5. Remove the door quarter glass (A) and seal (B) as an assembly from the door.



6. Release the glass (A) from the center channel (B), and carefully remove the glass out though the window slot. Take care not to drop the glass inside the door.

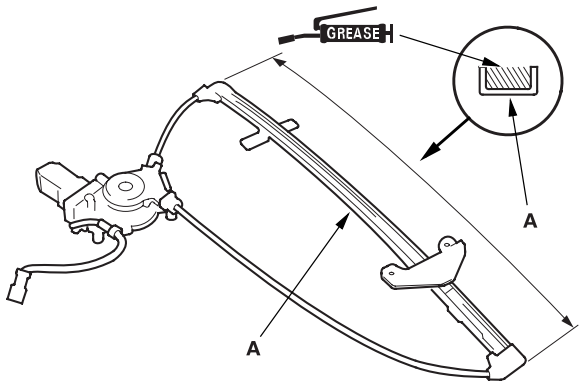


7. Disconnect and detach the connector (A) from the door.



8. Remove the bolts (B), and loosen the bolts (C), then remove the regulator (D) through the hole in the door.

9. Grease all the sliding surfaces of the regulator (A) where shown.

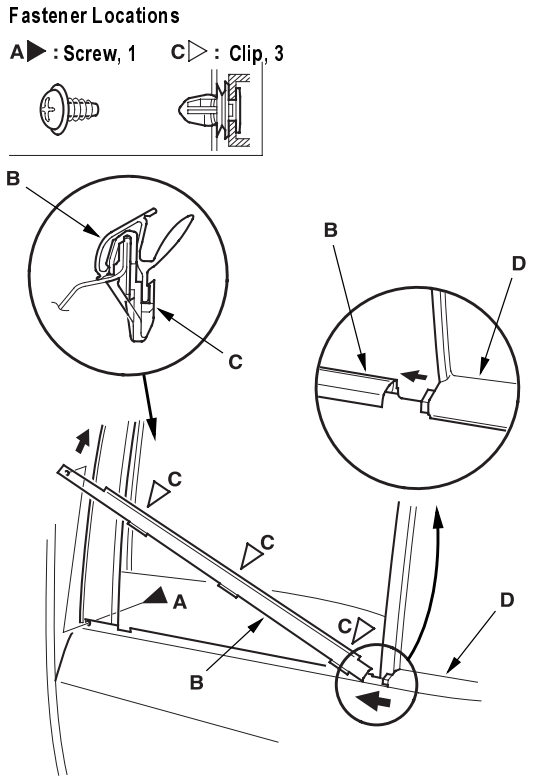


10. Install the glass and regulator in the reverse order of removal, and note these items:
    - Roll the glass up and down to see if it moves freely without binding.
    - Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
    - Adjust the position of the glass as necessary (see page 20-34).

Rear Door Glass Outer Weatherstrip Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the door.

1. Remove the screw (A) from the front edge of the door. Starting at the front, pry the door glass outer weatherstrip (B) up to detach the clips (C), and release the weatherstrip from the door quarter glass seal (D), then remove it.

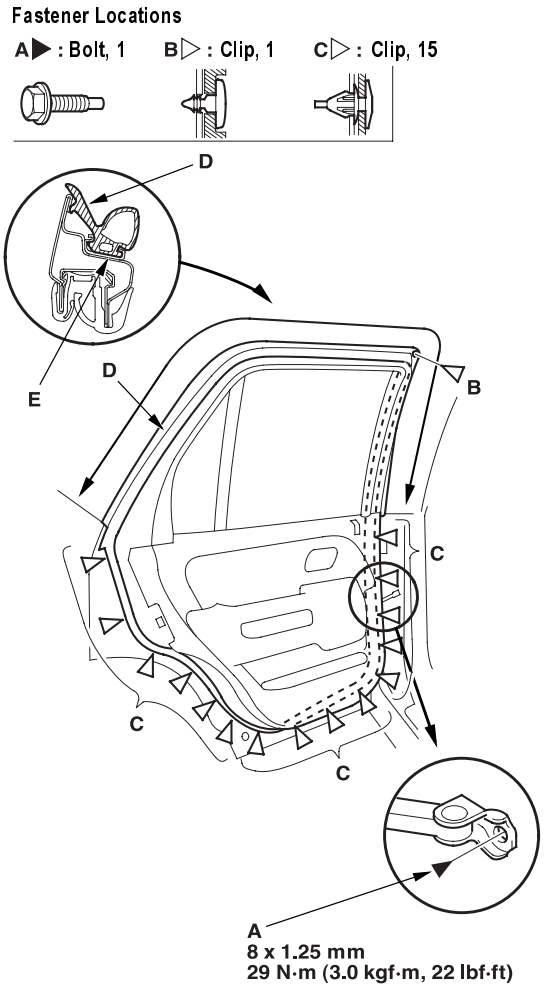


2. Install the weatherstrip in the reverse order of removal, and replace any damaged clips.

Rear Door Weatherstrip Replacement

NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

1. At the center pillar, remove the door stop mounting bolt (A).

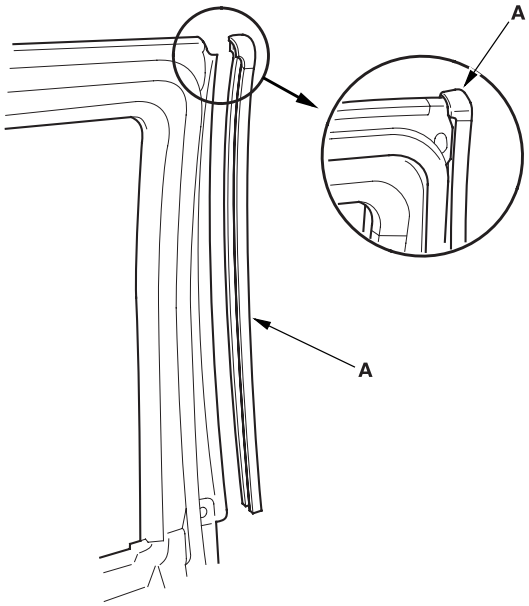


2. Detach the clip (B, C), then remove the door weatherstrip (D).
3. Install the weatherstrip in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Make sure the weatherstrip is installed in the holder (E) securely.
   - Apply liquid thread lock to the door stop mounting bolt before installation.
   - Check for water leaks (see step 7 on page 20-35).

Rear Door Center Pillar Seal Replacement

NOTE: Take care not to scratch the door.

1. Pull the door center pillar seal (A) away, then remove it.



2. After installing the seal to the upper edge of the door flange, align the seal to the bottom edge of the door flange, then push the seal into place.

Rear Door Channel Tape Replacement

NOTE:
- Keep dust away from the working area.
- When working at lower temperatures, heat the door channel and door channel tape with a hair dryer.
  Door channel: about 15°C (59°F).
  Door channel tape: about 30°C (86°F).
- When heating the door channel tape, heat it evenly and gradually to prevent deformation.
- When pressing the door channel tape, slowly press it from the corner to prevent air bubbles and wrinkles.
- If there are air bubbles in the door channel tape, release the air with your finger or a plastic squeegee.
- If the air bubble is more than 10 mm (0.4 in.) in diameter, peel up the door channel tape, then reapply it.

1. The following tools are required to replace the door channel tape:
- Plastic squeegee
- Alcohol
- Sponge or Shop towel
- Hair dryer

2. Remove these items:
- Door glass outer weatherstrip (see page 20-30)
- Glass run channel, as necessary (see page 20-6)
- Door center pillar seal (see page 20-31)

3. Slowly peel up the old door channel tape while heating it with a hair dryer.

4. Clean the door channel bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.

5. Attach the door channel tape.
1 Peel the edge of the adhesive backing from the channel tape.
2 Fit the door channel tape to the door channel.
3 Apply the door channel tape to the door channel while peeling the adhesive backing from it a little at a time. Check that the channel tape is parallel with the door channel.
4 Push firmly on the door channel tape with a plastic squeegee (felt side).

NOTE: To prevent air bubbles, slowly press the door channel tape around the door frame corner.

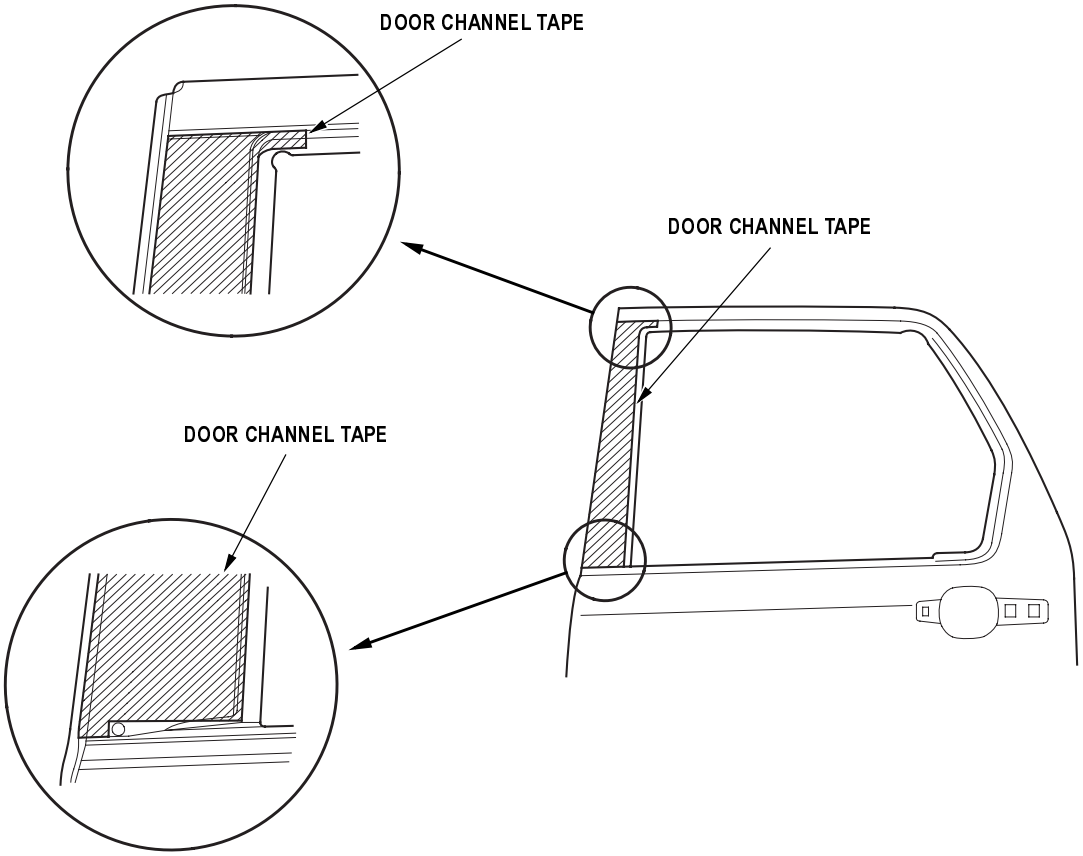
6. As necessary, repeat the preceding steps.

7. Reinstall all remaining removed parts.

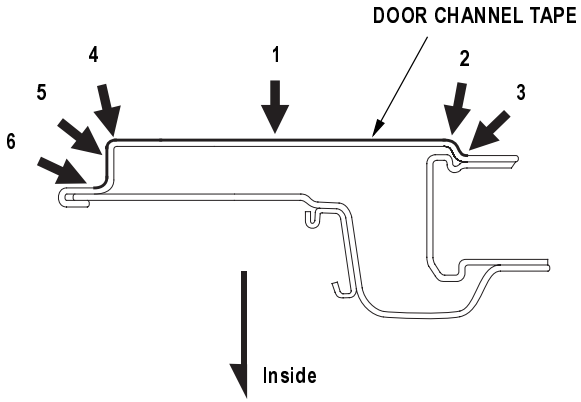
8. Check that the body color on the door channel is covered by the door channel tape.

9. Check for water leaks (see step 7 on page 20-35).

Attachment Point (Reference):



Note: Press in numbered sequence.

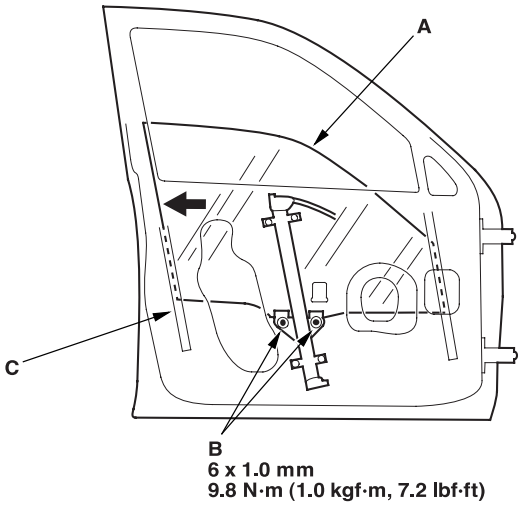


Front and Rear Door Glass Adjustment

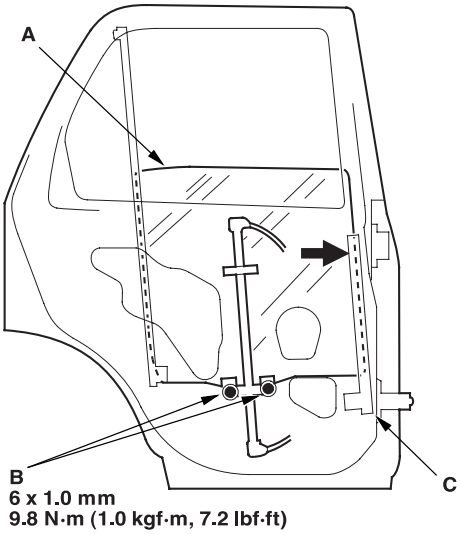
NOTE: Check the weatherstrips and glass run channel for damage or deterioration, and replace them if necessary.

1. Place the vehicle on a firm, level surface.
2. Remove these items:
   - Door panel, front door (see page 20-9), rear door (see page 20-21)
   - Plastic cover, front door (see page 20-2), rear door (see page 20-6)
3. Carefully move the glass (A) until you can see the glass mounting bolts (B), then loosen them.

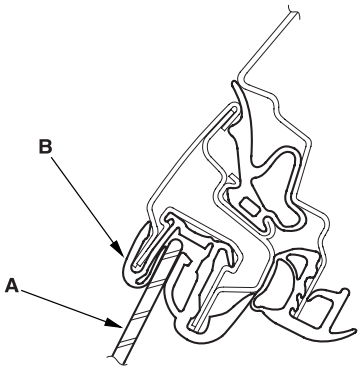
Front door:



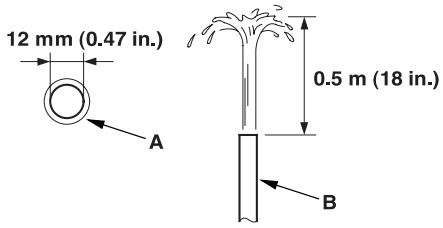
Rear door:

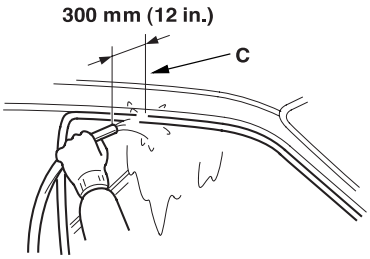


4. Push the glass (A) against the channel (C), then tighten the glass mounting bolts.
5. Check that the glass moves smoothly.
6. Raise the glass fully, and check for gaps. Also check that the glass (A) contacts the glass run channel (B) evenly.



7. Check for water leaks. Run water over the roof and on the sealing area as shown, and note these items:
   - Use a 12 mm (0.47 in.) diameter hose (A).
   - Adjust the rate of water flow as shown (B).
   - Do not use a nozzle.
   - Hold the hose about 300 mm (12 in.) away from the door (C).





8. Attach the plastic cover, and install the door panel, front door (see page 20-9), rear door (see page 20-21).

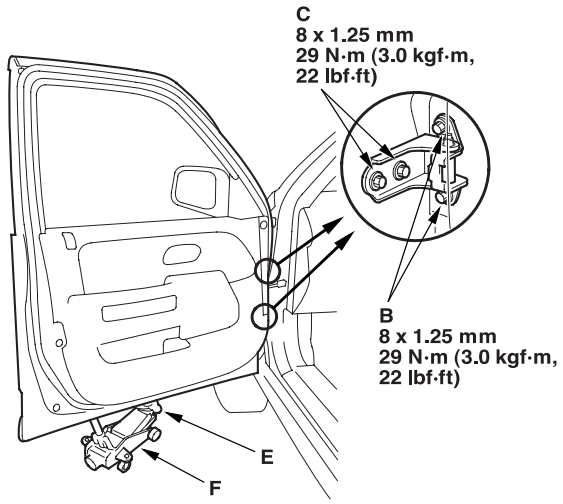
Front and Rear Door Position Adjustment

SRS components are located in the center pillar bottom area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

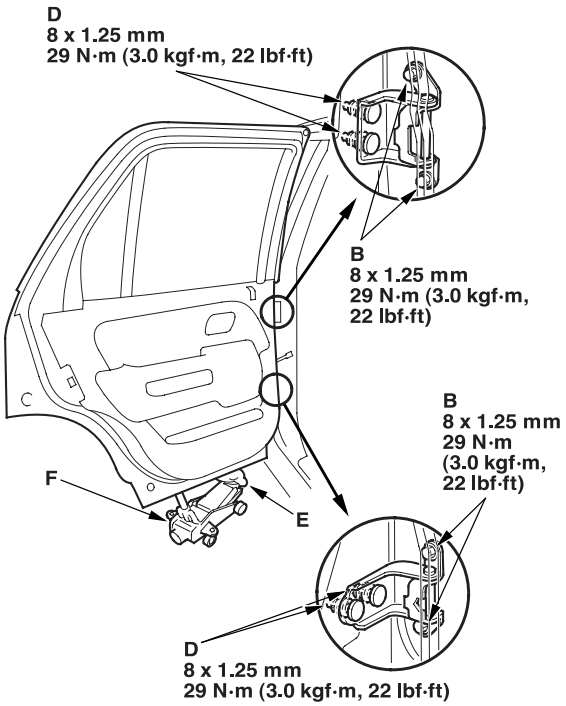
NOTE: Check for a flush fit with the body, then check for equal gaps between the front, rear, and bottom door edges and the body. Check that the door and body edges are parallel. Before adjusting, replace the mounting bolts.

1. Place the vehicle on a firm, level surface when adjusting the doors.
2. Adjust at the hinges (A):
   - Loosen the door mounting bolts (B) slightly, and move the door in or out until it's flush with the body.
   - On the front door: Remove the front inner fender (see page 20-155) and front fender fairing (see page 20-156). Loosen the hinge mounting bolts (C) slightly, and move the door backward or forward, up or down as necessary to equalize the gaps.
   - On the rear door: Remove the center pillar lower trim panel (see page 20-76), and remove the front seat belt and retractor (see page 23-4), and the plug seal from the body. Loosen the hinge mounting nuts (D) slightly, and move the door backward or forward, up or down as necessary to equalize the gaps.
   - Place a shop towel (E) on the jack (F) to prevent damage to the door when adjusting the door.

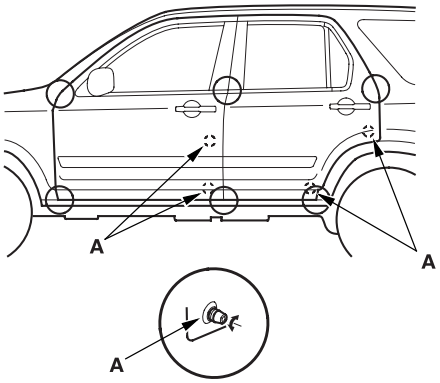
Front door:



Rear door:



3. Check that the door and body edges are parallel. If necessary, adjust the door cushions (A) to make the rear of the doors flush with the body.

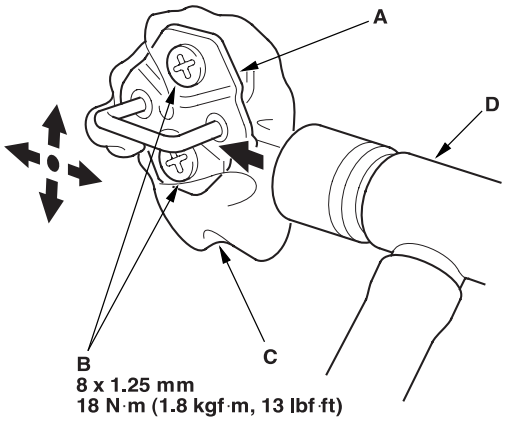


4. Apply body paint to the hinge mounting bolts, and around the hinges.
5. Check for water leaks (see step 7 on page 20-35).

Front and Rear Door Striker Adjustment

Make sure the door latches securely without slamming it. If necessary, adjust the striker (A): The striker nuts are fixed, but the striker can be adjusted slightly up or down, and in or out.

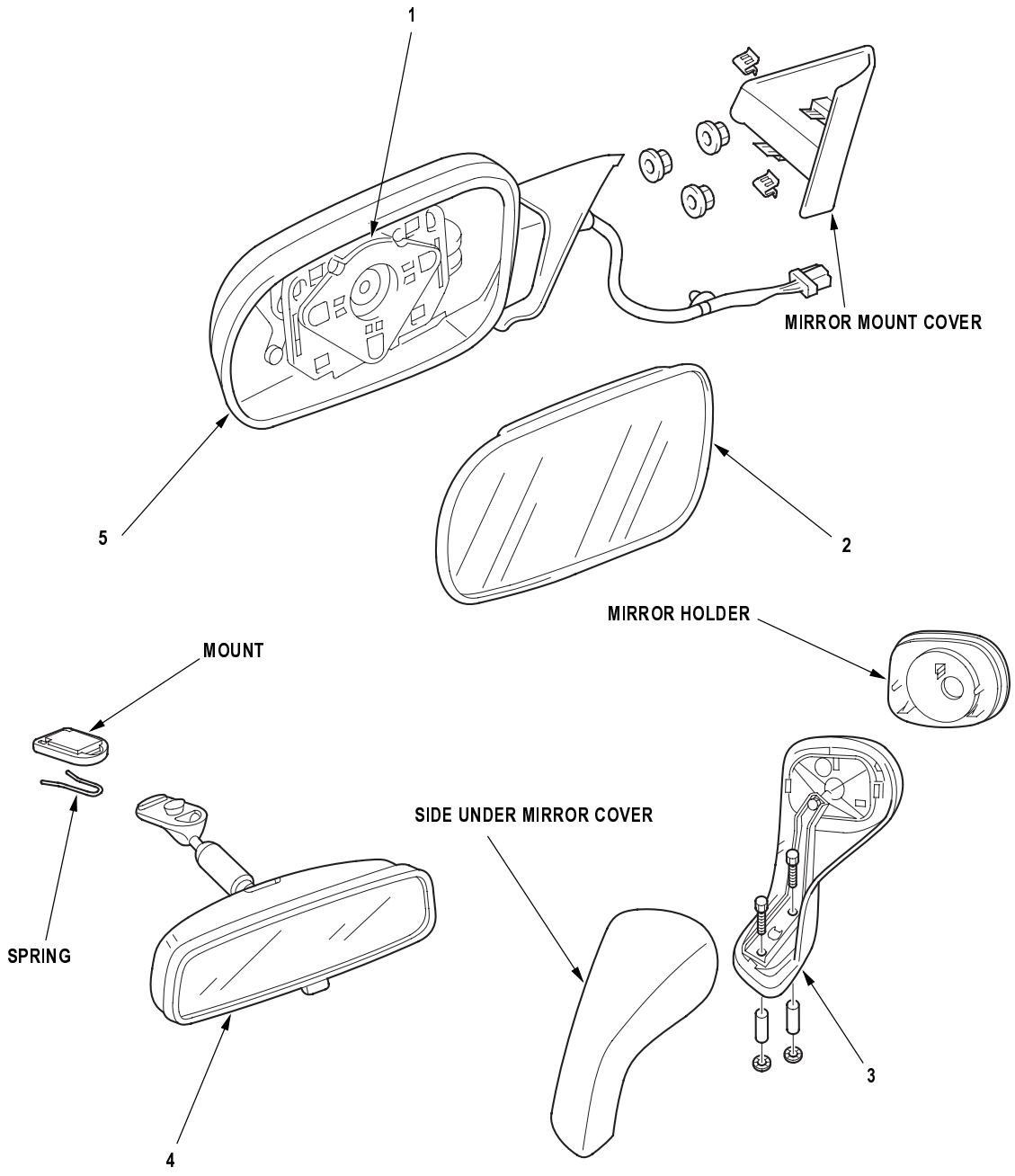
1. Loosen the screws (B), then insert a shop towel (C) between the body and striker.



2. Lightly tighten the screws.
3. Wrap the striker with a shop towel, then adjust the striker by tapping it with a plastic hammer (D). Do not tap the striker too hard.
4. Loosen the screws, and remove the shop towel.
5. Lightly tighten the screws.
6. Hold the outer handle out, and push the door against the body to be sure the striker allows a flush fit. If the door latches properly, tighten the screws and recheck.

Mirrors

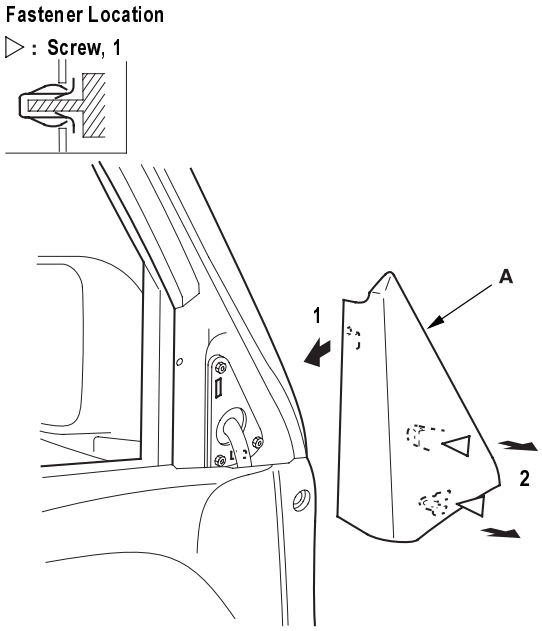
Component Location Index



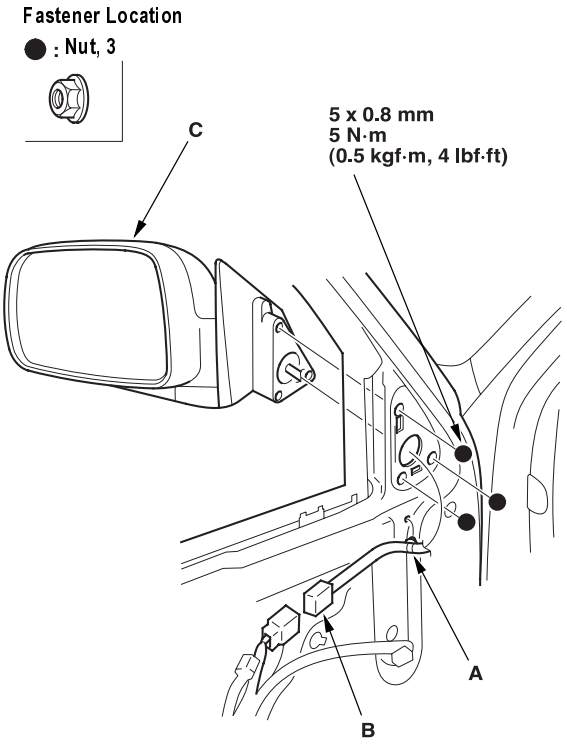
1	POWER MIRROR ACTUATOR	Replacement, Page 22A-137
2	MIRROR HOLDER	Replacement, page 20-40
3	SIDE UNDER MIRROR	Replacement, page 20-40
4	REARVIEW MIRROR	Replacement, page 20-41
5	POWER MIRROR	Replacement, page 20-39

Power Mirror Replacement

1. Lower the door glass fully.
2. Carefully pry out the mirror mount cover (A) by hand in the sequence shown.



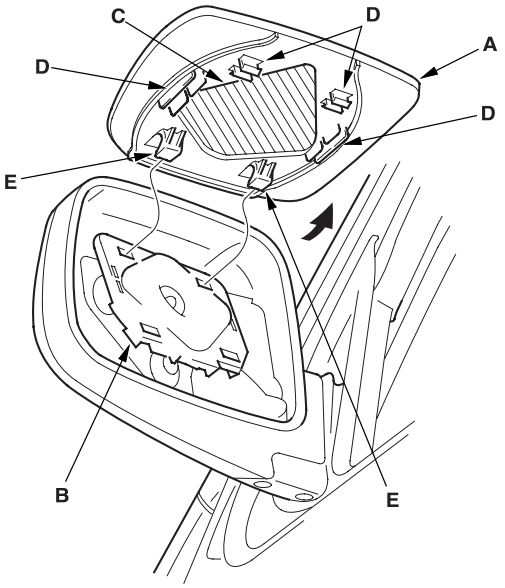
3. Remove the door panel (see page 20-9).
4. Remove the plastic cover as necessary, then detach the harness clip (A), and disconnect the connector (B). While holding the mirror (C), remove the nuts, then remove the mirror. Take care not to scratch the door.



5. Install the mirror in the reverse order of removal, and make sure the connector is plugged in properly.

Mirror Holder Replacement

1. Carefully pull out the bottom edge of the mirror holder (A) by hand. Take care not to scratch the mirror.



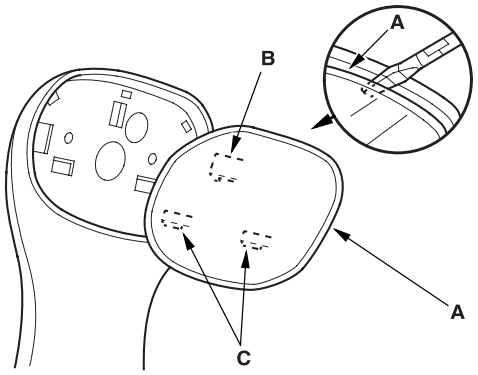
2. Separate the mirror holder from the actuator (B) by slowly pulling them apart while removing the adhesive (C), detaching the clips (D), and releasing the hooks (E). If equipped, disconnect the mirror defogger connectors from the heater pad terminals.
3. If equipped, reconnect the mirror defogger connectors.
4. Reattach the hooks of the mirror holder to the actuator, then position the mirror holder on the actuator. Carefully push on the clip portions of the mirror holder until the mirror holder locks into place.
5. Check the operation of the actuator.

Side Under Mirror Replacement

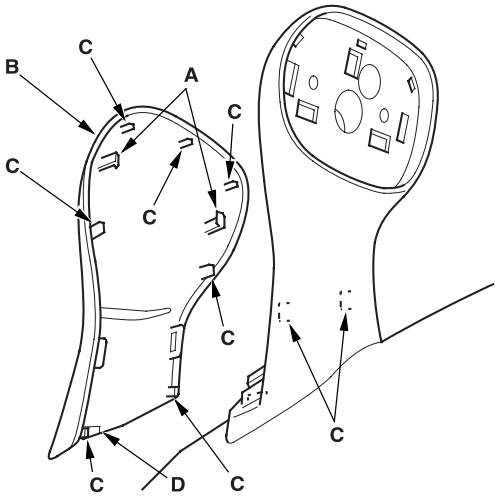
For Some Models

NOTE: When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.

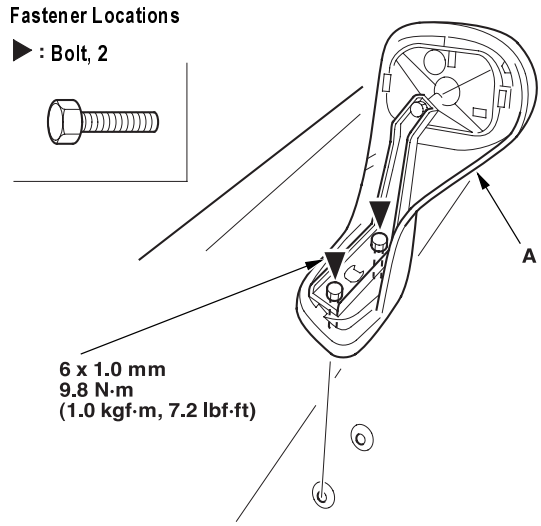
1. Using a flat-tip screwdriver, carefully pull out the upper edge of the mirror holder (A) to release the hook (B), and carefully pull out the mirror holder to release the hooks (C) by hand, then remove the mirror holder. Take care not to scratch the mirror.



2. From the mirror holder mounting, release the hooks (A) of the side under mirror cover (B), and release the tabs (C) and hook (D), then remove the side under mirror cover.



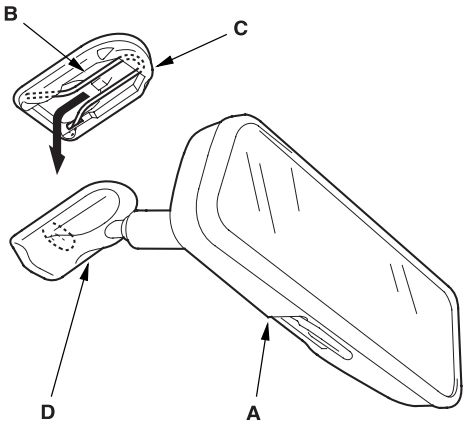
3. Remove the bolts, then remove the side under mirror base (A). Take care not to scratch the front fender.



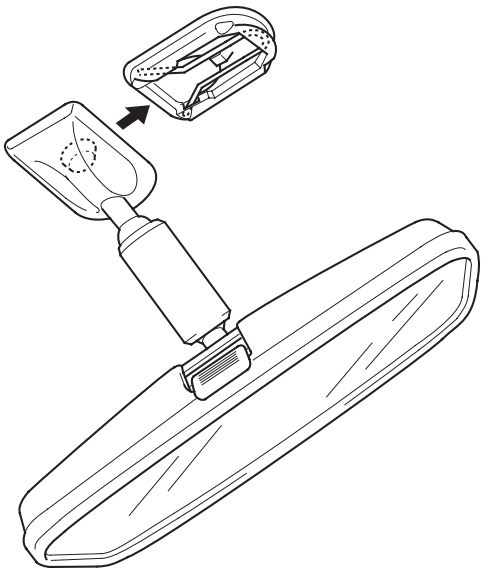
4. Install the mirror in the reverse order of removal.

Rearview Mirror Replacement

1. Slide the rearview mirror (A) down toward the bottom of the windshield, then detach it from the spring (B) in the mount (C), and remove the rearview mirror. Take care not to scratch the mirror base (D).



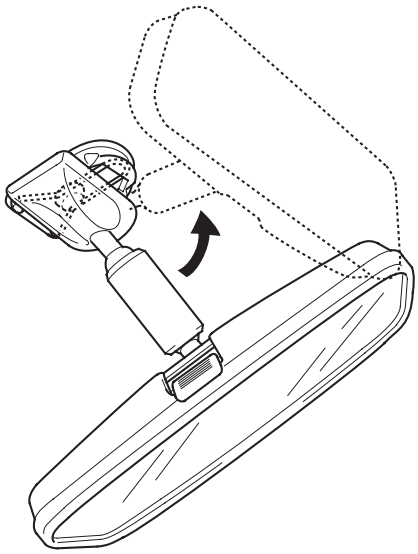
2. If necessary, remove the spring from the mount.
3. Fit the mirror base over the mount.



(cont'd)

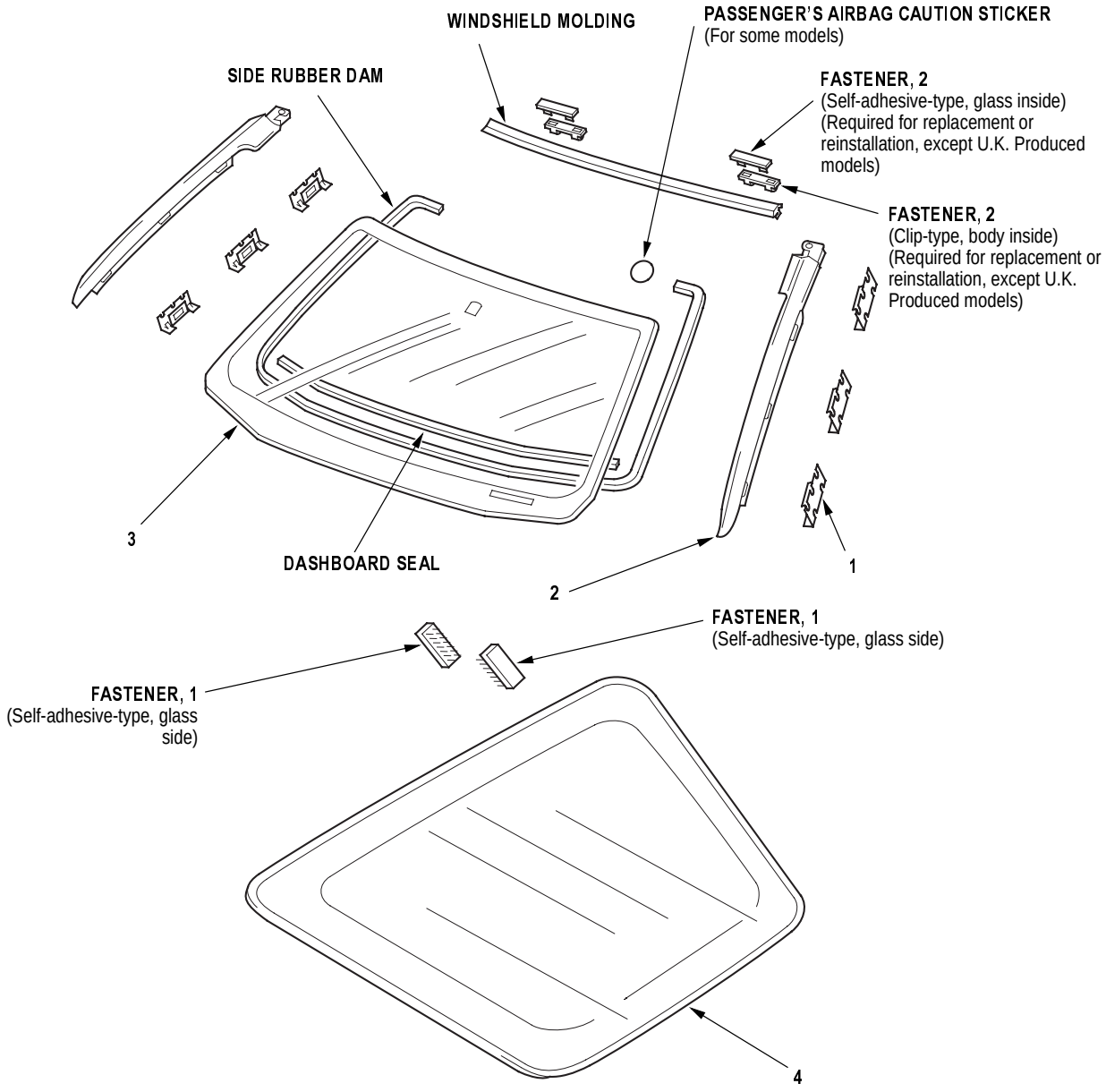
Rearview Mirror Replacement (cont'd)

4. Secure the mirror by turning the base 90°.



Glass

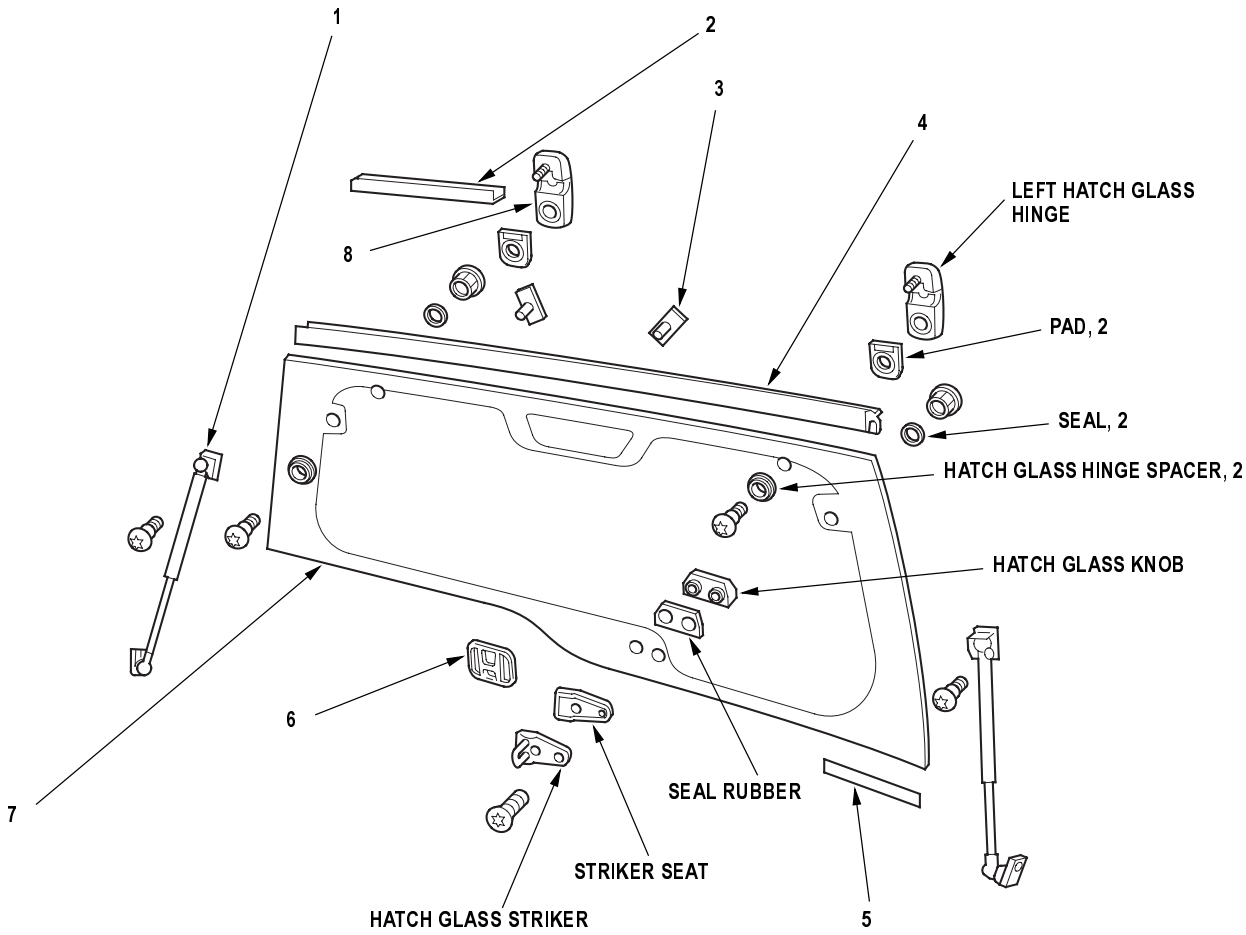
Component Location Index



1	RETAINER, 6	Installation, page 20-50
2	WINDSHIELD SIDE TRIM	Replacement, page 20-142
3	WINDSHIELD	Replacement, page 20-45
4	QUARTER GLASS	Replacement, page 20-50

(cont'd)

Component Location Index (cont'd)



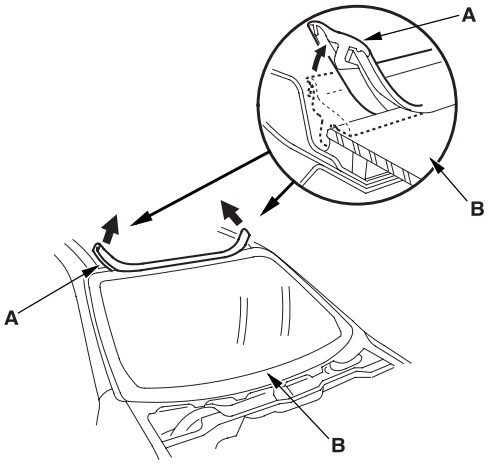
1	HATCH GLASS SUPPORT STRUT, 2	Replacement, page 20-55
2	WIRE HARNESS TRIM	Replacement, page 20-61
3	HIGH MOUNT BRAKE LIGHT BRACKET, 2	Replacement, page 20-61
4	REAR WINDOW MOLDING	Replacement, page 20-59
5	REALTIME 4WD STICKER (For some models)	Replacement, page 20-153
6	REAR "H" EMBLEM	Replacement, page 20-153
7	HATCH GLASS	Replacement, page 20-55; Disassembly/Reassembly, page 20-57; Adjustment, page 20-58; Hatch Glass Weatherstrip Replacement, page 20-62
8	RIGHT HATCH GLASS HINGE	

Windshield Replacement

NOTE:
- Put on gloves to protect your hands.
- Wear eye protection when removing the glass with piano wire.
- Use seat covers to avoid damaging the seat.
- Use glass adhesive set P/N 08C73-X0230N.

1. Remove these items:
- Windshield side trim (see page 20-142)
- Windshield wiper arms (see page 22A-223)
- Cowl covers (see page 20-140)

2. Remove the molding (A) from the upper edge of the windshield (B). If necessary, cut the molding with a utility knife.



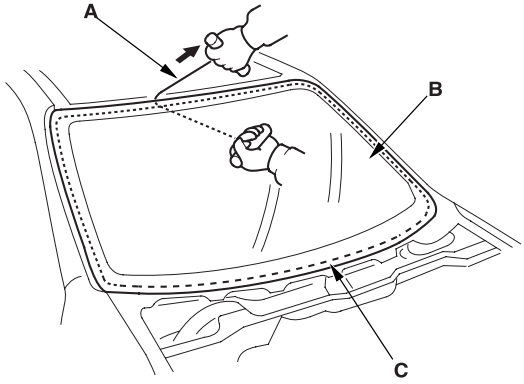
3. If the old windshield is to be reinstalled, make alignment marks across the glass and body with a grease pencil.

4. Pull down the front portion of the headliner (see page 20-81). Take care not to bend the headliner excessively, or you may crease or break it.

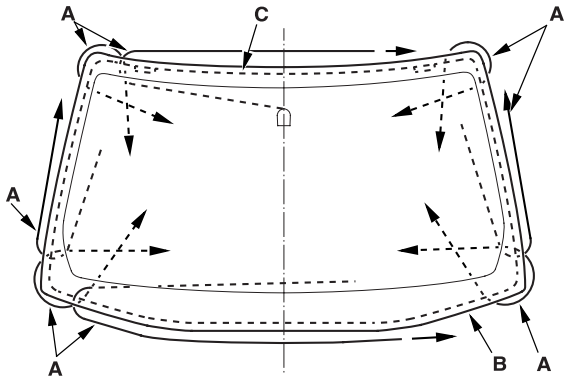
5. Apply protective tape along the edge of the dashboard and body. Using an awl, make a hole through the rubber dam and adhesive from inside the vehicle at the corner portion of the windshield. Push a piece of piano wire through the hole, and wrap each end around a piece of wood.

6. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the windshield (B) as possible to prevent damage to the body and dashboard.

Carefully cut through the rubber dam and adhesive (C) around the entire windshield.



Cutting portions:



7. Carefully remove the windshield.

(cont'd)

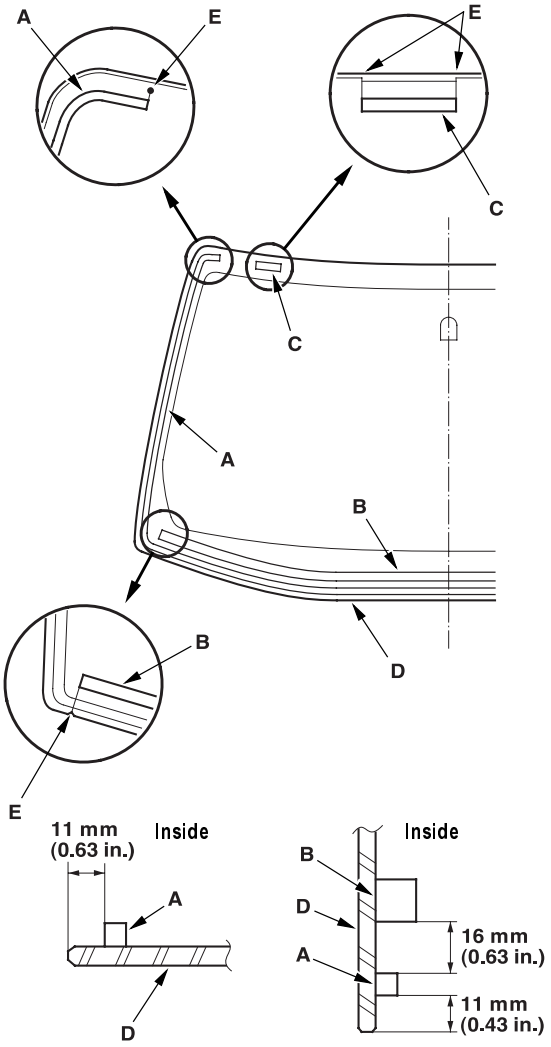
Windshield Replacement (cont'd)

8. With a knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire windshield opening flange:
- Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
- Remove the rubber dam and fasteners from the body.

9. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.

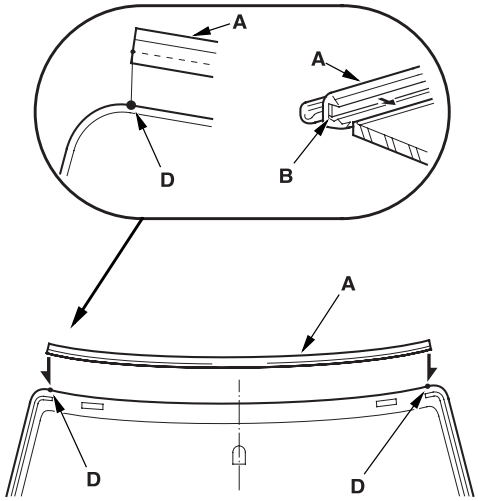
10. If the old windshield is to be reinstalled, use a putty knife to scrape off all of the old adhesive, the fasteners, and the rubber dam from the windshield. Clean the inside face and the edge of the windshield with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.

11. Glue the rubber dam (A), dashboard seal (B), and fasteners (C) to the inside face of the windshield (D) as shown:
- Be sure the rubber dam, dashboard seal, and fasteners line up with the alignment marks (E).
- Be careful not to touch the windshield where adhesive will be applied.



12. Glue the molding (A) with adhesive tape (B) of the windshield (C):

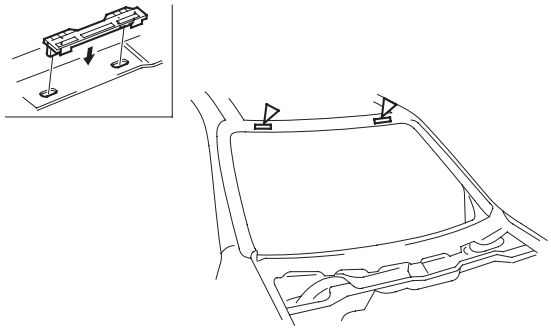
- Be sure the molding lines up with the alignment marks (D).
- Be careful not to touch the windshield where adhesive will be applied.



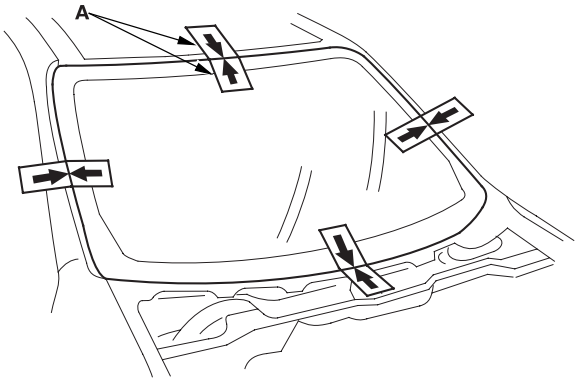
13. Install the fasteners to the body.

Fastener Locations

▷: Fastener, 2



14. Set the windshield in the opening, and center it. Make alignment marks (A) across the windshield and body with a grease pencil at the four points shown. Be careful not to touch the windshield where adhesive will be applied.



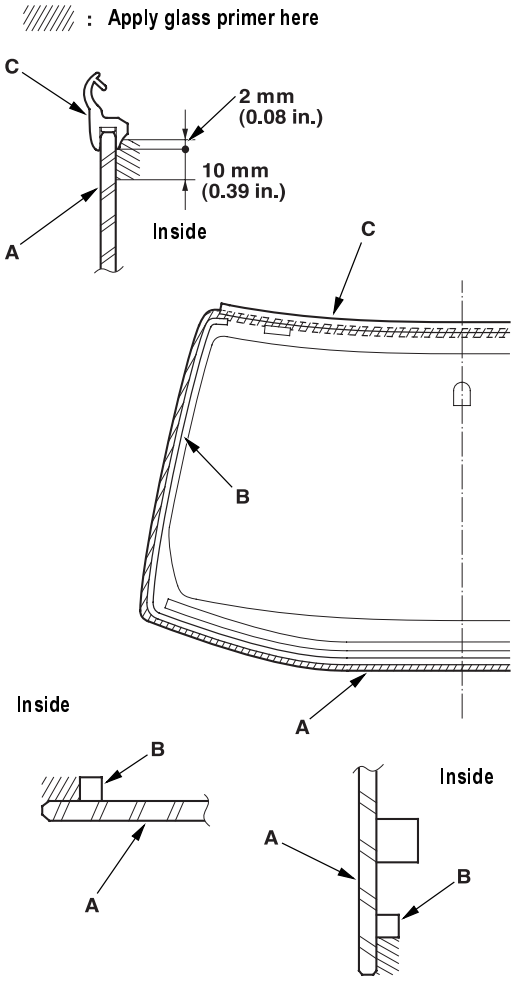
15. Remove the windshield.

(cont'd)

Windshield Replacement (cont'd)

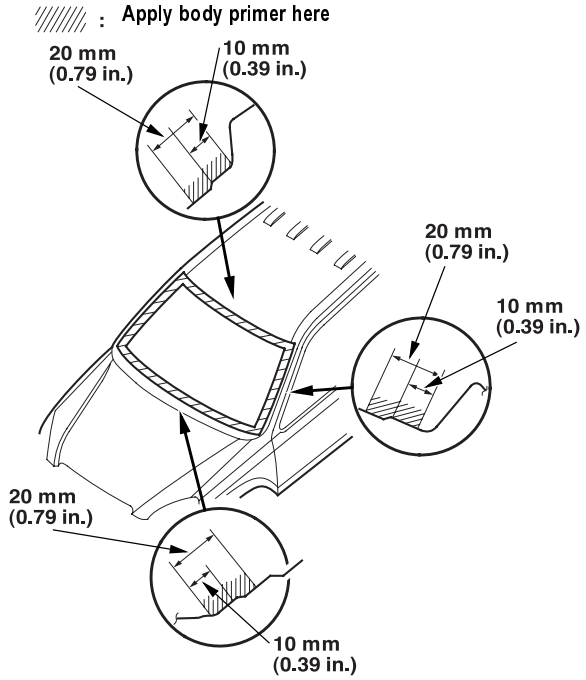
16. With a sponge, apply a light coat of glass primer around the edge of the windshield (A) between the rubber dam (B) and molding (C) as shown, then lightly wipe it off with gauze or cheesecloth:

- Apply glass primer to the molding.
- Do not apply body primer to the windshield, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the windshield properly, causing a leak after the windshield is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

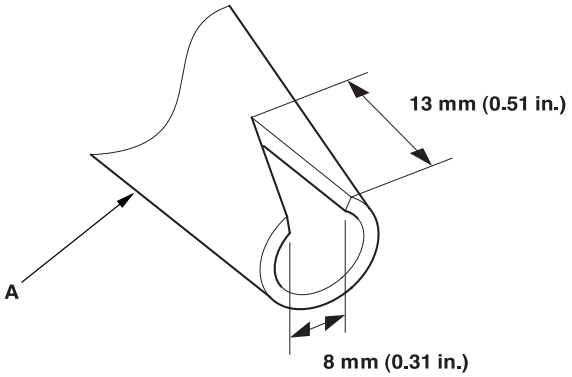


17. With a sponge, apply a light coat of body primer to the original adhesive remaining around the windshield opening flange. Let the body primer dry for at least 10 minutes:

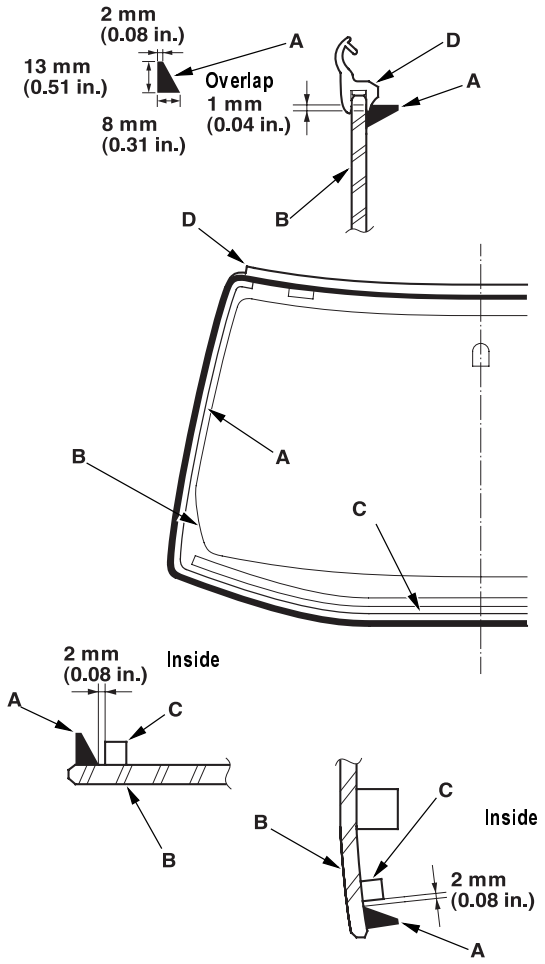
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.
- Mask off the dashboard before painting the flange.



18. Before filling a cartridge, cut a "V" in the end of the nozzle (A) as shown.



19. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive (A) around the edge of the windshield (B) between the rubber dam (C) and molding (D) as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



20. Use suction cups to hold the windshield over the opening, align it with the alignment marks made in step 14, and set it down on the adhesive. Lightly push on the windshield until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.

21. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the windshield, wipe with a soft shop towel dampened with alcohol.

22. Let the adhesive dry for at least 1 hour, then spray water over the windshield and check for leaks. Mark leaking areas, and let the windshield dry, then seal with sealant:

- Let the vehicle stand for at least 4 hours after windshield installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.
- Keep the windshield dry for the first hour after installation.

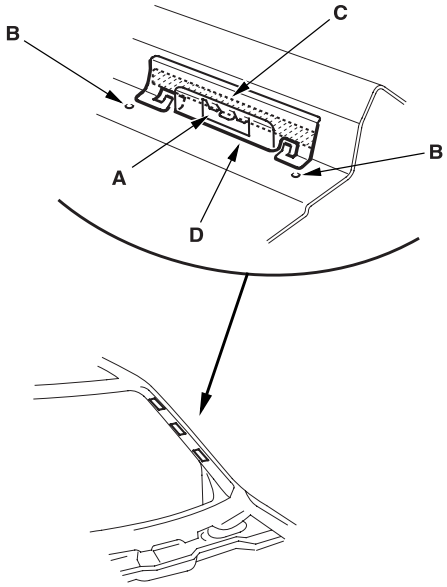
23. Reinstall all remaining removed parts. Advise the customer not to do the following things for 2 to 3 days:

- Slam the doors with all the windows rolled up.
- Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

Windshield Side Trim Retainer Installation

NOTE: Take care not to scratch the body.

1. Clean the body surface with alcohol where new retainers are to be applied.
2. Peel the adhesive backing away from the retainer.
3. Line up the retainers (A) with the alignment marks (B) on the body, and glue the retainers with adhesive tape (C).

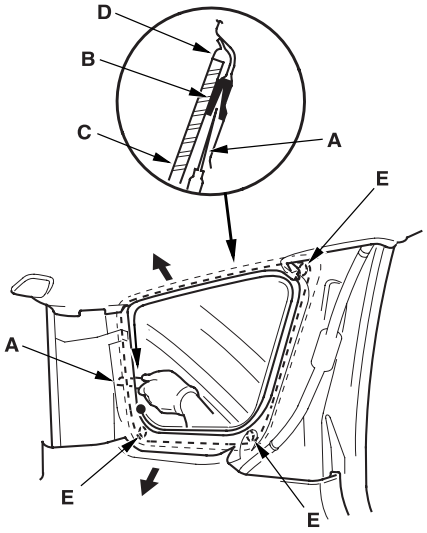


4. Apply two-part epoxy adhesive (D) around the edge of the retainers as shown.

Quarter Glass Replacement

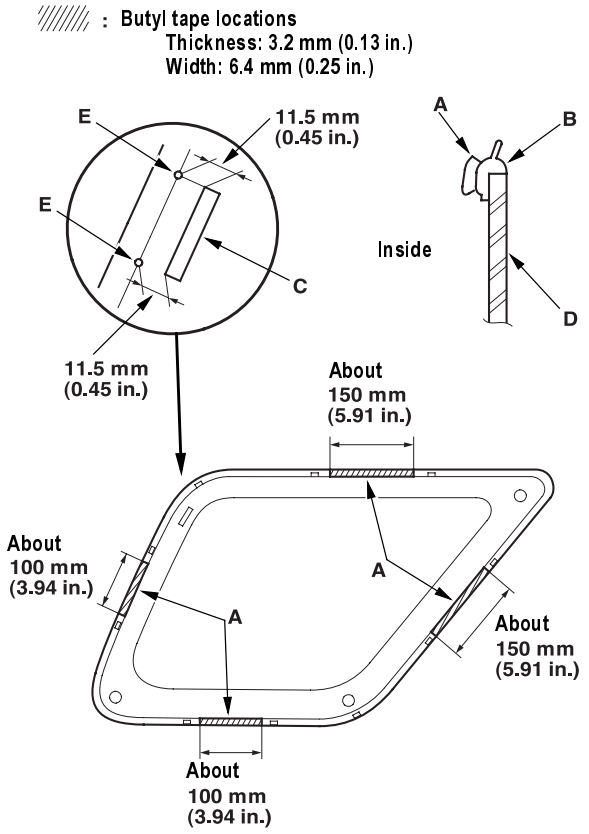
NOTE:
- Put on gloves to protect your hands.
- Use seat covers to avoid damaging any surface.
- Use glass adhesive set P/N 08C73-X0230N.

1. Remove these items (see page 20-78):
   - Quarter pillar trim
   - Rear pillar trim
2. From inside the vehicle, use a utility knife (A) to cut through the adhesive (B) all the way around:
   - If the quarter glass (C) is to be reinstalled, take care not to damage the molding (D).
   - If the molding is damaged, replace the quarter glass, molding and clips (E) as an assembly.
   - If any of the clips are broken, the quarter glass can be reinstalled using butyl tape (refer to step 7).
   - Apply protective tape along the edge of the entire quarter glass opening flange.



3. Carefully remove the quarter glass, and check the molding for damage, and replace the quarter glass if necessary.

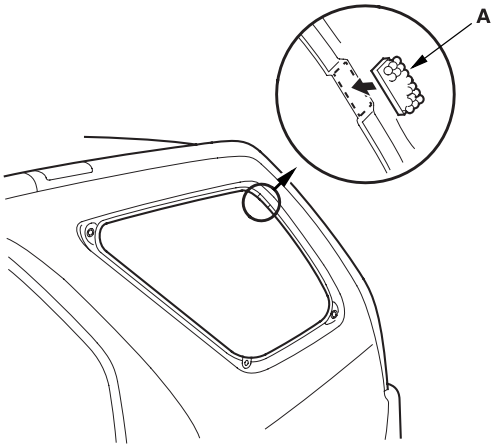
4. With a putty knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire quarter glass opening flange:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the clips and fastener from the body.
5. Clean the body bonding surface with a sponge damaged in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.
6. If the old quarter glass is to be reinstalled, use a putty knife to scrape off all of the old adhesive, any broken clips, and the fastener from the glass. Clean the inside face and the edge of the glass with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.
7. If the old quarter glass is to be reinstalled (and either clip is broken off the molding), apply a light coat of primer (C-100, or equivalent), then apply butyl tape (A) to the molding (B) as shown. Glue the fastener (C) to the inside face of the quarter glass (D):
   - Be sure the fastener lines up with the alignment marks (E).
   - Be careful not to touch the quarter glass where adhesive will be applied.
   - Do not peel the separator off the butyl tape.



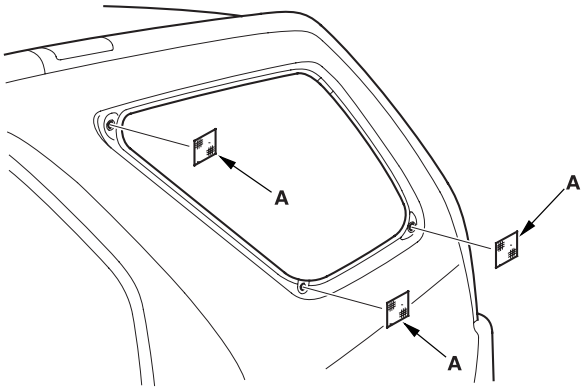
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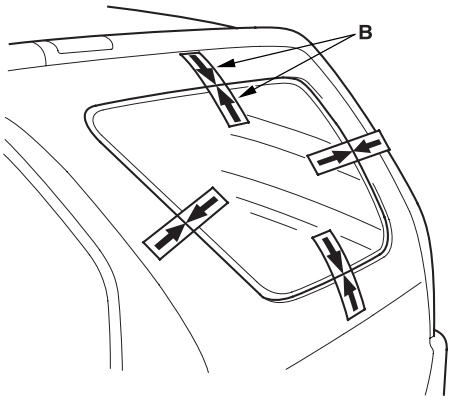
Quarter Glass Replacement (cont'd)

8. If the new quarter glass is to be installed, glue the fastener (A) to the body. Be sure the fastener lines up with the body contour.



9. If the old quarter glass is to be reinstalled (and either clip is broken off the molding), seal the body holes with pieces of urethane tape (A). Then set the quarter glass upright in the opening, and make alignment marks (B) across the quarter glass and body with a grease pencil at the three points shown. Be careful not to touch the quarter glass where adhesive will be applied.

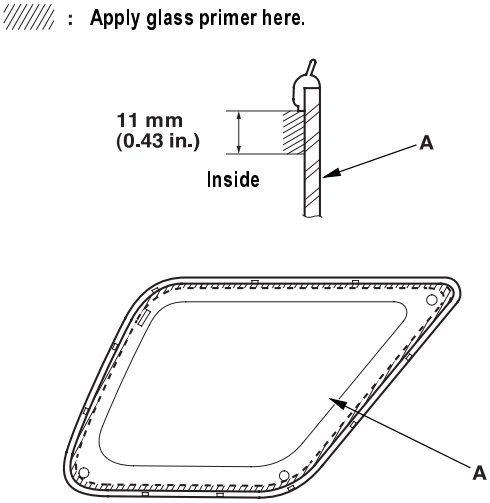




10. Remove the quarter glass.

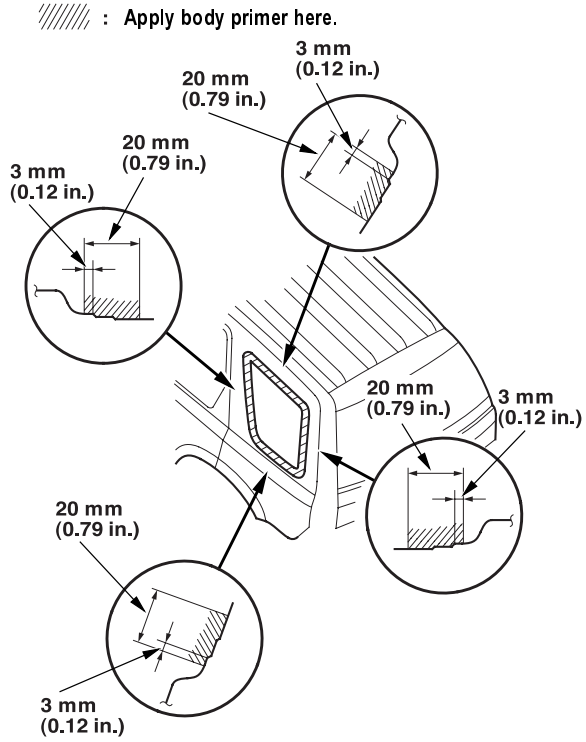
11. With a sponge, apply a light coat of glass primer to the inside face of the quarter glass (A) as shown, then lightly wipe it off with gauze or cheesecloth:

- Do not apply body primer to the quarter glass, and do not get the body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do the adhesive may not bond to the quarter glass properly, causing a leak after the quarter glass is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

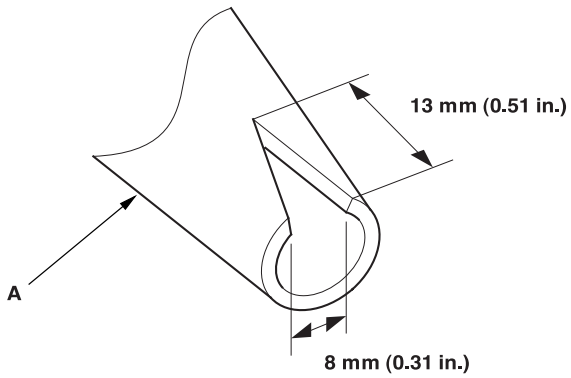


12. With a sponge, apply a light coat of body primer to the original adhesive remaining around the quarter glass opening flange. Let the body primer dry for at least 10 minutes:

- Do not apply glass primer to the body, and be careful not to mix up the glass and body primer sponges.
- Never touch the primed surfaces with your hands.
- Mask off the interior trim before painting the flange.



13. Before filling a cartridge, cut a "V" in the end of the nozzle (A) as shown.

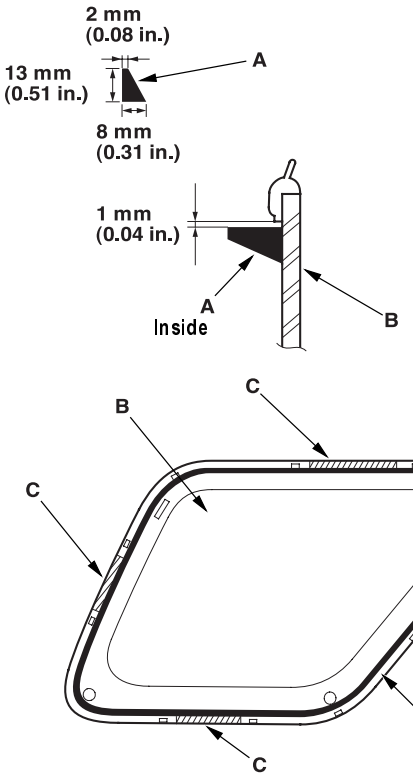


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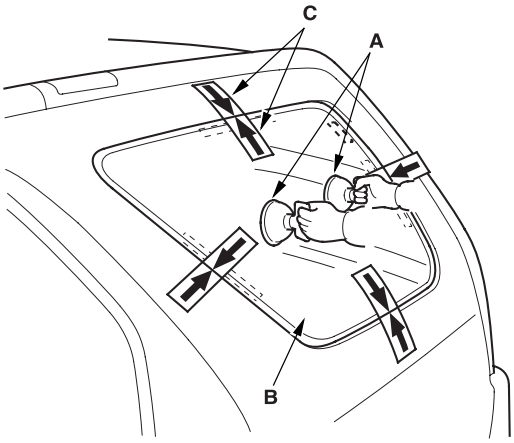
Quarter Glass Replacement (cont'd)

14. Park adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive (A) around the edge of the quarter glass (B) as shown:

- After applying the adhesive, peel the separator off the butyl tape (C).
- Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



15. Use suction cups (A) to hold the quarter glass (B) over the opening, align the clips or the alignment marks (C) made in step 9, and set it down on the adhesive. Lightly push on the quarter glass until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.



16. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the quarter glass, wipe with a soft shop towel dampened with alcohol.

17. Let the adhesive dry for at least 1 hour, then spray water over the quarter glass and check for leaks. Mark the leaking areas and let the quarter glass dry, then seal with sealant. Let the vehicle stand for at least 4 hours after quarter glass installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.

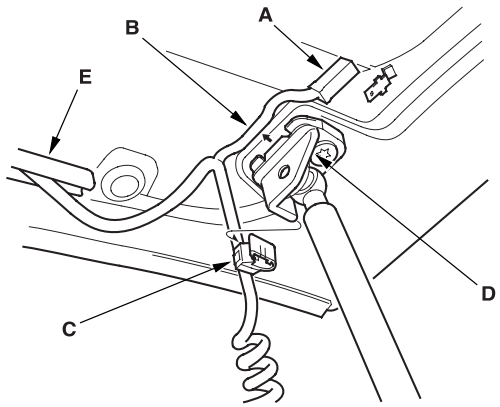
18. Reinstall all remaining removed parts. Advise the customer not to do the following things for 2 to 3 days:

- Slam the doors with all the windows rolled up.
- Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

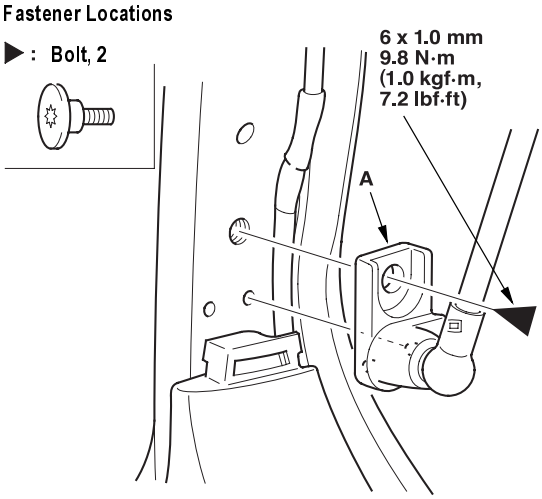
Hatch Glass/Hatch Glass Support Strut Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the tailgate.
- Do not damage the rear window defogger grid lines and terminals.

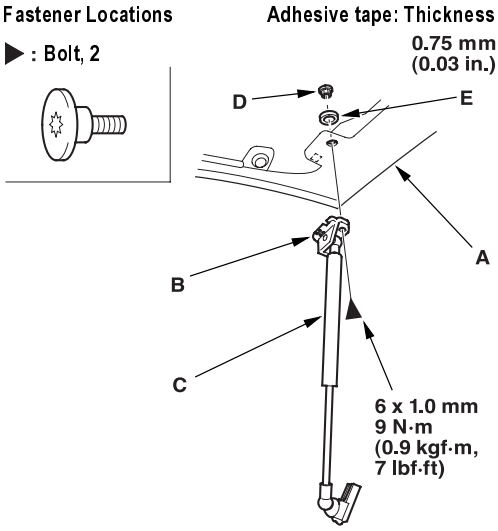
1. Remove the tailgate side trim from both sides (see page 20-80).
2. Remove the high mount brake light (see page 22A-98).
3. Disconnect the rear window defogger connectors (A), and release the wire harnesses (B) and harness holders (C) from both hatch glass support strut brackets (D). On the right side, release the wire harness from the wire harness trim (E).



4. While holding the hatch glass, using a Torx T30 bit, remove the bolts, then remove the hatch glass support strut brackets (A) from both sides.



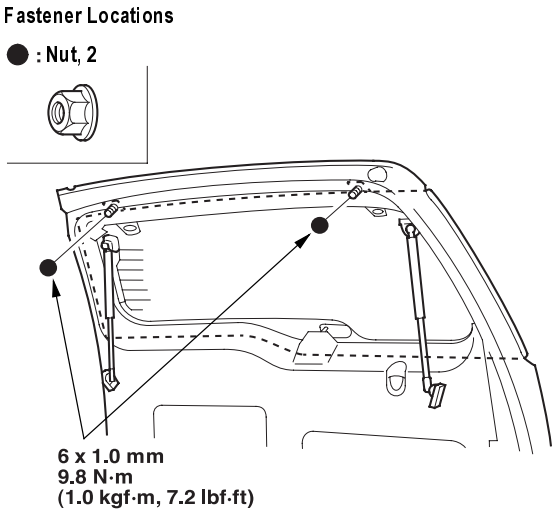
5. While holding the hatch glass (A), use a Torx T30 bit to remove the bolt, then release the double-faced adhesive tape (B), remove the hatch glass support strut (C), support strut nut (D), and seal (E) from the hatch glass.



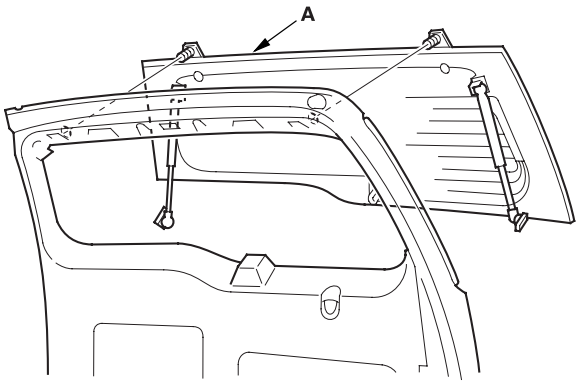
(cont'd)

Hatch Glass/Hatch Glass Support Strut Replacement (cont'd)

6. With an assistant holding the hatch glass, remove the nuts from both sides. Unlock the hatch glass latch.



7. Remove the hatch glass (A). Take care not to scratch the tailgate.



8. Install the glass and support strut in the reverse order of removal, and note these items:

- Replace the removed support strut mounting bolt with a new one.
- Make sure the rear window defogger connectors are plugged in properly.
- Adjust the position of the glass (see page 20-58).
- Check that the hatch glass opens properly and locks securely.

9. Check for water leaks (see step 9 on page 20-59).

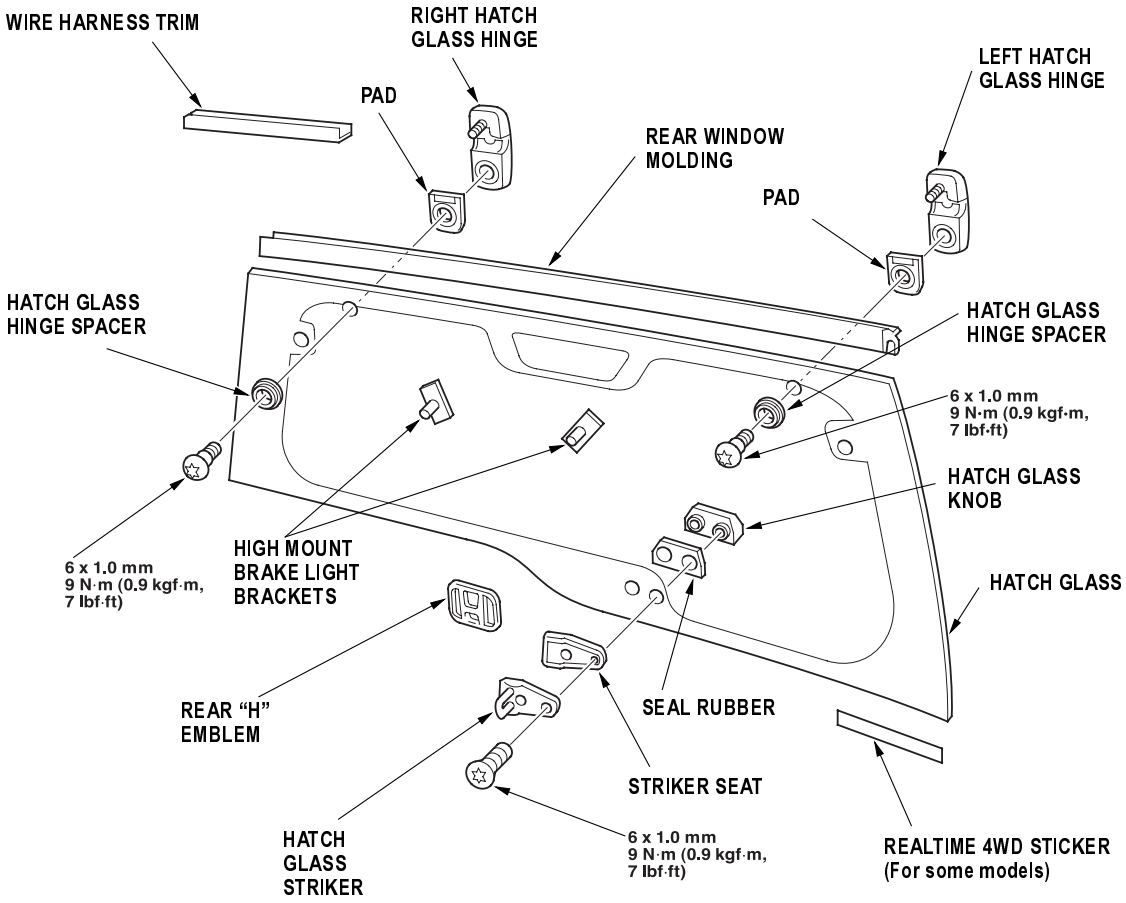
Hatch Glass Disassembly/Reassembly

NOTE:
- Put on gloves to protect your hands.
- Place the hatch glass on the protective seat to prevent damage.
- Do not damage the rear window defogger grid lines and terminals.

Disassemble the hatch glass as shown, and note these items:

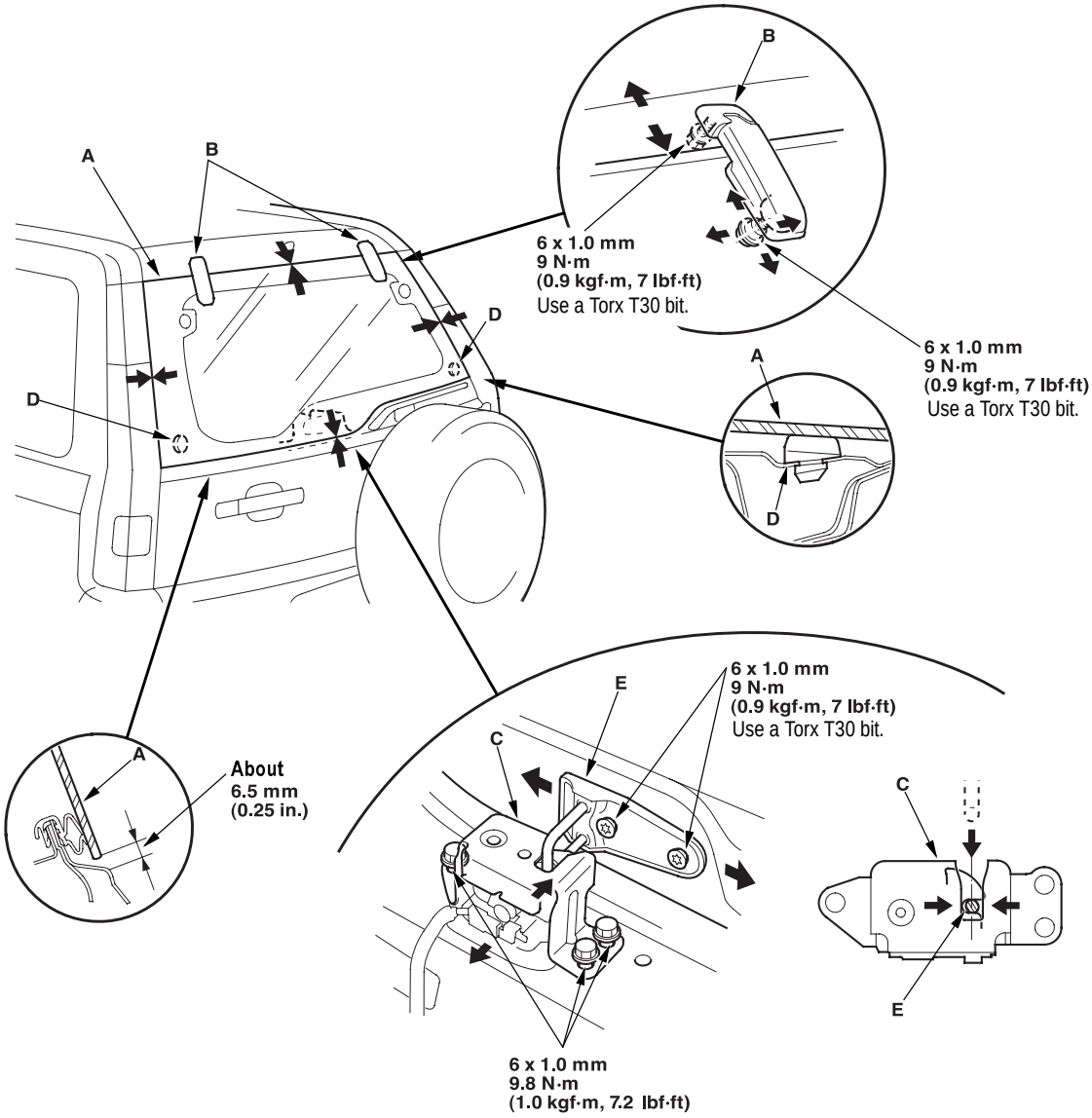
- To remove the bolts, use a Torx T30 bit.
- To remove the rear window molding, refer to Rear Window Molding Replacement (see page 20-59).
- To remove the high mount brake light bracket and wire harness trim, refer to High Mount Brake Light Bracket/Wire Harness Trim Replacement (see page 20-61).

Reassemble the hatch glass in the reverse order of removal. To install the rear ”H” emblem and the REALTIME 4WD sticker, refer to Emblem/Sticker Replacement (see page 20-153).

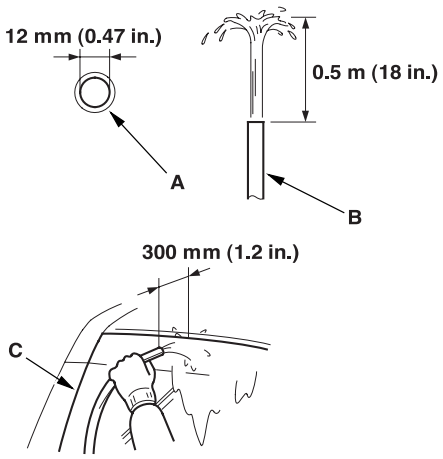


Hatch Glass Adjustment

1. Remove the tailgate lower trim panel (see page 20-80).
2. With the help of an assistant, remove the hatch glass support struts from both sides (see page 20-55). Hold the hatch glass when opening and closing it.
3. Slightly loosen each bolt, screw, and nut.
4. Adjust the hatch glass (A) alignment in the following sequence.
   - Adjust the hatch glass hinges (B) up and down, to obtain the proper gap between the hatch glass and tailgate.
   - Adjust the hatch glass hinges right and left, as necessary to equalize the gap between the hatch glass and taillight on each side. Adjust the striker at the same time.
   - Adjust the hatch glass latch (C) forward and rearward, to make the hatch glass fit flush with the tailgate at the bottom edge. There should be no gap between the hatch glass stops (D) and hatch glass on each side.
   - Adjust the strikes (E) right and left until it's centered in the hatch glass latch.



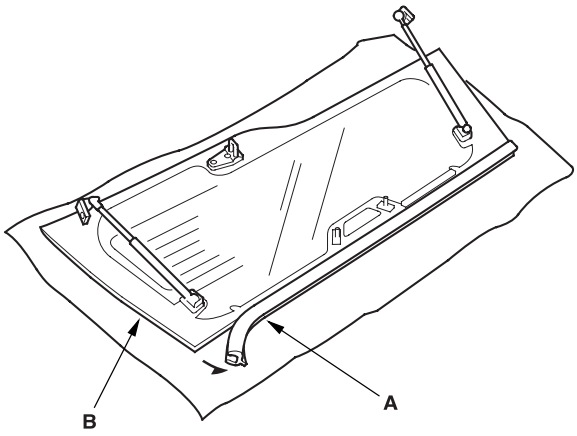
5. Tighten each bolt, screw, and nut securely.
6. Check that the hatch glass opens properly and locks securely.
7. Reinstall the support struts securely (see page 20-55).
8. Reinstall the tailgate lower trim panel (see page 20-80).
9. Check for water leaks. Run water over the roof and on the sealing area as shown, and note these items:
   - Use a 12 mm (0.47 in.) diameter hose (A).
   - Adjust the rate of water flow as shown (B).
   - Do not use a nozzle.
   - Hold the hose about 300 mm (12 in.) away from the tailgate (C).



Rear Window Molding Replacement

NOTE:
- Put on gloves to protect your hands.
- Place the hatch glass on the protective seat to prevent damage.
- Do not damage the rear window defogger grid lines and terminals.

1. Remove the hatch glass (see page 20-55).
2. Remove the hatch glass hinges from both sides of the hatch glass (see page 20-57).
3. Remove the molding (A) from the upper edge of the hatch glass (B). If necessary, cut the molding with a utility knife.



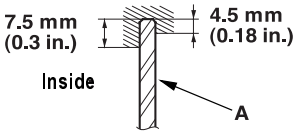
4. Use a putty knife to scrape off all of the adhesive from the hatch glass. Clean the upper edge of the hatch glass with isopropyl alcohol where new molding will be installed. After cleaning, keep oil, grease, and water from getting on the surface.

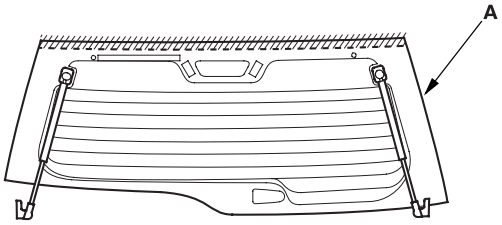
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Rear Window Molding Replacement (cont'd)

5. Apply primer (YOKOHAMA RUBBER MS-90, or equivalent) to the upper edge of the hatch glass (A). Be careful not to touch the hatch glass where primer will be applied.

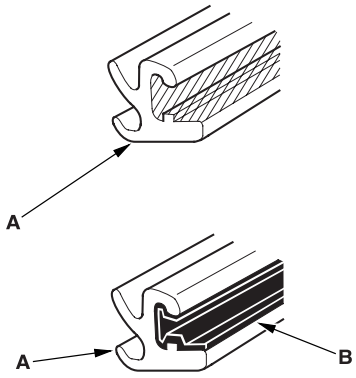
: Apply primer here.



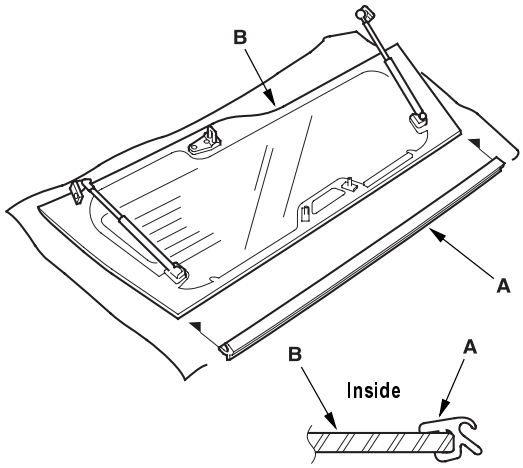


6. Apply primer (SAKAI CHEMISTRY SL-8861, or equivalent) to the entire groove of the molding (A), and run a bead of urethane adhesive (B) in the groove of the molding.

: Apply primer here.



7. Align the edge of the molding (A) with the corner edge of the hatch glase (B), and glue the molding.



8. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from the hatch glass, wipe with a soft shop towel dampened with alcohol.

9. Let the adhesive dry for at least 1 hour.

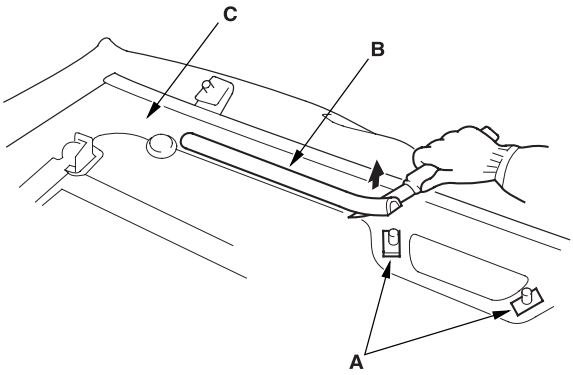
10. Reinstall the hatch glass hinges.

11. Reinstall the hatch glass.

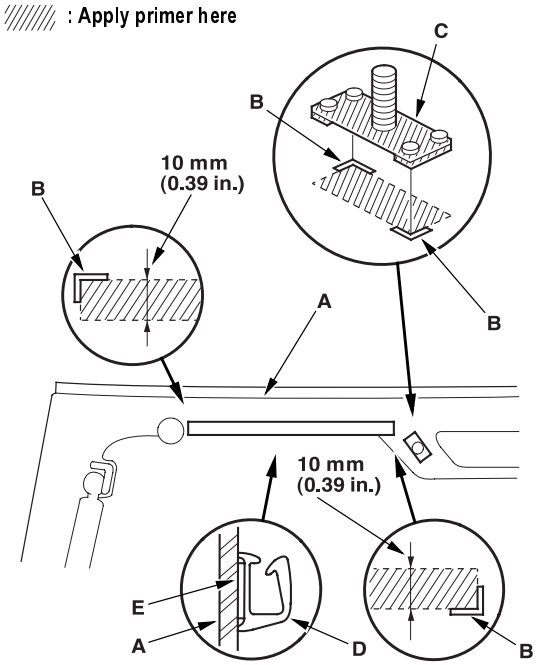
High Mount Brake Light Bracket/Wire Harness Trim Replacement

NOTE:
- Put on gloves to protect your hands.
- Place the hatch glass on the protective seat to prevent damage.
- Do not damage the rear window defogger grid lines and terminals.

1. Remove the hatch glass (see page 20-55).
2. Cut the adhesive portions of the high-mount brake light brackets (A) and wire harness trim (B) with a utility knife, then remove them. Take care not to scratch the hatch glass (C).



3. Use a putty knife to scrape off all of the old adhesive and adhesive tape from the hatch glass. Clean the inside face of the hatch glass with isopropyl alcohol where new bracket and trim are to be installed. Make sure the bonding surface is kept free of water, oil, and grease.
4. Apply primer (YOKOHAMA RUBBER MS-90, or equivalent) to the inside face of the hatch glass (A):
   - Be sure the primer lines up with the alignment marks (B).
   - Be careful not to touch the hatch glass where primer will be applied.

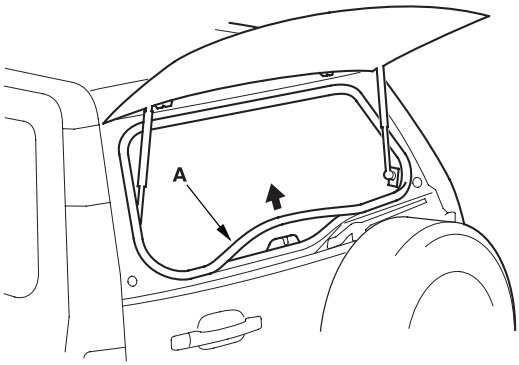


5. Apply primer (SAKAI CHEMISTRY SL-8861, or equivalent) to the back of the high-mount brake light brackets (C).
6. Glue the brackets to the hatch glass with urethane adhesive, and glue the trim (D) to the hatch glass with the adhesive tape (E). Be sure the brackets and trim line up with the alignment marks.
7. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from the hatch glass, use a soft shop towel dampened with alcohol.
8. Let the adhesive dry for at least 1 hour.
9. Reinstall the hatch glass.

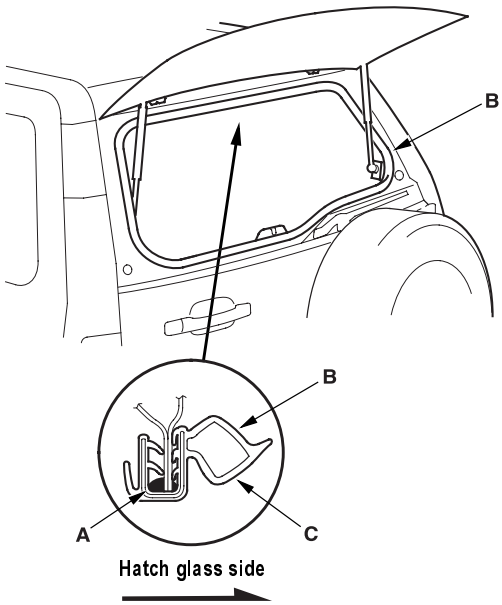
Hatch Glass Weatherstrip Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the tailgate.

1. Remove the tailgate side trim from both sides (see page 20-80).
2. Remove the high mount broke light (see page 22A-98).
3. Disconnect the rear window defogger connectors, and release the wire harnesses from both sides (see step 3 on page 20-55).
4. Remove the hatch glass support strut brackets from both sides of the tailgate (see step 4 on page 20-55).
5. With an assistant holding the hatch glass, remove the hatch glass weatherstrip (A) by pulling out on it.



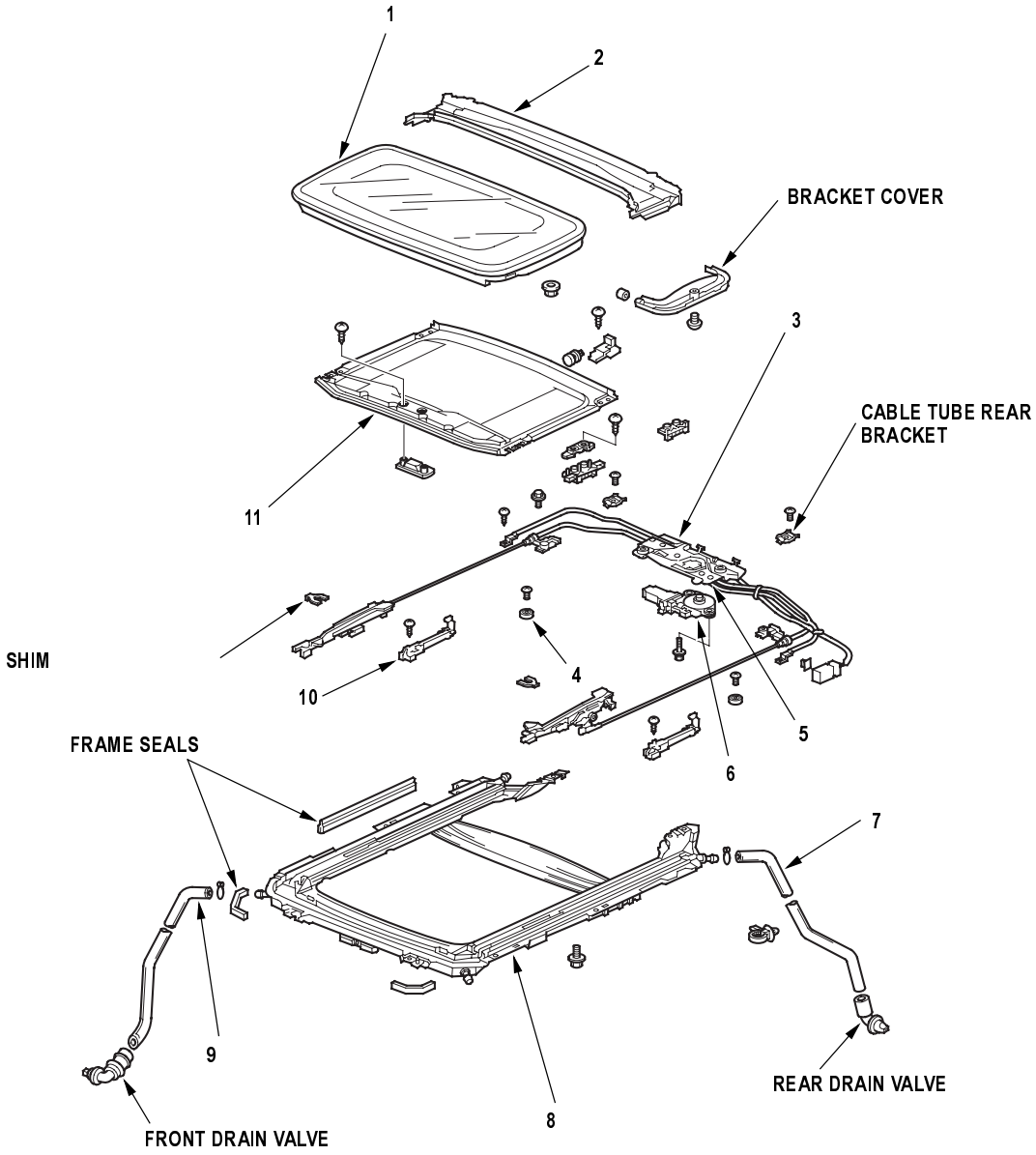
6. Clean the bonding surface around the hatch glass opening flange with alcohol.
7. Apply sealant (Cemedine P/N 08712-0004, or equivalent) (A) in the groove around the hatch glass weatherstrip (B).



8. Locate the painted alignment mark (C) on the hatch glass weatherstrip. Align the painted mark with the alignment tab in the center of the hatch glass opening, and install the weatherstrip. Make sure it's seated completely and facing in the direction shown. Make sure there are no wrinkles in the weatherstrip.
9. Check for water leaks (see step 9 on page 20-59).

Sunroof

Component Location Index



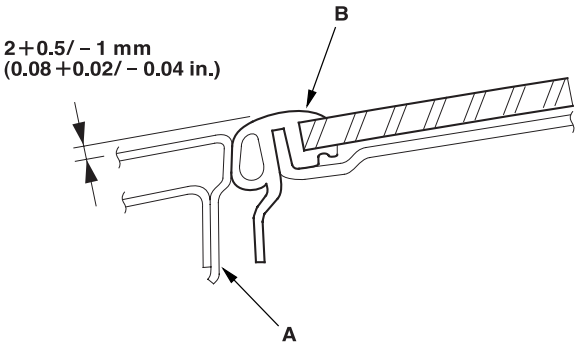
1	GLASS	Height Adjustment, page 20-65; Replacement, page 20-65 Closing Force and Opening Drag Check, page 20-74
2	DRAIN CHANNEL	Replacement, page 20-66
3	POSITION SWITCH	Adjustment, page 20-73
4	SLIDE STOP	
5	CABLE ASSEMBLY	Replacement, page 20-71
6	MOTOR	Replacement, page 20-68
7	REAR DRAIN TUBE	Replacement, page 20-69
8	FRAME	Replacement, page 20-69
9	FRONT DRAIN TUBE	Replacement, page 20-69
10	DRAIN CHANNEL SLIDER	Replacement, page 20-71
11	SUNSHADE	Replacement, page 20-67

Symptom Troubleshooting Index

Symptom	Diagnostic Procedure	Also check for
Water leaks	1. Check for a clogged drain tube. 2. Check for a gap between the glass weatherstrip and the roof panel. 3. Check for a defective or an improperly installed glass weatherstrip or drain channel. 4. Check for a gap between the drain seal and the roof panel.	
Wind noise	1. Check for excessive clearance between the glass weatherstrip and the roof panel.	
Motor noise	1. Check for a loose motor. 2. Check for a worn gear or bearing. 3. Check for a deformed cable assembly.	
Glass does not move, but motor turns	1. Check for a defective gear or inner cable. 2. Check for foreign matter stuck between the guide rail and the slider. 3. Check for a loose inner cable. 4. Make sure the cable assembly is attached properly.	
Glass does not move and motor does not turn (glass can be moved with sunroof wrench)	1. Check for a blown fuse. 2. Check for a faulty sunroof switch. 3. Check the limit switch. 4. Check for a run down battery. 5. Check for a defective motor. 6. Check for a faulty relay.	

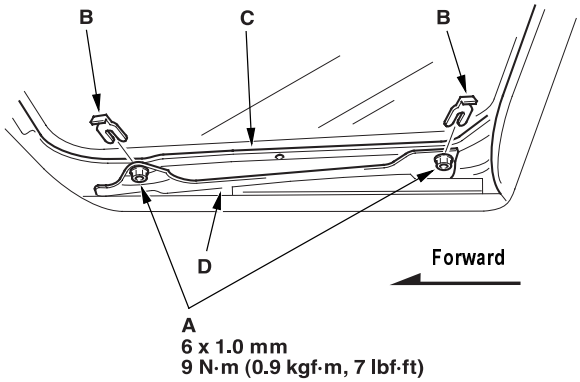
Glass Height Adjustment

The roof panel (A) should be even with the glass weatherstrip (B), to within 2+0.5/-1 mm (0.08+0.02/-0.04 in.) at the center of the glass opening. If not, make the following adjustment:



1. Remove the bracket cover from each side.
2. Loosen the nuts (A), and install the shims (B) between the glass frame (C) and glass bracket (D) on each side.

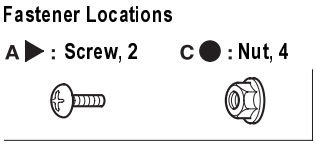
   Shim thickness: Front and rear max. 2 mm (0.08 in.)

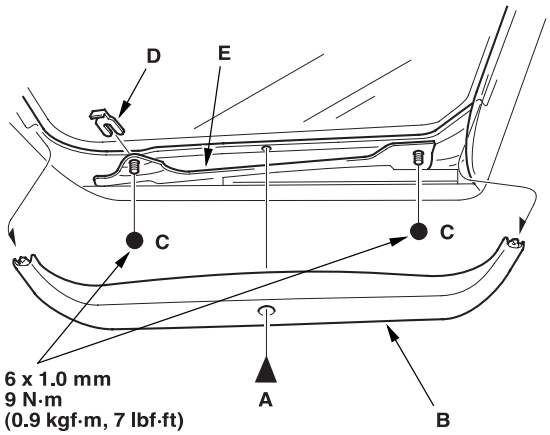


3. If necessary, repeat on the opposite side.

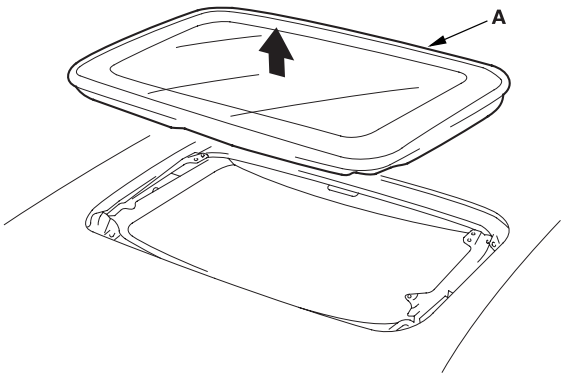
Glass Replacement

1. Close the glass fully.
2. Slide the sunshade all the way back.
3. Remove the screws (A), then remove both bracket covers (B). Remove the nuts (C) and shims (D) from both glass brackets (E).





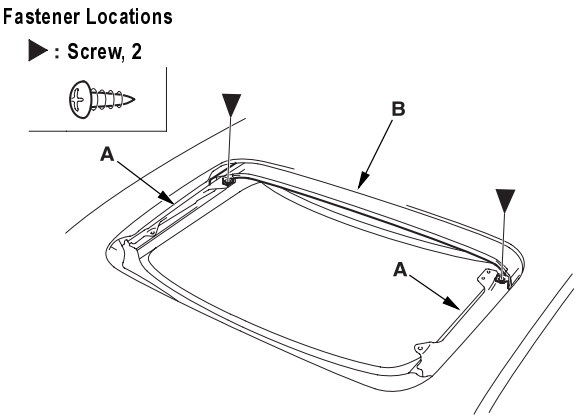
4. Remove the glass (A) by lifting it up. Do not damage the roof panel.



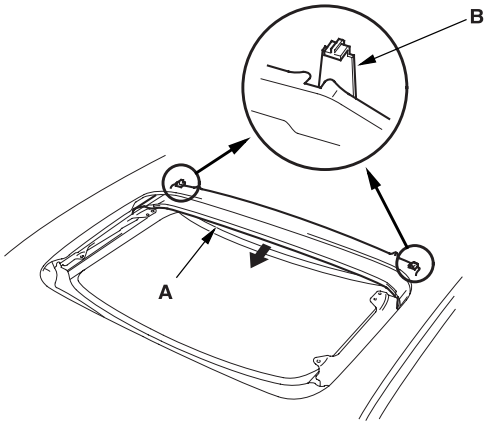
5. Install the glass in the reverse order of the removal, and adjust the glass height alignment.
6. Check for water leaks. Use free-flowing water from a hose without a nozzle. Do not use high-pressure water.

Drain Channel Replacement

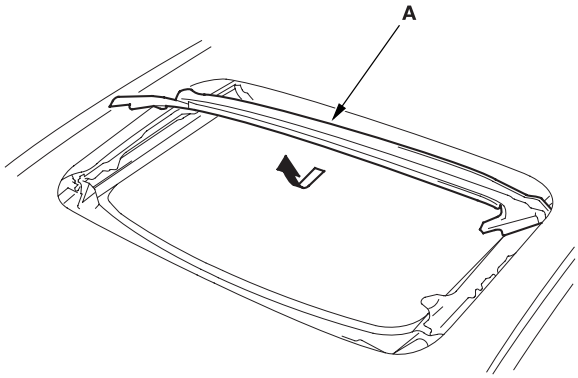
1. Remove the glass (see page 20-65).
2. With the sunroof wrench, move both glass brackets (A) to the position where the sunroof normally pivots down, and remove the screws securing the drain channel (B).



3. Release the drain channel (A) from both hooks (B) of the drain channel slider by pulling the drain channel forward.



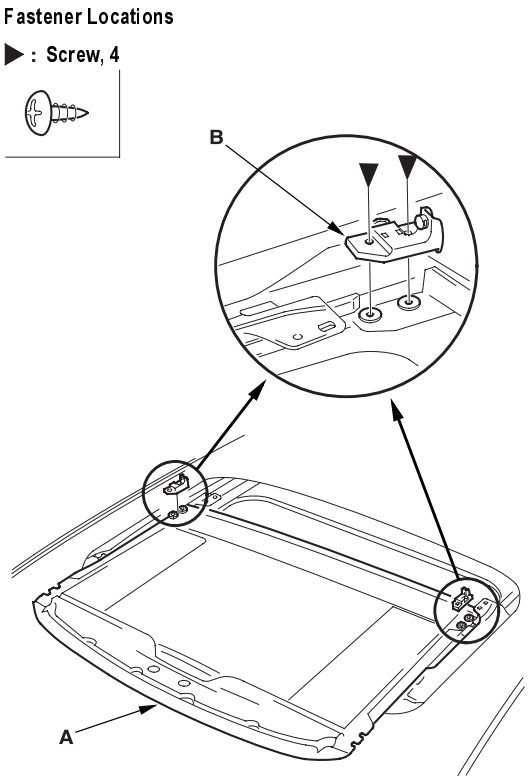
4. Remove the drain channel (A).



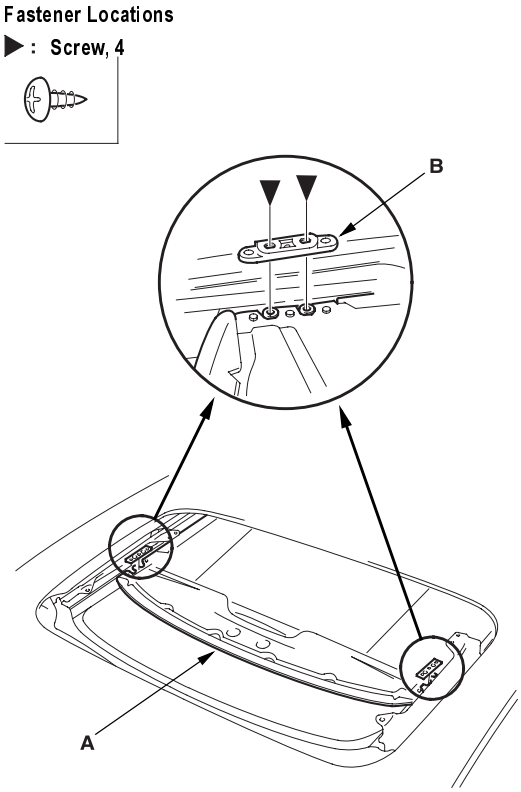
5. Install the channel in the reverse order of removal, and note these items:
   - Push the drain channel onto the hooks until a faint click is heard.
   - Check the glass height adjustment (see page 20-65).
6. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray.

Sunshade Replacement

1. Remove the drain channel (see page 20-66).
2. Slide the sunshade (A) until you can see both sunshade slider spacers (B).



3. Remove the screws, then remove both spacers.
4. While lifting the front portion of the sunshade (A), move the sunshade forward until you can see both sunshade rear hooks (B). Do not damage the sunshade and hooks.

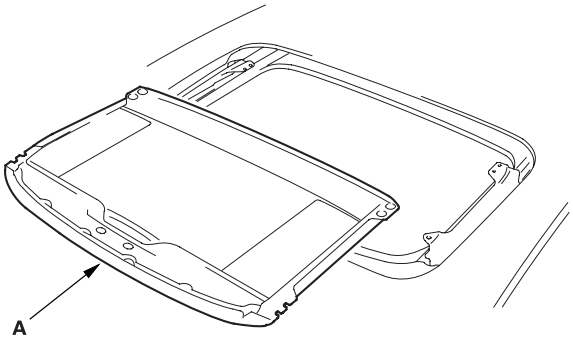


5. Remove the screws, then remove both hooks.

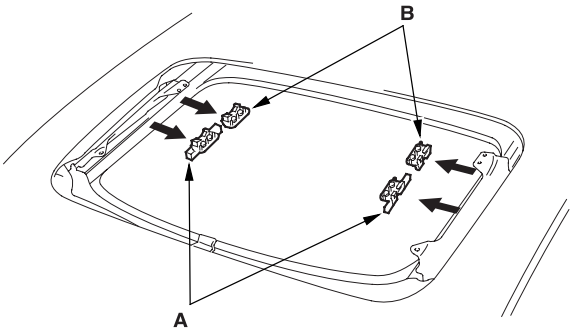
(cont'd)

Sunshade Replacement (cont'd)

6. Remove the sunshade (A).



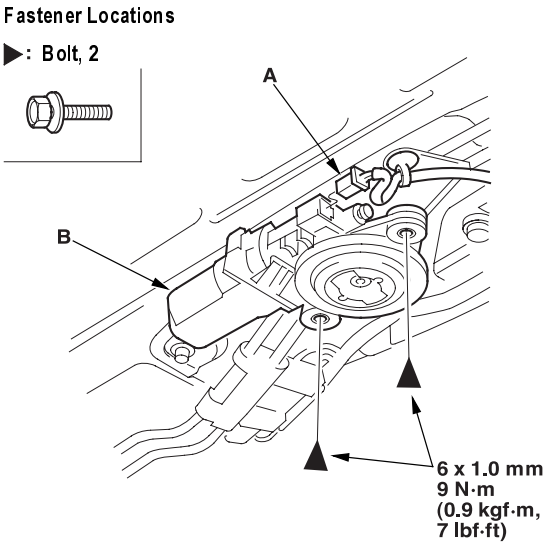
7. Remove the front sunshade base sliders (A) and rear sunshade base sliders (B) from both guide rail portions of the frame.



8. Install the sunshade in the reverse order of removal, and check the glass height adjustment (see page 20-65).
9. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray.

Motor Replacement

1. Remove the headliner (see page 20-81).
2. Put on gloves to protect your hands. Disconnect the connector (A), and remove the bolts, then remove the motor (B).

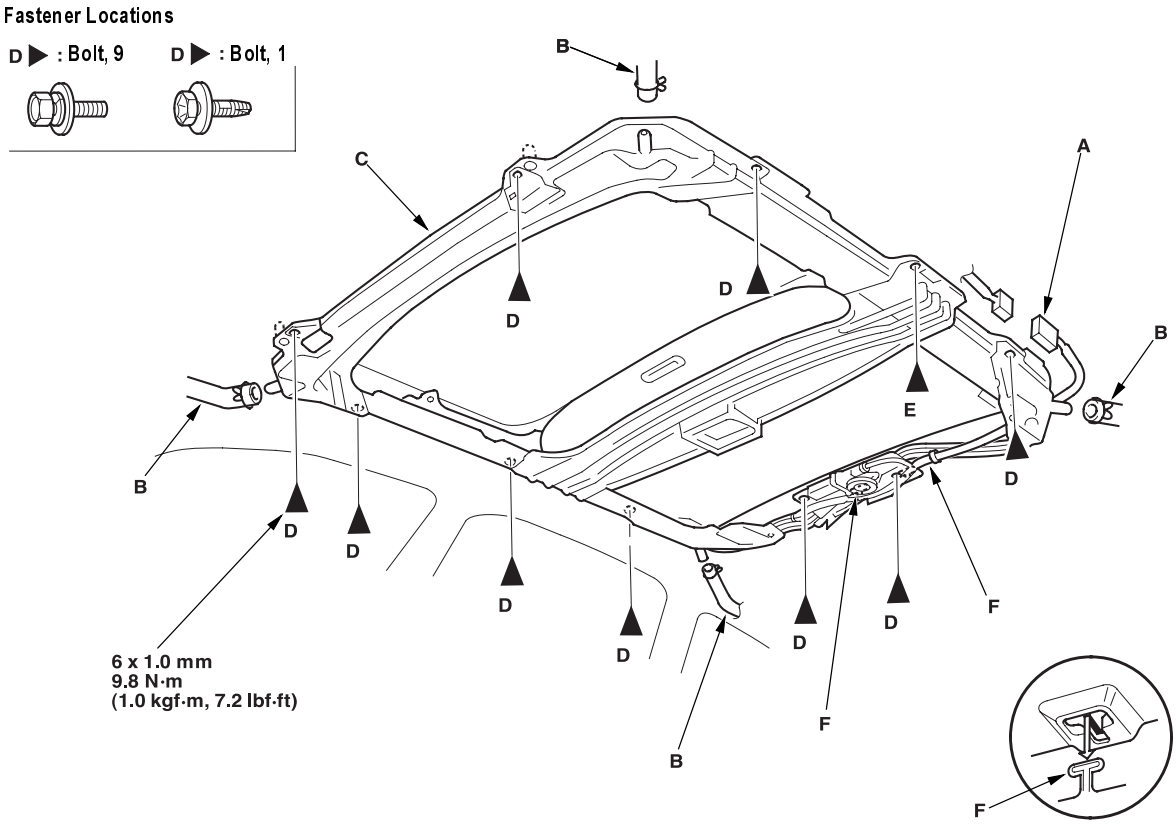


3. Install the motor in the reverse order of removal, and note these items:
   - Make sure the connector is plugged in properly.
   - Check the motor operation.

Frame and Drain Tube Replacement

NOTE: Put on gloves to protect your hands.

1. Remove these items:
   - Headliner (see page 20-81)
   - Sunroof glass (see page 20-65)
2. Disconnect the sunroof connector (A) and drain tubes (B). LHD is shown, RHD is symmetrical.

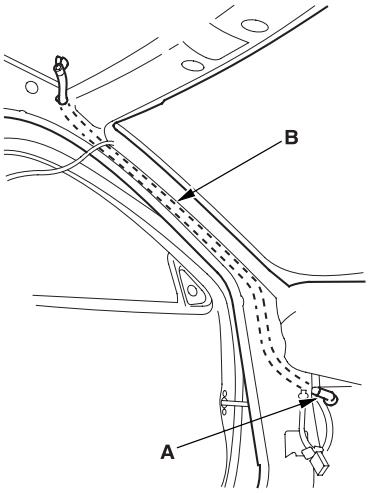


3. With an assistant holding the frame (C), remove the bolts (D) and ground bolt (E), starting at the rear, and release the rear hooks (F) by moving the frame forward, then remove the frame.
4. With the help of an assistant, carefully remove the frame through the front door opening.Take care not to scratch the interior trim and body, or tear the seat covers.

(cont'd)

Frame and Drain Replacement (cont'd)

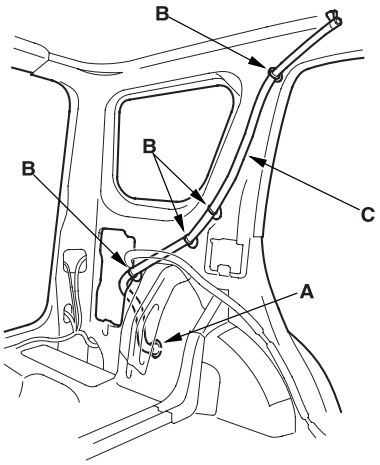
5. To remove a front drain valve (A) from the body, remove the kick panel, left or right (see page 20-76). Tie a string to the end of the drain tube, then pull the front drain tube (B) down out of the front pillar.



6. To remove a rear drain valve (A) from the cargo area, remove these parts:

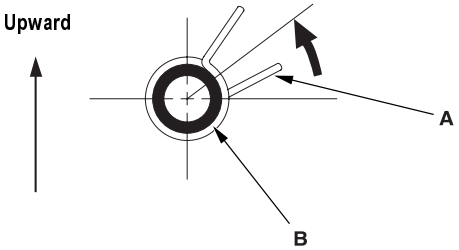
- Rear side trim panel (see page 20-77)
- Quarter pillar trim (see page 20-78)

Using a clip remover, detach the clips (B), then remove the rear drain tube (C).



7. Install the frame and drain tube in the reverse order of removal, and note these items:

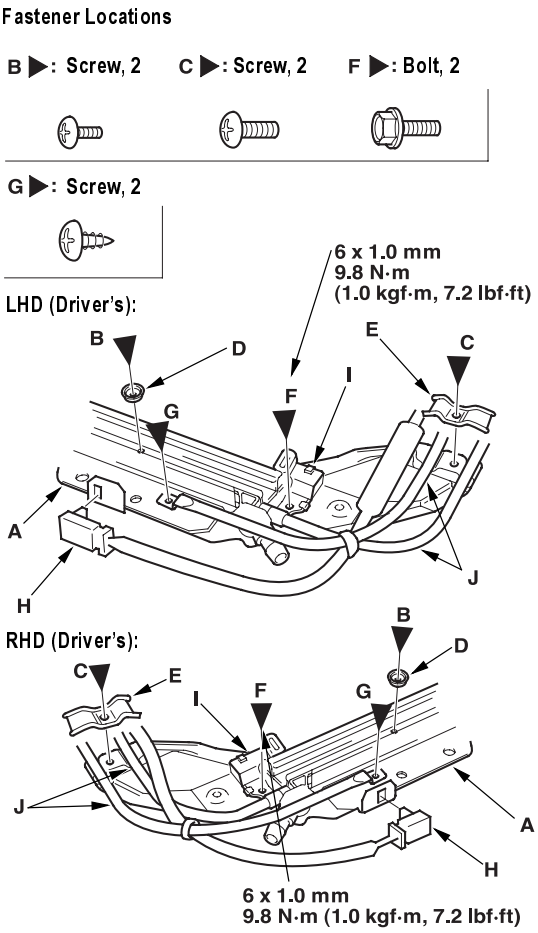
- Before installing the frame, clear the drain tubes and drain valves using compressed air.
- Check the frame seal.
- Clean the surface of the frame.
- When installing the frame, first attach the rear hooks into the body holes.
- Make sure the connector is plugged in properly.
- When connecting the drain tube, slide it over the frame nozzle at least 10 mm (0.39 in.).
- Install the tube clip (A) on the drain tube (B) as shown.



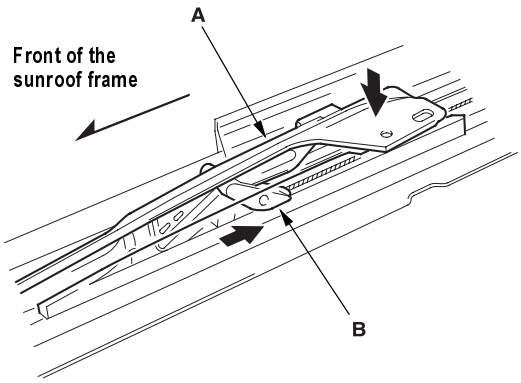
8. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray.

Drain Channel Slider and Cable Assembly Replacement

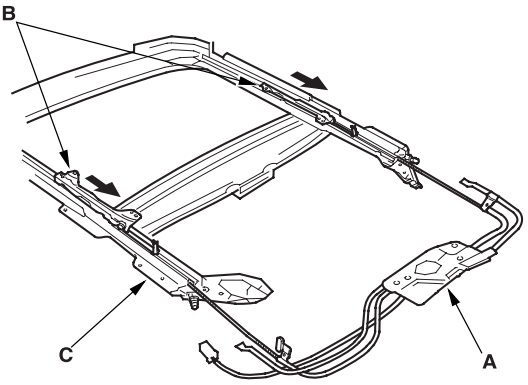
1. Remove the frame (see page 20-69).
2. Remove these parts from the frame:
   - Drain channel (see page 20-66)
   - Sunshade (see page 20-67)
   - Sunroof motor (see page 20-68)
3. Put on gloves to protect your hands. From both sides of the frame (A), remove the screws (B, C), then remove the slide stops (D) and cable tube rear brackets (E), and remove the cable tube side bracket mounting bolts (F) and the cable tube mounting screws (G).



4. From the driver's side, detach the sunroof connector (H) from the frame.
5. Remove the cable tube side brackets (I) and cable tubes (J) from both sides of the frame.
6. Pivot the glass bracket (A) down by sliding the link lifter (B) back, then slide both glass brackets back with the link lifter.



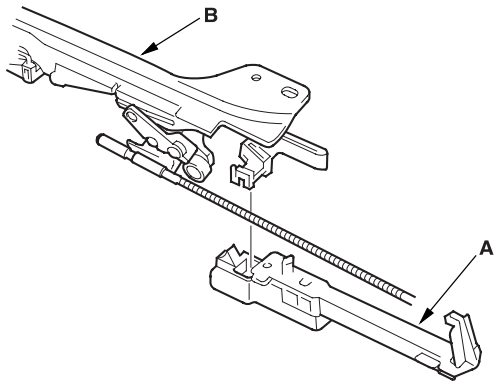
7. Slide the cable assembly (A) and both glass brackets (B) back, then remove them from the frame (C).



(cont'd)

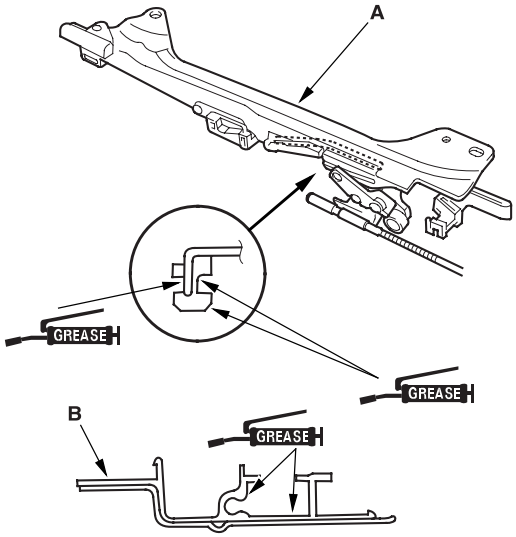
Drain Channel Slider and Cable Assembly Replacement (cont'd)

8. Remove the drain channel sliders (A) from the glass brackets (B) on both sides.



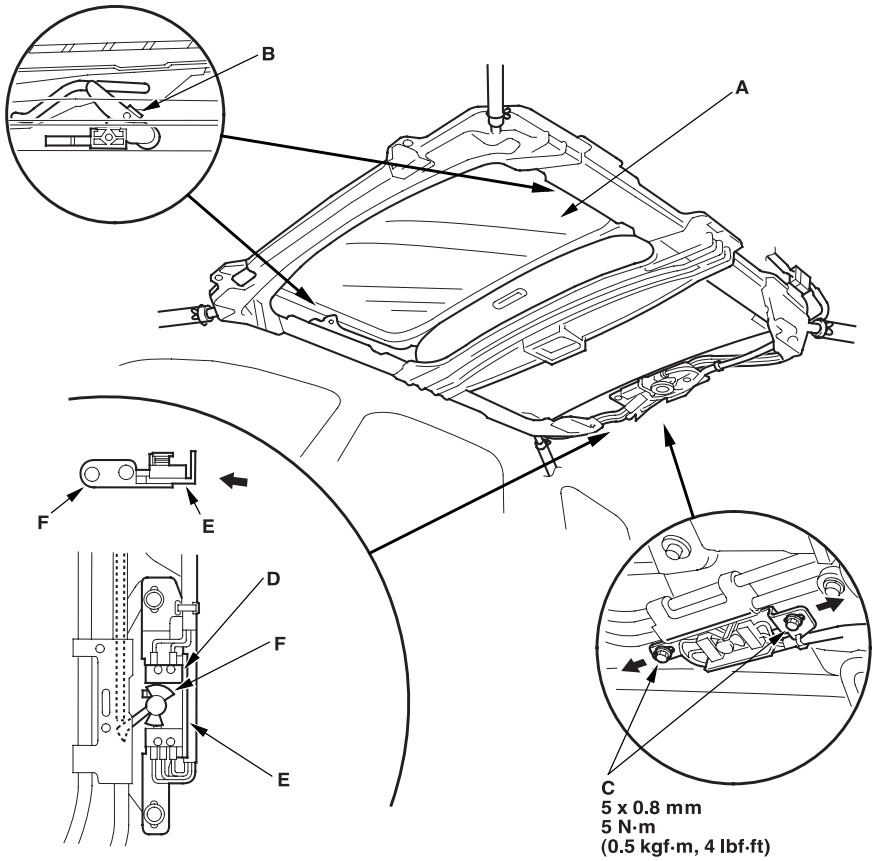
9. Install the slider and cable assembly in the reverse order of removal, and note these items:

- Damaged parts should be replaced.
- Apply multipurpose grease to the glass bracket (A) and guide rail portion of the frame (B) indicated by the arrows.
- Before reinstalling the motor, make sure both link lifters are parallel, and in the fully closed position.
- Before reinstalling the motor, install the frame and glass, then check the opening drag (see page 20-74).



Position Switch Adjustment

1. Remove the headliner (see page 20-81).
2. With the sunroof wrench, close the glass (A) fully:
   - Make sure both link lifters (B) are parallel, and in the position shown.
   - Check the glass fit to the roof panel and the glass height (see page 20-65).

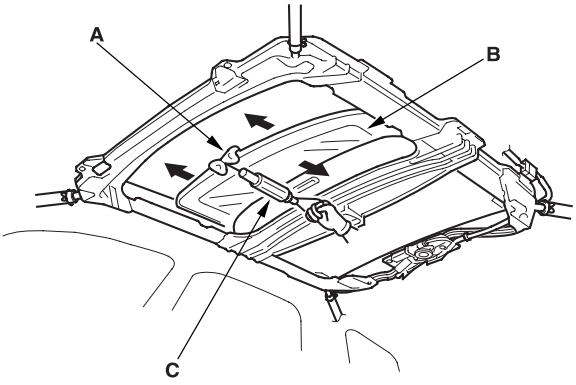


3. With an open-end wrench, loosen the position switch mounting bolts (C).
4. Adjust the position switch (D):
   - Move the switch plate (E) a little at a time, then secure it in the position where you hear a faint click when the switch cam (F) pushes the position switch (open/close).
   - Check that the switch plate contacts the switch bracket (F).
5. Check the operation of the glass (from the tilt-up position to fully closed position, from the fully open position to the fully closed position) by operating the sunroof switch.

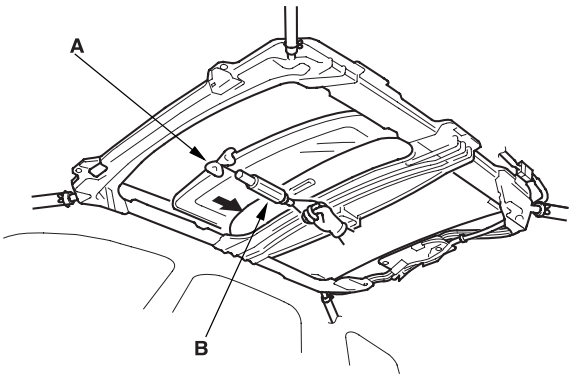
Closing Force and Opening Drag Check

1. Remove the headliner (see page 20-81).
2. Closing force check:
   - With a shop towel (A) on the leading edge of the glass (B), attach a spring scale (C) as shown.
   - Have an assistant hold the switch to close the glass while you measure the force required to stop it.
   - Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

   Closing Force: 200 - 290 N (20 - 30 kgf, 44 - 66 lbf)



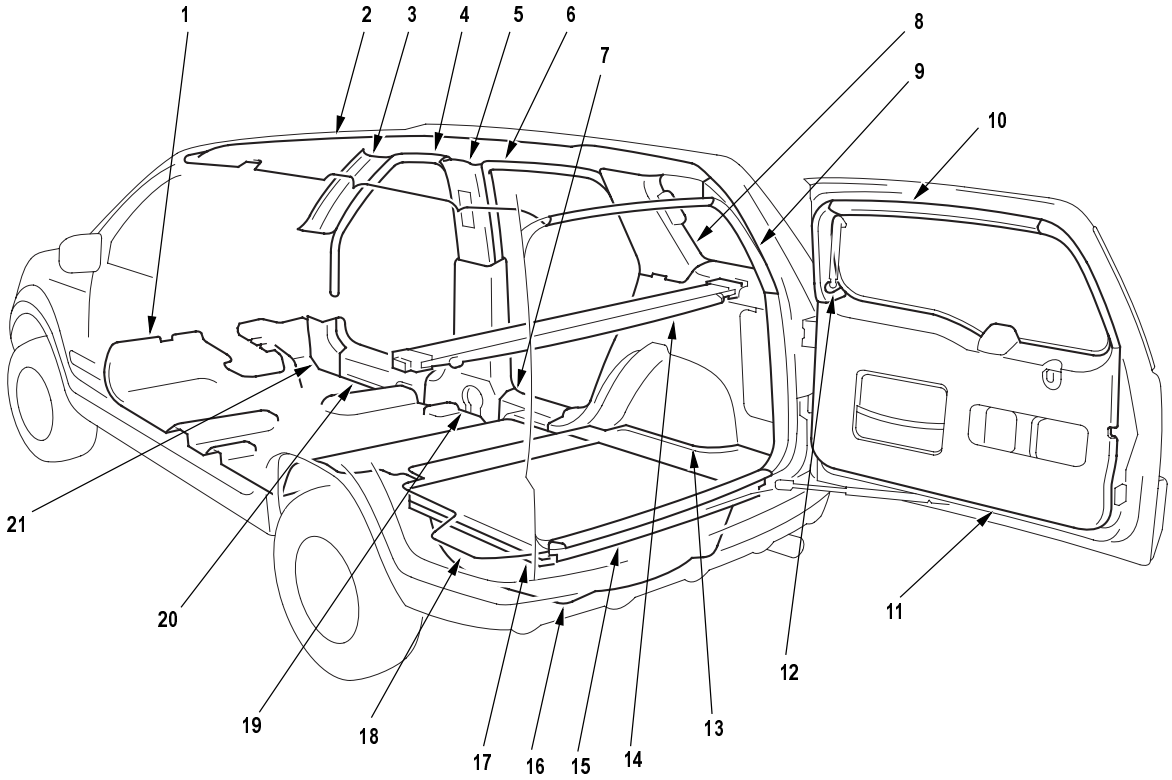
3. If the force is not within specification, remove the sunroof motor (see page 20-68), then check:
   - The gear portion and the inner cable for breakage and damage. If the gear portion is broken, replace the motor. If the inner cable is damaged, remove the frame (see page 20-69), and replace the cable assembly (see page 20-71).
   - The sunroof motor (see page 22A-128). If the motor fails to run or doesn't turn smoothly, replace it.
   - The opening drag. Go to step 4.
4. Opening drag check: Protect the leading edge of the glass with a shop towel (A). Measure the effort required to open the glass using a spring scale (B) as shown.



5. If the load is over 40 N (4 kgf, 9 lbf), check:
   - The side clearance and glass height adjustment (see page 20-65).
   - For broken or damaged sliding parts. If any sliding parts are damaged, replace them.

Interior Trim

Component Location Index



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5	CENTER PILLAR UPPER TRIM	page 20-76
6	REAR DOOR OPENING TRIM	page 20-76
7	REAR DOOR SILL TRIM	page 20-76
8	QUARTER PILLAR TRIM	page 20-78
9	REAR PILLAR TRIM	page 20-78
10	TAILGATE UPPER TRIM PANEL	page 20-80
11	TAILGATE LOWER TRIM PANEL	page 20-80
12	TAILGATE SIDE TRIM	page 20-80
13	REAR SIDE TRIM PANEL	page 20-77
14	TONNEAU COVER	page 20-77
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19	CENTER PILLAR LOWER TRIM PANEL	page 20-76
20	FRONT DOOR SILL TRIM	page 20-76
21	KICK PANEL	page 20-76

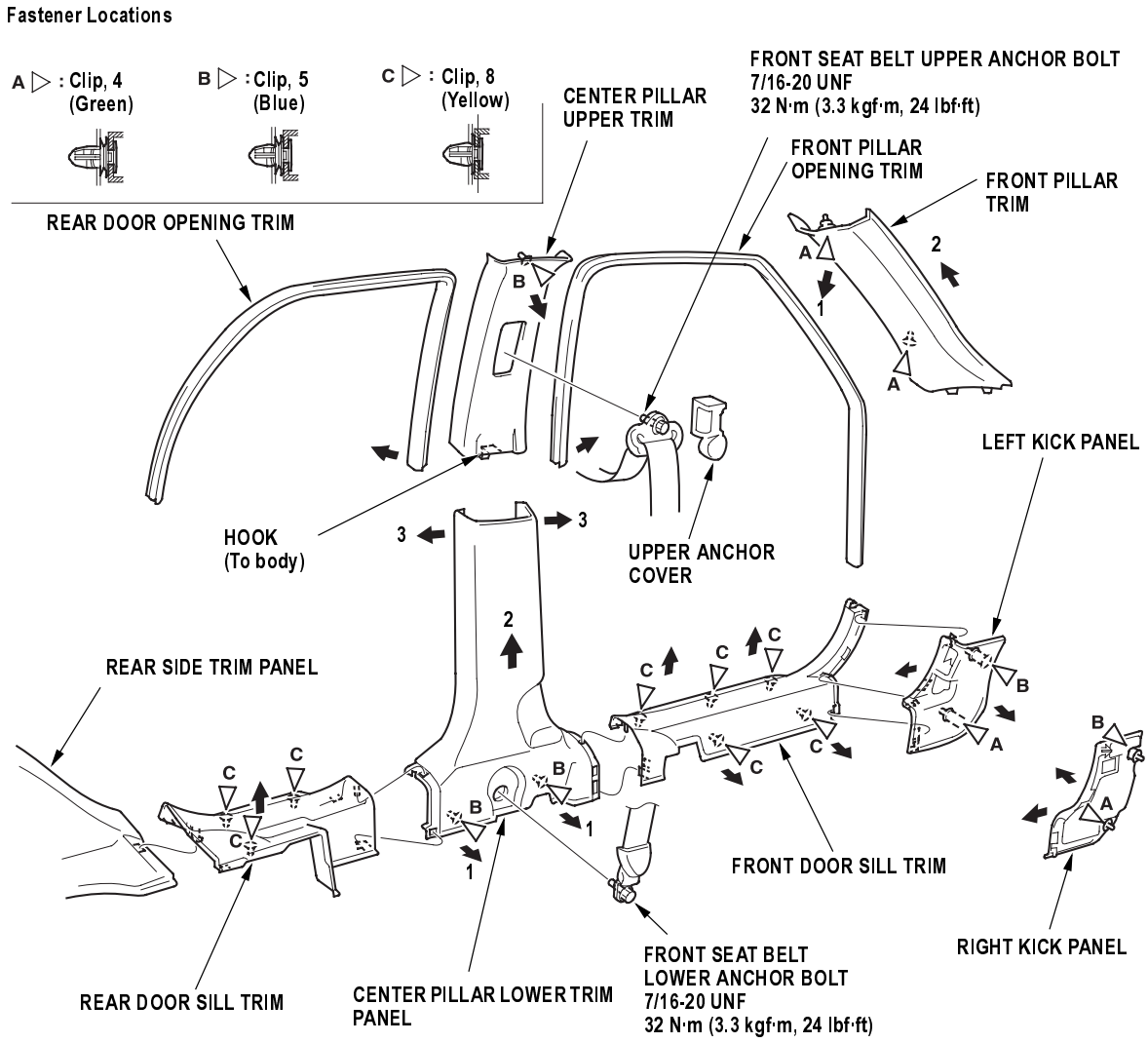
Trim Removal/Installation - Door Area

NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

Remove the trim as shown:

Install the trim in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Apply liquid thread lock to the front seat belt upper anchor bolt before installation.
- Before installing the anchor bolts, make sure there are no twists or kinks in the belts.



Trim Removal/Installation - Rear Side Area

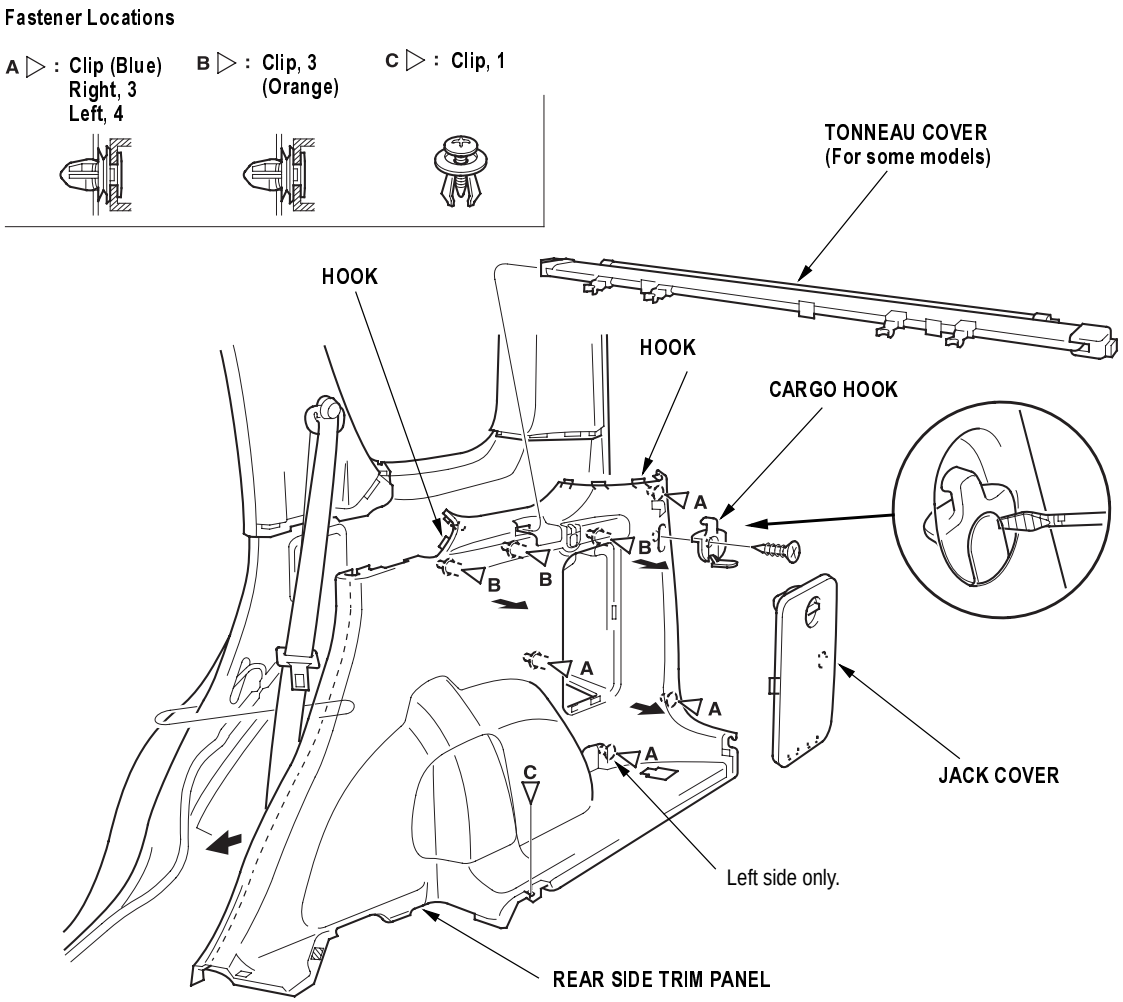
NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

Remove these items, then remove the trim as shown:

- Rear door sill trim (see page 20-76)
- Trunk floor mat, cargo floor lid, rear floor bucket, tie-down hooks, rear trim panel (see page 20-79)
- Accessory power socket (from the left rear side trim panel) (see page 22A-239)

Install the trim in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure there are no pinches in the belt.



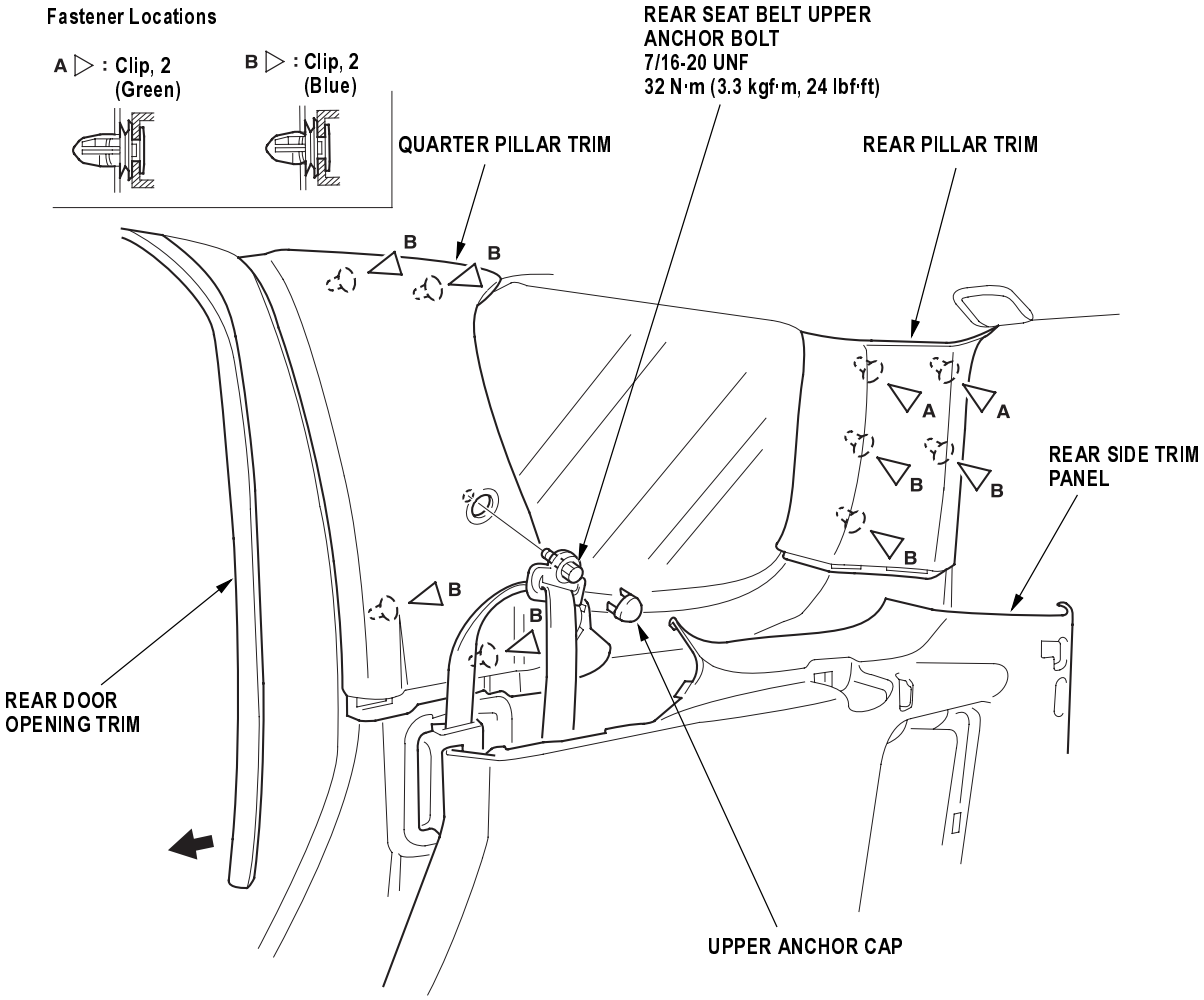
Trim Removal/Installation - Rear Side Pillar Area

NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

Remove the trim as shown. Remove the upper portion of the rear side trim panel as necessary (see page 20-77).

Install the trim in the reverse order of removal, and note these items:

- Replace any damaged clips.
- When installing the rear side trim panel, make sure there are no pinches in the belt.
- Before installing the anchor bolt, make sure there are no twists or kinks in the belt.

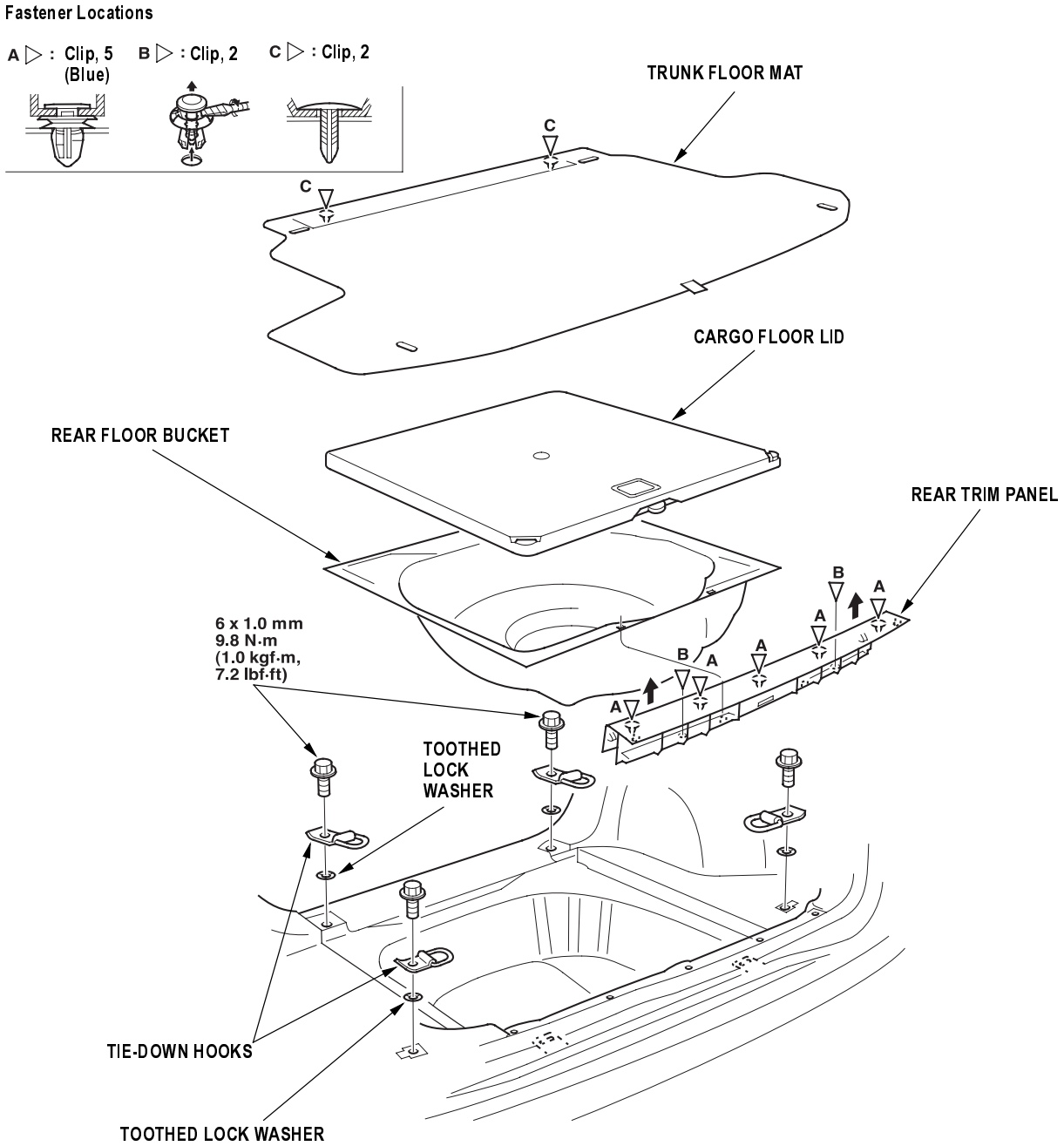


Trim Removal/Installation - Cargo Area

NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

Remove the trim as shown.

Install the trim in the reverse order of removal, and replace any damaged clips.

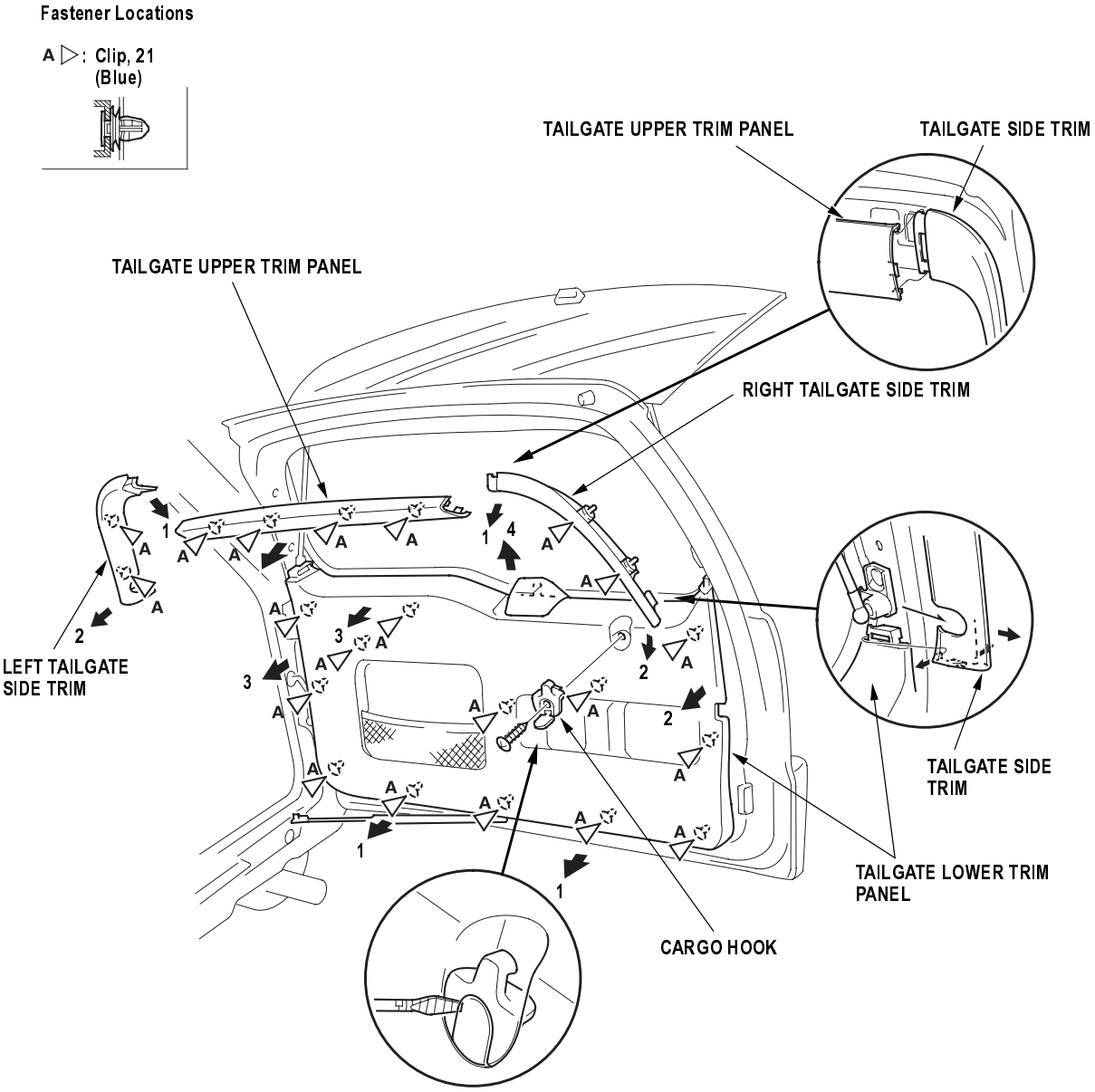


Trim Removal/Installation - Tailgate Area

NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend or scratch the trim and panels.

Remove the trim as shown.

Install the trim in the reverse order of removal, and replace any damaged clips.

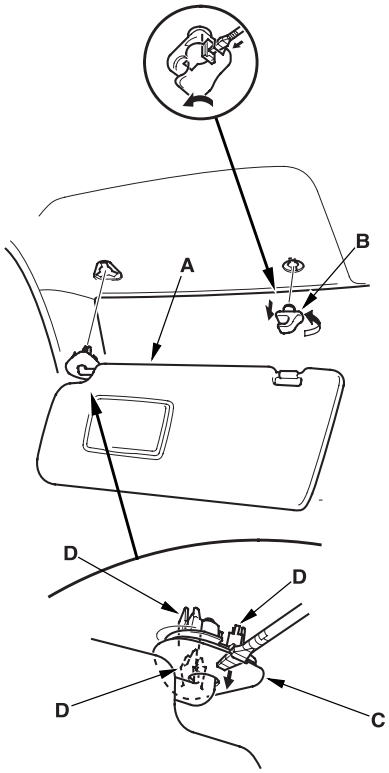


Headliner Removal/Installation

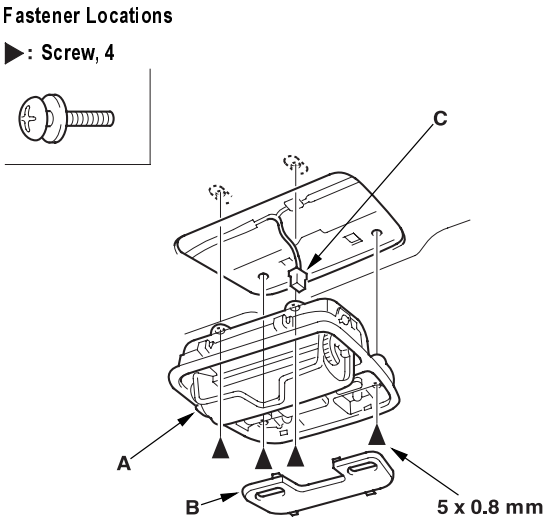
NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to bend and scratch the headliner.
- Be careful not to damage the dashboard and other interior trim.

1. Remove these items:
- Front pillar trim, both sides (see page 20-76)
- Center pillar upper trim, one side (see page 20-76)
- Quarter pillar trim, one side (see page 20-78)
- Rear pillar trim, both sides (see page 20-78)
- Spotlights, for some models (see page 22A-108)
- Ceiling light (see page 22A-109)
- Cargo room light (see page 22A-109)

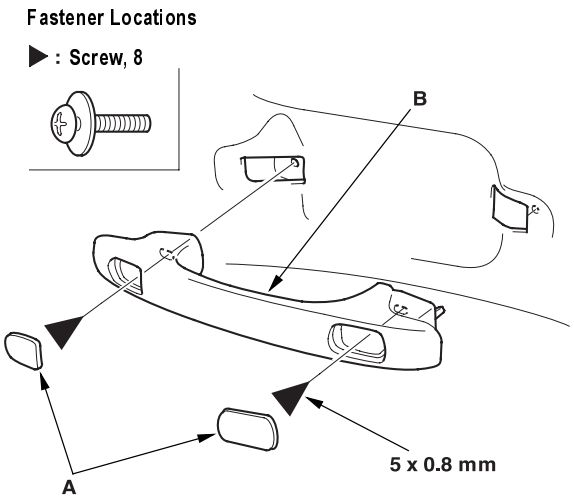
2. From both sides, remove the sunvisor (A) and holder (B).
1 Using a flat-tip screwdriver, pry the cap (C).
2 Pull the clip portions (D) of the cap down.
3 Remove the sunvisor from the body and holder.
4 Using a flat-tip screwdriver, push the hook, and turn the holder 90°, then pull it out.



3. If equipped, remove the roof console (A).
1 Remove the lens (B).
2 Remove the screws.
3 Pull out the roof console, and disconnect the front individual map light connector (C).



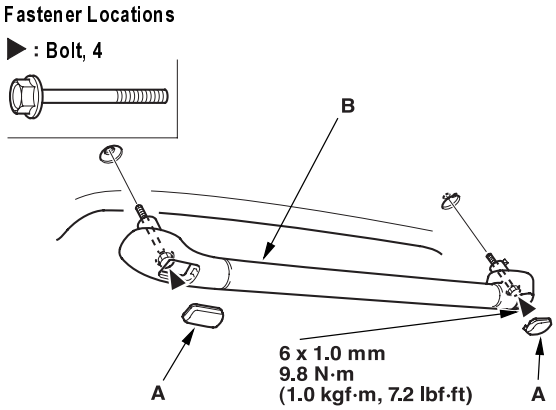
4. Remove the caps (A), and remove the screws, then remove the grab handles (B) (driver's and each passenger's).



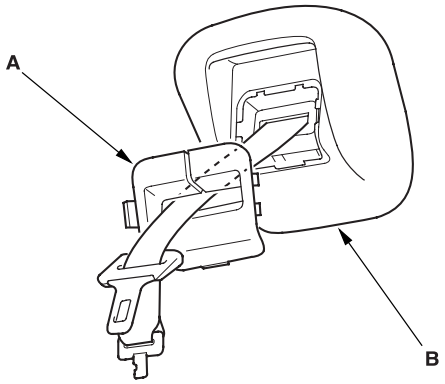
(cont'd)

Headliner Removal/Installation (cont'd)

5. If equipped, remove the caps (A), and remove the bolts, then remove the inner roof rails (B) from both sides.

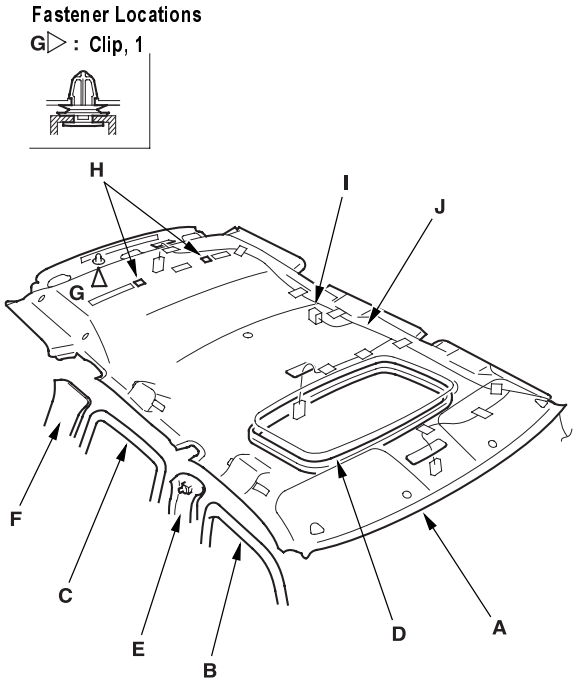


6. If equipped, remove the cap (A) from the center seat belt retractor cover (B).



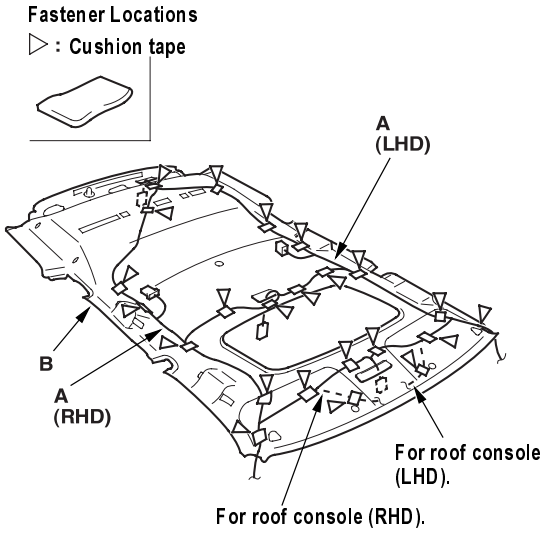
7. With the help of an assistant, remove the headliner (A). LHD is shown, RHD is similar.

1 Remove the remaining front door opening trim (B) and rear door opening trim (C) from each roof portion.
2 With sunroof: Remove the roof trim (D).
3 Remove the upper portion of the remaining center pillar upper trim (E) and quarter pillar trim (F). Take care not to damage the trim.
4 Detach the clip (G), and release the fasteners (H) by pulling the rear portion of the headliner down. Take care not to damage the headliner.
5 Lower the headliner, and remove it from the remaining trim, and disconnect the sunroof connector (I) (with sunroof). Take care not to damage the interior wire harness (J).

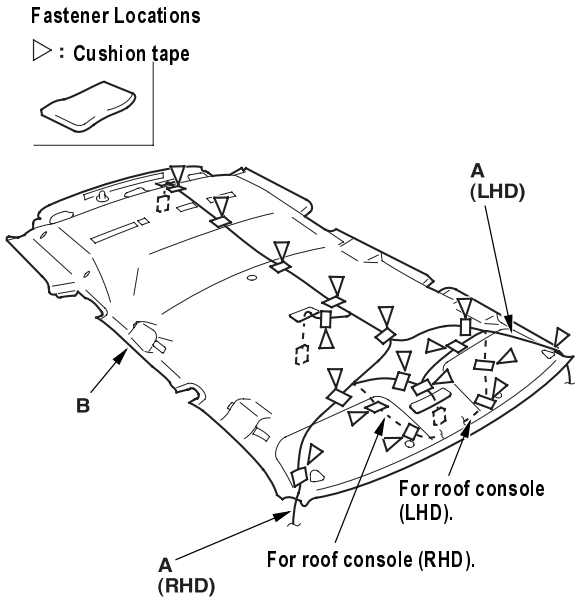


8. With the help of an assistant, remove the cushion tape, then remove the interior wire harness (A) from the headliner (B). Take care not to damage the headliner and interior wire harness.

With sunroof:

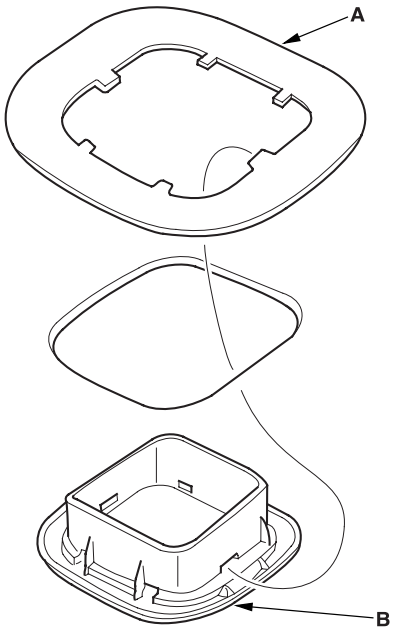


Without sunroof:

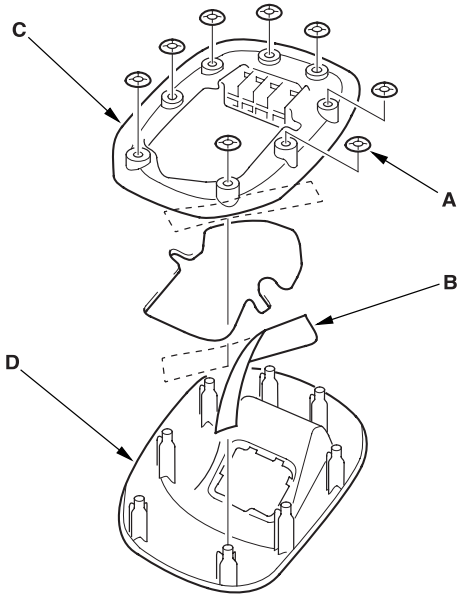


9. Remove the headliner through the tailgate opening.
Take care not to damage the headliner.

10. If equipped with the anchors, remove the anchor cover bracket (A), then remove the anchor cover (B) from the headliner.



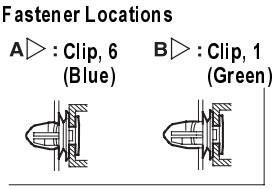
11. If equipped with a center seat belt retractor, remove the speed nuts (A), and remove the cushion tape (B), then remove the retractor cover bracket (C) and retractor cover (D) from the headliner.

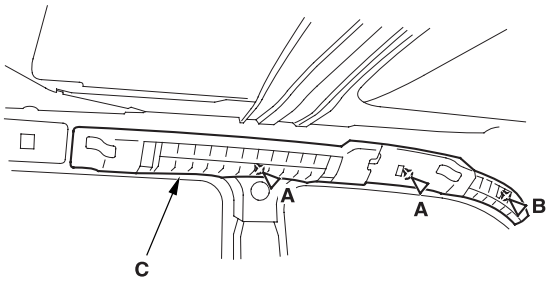


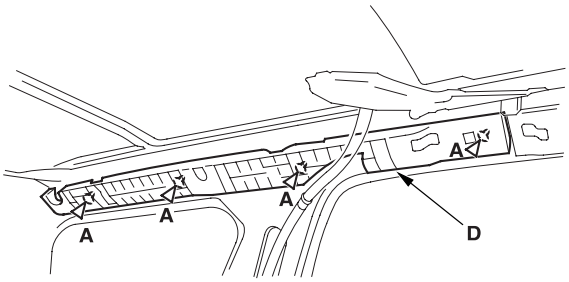
(cont'd)

Headliner Removal/Installation (cont'd)

12. Using a clip remover, detach the clips (A, B), then remove the front roof side pad (C) and rear roof side pad (D).

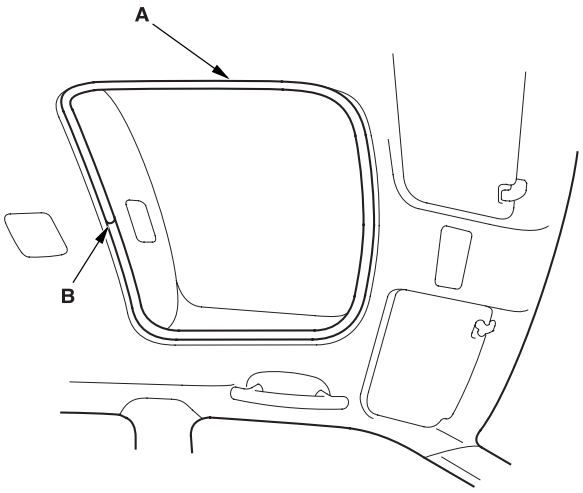






13. Install the headliner in the reverse order of removal, and note these items:

- When reinstalling the headliner through the tailgate opening, be careful not to fold or bend it. Also, be careful not to scratch the body.
- Replace any damaged clips, and replace the cushion tape.
- Check that both sides of the headliner are securely attached to the trim.
- With sunroof: When reinstalling the roof trim (A), install the joint (B) as shown.



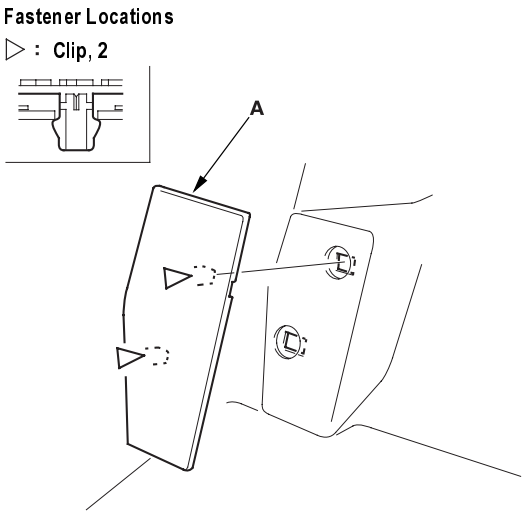
Carpet Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

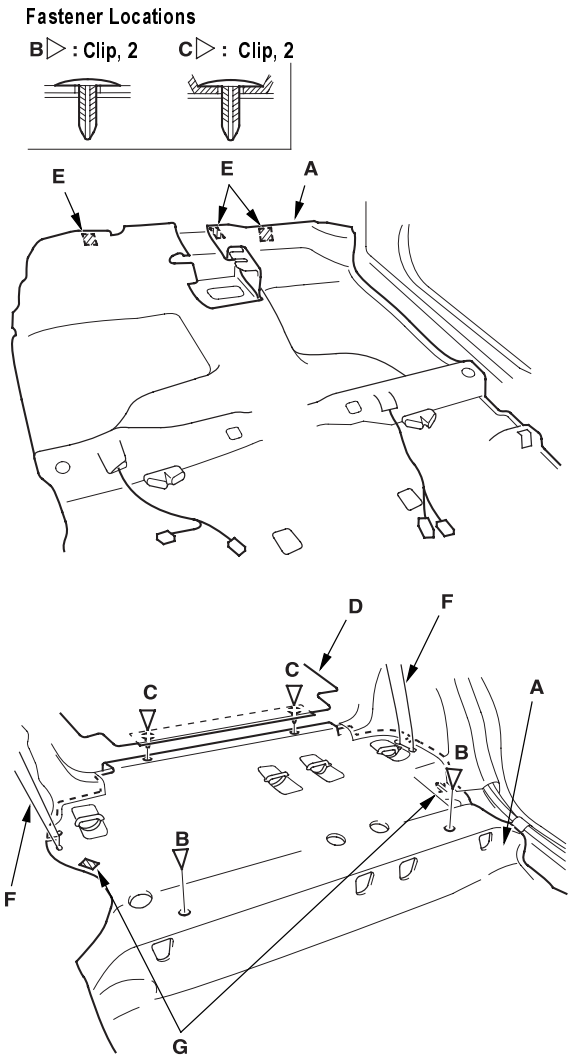
NOTE:
- Put on gloves to protect your hands.
- Take care not to damage, wrinkle or twist the carpet.
- Be careful not to damage the dashboard or other interior trim pieces.

1. Remove these items:
- Front seats, both sides (see page 20-103)
- Rear seats, both sides (see page 20-114)
- Center pillar lower trim panel, both sides (see page 20-76)
- Dashboard center lower cover, A/T (see page 20-91), M/T (see page 20-93)

2. RHD: Detach the clips, then remove the footrest (A).



3. Remove the carpet (A).
1 Remove the clips (B).
2 Detach the clips (C), then pull back the trunk floor mat (D).
3 Release the fasteners (E), then pull back the carpet from under the dashboard.
4 Remove both rear seat belts (F) through the slit in the carpet, and release the fasteners (G) for both rear side trim panels.



(cont'd)

Carpet Replacement (cont'd)

4. Install the carpet in the reverse order of removal, and note these items:

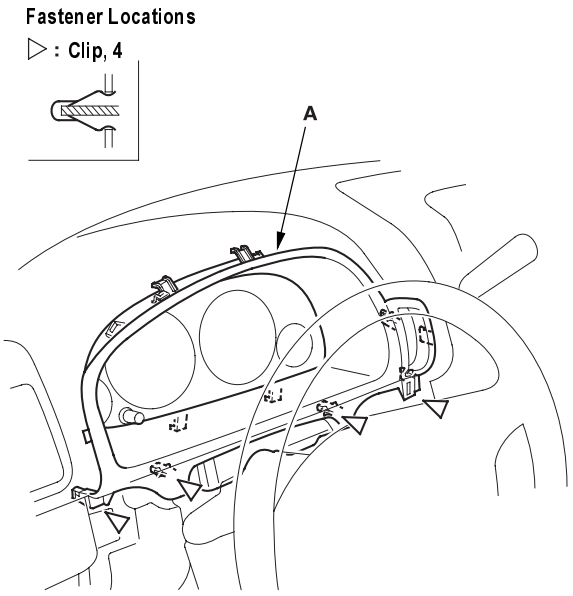
- Take care not to damage, wrinkle or twist the carpet.
- Make sure the seat harnesses are routed correctly.
- Replace any damaged clips.
- Slip both rear seat belts through the slit in the carpet properly.

Dashboard

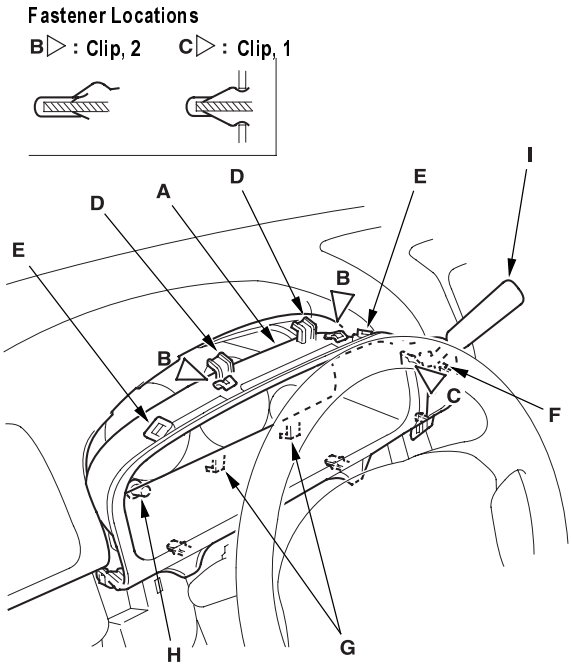
Instrument Panel Removal/Installation

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

1. Remove the driver's dashboard lower cover (see page 20-88).
2. Remove the steering column upper cover (see page 17-24).
3. Gently pull out the instrument panel (A) along the bottom to release the clips.



4. Remove the instrument panel (A).
   1 Gently pull out the upper portion of the instrument panel to release the clips (B, C) and hooks (D, E, F, G).
   2 Gently pull out on the panel being careful not bend the trip/reset (H) and dash lights brightness controller (for some models).
   3 On A/T model, slip the shift knob (I) through the hole in the instrument panel.

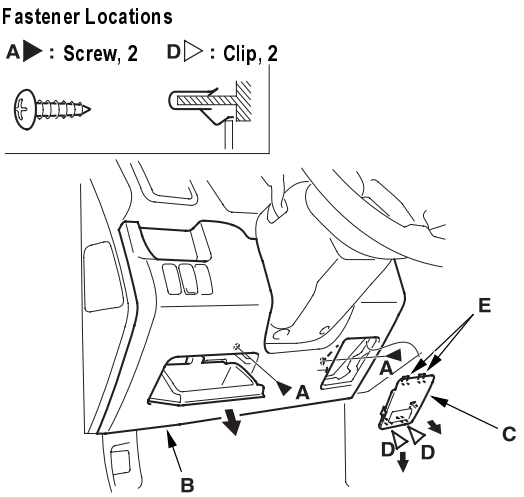


5. Install the panel in the reverse order of removal.

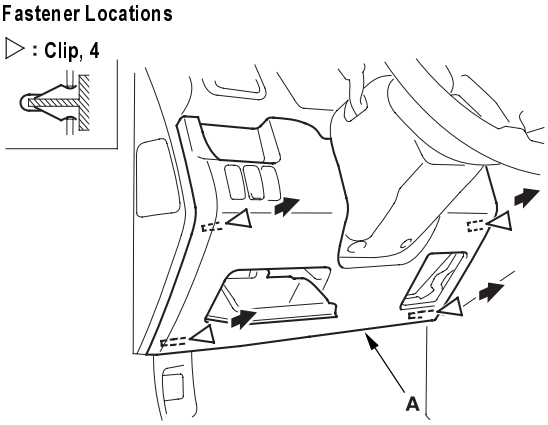
Driver's Dashboard Lower Cover Removal/Installation

NOTE:
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

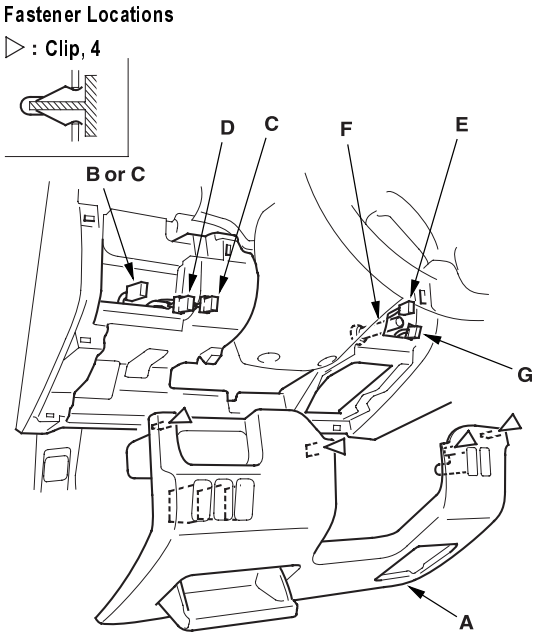
1. Remove the screws (A) from the driver's dashboard lower cover (B).
1 Pull out the bottom of the fuse lid (C) to release the clips (D), and pull it down to release the hooks (E).
2 Remove the screw from the fuse lid opening.
3 Open the pocket, then remove the screw.



2. Pull out the bottom of the driver's dashboard lower cover (A) to release the clips.



3. Remove the driver's dashboard lower cover (A).
1 Pull out the upper portions of the cover to release the clips.
2 If equipped, disconnect the headlight adjuster switch connector (B), cruise control main switch connector (C), sunroof switch connector (D), in-car temperature sensor connector (E), air hose (F), and seat heater switch connector (G).

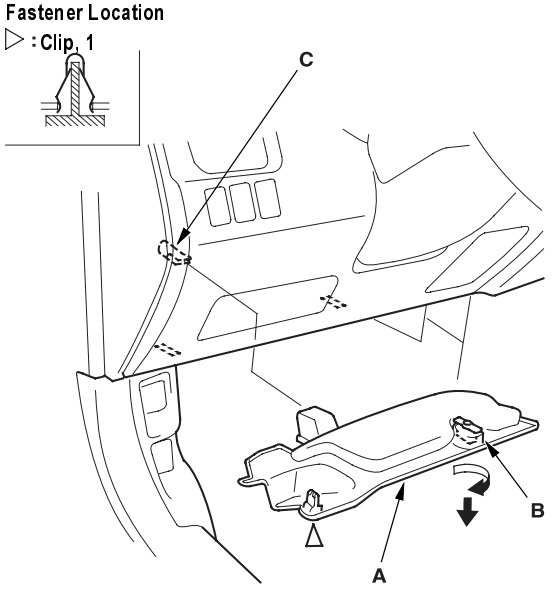


4. Install the cover in the reverse order of removal, and make sure that each connector is plugged in properly, and the air hose is connected properly.

Driver's Dashboard Under Cover Removal/ Installation

NOTE:
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

1. Remove the driver's dashboard under cover (A).
1 Turn the lock knob (B) 90°.
2 Gently pull down the rear edge to release the clip.
3 Pull the cover away to release it from the clip (C).

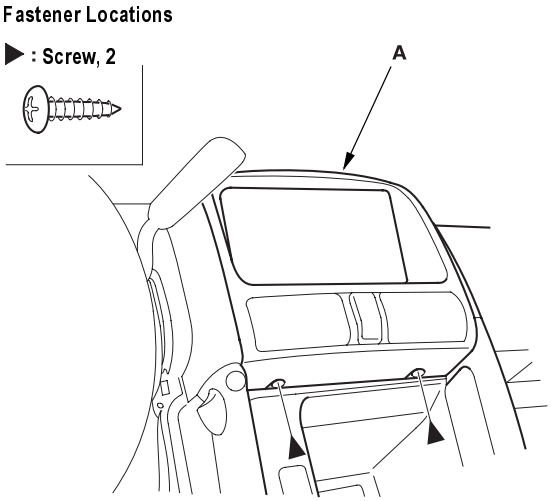


2. Install the cover in the reverse order of removal.

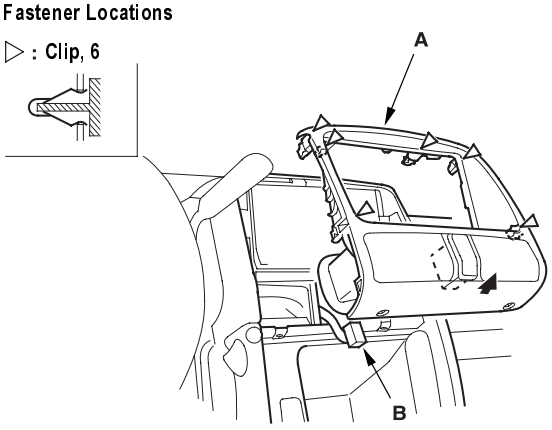
Dashboard Center Panel Removal/ Installation

NOTE:
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

1. Remove the screws from the bottom of the dashboard center panel (A).



2. Pull out on the bottom of the dashboard center panel (A) to make creat a gap between the dashboard and panel. Gently pull out along the panel to release the clips, then remove the panel. Disconnect the hazard warning switch connector (B).



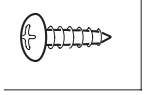
3. Install the panel in the reverse order of removal, and make sure the hazard warning switch connector is plugged in properly.

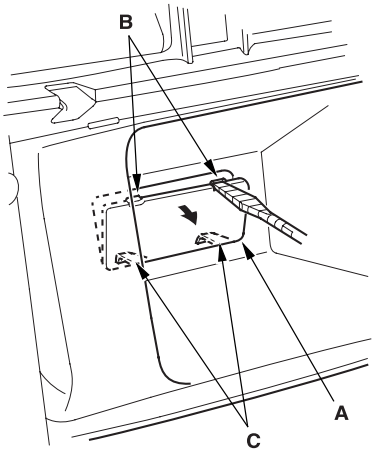
Dashboard Center Tray Removal/Installation

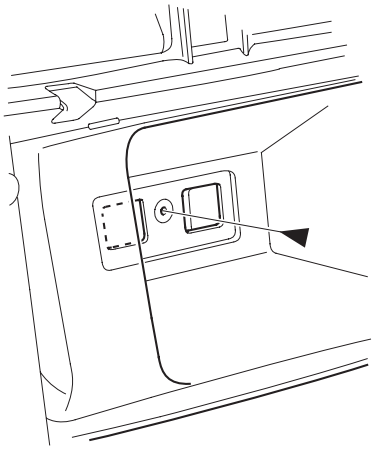
NOTE:
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

1. Remove the dashboard center panel (see page 20-89).
2. Using a flat-tip screwdriver, pry out the upper portion of the lid (A) to release the hooks (B), and release the bottom hooks (C), then remove the lid. Remove the screw.

Fastener Location
▶ : Screw, 1

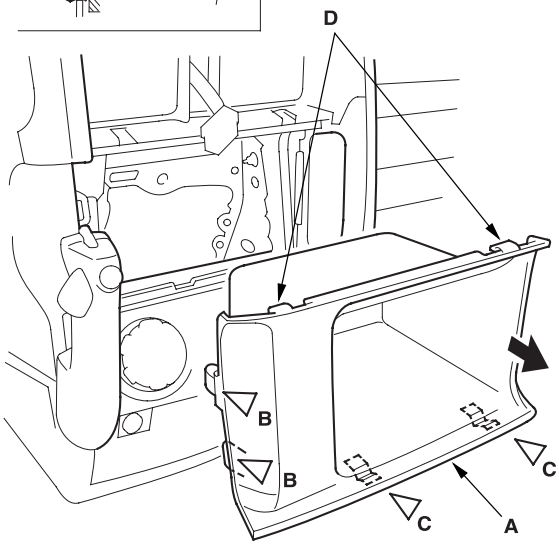






3. Hold the screw mounting portion of the dashboard center tray (A) by hand, and pull out the tray to release the clips (B, C) and hooks (D), then remove it.

Fastener Locations
B▷ : Clip, 2 C▷ : Clip, 2

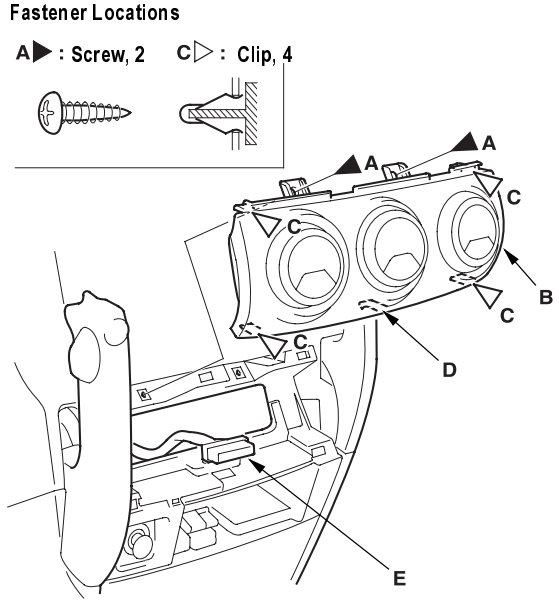


4. Install the tray in the reverse order of removal.

Heater Control Panel Removal/Installation

NOTE:
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

1. Remove the dashboard center tray (see page 20-90).
2. Pull the parking brake lever.
3. Remove the screws (A), and pull out the heater control panel (B) to release the clips (C) and hook (D). Disconnect the heater control unit connector (E), then remove the heater control panel.



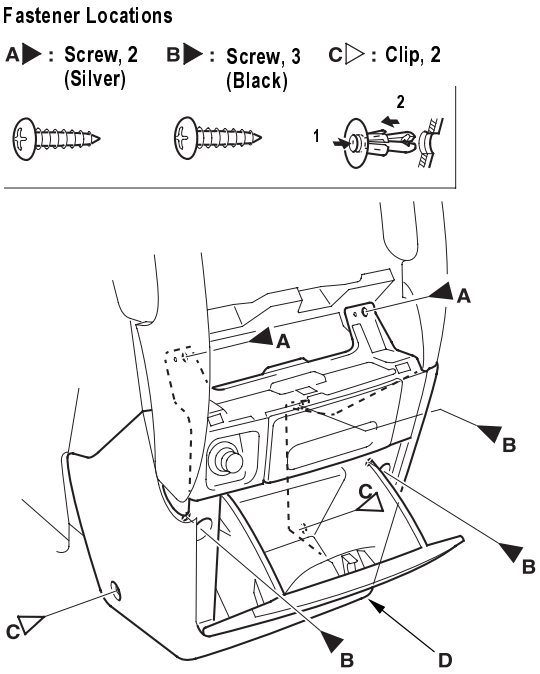
4. Install the panel in the reverse order of removal, and make sure the heater control unit connector is plugged in properly.

Dashboard Center Lower Cover Removal/ Installation - A/T

SRS components are located in this area. Review the SRS component locations (see page 23-14) and precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

1. Remove these items:
   - Passenger's dashboard under cover (see page 20-95)
   - Heater control panel
2. Open the pocket. Remove the screws (A, B) and clips (C) from the dashboard center lower cover (D).

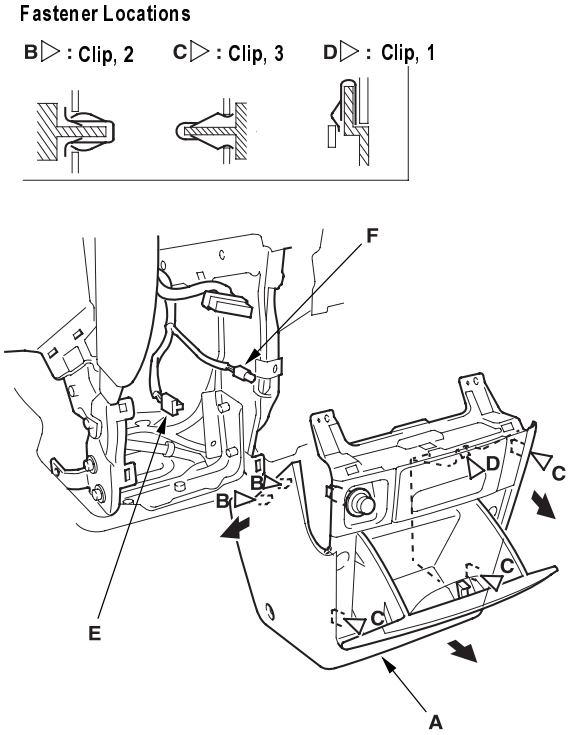


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Dashboard Center Lower Cover Removal/Installation - A/T (cont'd)

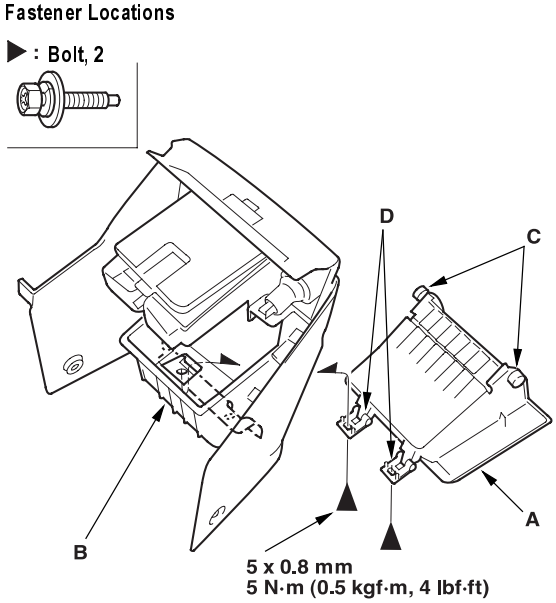
3. Remove the dashboard center lower cover (A).

1 Pull out the parking brake lever portion of the cover to release the clips (B).
2 Pull out the cover to release the clips (C, D).
3 Disconnect the cigaret lighter connector (E) and ashtray light bulb socket (F) (for some models).



4. If necessary, remove the pocket (A) from the dashboard center lower cover (B).

1 Remove the bolts.
2 Release the stops (C) from the cover.
3 Pull out the hinges (D) from the cover.



5. Install the cover in the reverse order of removal, and note these items:

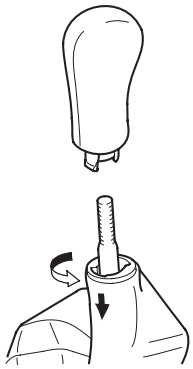
- Replace any damaged clips.
- Make sure the cigaret lighter connector is plugged in properly and the ashtray light bulb socket is connected properly.

Dashboard Center Lower Cover Removal/Installation - M/T

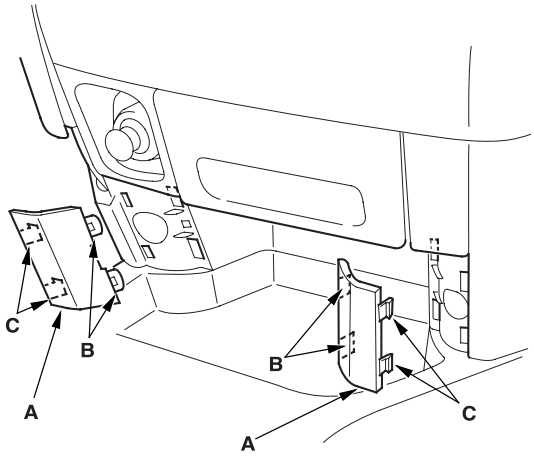
SRS components are located in this area. Review the SRS component locations (see page 23-14), and precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

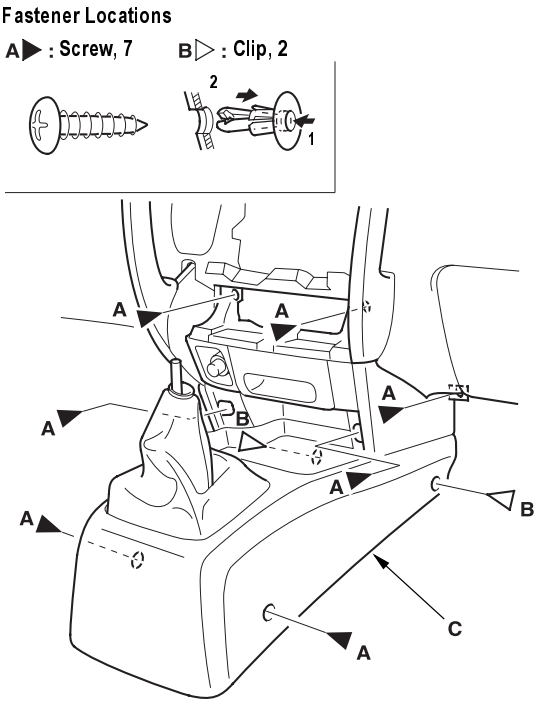
1. Remove these items:
   - Front seat center table (see page 20-106)
   - Passenger's dashboard under cover (see page 20-95)
   - Heater control panel (see page 20-91)
2. Remove the shift knob.



3. Using a flat-tip screwdriver, pry out the inside edge of the caps (A) to release the hooks (B), and pull out the caps to release the hooks (C), then remove the caps from both sides.



4. Remove the screws (A) and clips (B) from the dashboard center lower cover (C).

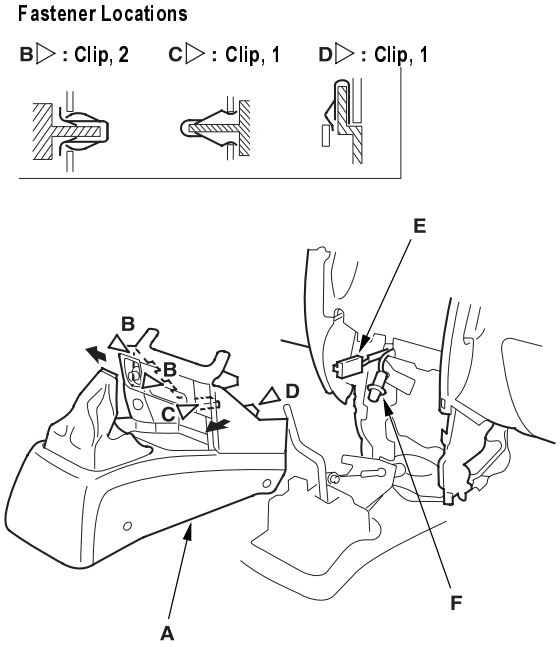


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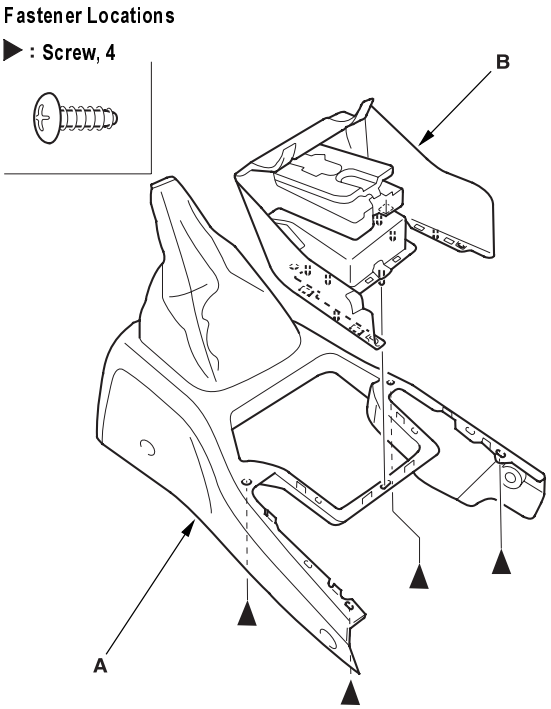
Dashboard Center Lower Cover Removal/Installation - M/T (cont'd)

5. Remove the dashboard center lower cover (A).

1 Pull out the parking brake lever portion of the cover to release the clips (B).
2 Pull out the cover to release the clips (C, D).
3 Disconnect the cigaret lighter connector (E) and ashtray light bulb socket (F) (for some models).



6. If necessary, remove the screws, then separate the center console (A) and center lower cover (B).



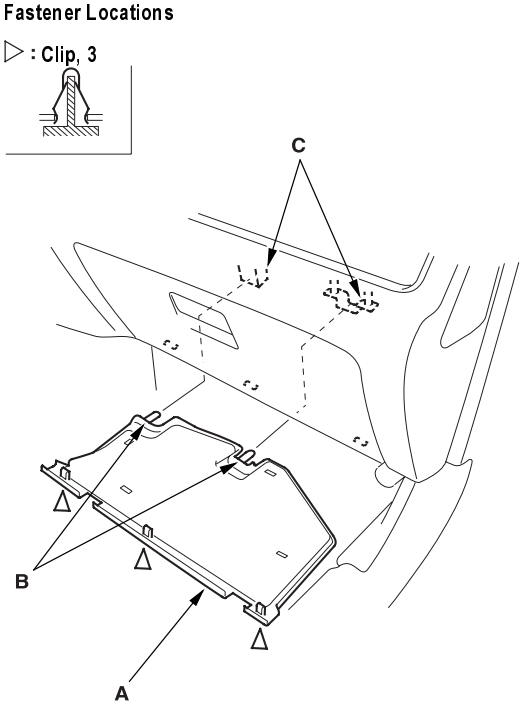
7. Install the cover in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure the cigaret lighter connector is plugged in properly and the ashtray light bulb socket is connected properly.

Passenger's Dashboard Under Cover Removal/Installation

NOTE:
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

1. Remove the passenger's dashboard under cover (A).
   1 Gently pull down the rear edge to release the clips.
   2 Pull the cover away to release the pins (B) from the holders (C).



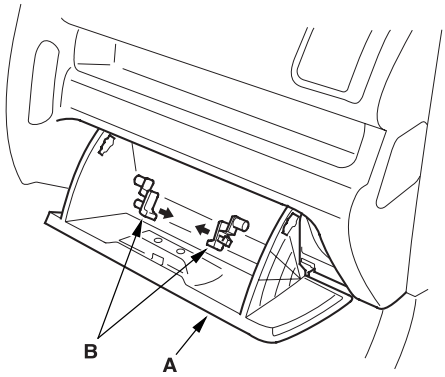
2. Install the cover in the reverse order of removal.

Glove Box Removal/Installation

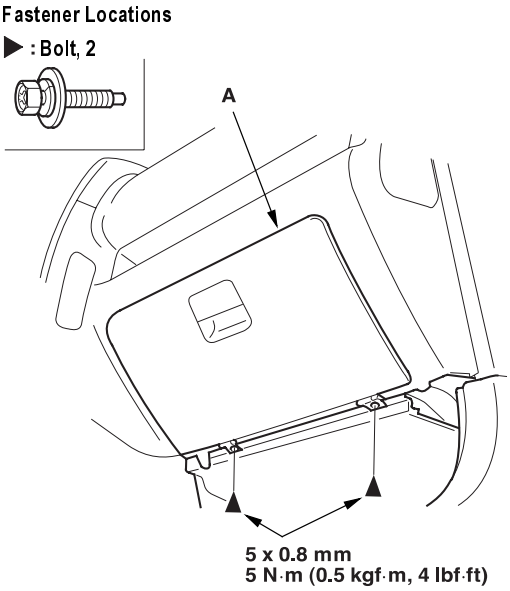
SRS components are located in this area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- Take care not to scratch the dashboard and related parts.
- LHD is shown, RHD is symmetrical.

1. While holding the glove box (A), remove the glove box stop (B) on each side.



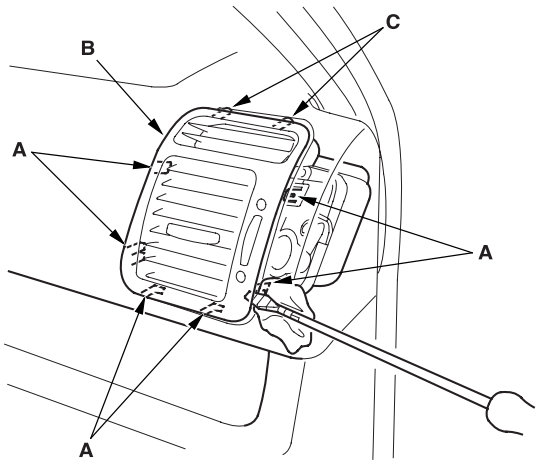
2. Remove the bolts, then remove the glove box (A).



3. Install the glove box in the reverse order of removal.

Dashboard Side Vent Removal/Installation

1. Wrap a flat-tip screwdriver with protective tape, and apply protective tape around the related parts to prevent damage. Carefully insert a flat-tip screwdriver next to the clip (A), and detach the clips by prying on the side vent (B). Take care not to scratch the dashboard and related parts.



2. Remove the vent by releasing the hooks (C).
3. Reinstall the hook portions of the vent first, then push the clip portions into place securely.

Dashboard Removal/Installation

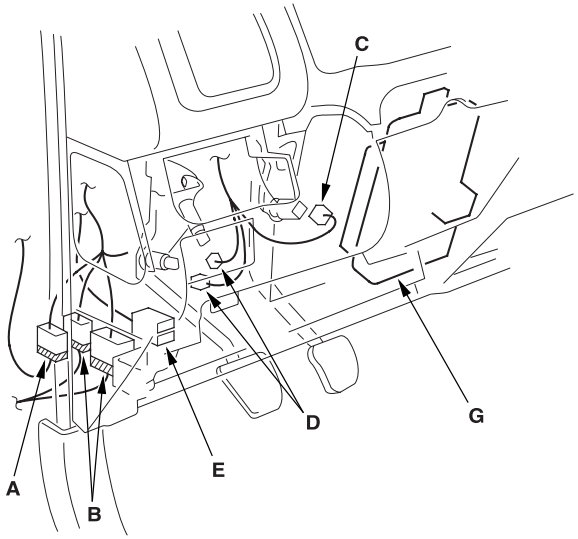
SRS components are located in this area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

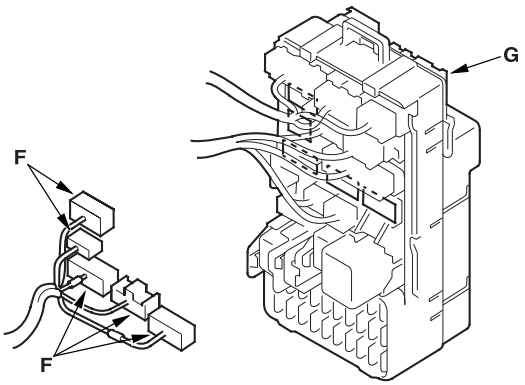
NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
- Have an assistant help you when removing and installing the dashboard.
- Take care not to scratch the dashboard, body and other related parts.
- Put on gloves to protect your hands.

1. If equipped, make sure you have the anti-theft code for the radio, then write down the frequencies for the preset buttons.
2. Disconnect the negative battery cable, and wait at least three minutes before beginning work.
3. Remove these items:
   - Driver's dashboard lower cover (see page 20-88)
   - Driver's dashboard under cover (see page 20-89)
   - Glove box (see page 20-95)
   - Passenger's dashboard under cover (see page 20-95)
   - Dashboard center lower cover, A/T (see page 20-91), M/T (see page 20-93)
   - Passenger's side vent (see page 20-96)
   - Front pillar trim, both sides (see page 20-76)
   - Kick panels, both sides (see page 20-76)
   - Steering column (see page 17-24)
   - Parking brake lever (see page 19A-42)
   - A/T model only: Disconnect the A/T control cable (see page 14-157)

Driver's side:

4. Front under the dash, disconnect the interior wire harness connector (A), driver's door wire harness connectors (B), brake switch connector (C) and clutch switch connector (D) (on MT model). Remove the relay (E) from the bracket, and disconnect the engine compartment wire harness connectors (F) from the under-dash fuse/relay box (G). LHD is shown, RHD is similar.

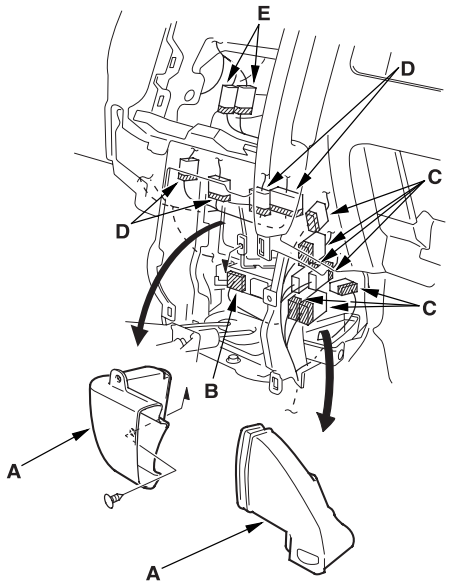




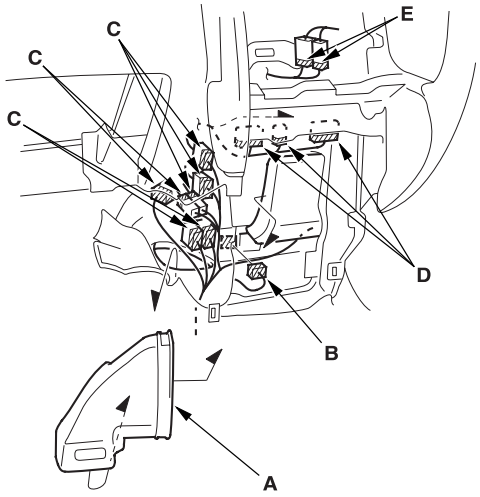
Middle portion:

5. Remove the rear heater joint ducts (A). Disconnect the SRS control unit connector (B), floor wire harness connectors (C), engine compartment wire harness connectors (D), and heater sub harness connectors (E).

LHD:



RHD:



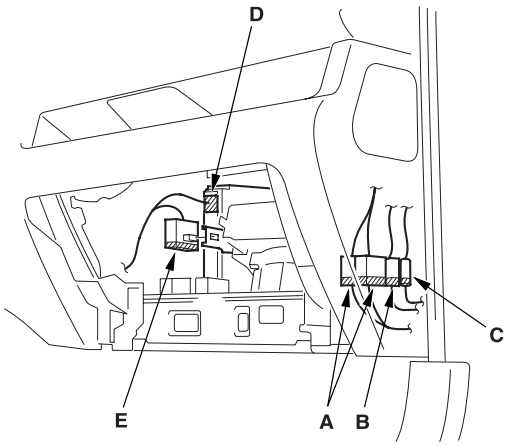
(cont'd)

Dashboard Removal/Installation (cont'd)

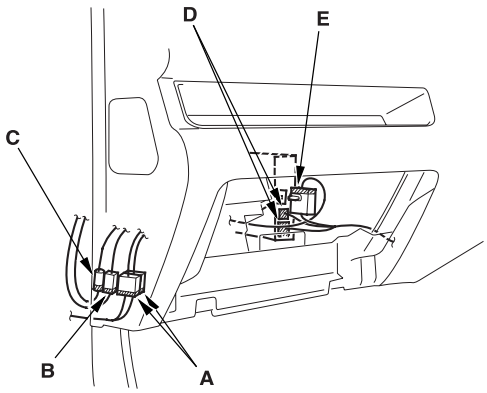
Passenger's side:

6. From under the dash, disconnect the passenger's door wire harness connectors (A), roof antenna connector (B), antenna lead (C), ECM/PCM connector (D), and engine wire harness connector (E).

LHD:

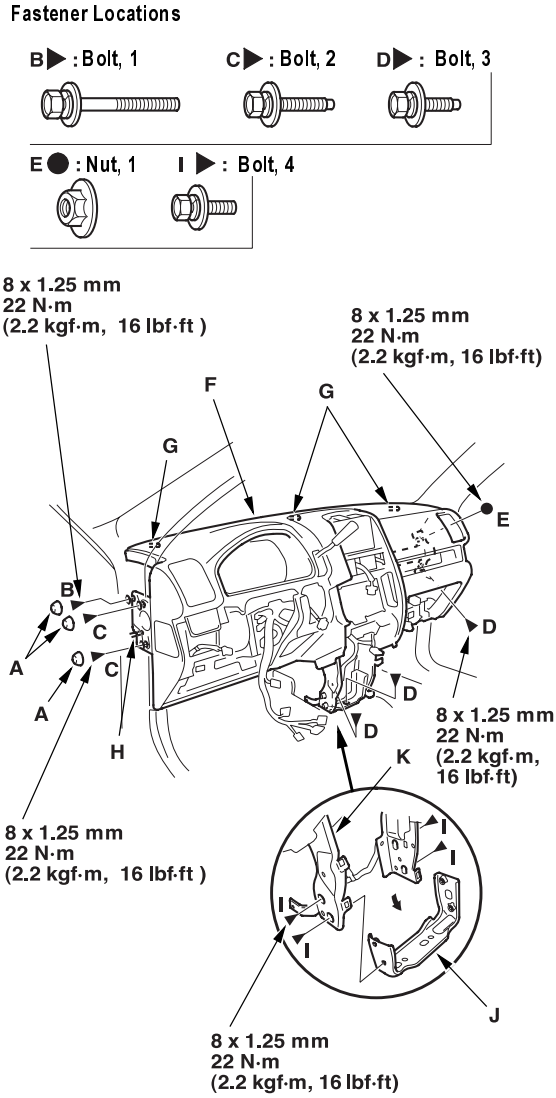


RHD:



7. Detach all of the harness and connector clips.

8. From outside the driver's door, remove the caps (A), then remove the bolts (B, C, D) and nut (E), and lift up on the dashboard (F) to release it from the guide pins (G, H) on the body. When pulling the dashboard out, remove the canter frame mounting bolts (I), then remove the center bracket (J) from the center frame (K). LHD is shown, RHD is symmetrical.



9. Carefully remove the dashboard through the front door opening.

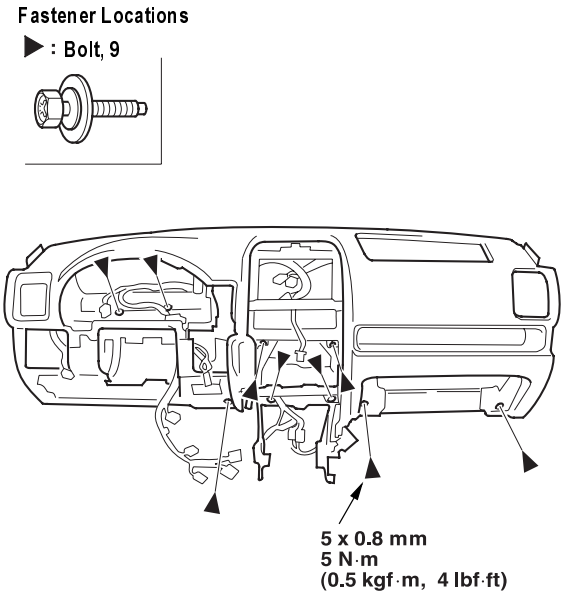
10. A/T model only: Remove the center bracket from the center frame.

11. Install the dashboard in the reverse order of removal, and note these items:
    - Make sure the dashboard fits onto the guide pins correctly.
    - Apply liquid thread lock to the center frame mounting bolts before reinstallation.
    - Reinstall the center bracket on the center frame, and slightly tighten the mounting bolts. Reinstall the dashboard on the body. After tightening both dashboard mounting bolts and nut, tighten the center bracket mounting bolts and center frame mounting bolts.
    - Before tightening the bolts, make sure each wire harness is not pinched.
    - Make sure the connectors are plugged in properly, and the antenna lead is connected properly.
    - Reconnect the negative cable to battery.
    - If equipped, enter the anti-theft code for the radio, then enter the customer's radio station presets.

Steering Hanger Beam Replacement

NOTE:
- Have an assistant help you when removing and installing the steering hanger beam.
- Take care not to scratch the dashboard.
- Put on gloves to protect your hands.
- LHD is shown, RHD is symmetrical.

1. Remove the dashboard (see page 20-96)
2. Remove these items from the dashboard:
    - Instrument panel (see page 20-87)
    - Gauge assembly (see page 22A-74)
    - Shift lever, A/T (see page 14-152)
    - AVN unit, for some models (see page 22B-26)
    - Audio unit (see page 22A-118)
    - Passenger's airbag (see page 23-136)
    - Sunlight sensor, auto A/C (see page 21-91)
3. Remove the bolts from the dashboard.



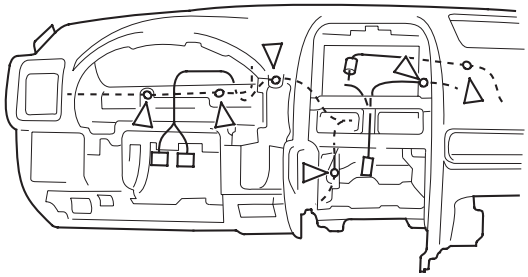
(cont'd)

Steering Hanger Beam Replacement (cont'd)

4. Detach the harness clips.

Fastener Locations

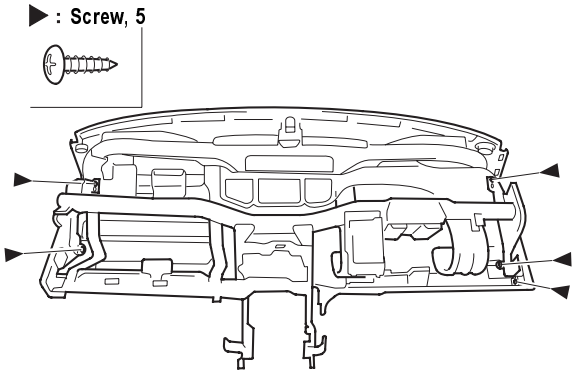
▷ : Harness Clip



5. From the back of the dashboard, remove the screws.

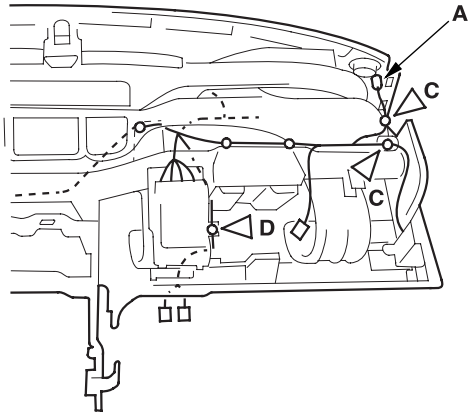
Fastener Locations

▶ : Screw, 5

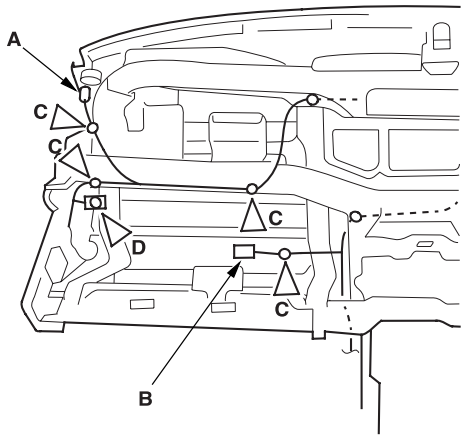


6. From the back of the dashboard, disconnect the tweeter connectors (A) (for some models) from both sides and the glove box light connector (B) (for some models), and detach the harness clips (C) and harness holders (D).

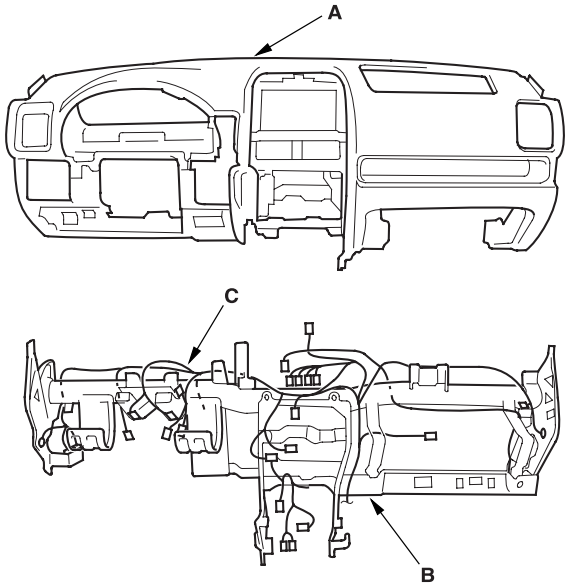
Driver's side:



Passenger's side:



7. With the help of an assistant, separate the dashboard (A) and steering hanger beam (B).

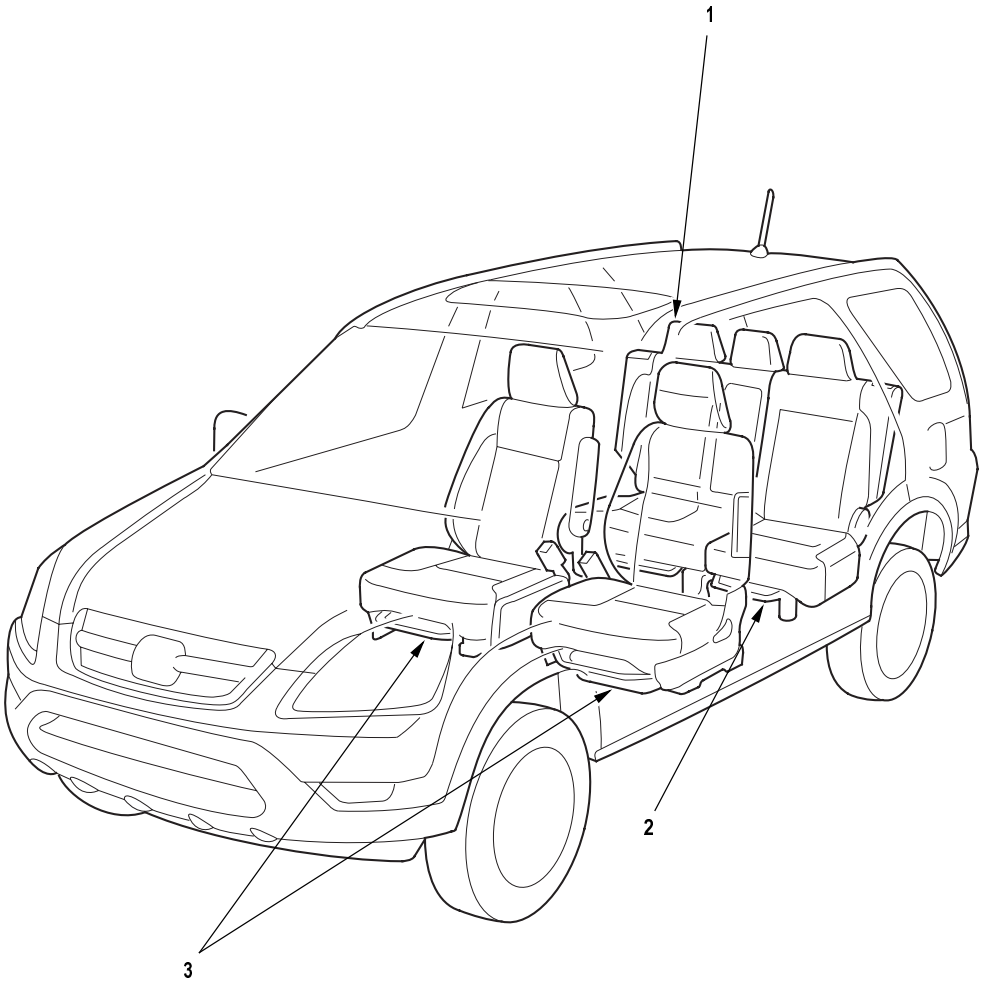


8. Install the beam in the reverse order of removal, and note these items:

- Make sure the dashboard wire harness (C) is not pinched.
- Make sure the connectors are plugged in properly.

Seats

Component Location Index



1	RIGHT REAR SEAT	Removal/Installation, page 20-114; Armrest Replacement, page 20-115; Armrest Cover Replacement, page 20-116; Seat Cover Replacement, page 20-117; Lock Control Cable Replacement, page 20-127; Seat-back Latch Lever replacement, page 20-128
2	LEFT REAR SEAT	Removal/Installation, page 20-114; Seat Cover Replacement, page 20-123; Seat-back Latch Lever Replacement, page 20-128
3	FRONT SEAT	Removal/Installation, page 20-103; Center Table Replacement, page 20-106; Armrest Replacement, page 20-107; Disassembly/Reassembly-with manual height adjustable, page 20-108; Disassembly/Reassembly-without manual height adjustable, page 20-109; Seat Cover Replacement, page 20-110

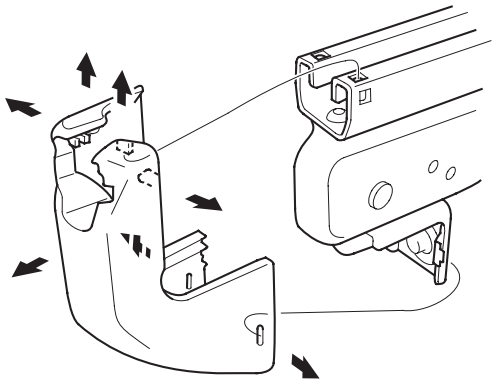
Front Seat Removal/Installation

For some models: SRS components are located in this area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16)) in the SRS section before performing repairs or service.

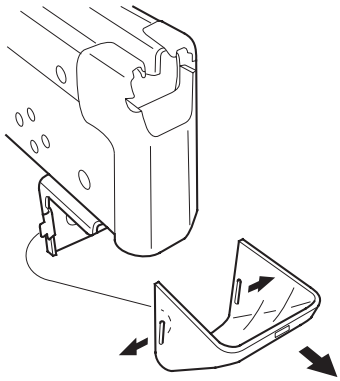
NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch the body or tear the seat covers.
- Put on gloves to protect your hands.
- LHD is shown, RHD is symmetrical.

1. If equipped, make sure you have the anti-theft code for the radio, then write down the frequencies for the preset buttons.
2. If equipped with a side airbag, disconnect the negative battery cable, and wait at least 3 minutes before beginning work.
3. Remove the front seat track end covers from the front of both seat tracks.

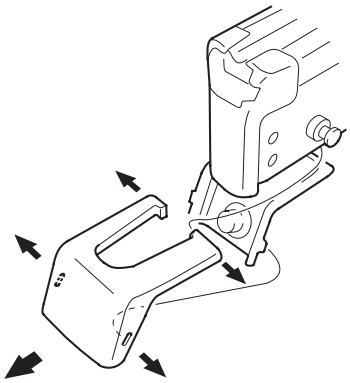
Driver's:



Passenger's:

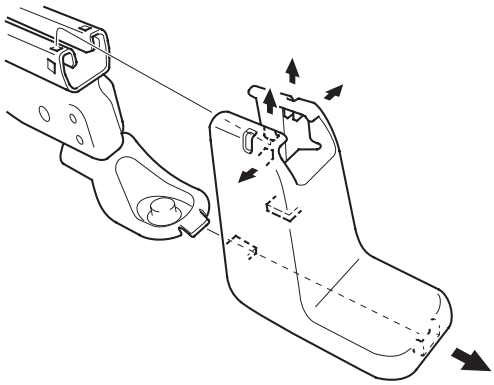


4. Remove the rear outer seat track end cover.

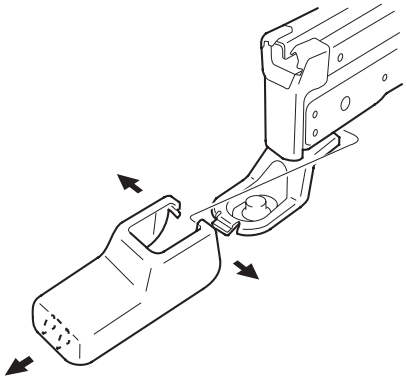


5. Remove the rear inner seat track end cover.

Driver's:



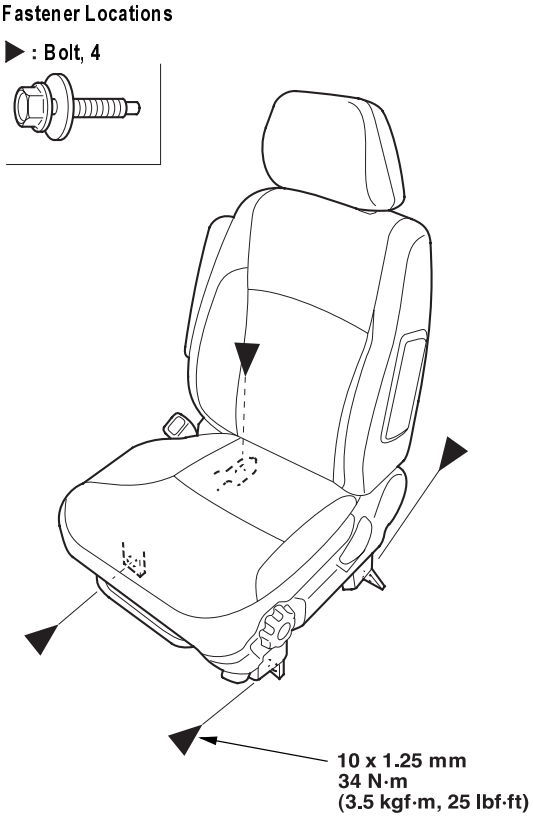
Passenger's:



(cont'd)

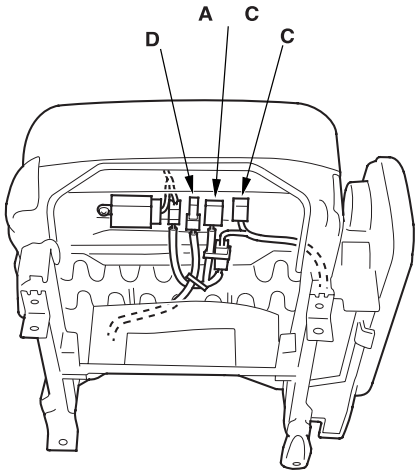
Front Seat Removal/Installation (cont'd)

6. Remove the bolts securing the front seat.

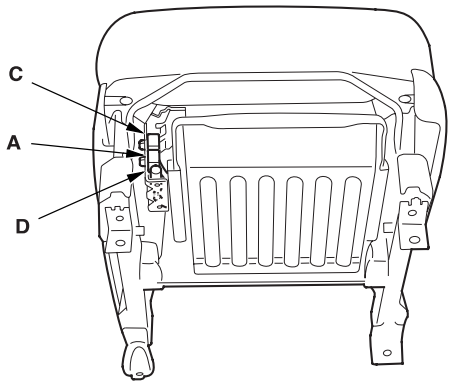


7. For some models: Lift up the front seat, disconnect the seat sub harness connector (A) or the seat belt switch connector (B), the seat belt buckle tensioner connector (C), and the side airbag connector (D). RHD is shown, LHD is symmetrical.

Driver's:



Passenger's:



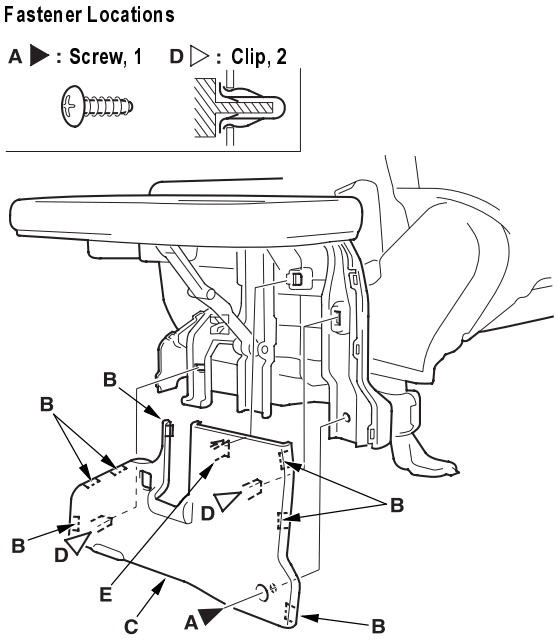
8. Remove the headrest.
9. With the help of an assistant, carefully remove the front seat through the front door opening.
10. Install the seat in the reverse order of removal, and note these items:
    - Make sure each connector is plugged in properly.
    - If equipped with a side airbag, reconnect the negative cable to the battery.
    - If equipped, enter the anti-theft code for the radio, then enter the customer's radio station presets.

Front Seat Center Table Replacement

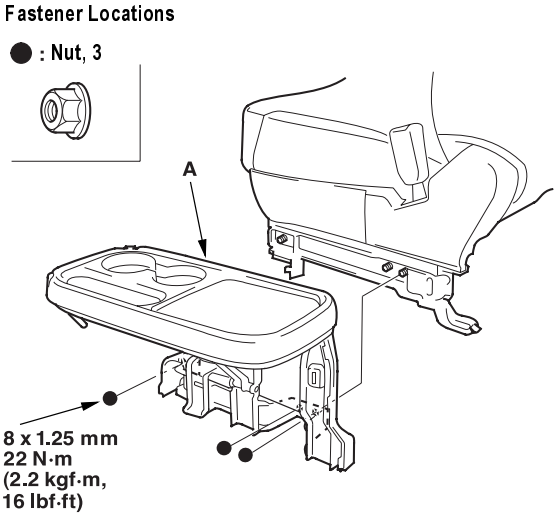
NOTE:
- Take care not to scratch the dashboard, tear the seams or damage the seat covers.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Put on gloves to protect your hands.
- A/T models are shown, and M/T models are similar.

1. Set up the table.

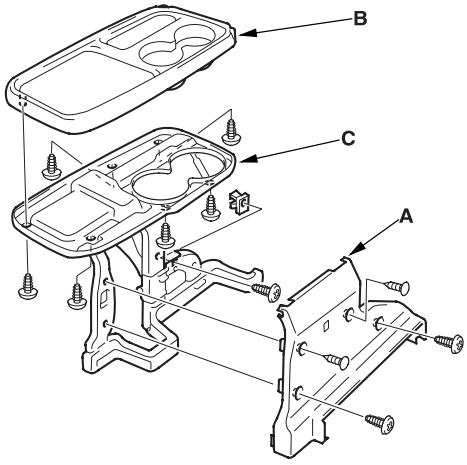
2. Remove the screw (A), release the tabs (B), and pull the outer cover (C) back to detach the clips (D) and hooks (E), then remove it.



3. Remove the nuts, then remove the center table (A).



4. Remove the inner cover (A) and the center table cover (B) from the center table frame (C).



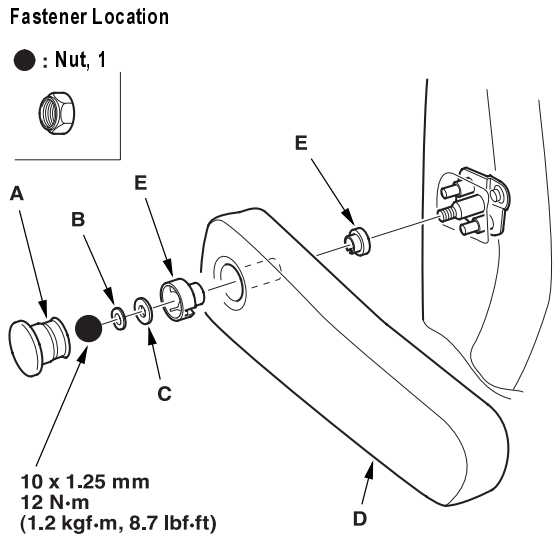
5. Install the table in the reverse order of removal, and note these items:
- Replace any damaged clips.
- Push the clip, hook, and tab portions into place securely.

Front Seat Armrest Replacement

For Some Models

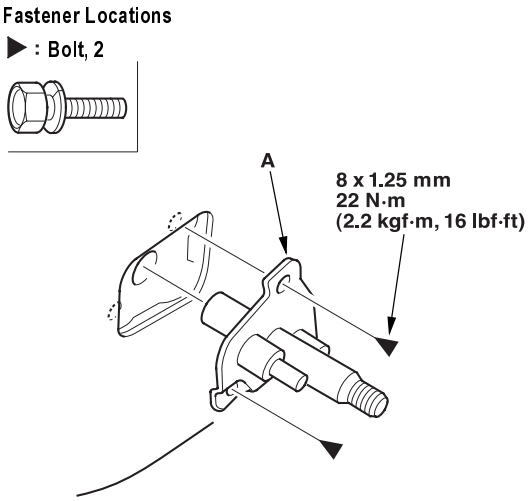
NOTE: Take care not to tear the seams or damage the seat covers.

1. Remove the cap (A).



2. Remove the nut, the washer (B), and the wave washer (C), then remove the armrest (D). If necessary, remove the bushings (E) from the armrest.

3. Remove the bolts, then remove the armrest bracket (A).



4. Install the armrest in the reverse order of removal.

Front Seat Disassembly/Reassembly - With Manual Height Adjustable

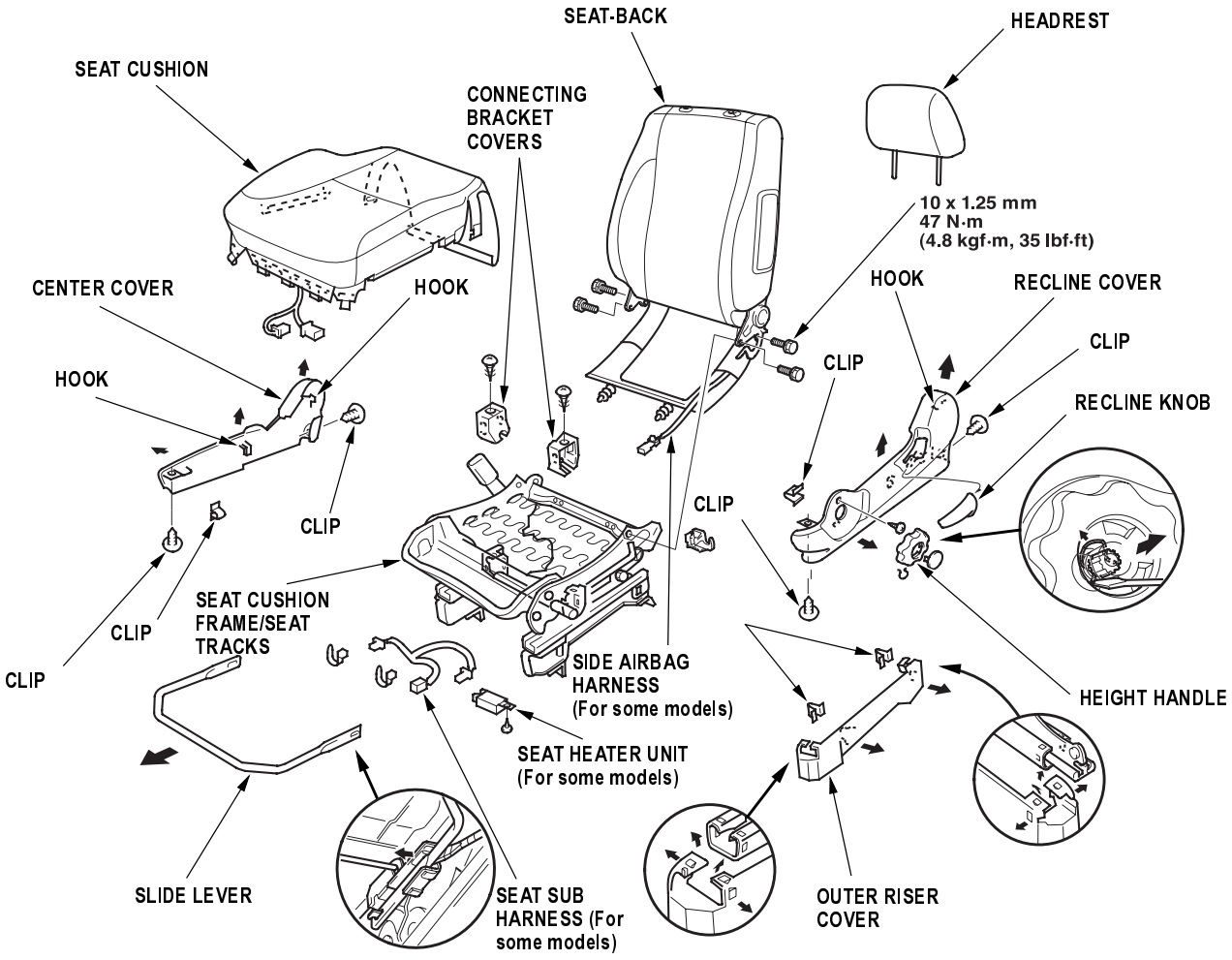
For some models: SRS components are located in this area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- The left side seat is shown, the right side seat is symmetrical.

Disassemble the seat as shown. For seat cushion removal and installation procedures, refer to Front Seat Cover Replacement (see page 20-112).

Reassemble the seat in the reverse order of disassembly, and note these items:

- Apply multipurpose grease to the moving portion of the seat track.
- To prevent wrinkles in the seat cushion cover, stretch the material evenly over the pad.



Front Seat Disassembly/Reassembly - Without Manual Height Adjustable

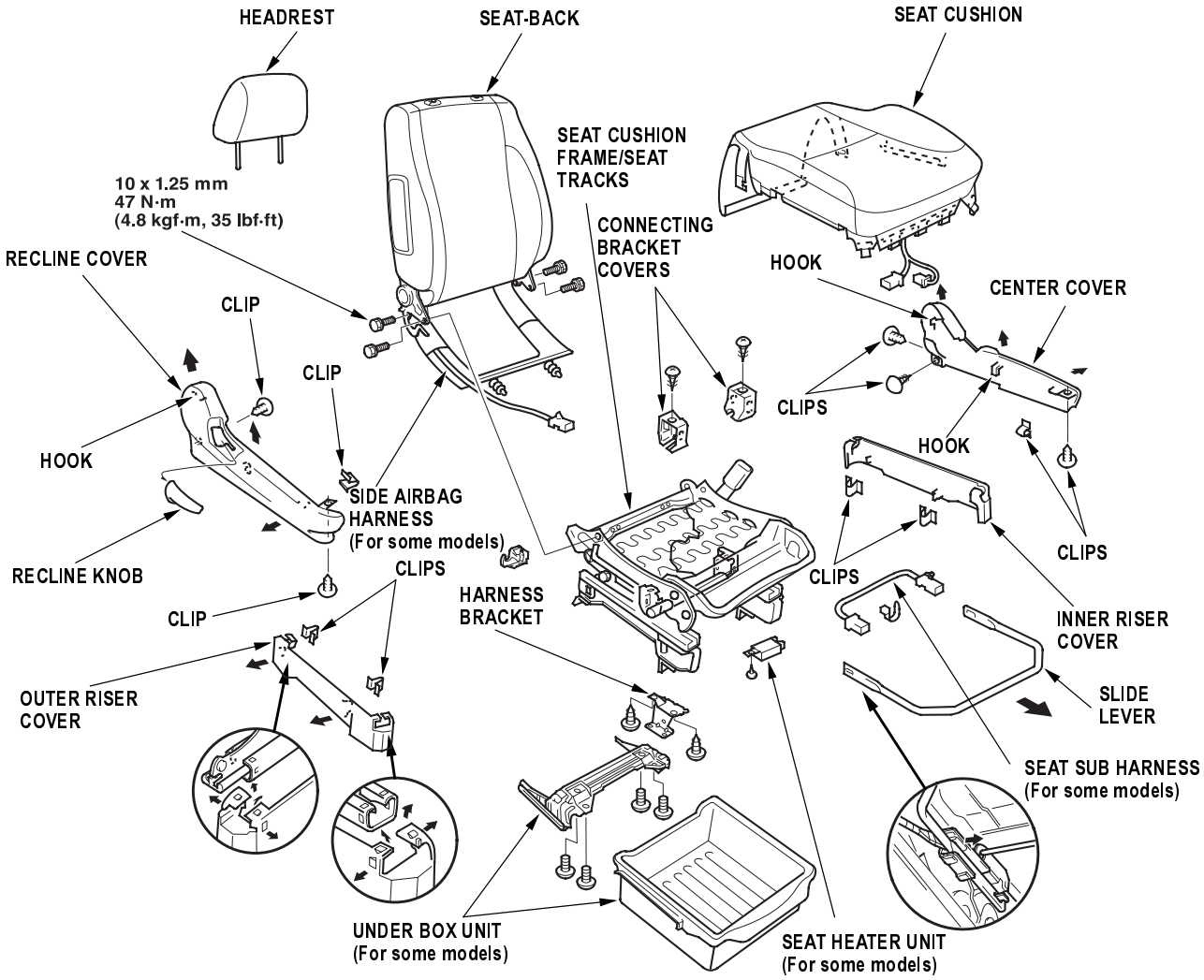
For some models: SRS components are located in this area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- The right side seat is shown, the left side seat is symmetrical.

Disassemble the seat as shown. For seat cushion removal and installation procedures, refer to Front Seat Cover Replacement (see page 20-112).

Reassemble the seat in the reverse order of disassembly, and note these items:

- Apply multipurpose grease to the moving portion of the seat track.
- To prevent wrinkles in the seat cushion cover, stretch the material evenly over the pad.



Front Seat Cover Replacement

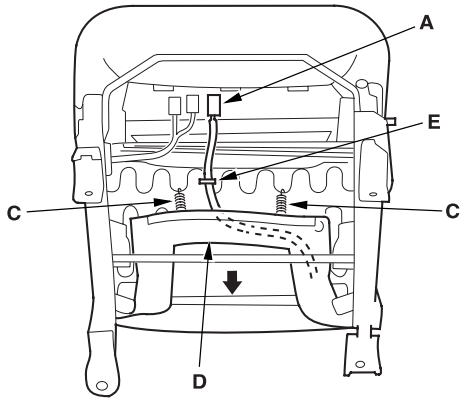
For some models: SRS components are located in this area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE:
- Take care not to tear the seams or damage the seat covers.
- On the passenger's seat with side airbag, do not touch the OPDS sensor in the seat-back pad, and keep it away from oil. Oil can corrode the sensor causing it to fail.
- Put on gloves to protect your hands.

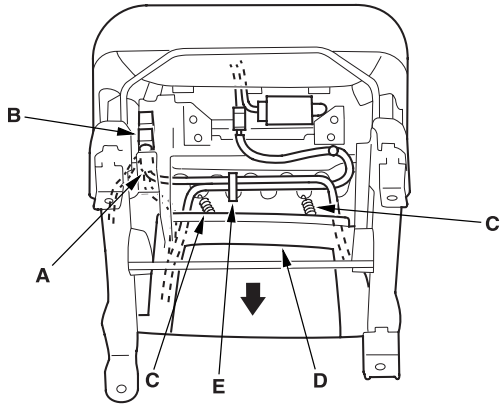
Seat-back Cover

1. Remove the front seat (see page 20-103).
2. If equipped, remove the armrest (see page 20-107).
3. With side airbag: From under the seat cushion, detach the side airbag connector clip (A), and from under the passenger's eat cushion on some RHD models, detach the seat sub harness connector clip (B). Release the hook springs (C), pull the seat cushion cover (D) back, then remove the harness bands (E). The passenger's seat on RHD model is shown, and the passenger's seat on LHD model is symmetrical except it has no OPDS unit.

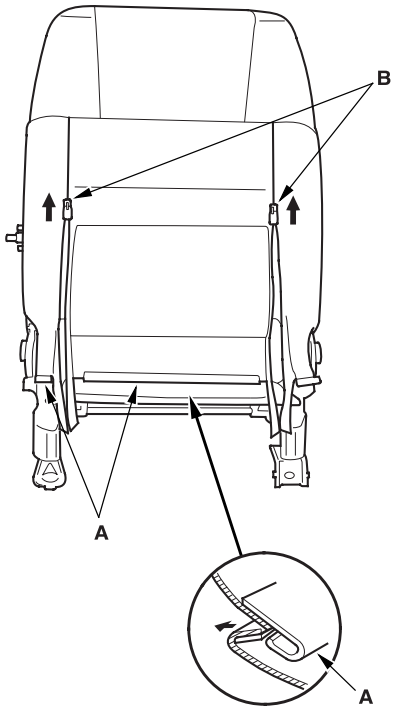
Driver's (LHD):



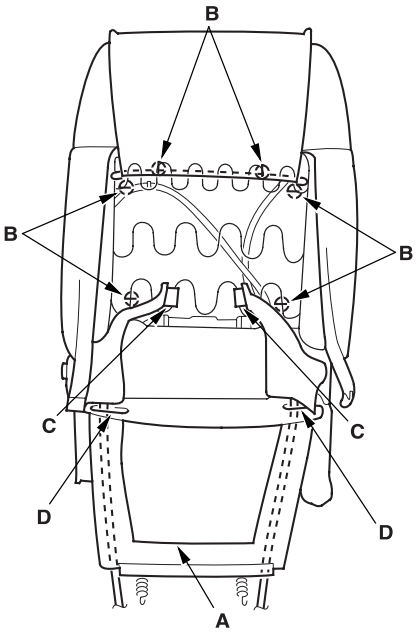
Passenger's (RHD):



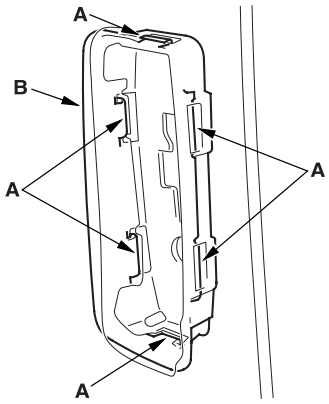
4. Fold the seat-back forward.
5. With side airbag: Release the hooks (A), and unzip the seat-back cover (B).



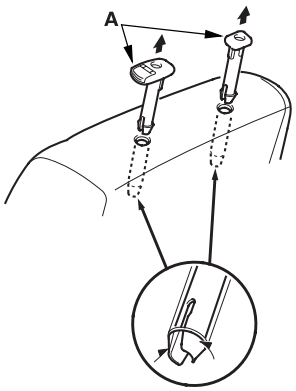
6. Turn over the seat back cover (A), release the inside springs (B) and hooks (C). Pull the side airbag harness, and if equipped, the OPDS unit harness out through the holes (D) in the seat-back cover.



7. With side airbag: Remove the side airbag (see (see page 23-137), and release the hooks (A) from the airbag module holder (B).



8. Pull out the headrest guides (A) while pinching the end of the guides, and remove them.



9. Pull back the seat-back cover all the way around, then remove it.

10. Install the cover in the reverse order of removal, and note these items:
    - To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the clips, hooks, and inside springs.
    - Make sure the side airbag harness is routed properly.
    - If necessary, reinitialize the OPDS control unit (see page 23-30).

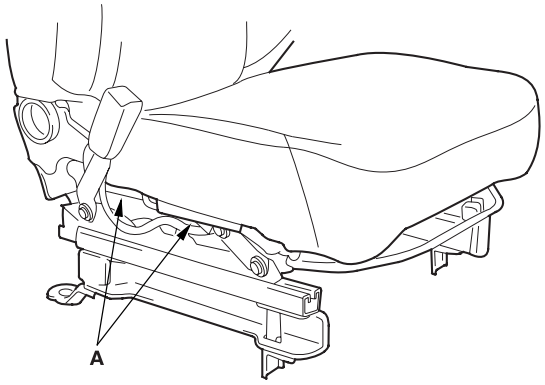
(cont'd)

Front Seat Cover Replacement (cont'd)

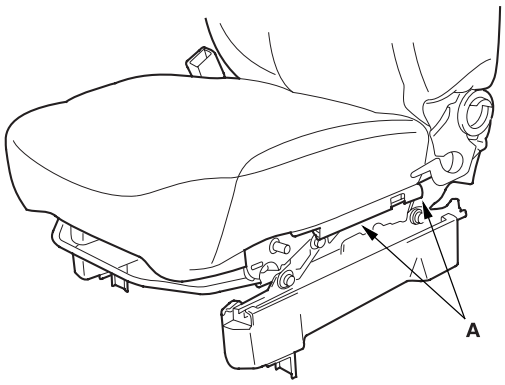
Seat Cushion Cover

1. Remove the front seat (see page 20-103).
2. Remove these items from the front seat:
   - Center table (see page 20-106)
   - Recline cover, driver's seat (see page 20-108), passenger's seat (see page 20-109)
   - Center cover, driver's seat (see page 20-108), passenger's seat (see page 20-109)
3. From under the seat cushion, detach the side airbag connector clip, and from under the passenger's seat, on some RHD models, detach the OPDS unit connector clip. Release the hook springs from the seat cushion frame spring, then pull the cover back, and remove the harness bands.
4. Release the hook, and unzip the seat-back cover. Pull the side airbag harness and the OPDS harness (passenger's seat on some RHD models) out through the hole in the seat-back cover.
5. Remove the clip, and release the hooks (A).

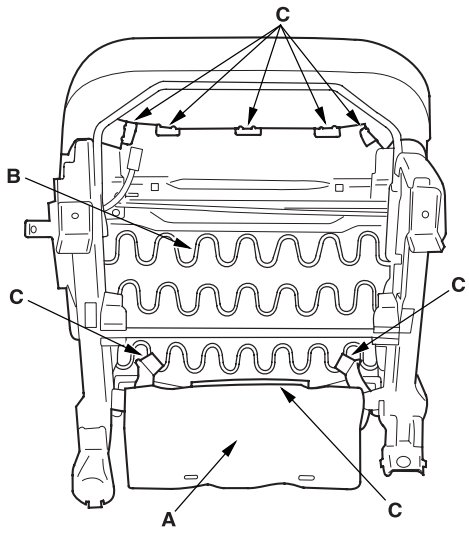
Inside:



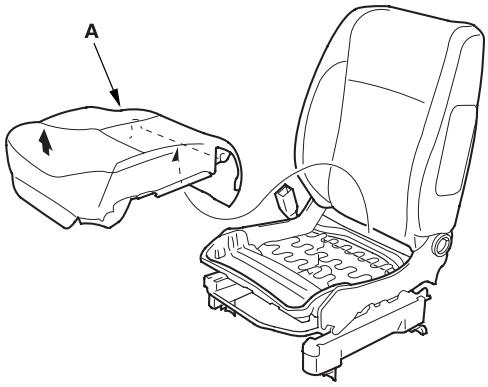
Outside:



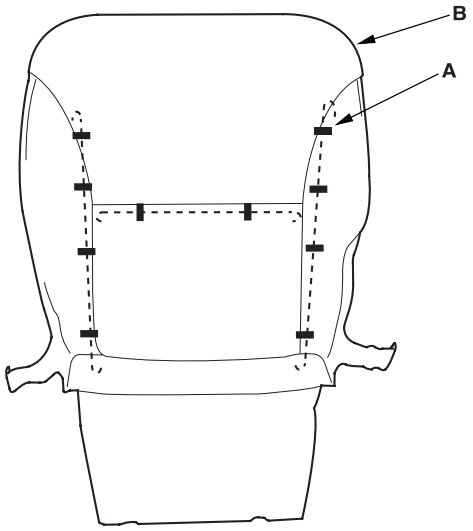
6. From under the seat cushion, release the seat cushion cover (A) from the seat cushion frame spring (B), and release the hooks (C).



7. Remove the seat cushion cover (A) with the seat cushion pad from the seat cushion frame.

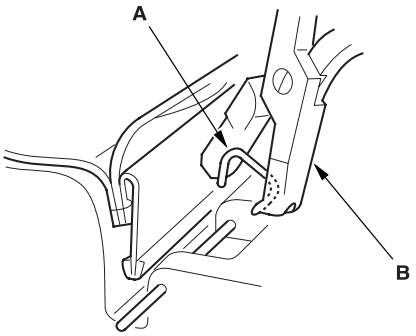


8. Pull back the edge of the seat cushion cover all the way around, and release the clips (A), then remove the seat cushion cover (B).



9. Install the cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips and hooks.
- Make sure the side airbag harness and OPDS harness (passenger's seat) are routed properly.
- Replace any clips you removed with new ones (A). Install them with commercially available upholstery ring pliers (B).

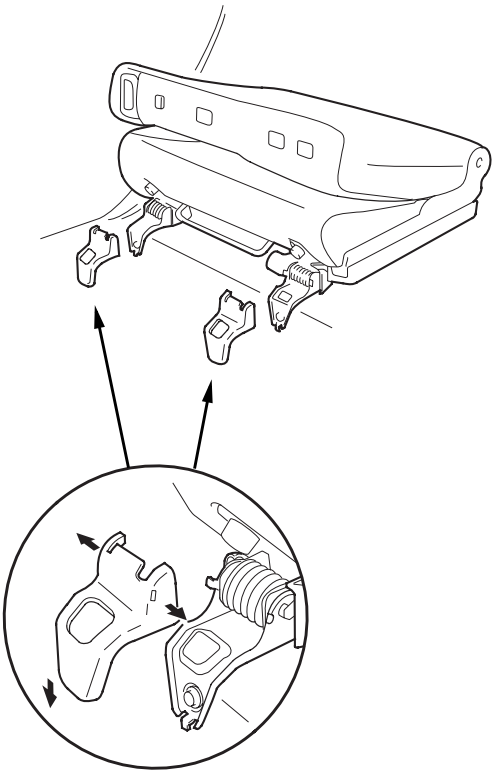


Rear Seat Removal/Installation

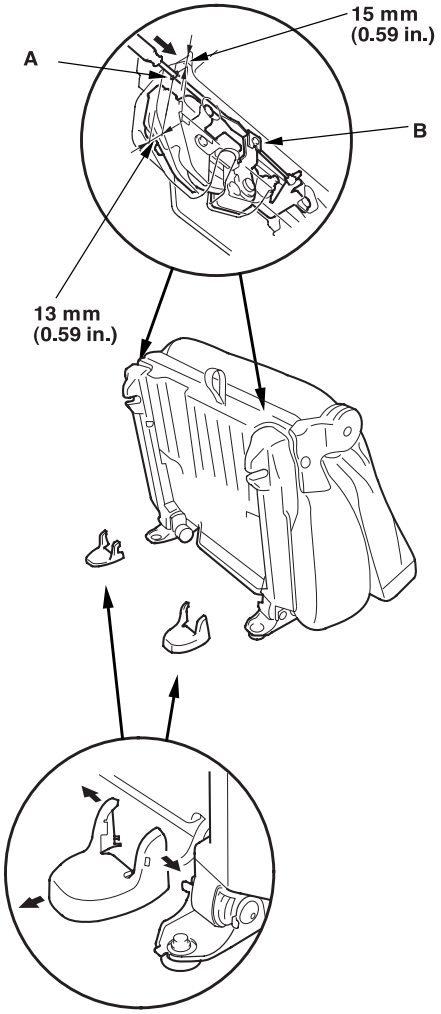
NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Take care not to scratch the body or rear the seat covers.
- Right rear seat is shown, and left rear seat is similar.

1. Remove the headrests. Fold the seat-back forward, and slide the rear seat backward fully.

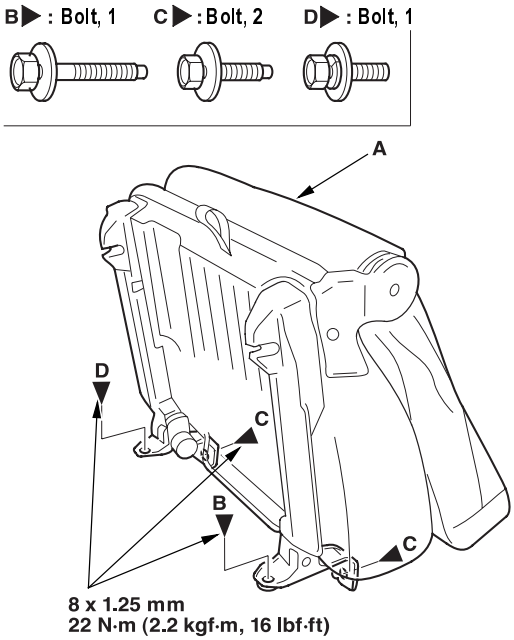
2. Remove the front seat track end covers from the front of both seat tracks.



3. Unlock the rear seat and tip it up, then remove the rear seat track end covers from the back of both seat tracks. If the seat cannot be unlocked by pulling the strap, make the holes (A) in the back of both seat tracks as shown. Insert a flat-tip screwdriver over 100 mm (3.94 in.) through holes, and push both levers (B) to unlock the seat.



4. While holding the rear seat (A) up, remove the mounting bolt (B, C, D).

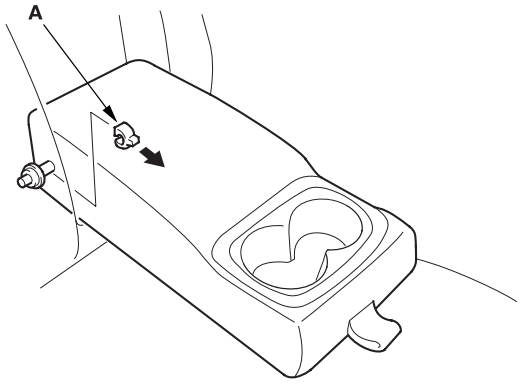


5. With the help of an assistant, remove the rear seat (A) through the door opening.
6. Install the rear seat in the reverse order of removal.

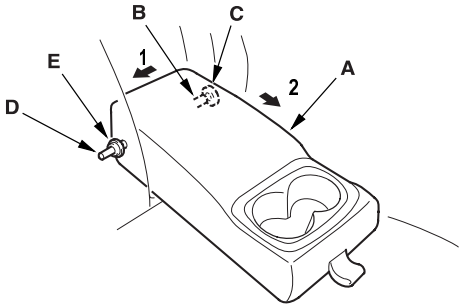
Rear Seat Armrest Replacement

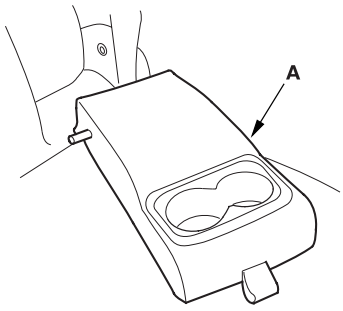
NOTE: Take care not to tear the seams or damage the seat covers.

1. Remove the clip (A) from the right portion of the armrest pivot.



2. Remove the armrest.
   - Slide the armrest (A) toward the right, side.
   - Remove the left pivot shaft (B) from the collar (C), and remove the right pivot shaft (D) from the collar (E) by pulling the armrest back.



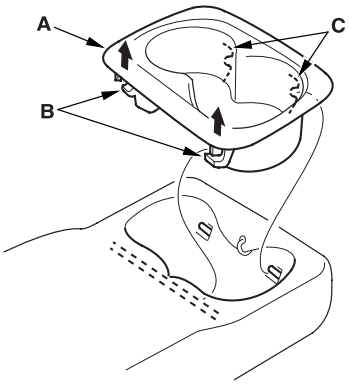


3. Install the armrest in the reverse order of removal.

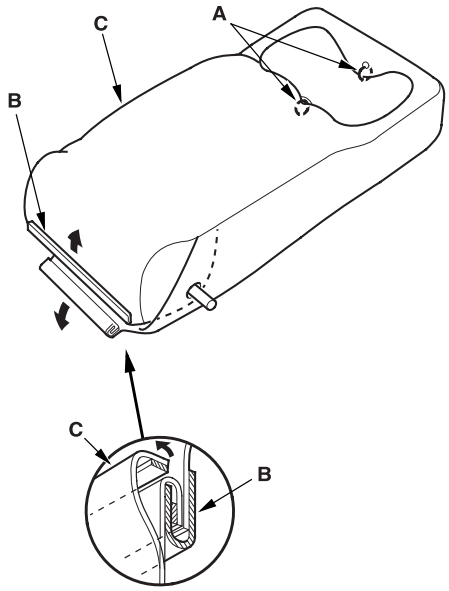
Rear Seat Armrest Cover Replacement

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.

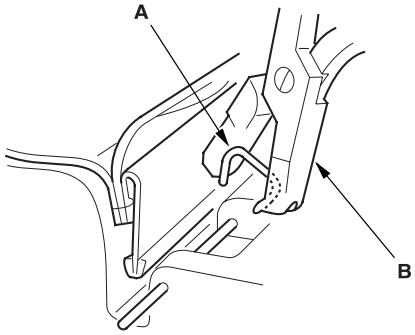
1. Remove the armrest (see page 20-115).
2. Remove the beverage holder (A).
   1 Pull up on the rear edge of the holder to release the hooks (B).
   2 Release the front hooks (C), then remove the holder.



3. Release the clips (A) from the beverage holder opening, release the rear hook (B), then pull back the edge of the armrest cover (C) all the way around and remove it.



4. Install the cover in the reverse order of removal, and note these items:
   - To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips and hooks.
   - Replace any clips you removed with new ones (A). Install them with commercially available upholstery ring pliers (B).

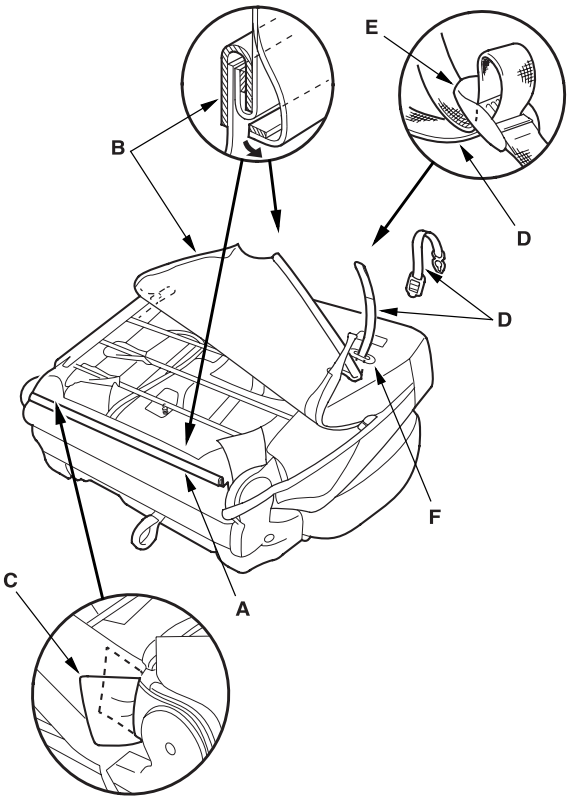


Right Rear Seat Cover Replacement

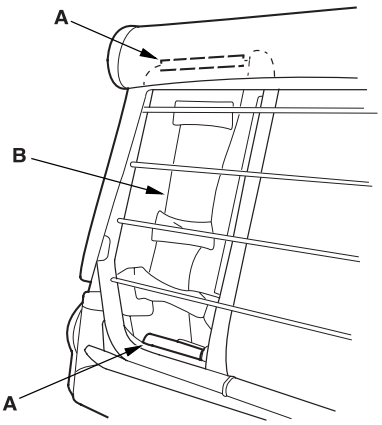
NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.

Seat-back Cover

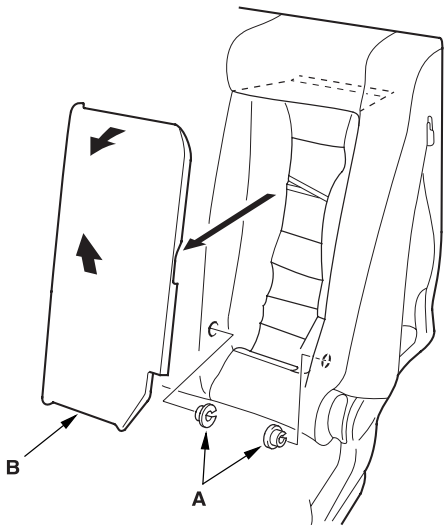
1. Remove the right rear seat (see page 20-114).
2. Remove the armrest (see page 20-115).
3. Release the bottom hook (A), unzip the seat-back cover (B), then fold back the cover. From between the left recline adjuster and the pad, remove a piece of cloth (C).



4. Loosen the seat-back strap (D) with the adjuster (E), and separate it into two pieces. Pull the strap secured on the seat-back frame inside the seat-back cover through the slot (F).
5. Release the hook strips (A) from the edge of the armrest back cover (B).



6. From the front of the seat-back, remove the armrest collars (A) and armrest back cover (B).

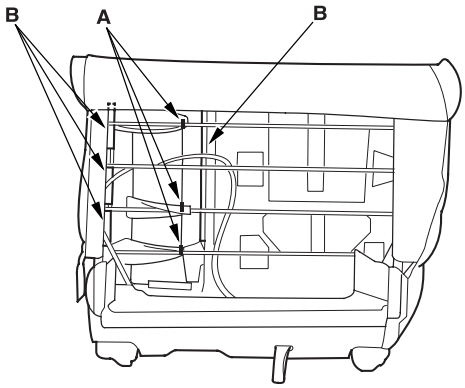


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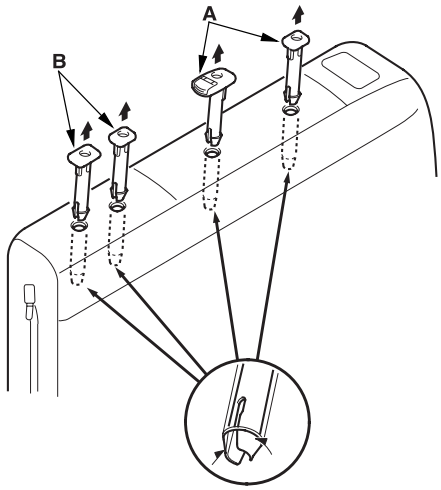
Right Rear Seat Cover Replacement (cont'd)

Seat-back Cover (cont'd)

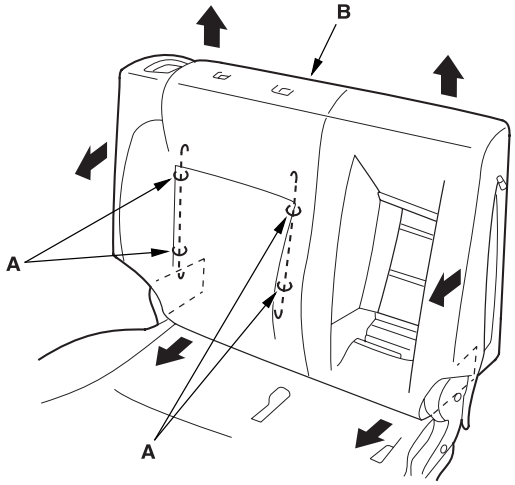
7. Release the clips (A) and hook strips (B) from the back of the seat-back.



8. Pull out the headrest guides (A), and if equipped, center headrest guides (B) while pinching the end of the guides, and remove them.

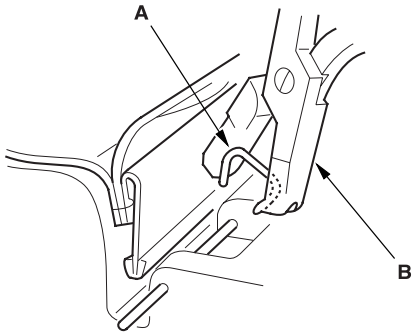


9. Pull back the edge of the seat-back cover all the way around, and release the clips (A), then remove the seat-back cover (B).



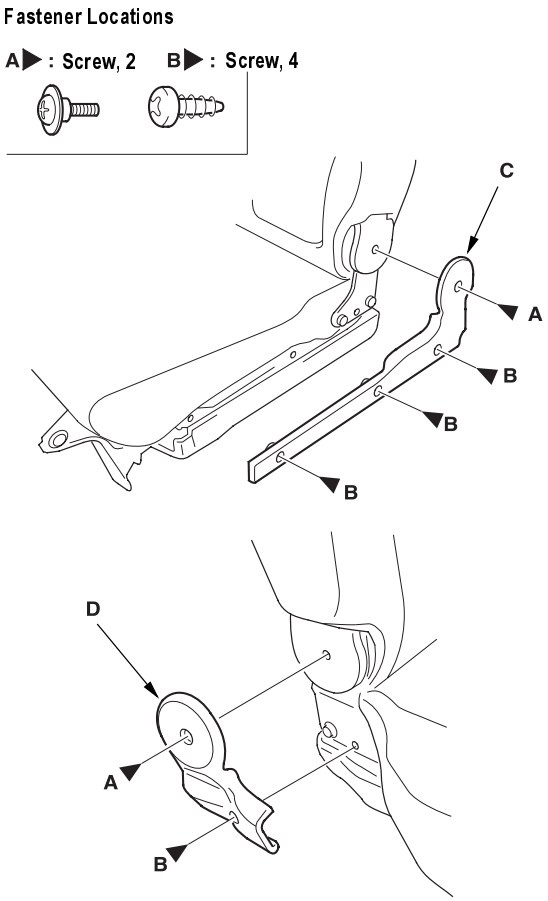
10. Install the seat-back cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hook and clips.
- Replace the any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).

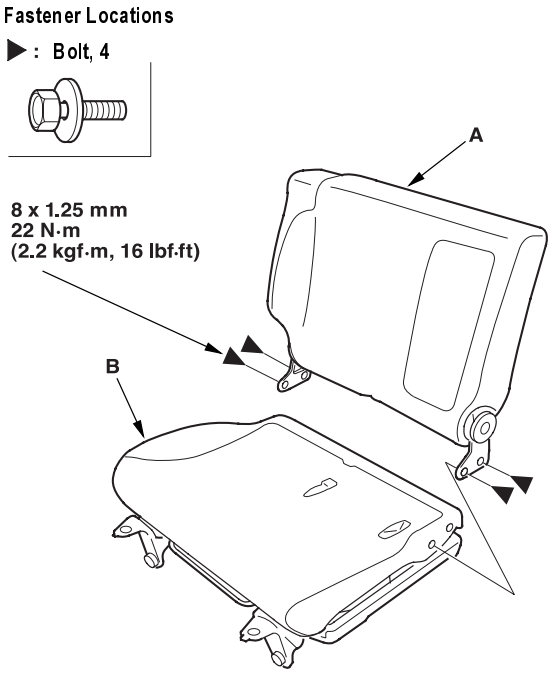


Seat Cushion Cover

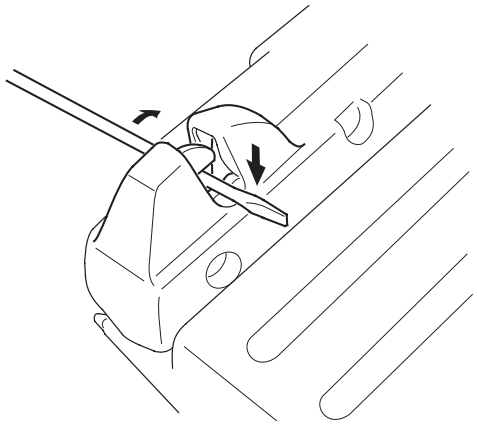
1. Remove the right rear seat (see page 20-114).
2. Remove the screws (A, B), then remove the recline cover (C) and the center cover (D).



3. Remove the bolts searing the seat-back (A) and seat cushion (B), then separate them.



4. To allow the seat cushion to slide, use a screwdriver to move the latch.



(cont'd)

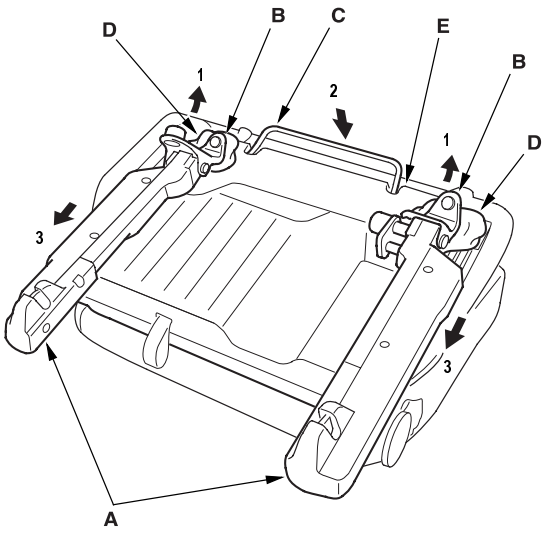
Right Rear Seat Cover Replacement (cont'd)

Seat Cushion Cover (cont'd)

5. Slide both seat tracks (A) backward fully.

1 Raise both foot brackets (B), and hold them.
2 Push the slide lever (C) down.
3 While holding both foot brackets, slide both seat tracks backward fully.
4 Place a shop towel (D) between the brackets and the under cover (E).

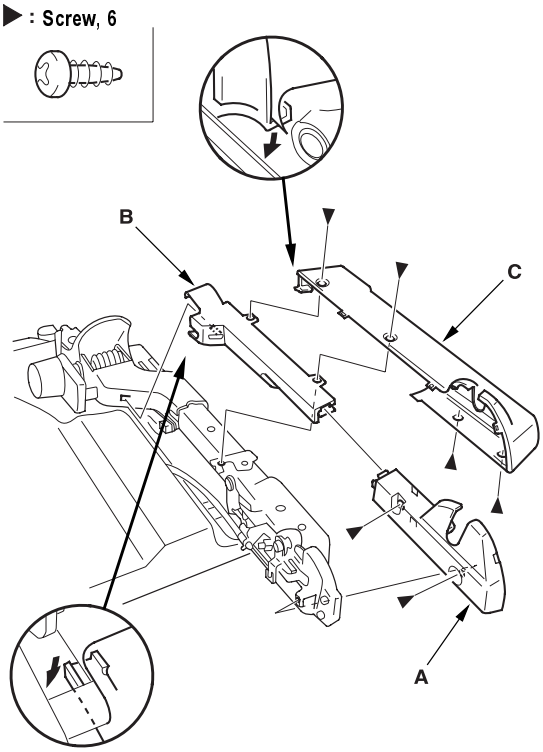
NOTE: While sliding both seat tracks, keep both foot brackets raised securely so as not to make them return with their spring tensions.



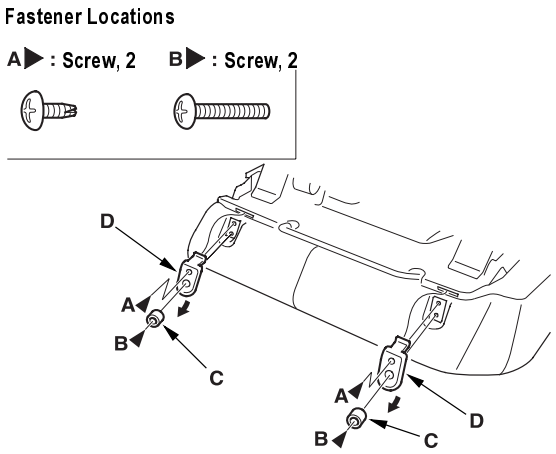
6. Remove the screws, then remove the latch cover (A), outer seat track cover B (B), and outer seat track cover A (C), the left seat track is shown, the right seat track is similar.

Fastener Locations

▶ : Screw, 6



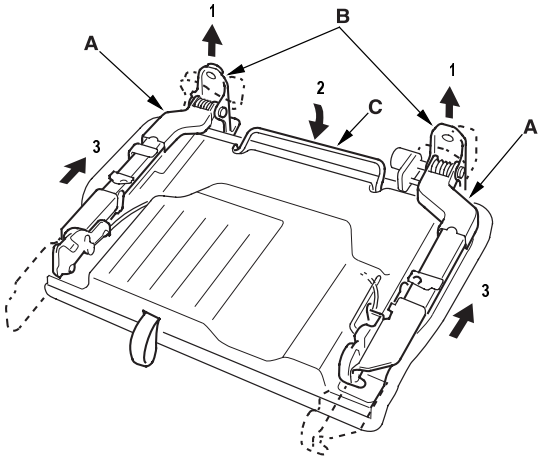
7. Remove the screws (A, B), then remove both dampers (C) and both damper covers (D).



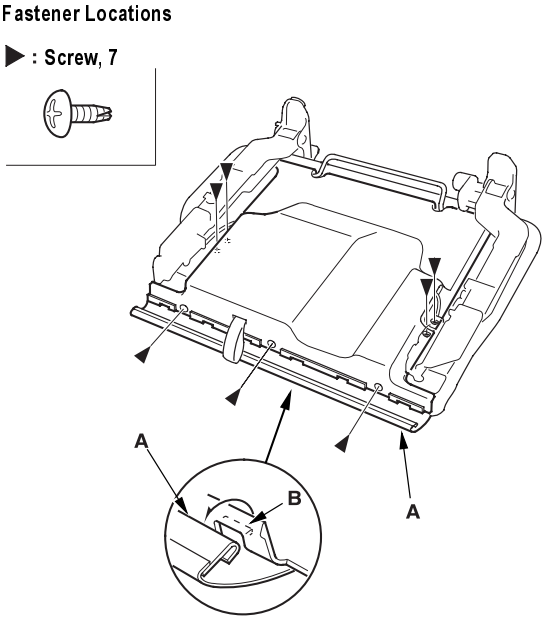
8. Slide both seat tracks (A) forward fully.

1 Raise both foot brackets (B), and hold them.
2 Push the slide lever (C) down.
3 While holding both foot brackets, slide both seat tracks forward fully.

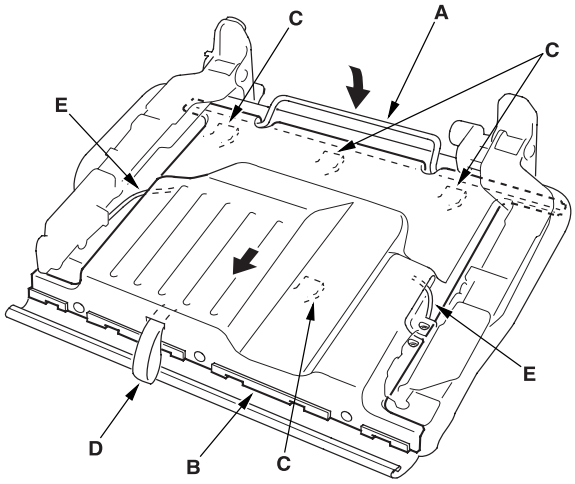
NOTE: While sliding both seat tracks, keep both foot brackets raised securely so as not to make them return with their spring tensions.



9. Pull back the rear edge of the seat cushion cover (A) to release it from the hooks (B), and remove the screws.



10. While pushing the slide lever (A) down, remove the under cover (B) by pulling it to release the hooks (C). Pass the strap (D) through a slot, and both side cables (E) through each side slit in the cover. Take care not to band any cable.

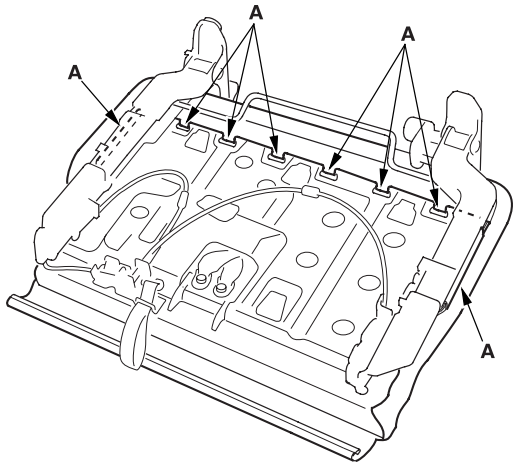


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Right Rear Seat Cover Replacement (cont'd)

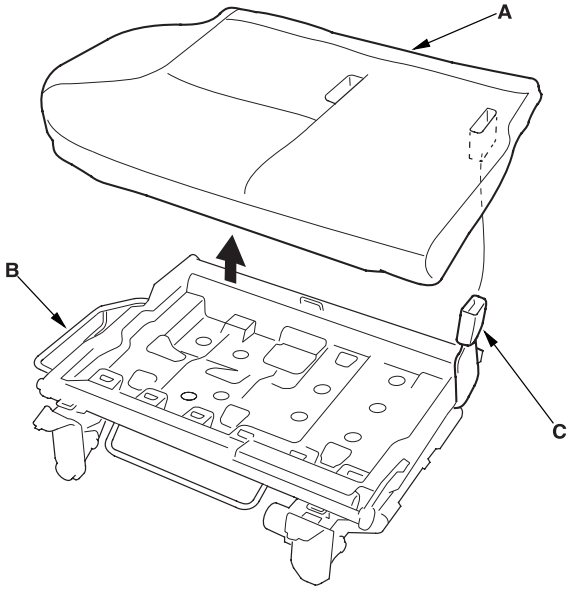
Seat Cushion Cover (cont'd)

11. Release all of the hook strips (A).

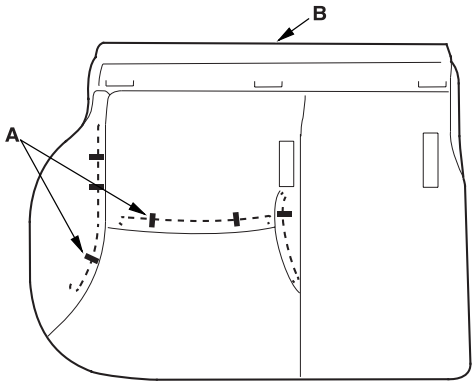


12. Remove the rear seat belt buckle and center seat belt/detachable anchor (see step 3 on page 23-10.

13. Remove the seat cushion cover (A) with the seat cushion pad from the seat cushion frame (B). Pass the center seat belt buckle (C) through a hole in the seat cushion cover.

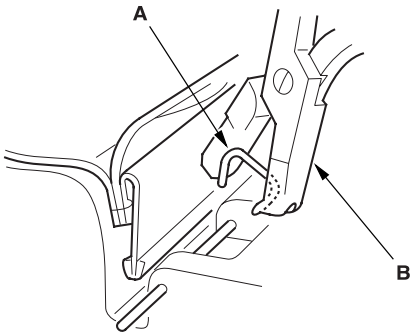


14. Pull back the edge of the seat cushion cover all the way around, and release the clips (A), then remove the seat cushion cover (B).



15. Install the cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the hook and clips.
- Replace any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).

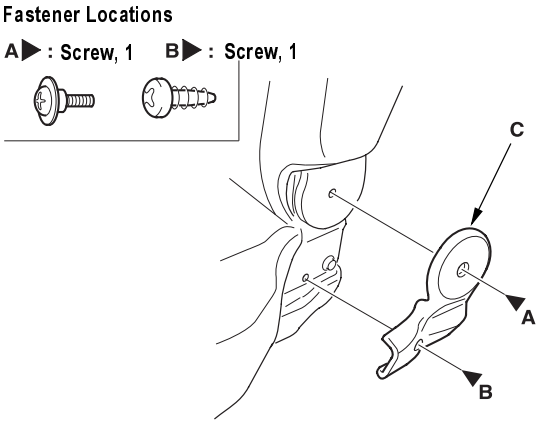


Left Rear Seat Cover Replacement

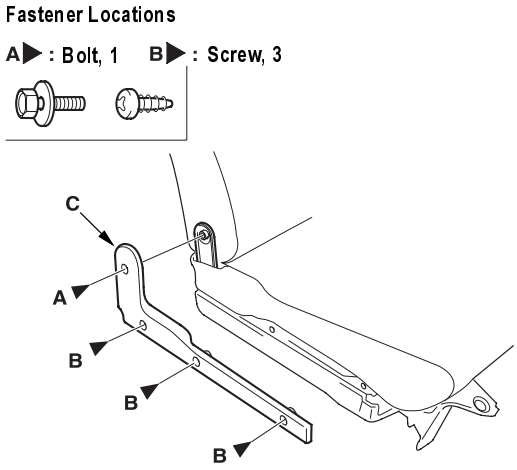
NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.

Seat-back Cover

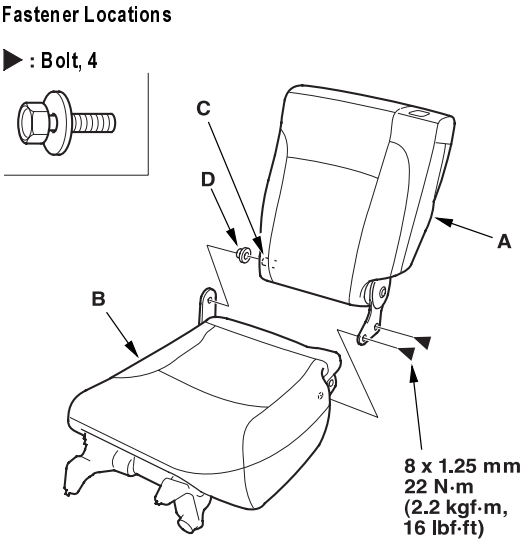
1. Remove the left rear seat (see page 20-114).
2. Remove the screws holder (A, B), then remove the recline cover (C).



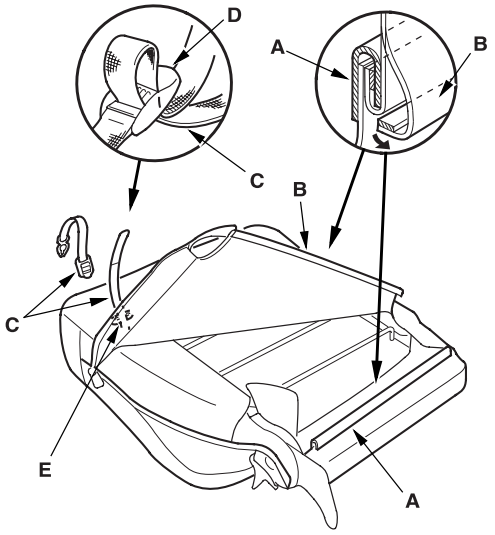
3. Remove the bolt (A) and screw (B), then remove the center cover (C).



4. Remove the bolts securing the seat-back (A) and seat cushion (B), pull the center pivot (C) out from the pivot bracket then separate them. If necessary, remove the bushing (D).



5. Release the bottom hook (A), unzip the seat-back cover (B), then fold back the cover. Loosen the seat-back strap (C) with the adjuster (D), and separate it into two pieces. Pull the strap secured on the seat-back frame in inside of the seat-back cover through the slot (E).

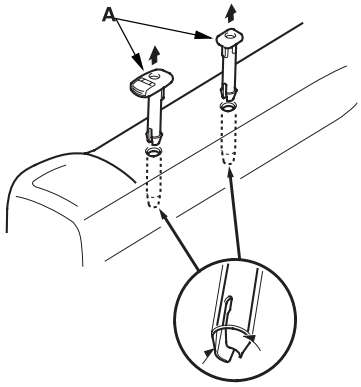


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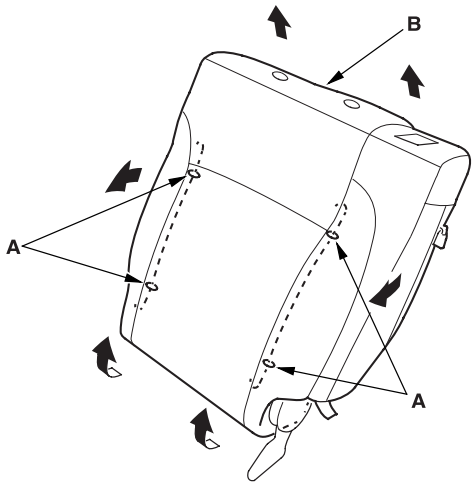
Left Rear Seat Cover Replacement (cont'd)

Seat-back Cover (cont'd)

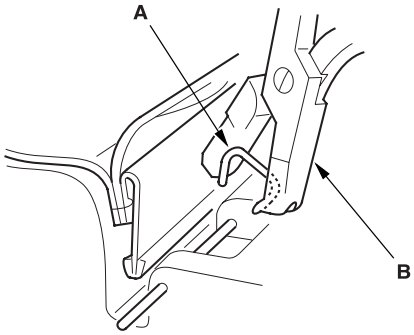
6. Pull out the headrest guides (A, B) while pinching the end of the guides, and remove them.



7. Remove the latch cover (see page 20-128).
8. Pull back the edge of the seat-back cover all the way around, and release the clips (A), then remove the seat-back cover (B).

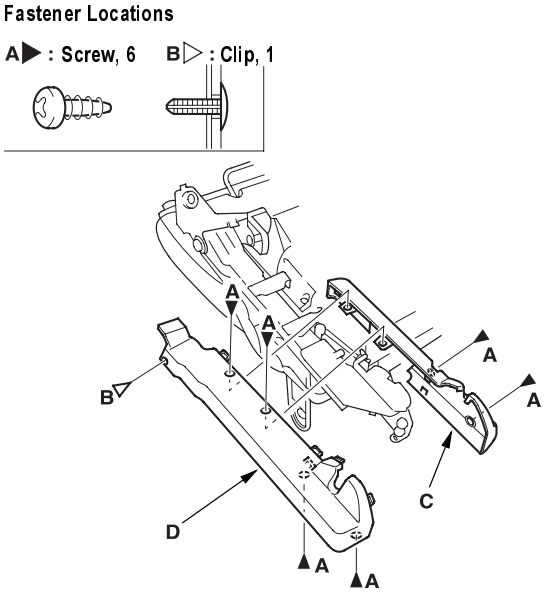


9. Install the seat-back cover in the reverse order of removal, and note these items:
   - To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hook and clips.
   - Replace any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).

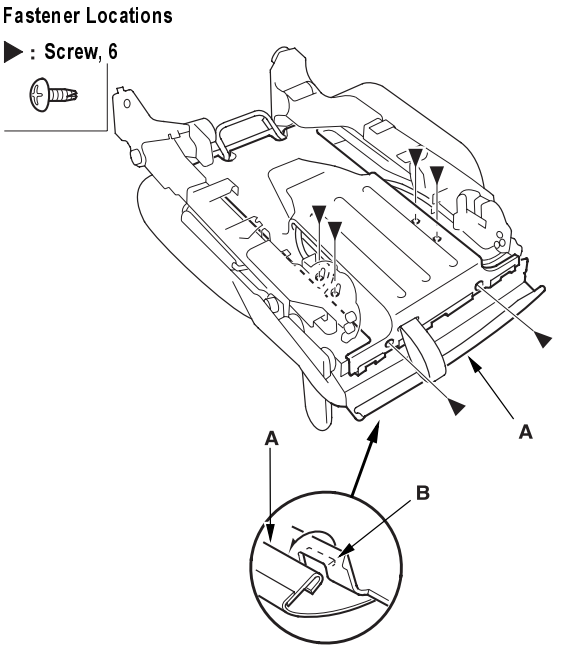


Seat Cushion Cover

1. Remove the left rear seat (see page 20-114).
2. Remove the seat-back.
3. To allow the seat cushion to slide, use a screwdriver to move the latch (see step 4 on page 20-119).
4. Slide both seat tracks backward fully (see step 5 on page 20-120).
   NOTE: While sliding the outer seat track, keep the outer foot bracket raised securely so as not to make it return with its spring tension.
5. Remove the outer seat track cover (see step 6 on page 20-120).
6. Remove the screws (A) and release the clips (B), then remove the inner seat track end cover B (C) and inner seat track end cover A (D).



7. Remove both dampers and both damper covers (see step 7 on page 20-121).
8. Slide both seat tracks forward fully (see step 8 on page 20-121).
   NOTE: While sliding the outer seat track, keep the outer foot bracket raised securely so as not to make it return with its spring tension.
9. Pull back the rear edge of the seat cushion cover (A) to release it from the hooks (B), and remove the screws.

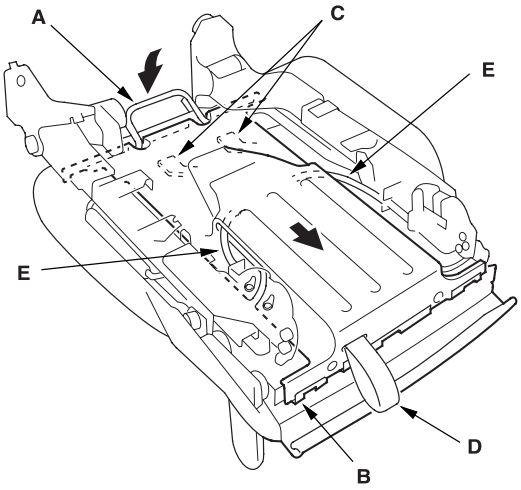


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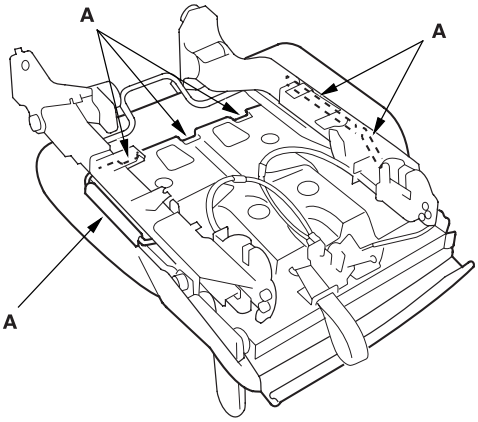
Left Rear Seat Cover Replacement (cont'd)

Seat Cushion Cover (cont'd)

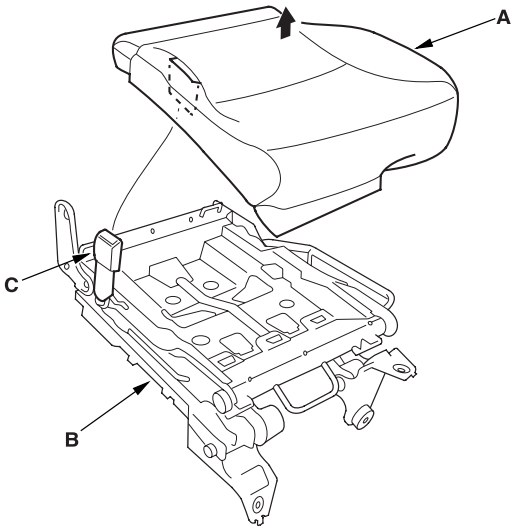
10. While pushing the slide lever (A) down, remove the under cover (B) by pulling it to release the hooks (C). Pass the strap (D) through a slot, and both side cables (E) through each side slit in the cover. Take care not to bend any cable.



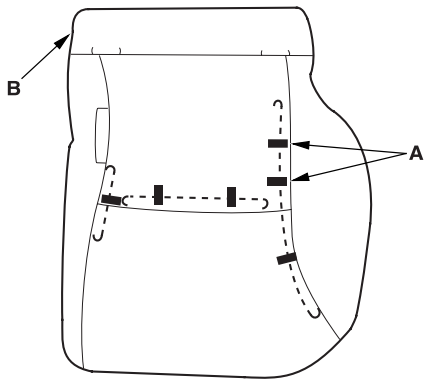
11. Release all of the hook strips (A).



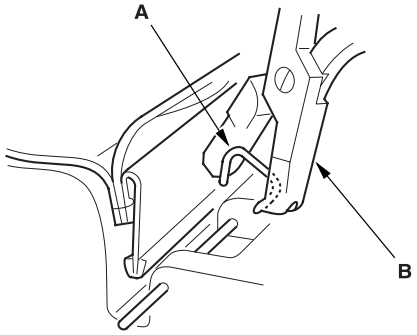
12. Remove the seat cushion cover (A) with the seat cushion pad from the seat cushion frame (B). Pass the seat belt buckle (C) through a hole in the seat cushion cover.



13. Pull back the edge of the seat-back cover all the way around, and release the clips (A), then remove the seat cushion.



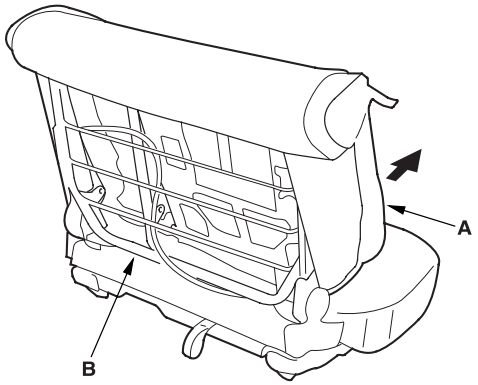
14. Install the cover in the reverse order of removal, and note these items:
    - To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hook and clips.
    - Replace any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).



Right Rear Seat-back Lock Control Cable Replacement

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.

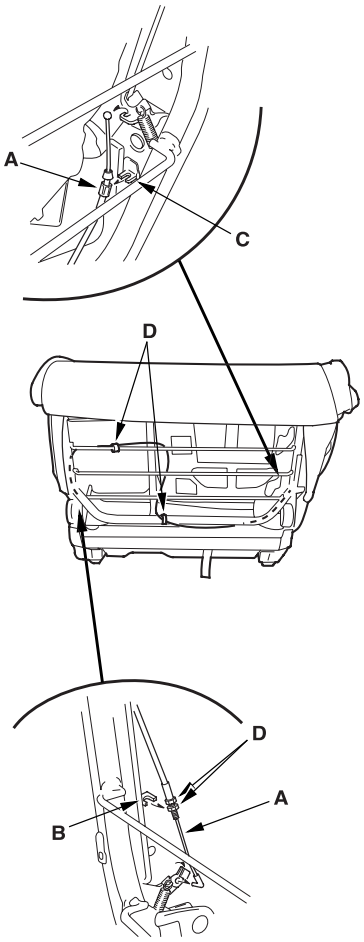
1. Remove the armrest (see page 20-115).
2. Release the bottom hook, unzip the seat-back cover, then fold back the cover (see step 3 on page 20-117).
3. Release the hook strips from the edge of the armrest back cover (see step 5 on page 20-117).
4. Remove the armrest back cover (see step 6 on page 20-117).
5. Release the hook strips at the armrest portions from the back of the seat-back (see step 7 on page 20-118).
6. Pull up the bottom of the seat-back pad (A) halfway apart from the seat-back frame (B).



(cont'd)

Right Rear Seat-back Lock Control Cable Replacement (cont'd)

7. Disconnect the seat-back lock control cable (A) from the inner recline adjuster (B) and the outer recline adjuster (C). Release the clamps (D), then remove the cable.



8. Install the cable in the reverse order of removal, and note these items:

- After reconnecting the cable, adjust its tension with its adjusting nuts (D).
- Replace anu clamps you removed with new ones.
- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hooks.

Rear Seat-back Latch Lever Replacement

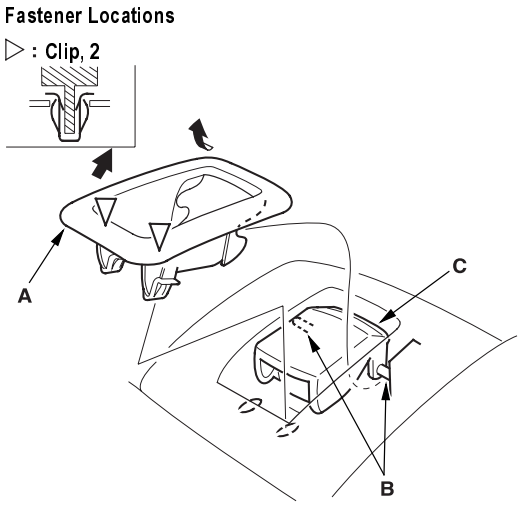
NOTE:

- Take care not to teat the seams or damage the seat covers.
- Put on gloves to protect your hands.
- The right rear seat is shown, and the left rear seat is symmetrical.

1. Remove the latch cover (A).

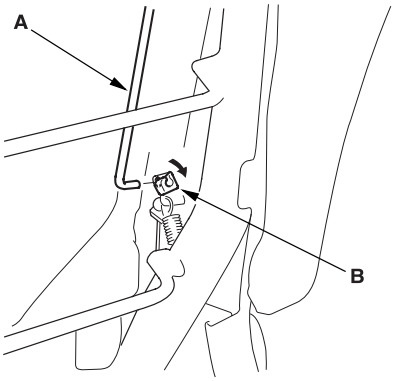
1 Pull up the rear edge of the latch lever cover to release the clips.

2 Release the cover from the pivot pins (B) of the latch lever (C) while pulling the latch lever.

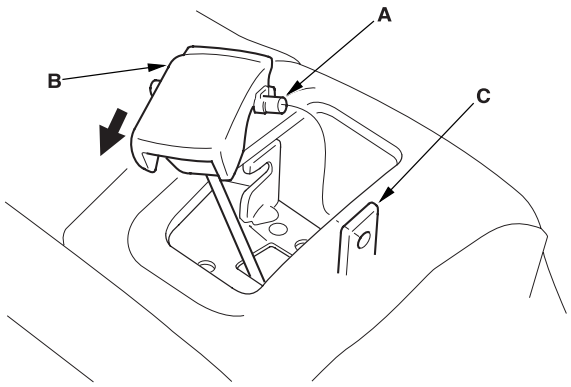


2. Release the bottom hook, unzip the seat-back cover, then fold back the cover, right rear seat (see step 3 on page 20-117), left rear seat (see step 5 on page 20-123).

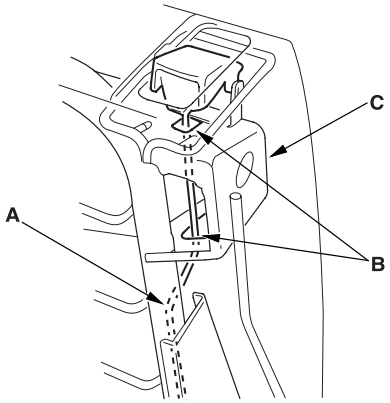
3. Disconnect the lock knob rod (A) from the outer recline adjuster (B).



4. Release the pivot pin (A) of the latch lever (B) from the seat-back frame (C), then remove the latch lever by pulling it up.



5. Install the lever in the reverse order of removal, and note these items:
   - Make sure the lock knob rod (A) is passed through the holes (B) in the seat-back frame (C) correctly when reinstalling the latch lever.
   - To prevent wrinkles, make sure the material is stretched evenly over the pad before securing the clips.
   - Replace any damaged clips with new ones.



Bumpers

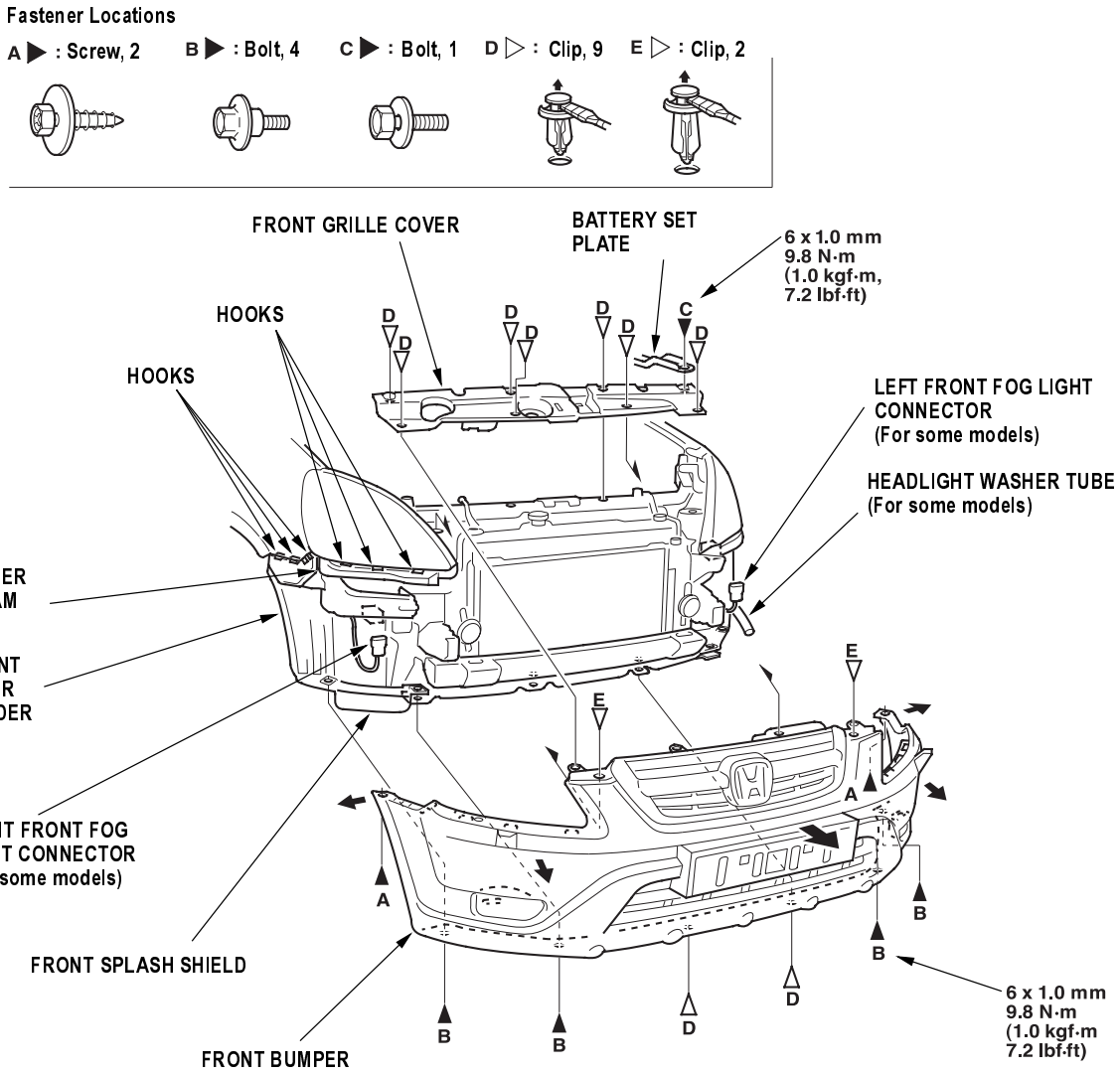
Front Bumper Removal/Installation

NOTE:
- Have an assistant help you when removing and installing the front bumper.
- Take care not to scratch the front bumper and body.
- Put on gloves to protect your hands.

Remove the front bumper as shown.

Install the bumper in the reverse order of removal, and note these items:

- If equipped, make sure the front fog light connector is plugged in properly, and the headlight washer tube is connected properly.
- Make sure the front bumper engages the hooks of the side spacers and upper beams on both sides securely.
- Replace any damaged clips.



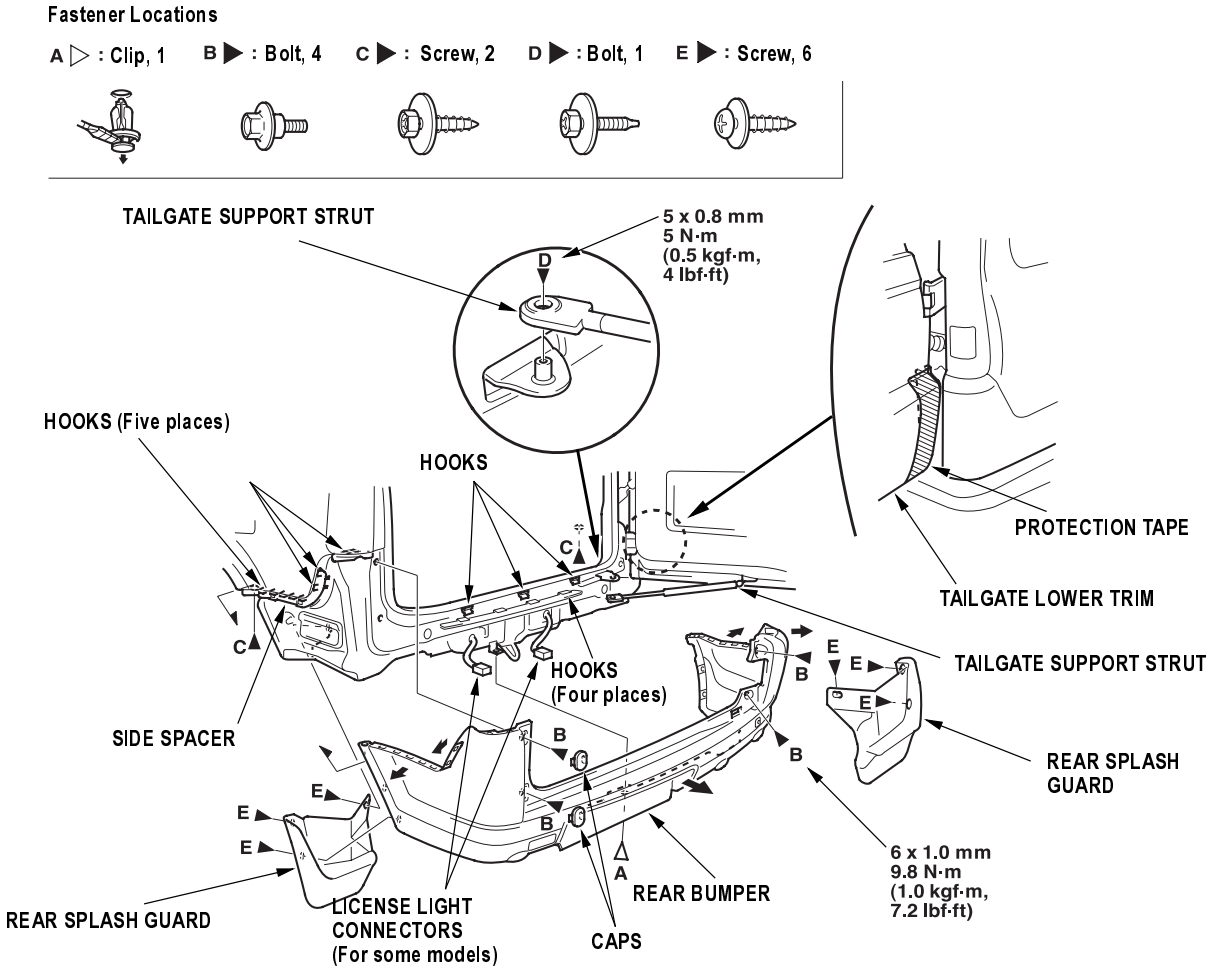
Rear Bumper Removal/Installation

NOTE:
- Have an assistant help you when removing and installing the rear bumper.
- Take care not to scratch the rear bumper and body.
- When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.
- Put on gloves to protect your hands.
- Apply protective tape around the hinge side edge of the tailgate lower trim to prevent damage to the rear bumper.
- For removing the rear bumper, remove the bolt securing the body side end of the tailgate support strut. After removing the bolt, gently open or close the tailgate to make most clearance between the rear bumper and the tailgate lower trim, and securely keep this position.

Remove the rear bumper as shown.

Install the bumper in the reverse order of removal, and note these items:

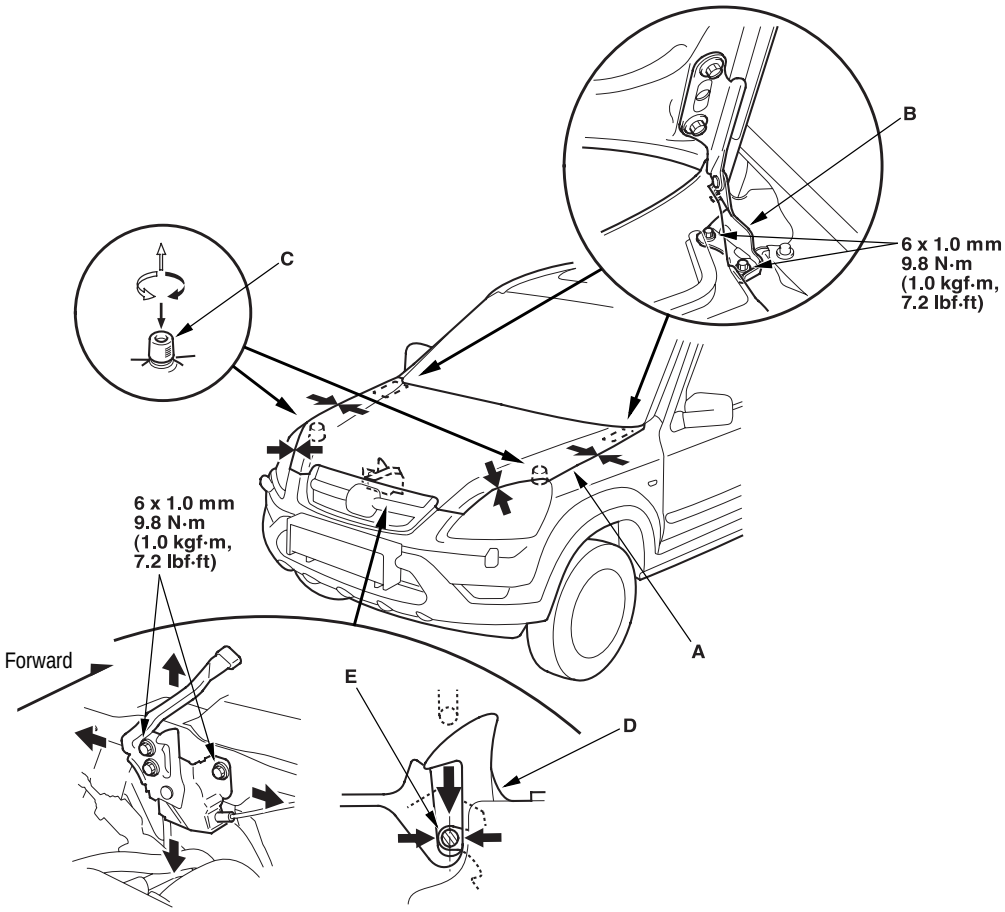
- Make sure each connector is plugged in properly.
- Make sure the rear bumper engages the hooks of the side spacers and upper brackets on both sides securely.
- Replace any damaged clips.



Hood

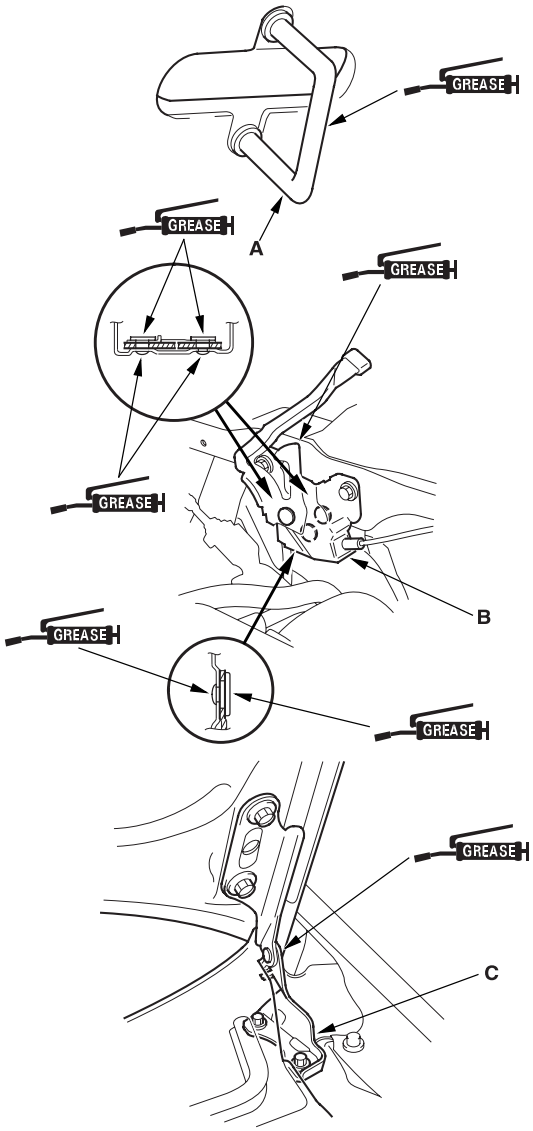
Adjustment

1. Slightly loosen each bolt.
2. Adjust the hood (A) alignment in this sequence.
   - Adjust the hood right and left, as well as forward and rearward, by using the elongated holes on the hood hinge(B).
   - Turn the hood edge cushions (C), as necessary, to make the hood fit flush with the body at the front and side edges.
   - Adjust the hood latch (D) to obtain the proper height at the forward edge, and move the hood latch right or left until the striker (E) is centered in the hood latch.



3. Tighten each bolt securely.

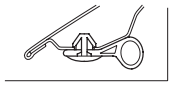
4. Check that the hood opens properly and locks securely.
5. Apply body paint to the hinge mounting bolts and around the hinges.
6. Grease each location of the hood striker (A), hood latch (B), and hood hinge (C) as indicated by the arrows.

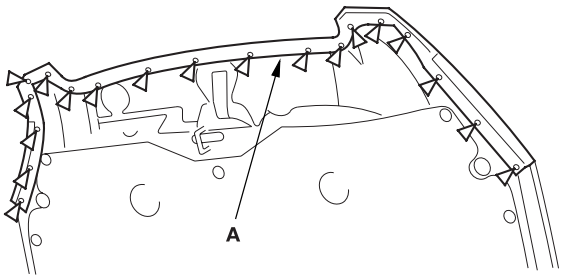


Hood Seal Replacement

1. Using a clip remover, detach the clips, then remove the hood seal (A). Take care not to scratch the hood.

Fastener Locations
▷: Clip, 19



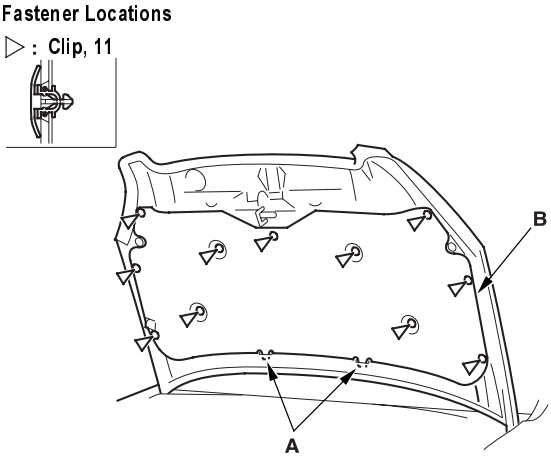


2. Install the seal in the reverse order of removal, and replace any damaged clips.

Hood Insulator Replacement

For Some Models

1. Using a clip remover, detach the clips, release the hooks (A), then remove the hood insulator (B). Take care not to scratch the hood.



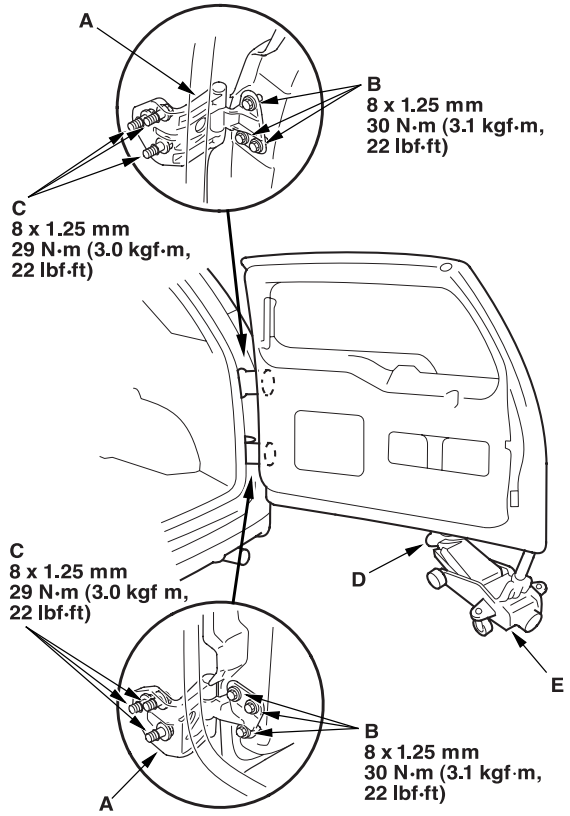
2. Install the insulator in the reverse order of removal, and replace any damaged clips.

Tailgate

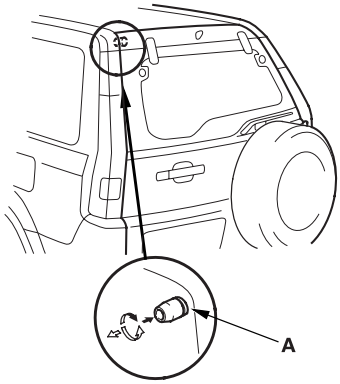
Tailgate Adjustment

NOTE: Check for a flush fit with the body, then check for equal gaps between the top, both sicles, and bottom tailgate edges and the body. Check that the tailgate and body edges are parallel. Before adjusting, replace the mounting bolts.

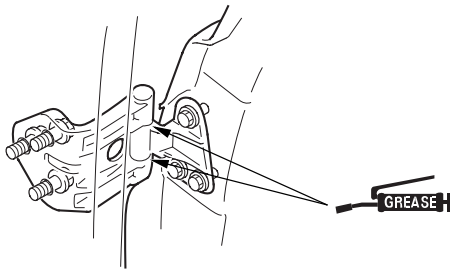
1. Place the vehicle on a firm, level surface when adjusting the tailgate.
2. Remove the tailgate support strut from each side (see page 20-137).
3. Adjust at the hinges (A):
   - Loosen the tailgate mounting bolts (B) slightly, and move the tailgate in or out until it's flush with the body.
   - Remove the right taillight (see page 22A-98)and rear bumper (see page 20-131).
   - Loosen the hinge mounting bolts (C) slightly, and move the tailgate left or right , up or down as necessary to equalize the gaps.
   - Place a shop towel (D) on the jack (E) to prevent damage to the tailgate when adjusting the tailgate.

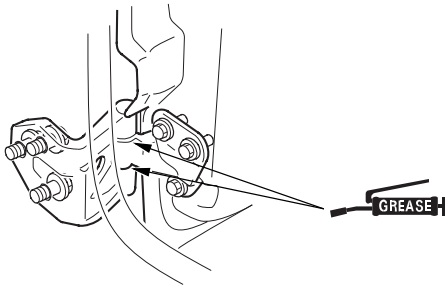


4. Tighten each bolts securely.
5. Check that the tailgate and body edges are parallel. If necessary, adjust the tailgate cushions (A) to make the left of the tailgate flush with the body.



6. Reinstall the support strut securely.
7. Apply body paint to the hinge mounting bolts and around the hinges.
8. Reinstall all removing removed parts.
9. Grease the location of the tailgate hinges is indicated by the arrows.



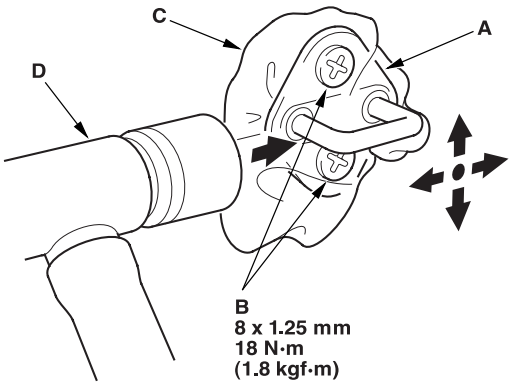


10. Check for water leaks (see step 9 on page 20-59).

Tailgate Striker Adjustment

Make sure the tailgate latches securely without slamming it. If necessary, adjust the striker (A): The striker nuts are fixed, but the striker can be adjusted slightly up or down, and in or out.

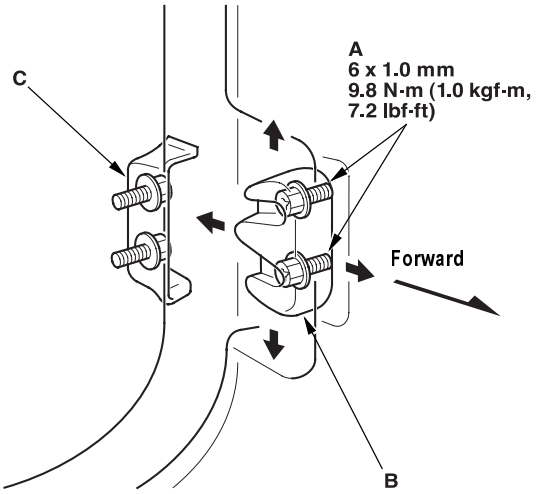
1. Remove the rear portion of the left rear side trim panel, as necessary (see page 20-77).
2. Loosen the screws (B), then insert a shop towel (C) between the body and striker.



3. Lightly tighten the screws.
4. Wrap the striker with a shop towel, then adjust the striker by tapping it with a plastic hammer (D). Do not tap the striker too hard.
5. Loosen the screws, and remove the shop towel.
6. Lightly tighten the screws.
7. Hold the outer handle out, and push the tailgate against the body to be sure the striker allows a flush fit. If the tailgate latches properly, tighten the screws and recheck.
8. Install the left rear side trim panel.

Tailgate Wedge Adjustment

1. Loosen the bolts (A) and move the tailgate wedge (B) up or down to align it with the tailgate wedge striker (C). Move the tailgate wedge in or out to center it. Then lightly tighten the bolts and recheck.

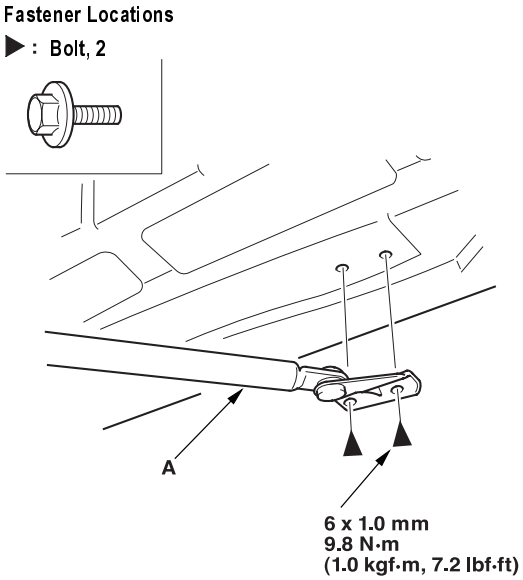


2. Hold the tailgate door handle out and push the tailgate against the body to be sure the tailgate wedge allows a flush fit.
3. If the tailgate latches properly, tighten the bolts and recheck.

Tailgate Support Strut Replacement

NOTE:
- Have an assistant help you when removing and installing the support strut.
- Take care not to scratch the body and tailgate.

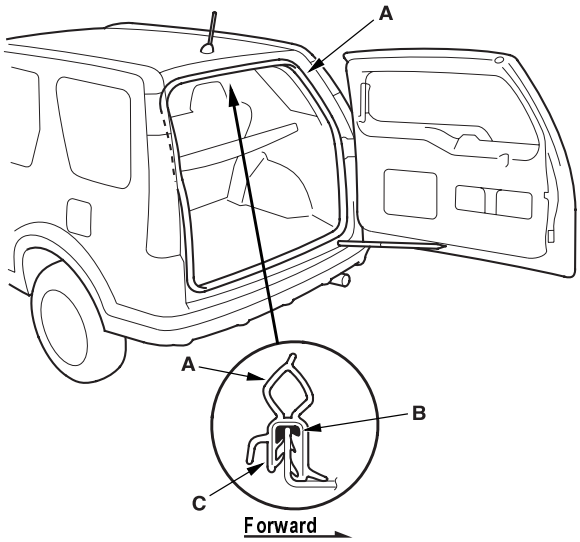
1. Remove the bolt securing the body side end of the tailgate support strut, then release it from the bracket (see page 20-131).
2. Remove the bolts, then remove the support strut (A).



3. Install the support strut in the reverse order of removal.

Tailgate Weatherstrip Replacement

1. Remove the tailgate weatherstrip (A) by pulling out on it.
2. Clean the bonding surface around the tailgate flange with alcohol.

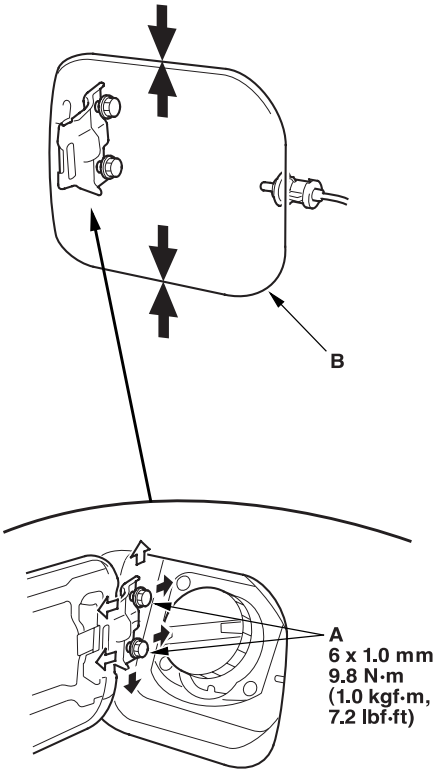


3. Apply sealant (Cemedine P/N 08712-0004, or equivalent) (B) in the groove around all of the tailgate weatherstrip.
4. Locate the painted alignment mark (C) on the tailgate weatherstrip. Align the painted mark with the alignment tab in the center of the tailgate opening, and install the weatherstrip. Make sure it's seated completely and facing in the direction shown. Make sure there are no wrinkles in the weatherstrip.
5. Check for water leaks.

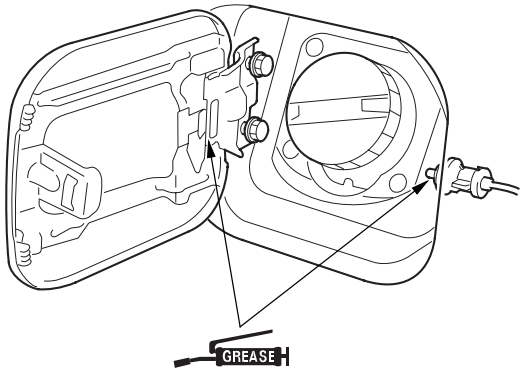
Fuel Fill Door

Adjustment

1. Slightly loosen the hinge mounting bolts (A).



2. Adjust the fuel fill door (B) in or out until it's flush with the body, and up or down as necessary to equalize the gaps.
3. Tighten the hinge mounting bolts.
4. Check that the fuel fill door opens properly and locks securely, and check that the rear of the door is flush with the body.
5. Grease each location indicated by the arrows.



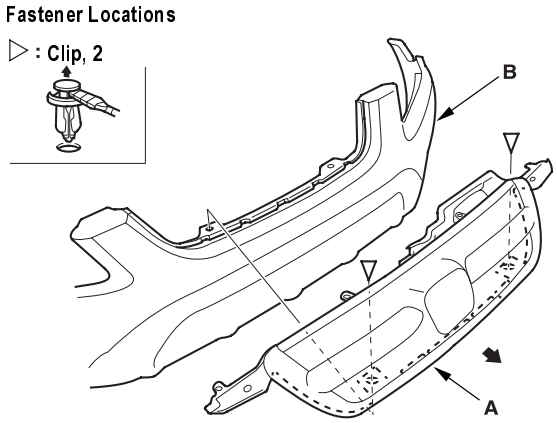
6. Apply body paint to the hinge mounting bolts and around the hinges.

Exterior Trim

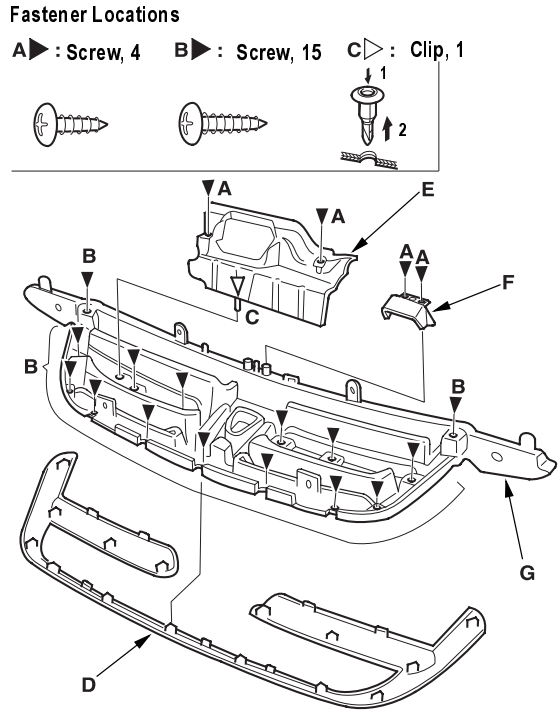
Front Grille Replacement

NOTE: Put on gloves to protect your hands.

1. Remove the front bumper (see page 20-130).
2. Remove the clips, and remove the front grille (A) from the front bumper (B) by pulling it out. Take care not to scratch the front bumper.



3. If necessary, remove the screws (A, B) and clips (C), then remove the grille molding (D), mist cover plate (E), and front grille absorber (F) from the front grille (G).

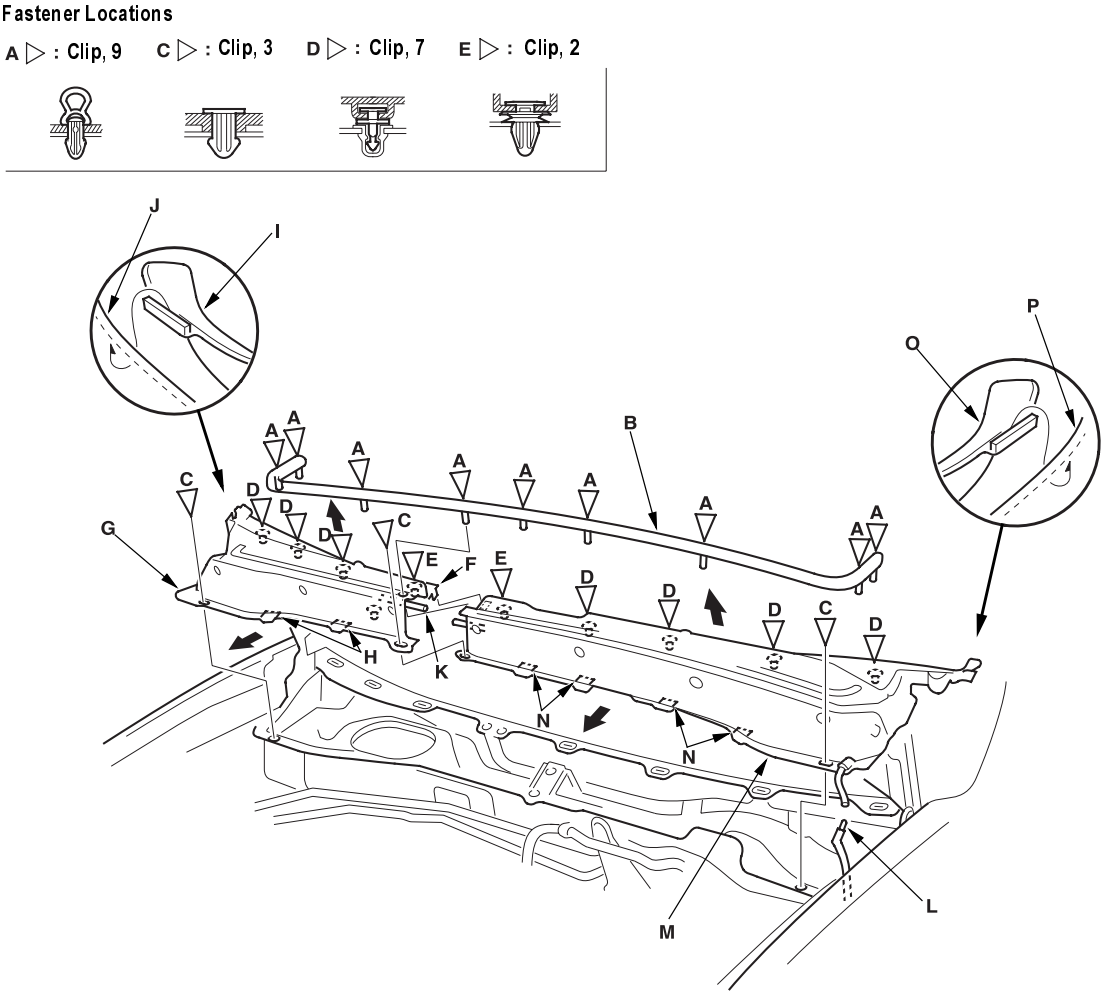


4. Install the grille in the reverse order of removal, and replace any damaged clips.

Cowl Covers Replacement

NOTE: LHD is shown RHD is symmetrical except the windshield washer tubes.

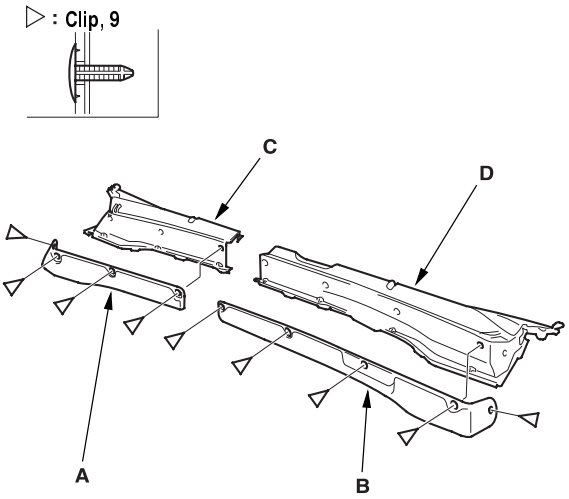
1. Remove the windshield wiper arms (see page 22A-223).
2. Using a clip remover, detach the clips (A), then remove the hood rear seal (B), and detach the clips (C) from the cowl covers. Take care not to scratch the cowl covers.



3. Detach the clips (D, E) and release the hook (F) by carefully pulling the passenger's cowl cover (G) upward. Pull the cover forward to release the hooks (H), pull the hinge cover (I) out from the front fender (J) and disconnect the windshield washer tube (K), then remove the cover. On RHD models, disconnect the windshield washer tube (L) routed from the washer reservoir to remove the passenger's cowl cover at this time. Take care not to scratch the body.
4. Detach the clips (D, E) by carefully pulling the driver's cowl cover (M) upward, and pull the cover forward to release the hooks (N). Pull the hinge cover (O) out from the front fender (P), and disconnect the windshield washer tube (L) routed from the washer reservoir then remove the cover. Take care not to scratch the body.

5. If necessary, release the clips, then remove the insulators (A, B) from both cowl covers (C, D).

Fastener Locations



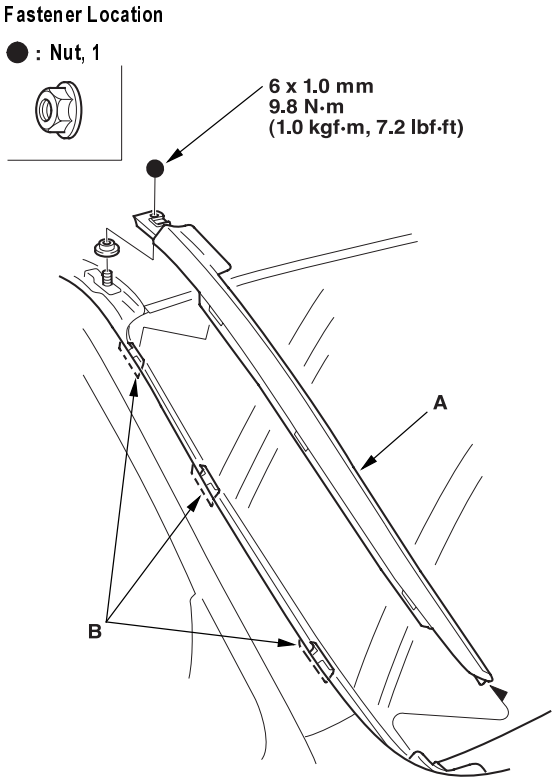
6. Install the cover in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure the washer tubes are connected securely.

Windshield Side Trim Replacement

NOTE:
- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts to prevent damage.
- Put on gloves to protect your hands.

1. Remove the roof side front trim.
2. Remove the nut, and detach the windshield side trim (A) from the retainer (B) by pulling the trim up. Take care not to scratch the body.

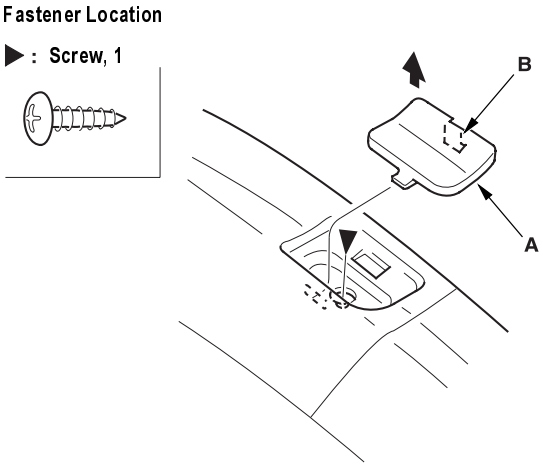


3. Install the windshield side trim in the revers order of removal.

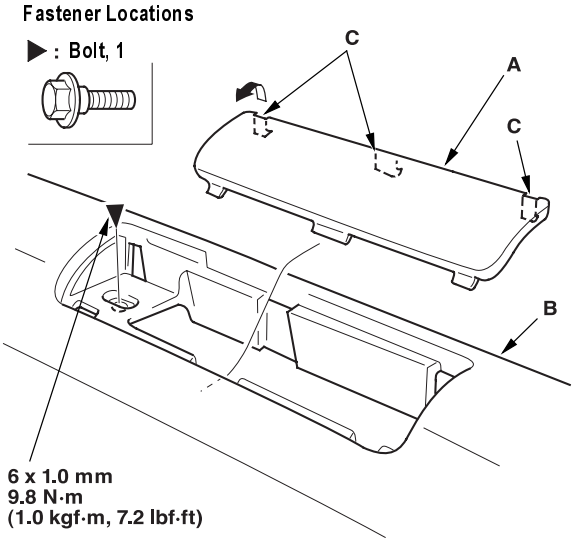
Roof Side Front Trim Replacement

NOTE: Put on gloves to protect your hands.

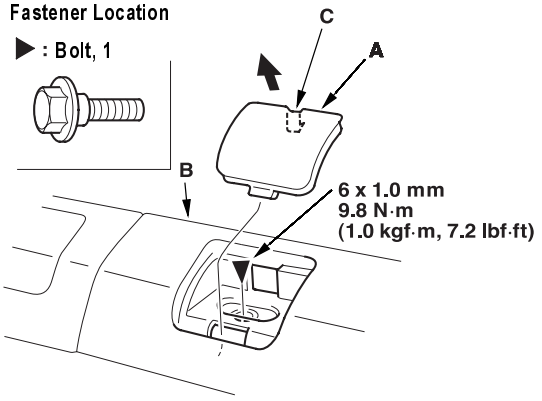
1. Using a flat-tip screwdriver wrapped with protective tape, pry up on the front lid (A) of the roof side front trim to detach the hook (B), and remove the screw.



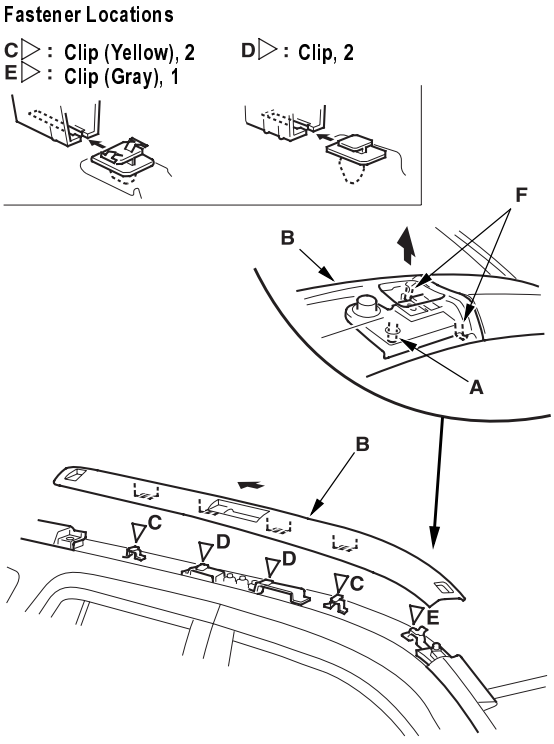
2. Using a flat-tip screwdriver wrapped with protective tape, pry up on the middle lid (A) of the roof side front trim (B) to detach the hooks (C), and remove the bolts.



3. Using a flat-tip screwdriver wrapped with protective tape, pry up on the rear lid (A) of the roof side front trim (B) to detach the hooks (C), and remove the bolts.

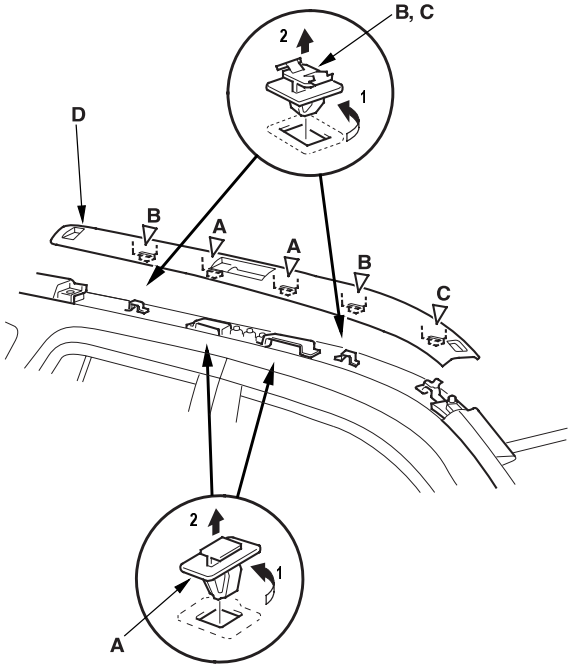


4. Release the pin (A) by pulling the front portion of the roof side front trim (B) up, and hold it.



5. Release the trim from the clips (C, D, E), and release the hooks (F) by sliding the trim rearward, and remove the trim. Take care not to scratch the other trim and body.

6. Replace any damaged clips (A, B, C).



7. Remove the clips (A, B, C) from the body, and install them on the roof side front trim (D).

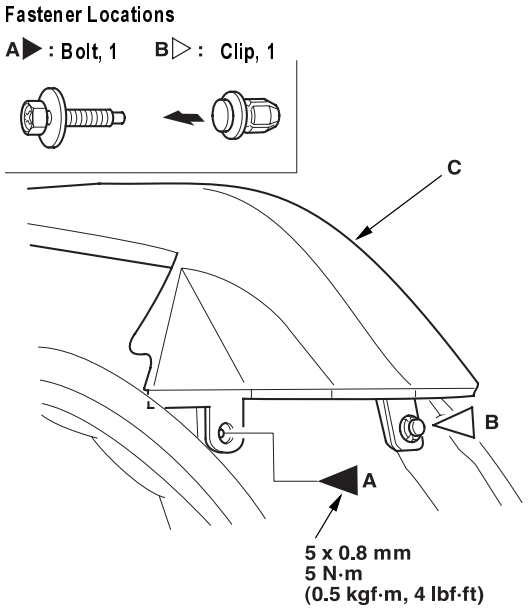
8. Fit the clips (A, B, C) into the holes in the body, then push on the trim until the clips snap into place.

9. Install the bolts, and install the lids.

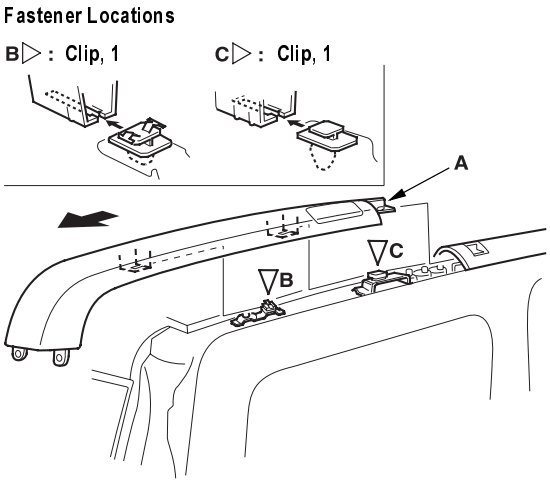
Roof Side Rear Trim Replacement

NOTE: Put on gloves to protect your hands.

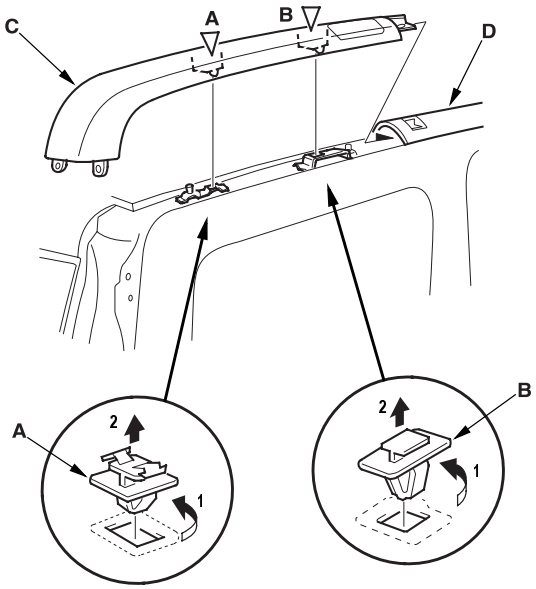
1. Remove the taillight (see page 22A-98).
2. Remove the bolt (A) and clip (B) from the rear portion of the roof side rear trim (C).



3. Using a flat-tip screwdriver wrapped with protective tape, pry up on the rear lid of the roof side front trim to detach the hook, and remove the screw (see page 20-142).
4. Remove the roof side rear trim (A) from the clips (B, C) by sliding the trim rear ward, then remove the trim. Take care not to scratch the body.



5. Replace any damaged clips (A, B).

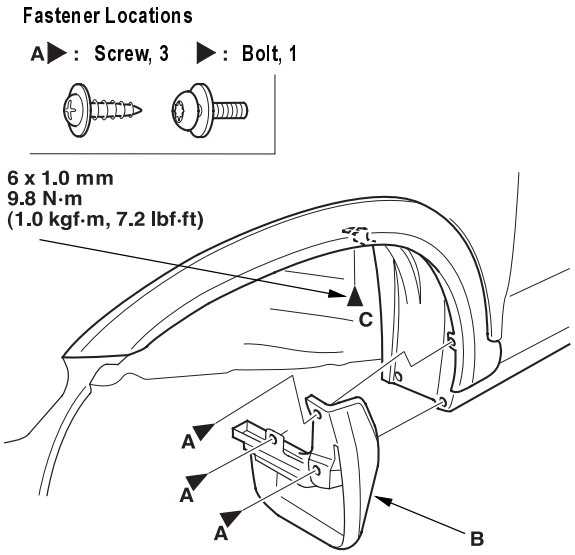


6. Remove the clips (A, B) from the body, and install them on the roof side rear trim (C).
7. Insert the roof side rear trim in the roof side front trim (D), and fit the clips (A, B) into the holes in the body, then push on the trim until the clips snap into place.
8. Install the bolt clip, and install the lid.
9. Reinstall the taillight.

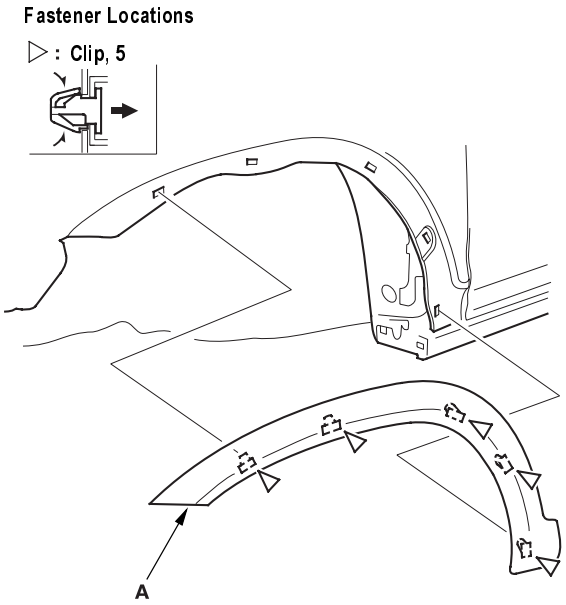
Front Wheel Arch Protector Replacement

NOTE:
- Take care not to scratch the body.
- Put on gloves to protect your hands.

1. Remove the screw, then detach the wheel arch portion of the front bumper outward (see page 20-130).
2. On the back of the wheel arch, remove the screws (A), then remove the front splash guard (B). With a Torx T30 bit, remove the bolt (C).



3. Remove the front inner fender (see page 20-155).
4. Remove the front wheel arch protector (A) while pinching the clips from inside the front fender.

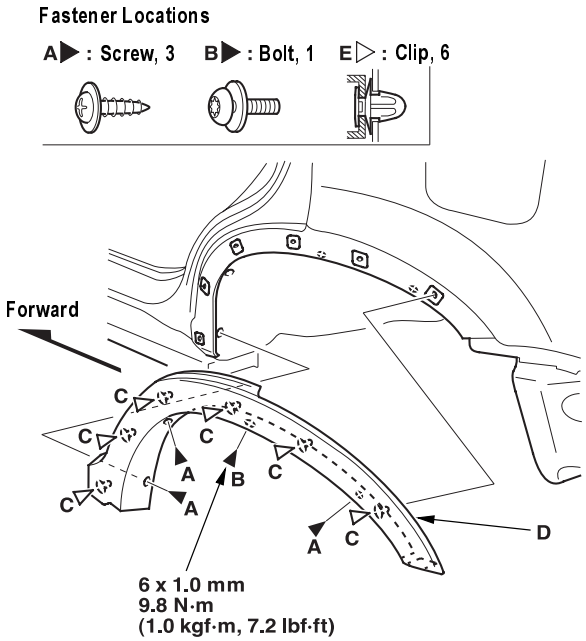


5. Install the protector in the reverse order of removal, and replace any damaged clips.

Rear Wheel Arch Protector Replacement

NOTE: Take care not to scratch the body.

1. Remove the screw, and detach the wheel arch portion of the rear bumper outward (see page 20-131), then open the rear door.
2. From the wheel arch, remove the screws (A). With a Torx T30 bit, remove the bolt (B).



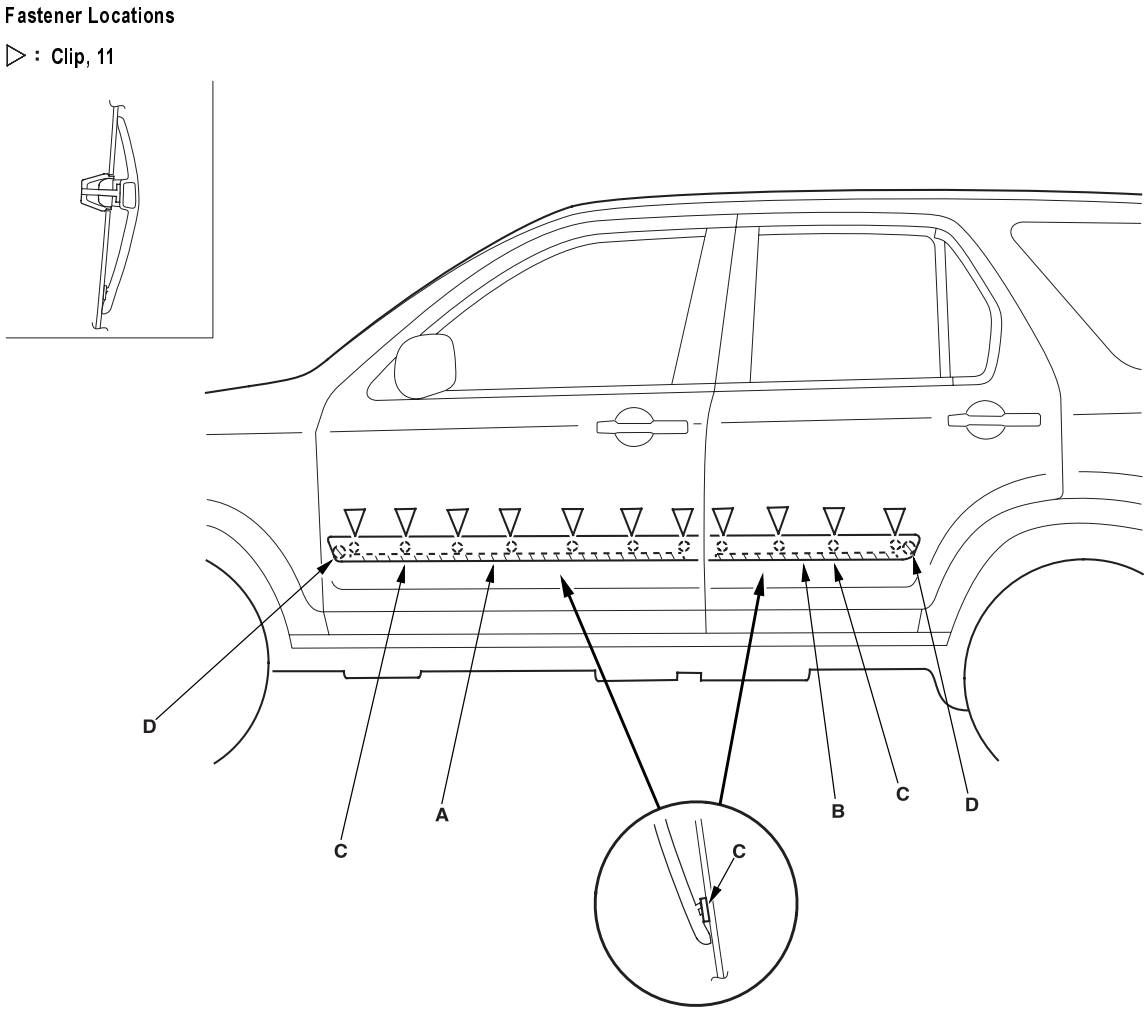
3. Remove the rear wheel arch protector (D) while pinching the clips (E) from inside the rear fender.
4. Install the protector in the reverse order of removal, and replace any damaged clips.

Door Moldings Replacement

NOTE:
- Wrap the blade of your putty knife or flat-tip screwdriver with protective tape to prevent damage to the door.
- Be careful not to pry too far or you may bend the molding.
- Put on gloves to protect your hands.

1. Prepare to release the molding clips from inside the vehicle:
   - To remove the front door molding, remove the front door panel (see page 20-9) and plastic cover.
   - To remove the rear door molding, remove the rear door panel (see page 20-21) and plastic cover.
2. Release the clips and gently pry the front door molding (A) or rear door molding (B) away from the door while removing the adhesive tape (C, D).

Adhesive tape C: **3M5311 or equivalent**
Thickness 1.2 mm (0.047 in.), Width 5 mm (0.2 in.)
Adhesive tape D: **3M5311 or equivalent**
Thickness 1.2 mm (0.047 in.), Width 8 mm (0.3 in.)



3. Install the moldings in the reverse order of removal, and replace any damaged clips and adhesive tape.

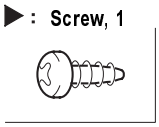
Door Lower Trim Replacement

NOTE:
- Take care not to scratch the door.
- Put on gloves to protect your hands.

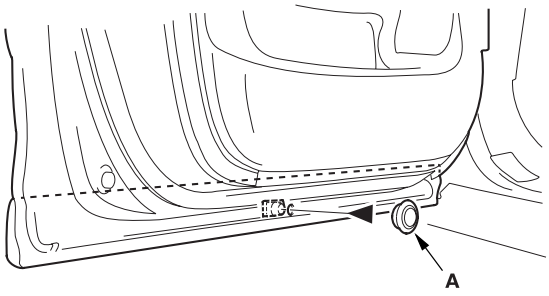
1. Open the front or rear door fully, remove the maintenance cap (A) from the door, then remove the screw.

Fastener Location

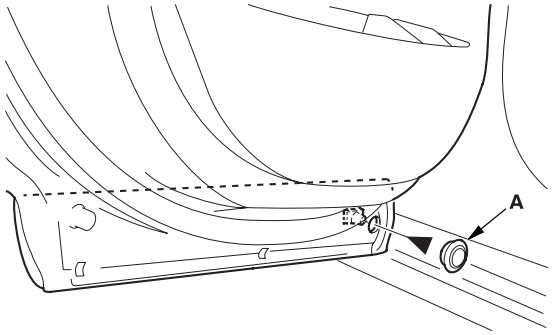
▶ : Screw, 1



Front Door:



Rear Door:



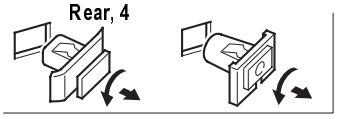
2. For rear door lower trim removal, close the rear door half-way.

3. Slide the door lower trim (A) forward and remove it. Clips (B, C) will stay in the body.

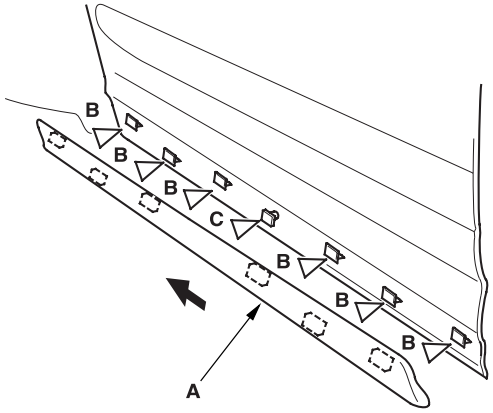
Fastener Locations

B▷ : Clip, Front, 6 Rear, 4

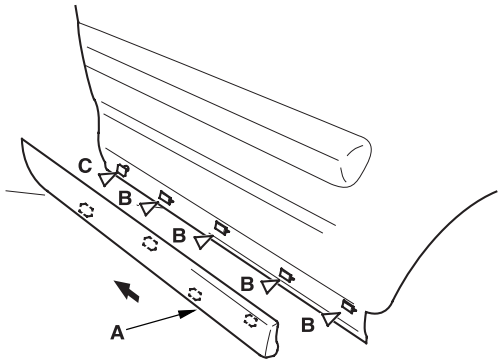
C▷ : Clip,1



Front Door:



Rear Door:



4. Remove the clips (B, C) from the body.

5. Replace any damaged clips.

6. Reinstall the clips (B, C) on the door lower trim, then secure the middle clip (front door) (C) or the front clip (rear door) (C) with the screw you removed in step 1. Make sure the clips are not upside down.

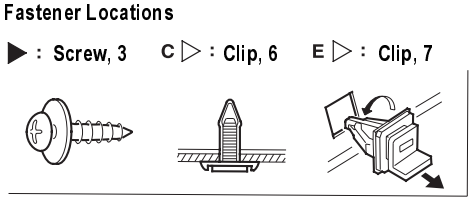
7. Hold the trim up, and fit all the clips into the holes in the door, then push on the trim until the clips snap into place.

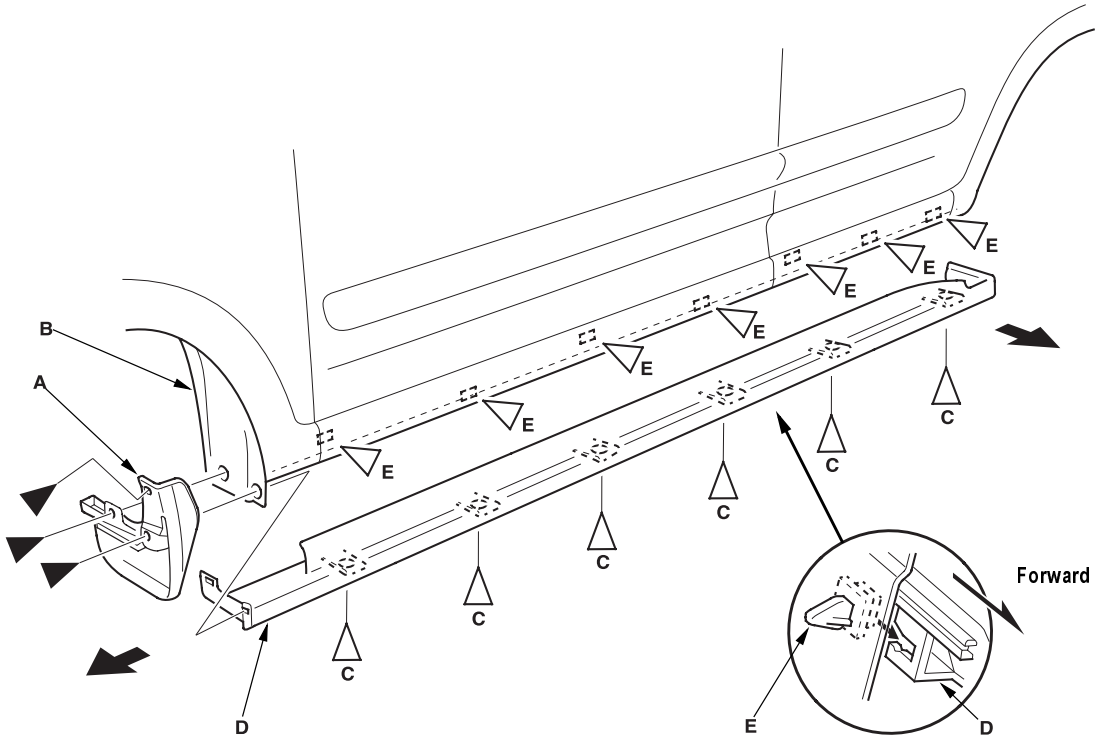
8. Install the maintenance cap on the door.

Side Sill Panel Replacement

1. Remove the side sill panel.

1 Remove the splash guard (A).
2 Pull the inner fender (B) back as necessary, and remove the expansion clip (C).
3 Slide the side sill panel (D) forward, and remove it. The side clips (E) will stay in the body.
4 Remove the side clips from the body.





2. Replace any damaged clips.

3. Install the side clips on the side sill panel.

4. Hold the panel up, and fit all the side clips into the holes in the body, then push on the panel until the clips snap into place.

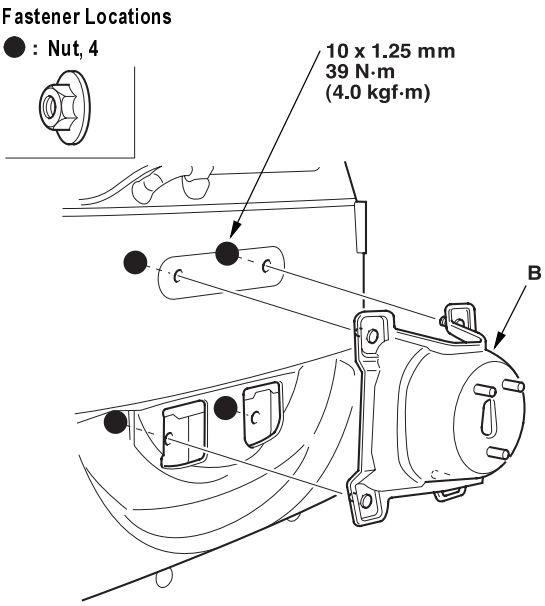
5. Install all the expansion clips.

6. Reinstall the inner fender and splash guard.

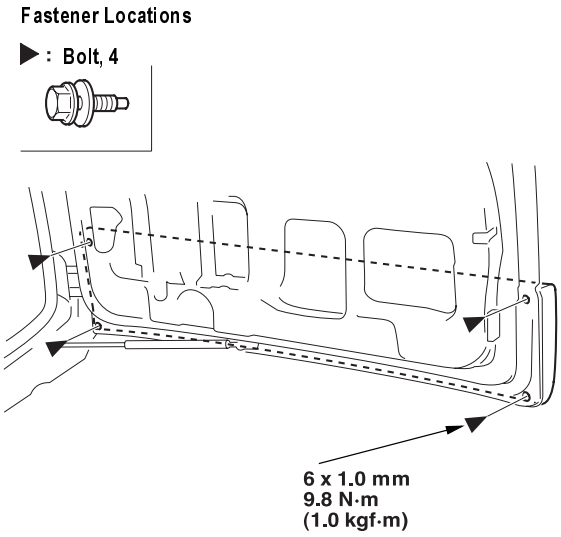
Tailgate Lower Trim Replacement

NOTE:
- Take care not to scratch the tailgate.
- Put on gloves to protect your hands.

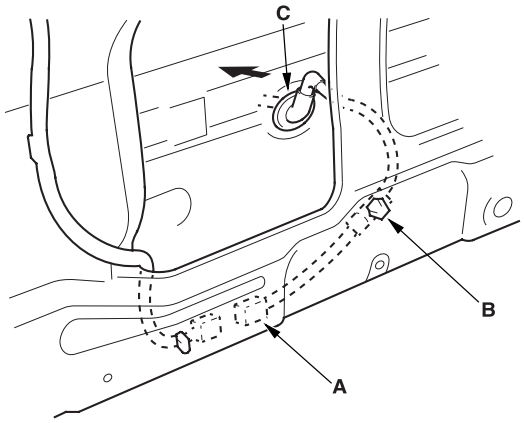
1. Remove these items:
   - License plate (for some models)
   - Tailgate lower trim panel (see page 20-80)
2. Remove the spare tyre holder (A).



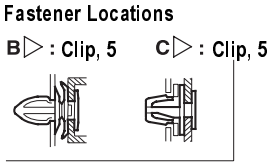
3. Open the tailgate, then remove the bolt securing the tailgate lower trim.

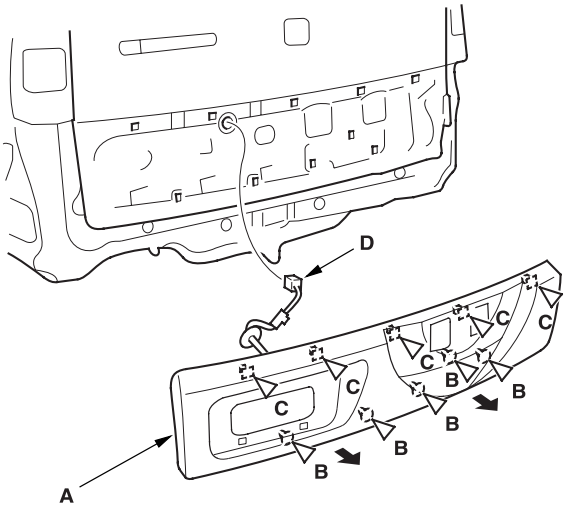


4. For some models: Disconnect the license light connector (A), detach the harness clip (B), then pull out the grommet (C).

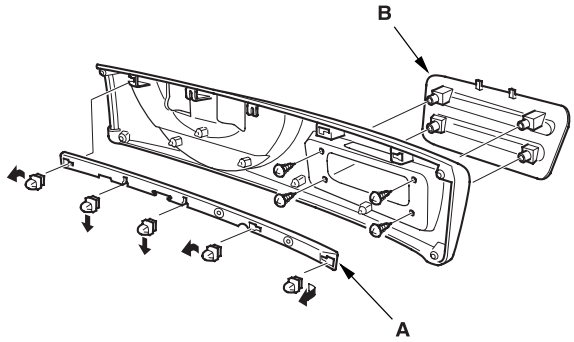


5. Pull out along the bottom of the tailgate lower trim (A) to detach the lower clips (B). While pinching the upper clips (C) from inside the tailgate, remove the tailgate lower trim. If equipped, pull the license light harness (D) out from inside the tailgate.





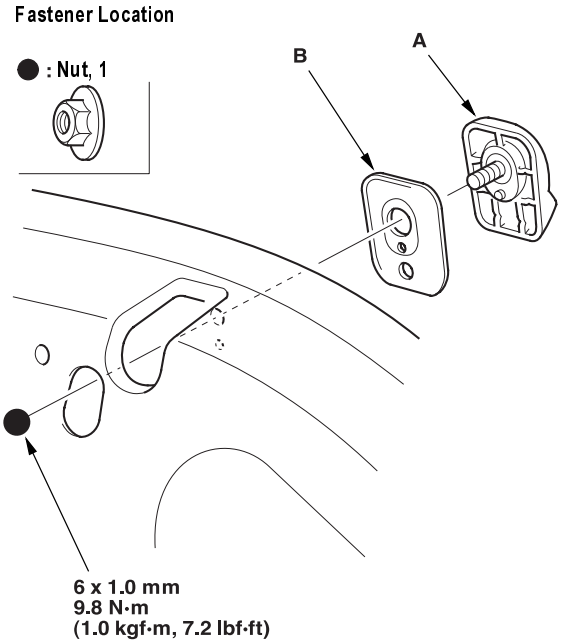
6. If necessary, remove the clips as shown, and remove the stiffener (A). And if applicable, remove the screws to remove the license cover (B).



7. Install the trim in the reverse order of removal, and note these items:
   - Replace all the spare tyre holder mounting nuts as new ones.
   - Replace any damaged clips.

Rear Window Wiper Lifter Replacement

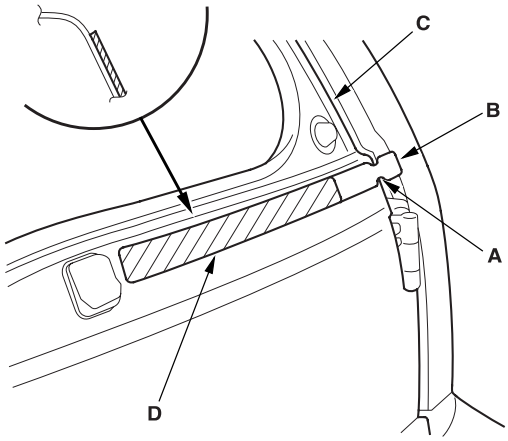
1. Remove the tailgate lower trim panel (see page 20-80).
2. Remove the nut from inside the tailgate, then remove the rear window wiper lifter (A) and the seal (B).



3. Install the lifter in the reverse order of removal.

Rear Window Wiper Protection Tape Replacement

1. Slowly peel up the old rear window wiper protection tape.
2. Clean the tailgate bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.
3. Peel the adhesive backing from the rear window wiper protection tape.
4. Align the notch (A) of the application tape (B) with the edge of the tailgate (C) and align the top edge of the application tape with the edge of the tailgate, then press the rear window wiper protection tape (D) into place.

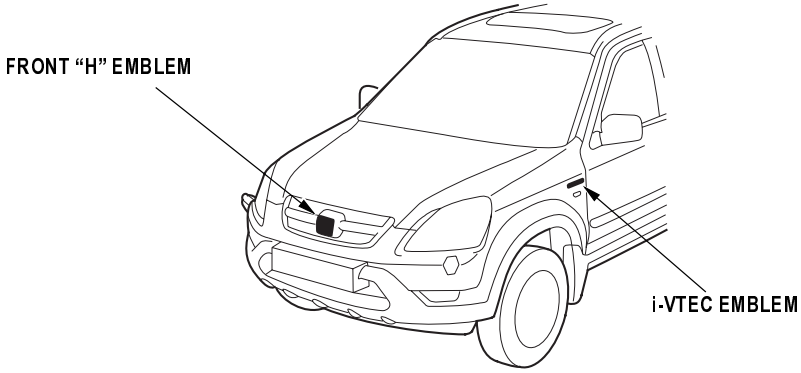


5. Remove the application tape.

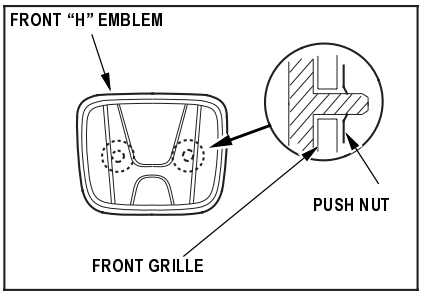
Emblem/Sticker Replacement

NOTE: When removing the emblem/sticker, take care not to scratch the body.

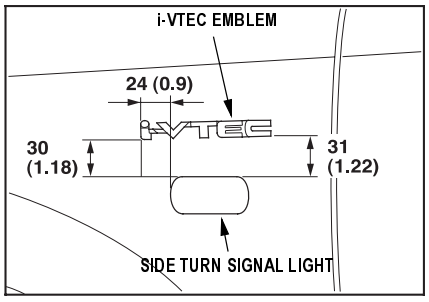
1. To remove the front ”H” emblem, remove the front grille (see page 20-139).
2. Clean the body surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.
3. Apply the emblem/sticker, where shown. When installing the REALTIME 4WD sticker on the hatch glass, align the application tape with the alignment marks, then press the sticker into place, and remove the application tape.



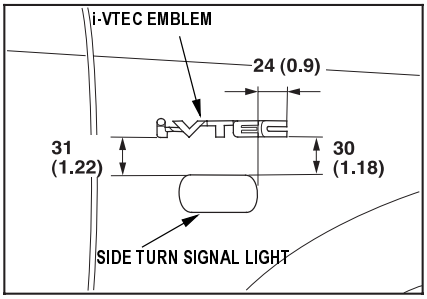
Unit: mm (in.)



Left side:

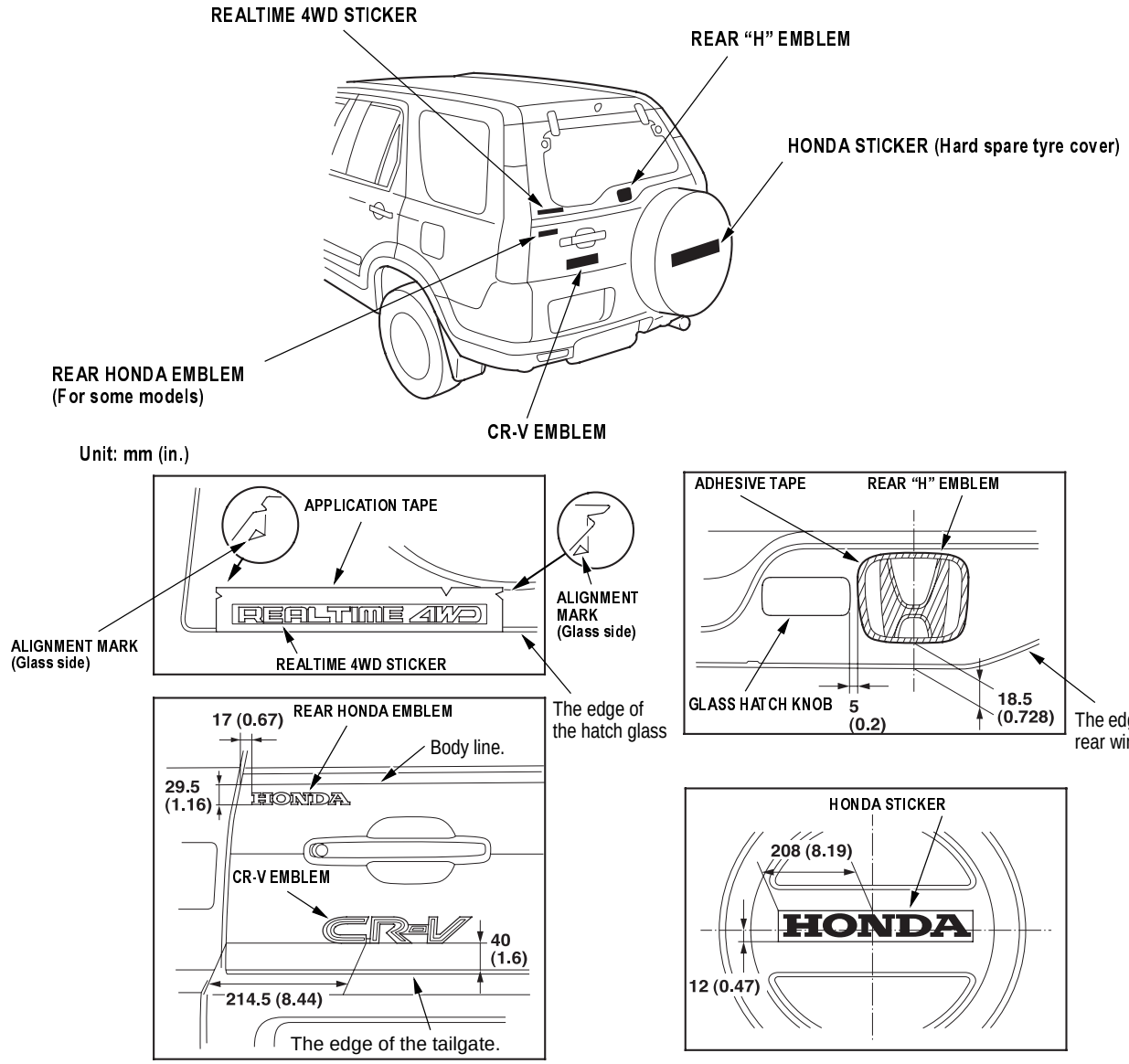


Right side:



(cont’d)

Emblem/Sticker Replacement (cont'd)



4. After installing the front "H" emblem, reinstall the front grille to the front bumper, and reinstall the front bumper.

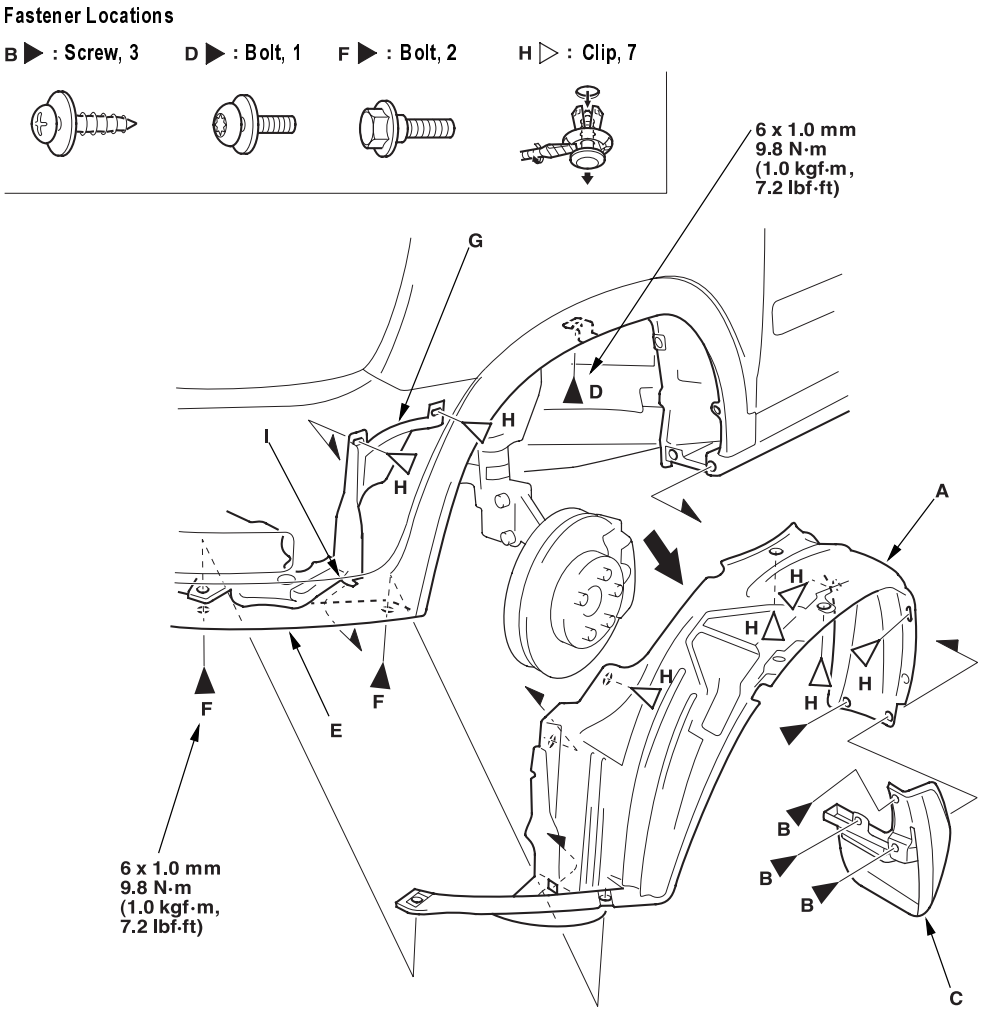
Fenderwell

Front Inner Fender Replacement

NOTE: Take care not to scratch the body.

1. Remove the front inner fender (A).

1 On the back of the wheel arch, remove the screws (B),then remove the front splash guard (C).
2 With a Torx T30 bit, remove the bolt (D) securing the front wheel arch protector.
3 From under the front bumper (E), remove the bolt (F) securing the front bumper, splash shield (G), and front inner fender.
4 From the wheel arch, remove the clips (H) securing the front inner fender (and splash shield) on the body.
5 Release the hook (I) of the splash shield, then remove the front inner fender.



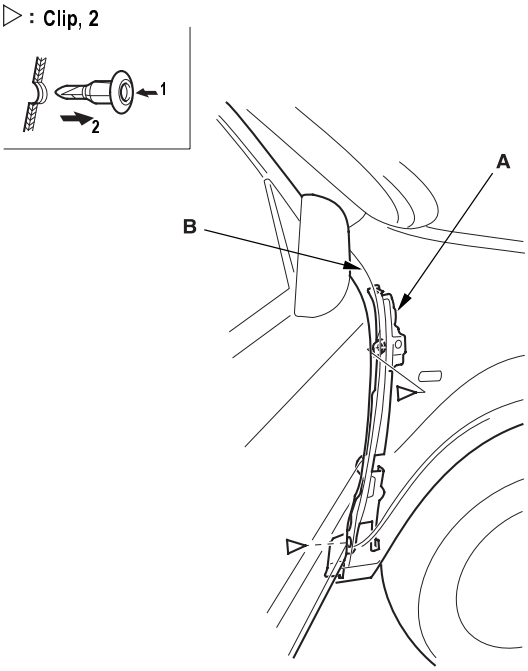
2. Install the inner fender in the reverse order of removal, and replace any damaged clips.

Front Fender Fairing Replacement

1. Remove the front inner fender as necessary (see page 20-155).
2. For the left front fender fairing removal, remove the washer reservoir (see page 22A-224).
3. Open the front door. From outside the door, remove the upper clip, and from inside the door, remove the lower clip securing the front fender fairing (A) and front fender (B).

Fastener Locations

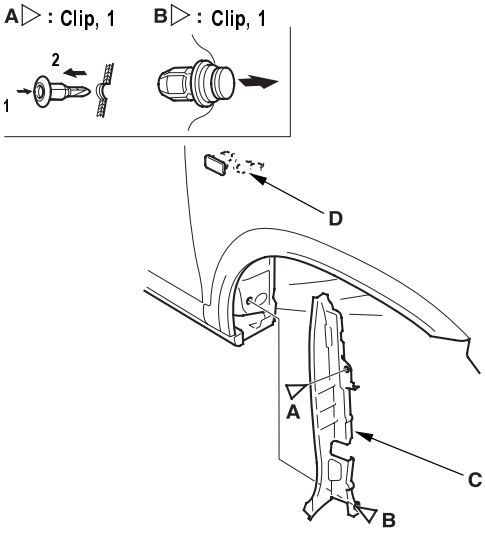
▷ : Clip, 2



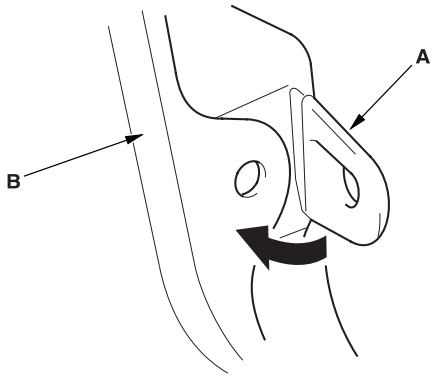
4. From the wheel arch, remove the clip (A), and release the clip (B), then remove the front fender fairing (C).If the fairing is caught by the side turn signal light harness, disconnect the connector (D).

Fastener Locations

A▷ : Clip, 1 B▷ : Clip, 1



5. Install the fender fairing in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Before installing the clips of the door upper and lower portions, install the front fender fairing (A) to the front fender (B) properly as shown.

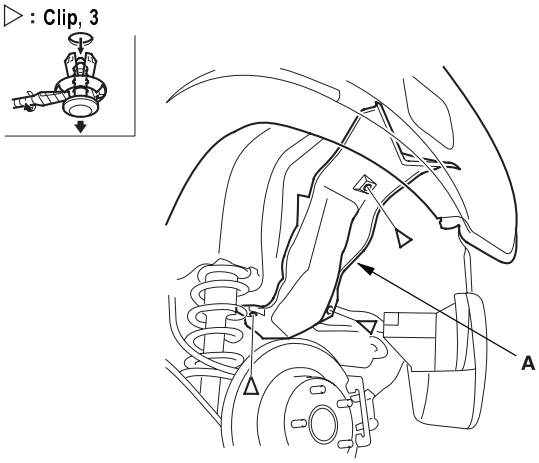


Fuel Pipe Protector Replacement

1. Remove the clips, then remove the fuel pipe protector (A). Take care not to scratch the body.

Fastener Locations

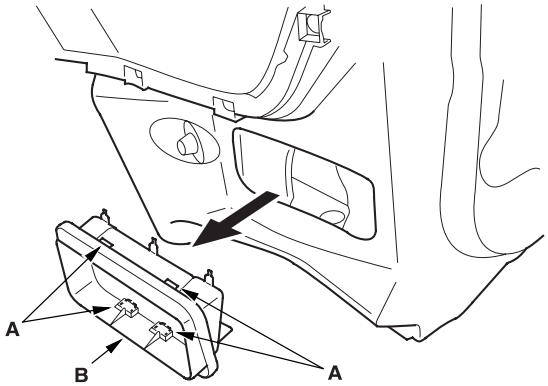
▷ : Clip, 3



2. Install the protector in the reverse order of removal, and replace any damaged clips.

Rear Air Outlet Replacement

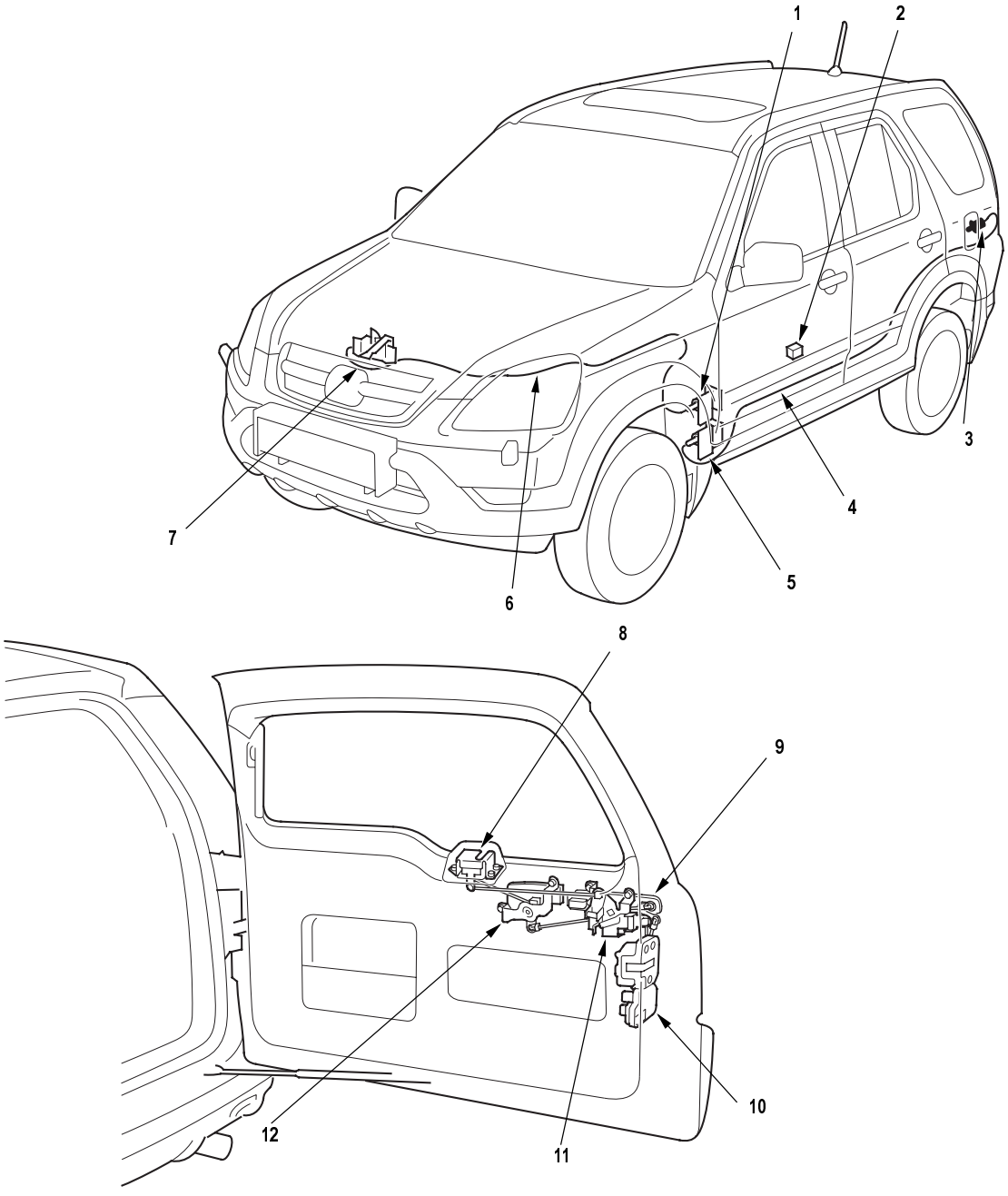
1. Remove the rear bumper (see page 20-131).
2. Detach the hooks (A), then remove the rear air outlet (B). Take care not to scratch the body.



3. Install the air outlet by pushing on the hook portions until the hooks snap into place.

Openers

Component Location Index

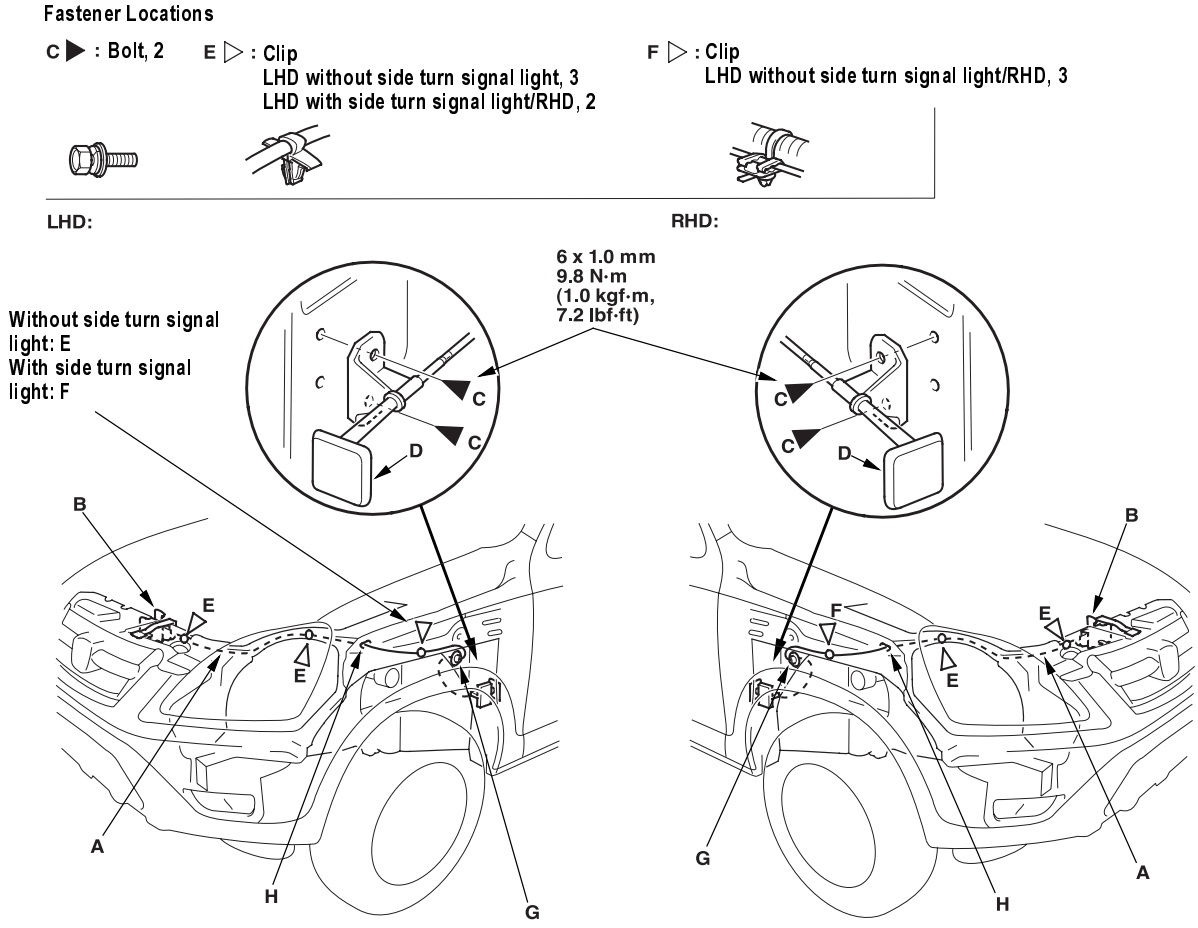


1	HOOD RELEASE HANDLE	page 20-159	7	HOOD LATCH	Replacement, page 20-162
2	HATCH GLASS OPENER SWITCH	Test, (see page 22A-181)	8	HATCH GLASS LATCH	Replacement, page 20-166
3	FUEL FILL DOOR LATCH	page 20-160	9	TAILGATE HANDLE	Replacement, page 20-163
4	FUEL FILL DOOR OPENER CABLE	Replacement, page 20-160	10	TAILGATE LATCH	Replacement, page 20-164
5	FUEL FILL DOOR OPENER	page 20-160	11	TAILGATE STOPPER ASSEMBLY	Replacement, page 20-165
6	HOOD OPENER CABLE	Replacement, page 20-159	12	HATCH GLASS ACTUATOR	Replacement, page 20-167

Hood Opener Cable Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the body and related parts.

1. Remove these items:
   - Front inner fender (see page 20-155)
   - Kick panel (see page 20-76)
2. Disconnect the hood opener cable (A) from the hood latch (B) (see page 20-162), and remove the bolts (C), then remove the hood release handle (D).



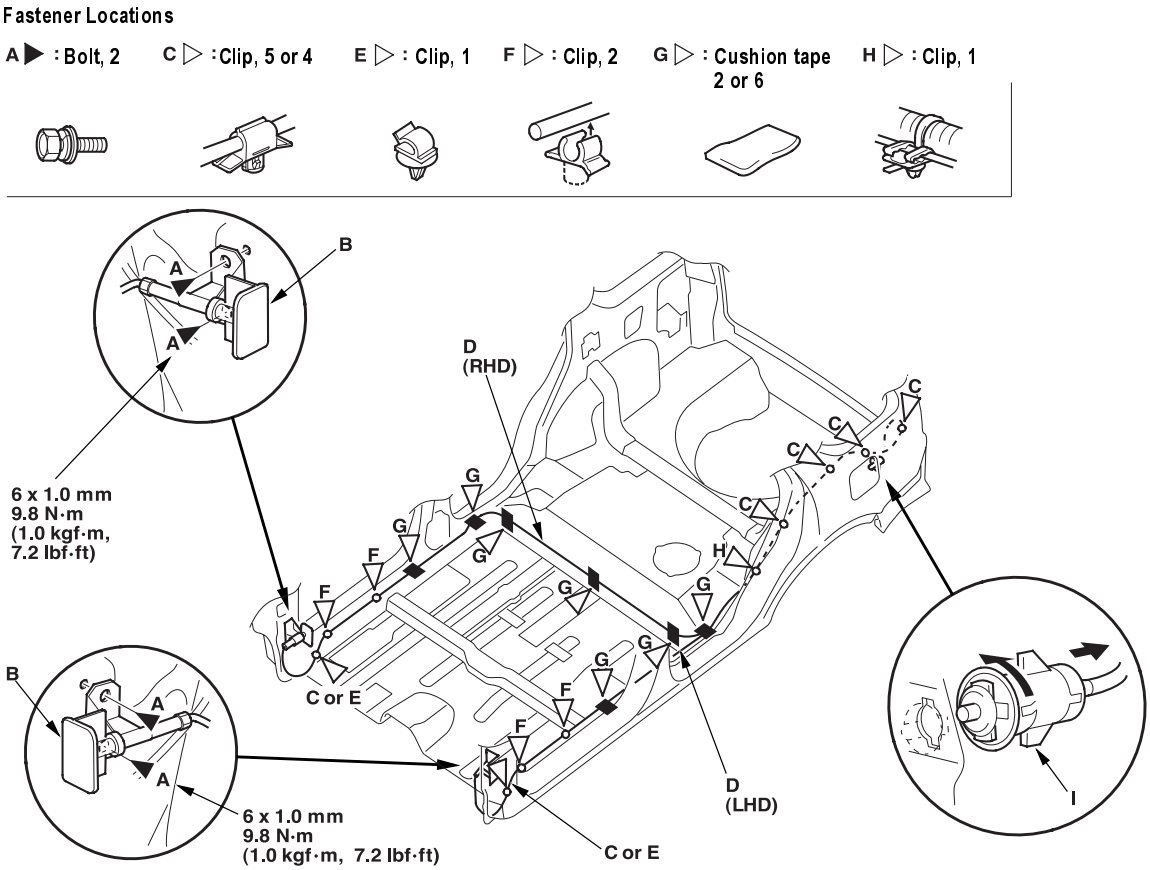
3. Using a clip remover, detach the clips (E), and remove the cable from the clip (F). Remove the grommet (G) from the body, then remove the hood opener cable from the vehicle. Take care not to bend the cable.
4. Install the cable in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Route the cable through the hole (H) in the body.
   - Make sure the hood opens properly and locks securely.

Fuel Fill Door Opener Cable Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-14), and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

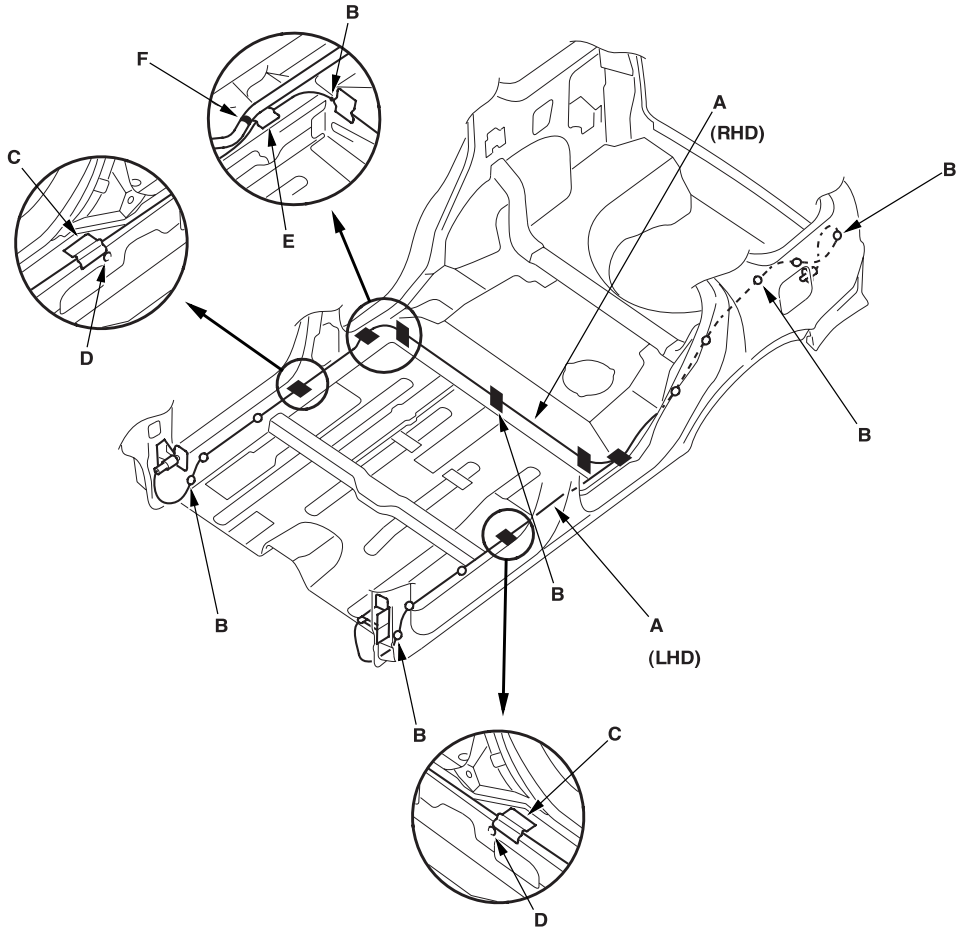
NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the body and related parts.

1. Remove these items:
   - Front door sill trim (see page 20-76)
   - Kick panel (see page 20-76)
   - Rear door sill trim (see page 20-76)
   - Center pillar lower trim (see page 20-76)
   - Rear seat (see page 20-114)
   - Rear side trim panel, left side (see page 20-77)
2. Pull the carpet back as necessary (see page 20-85).
3. Remove the bolts (A), then remove the opener (B). Detach the clip (C) (for some models) by using a clip remover, and remove the fuel fill door opener cable (D) from the clips (E, F).



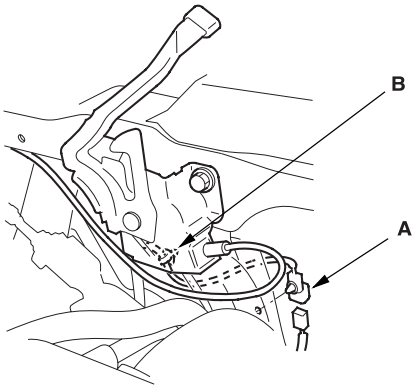
4. Remove the cushion tape (G). Remove the cable from the clip (H), and detach the clips (C) by using a clip remover.
5. Remove the fuel fill door latch (I) from the body by turning it 90°, then remove the fuel fill door opener cable from the vehicle. Take care not to bend the cable.

6. Install the opener cable (A) in the reverse order of removal, and note these items:
- Replace any damaged clips, and replace the cushion tape.
- Align the mark (B) on the cable with the clips and cushion tape. At the bottom of the center pillar, align the front cushion tape (C) with the hole (D) in the body, and or RHD, align rear cushion tape (E) with a harness clip (F).

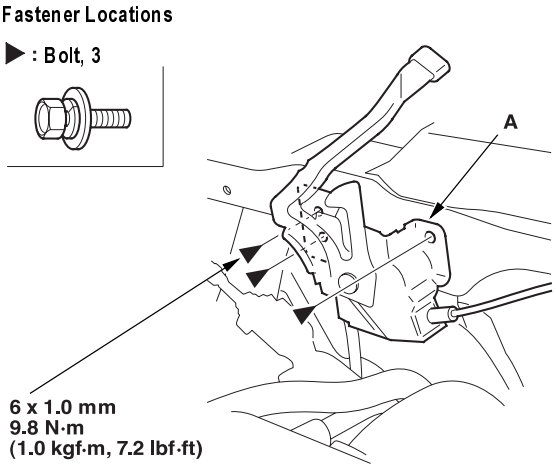


Hood Latch Replacement

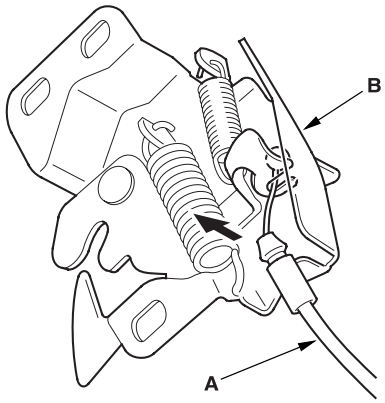
1. If equipped, detach the hood latch switch connector (A) and the harness clip (B) from the body, and disconnect the connector.



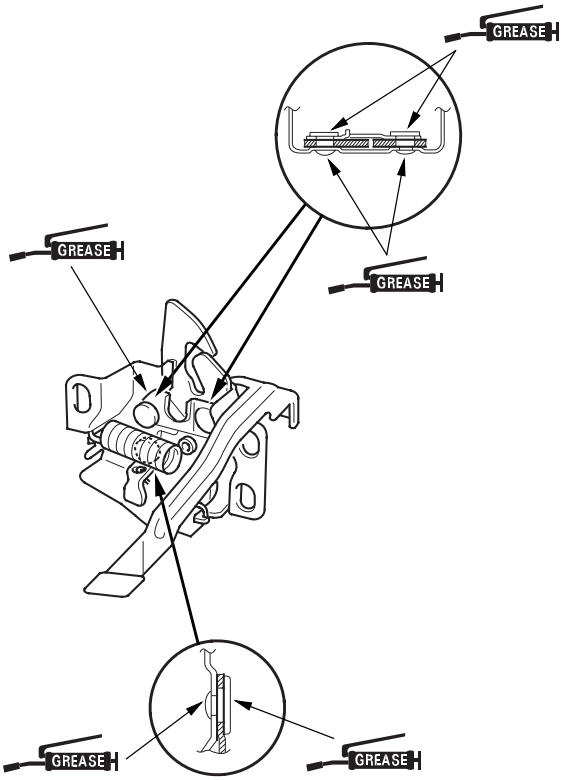
2. Remove the bolts, then remove the hood latch (A) from the body.



3. Disconnect the hood opener cable (A) from the hood latch (B). Take care not to bend the cable.



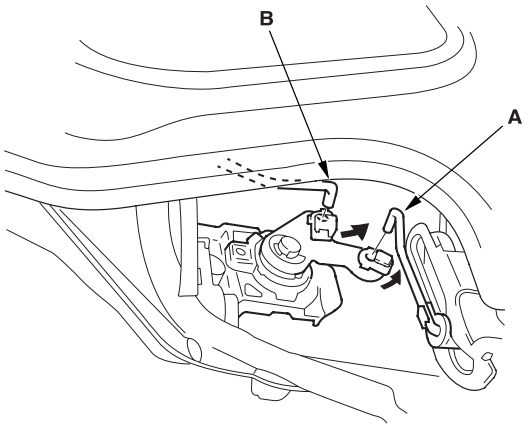
4. Install the hood latch in the reverse order of removal, and note these items:
   - Grease each location of the hood latch indicated by the arrows.
   - Make sure the hood opener cable is connected properly and hood latch switch connector is plugged in properly (for some models).
   - Adjust the hood latch alignment (see page 20-132).
   - Make sure the hood opens properly and locks securely.



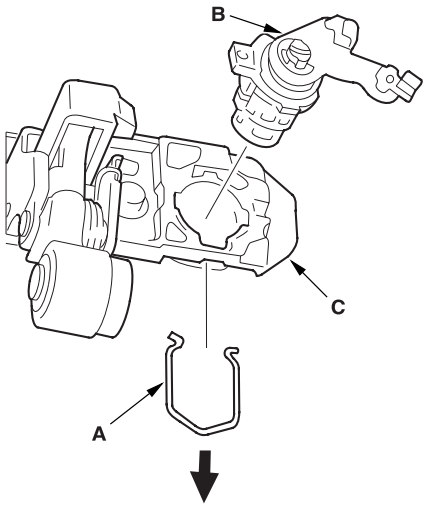
Tailgate Handle Replacement

NOTE:
- Take care not to scratch the tailgate.
- Put on gloves to protect your hands.

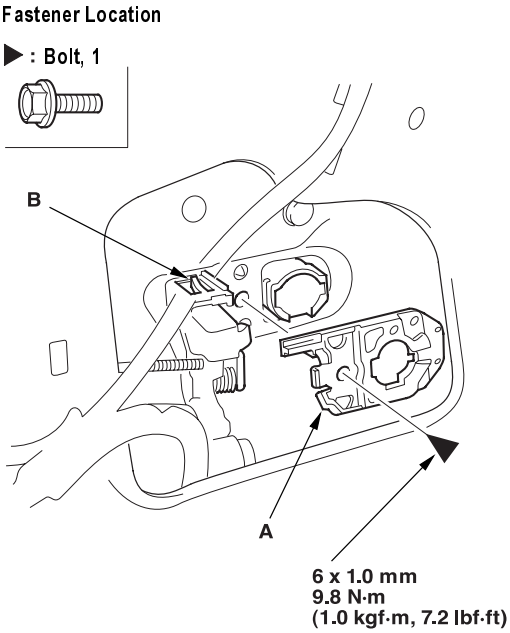
1. Remove the tailgate stopper assembly (see page 20-165).
2. Disconnect the cylinder rod (A) and the hatch glass open rod (B) from the tailgate lock cylinder (C).



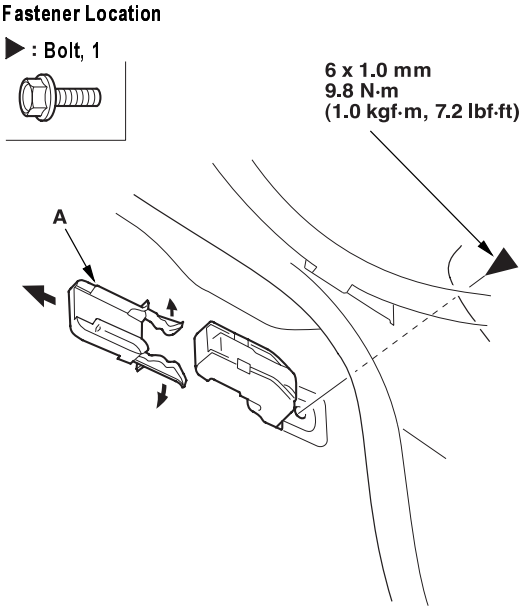
3. Release the retainer clip (A) with a hooked shaped tool, then remove the lock cylinder (B) from the tailgate handle (C).



4. Remove the bolt securing the cylinder protector (A) and tailgate handle. Release the hook (B), then remove the protector.



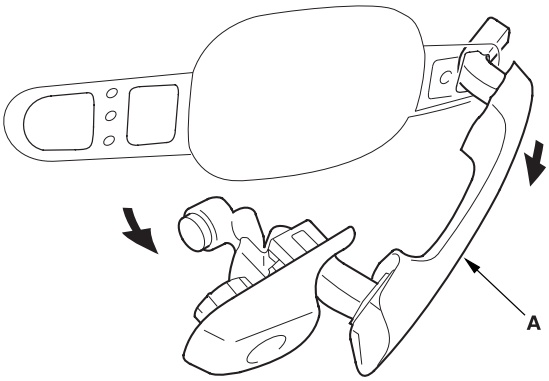
5. Remove the bolt securing the tailgate handle, and remove the spacer (A).



(cont'd)

Tailgate Handle Replacement (cont'd)

6. Remove the outer handle (A) while pulling it as shown.



7. Install the tailgate handle in the reverse order of removal, and note these items:

- Make sure each rod is connected securely.
- Make sure the tailgate locks and opens properly.
- Install the lock cylinder retaining clip on the handle, then install the lock cylinder. Be sure the clip is fully seated in the slot on the lock cylinder.

Tailgate Latch Replacement

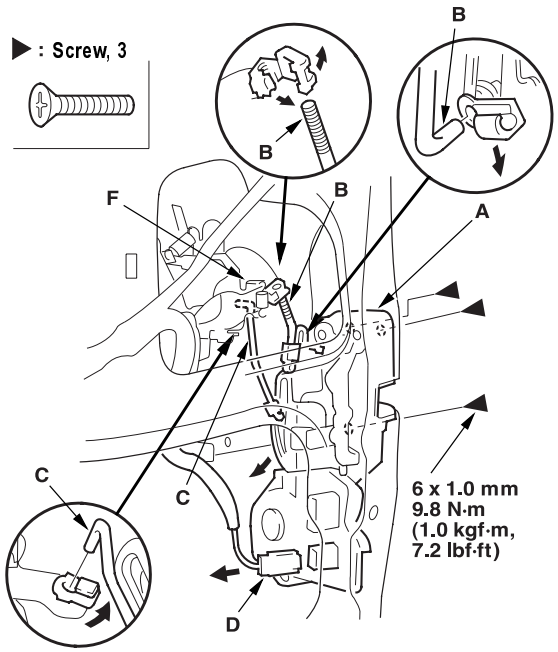
NOTE:
- Take care not to scratch the tailgate.
- Put on gloves to protect your hands.

1. Remove the tailgate lower trim panel (see page 20-80)

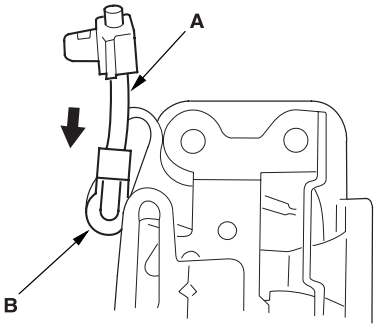
2. Remove the tailgate latch (A).

1 Disconnect the tailgate rod (B) and cylinder rod (C).
2 Disconnect the actuator connector (D).
3 Remove the screws securing the latch.
4 Remove the latch through the hole in the tailgate.Take care not to bend the tailgate rod and cylinder rod.

Fastener Locations



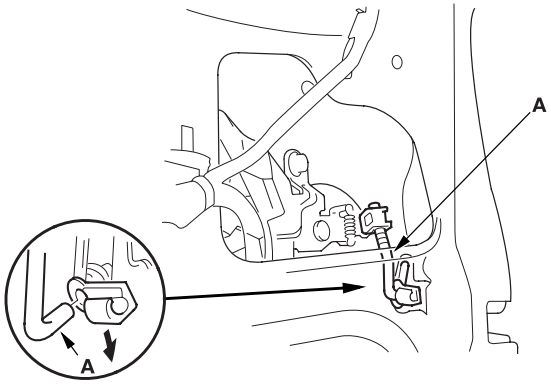
3. Install the latch in the reverse order of removal, and note these items:
   - Make sure the actuator connector is plugged in properly, and each rod is connected securely.
   - If the tailgate rod (A) was disconnected at the upper end (the tailgate stopper assembly side), reconnect it with its lower end on the bottom of a hole in the lever (B).
   - Make sure the tailgate locks and opens properly.



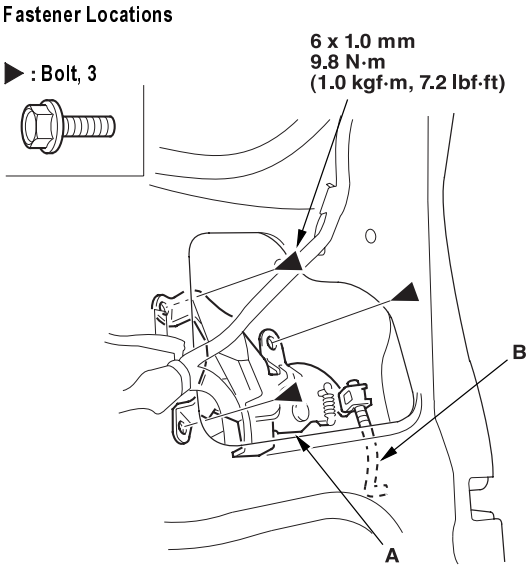
Tailgate Stopper Assembly Replacement

NOTE:
- Take care not to scratch the tailgate.
- Put on gloves to protect your hands.

1. Remove the tailgate lower trim panel (see page 20-80)
2. Disconnect the tailgate rod (A) at the lower end from the tailgate latch.



3. Remove the bolt, then remove the tailgate stopper assembly (A).



4. If necessary, disconnect the tailgate rod (B) from the tailgate stepper assembly.

(cont'd)

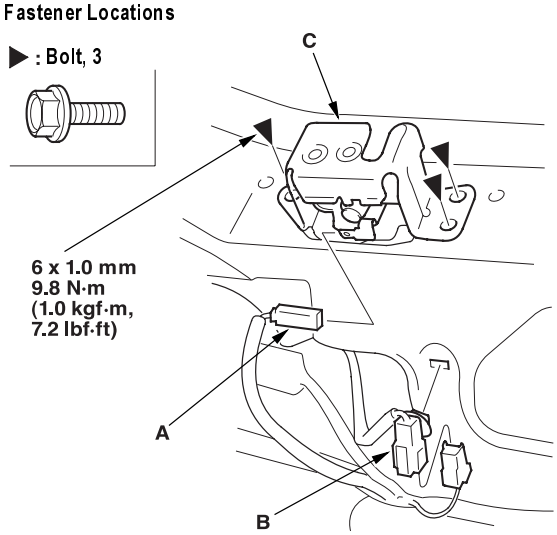
Tailgate Stopper Assembly Replacement (cont'd)

5. Install the stopper assembly in the reverse order of removal, and note these items:
   - Make sure the tailgate rod is connected securely. If you removed the tailgate rod from the tailgate stopper assembly, adjust the rod when reinstalling it (see step 3 on page 20-165).
   - Make sure the tailgate opens properly.

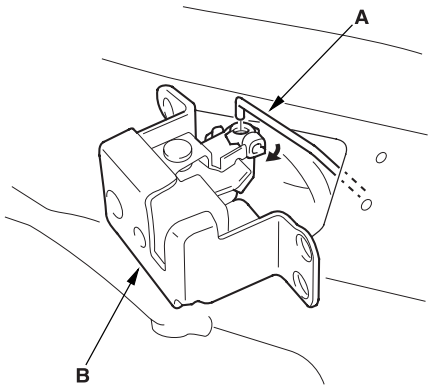
Hatch Glass Latch Replacement

NOTE:
- Take care not to scratch the tailgate.
- Put on gloves to protect your hands.

1. Remove the tailgate lower trim panel (see page 20-80)
2. Disconnect the hatch glass latch switch connector (A), hatch glass latch connector (B), and detach the hatch glass latch connector from the tailgate.



3. Remove the bolts, then pull the hatch glass latch (C) out.
4. Disconnect the hatch glass rod (A), than remove the hatch glass latch (B).Take care not to bend the rod.

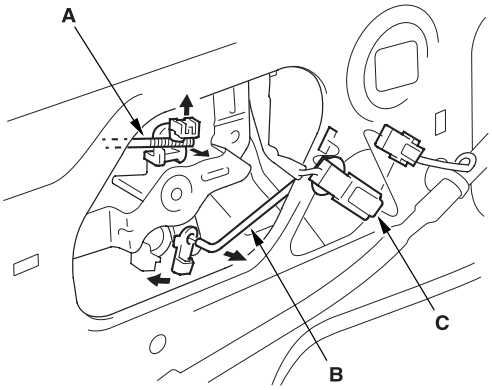


5. Install the latch in the reverse order of removal, and note these items:
   - Make sure each connector is plugged in properly, and the rod is connected properly.
   - Make sure the hatch glass opens properly and locks securely.

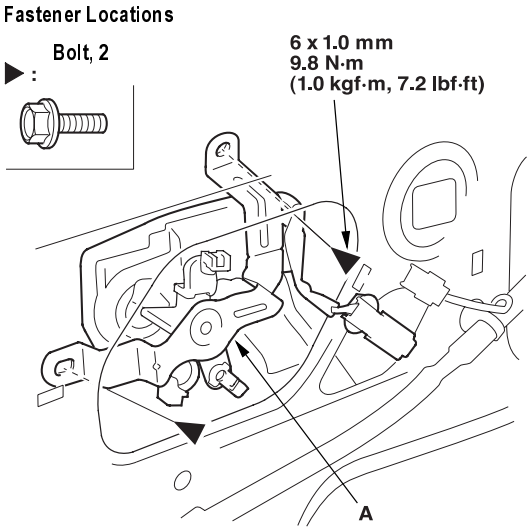
Hatch Glass Actuator Replacement

NOTE:
- Take care not to scratch the tailgate.
- Put on gloves to protect your hands.

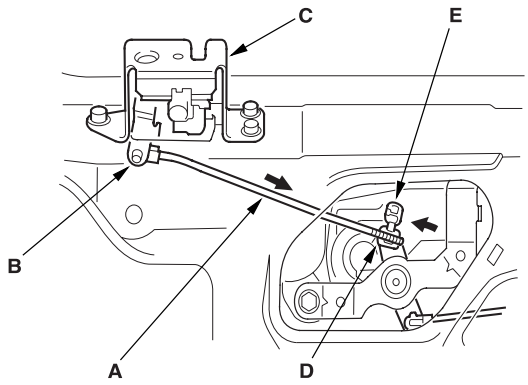
1. Remove the tailgate lower trim panel (see page 20-80)
2. Disconnect the hatch glass rod (A), hatch glass open rod (B), and actuator connector (C), then detach the connector from the tailgate.



3. Remove the bolts, then remove the hatch glass actuator (A).



4. Install the actuator in the reverse order of removal, and note these items:
   - Make sure the actuator connector is plugged in properly, and each rod is connected securely.
   - Reconnect the hatch glass rod (A) as following sequence.
     - Move the lever (B) of the latch (C) into lock position.
     - While holding the lever (B) into lock position, take off the looseness on the latch side of the rod by pulling the rod in direction shown by the arrow.
     - Move the lever (D) of the actuator into set position as shown by the arrow.
     - Connect the rod to the fastener (E) of the lever.
   - Make sure the hatch glass opens properly and locks securely.

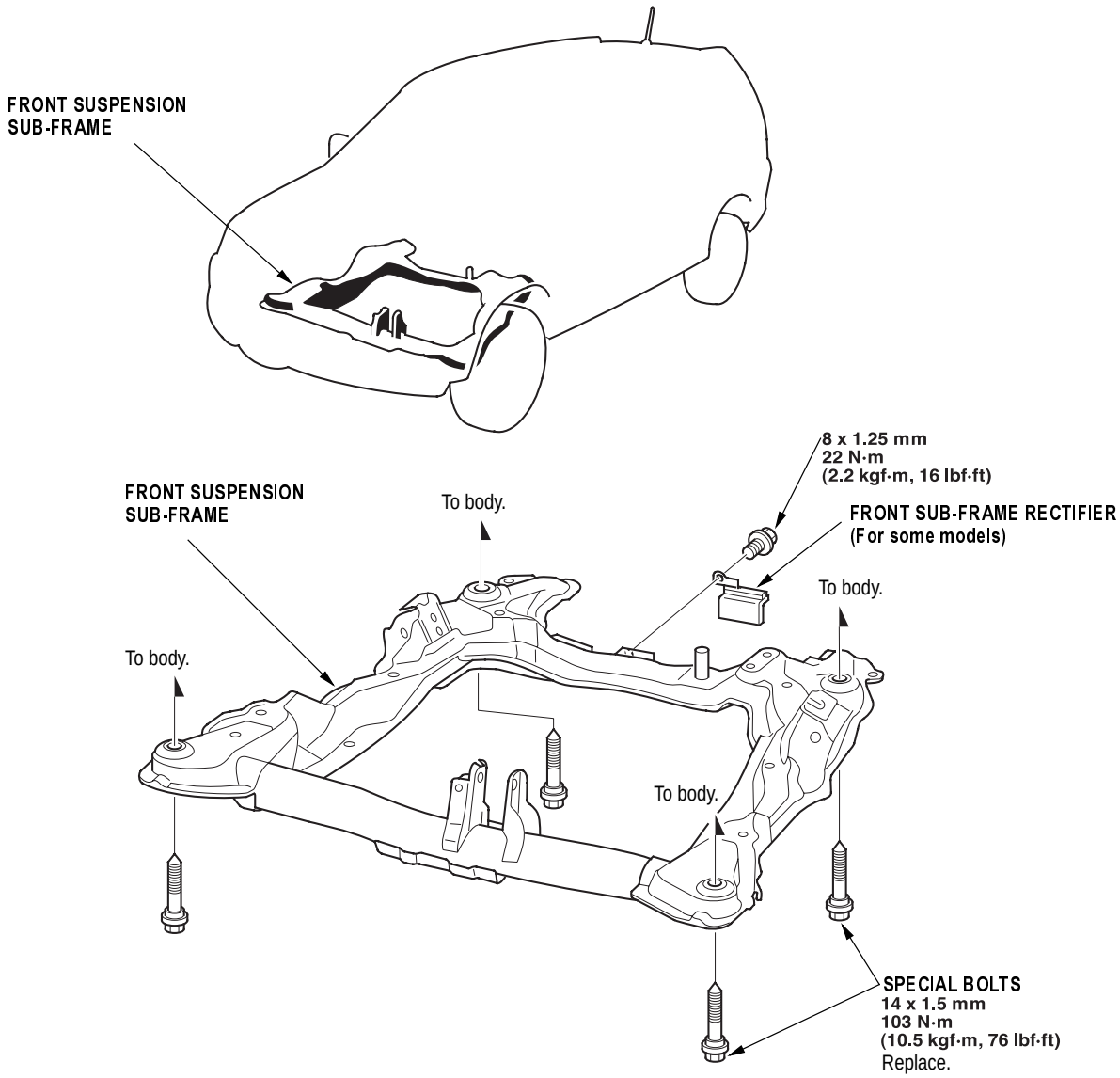


Frame

Sub-frame Replacement

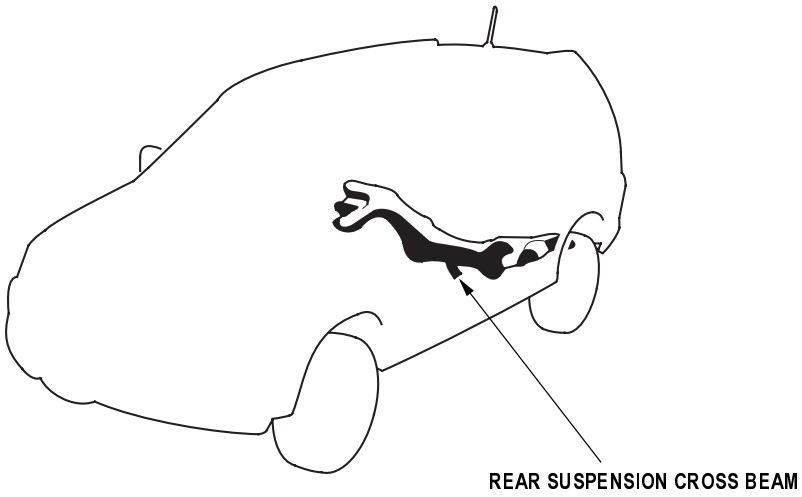
Front Sub-frame Torque

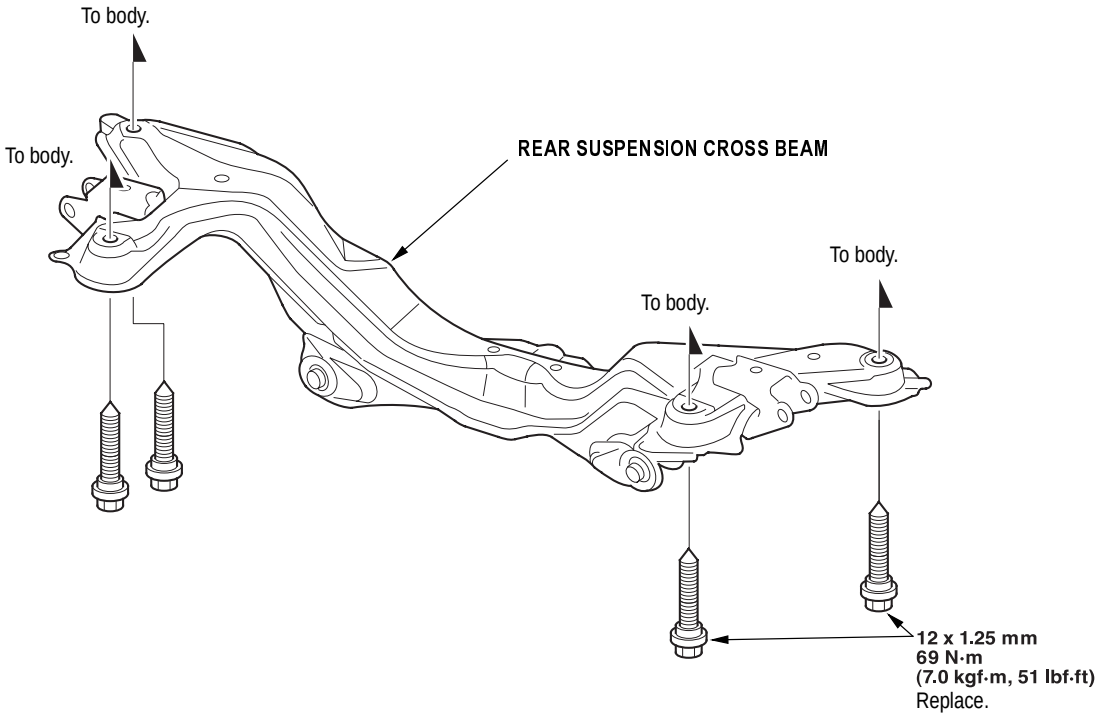
NOTE: After loosening the sub-frame mounting bolts, be sure to replace them with new ones.



Rear Sub-frame Torque

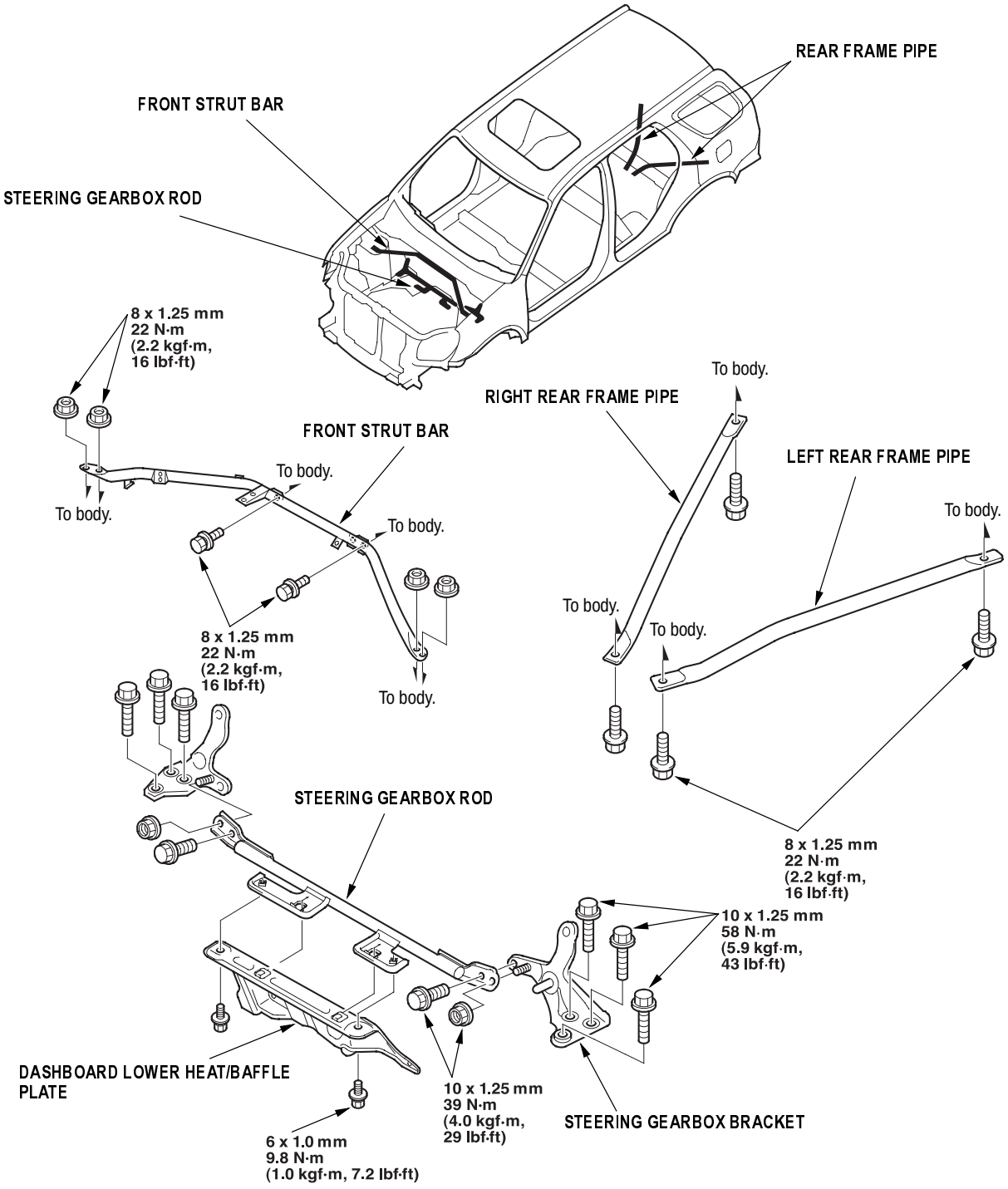
NOTE: After loosening the sub-frame mounting bolts, be sure to replace them with new ones.





Frame Stiffener Replacement

Front Strut Bar, Steering Gearbox Rod and Rear Frame Pipe Torque



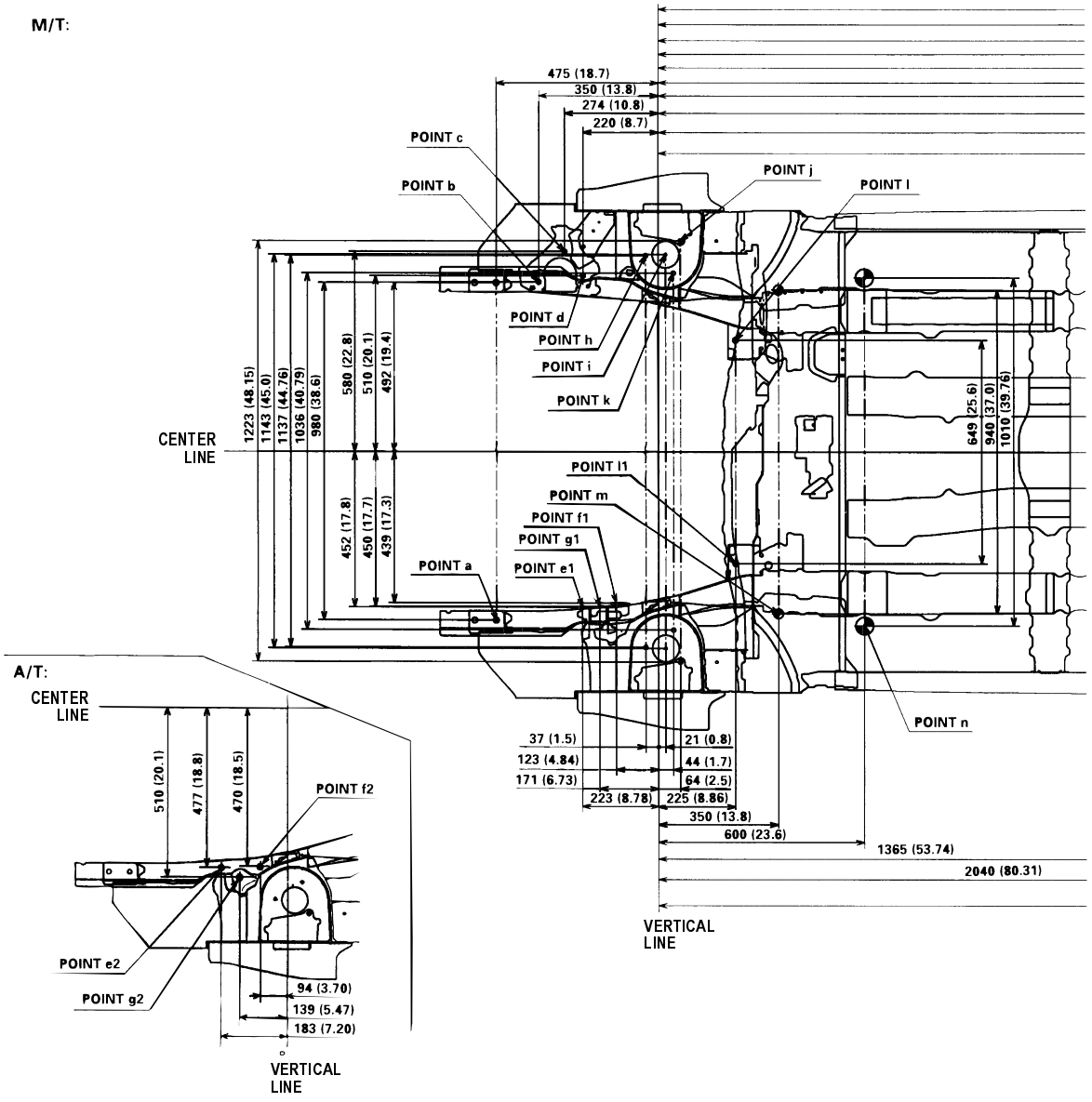
Frame Repair Chart

Top View

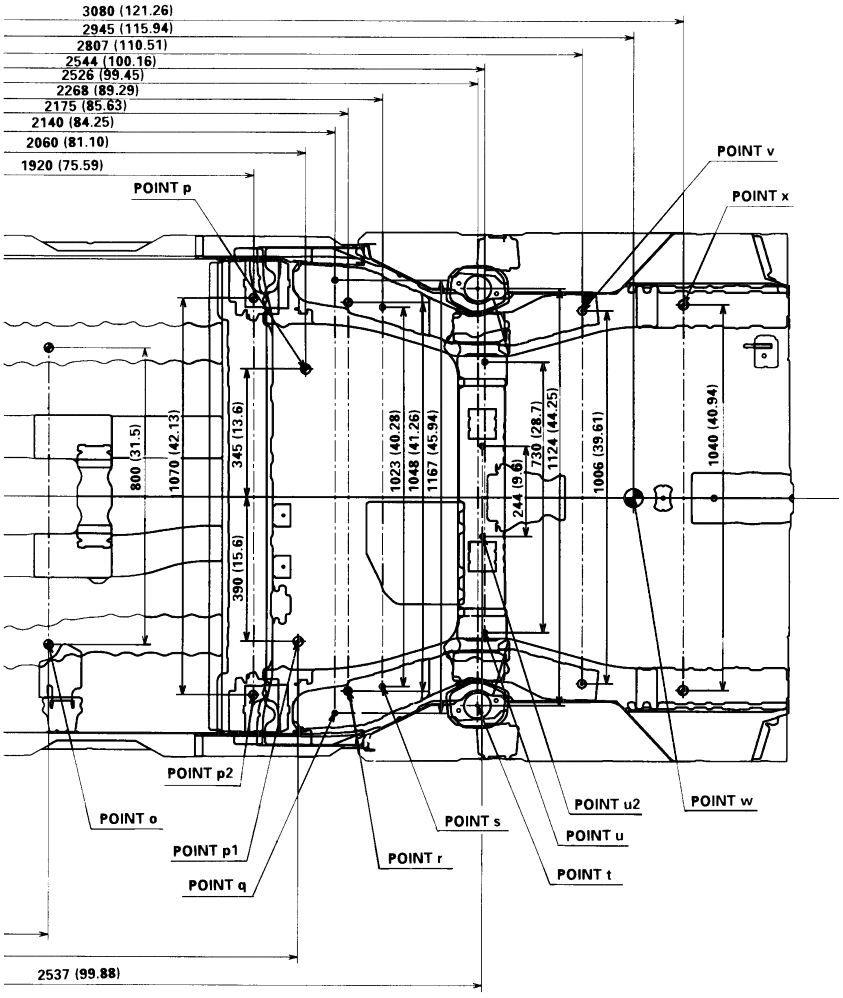
Unit: mm (in.)

Ø: Inner diameter

a	For sub-frame Ø16 (0.63)	h	For damper mount Ø11.5 (0.45)
b	For engine mount Ø13 (0.51)	i	For damper center Ø78 (3.07)
c	For engine mount Ø13 (0.51)	j	For damper mount Ø11.5 (0.45
d	For engine mount Ø13 (0.51)	k	For damper mount Ø11.5 (0.45)
e1	For M/T transmission mount Ø13 (0.51)	l	For sub-frame Ø16 (0.63)
e2	For A/T transmission mount Ø13 (0.51)	l1	For sub-frame Ø16 (0.63)
f1	For M/T transmission mount Ø13 (0.51)	m	Locating hole Ø27.4 (1.08)
f2	For A/T transmission mount Ø13 (0.51)	n	Locating hole Ø50 (1.97)
g1	For M/T transmission mount Ø13 (0.51)		
g2	For A/T transmission mount Ø13 (0.51)		



o	Locating hole Ø25 (0.98)	t	Rear damper center Ø68 (2.68)
p	Locating hole Ø25 (0.98)	u	For rear cross beam Ø15 (0.59)
p1	Locating hole Ø25 (0.98)	u2	Locating hole Right side: Ø13 (0.51)/Left side: Ø15 (0.59)
p2	Locating hole Ø23 (0.91)	v	For rear cross beam Ø15 (0.59)
q	For trailing arm Ø14 (0.55)	w	Locating hole Ø50 (1.97)
r	Locating hole Ø20 (0.79)	x	Locating hole Ø25 (0.98)
s	For trailing arm Ø14 (0.55)		



(cont'd)

Frame Repair Chart (cont'd)

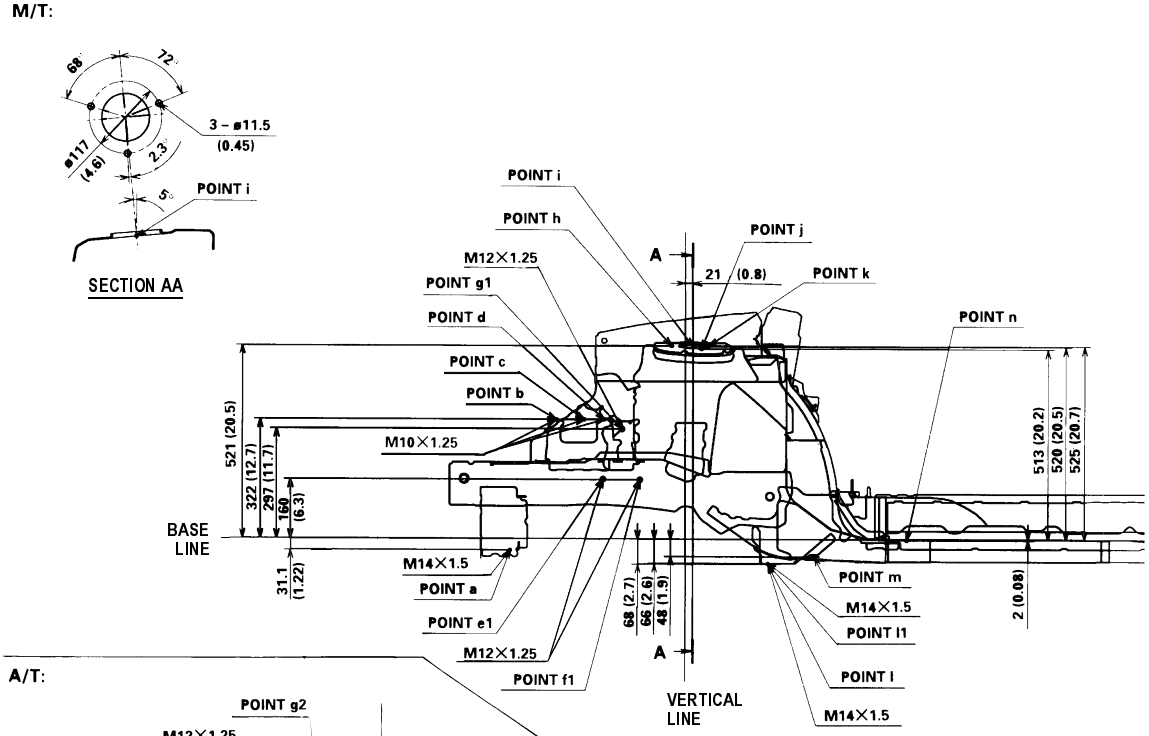
Side View

Unit: mm (in.)

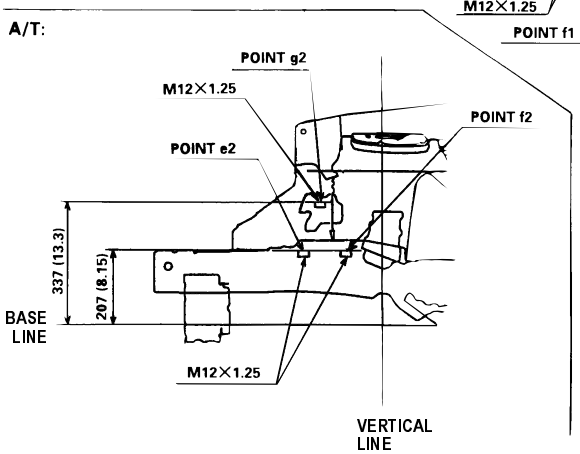
Ø: Inner diameter

a	For sub-frame Ø16 (0.63)	h	For damper mount Ø11.5 (0.45)
b	For engine mount Ø13 (0.51)	i	For damper center Ø78 (3.07)
c	For engine mount Ø13 (0.51)	j	For damper mount Ø11.5 (0.45
d	For engine mount Ø13 (0.51)	k	For damper mount Ø11.5 (0.45)
e1	For M/T transmission mount Ø13 (0.51)	l	For sub-frame Ø16 (0.63)
e2	For A/T transmission mount Ø13 (0.51)	l1	For sub-frame Ø16 (0.63)
f1	For M/T transmission mount Ø13 (0.51)	m	Locating hole Ø27.4 (1.08)
f2	For A/T transmission mount Ø13 (0.51)	n	Locating hole Ø50 (1.97)
g1	For M/T transmission mount Ø13 (0.51)		
g2	For A/T transmission mount Ø13 (0.51)		

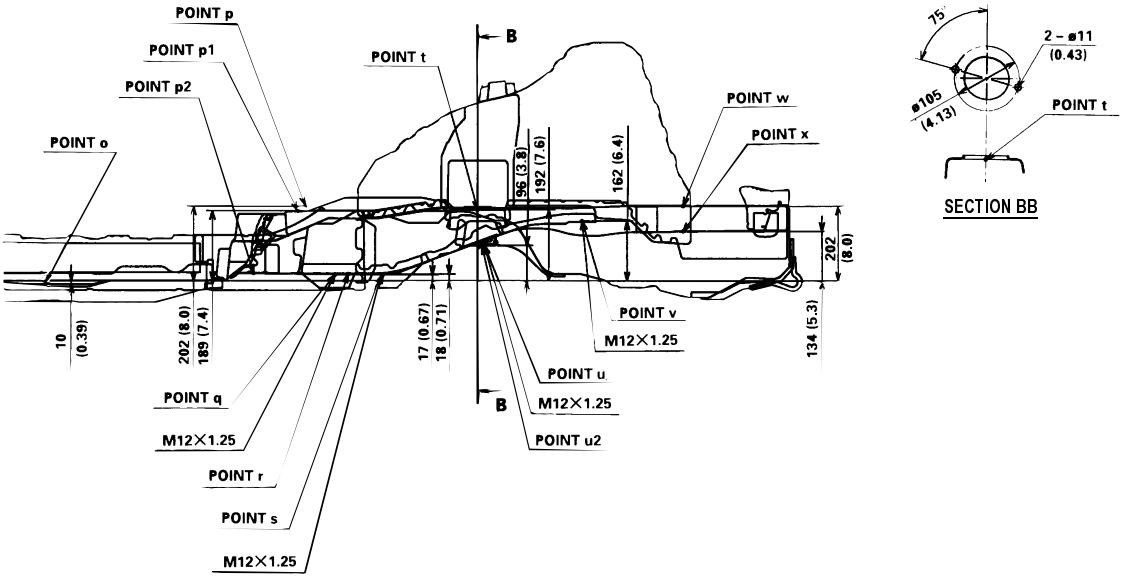
M/T:



A/T:



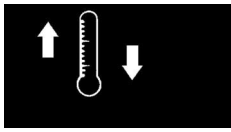
o	Locating hole Ø25 (0.98)	t	Rear damper center Ø68 (2.68)
p	Locating hole Ø25 (0.98)	u	For rear cross beam Ø15 (0.59)
p1	Locating hole Ø25 (0.98)	u2	Locating hole Right side: Ø13 (0.51)/Left side: Ø15 (0.59)
p2	Locating hole Ø23 (0.91)	v	For rear cross beam Ø15 (0.59)
q	For trailing arm Ø14 (0.55)	w	Locating hole Ø50 (1.97)
r	Locating hole Ø20 (0.79)	x	Locating hole Ø25 (0.98)
s	For trailing arm Ø14 (0.55)		



21

HVAC
(Heating, Ventilation, and Air Conditioning)

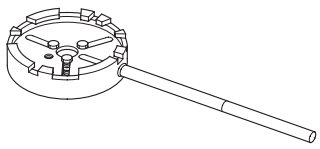
Heating 21-2
Air Conditioning 21-31
Climate Control 21-61



Heating

Special Tools

Ref. No.	Tool Number	Description	Qty
1	07NAB-HAC0100	A/C Clutch Holder	1



1

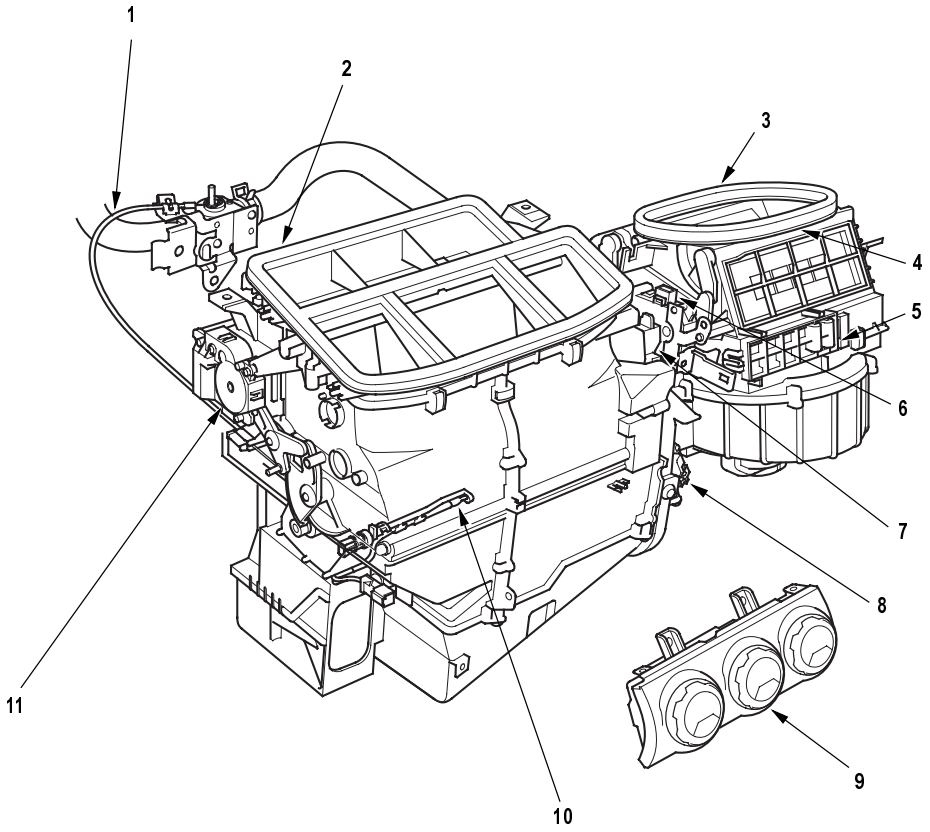
SUPPLEMENAL RESTRAINT SYSTEM (SRS) (If HVAC maintenance is required)

The CR-V SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents include or are located near SRS components. Servicing, disassembling, or replacing these items will require special precautions and tools, and should be done only by an authorized Honda dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS could lead to personal injury caused by unintentional deployment of the airbags and side airbags.
- Do not bump the SRS unit. Otherwise, the system may fail in a collision, or the airbags may deploy when the ignition switch is ON (II).
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

Component Location Index

NOTE: LHD type is shown, RHD type is symmetrical.



1	HEATER VALVE CABLE	Adjustment, page 21-30
2	HEATER UNIT / CORE	Replacement, page 21-28
3	BLOWER UNIT	Removal and Installation, page 21-26
4	BLOWER UNIT COMPONENTS	Replacement, page 21-27
5	DUST AND POLLEN FILTER	Replacement, page 21-25
6	RECIRCULATION CONTROL MOTOR	Test, page 21-23; Replacement, page 21-23
7	MODE CONTROL MOTOR	Test, page 21-22; Replacement, page 21-22
8	POWER TRANSISTOR	Test, page 21-24
9	HEATER CONTROL PANEL	Removal and Installation, page 21-24
10	EVAPORATOR TEMPERATURE SENSOR (With A/C)	Replacement, page 21-44; Test, page 21-44
11	AIR MIX CONTROL MOTOR	Replacement, page 21-21; Test, page 21-21

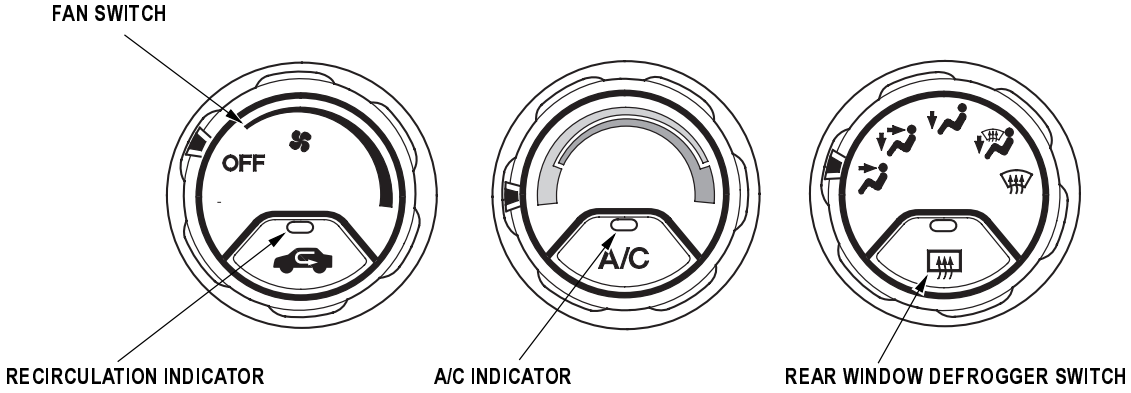
General Troubleshooting Information

How to Retrieve a DTC

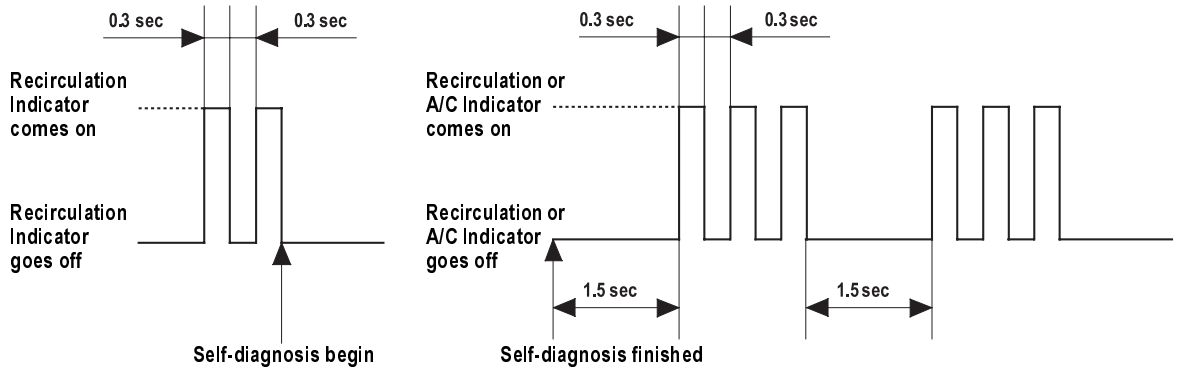
The Heater Control Panel has a self-diagnosis function.

Running the Self-diagnosis Function

1. Turn the ignition switch OFF.
2. Turn the fan switch OFF, the temperature control dial on Max Cool and the mode control dial on Vent.
3. Turn the ignition switch ON (II), then press and hold the recirculation control switch. Within 10 seconds while holding the switch down, press the rear window defogger switch five times. The recirculation indicator blinks two times, then the self-diagnosis will begin. If there is any problem in the system after self-diagnosis is finished, the recirculation indicator will blink the Diagnostic Trouble Code (DTC) 7 through 13 when problems in the evaporator temperature sensor circuit are detected (codes 14 and 15), the A/C indicator will blink the DTC. If no DTC's are found, the indicator will not blink.



Example of DTC indication Pattern (DTC 3)



Resetting the Self-diagnosis Function

Turn the ignition switch OFF to cancel the self-diagnosis function. After completing repair work, run the self-diagnosis function again to make sure that there are no other malfunctions.

DTC Troubleshooting Index

DTC (Recirculation Indicator Blinks)	Detection Item	Page
7	An open in the air mix control motor circuit	(see page 21-9)
8	A short in the air mix control motor circuit	(see page 21-9)
9	A problem in the air mix control linkage, door, or motor	(see page 21-10)
10	An open or short in the mode control motor circuit	(see page 21-11)
11	A problem in the mode control linkage, doors, or motor	(see page 21-12)
12	A problem in the blower motor circuit	(see page 21-13)
13	A problem in the EEPROM in the heater control panel; the control panel must be replaced	(see page 21-24)

DTC (A/C Indicator Blinks)	Detection Item	Page
14 (With A/C)	An open in the evaporator temperature sensor circuit	(see page 21-16)
15 (With A/C)	A short in the evaporator temperature sensor circuit	(see page 21-17)

In case of multiple problems, the recirculation indicator will indicate only the DTC with the least number of blinks.

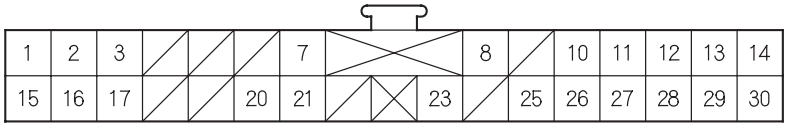
Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Recirculation control doors do not change between Fresh and Recirculate	Recirculation Control Motor Circuit Troubleshooting (see page 21-18)	• Blown fuse No. 14 (10A) in the under-dash fuse/relay box • Cleanliness and tightness of all connectors
Both heater and A/C do not work	Heater Control Power and Ground Circuits Troubleshooting (see page 21-20)	• Blown fuse No. 14 (10A) in the under-dash fuse/relay box • Poor ground at G501 • Cleanliness and tightness of all connectors

System Description

Heater Control Panel Inputs and Outputs

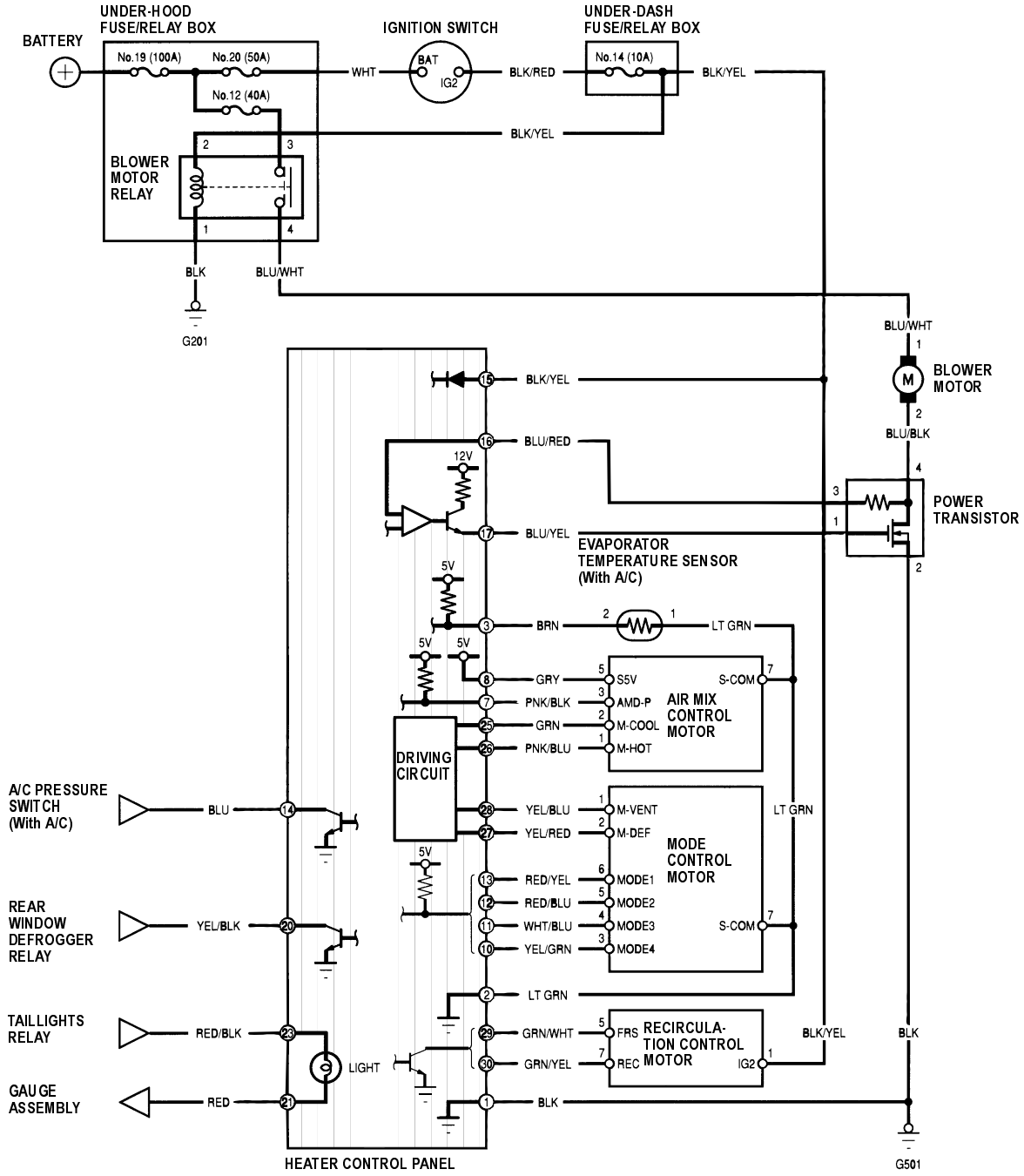
HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Cavity	Wire color	Signal	
1	BLK	Ground	Input
2	LT GRN	Sensor Common Ground	Input
3	BRN	Evaporator temperature sensor	Output
4	——	——	——
5	——	——	——
6	——	——	——
7	PNK/BLK	Air mix potential	Output
8	GRY	Air mix potential +5V	Output
9	——	——	——
10	YEL/GRN	Mode 4	Output
11	WHT/BLU	Mode 3	Output
12	RED/BLU	Mode 2	Output
13	RED/YEL	Mode 1	Output
14	BLU	A/C pressure switch	Input
15	BLK/YEL	IG2 Power	Input
16	BLU/RED	Blower feed back	Input
17	BLU/YEL	Power transistor base	Output
18	——	——	——
19	——	——	——
20	YEL/BLK	Rear window defogger relay	Output
21	RED	Ground (For lighting)	Output
22	——	——	——
23	RED/BLK	Taillights relay	Input
24	——	——	——
25	GRN	Air mix cool	Output
26	PNK/BLU	Air mix hot	Output
27	YEL/RED	Mode vent	Output
28	YEL/BLU	Mode def	Output
29	GRN/WHT	Fresh	Input
30	GRN/YEL	Recirculate	Input

Circuit Diagram



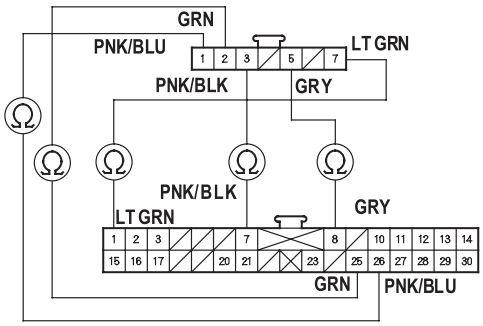
DTC Troubleshooting

DTC 7: An Open in the Air Mix Control Motor Circuit

1. Disconnect the air mix control motor 7P connector.
2. Disconnect the heater control panel 30P connector.
3. Check for continuity between the following terminals of the heater control panel 30P connector and the air mix control motor 7P connector.

30P:	7P:
No. 2	No. 7
No. 7	No. 3
No. 8	No. 5
No. 25	No. 2
No. 26	No. 1

AIR MIX CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals



HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals

Is there continuity?

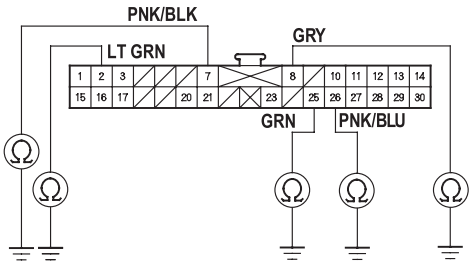
Yes Check for loose wires or poor connections at the heater control panel 30P connector and at the air mix control motor 7P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

No Repair any open in the wire(s) between the heater control panel and the air mix control motor.■

DTC 8: A Short in the Air Mix Control Motor Circuit

1. Disconnect the air mix control motor 7P connector.
2. Disconnect the heater control panel 30P connector.
3. Check for continuity between body ground and heater control panel 30P connector terminals No. 2, 7, 8, 25, and 26 individually.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Repair any short to body ground in the wire(s) between the heater control panel and the air mix control motor.■

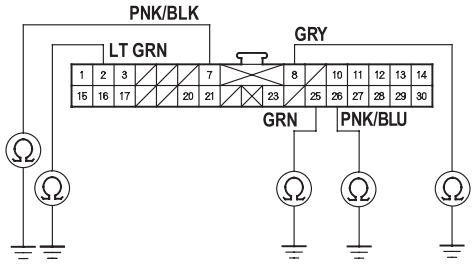
No Go to step 4.

(cont'd)

DTC Troubleshooting (cont'd)

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there any voltage?

Yes Repair any short to power in the wire(s) between the heater control panel and the air mix control motor. This short also may damage the heater control panel. Repair the short to power before replacing the heater control panel.■

No Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

DTC 9: A Problem in the Air Mix Control Linkage, Door, or Motor

1. Test the air mix control motor (see page 21-21).

Is the air mix control motor OK?

Yes Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

No Go to step 2.

2. Remove the air mix control motor (see page 21-21).

3. Check the air mix control linkage and door for smooth movement.

Do the air mix control linkage and door move smoothly?

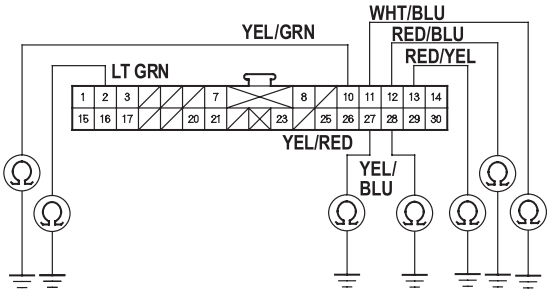
Yes Replace the air mix control motor.■

No Repair the air mix control linkage or door.■

DTC 10: An Open or Short in the Mode Control Motor Circuit

1. Disconnect the mode control motor 7P connector.
2. Disconnect the heater control panel 30P connector.
3. Check for continuity between body ground and the heater control panel 30P connector terminals No. 2, 10, 11, 12, 13, 27, and 28 individually.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

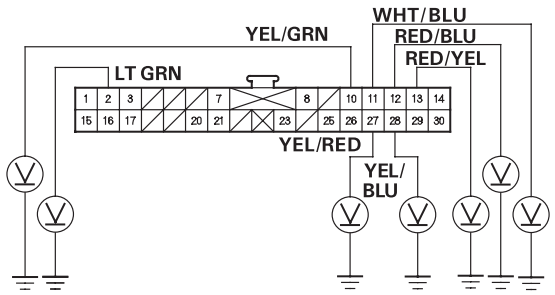
Is there continuity?

Yes Repair any short to body ground in the wire(s) between the heater control panel and the mode control motor.■

No Go to step 4.

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there any voltage?

Yes Repair any short to power in the wire(s) between the heater control panel and the mode control motor. This short also may damage the heater control panel. Repair the short to power before replacing the heater control panel.■

No Go to step 5.

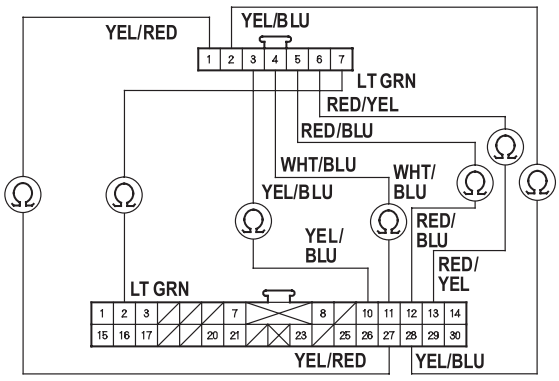
(cont'd)

DTC Troubleshooting (cont'd)

5. Turn the ignition switch OFF, and check for continuity between the following terminals of the heater control panel 30P connector and the mode control motor 7P connector.

30P:	7P:
No. 2	No. 7
No. 10	No. 3
No. 11	No. 4
No. 12	No. 5
No. 13	No. 6
No. 28	No. 2
No. 27	No. 1

MODE CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals



HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals

Is there continuity?

Yes Check for loose wires or poor connections at the heater control panel 30P connector and at the mode control motor 7P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

No Repair any open in the wire(s) between the heater control panel and the mode control motor.■

DTC 11: A Problem in the Mode Control Linkage, Doors, or Motor

1. Test the mode control motor (see page 21-22).

Is the mode control motor OK?

Yes Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

No Go to step 2.

2. Remove the mode control motor (see page 21-22).

3. Check the mode control linkage and doors for smooth movement.

Do the mode control linkage and doors move smoothly?

Yes Replace the mode control motor.■

No Repair the mode control linkage or doors.■

DTC 12: A Problem in the Blower Motor Circuit

1. Check the No. 12 (40A) fuse in the under-hood fuse/relay box, and the No. 14 (10A) fuse in the under-dash fuse/relay box.

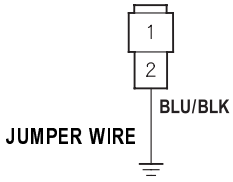
Are the fuses OK?

Yes Go to step 2.

No Replace the fuse(s), and recheck.■

2. Connect the No. 2 terminal of the blower motor 2P connector to body ground with a jumper wire.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

3. Turn the ignition switch ON (II).

Does the blower motor run?

Yes Go to step 4.

No Go to step 17.

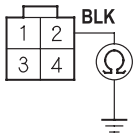
4. Turn the ignition switch OFF.

5. Disconnect the jumper wire.

6. Disconnect the power transistor 4P connector.

7. Check for continuity between the No. 2 terminal of the power transistor 4P connector and body ground.

POWER TRANSISTOR 4P CONNECTOR



Wire side of female terminals

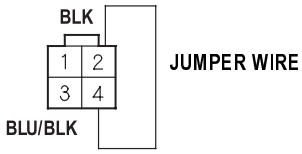
Is there continuity?

Yes Go to step 8.

No Check for an open in the wire between the power transistor and body ground. If the wire is OK, check for poor ground at G501.■

8. Connect the No. 2 and No. 4 terminals of the power transistor 4P connector with a jumper wire.

POWER TRANSISTOR 4P CONNECTOR



Wire side of female terminals

9. Turn the ignition switch ON (II).

Does the blower motor run at high speed?

Yes Go to step 10.

No Repair open in the wire between the power transistor and the blower motor.■

10. Turn the ignition switch OFF.

11. Disconnect the jumper wire.

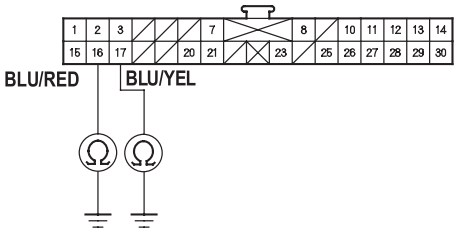
(cont'd)

DTC Troubleshooting (cont'd)

12. Disconnect the heater control panel 30P connector.

13. Check for continuity between the No. 16 and No. 17 terminals of the heater control panel 30P connector and body ground individually.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there continuity?

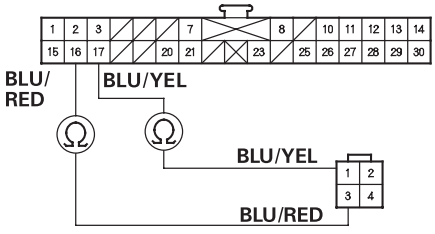
Yes Repair any short to body ground in the wire(s) between the heater control panel and the power transistor.■

No Go to step 14.

14. Check for continuity between the following terminals of the heater control panel 30P connector and the power transistor 4P connector.

30P:	4P:
No. 17	No. 1
No. 16	No. 3

HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals



Wire side of female terminals

Is there continuity?

Yes Go to step 15.

No Repair any open in the wire(s) between the heater control panel and the power transistor.■

15. Reconnect the heater control panel 30P connector.

16. Test the power transistor (see page 21-24)

Is the power transistor OK?

Yes Check for loose wires or poor connections at the heater control panel 30P connector and at the power transistor 4P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

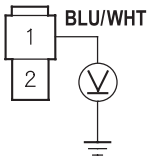
No Replace the power transistor.■

17. Disconnect the jumper wire.

18. Disconnect the blower motor 2P connector.

19. Measure the voltage between the No. 1 terminal of the blower motor 2P connector and body ground.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Replace the blower motor.■

No Go to step 20.

20. Turn the ignition switch OFF.

21. Remove the blower motor relay from the under-hood fuse/relay box, and test it (see page 21-26).

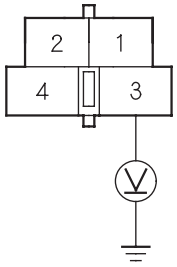
Is the relay OK?

Yes Go to step 22.

No Replace the blower motor relay.■

22. Measure the voltage between the No. 3 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR 4P SOCKET



Is there battery voltage?

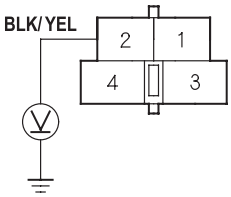
Yes Go to step 23.

No Replace the under-hood fuse/relay box.■

23. Turn the ignition switch ON (II).

24. Measure the voltage between the No. 2 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR 4P SOCKET



Is there battery voltage?

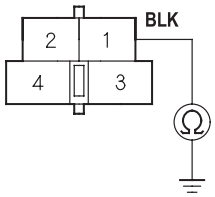
Yes Go to step 25.

No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the blower motor relay.■

25. Turn the ignition switch OFF.

26. Check for continuity between the No. 1 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Repair open in the wire between the blower motor relay and the blower motor.■

No Check for an open in the wire between the blower motor relay and body ground. If the wire is OK, check for poor ground at G501.■

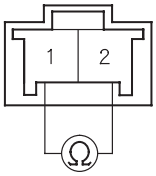
DTC Troubleshooting (cont'd)

DTC 14: An Open in the Evaporator Temperature Sensor Circuit

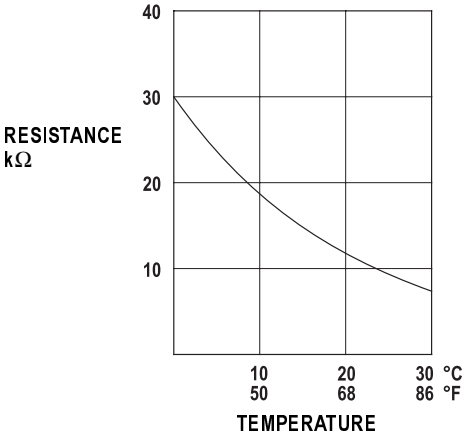
1. Remove the evaporator temperature sensor (see page 21-44).
2. Measure the resistance between the No. 1 and No. 2 terminals of the evaporator temperature sensor.

   *Dip the sensor in ice water, and measure resistance. Then pour hot water on the sensor, and check for change in resistance.

EVAPORATOR TEMPERATURE SENSOR



Terminal side of male terminals



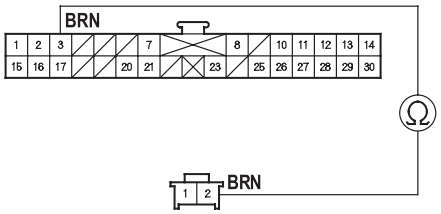
Is the resistance within the specifications shown on the graph?

Yes Go to step 3.

No Replace the evaporator temperature sensor.■

3. Disconnect the heater control panel 30P connector.
4. Check for continuity between the No. 3 terminal of the heater control panel 30P connector and the No. 2 terminal of the evaporator temperature sensor 2P connector.

HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

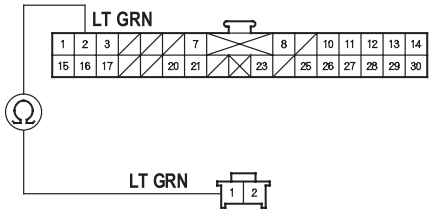
Is there continuity?

Yes Go to step 5.

No Repair open in the wire between the heater control panel and the evaporator temperature sensor.■

5. Check for continuity between the No. 2 terminal of the heater control panel 30P connector and the No. 1 terminal of the evaporator temperature sensor 2P connector.

HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

Yes Check for loose wires or poor connections at the heater control panel 30P connector and at the evaporator temperature sensor 2P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

No Repair open in the wire between the heater control panel and the evaporator temperature sensor.■

DTC 15: A Short in the Evaporator Temperature Sensor Circuit

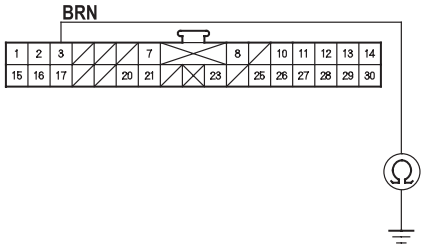
1. Remove the evaporator temperature sensor (see page 21-44).
2. Test the evaporator temperature sensor (see page 21-44).

   Is the resistance within the specifications shown on the graph?

   Yes Go to step 3.

   No Replace the evaporator temperature sensor.■
3. Disconnect the heater control panel 30P connector.
4. Check for continuity between the No. 3 terminal of the heater control panel 30P connector and body ground.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Repair short to body ground in the wire between the heater control panel and the evaporator temperature sensor.■

No Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

Recirculation Control Motor Circuit Troubleshooting

1. Check the No. 14 (10A) fuse in the under-dash fuse/relay box.

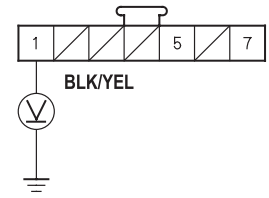
   Is the fuse OK?

   Yes Go to step 2.

   No Replace the fuse, and recheck.■

2. Disconnect the recirculation control motor 7P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 1 terminal of the recirculation control motor 7P connector and body ground.

RECIRCULATION CONTROL MOTOR 7P CONNECTOR



Wire side of female terminals

   Is there battery voltage?

   Yes Go to step 5.

   No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the recirculation control motor.■

5. Turn the ignition switch OFF.
6. Test the recirculation control motor (see page 21-23).

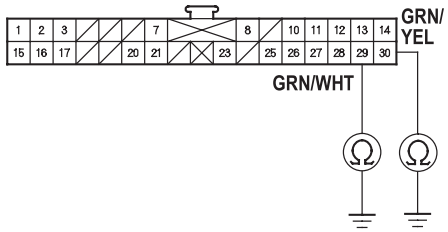
   Is the recirculation control motor OK?

   Yes Go to step 7.

   No Go to step 12.

7. Disconnect the heater control panel 30P connector.
8. Check for continuity between the No. 29 and No. 30 terminals of the heater control panel 30P connector and body ground individually.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

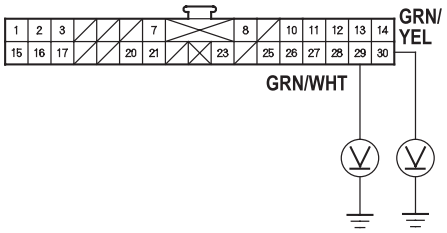
   Is there continuity?

   Yes Repair any short to body ground in the wire(s) between the heater control panel and the recirculation control motor.■

   No Go to step 9.

9. Turn the ignition switch ON (II), and check the same wires for voltage.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

   Is there any voltage?

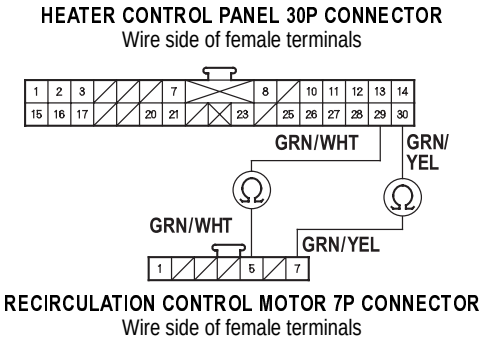
   Yes Repair any short to power in the wire(s) between the heater control panel and the recirculation control motor. This short also may damage the heater control panel. Repair the short to power before replacing the heater control panel.■

   No Go to step 10.

10. Turn the ignition switch OFF.

11. Check for continuity between the following terminals of the heater control panel 30P connector and the recirculation control motor 7P connector.

30P:	7P:
No. 29	No. 5
No. 30	No. 7



Is there continuity?

Yes Check for loose wires or poor connections at the heater control panel 30P connector and at the recirculation control motor 7P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

No Repair any open in the wire(s) between the heater control panel and the recirculation control motor.■

12. Remove the recirculation contol motor (see page 21-23).

13. Check the recirculation control linkage and doors for smooth movement.

Do the recirculation control linkage and doors move smoothly?

Yes Replace the recirculation control motor.■

No Repair the recirculation control linkage or doors.■

Heater Control Power and Ground Circuits Troubleshooting

1. Check the No.14 (10A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

Yes Go to step 2.

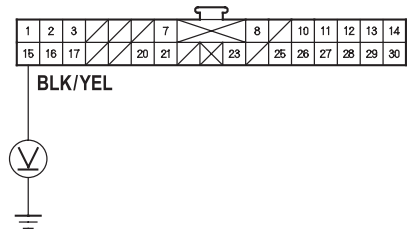
No Replace the fuse, and recheck.■

2. Disconnect the heater control panel 30P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 15 terminal of the heater control panel 30P connector and body ground.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there battery voltage?

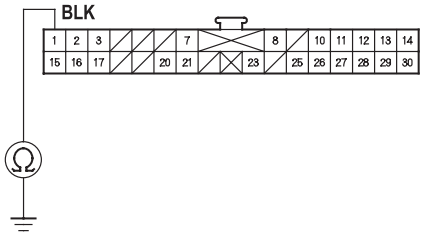
Yes Go to step 5.

No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the heater control panel.■

5. Turn the ignition switch OFF.

6. Check for continuity between the No. 1 terminal of the heater control panel 30P connector and body ground.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there continuity?

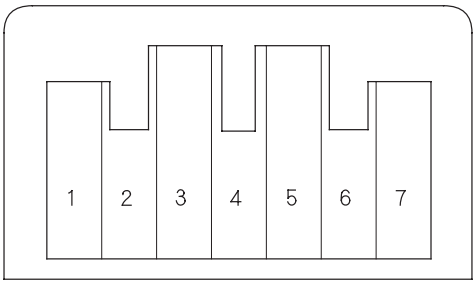
Yes Check for loose wires or poor connections at the heater control panel 30P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

No Check for an open in the wire between the heater control panel and body ground. If the wire is OK, check for poor ground at G501.■

Air Mix Control Motor Test

1. Disconnect the 7P connector from the air mix control motor.
2. Connect battery power to the No. 1 terminal of the air mix control motor, and ground the No. 2 terminal; the air mix control motor should run smoothly, and stop at Max Hot. If it doesn't, reverse the connections; the air mix control motor should run smoothly, and stop at Max Cool. If the air mix control motor does not run, remove it, then check the air mix control linkage and door for smooth movement.
   - If the linkage and door move smoothly, replace the air mix control motor.
   - If the linkage or door sticks or binds, repair them as needed.

AIR MIX CONTROL MOTOR



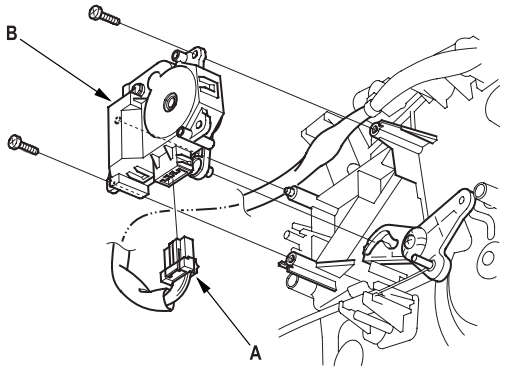
3. Measure the resistance between the No. 5 and No. 7 terminals. It should be between 4.2 k to 7.8 kΩ.
4. Reconnect the air mix control motor 7P connector, then turn the ignition switch ON (II).
5. Measure the voltage between the No. 3 and No. 7 terminals.

Max Cool - about 1V
Max Hot - about 4V

Air Mix Control Motor Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

1. RHD type, remove the clutch pedal bracket (M/T) or the parking brake pedal bracket (A/T).
2. 2. Disconnect the 7P connector (A) from the air mix control motor (B). Remove the self-tapping screws and the air mix control motor from the heater unit.

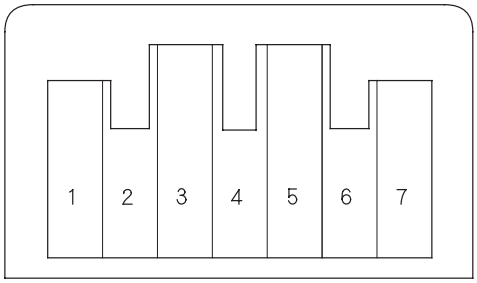


3. Install the motor in the reverse order of removal. After installation, make sure the motor runs smoothly.

Mode Control Motor Test

1. Disconnect the 7P connector from the mode control motor.
2. Connect battery power to the No. 1 terminal of the mode control motor, and ground the No. 2 terminal; the mode control motor should run smoothly, and stop at Vent. If it doesn't, reverse the connections; the mode control motor should run smoothly, and stop at Defrost. When the mode control motor stops running, disconnect battery power immediately.

MODE CONTROL MOTOR

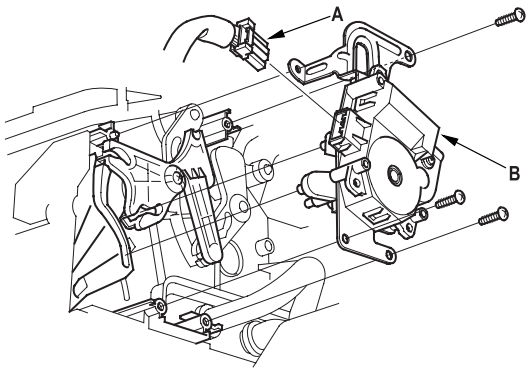


3. If the mode control motor does not run in step 2, remove it, then check the mode control linkage and doors for smooth movement.
   - If the linkage and doors move smoothly, replace the mode control motor.
   - If the linkage or doors stick or bind, repair them as needed.
4. Use a digital multimeter with an output of 1 mA or less at the 20 kΩ range. With the mode control motor running as in step 2, check for continuity between the No. 3, 4, 5, 6 terminals and the No. 7 terminal individually. There should be continuity for a moment at each terminal.
5. If there is no continuity for a moment at each terminal, replace the mode control motor.

Mode Control Motor Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

1. Remove the ECM/PCM (see page 11-4).
2. Disconnect the 7P connector (A) from the mode control motor (B). Remove the self-tapping screws and the mode control motor from the heater unit.



3. Install the motor in the reverse order of removal. After installation, make sure the motor runs smoothly.

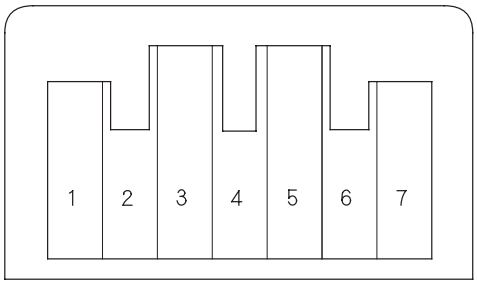
Recirculation Control Motor Test

1. Disconnect the 7P connector from the recirculation control motor.

   NOTICE
   Incorrectly applying power and ground to the recirculation control motor will damage it. Follow the instructions carefully.

2. Connect battery power to the No. 1 terminal of the recirculation control motor, and ground the No. 5 and No. 7 terminals; the recirculation control motor should run smoothly. To avoid damaging the recirculation control motor, do not reverse power and ground. Disconnect the No. 5 or No. 7 terminals from ground; the recirculation control motor should stop at Fresh or Recirculate. Don't cycle the recirculation control motor for a long time.

RECIRCULATION CONTROL MOTOR

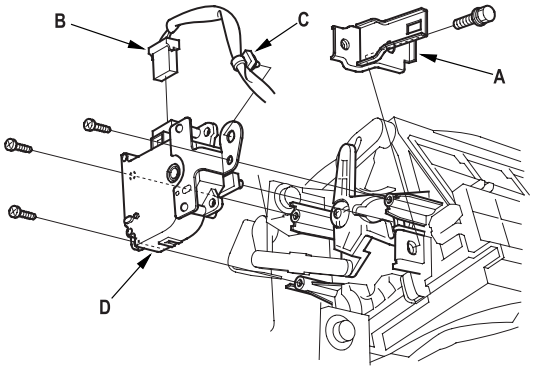


3. If the recirculation control motor does not run in step 2, remove it, then check the recirculation control linkage and doors for smooth movement.
   - If the linkage and doors move smoothly, replace the recirculation control motor.
   - If the linkage or doors stick or bind, repair them as needed.

Recirculation Control Motor Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

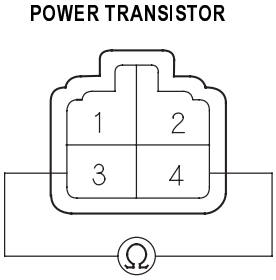
1. Remove the ECM/PCM (see page 11-4).
2. Remove the bolt and the bracket (A). Disconnect the 7P connector (B) and the harness clip (C) from the recirculation control motor (D). Remove the self-tapping screws and the recirculation control motor from the blower unit.



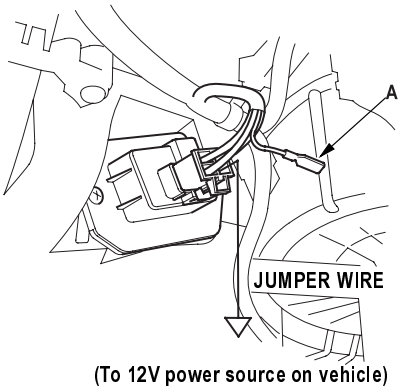
3. Install the motor in the reverse order of removal. After installation, make sure the motor runs smoothly.

Power Transistor Test

1. Disconnect the 4P connector from the power transistor.
2. Measure the resistance between the No. 3 and No. 4 terminals of the power transistor. It should be about 1.4 - 1.5 kΩ.
   - If the resistance is within the specifications, go to step 3.
   - If the resistance is not within the specifications, replace the power transistor.



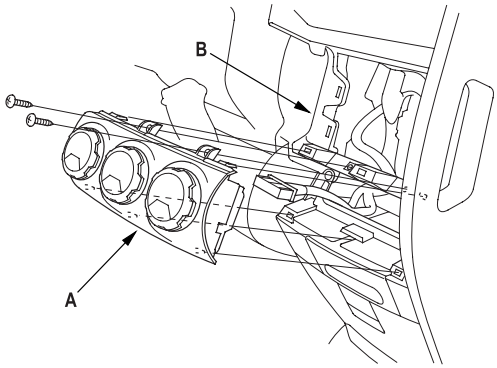
3. Carefully release the lock tab on the No. 1 terminal (BLU/YEL) (A) in the 4P connector, then remove the terminal and insulate it from body ground.



4. Reconnect the 4P connector to the power transistor.
5. Supply 12 volts to the No. 1 cavity with a jumper wire.
6. Turn the ignition switch ON (II), and check that the blower motor runs.
   - If the blower motor does not run, replace the power transistor.
   - If the blower motor runs, the power transistor is OK.

Heater Control Panel Removal and Installation

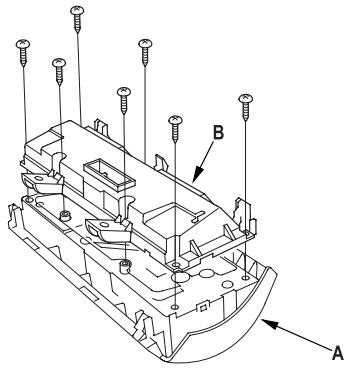
1. Remove the center panel (see page 20-87).
2. Remove the self-tapping screws and the heater control panel (A) from the dashboard (B).



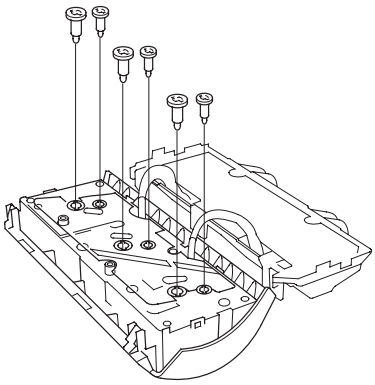
3. Install the control panel in the reverse order of removal. After installation, operate the control panel controls to see whether it works properly.
4. Run the self-diagnosis function to confirm that there are no problems in the system (see page 21-4).

Heater Control Panel Bulb Replacement

1. Discharge the static electricity (which accumulated on you when you removed the heater control panel) by touching the door striker or other body parts.
2. Remove the self-tapping screws, then carefully separate the heater control panel display (A) from the control panel (B). Do not kink or pull on the wires between the display and control panel. Do not touch the electronic components on the printed circuit board in the control panel.



3. Remove the bulb(s) with a flat-tip screw driver.



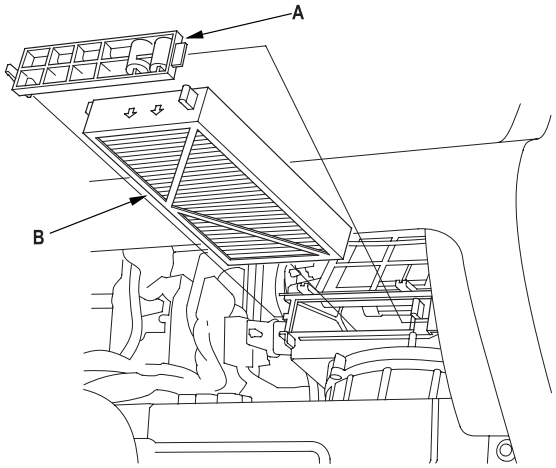
4. Install the bulb(s) in the reverse order of removal.

Dust and Pollen Filter Replacement (With Air Conditioning)

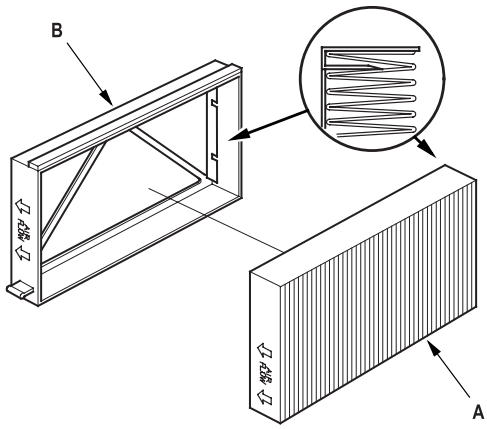
NOTE: LHD type is shown, RHD type is symmetrical.

The dust and pollen filters should be replaced every 30,000 km (6,000 miles) or 12 months whichever comes first. Replace the filters more often if the air flow is less than usual.

1. Open the glove box. Remove the glove box stop on each side, then hang the glove box down (see page 20-95).
2. Remove the filter lid (A) from the blower unit, then pull out the first dust and pollen filter (B). Slide the second filter to the left, and pull it out.



3. Remove the filter (A) from the housing (B), and replace the filter.

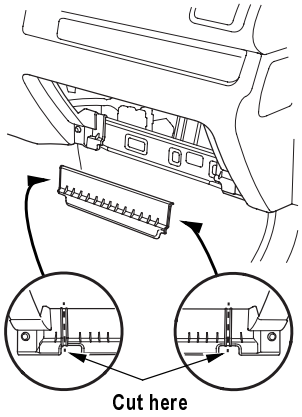


4. Install the filters in the reverse order of removal.

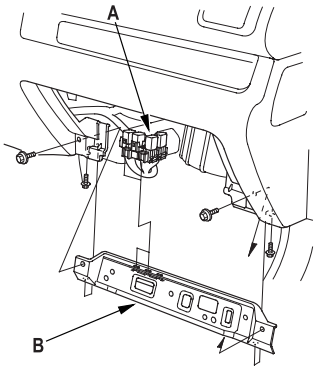
Blower Unit Removal and Installation

NOTE: LHD type is shown, RHD type is symmetrical.

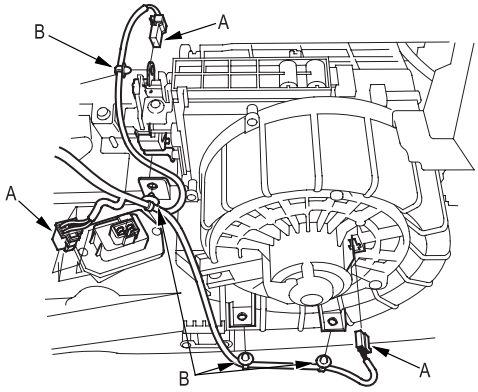
1. Remove the passenger's dashboard lower cover (see page 20-95), the right kick panel (see page 20-76), and the glove box (see page 20-95).
2. Cut the plastic cross brace in the glove box opening with diagonal cutters in the area shown. Remove and discard the plastic cross brace.



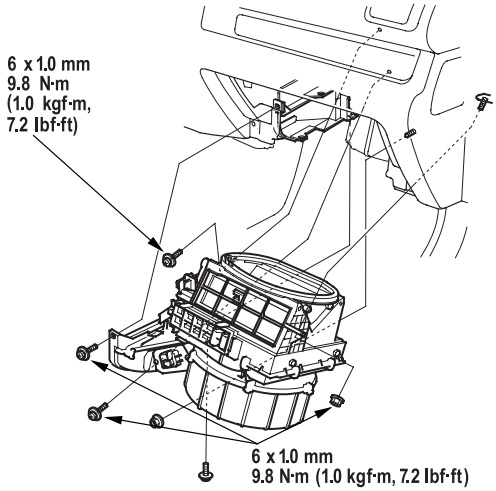
3. Remove the relays (A), then remove the bolts and the glove box frame (B).



4. Remove the ECM/PCM (see page 11-4).
5. Disconnect the connectors (A) from the blower motor, the power transistor, and the recirculation control motor, then remove the wire harness clips (B).



6. Fold the carpet and pad back toward you. Remove the mounting bolts, the mounting nut, and the blower unit.



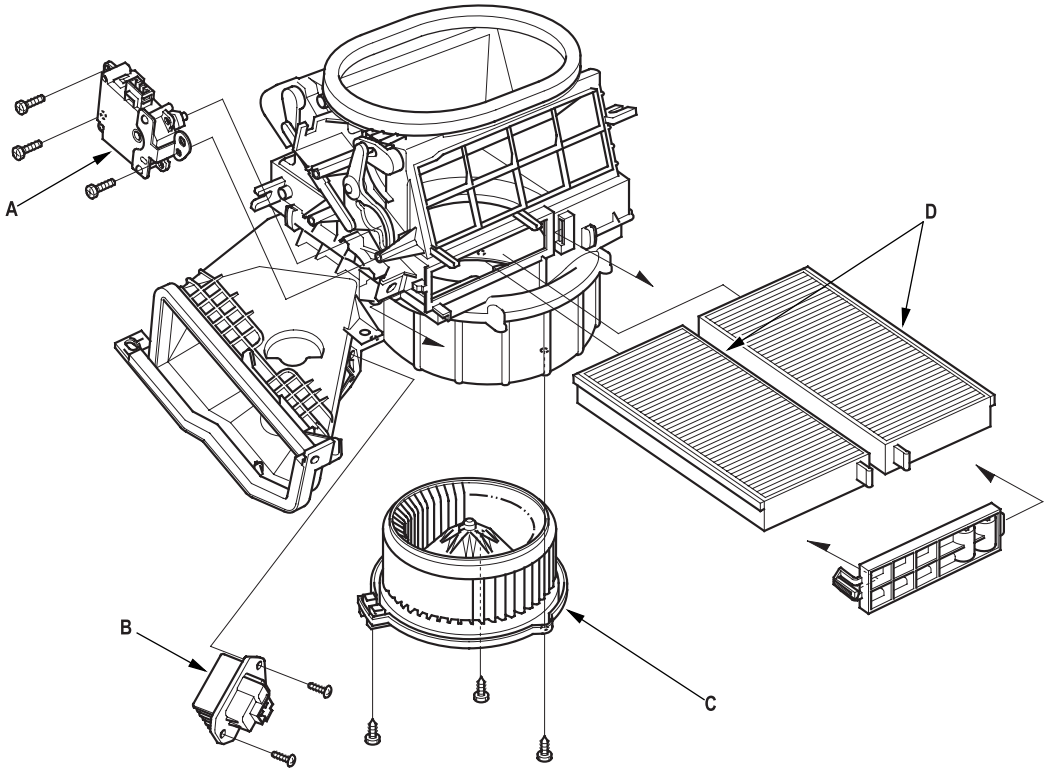
7. Install the unit in the reverse order of removal. Make sure that there is no air leakage.

Blower Unit Components Replacement

Note these items when overhauling the blower unit:

- The recirculation control motor (A), the power transistor (B), the blower motor (C), and the dust and pollen filters (with A/C)(D) can be replaced without removing the blower unit.
- Before reassembly, make sure that the recirculation control linkage and doors move smoothly.
- After reassembly, make sure the recirculation control motor runs smoothly (see page 21-23).

NOTE: LHD type is shown, RHD type is symmetrical.

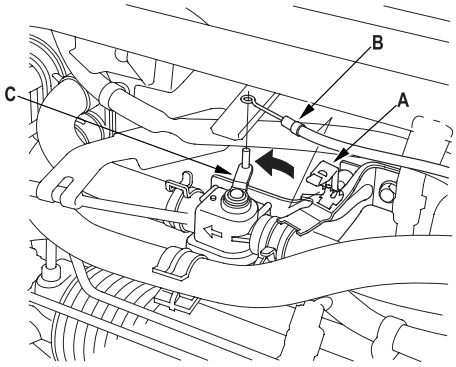


Heater Unit/Core Replacement

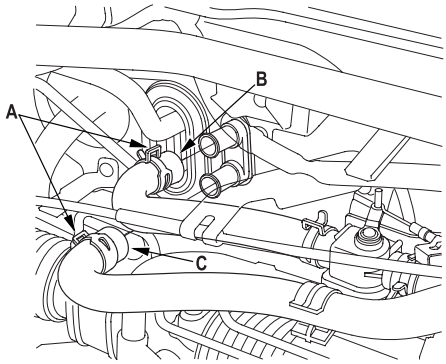
SRS components are located in this area. Review the SRS component locations (see page 23-14), and precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

NOTE: LHD type is shown, RHD type is symmetrical.

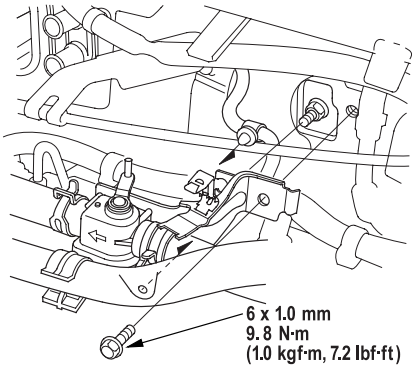
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. With air conditioning; disconnect the A/C line from the evaporator core (see page 21-45).
4. From under the hood, open the cable clamp (A), then disconnect the heater valve cable (B) from the heater valve arm (C). Turn the heater valve arm to the fully opened position as shown.



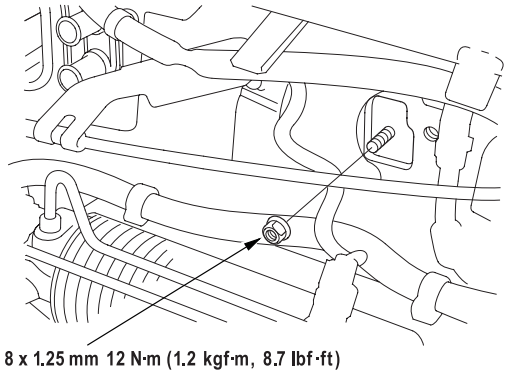
5. When the engine is cool, drain the engine coolant from the radiator (see page 10-6).
6. Slide the hose clamps (A) back, then disconnect the inlet heater hose (B) and the outlet heater hose (C) from the heater core. Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on the electrical parts or the painted surfaces. If any coolant spills, rinse it off immediately.



7. Remove the mounting bolt and the heater valve as shown.



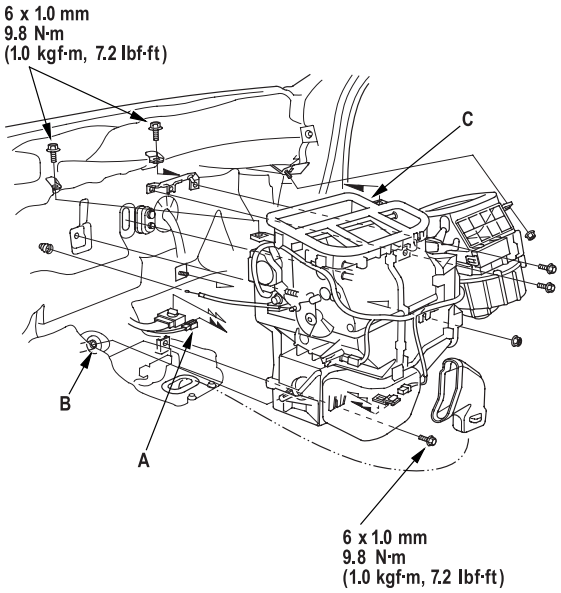
8. Remove the mounting nut from the heater unit. Take care not to damage or bend the fuel lines and the brake lines, etc.



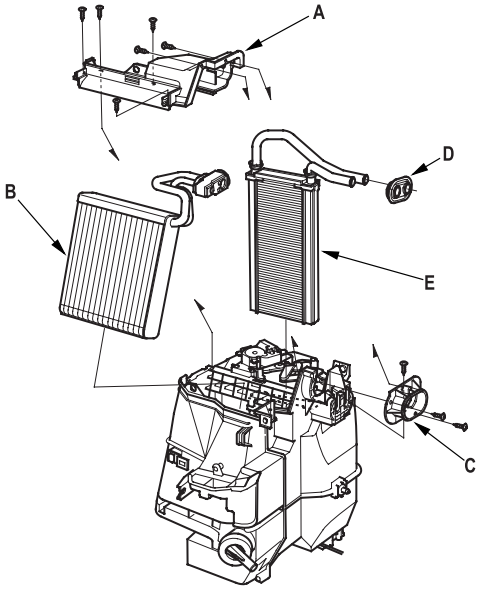
9. Remove the dashboard (see page 20-96).

10. Remove the ECM/PCM (see page 11-4)

11. Disconnect the connectors (A) from the heater unit, then disconnect the drain hose (B). Remove the mounting bolts and nuts, then remove the heater unit/Core (C).



12. Remove the self-tapping screws and the expansion valve cover (A). With air conditioning; carefully pull out the evaporator core (B) so you don't bend the inlet and outlet pipes. Remove the self-tapping screws and the flange cover (C), then remove the grommet (D), and carefully pull out the heater core (E) so you don't bend the inlet and outlet pipes.



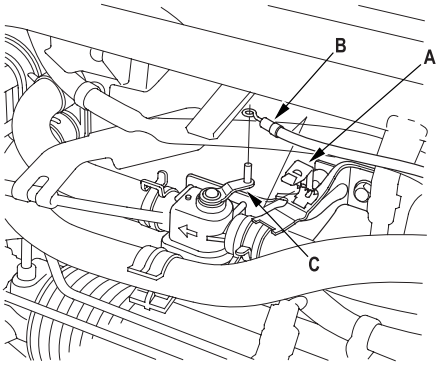
13. Install the heater core and the evaporator core (with A/C) in the reverse order of removal.

14. Install the heater unit in the reverse order of removal, and note these items:
    - Do not interchange the inlet and outlet heater hoses, and install the hose clamps securely.
    - Refill the cooling system with engine coolant (see page 10-6).
    - Be sure to connect the drain hose securely.
    - Adjust the heater valve cable (see page 21-30).
    - Make sure that there is no coolant leakage.
    - Make sure that there is no air leakage.
    - With air conditioning, refer to evaporator core replacement (see step 6 on page 21-45).

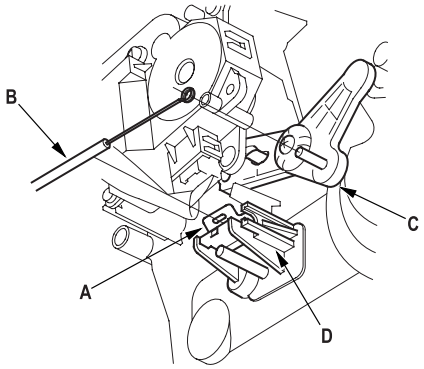
Heater Valve Cable Adjustment

NOTE: LHD type is shown, RHD type is symmetrical.

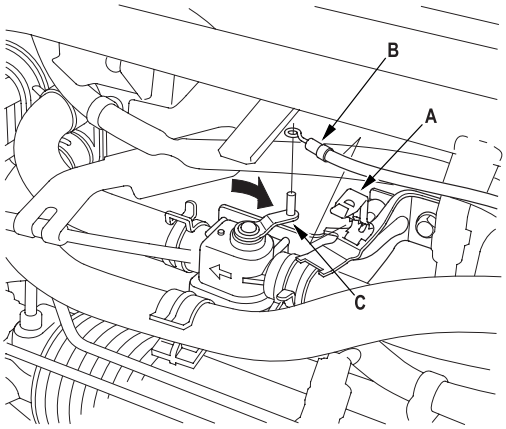
1. From under the hood, open the cable clamp (A), then disconnect the heater valve cable (B) from the heater valve arm (C).



2. From under the dash, disconnect the heater valve cable housing from the cable clamp (A), and disconnect the heater valve cable (B) from the air mix control linkage (C).



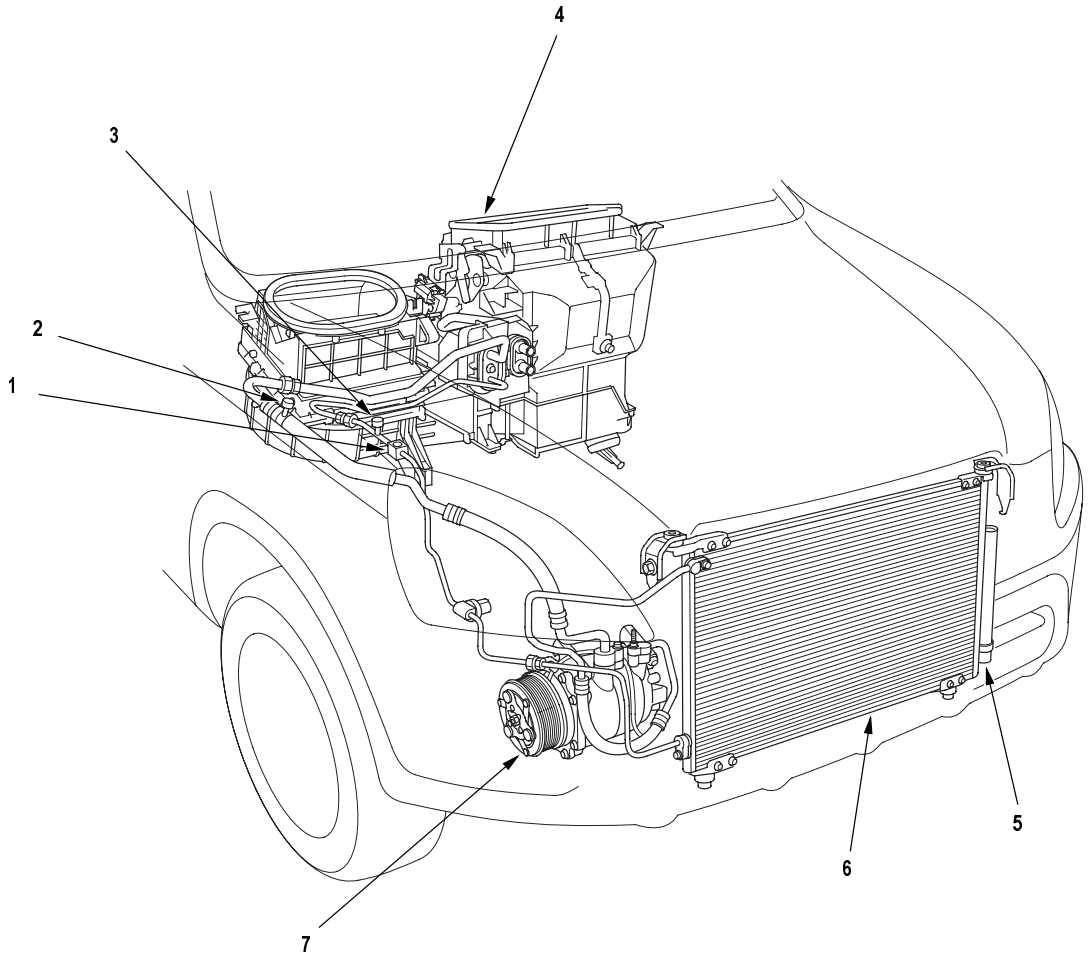
3. Set the temperature control dial on Max Cool with the ignition switch ON (II).
4. Attach the heater valve cable (B) to the air mix control linkage (C) as shown above. Hold the end of the heater valve cable housing against the stop (D), then snap the heater valve cable housing into the cable clamp (A).
5. From under the hood, turn the heater valve arm (C) to the fully closed position as shown, and hold it. Attach the heater valve cable (B) to the heater valve arm, and gently pull on the heater valve cable housing to take up any slack, then install the heater valve cable housing into the cable clamp (A).



Air Conditioning

Component Location Index

NOTE: LHD type is shown, RHD type is similar.

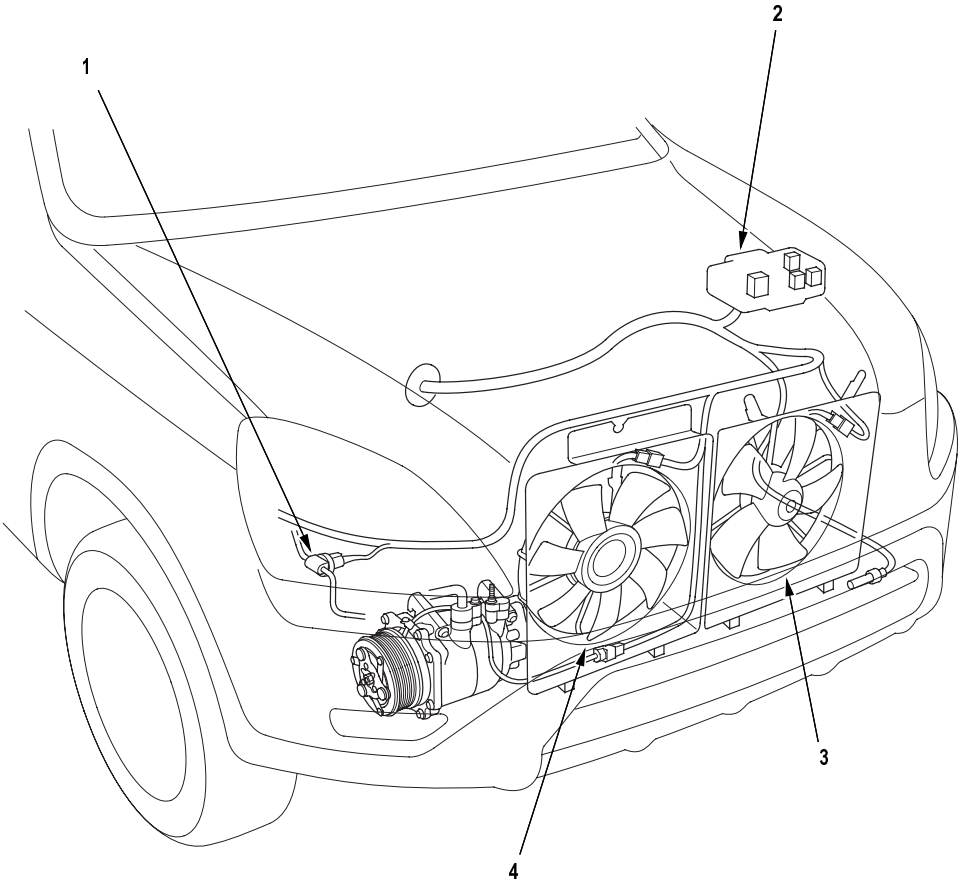


1	SIGHT GLASS	
2	SERVICE VALVE (LOW PRESSURE SIDE)	
3	SERVICE VALVE (HIGH PRESSURE SIDE)	
4	EVAPORATOR CORE (Built-in the heater unit)	Replacement, page 21-45
5	RECEIVER/DRYER	
6	CONDENSER	Replacement, page 21-51
7	COMPRESSOR	Replacement, page 21-46; Clutch Check, page 21-47; Clutch Overhaul, page 21-48; Thermal Protector Check, page 21-47; Thermal Protector Replacement, page 21-50; Relief Valve Replacement, page 21-50

(cont'd)

Component Location Index (cont'd)

NOTE: LHD type is shown, RHD type is similar.



1 A/C PRESSURE SWITCH

2 BLOWER MOTOR RELAY, RADIATOR FAN RELAY, CONDENSER FAN RELAY, COMPRESSOR CLUTCH RELAY (Located in the under-hood fuse/relay box) Test, page 22A-60

3 RADIATOR FAN

4 CONDENSER FAN

A/C Service Tips and Precautions

WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

The air conditioning system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil, which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioning system or your servicing equipment will result.
Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

- Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
- Keep moisture and dirt out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
- Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
- When tightening or loosening a fitting, use a second wrench to support the matching fitting.
- When discharging the system, don't let refrigerant escape too fast; it will draw the compressor oil out of the system.

A/C Refrigerant Oil Replacement

Recommended PAG oil:

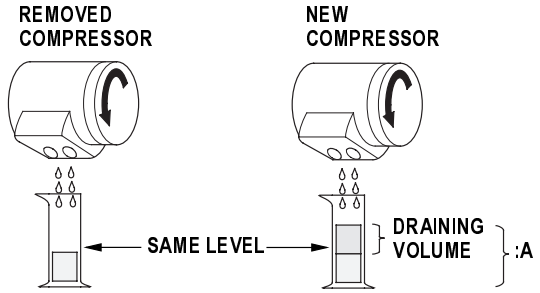
KEIHIN SP-10:
- P/N 38897-P13-003: 120 m*l* (4 fl·oz, 4.2 lmp·oz)
- P/N 38898-P13-003: 250 m*l* (8 1/3 fl·oz, 8.8 lmp·oz)
- P/N 38899-P13-A01: 40 m*l* (1 1/3 fl·oz, 1.4 lmp·oz)

Add the recommended refrigerant oil in the amount listed if you replace any of the following parts.

- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if it gets on the paint, wash it off immediately.

Condenser ..... 35 m*l* (1 1/6 fl·oz, 1.2 lmp·oz)
Front evaporator ..... 40 m*l* (1 1/3 fl·oz, 1.4 lmp·oz)
Rear evaporator ..... 30 m*l* (1 fl·oz, 1.1 lmp·oz)
Line or hose ..... 10 m*l* (1/3 fl·oz, 0.4 lmp·oz)
Leakage repair ..... 25 m*l* (5/6 fl·oz, 0.9 lmp·oz)
Compressor ..... For compressor replacement, subtract the volume of oil drained from the removed compressor from A, and drain the calculated volume of oil from the new compressor: A - Volume of removed compressor = Volume to drain from new compressor.

NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 m*l* (1 2/3 fl·oz, 1.8 lmp·oz) from the new compressor.

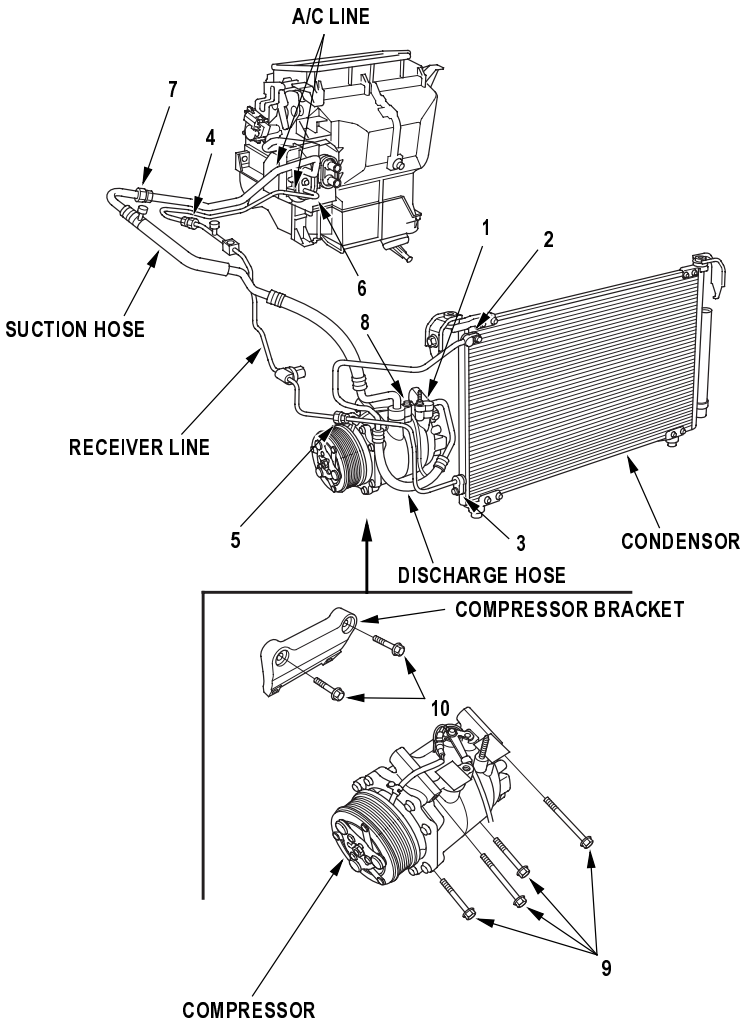


A: KEIHIN COMPRESSOR 130 m*l* (4 1/3 fl·oz, 4.6 lmp·oz)

(cont'd)

A/C Refrigerant Oil Replacement (cont'd)

NOTE: LHD type is shown, RHD type is similar.



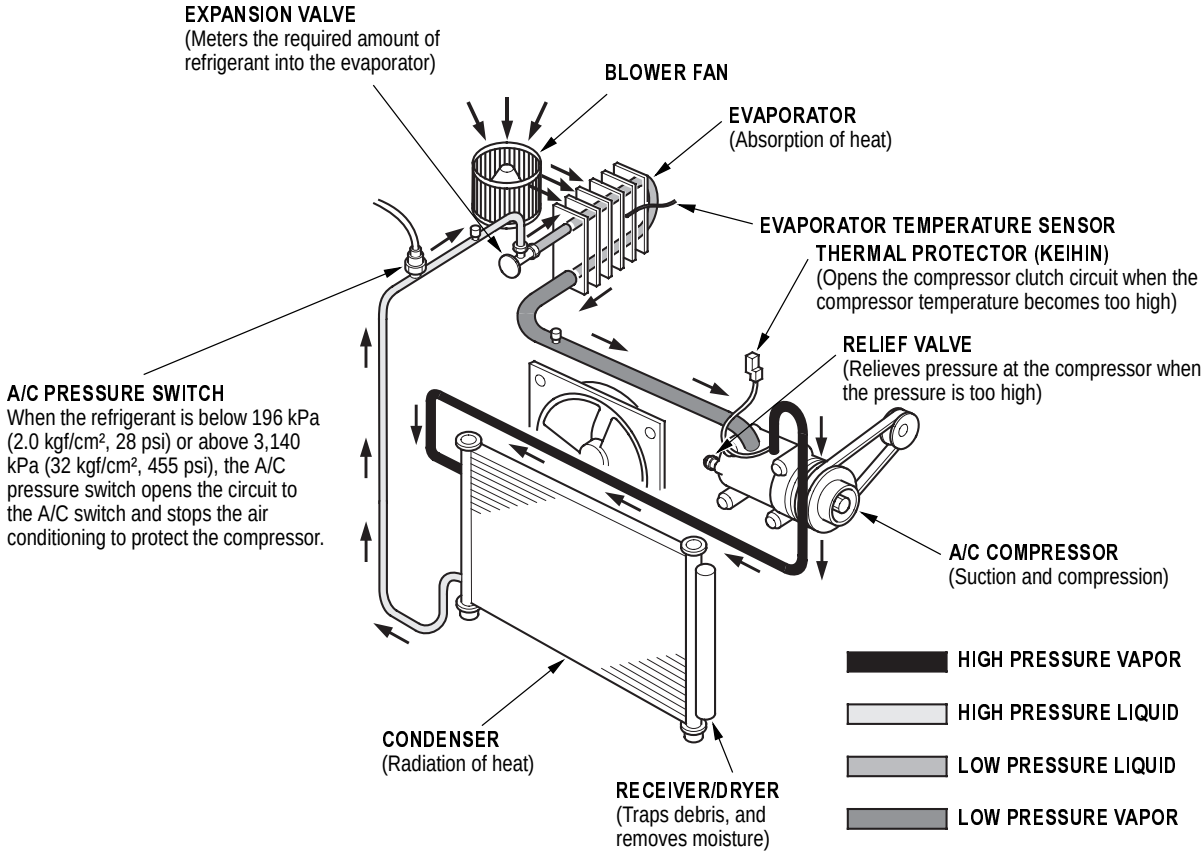
1 Discharge hose to the compressor (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
2 Discharge hose to the condenser (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
3 Receiver line to the condenser (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
4 Receiver line to the A/C line : 13 N·m (1.3 kgf·m, 9.4 lbf·ft)
5 Receiver line A to the receiver line B (16 x 1.5 mm) : 13 N·m (3.2 kgf·m, 23 lbf·ft)
6 A/C line to the evaporator (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
7 Suction hose to the A/C line : 31 N·m (3.2 kgf·m, 23 lbf·ft)
8 Suction hose to the compressor (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
9 Compressor to the compressor bracket (8 x 1.25 mm) : 22 N·m (2.2 kgf·m, 16 lbf·ft)
10 Compressor bracket to the engine block (10 x 1.25 mm) : 44 N·m (4.5 kgf·m, 33 lbf·ft)

Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Condenser fan does not run at all (but radiator fan runs with the A/C on)	Condenser Fan Circuit Troubleshooting (see page 21-38)	• Blown fuse No. 1 (20A) in the under-hood fuse/relay box, and No. 14 (10A) in the under-dash fuse/relay box • Poor ground at G201 • Cleanliness and tightness of all connectors
Both fans do not run with the A/C on	Radiator and Condenser Fans Common Circuit Troubleshooting (see page 21-39)	• Blown fuse No. 1 (20A) and No. 4 (20A) in the under-hood fuse/relay box, and No. 14 (10A) in the under-dash fuse/relay box • Poor ground at G201 • Cleanliness and tightness of all connectors
Compressor clutch does not engage	Compressor Clutch Circuit Troubleshooting (see page 21-40)	• Blown fuse No. 1 (20A) in the under-hood fuse/relay box, and No. 14 (10A) in the under-dash fuse/relay box • Cleanliness and tightness of all connectors
A/C System does not come on (both fans and compressor)	A/C Pressure Switch Circuit Troubleshooting (see page 21-42)	Cleanliness and tightness of all connectors

System Description

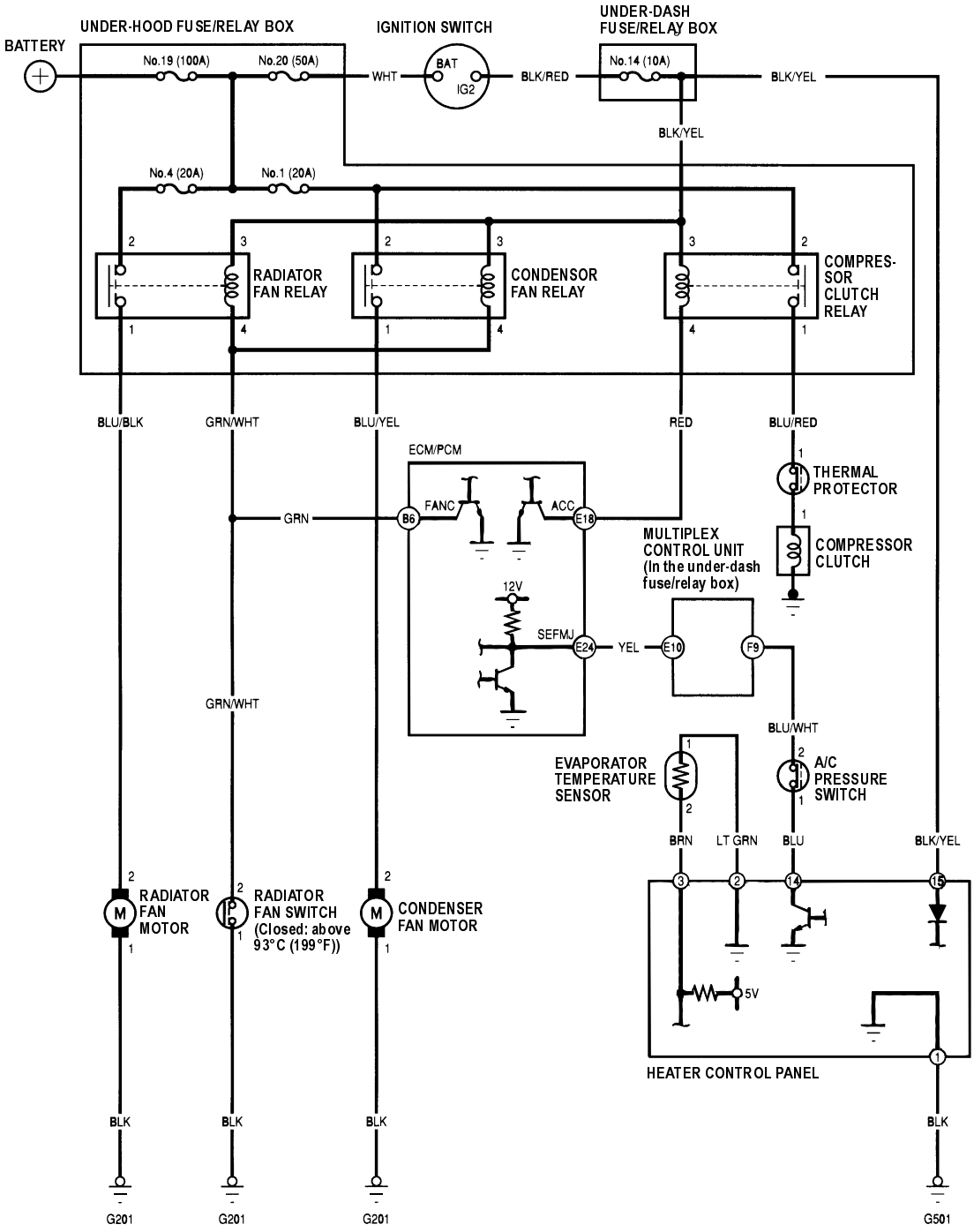
The air conditioning system removes heat from the passenger compartment by circulating refrigerant through the system as shown below.



This vehicle uses HFC-134a (R-134a) refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

- Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil (KEIHIN SP-10) designed for the R-134a compressor. Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joints) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- Use a vacuum pump adapter which is equipped with a check valve to prevent the backflow of the vacuum pump oil.
- Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.

Circuit Diagram



Condenser Fan Circuit Troubleshooting

1. Check the No. 1 (20A) fuse in the under-hood fuse/relay box, and the No. 14 (10A) fuse in the under-dash fuse/relay box.

   Are the fuses OK?

   Yes Go to step 2.

   No Replace the fuse(s), and recheck.■

2. Remove the condenser fan relay from the under-hood fuse/relay box, and test it (see page 22A-60).

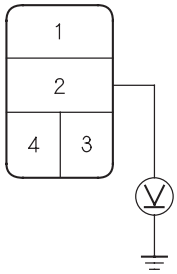
   Is the relay OK?

   Yes Go to step 3.

   No Replace the condenser fan relay.■

3. Measure the voltage between the No. 2 terminal of the condenser fan relay 4P socket and body ground.

   CONDENSER FAN RELAY 4P SOCKET



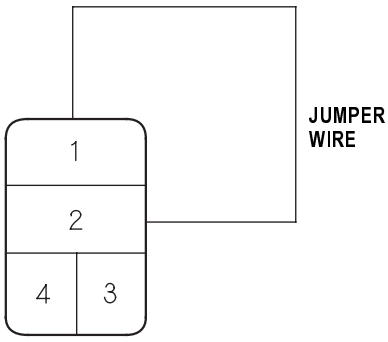
   Is there battery voltage?

   Yes Go to step 4.

   No Replace the under-hood fuse/relay box.■

4. Connect the No. 1 and No. 2 terminals of the condenser fan relay 4P socket with a jumper wire.

   CONDENSER FAN RELAY 4P SOCKET



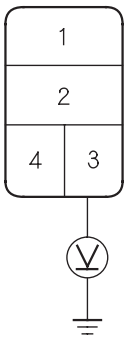
   Does the condenser fan run?

   Yes Go to step 5.

   No Go to step 8.

5. Disconnect the jumper wire.
6. Turn the ignition switch ON (II).
7. Measure the voltage between the No. 3 terminal of the condenser fan relay 4P socket and body ground.

   CONDENSER FAN RELAY 4P SOCKET



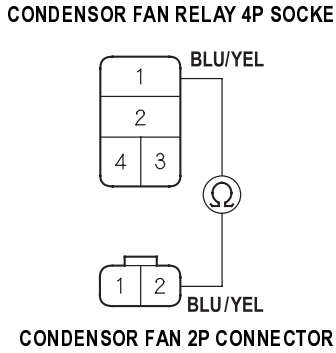
   Is there battery voltage?

   Yes Replace the under-hood fuse/relay box.■

   No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the condenser fan relay socket in the under-hood fuse/relay box.■

8. Disconnect the jumper wire.

9. Disconnect the condenser fan 2P connector.
10. Check for continuity between the No. 1 terminal of the condenser fan relay 4P socket and the No. 2 terminal of the condenser fan 2P connector.

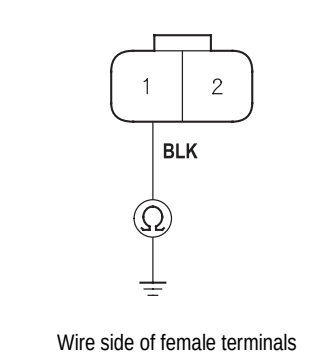


Is there continuity?

Yes Go to step 11.

No Repair open in the wire between the condenser fan relay socket in the under-hood fuse/relay box and the condenser fan.■

11. Check for continuity between the No. 1 terminal of the condenser fan 2P connector and body ground.



Is there continuity?

Yes Replace the condenser fan motor.■

No Check for an open in the wire between the condenser fan and body ground. If the wire is OK, check for poor ground at G201.■

Radiator and Condenser Fans Common Circuit Troubleshooting

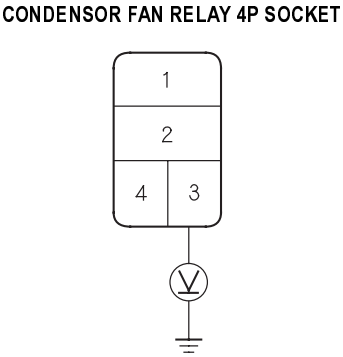
1. Check the No. 1 (20A) and No. 4 (20A) fuses in the under-hood fuse/relay box, and the No. 14 (10A) fuse in the under-dash fuse/relay box.

   Are the fuses OK?

   Yes Go to step 2.

   No Replace the fuse(s), and recheck.■

2. Remove the condenser fan relay from the under-hood fuse/relay box.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 3 terminal of the condenser fan relay 4P socket and body ground.



Is there battery voltage?

Yes Go to step 5.

No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the radiator fan relay socket, and the condenser fan relay socket.■

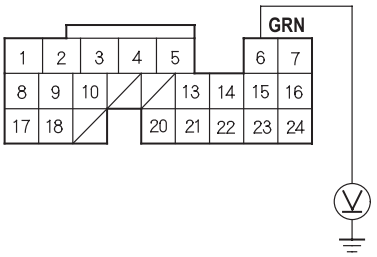
5. Turn the ignition switch OFF.
6. Reinstall the condenser fan relay.
7. Make sure the A/C switch is OFF.
8. Turn the ignition switch ON (II).

(cont'd)

Radiator and Condenser Fans Common Circuit Troubleshooting (cont'd)

9. Measure the voltage between the No. 6 terminal of ECM/PCM connector B (24P) and body ground with the ECM/PCM connectors connected.

ECM / PCM CONNECTOR B (24P)



Wire side of female terminals

Is there battery voltage?

Yes Check for loose wires or poor connections at ECM/PCM connector B (24P). If the connections are good, substitute a known-good ECM/PCM, and recheck. If the symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between the radiator fan relay socket, the condenser fan relay socket and the ECM/PCM.■

Compressor Clutch Circuit Troubleshooting

1. Check the No. 1 (20A) fuse in the under-hood fuse/relay box, and the No. 14 (10A) fuse in the under-dash fuse/relay box.

Are the fuses OK?

Yes Go to step 2.

No Replace the fuse(s), and recheck.■

2. Check the engine coolant temperature (use the Honda PGM Tester PGM-FI data list if possible).

Is the coolant temperature above nomal?

Yes Troubleshoot and repair the cause of the high engine coolant temperature.■

No Go to step 3.

3. Remove the compressor clutch relay from the under-hood fuse/relay box, and test it (see page 22A-60).

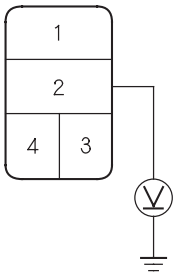
Is the relay OK?

Yes Go to step 4.

No Replace the compressor clutch relay.■

4. Measure the voltage between the No. 2 terminal of the compressor clutch relay 4P socket and body ground.

CONDENSOR FAN RELAY 4P SOCKET



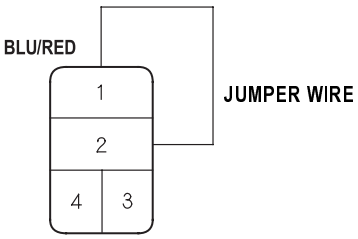
Is there battery voltage?

Yes Go to step 5.

No Replace the under-hood fuse/relay box.■

5. Connect the No. 1 and No. 2 terminals of the compressor clutch relay 4P socket with a jumper wire.

COMPRESSOR CLUTCH RELAY 4P SOCKET



Does the compressor clutch click ?

Yes Go to step 6.

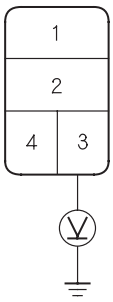
No Go to step 14.

6. Disconnect the jumper wire.

7. Turn the ignition switch ON (II).

8. Measure the voltage between the No. 3 terminal of the compressor clutch relay 4P socket and body ground.

COMPRESSOR CLUTCH RELAY 4P SOCKET



Is there battery voltage?

Yes Go to step 9.■

No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the compressor clutch relay socket.■

9. Turn the ignition switch OFF.

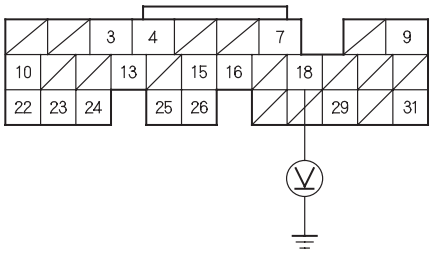
10. Reinstall the compressor clutch relay.

11. Make sure the A/C switch is OFF.

12. Turn the ignition switch ON (II).

13. Measure the voltage between the No. 18 terminal of ECM/PCM connector E (31P) and body ground with the ECM/PCM connectors connected.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there battery voltage?

Yes Check for loose wires or poor connections at ECM/PCM connector E (31P). If the connections are good, substitute a known-good ECM/PCM, and recheck. If the symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between the compressor clutch relay and the ECM/PCM.■

14. Disconnect the jumper wire.

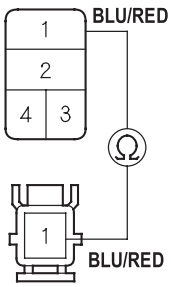
15. Disconnect the compressor clutch 1P connector.

(cont'd)

Compressor Clutch Circuit Troubleshooting (cont'd)

16. Check for continuity between the No. 1 terminal of the compressor clutch relay 4P socket and the No. 1 terminal of the compressor clutch 1P connector.

COMPRESSOR CLUTCH RELAY 4P SOCKET



COMPRESSOR CLUTCH 1P CONNECTOR
Terminal side of male terminals

Is there continuity?

Yes Check the KEIHIN compressor clutch clearance, the thermal protector, and the compressor clutch field coil (see page 21-47).■

No Repair open in the wire between the compressor clutch relay socket and the compressor clutch.■

A/C Pressure Switch Circuit Troubleshooting

1. Turn the ignition switch ON (II).

2. Turn the blower switch on, and check for blower motor operation.

Does the blower motor run on all speeds?

Yes Go to step 3.

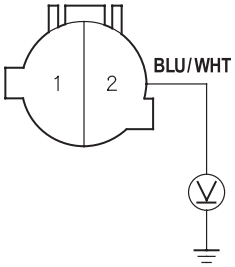
No Troubleshoot the blower motor circuit (see page 21-13).

3. Disconnect the A/C pressure switch 2P connector.

4. Turn the ignition switch ON (II).

5. Measure the voltage between the No. 2 terminal of the A/C pressure switch 2P connector and body ground.

A/C PRESSURE SWITCH 2P CONNECTOR



Wire side of female terminals

Is there 5V or more?

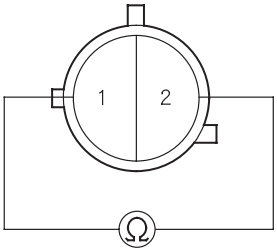
Yes Go to step 6.

No Go to step 12.

6. Turn the ignition switch OFF.

7. Check for continuity between the No. 1 and No. 2 terminals of the A/C pressure switch.

A/C PRESSURE SWITCH



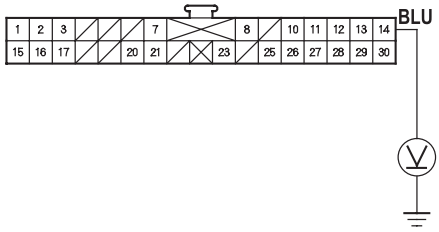
Is there continuity?

Yes Go to step 8.

No Go to step 14.

8. Reconnect the A/C pressure switch 2P connector.
9. Disconnect the heater control panel 30P connector.
10. Turn the ignition switch ON (II).
11. Measure the voltage between the No. 14 terminal of the heater control panel 30P connector and body ground.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

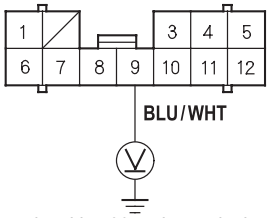
Is there battery voltage?

Yes Check for loose wires or poor connections at the heater control panel 30P connector and at the A/C pressure switch 2P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

No Repair open in the wire between the heater control panel and the A/C pressure switch.■

12. Make sure the A/C switch is OFF.
13. Measure the voltage between the No. 9 terminal of under-dash fuse/relay box connector F (12P) and body ground with the under-dash fuse/relay box connectors connected.

UNDER - DASH FUSE/RELAY BOX CONNECTOR F (12P)



Wire side of female terminals

Is there 5 V or more?

Yes Repair open in the wire between the under-dash fuse/relay box and the A/C pressure switch.■

No Refer to the multiplex control system (see page 22A-227).■

NOTE: Check for multiplex codes in mode 1. Follow the troubleshooting for any codes found. If no codes are found, substitute a known-good multiplex control unit and a PCM one at a time.

14. Check for proper A/C system pressure.

Is the pressure within specifications?

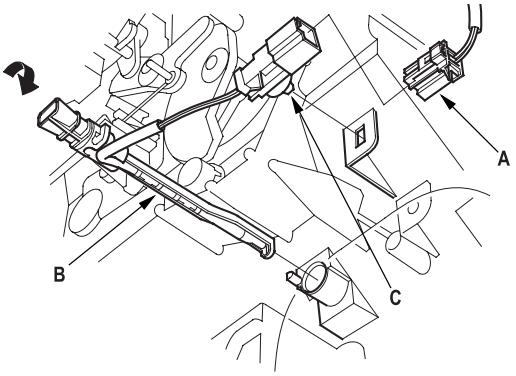
Yes Replace the A/C pressure switch.■

No Repair the A/C pressure problem.■

Evaporator Temperature Sensor Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

1. Disconnect the 2P connector (A) from the evaporator temperature sensor (B), then remove the connector clip (C). Turn the evaporator temperature sensor counterclockwise to the stop, and carefully pull out it.

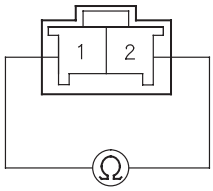


2. Install the sensor in the reverse order of removal.

Evaporator Temperature Sensor Test

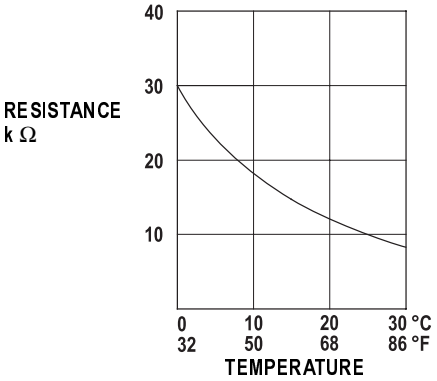
1. Dip the sensor in ice water, and measure the resistance between its terminals.

EVAPORATOR TEMPERATURE SENSOR



Terminal side of male terminals

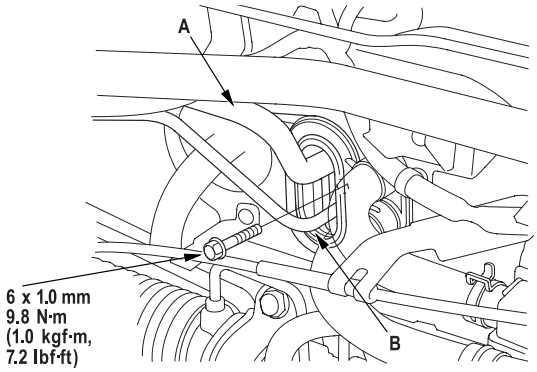
2. Then pour hot water on the sensor, and check for a change in resistance.
3. Compare the resistance readings with the specifications shown in the graph; the resistance should be within the specifications.



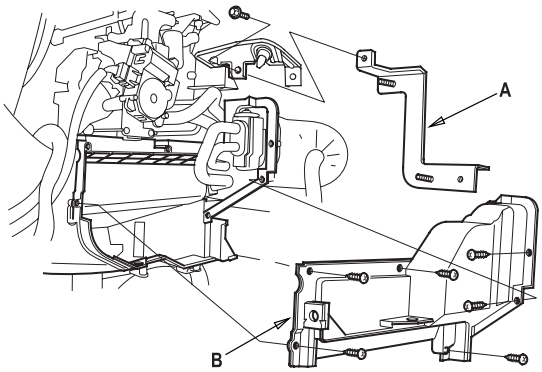
Evaporator Core Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

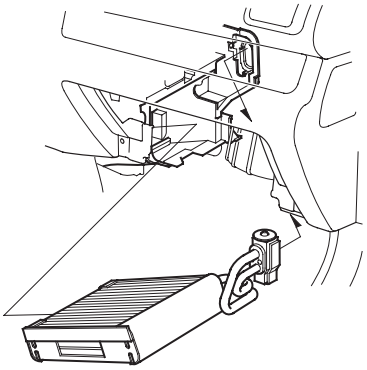
1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-53).
2. Remove the bolt, then disconnect the A/C line from the evaporator core.



3. Remove the blower unit (see page 21-26).
4. Remove the bolt and the ECM/PCM bracket (A). Remove the self-tapping screws and the expansion valve cover (B).



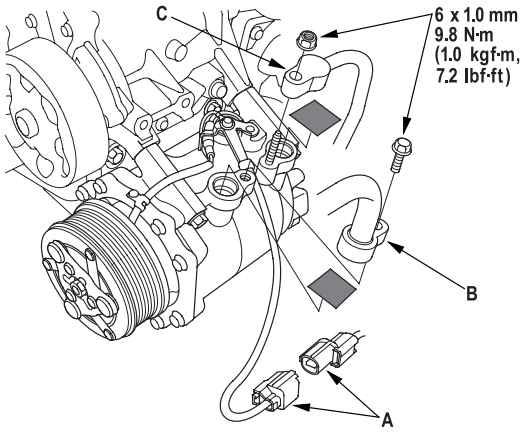
5. Carefully pull out the evaporator core without bending the pipes.



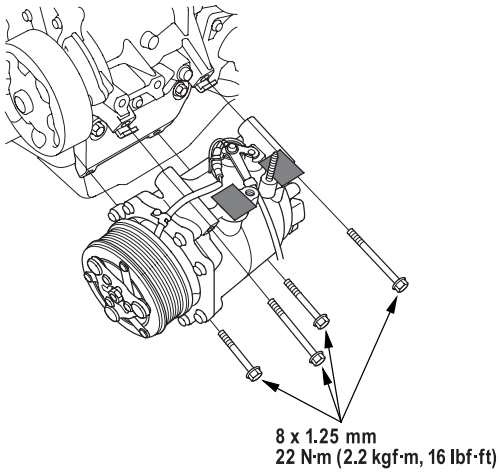
6. Install the core in the reverse order of removal, and note these items:
   - If you're installing a new evaporator core, add refrigerant oil (KEIHIN SP-10) (see page 21-33).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
   - Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
   - Charge the system (see page 21-55).

Compressor Replacement

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Disconnect the negative cable from the battery.
3. Recover the refrigerant with a recovery/recycling/charging station (see page 21-53).
4. Remove the radiator reservoir tank (see page 10-10).
5. Remove the alternator (see page 04-32).
6. Disconnect the compressor clutch connector (A), remove the bolt and nut, then disconnect the suction line (B) and the discharge line (C) from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



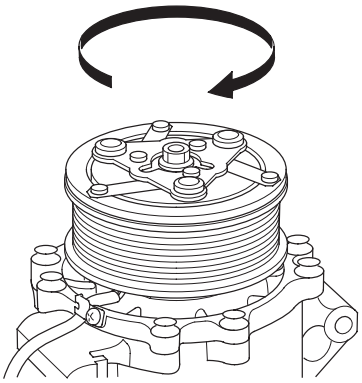
7. Remove the mounting bolts and the compressor. Be careful not to damage the radiator fins when removing the compressor.



8. Install the compressor in the reverse order of removal, and note these items:
   - If you're installing a new compressor, you must calculate the amount of refrigerant oil to be removed from it (see page 21-33).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Use refrigerant oil (KEIHIN SP-10) for HFC-134a KEIHIN spiral type compressor only.
   - To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
   - Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
   - Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
   - Be careful not to damage the radiator fins when installing the compressor and the condenser fan shroud.
   - Charge the system (see page 21-55)
   - Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Compressor Clutch Check

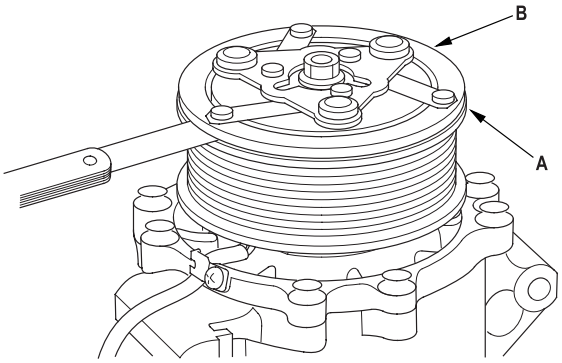
1. Check the armature plate for discoloration, peeling, or other damage. If there is damage, replace the clutch set (see page 21-48).
2. Check the rotor pulley bearing play and drag by rotating the rotor pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag (see page 21-48).



3. Measure the clearance between the rotor pulley (A) and the armature plate (B) all the way around. If the clearance is not within specified limits, remove the armature plate (see page 21-48) and add or remove shims as needed to increase or decrease clearance.

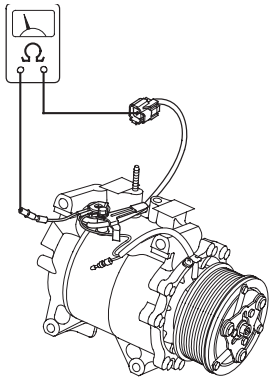
   Clearance: 0.5 ± 0.15 mm (0.020 ± 0.006 in.)

   NOTE: The shims are available in four thicknesses: 0.1 mm, 0.2 mm, 0.4 mm, and 0.5 mm.



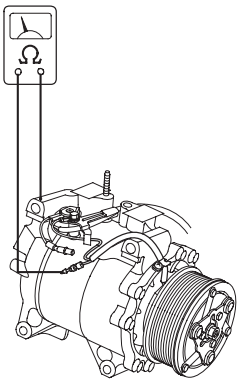
4. Release the field coil connector from the holder, then disconnect it. Check the thermal protector for continuity. If there is no continuity, replace the thermal protector (see page 21-50).

   NOTE: The thermal protector will have no continuity above 122 to 128°C (252 to 262°F). When the temperature drops below 116 to 104°C (241 to 219°F), the thermal protector will have continuity.



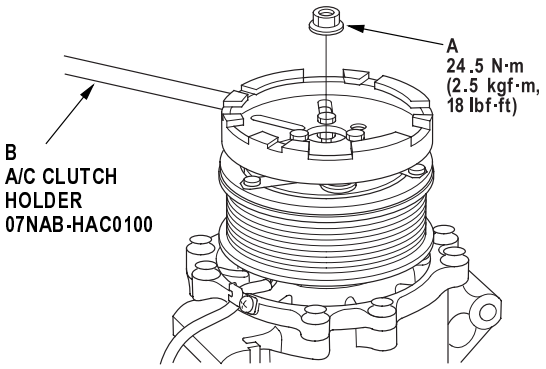
5. Check resistance of the field coil. If resistance is not within specifications, replace the field coil (see page 21-48).

   Field Coil Resistance: 3.05 - 3.35 ohms at 20°C (68°F)



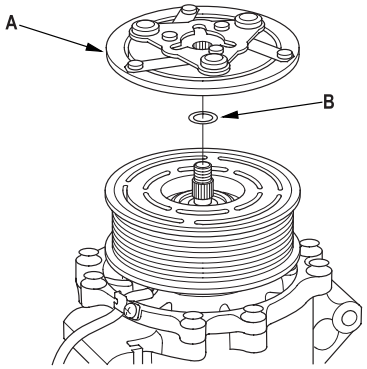
Compressor Clutch Overhaul

1. Remove the center nut (A) while holding the armature plate with the special tool (B).

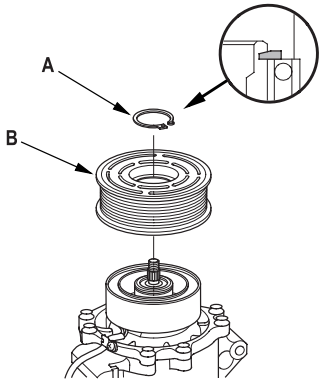


2. Remove the armature plate (A) and shim(s) (B), taking care not to lose the shim(s). If the clutch needs adjustment, increase or decrease the number and thickness of shims as necessary, then reinstall the armature plate, and recheck its clearance (see page 21-47).

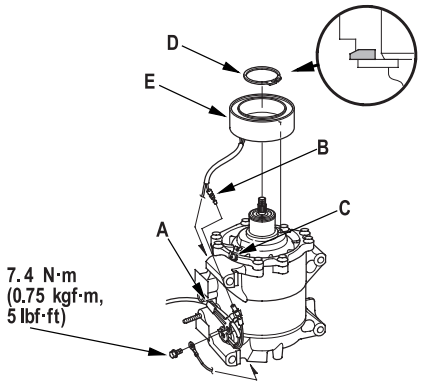
   NOTE: The shims are available in four thickness: 0.1 mm, 0.2 mm, 0.4 mm and 0.5 mm.



3. If you are replacing the field coil, remove the snap ring (A) with snap ring pliers, then remove the rotor pulley (B). Be careful not to damage the rotor pulley and compressor.



4. Remove the bolt and holder (A), then disconnect the field coil connector (B). Loosen the clamp screw (C) to free the field coil wire. Remove the snap ring (D) with snap ring pliers, then remove the field coil (E). Be careful not to damage the field coil and compressor.

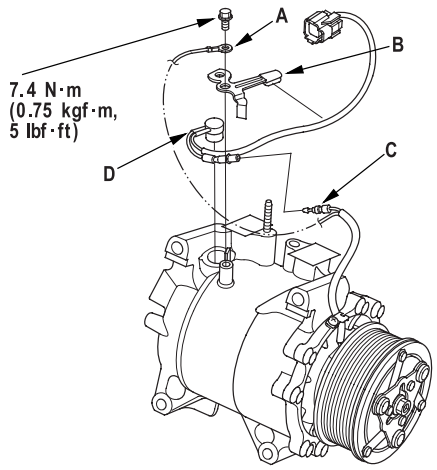


5. Reassemble the clutch in the reverse order of disassembly, and note these items:

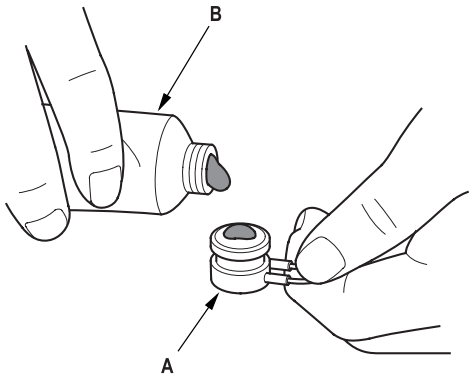
- Install the field coil with the wire side facing down, and align the boss on the field coil with the hole in the compressor.
- Clean the rotor pulley and compressor sliding surfaces with contact cleaner or other non-petroleum solvent.
- Install new snap rings, note the installation direction, and make sure they are fully seated in the groove.
- Make sure that the rotor pulley turns smoothly after it's reassembled.
- Route and clamp the wires properly or they can be damaged by the rotor pulley.

Compressor Thermal Protector Replacement

1. Remove the bolt, the ground terminal (A), and the holder (B). Disconnect the field coil connector (C), then remove the thermal protector (D).



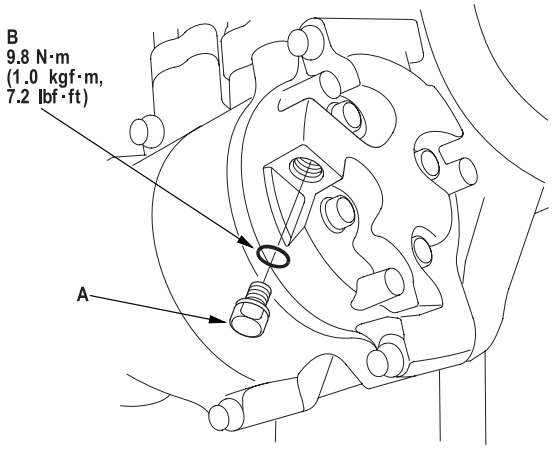
2. Replace the thermal protector (A) with a new one, and apply silicone sealant (B) to the bottom of the thermal protector.



3. Install in the reverse order of removal.

Compressor Relief Valve Replacement

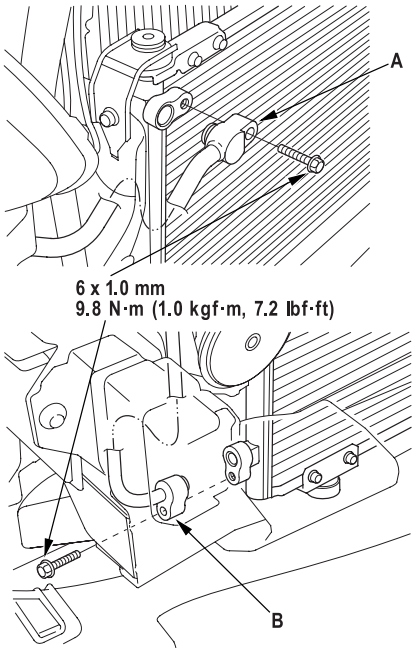
1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-53).
2. Remove the relief valve (A), and the O-ring (B). Plug the opening to keep foreign matter from entering the system and the compressor oil from running out.



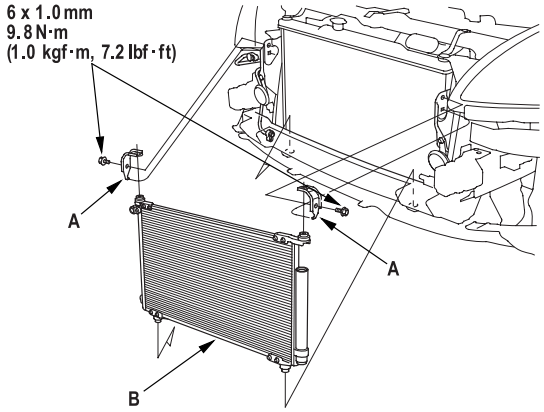
3. Clean the mating surfaces.
4. Install a new O-ring on the relief valve, and apply a thin coat of refrigerant oil to the O-ring.
5. Remove the plug, and install and tighten the relief valve.
6. Charge the system (see page 21-55).

Condenser Replacement

1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-55).
2. Remove the front bumper (see page 20-130).
3. Remove the bolts, then disconnect the discharge line (A) and the receiver line (B) from the condenser. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



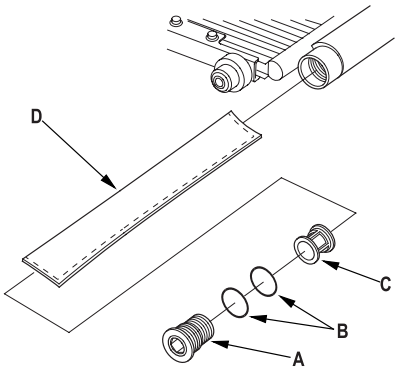
4. Remove the bolts and mounting brackets (A), then remove the condenser (B) by lifting it up. Be careful not to damage the radiator and condenser fins when removing the condenser.



5. Install the condenser in the reverse order of removal, and note these items:
   - If you're installing a new condenser, add refrigerant oil (KEIHIN SP-10) (see page 21-33).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
   - Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
   - Be careful not to damage the radiator and condenser fins when installing the condenser.
   - Charge the system (see page 21-55).

Receiver/Dryer Desiccant Replacement

1. Remove the condenser (see page 21-51).
2. Remove the cap (A) from the bottom of the condenser, then remove the O-rings (B), the filter (C) and the desiccant (D).



3. Install the desiccant in the reverse order of removal, and note these items:
   - Replace the O-rings with new ones, and apply a thin coat of refrigerant oil (KEIHIN SP-10) before installing them.
   - Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.

Refrigerant Recovery

CAUTION

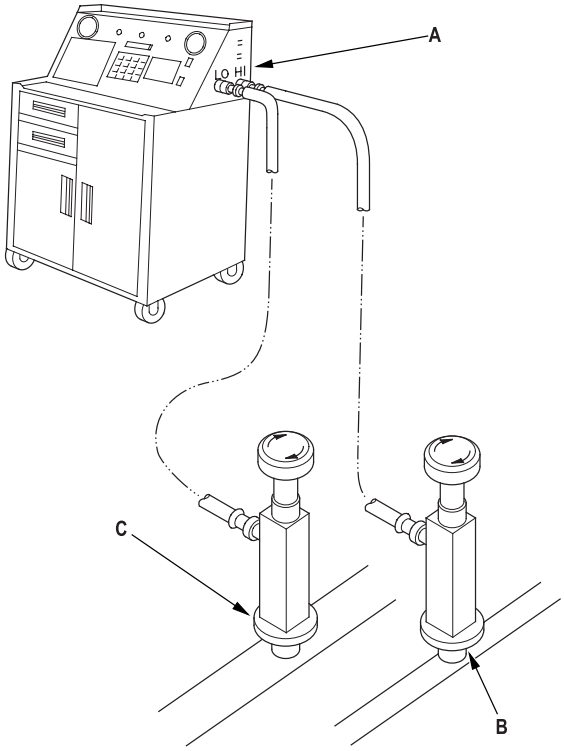
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment for refrigerant HFC-134a (R-134a).

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed. Be sure to put the same amount of new refrigerant oil back into the A/C system before charging.

System Evacuation

CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

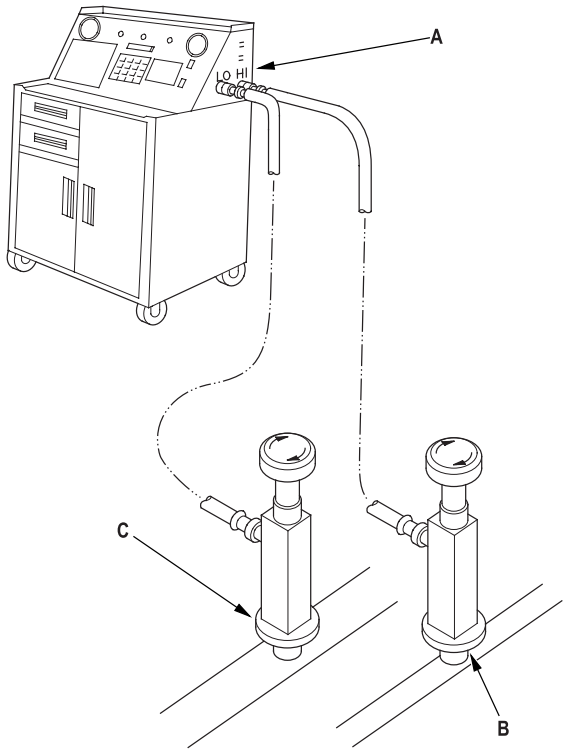
Use only service equipment for refrigerant HFC-134a (R-134a).

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C system has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a R-134a refrigerant recovery/recycling/charging station. (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)

2. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions. Evacuate the system.



3. If the low-pressure does not reach more than 93.3 kPa (700 mmHg, 27.6 in.Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system, and check for leaks (see step 3 on page 21-56).

System Charging

CAUTION

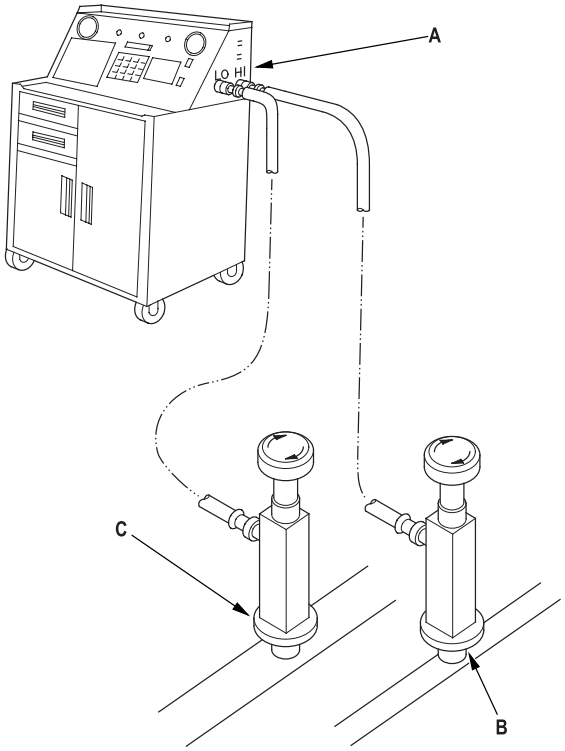
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment for refrigerant HFC-134a (R-134a).

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Evacuate the system (see page 21-54).
3. Add the same amount of new refrigerant oil to the system that was removed during recovery. Use only KEIHIN SP-10 refrigerant oil.
4. Charge the system with the specified amount of R-134a refrigerant. Do not overcharge the system; the compressor will be damaged.

   Select the appropriate units of measure for your refrigerant charging station.

   Refrigerant capacity:
   480 to 530 g
   0.48 to 0.53 kg
   1.06 to 1.17 lbs
   16.9 to 18.7 oz
5. Check for refrigerant leaks (see page 21-56).
6. Check for system performance (see page 21-58).

Refrigerant Leak Test

WARNING

- Compressed air mixed with R-134a froms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning system.

CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

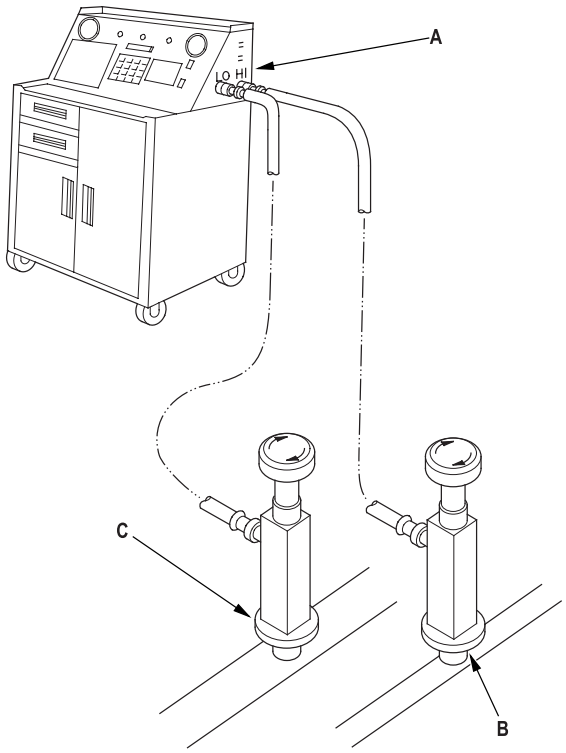
Use only service equipment for refrigerant HFC-134a (R-134a).

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Open high pressure valve to charge the system to the specified capacity, then close the supply valve, and remove the charging system couplers.

   Select the appropriate units of measure for your refrigerant charging station.

   Refrigerant capacity:
   480 to 530 g
   0.48 to 0.53 kg
   1.06 to 1.17 lbs
   16.9 to 18.7 oz

3. Check the system for leaks using a R-134a refrigerant leak detector with an accuracy of 14 g (0.5 oz) per year or better.
4. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), recover the system.
5. After checking and repairing leaks, the system must be evacuated.

A/C System Tests

Pressure Test

Test results	Related symptoms	Probable cause	Remedy
Discharge (high) pressure abnormally high	After stopping compressor, pressure drops to about 196 kPa (2.0 kgf/cm^2, 28 psi) quickly, and then falls gradually.	Air in system	Discharge, evacuate (see page 21-54), and recharge with specified amount (see page 21-55).
	No bubbles in sight glass when condenser is cooled by water.	Excessive refrigerant in system	Discharge, evacuate, and recharge with specified amount.
	Reduced or no air flow through condenser.	• Clogged condenser or radiator fins • Condenser or radiator fan not working properly	• Clean. • Check voltage and fan rpm. • Check fan direction.
	Line to condenser is excessively hot.	Restricted flow of refrigerant in system	Restricted lines
Discharge pressure abnormally low	Excessive bubbles in sight glass; condenser is not hot.	Insufficient refrigerant in system	• Check for leak. • Charge system.
	High and low pressures are balanced soon after stopping compressor. Low side is higher than normal.	• Faulty compressor discharge valve • Faulty compressor seal	Replace the compressor.
	Outlet of expansion valve is not frosted, low-pressure gauge indicates vacuum.	• Faulty expansion valve • Moisture in system	• Replace. • Discharge, evacuate, and recharge with specified amount.
Suction (low) pressure abnormally low	Excessive bubbles in sight glass; condenser is not hot.	Insufficient refrigerant in system	• Repair the leaks. • Discharge, evacuate, and recharge with specified amount. • Charge as required.
	Expansion valve is not frosted, and low-pressure line is not cold. Low-pressure gauge indicates vacuum.	• Frozen expansion valve (Moisture in system) • Faulty expansion valve	• Discharge, evacuate, and recharge with specified amount. • Replace the expansion valve.
	Discharge temperature is low, and the air flow from vents is restricted.	Frozen evaporator	Run the fan with compressor off, then check evaporator temperature sensor.
	Expansion valve is frosted.	Clogged expansion valve	Clean or replace.
Suction pressure abnormally high	Low-pressure hose and check joint are cooler than the temperature around evaporator.	Expansion valve open too long	Repair or replace.
	Suction pressure is lowered when condenser is cooled by water.	Excessive refrigerant in system	Discharge, evacuate, and recharge with specified amount.
	High and low-pressure are equalized as soon as the compressor is stopped, and both gauges fluctuate while running.	• Faulty gasket • Faulty high-pressure valve • Foreign particle stuck in high-pressure valve	Replace the compressor.
Suction and discharge pressures abnormally high	Reduced air flow through condenser.	• Clogged condenser or radiator fins • Condenser or radiator fan not working properly	• Clean. • Check voltage and fan rpm. • Check fan direction.
	No bubbles in sight glass when condenser is cooled by water.	Excessive refrigerant in system	Discharge, evacuate, and recharge with specified amount.
Suction and discharge pressure abnormally low	Low-pressure hose and metal end areas are cooler than evaporator.	Clogged or kinked low-pressure hose parts	Repair or replace.
	Temperature around expansion valve is too low compared with that around receiver/dryer.	Clogged high-pressure line	Repair or replace.
Refrigerant leaks	Compressor clutch is dirty.	Compressor shaft seal leaking	Replace the compressor.
	Compressor bolt(s) are dirty.	Leaking around bolt(s)	Tighten bolt(s) or replace compressor.
	Compressor gasket is wet with oil.	Gasket leaking	Replace the compressor.

(cont'd)

A/C System Tests (cont'd)

Performance Test

WARNING

- Compressed air mixed R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

The performance test will help determine if the air conditioner system is operating within specifications.

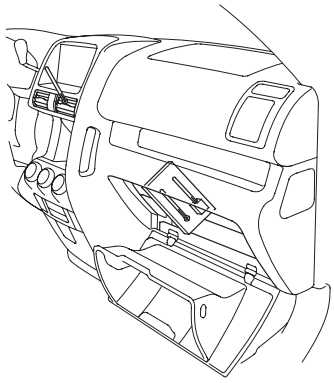
Use only service equipment for refrigerant HFC-134a (R-134a).

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recover/recycling/charging station to the high-pressure service port and the low-pressure service port, following the equipment manufacturer's instructions.
2. Insert a thermometer in the center vent.

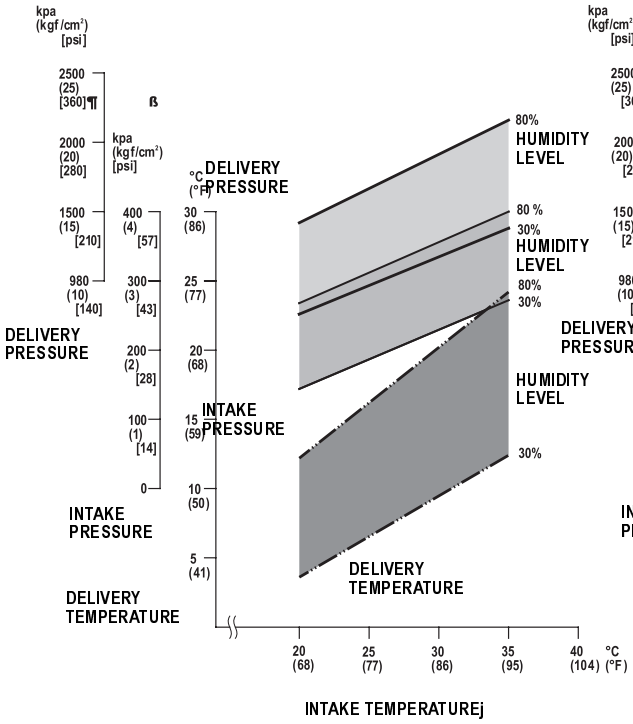


3. Test conditions:
   - Avoid direct sunlight.
   - Open the hood.
   - Open the front doors.
   - Set the temperature control dial to Max Cool, the mode control dial to Vent and the recirculation control lever to Recirculate.
   - Turn the A/C switch on and the fan switch on Max.
   - Run the engine at 1,500 rpm (min^{-1}).
   - No driver or passengers in vehicle.
4. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the center vent, the intake temperature near the blower unit behind the glove box and the high and low system pressure from the A/C gauges.

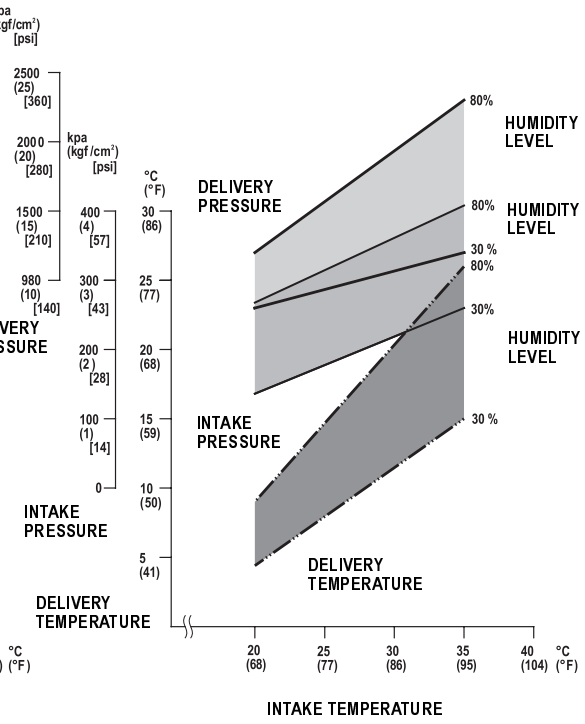
5. To complete the charts:

- Mark the delivery temperature along the vertical line.
- Mark the intake temperature (ambient air temperature) along the bottom line.
- Draw a line straight up from the air temperature to the humidity.
- Mark a point 10 % above and 10 % below the humidity level.
- From each point, draw a horizontal line across the delivery temperature.
- The delivery temperature should fall between the two lines.
- Complete the low-side pressure test and high-side pressure test in the same way.
- Any measurements outside the line may indicate the need for further inspection.

LHD model:



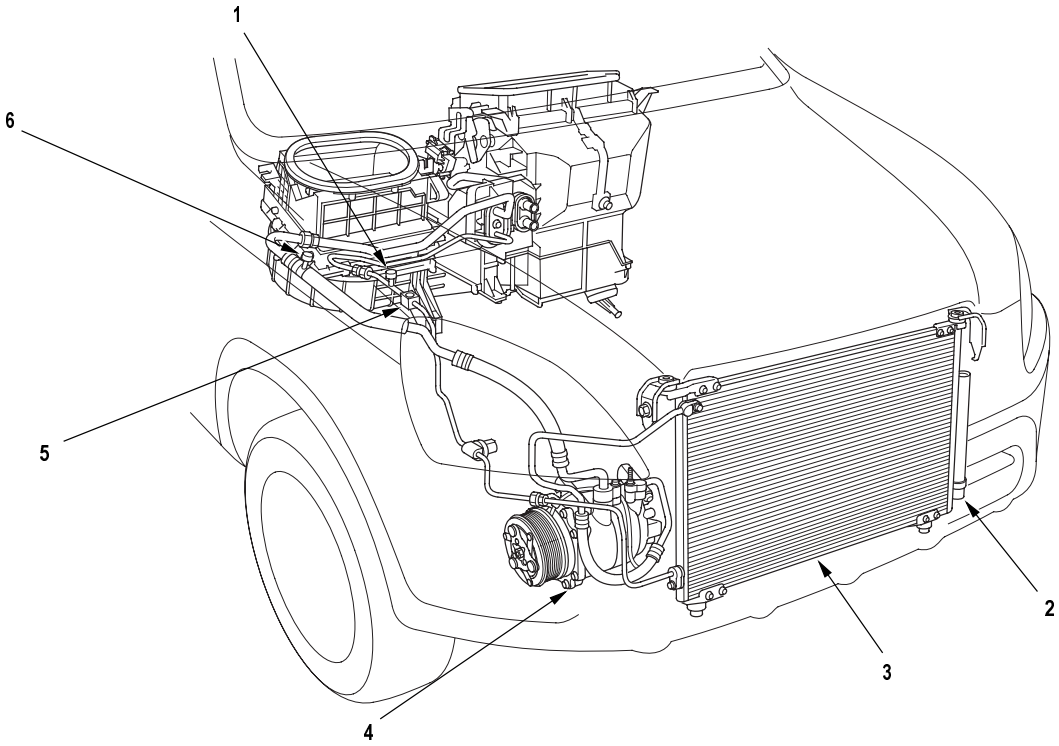
RHD model:



Climate Control

Component Location Index

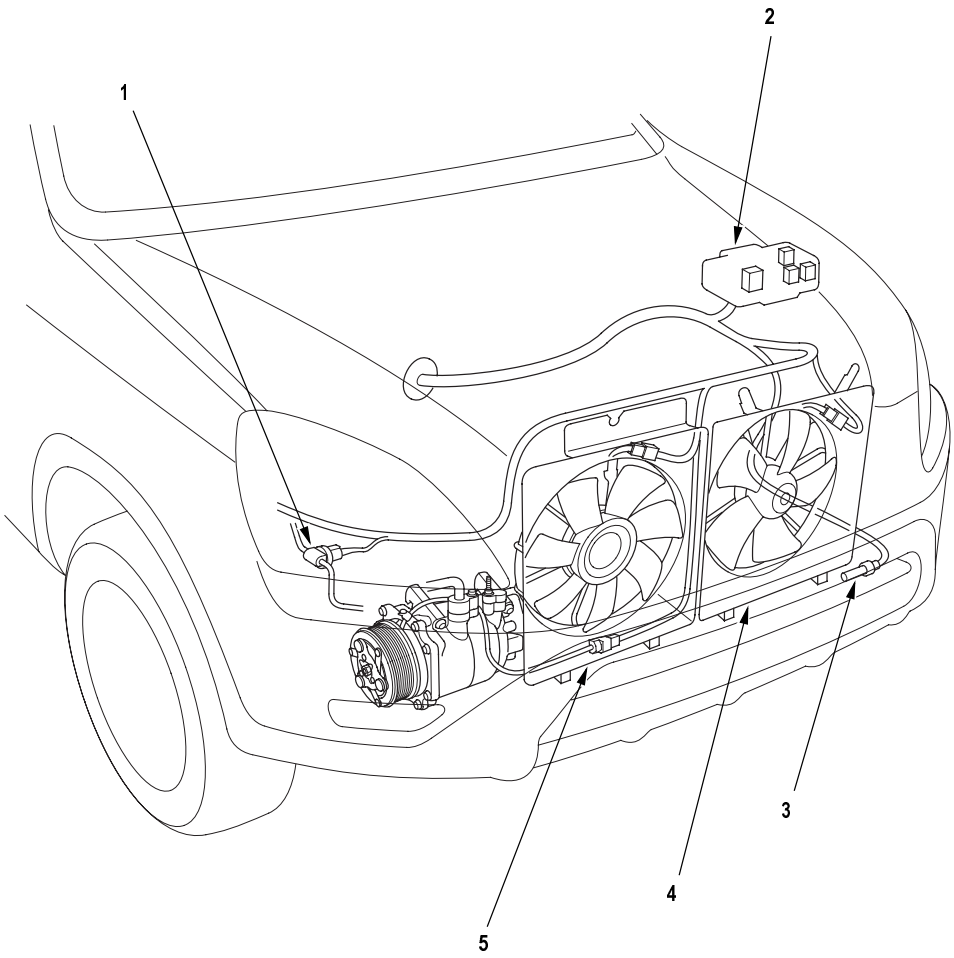
NOTE: LHD type is shown, RHD type is similar.



1	SERVICE VALVE (HIGH PRESSURE SIDE)	
2	RECEIVER/DRYER	
3	CONDENSER	Replacement, page 21-51
4	COMPRESSOR	Replacement, page 21-46; Clutch Check, page 21-47; Clutch Overhaul, page 21-48; Thermal Protector Check, page 21-47; Thermal Protector Replacement, page 21-50; Relief Valve Replacement, page 21-50
5	SIGHT GLASS	
6	SERVICE VALVE (LOW PRESSURE SIDE)	

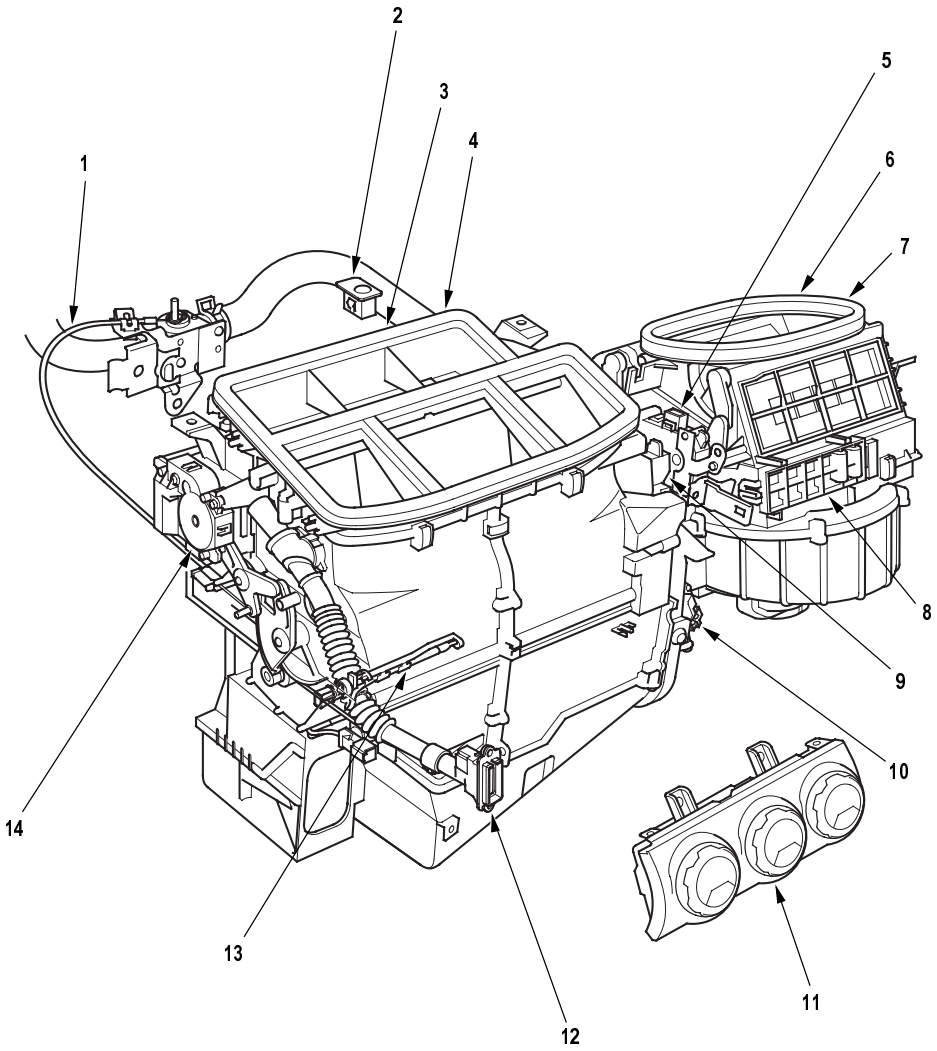
Component Location Index (cont'd)

NOTE: LHD type is shown, RHD type is similar.



1	A/C PRESSURE SWITCH	
2	BLOWER MOTOR RELAY, RADIATOR FAN RELAY, CONDENSER FAN RELAY, COMPRESSOR CLUTCH RELAY (Located in the under-hood fuse/relay box)	Test, page 22A-60
3	OUTSIDE AIR TEMPERATURE SENSOR	Replacement, page 21-90; Test, page 21-90
4	RADIATOR FAN	
5	CONDENSER FAN	

NOTE: LHD type is shown, RHD type is symmetrical.



1	HEATER VALVE CABLE	Adjustment, page 21-30
2	SUNLIGHT SENSOR	Replacement, page 21-91; Test, page 21-91
3	HEATER UNIT/CORE	Replacement, page 21-28
4	EVAPORATOR CORE (Built-in the heater unit)	Replacement, page 21-45
5	RECIRCULATION CONTROL MOTOR	Test, page 21-23; Replacement, page 21-23
6	BLOWER UNIT	Removal and Installation, page 21-26
7	BLOWER UNIT COMPONENTS	Replacement, page 21-27
8	DUST AND POLLEN FILTER	Replacement, page 21-25
9	MODE CONTROL MOTOR	Test, page 21-22; Replacement, page 21-22
10	POWER TRANSISTOR	Test, page 21-24
11	CLIMATE CONTROL UNIT	Removal and Installation, page 21-92
12	IN-CAR TEMPERATURE SENSOR	Replacement, page 21-89; Test, page 21-89
13	EVAPORATOR TEMPERATURE SENSOR	Replacement, page 21-44; Test, page 21-44
14	AIR MIX CONTROL MOTOR	Test, page 21-21; Replacement, page 21-21

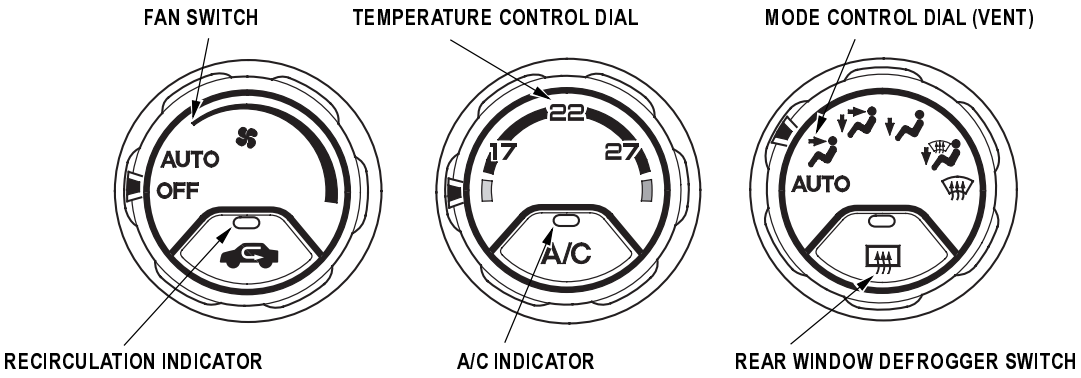
General Troubleshooting Information

How to Retrieve a DTC

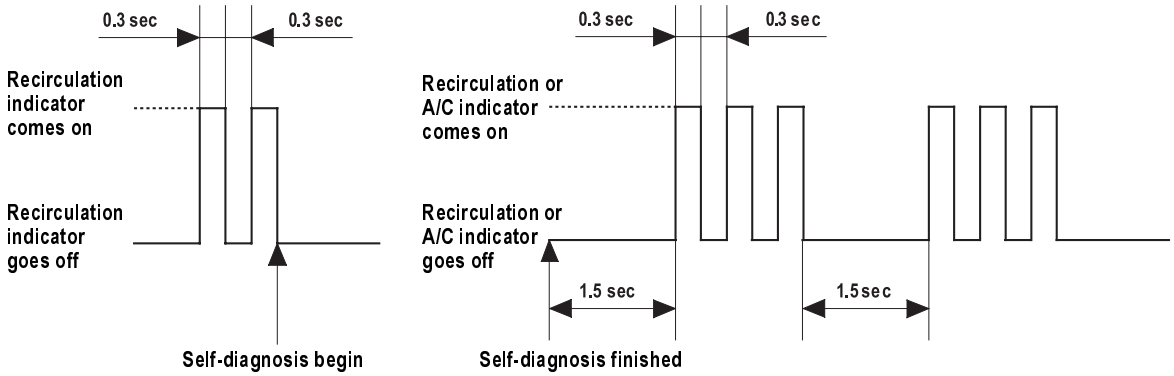
The Climate Control Unit has a self-diagnosis function.

Running the Self-diagnosis Function

1. Turn the ignition switch OFF.
2. Turn the fan switch OFF, the temperature control dial on Max Cool and the mode control dial on Vent.
3. Turn the ignition switch ON (II), then press and hold the recirculation control switch. Within 10 seconds while holding the switch down, press the rear window defogger switch five times. The recirculation indicator blinks two times, then the self-diagnosis will begin. If there is any problem in the system after self-diagnosis is finished, the recirculation indicator will blink the Diagnostic Trouble Code (DTC) 1 through 13, When problems in the evaporator temperature sensor circuit are detected (codes 14 and 15), the A/C indicator will blink the DTC. If no DTC's are found, the indicator will not blink.



Example of DTC indication Pattern (DTC 3)



Resetting the Self-diagnosis Function

Turn the ignition switch OFF to cancel the self-diagnosis function. After completing repair work, run the self-diagnosis function again to make sure that there are no other malfunctions.

DTC Troubleshooting Index

DTC (Recirculation Indication Blinks)	Detection Item	Page
1	An open in the in-car temperature sensor circuit	(see page 21-70)
2	A short in the in-car temperature sensor circuit	(see page 21-71)
3	An open in the outside air temperature sensor circuit	(see page 21-71)
4	A short in the outside air temperature sensor circuit	(see page 21-73)
5	An open in the sunlight sensor circuit	(see page 21-73)
6	A short in the sunlight sensor circuit	(see page 21-74)
7	An open in the air mix control motor circuit	(see page 21-75)
8	A short in the air mix control motor circuit	(see page 21-75)
9	A problem in the air mix control linkage, door, or motor	(see page 21-76)
10	An open or short in the mode control motor circuit	(see page 21-77)
11	A problem in the mode control linkage, doors, or motor	(see page 21-78)
12	A problem in the blower motor circuit	(see page 21-79)
13	A problem in the EEPROM in the climate control unit; the control unit must be replaced	(see page 21-92)

DTC (A/C Indication Blinks)	Detection Item	Page
14	An open in the evaporator temperature sensor circuit	(see page 21-82)
15	A short in the evaporator temperature sensor circuit	(see page 21-83)

In case of multiple problems, the recirculation or A/C indicator will indicate only the DTC with the least number of blinks.

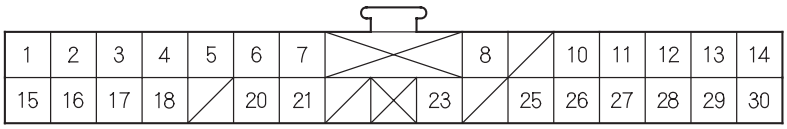
Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Recirculation control doors do not change between Fresh and Recirculate	Recirculation Control Motor Circuit Troubleshooting (see page 21-84)	• Blown fuse No. 14 (10A) in the under-dash fuse/relay box • Cleanliness and tightness of all connectors
The blower motor does not run immediately even through the engine is fully warmed up NOTE: The temperature control dial must be set between 18°C (64°F) and 32°C (90°F)	ECT Sensor Circuit Troubleshooting (see page 21-88)	Cleanliness and tightness of all connectors
Both heater and A/C do not work	Climate Control Power and Ground Circuits Troubleshooting (see page 21-86)	• Blown fuse No. 14 (10A) in the under-dash fuse/relay box • Poor ground at G501 • Cleanliness and tightness of all connectors
Condenser fan does not run at all (but radiator fan runs with the A/C on)	Condenser Fan Circuit Troubleshooting (see page 21-38)	• Blown fuse No. 1 (20A) in the under-hood fuse/relay box, and No. 14 (10A) in the under-dash fuse/relay box • Poor ground at G201 • Cleanliness and tightness of all connectors
Both fans do not run with the A/C on	Radiator and Condenser Fans Common Circuit Troubleshooting (see page 21-39)	• Blown fuse No. 1 (20A) and No. 4 (20A) in the under-hood fuse/relay box, and No. 14 (10A) in the under-dash fuse/relay box • Poor ground at G201 • Cleanliness and tightness of all connectors
Compressor clutch does not engage	Compressor Clutch Circuit Troubleshooting (see page 21-40)	• Blown fuse No. 1 (20A) in the under-hood fuse/relay box, and No. 14 (10A) in the under-dash fuse/relay box • Cleanliness and tightness of all connectors
A/C System does not come on (both fans and compressor)	A/C Pressure Switch Circuit Troubleshooting (see page 21-87)	Cleanliness and tightness of all connectors

System Description

Climate Control Unit Inputs and Outputs

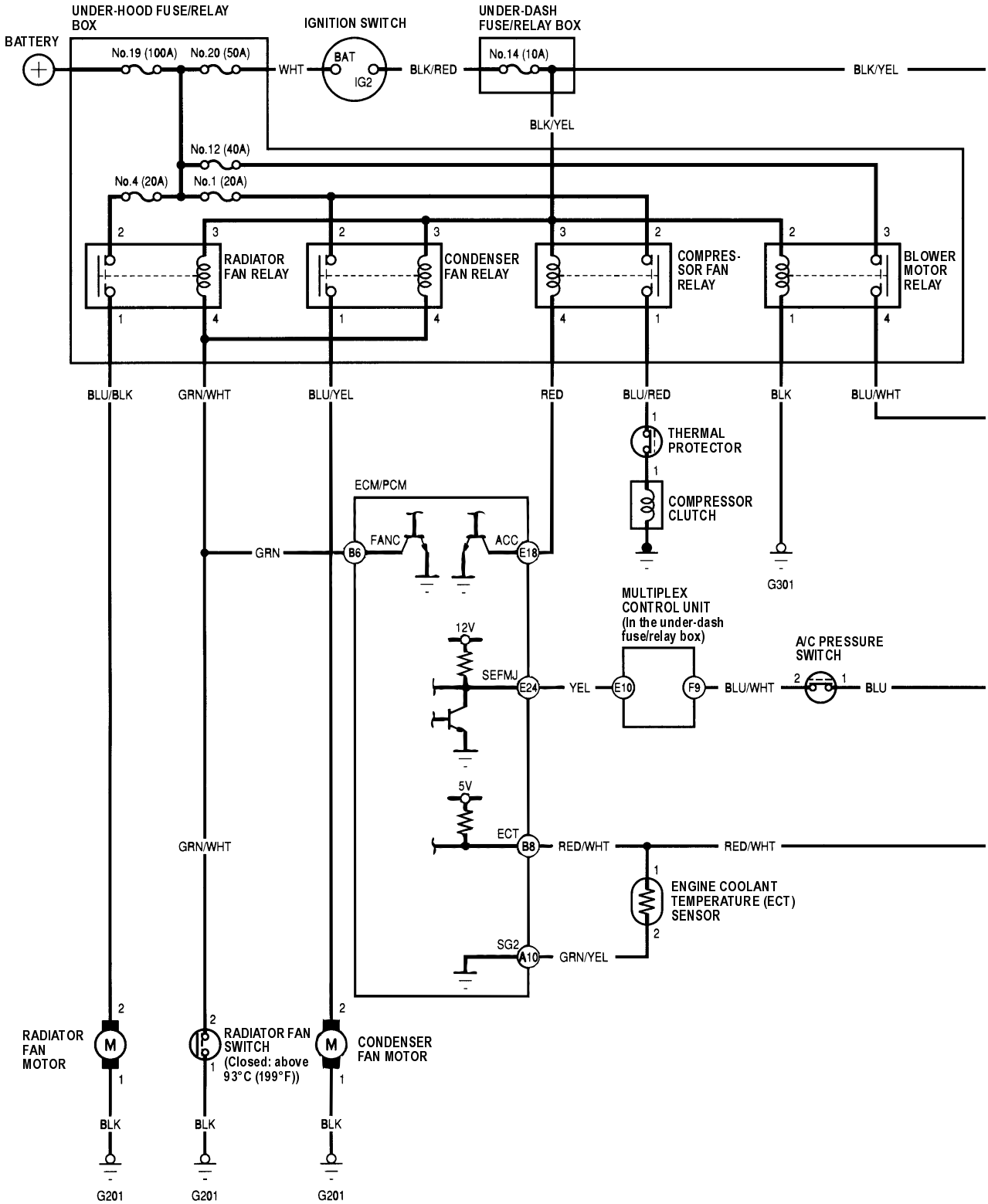
CLIMATE CONTROL UNIT 30P CONNECTOR

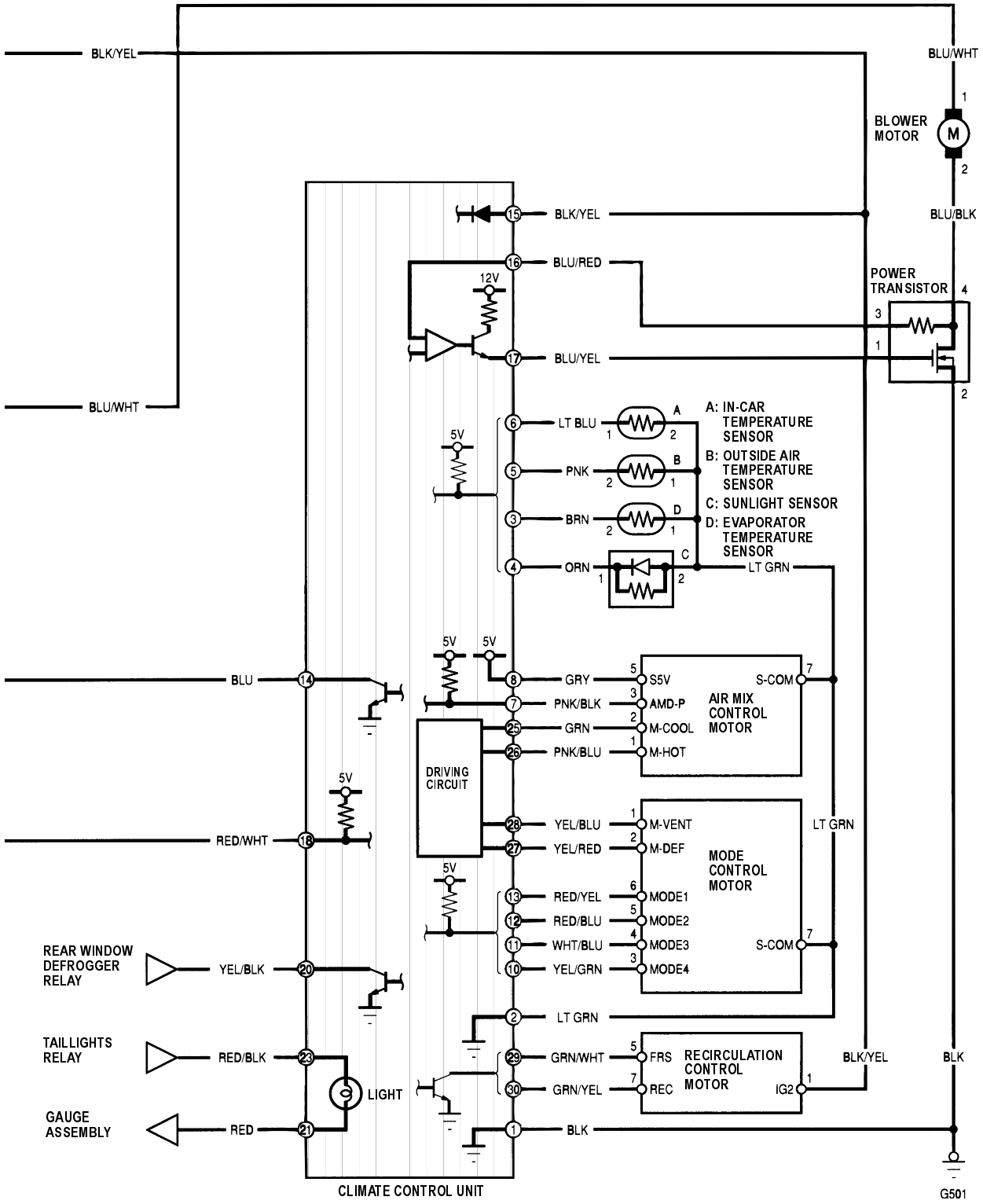


Wire side of female terminals

Cavity	Wire color	Signal	
1	BLK	Ground	Input
2	LT GRN	Sensor Common Ground	Input
3	BRN	Evaporator temperature sensor	Output
4	ORN	Sunlight sensor	Output
5	PNK	Outside air temperature sensor	Output
6	LT BLU	In-car temperature sensor	Output
7	PNK/BLK	Air mix potential	Output
8	GRY	Air mix potential +5V	Output
9	—-—	—-—	—-—
10	YEL/GRN	Mode 4	Output
11	WHT/BLU	Mode 3	Output
12	RED/BLU	Mode 2	Output
13	RED/YEL	Mode 1	Output
14	BLU	A/C pressure switch	Input
15	BLK/YEL	IG2 Power	Input
16	BLU/RED	Blower feed back	Input
17	BLU/YEL	Power transistor base	Output
18	RED/WHT	Engine coolant temperature (ECT) sensor	Output
19	—-—	—-—	—-—
20	YEL/BLK	Rear window defogger relay	Output
21	RED	Ground (For lighting)	Output
22	—-—	—-—	—-—
23	RED/BLK	Taillights relay	Input
24	—-—	—-—	—-—
25	GRN	Air mix cool	Output
26	PNK/BLU	Air mix hot	Output
27	YEL/RED	Mode vent	Output
28	YEL/BLU	Mode def	Output
29	GRN/WHT	Fresh	Input
30	GRN/YEL	Recirculate	Input

Circuit Diagram

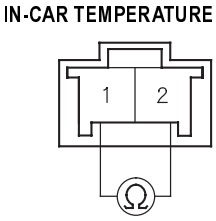


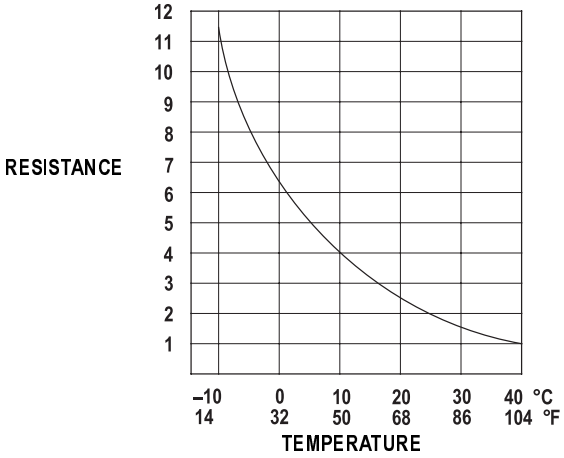

BLK/YEL
BLU/WHT
BLOWER MOTOR
BLU/BLK
POWER TRANSISTOR
BLU/RED
BLU/YEL
12V
A: IN-CAR TEMPERATURE SENSOR
B: OUTSIDE AIR TEMPERATURE SENSOR
C: SUNLIGHT SENSOR
D: EVAPORATOR TEMPERATURE SENSOR
LT BLU
PNK
BRN
ORN
LT GRN
5V
BLU
GRY
PNK/BLK
GRN
PNK/BLU
S5V
AMD-P
M-COOL
M-HOT
S-COM
AIR MIX CONTROL MOTOR
DRIVING CIRCUIT
RED/WHT
YEL/BLU
YEL/RED
M-VENT
M-DEF
MODE CONTROL MOTOR
RED/YEL
RED/BLU
WHT/BLU
YEL/GRN
MODE1
MODE2
MODE3
MODE4
REAR WINDOW DEFROGGER RELAY
YEL/BLK
TAILLIGHTS RELAY
RED/BLK
LIGHT
GAUGE ASSEMBLY
RED
GRN/WHT
GRN/YEL
FRS
REC
RECIRCULATION CONTROL MOTOR
IG2
BLK
CLIMATE CONTROL UNIT
G501

DTC Troubleshooting

DTC 1: An Open in the In-car Temperature Sensor Circuit

1. Remove the in-car temperature sensor (see page 21-89).
2. Measure the resistance between the No. 1 and No. 2 terminals of the in-car temperature sensor.
*Check for change in resistance by heating or cooling the sensor with a hair drier.



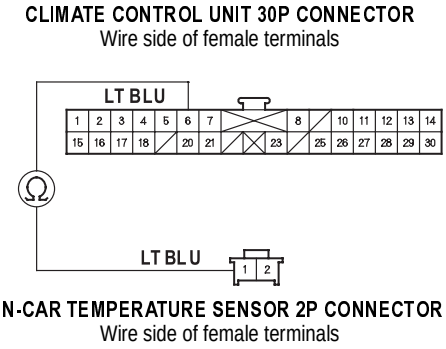


Is the resistance within the specifications shown on the graph?

Yes Go to step 3.

No Replace the in-car temperature sensor.■

3. Disconnect the climate control unit 30P connector.
4. Check for continuity between the No. 6 terminal of the climate control unit 30P connector and the No. 1 terminal of the in-car temperature sensor 2P connector.

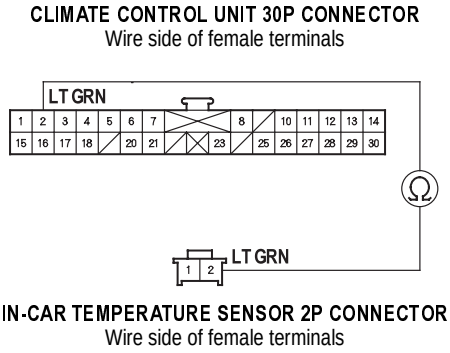


Is there continuity?

Yes Go to step 5.

No Repair open in the wire between the climate control unit and the in-car temperature sensor.■

5. Check for continuity between the No. 2 terminal of the climate control unit 30P connector and the No. 2 terminal of the in-car temperature sensor 2P connector.



Is there continuity?

Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the in-car temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Repair open in the wire between the climate control unit and the in-car temperature sensor.■

DTC 2: A Short in the In-car Temperature Sensor Circuit

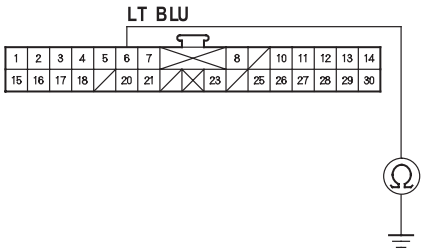
1. Remove the in-car temperature sensor (see page 21-89).
2. Test the in-car temperature sensor (see page 21-89).

   Is the resistance within the specifications shown on the graph?

   Yes Go to step 3.

   No Replace the in-car temperature sensor.■
3. Disconnect the climate control unit 30P connector.
4. Check for continuity between the No. 6 terminal of the climate control unit 30P connector and body ground.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

Is there continuity?

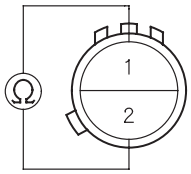
Yes Repair short to body ground in the wire between the climate control unit and the in-car temperature sensor.■

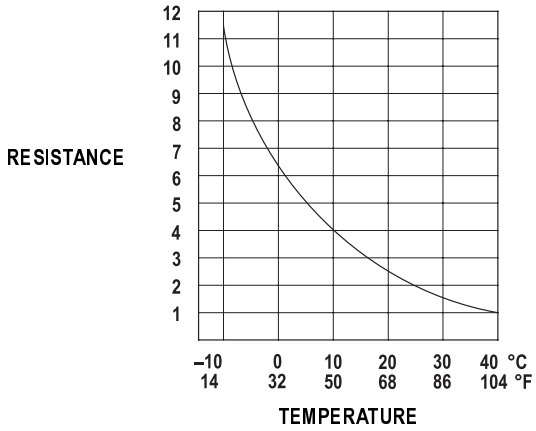
No Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

DTC 3: An Open in the Outside Air Temperature Sensor Circuit

1. Remove the outside air temperature sensor (see page 21-90).
2. Measure the resistance between the No. 1 and No. 2 terminals of the outside air temperature sensor. *Dip the sensor in ice water, and measure resistance. Then pour hot water on the sensor, and check for change in resistance.

OUTSIDE AIR TEMPERATURE SENSOR





Is the resistance within the specifications shown on the graph?

Yes Go to step 3.

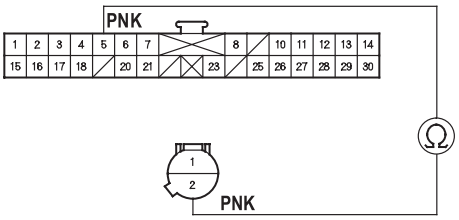
No Replace the outside air temperature sensor.■
3. Disconnect the climate control unit 30P connector.

(cont'd)

DTC Troubleshooting (cont'd)

4. Check for continuity between the No. 5 terminal of the climate control unit 30P connector and the No. 2 terminal of the outside air temperature sensor 2P connector.

CLIMATE CONTROL UNIT 30P CONNECTOR
Wire side of female terminals



OUTSIDE TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

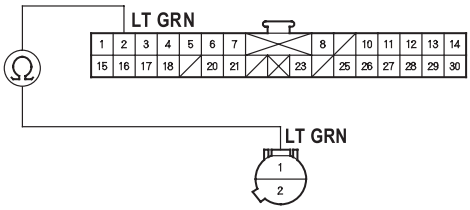
Is there continuity?

Yes Go to step 5.

No Repair open in the wire between the climate control unit and the outside air temperature sensor.■

5. Check for continuity between the No. 2 terminal of the climate control unit 30P connector and the No. 1 terminal of the outside air temperature sensor 2P connector.

CLIMATE CONTROL UNIT 30P CONNECTOR
Wire side of female terminals



OUTSIDE TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the outside air temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Repair open in the wire between the climate control unit and the outside air temperature sensor.■

DTC 4: A Short in the Outside Air Temperature Sensor Circuit

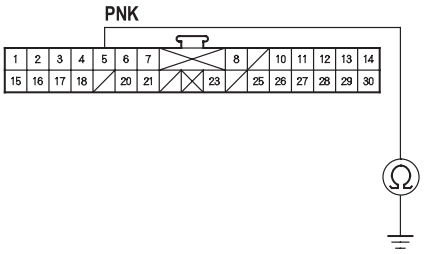
1. Remove the outside air temperature sensor (see page 21-90).
2. Test the outside air temperature sensor (see page 21-90).

   Is the resistance within the specifications shown on the graph?

   Yes Go to step 3.

   No Replace the outside air temperature sensor.■
3. Disconnect the climate control unit 30P connector.
4. Check for continuity between the No. 5 terminal of the climate control unit 30P connector and body ground.

CLIMATE CONTROL UNIT 30P CONNECTOR



Is there continuity?

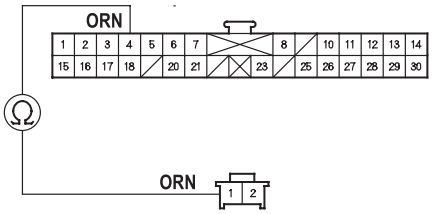
Yes Repair short to body ground in the wire between the climate control unit and the outside air temperature sensor.■

No Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

DTC 5: An Open in the Sunlight Sensor Circuit

1. Disconnect the sunlight sensor 2P connector.
2. Disconnect the climate control unit 30P connector.
3. Check for continuity between the No. 4 terminal of the climate control unit 30P connector and the No. 1 terminal of the sunlight sensor 2P connector.

CLIMATE CONTROL UNIT 30P CONNECTOR
Wire side of female terminals



SUN LIGHT SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

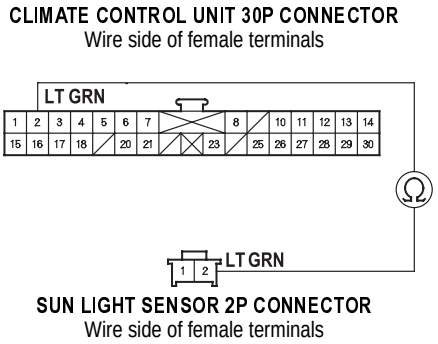
Yes Go to step 4.

No Repair open in the wire between the climate control unit and the sunlight sensor.■

(cont'd)

0 DTC Troubleshooting (cont'd)

4. Check for continuity between the No. 2 terminal of the climate control unit 30P connector and the No. 2 terminal of the sunlight sensor 2P connector.



Is there continuity?

Yes Go to step 5.

No Repair open in the wire between the climate control unit and the sunlight sensor.■

5. Reconnect the sunlight sensor 2P connector.
6. Reconnect the climate control unit 30P connector.
7. Test the sunlight sensor (see page 21-91).

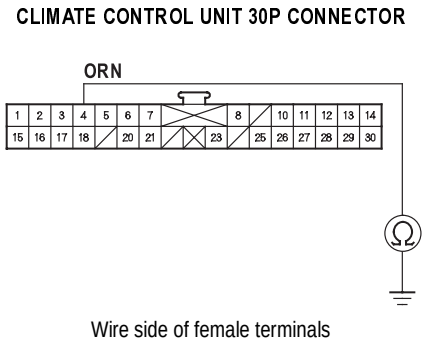
Is the sunlight sensor OK?

Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the sunlight sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Replace the sunlight sensor.■

DTC 6: A Short in the Sunlight Sensor Circuit

1. Disconnect the sunlight sensor 2P connector.
2. Disconnect the climate control unit 30P connector.
3. Check for continuity between the No. 4 terminal of the climate control unit 30P connector and body ground.



Is there continuity?

Yes Repair short to body ground in the wire between the climate control unit and the sunlight sensor.■

No Go to step 4.

4. Reconnect the sunlight sensor 2P connector.
5. Reconnect the climate control unit 30P connector.
6. Test the sunlight sensor (see page 21-91).

Is the sunlight sensor OK?

Yes Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

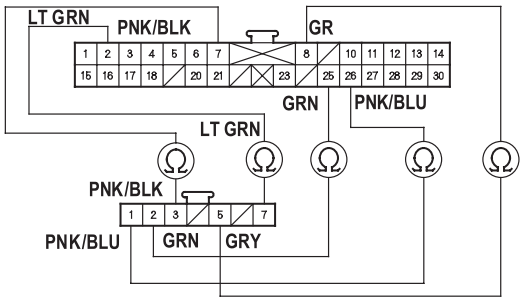
No Replace the sunlight sensor.■

DTC 7: An Open in the Air Mix Control Motor Circuit

1. Disconnect the air mix control motor 7P connector.
2. Disconnect the climate control unit 30P connector.
3. Check for continuity between following terminals of the climate control unit 30P connector and the air mix control motor 7P connector.

30P:	7P:
No. 2	No. 7
No. 7	No. 3
No. 8	No. 5
No. 25	No. 2
No. 26	No. 1

CLIMATE CONTROL UNIT 30P CONNECTOR
Wire side of female terminals



AIR MIX CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals

Is there continuity?

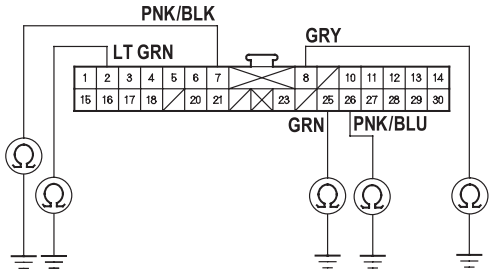
Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the air mix control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Repair any open in he wire(s) between the climate control unit and the air mix control motor.■

DTC 8: A Short in the Air Mix Control Motor Circuit

1. Disconnect the air mix control motor 7P connector.
2. Disconnect the climate control unit 30P connector.
3. Check for continuity between body ground and the climate control unit 30P connector terminals No. 2, 7, 8, 25 and 26 individually.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Repair any short to body ground in the wire(s) between the climate control unit and the air mix control motor.■

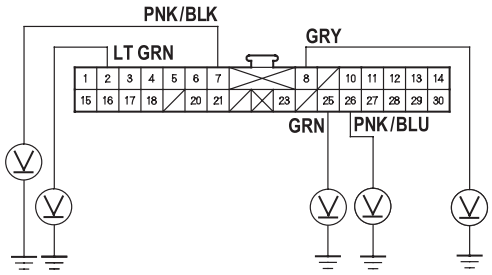
No Go to step 4.

(cont'd)

DTC Troubleshooting (cont'd)

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

Is there any voltage?

Yes Repair any short to power in the wire(s) between the climate control unit and the air mix control motor. This short also may damage the climate control unit. Repair the short to power before replacing the climate control unit.■

No Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

DTC 9: A Problem in the Air Mix Control Linkage, Door, or Motor

1. Test the air mix control motor (see page 21-21).

Is the air mix control motor OK?

Yes Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Go to step 2.

2. Remove the air mix control motor (see page 21-21).

3. Check the air mix control linkage and door for smooth movement.

Do the air mix control linkage and door move smoothly?

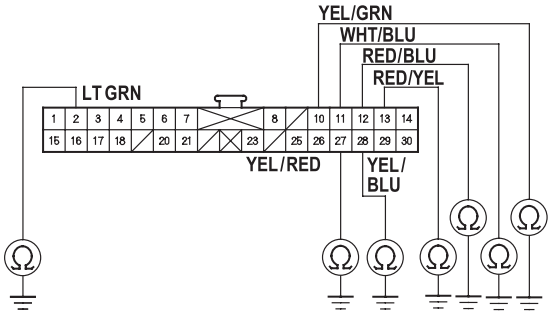
Yes Replace the air mix control motor.■

No Repair the air mix control linkage or door.■

DTC 10: An Open or Short in the Mode Control Motor Circuit

1. Disconnect the mode control motor 7P connector.
2. Disconnect the climate control unit 30P connector.
3. Check for continuity between body ground and the climate control unit 30P connector terminals No. 2, 10, 11, 12, 13, 27 and 28 individually.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

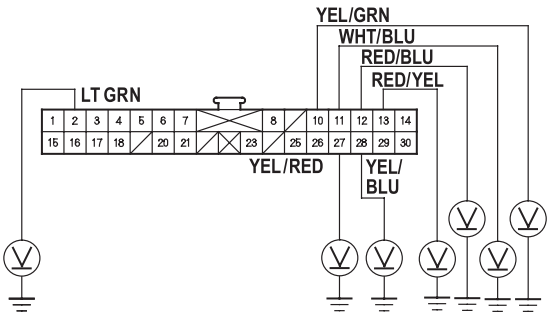
Is there continuity?

Yes Repair any short to body ground in the wire(s) between the climate control unit and the mode control motor.■

No Go to step 4.

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

Is there any voltage?

Yes Repair any short to power in the wire(s) between the climate control unit and the mode control motor. This short also may damage the climate control unit. Repair the short to power before replacing the climate control unit.■

No Go to step 5.

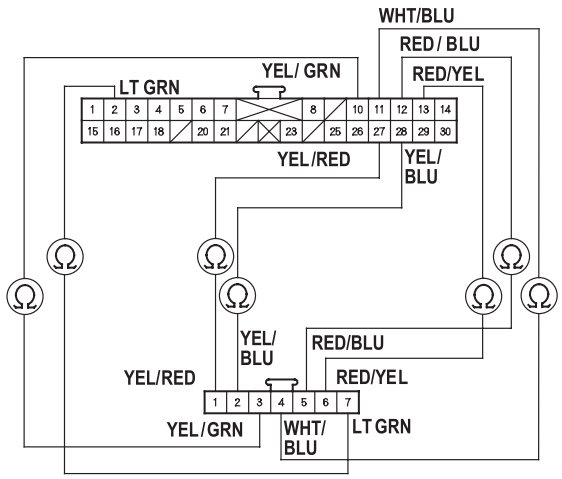
(cont'd)

DTC Troubleshooting (cont'd)

5. Turn the ignition switch OFF,and check for continuity between following terminals of the climate control unit 30P connector and the mode control motor 7P connector.

30P:	7P:
No. 2	No. 7
No. 10	No. 3
No. 11	No. 4
No. 12	No. 5
No. 13	No. 6
No. 28	No. 2
No. 27	No. 1

CLIMATE CONTROL UNIT 30P CONNECTOR
Wire side of female terminals



MODE CONTROL MOTOR
Wire side of female terminals

Is there continuity?

Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the mode control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Repair any open in the wire(s) between the climate control unit and the mode control motor.■

DTC 11: A Problem in the Mode Control Linkage, Doors, or Motor

1. Test the mode control motor (see page 21-22).

Is the mode control motor OK?

Yes Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Go to step 2.

2. Remove the mode control motor (see page 21-22).

3. Check the mode control linkage and doors for smooth movement.

Do the mode control linkage and doors move smoothly?

Yes Replace the mode control motor.■

No Repair the mode control linkage or doors.■

DTC 12: A Problem in the Blower Motor Circuit

1. Check the No. 12 (40A) fuse in the under-hood fuse/relay box, and the No. 14 (10A) fuse in the under-dash fuse/relay box.

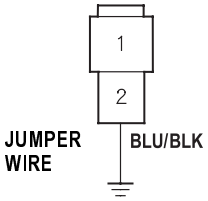
   Are the fuses OK?

   Yes Go to step 2.

   No Replace the fuse(s), and recheck.■

2. Connect the No. 2 terminal of the blower motor 2P connector to body ground with a jumper wire.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

3. Turn the ignition switch ON (II).

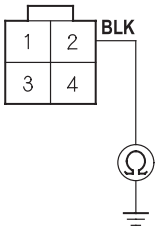
   Does the blower motor run?

   Yes Go to step 4.

   No Go to step 17.

4. Turn the ignition switch OFF.
5. Disconnect the jumper wire.
6. Disconnect the power transistor 4P connector.
7. Check for continuity between the No. 2 terminal of the power transistor 4P connector and body ground.

POWER TRANSISTOR 4P CONNECTOR



Wire side of female terminals

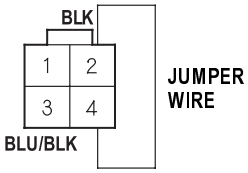
   Is there continuity?

   Yes Go to step 8.

   No Check for an open in the wire between the power transistor and body ground. If the wire is OK, check for poor ground at G501.■

8. Connect the No. 2 and No. 4 terminals of the power transistor 4P connector with a jumper wire.

POWER TRANSISTOR 4P CONNECTOR



Wire side of female terminals

9. Turn the ignition switch ON (II).

   Does the blower motor run at high speed?

   Yes Go to step 10.

   No Repair open in the wire between the power transistor and the blower motor.■

10. Turn the ignition switch OFF.
11. Disconnect the jumper wire.

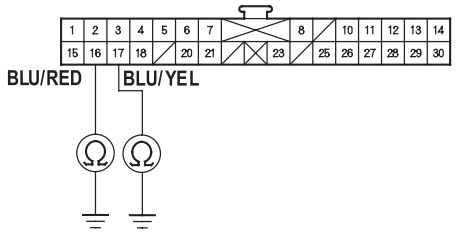
(cont'd)

DTC Troubleshooting (cont'd)

12. Disconnect the climate control unit 30P connector.

13. Check for continuity between the No. 16 and No. 17 terminals of the climate control unit 30P connector and body ground individually.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

Is there continuity?

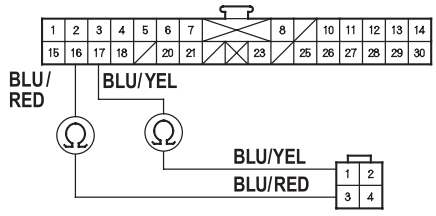
Yes Repair any short to body ground in the wire(s) between the climate control unit and the power transistor.■

No Go to step 14.

14. Check for continuity between the following terminals of the climate control unit 30P connector and power transistor 4P connector.

30P:	4P:
No. 17	No. 1
No. 16	No. 3

CLIMATE CONTROL UNIT 30P CONNECTOR
Wire side of female terminals



POWER TRANSISTOR 4P CONNECTOR
Wire side of female terminals

Is there continuity?

Yes Go to step 15.

No Repair any open in the wire(s) between the climate control unit and the power transistor.■

15. Reconnect the climate control unit 30P connector.

16. Test the power transistor (see page 21-24).

Is the power transistor OK?

Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the power transistor 4P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

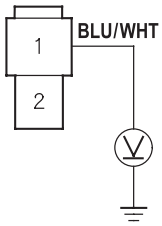
No Replace the power transistor.■

17. Disconnect the jumper wire.

18. Disconnect the blower motor 2P connector.

19. Measure the voltage between the No. 1 terminal of the blower motor 2P connector and body ground.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Replace the blower motor.■

No Go to step 20.

20. Turn the ignition switch OFF.

21. Remove the blower motor relay from the under-hood fuse/relay box, and test it (see page 22A-60).

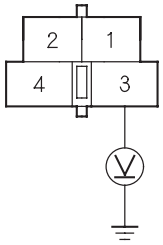
Is there relay OK?

Yes Go to step 22.

No Replace the blower motor relay.■

22. Measure the voltage between the No. 3 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage?

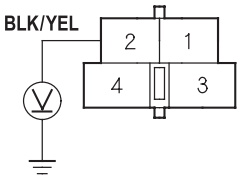
Yes Go to step 23.

No Replace the under-hood fuse/relay box.■

23. Turn the ignition switch ON (II).

24. Measure the voltage between the No. 2 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage?

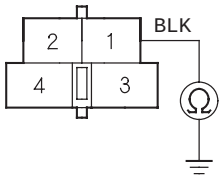
Yes Go to step 25.

No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the blower motor relay.■

25. Turn the ignition switch OFF.

26. Check for continuity between the No. 1 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there contnuity?

Yes Repair open in the wire between the blower motor relay and the blower motor.■

No Check for an open in the wire between the blower motor relay and body ground. If the wire is OK, check for poor ground at G201.■

(cont'd)

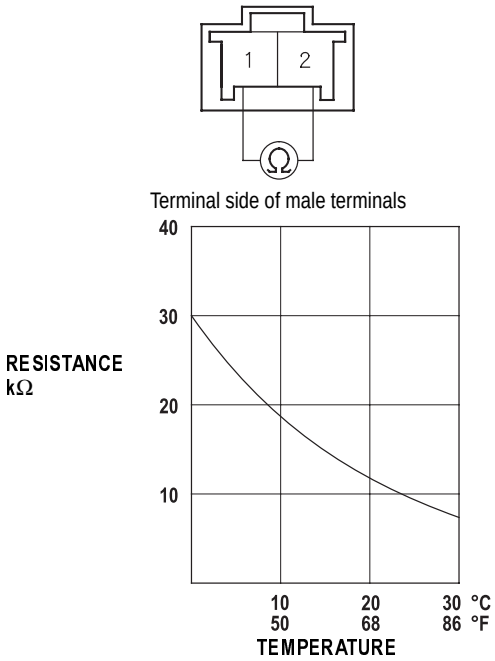
DTC Troubleshooting (cont'd)

DTC 14: An Open in the Evaporator Temperature Sensor Circuit

1. Remove the evaporator temperature sensor (see page 21-44).
2. Measure the resistance between the No. 1 and No. 2 terminals of the evaporator temperature sensor.

   *Dip the sensor in ice water, and measure resistance. Then pour hot water on the sensor, and check for change in resistance.

EVAPORATOR TEMPERATURE SENSOR



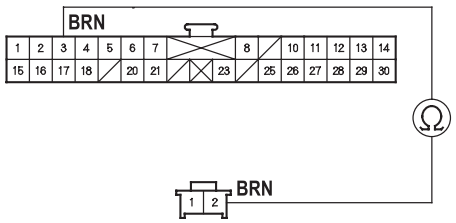
Is the resistance within the specifications shown on the graph?

Yes Go to step 3.

No Replace the evaporator temperature sensor.■

3. Disconnect the climate control unit 30P connector.
4. Check for continuity between the No. 3 terminal of the climate control unit 30P connector and the No. 2 terminal of the evaporator temperature sensor 2P connector.

CLIMATE UNIT 30P CONNECTOR
Wire side of female terminals



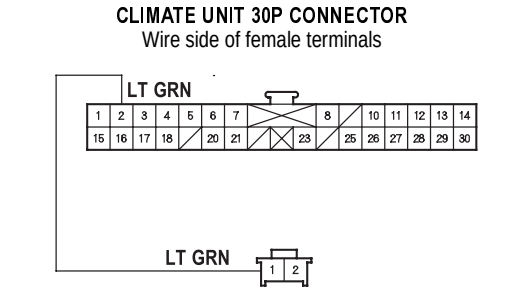
EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

Yes Go to step 5.

No Repair open in the wire between the climate control unit and the evaporator temperature sensor.■

5. Check for continuity between the No. 2 terminal of the climate control unit 30P connector and the No. 1 terminal of the evaporator temperature sensor 2P connector.



Is there continuity?

Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the evaporator temperature sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Repair open in the wire between the climate control unit and the evaporator temperature sensor.■

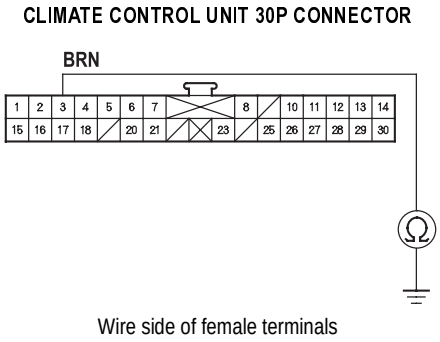
DTC 15: A Short in the Evaporator Temperature Sensor Circuit

1. Remove the evaporator temperature sensor (see page 21-44).
2. Test the evaporator temperature sensor (see page 21-44).

   Is the resistance within the specifications shown on the graph?

   Yes Go to step 3.

   No Replace the evaporator temperature sensor.■
3. Disconnect the climate control unit 30P connector.
4. Check for continuity between the No. 3 terminal of the climate control unit 30P connector and body ground.



Is there continuity?

Yes Repair short to body ground in the wire between the climate control unit and the evaporator temperature sensor.■

No Substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

Recirculation Control Motor Circuit Troubleshooting

1. Check the No. 14 (10A) fuse in the under-dash fuse/relay box.

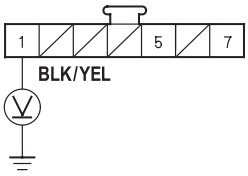
   Is the fuse OK?

   Yes Go to step 2.

   No Replace the fuse, and recheck.■

2. Disconnect the recirculation control motor 7P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 1 terminal of the recirculation control motor 7P connector and body ground.

RECIRCULATION CONTROL MOTOR 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Go to step 5.

No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the recirculation control motor .■

5. Turn the ignition switch OFF.
6. Test the recirculation control motor (see page 21-23).

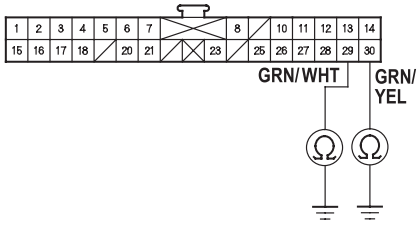
   Is the recirculation control motor OK?

   Yes Go to step 7.

   No Go to step 12.

7. Disconnect the climate control unit 30P connector.
8. Check for continuity between the No. 29 and No. 30 terminals of the climate control unit 30P connector and body ground individually.

CLIMATE CONTROLUNIT 30P CONNECTOR



Wire side of female terminals

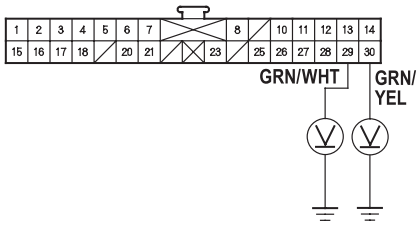
Is there continuity?

Yes Repair any short to body ground in the wire(s) between the climate control unit and the recirculation control motor.■

No Go to step 9.

9. Turn the ignition switch ON (II), and check the same wires for voltage.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

Is there any voltage?

Yes Repair any short to power in the wire(s) between the climate control unit and the recirculation control motor. This short also may damage the climate control unit. Repair the short to power before replacing the climate control unit.■

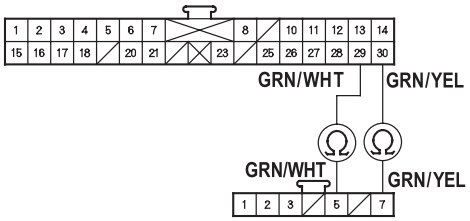
No Go to step 10.

10. Turn the ignition switch OFF.

11. Check for continuity between the following terminals of the climate control unit 30P connector and the recirculation control motor 7P connector.

30P:	7P:
No. 29	No. 5
No. 30	No. 7

CLIMATE CONTROL UNIT 30P CONNECTOR
Wire side of female terminals



RECIRCULATION CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals

Is there continuity?

Yes Check for loose wires or poor connections at the climate control unit 30P connector and at recirculation control motor 7P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Repair any open in the wire(s) between the climate control unit and the recirculation control motor.■

12. Remove the recirculation contol motor (see page 21-23).

13. Check the recirculation control linkage and doors for smooth movement.

Do the recirculation control linkage and doors move smoothly?

Yes Replace the recirculation control motor.■

No Repair the recirculation control linkage or doors.■

Climate Control Power and Ground Circuits Troubleshooting

1. Check the No. 14 (10A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

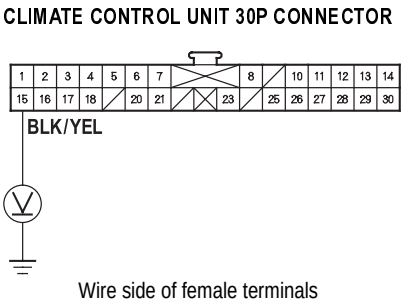
Yes Go to step 2.

No Replace the fuse, and recheck.■

2. Disconnect the climate control unit 30P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 15 terminal of the climate control unit 30P connector and body ground.



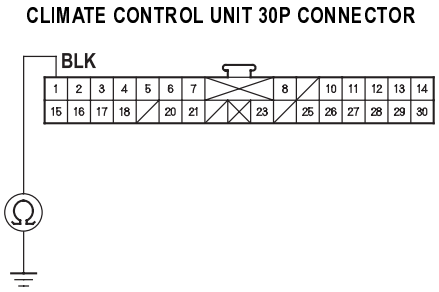
Is there battery voltage?

Yes Go to step 5.

No Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the climate control unit.■

5. Turn the ignition switch OFF.

6. Check for continuity between the No. 1 terminal of the climate control unit 30P connector and body ground.



Is there continuity?

Yes Check for loose wires or poor connections at the climate control unit 30P connector. If the connections are good,substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Check for an open in the wire between the climate control unit and body ground. If the wire is OK, check for poor ground at G501.■

A/C Pressure Switch Circuit Troubleshooting

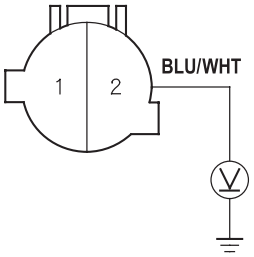
1. Turn the ignition switch ON (II).
2. Turn the blower switch on, and check for blower motor operation.

   Does the blower motor run on all speeds?

   Yes Go to step 3.

   No Troubleshoot the blower motor circuit (see page 21-79).
3. Disconnect the A/C pressure switch 2P connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the No. 2 terminal of the A/C pressure switch 2P connector and body ground.

A/C PRESSURE SWITCH 2P CONNECTOR



Wire side of female terminals

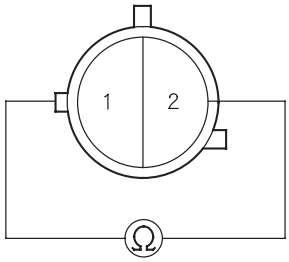
Is there battery voltage?

Yes Go to step 6.

No Go to step 12.

6. Turn the ignition switch OFF.
7. Check for continuity between the No. 1 and No. 2 terminals of the A/C pressure switch.

A/C PRESSURE SWITCH



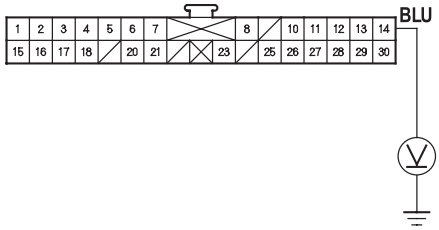
Is there continuity?

Yes Go to step 8.

No Go to step 14.

8. Reconnect the A/C pressure switch 2P connector.
9. Disconnect the climate control unit 30P connector.
10. Turn the ignition switch ON (II).
11. Measure the voltage between the No. 14 terminal of the climate control unit 30P connector and body ground.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

Is battery voltage?

Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the A/C pressure switch 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Repair open in the wire between the climate control unit and the A/C pressure switch.■

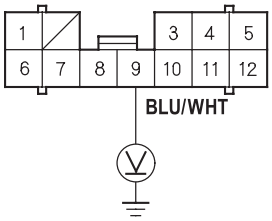
(cont'd)

A/C Pressure Switch Circuit Troubleshooting (cont'd)

12. Make sure the A/C switch is OFF.

13. Measure the voltage between the No. 9 terminal of under-dash fuse/relay box connector F (12P) and body ground with the under-dash fuse/relay box connectors connected.

UNDER-DASH FUSE/RELAY BOX CONNECTOR F (12P)



Wire side of female terminals

Is there 5V or more?

Yes Repair open in the wire between the under-dash fuse/relay box and the A/C pressure switch.■

No Refer to the multiplex control system (see page 22A-227).■

NOTE: Check for multiplex codes in mode 1. Follow the troubleshooting for any codes found. If no codes are found, subsititute a known-good multiplex control unit and a PCM one at a time.

14. Check for proper A/C system pressure.

Is the pressure within specifications?

Yes Replace the A/C pressure switch.■

No Repair the A/C pressure problem.■

ECT Sensor Circuit Troubleshooting

1. Check the malfunction indicator lamp (MIL).

Does the malfunction indicator lamp come on?

Yes Refer to the fuel and emissions section (see page 11-3).■

No Go to step 2.

2. Turn the ignition switch OFF.

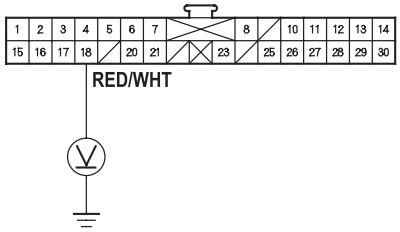
3. Disconnect the ECT sensor 2P connector.

4. Disconnect the climate control unit 30P connector.

5. Turn the ignition switch ON (II).

6. Measure the voltage between the No. 18 terminal of the climate control unit 30P connector and body ground.

CLIMATE CONTROL UNIT 30P CONNECTOR



Wire side of female terminals

Is there about 5 V?

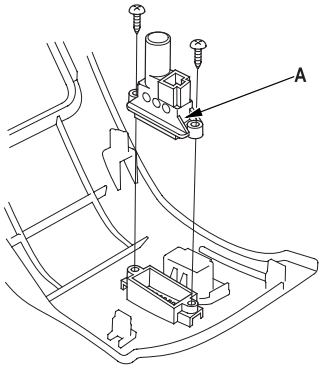
Yes Check for loose wires or poor connections at the climate control unit 30P connector and at the ECT sensor 2P connector. If the connections are good, substitute a known-good climate control unit, and recheck. If the symptom/indication goes away, replace the original climate control unit.■

No Repair open in the wire between the climate control unit and the ECT sensor.■

In-car Temperature Sensor Replacement

NOTE: LHD type is shown, RHD type is symmetrical.

1. Remove the driver's dashboard lower cover (see page 20-88).
2. Disconnect the 2P connector and the air hose, then remove the self-tapping screws and the in-car temperature sensor (A) from the dashboard.

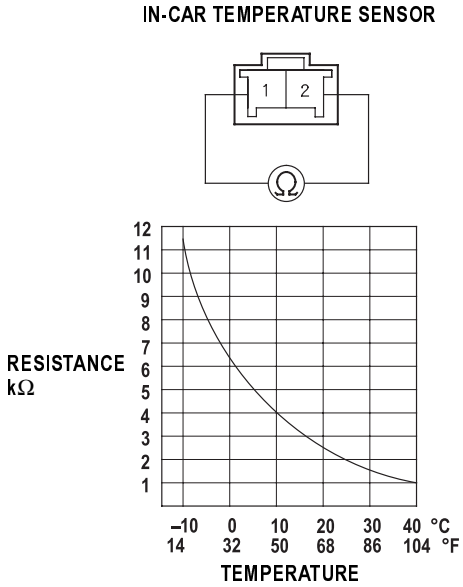


3. Install the sensor in the reverse order of removal. Be sure to connect the air hose securely.

In-car Temperature Sensor Test

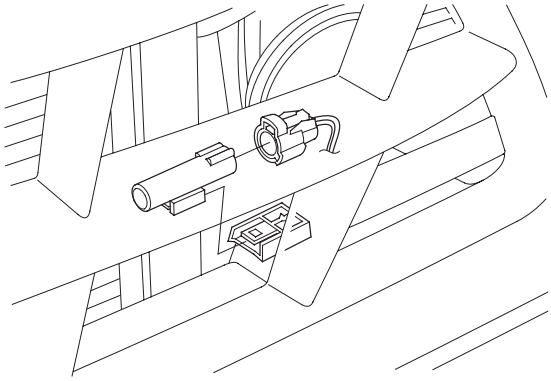
Check for a change in resistance by heating or cooling the sensor with a hair drier.

Compare the resistance reading between the No. 1 and No. 2 terminals of the in-car temperature sensor with the specifications shown in the graph; the resistance should be within the specifications.



Outside Air Temperature Sensor Replacement

1. Release the lock, and remove the outside air temperature sensor, then disconnect the 2P connector.

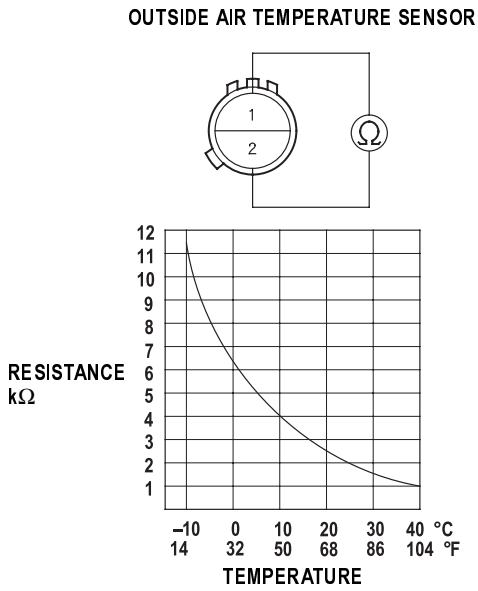


2. Install the sensor in the reverse order of removal.

Outside Air Temperature Sensor Test

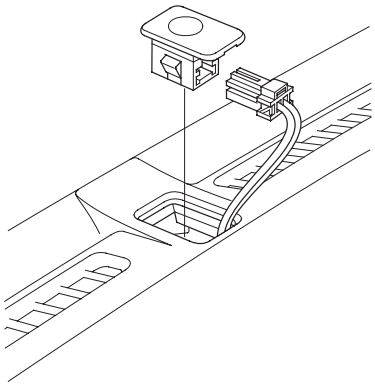
Dip the sensor in ice water, and measure the resistance. Then pour hot water on the sensor, and check for a change in resistance.

Compare the resistance reading between the No. 1 and No. 2 terminals of the outside air temperature sensor with the specifications shown in the graph; the resistance should be within the specifications.



Sunlight Sensor Replacement

1. Remove the sunlight sensor from the dashboard, then disconnect the 2P connector. Be careful not to damage the sensor and the dashboard.

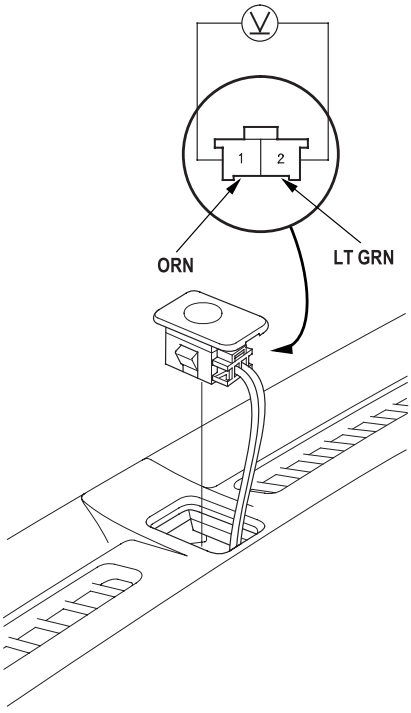


2. Install the sensor in the reverse order of removal.

Sunlight Sensor Test

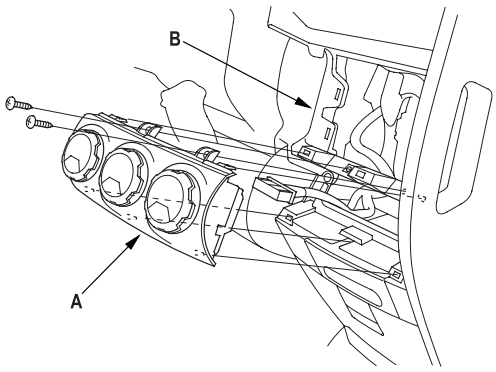
Turn the ignition switch ON (II). Measure the voltage between the terminals with the (+) probe on the No. 1 terminal and the (-) probe on the No. 2 terminal with the 2P connector connected. The voltage will not change under the light at a flashlight or fluorescent lamp. Voltage should be:

- 3.6 - 3.7 V or more with the sensor out of direct.
- 3.6 - 3.5 V or less with the sensor is direct sunlight.



Climate Control Unit Removal and Installation

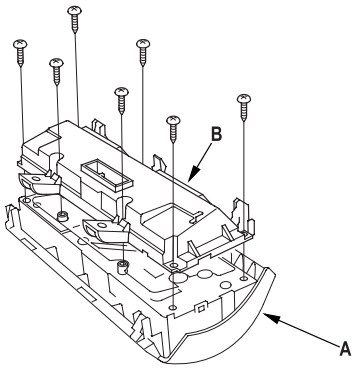
1. Remove the cool box (see page 20-90).
2. Remove the self-tapping screws and the heater control panel (A) from the dashboard (B).



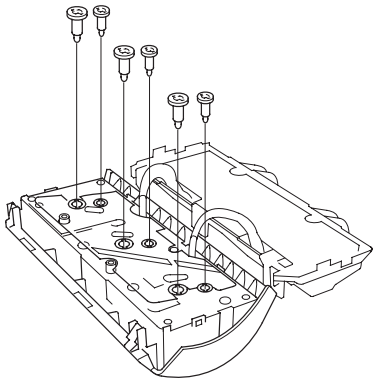
3. Install the control panel in the reverse order of removal. After installation, operate the control panel controls to see whether it works properly.
4. Run the self-diagnosis function to confirm that there are no problems in the system (see page 21-64).

Climate Control Unit Bulb Replacement

1. Discharge the static electricity (which accumulated on you when you removed the climate control unit) by touching the door striker or other body parts.
2. Remove the self-tapping screws, then carefully separate the climate control unit display (A) from the control unit (B). Do not kink or pull on the wires between the display and control unit. Do not touch the electronic components on the printed circuit board in the control unit.



3. Remove the bulb(s) with a flat-tip screw driver.



4. Install the bulb(s) in the reverse order of removal.

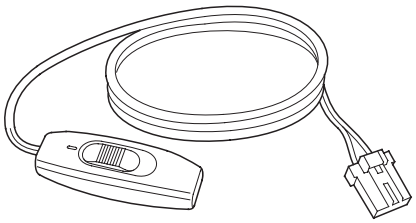
22A

Body Electrical

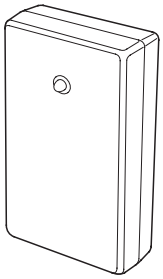
Special Tools 22A-2
General Troubleshooting Information 22A-3
Relay and Control Unit Locations 22A-7
Wire Harness and Ground Locations 22A-14
Fuse/Relay Boxes 22A-35
Power Distribution 22A-37
Ground Distribution 22A-48
Under-dash Fuse/Relay Box 22A-58
Battery 22A-59
Relays 22A-60
* Ignition Switch 22A-63
* Gauges 22A-64
Exterior Lights 22A-79
Turn Signal/Hazard Flasher 22A-102
Interior Lights 22A-106
Entry Light Control System 22A-111
* Stereo Sound System 22A-116
Rear Window Defogger 22A-122
Sunroof 22A-126
Power Mirrors 22A-130
Cigarette Lighter 22A-139
Horns 22A-140
Power Windows 22A-143
Keyless/Power Door Lock System 22A-158
Hatch Glass Opener 22A-179
Seat Heaters 22A-182
Immobilizer System 22A-186
Security Alarm System 22A-192
Wipers/Washers 22A-206
Multiplex Control System 22A-227
Accessory Power Socket 22A-238

Special Tools

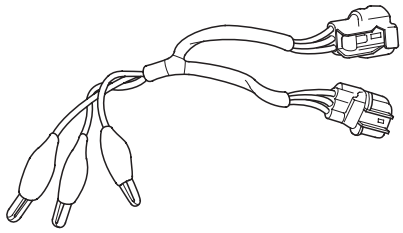
Ref. No.	Tool Number	Description	Qty
1	07WAZ-0010100	MPCS Short Connector	1
2	07MAJ-SP00300	Keyless Entry Checker	1
3	07LAJ-PT30200	Test Harness	1



1



2



3

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If electrical maintenance is required)

The CR-V SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items will require special precautions and tools, and should be done only by an authorized Honda dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS could lead to personal injury caused by unintentional deployment of the airbags and side airbags.
- Do not bump the SRS unit. Otherwise, the system may fail in a collision, or the airbags may deploy when the ignition switch is ON (II).
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

General Troubleshooting Information

Tips and Precautions

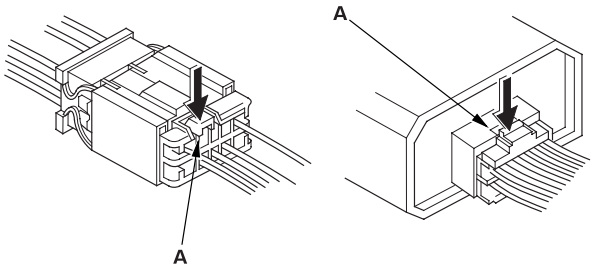
Before Troubleshooting

1. Check applicable fuses in the appropriate fuse/relay box.
2. Check the battery for damage, state of charge, and clean and tight connections.

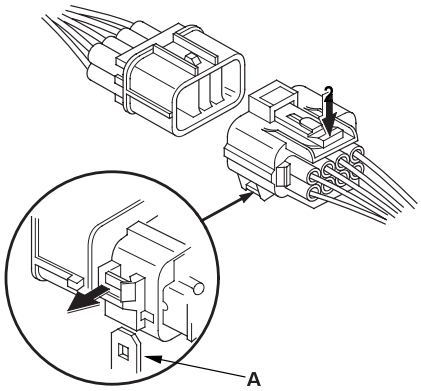
   NOTICE
   - Do not quick-charge a battery unless the battery ground cable has been disconnected, otherwise you will damage the alternator diodes.
   - Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.
3. Check the alternator belt tension.

Handling Connectors

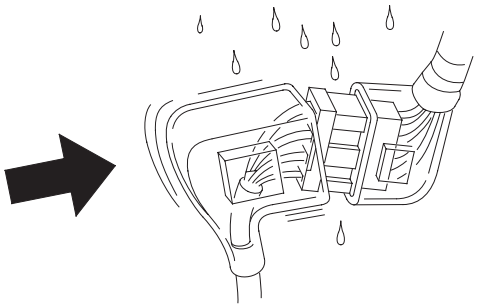
- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks (A).



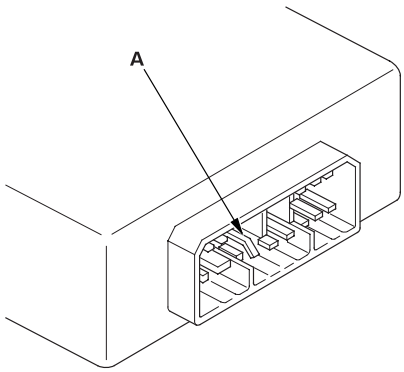
- Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its mount bracket (A).



- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



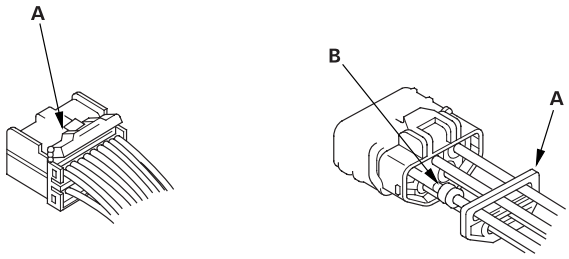
- Before connecting connectors, make sure the terminals (A) are in place and not bent.



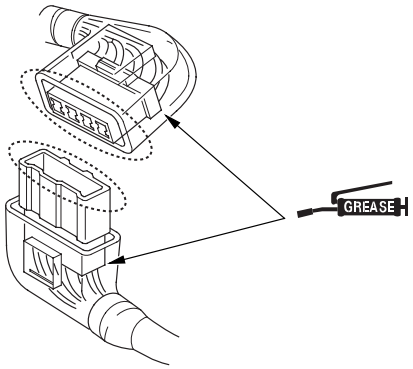
(cont'd)

Tips and Precautions (cont'd)

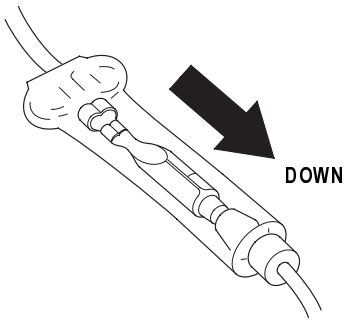
- Check for loose retainer (A) and rubber seals (B).



- The backs of some connectors are packed with grease. Add grease if necessary. If the grease is contaminated, replace it.

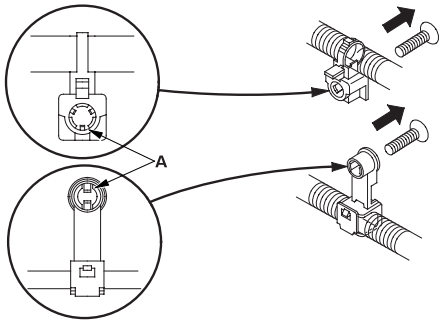


- Insert the connector all the way and make sure it is securely locked.
- Position wires so that the open end of the cover faces down.

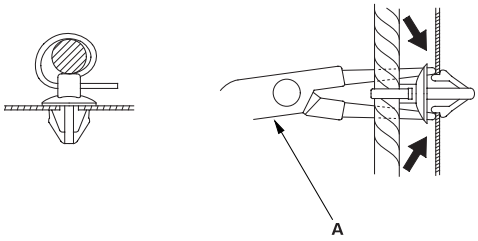


Handling Wires and Harnesses

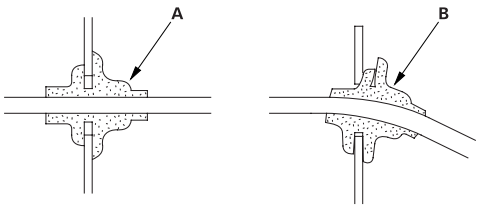
- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks (A).



- Slip pliers (A) under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.

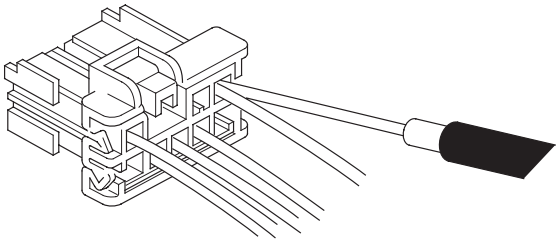


- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.
- Seat grommets in their grooves properly (A). Do not leave grommets distorted (B).

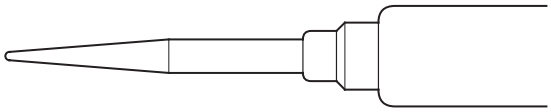


Testing and Repairs

- Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- After installing parts, make sure that no wires are pinched under them.
- When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- If possible, insert the probe of the tester from the wire side (except waterproof connector).



- Use a probe with a tapered tip.



- Refer to the instructions in the Honda Terminal Kit for identification and replacement of connector terminals.

(cont'd)

5-step Troubleshooting

1. Verify The Complaint

Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. Analyze The Schematic

Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause.

Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.

3. Isolate The Problem By Testing The Circuit

Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

4. Fix The Problem

Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

5. Make Sure The Circuit Works

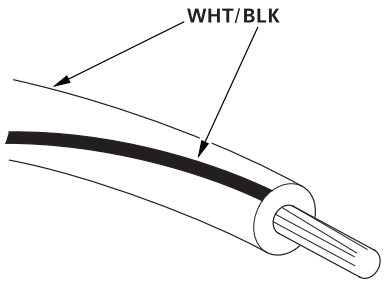
Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on the fuse. Make sure no new problems turn up and the original problem does not recur.

Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics:

WHT	White
YEL	Yellow
BLK	Black
BLU	Blue
GRN	Green
RED	Red
ORN	Orange
PNK	Pink
BRN	Brown
GRY	Gray
PUR	Purple
LT BLU	Light Blue
LT GRN	Light Green

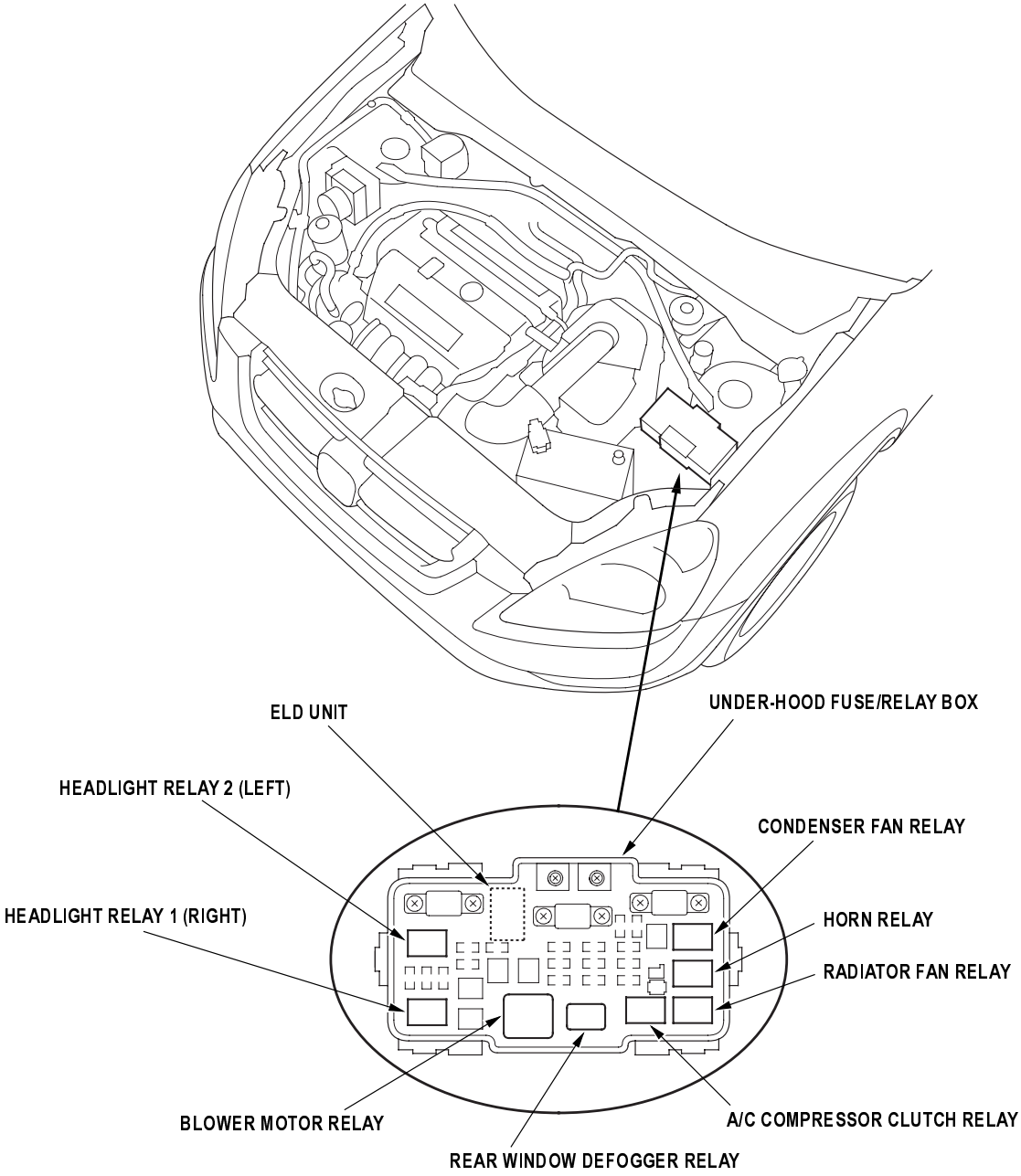
The wire insulation has one color or one color with another color stripe. The second color is the stripe.



Relay and Control Unit Locations

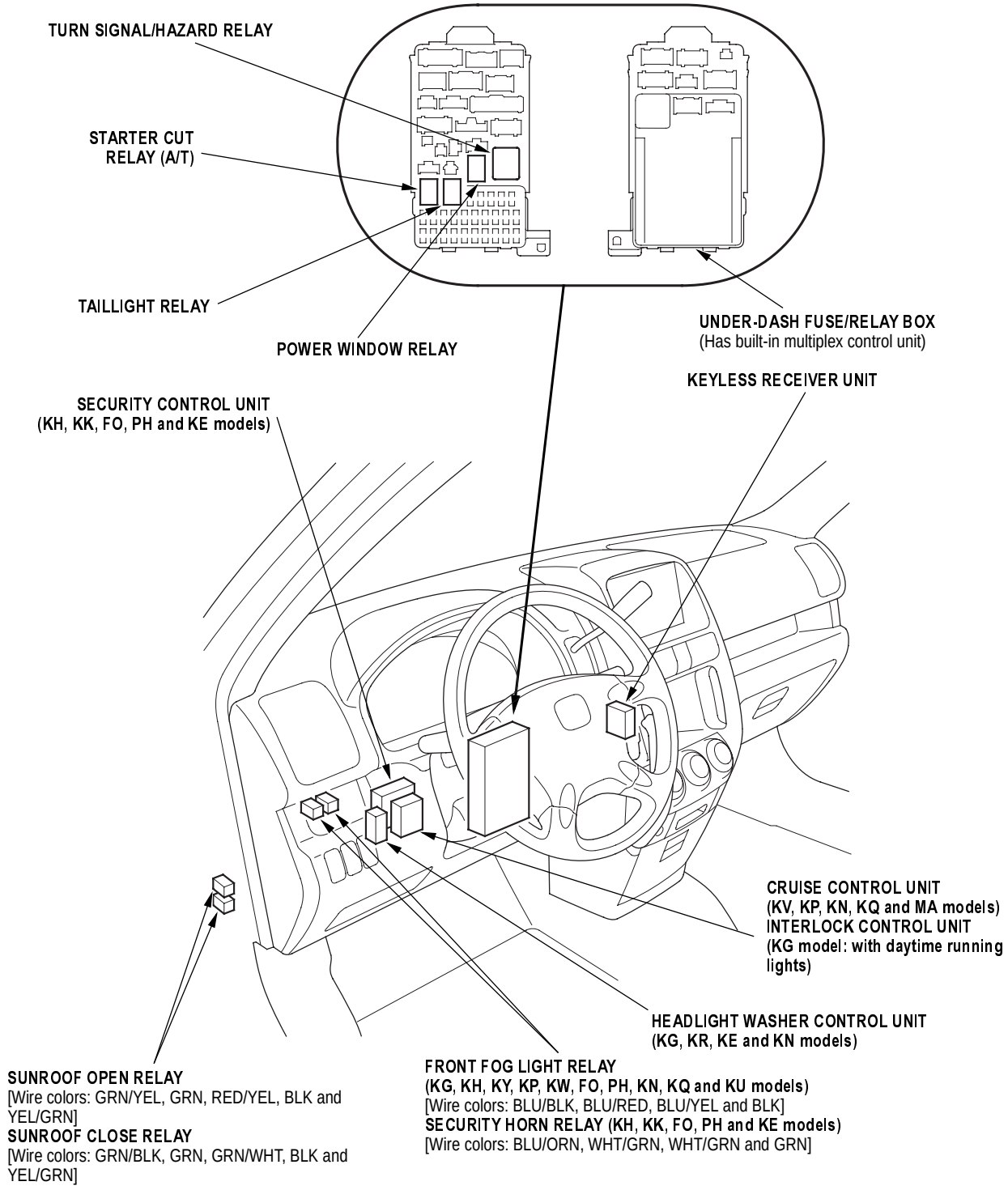
Engine Compartment

Note: LHD type is shown, RHD type is similar.

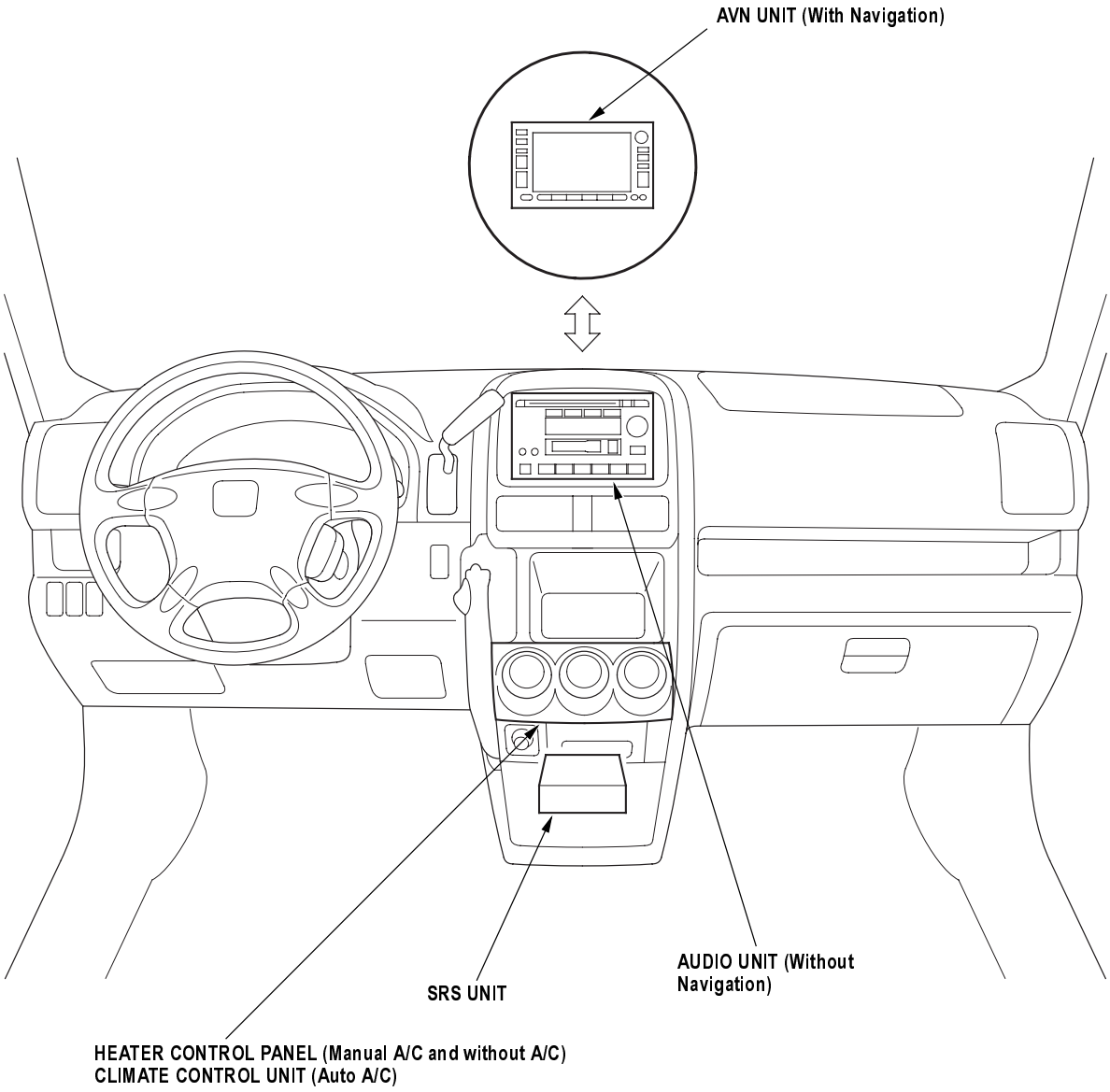


Dashboard

Note: LHD type is shown, RHD type is similar.



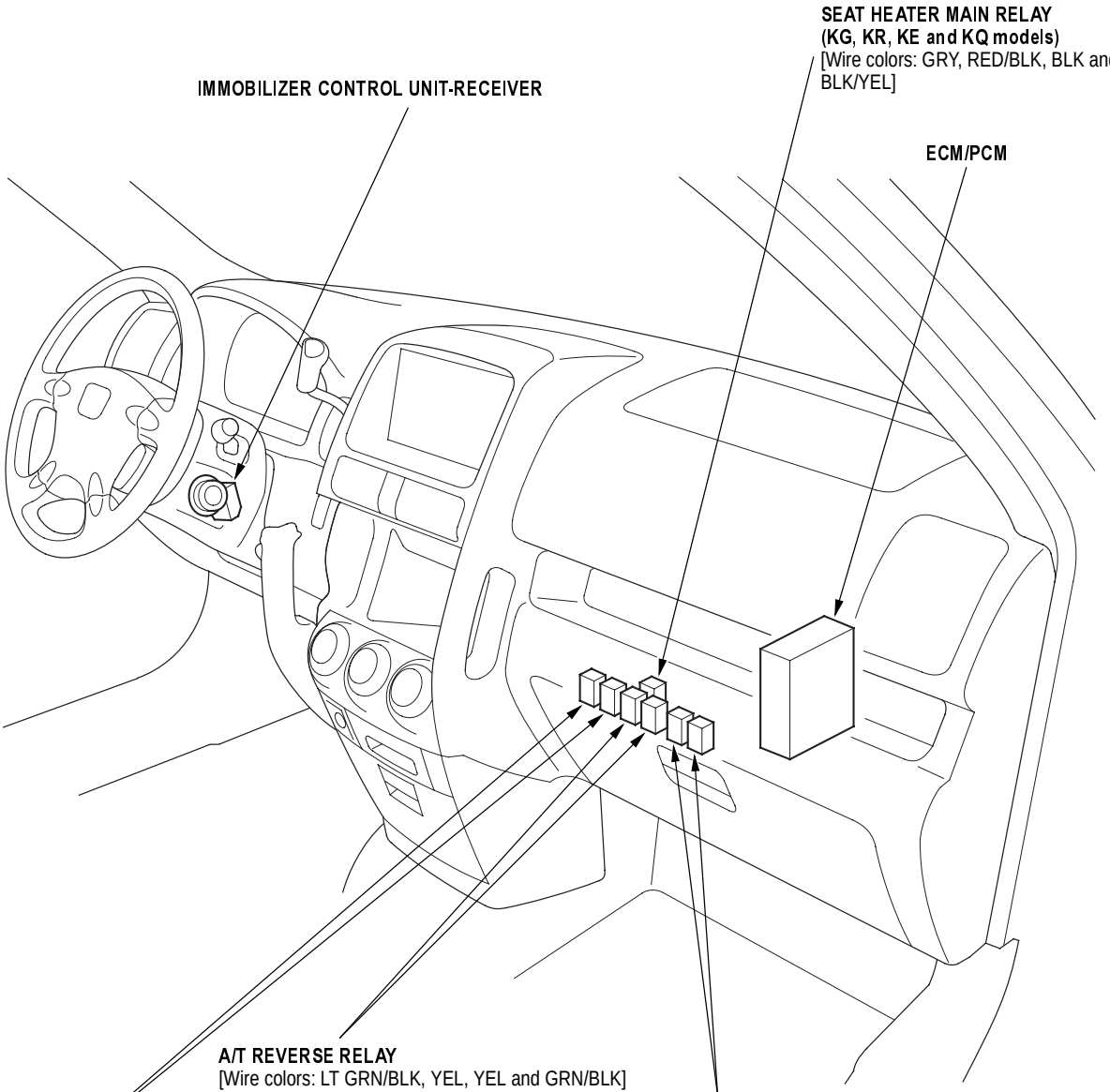
Note: LHD type is shown, RHD type is similar.



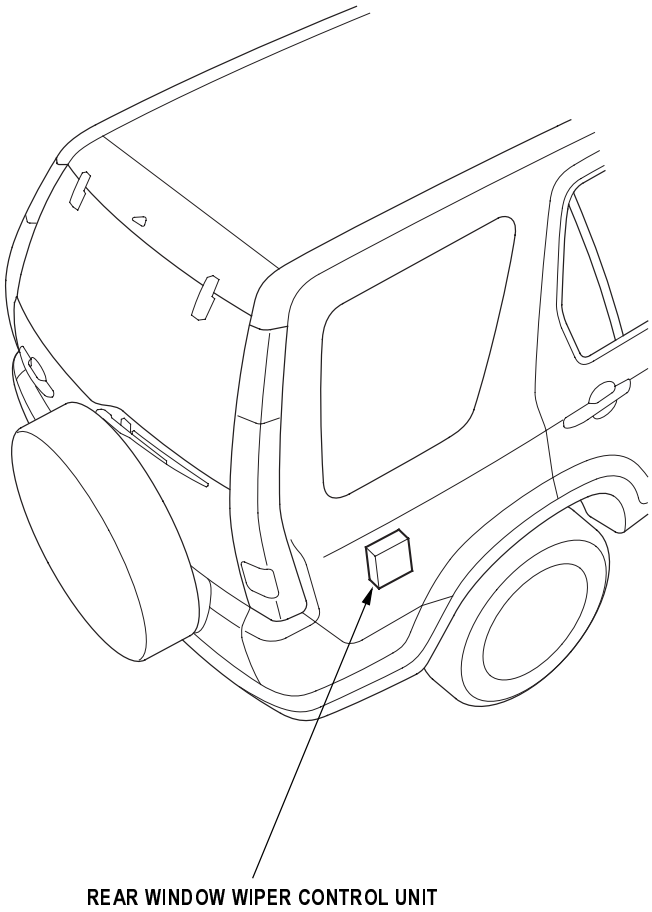
(cont'd)

Dashboard (cont'd)

Note: LHD type is shown, RHD type is similar.

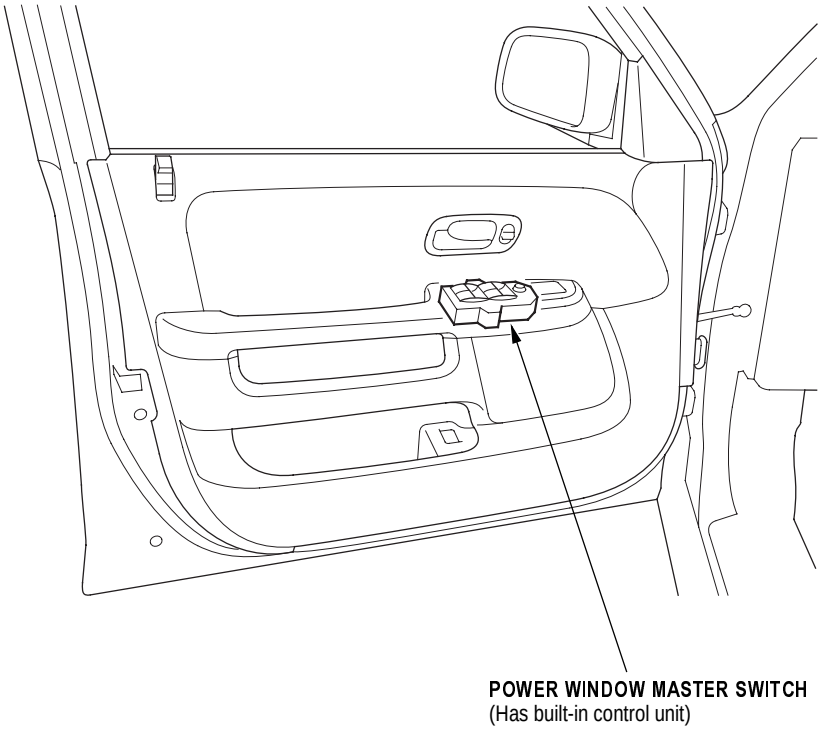


Rear



Door

Note: LHD type is shown, RHD type is similar.



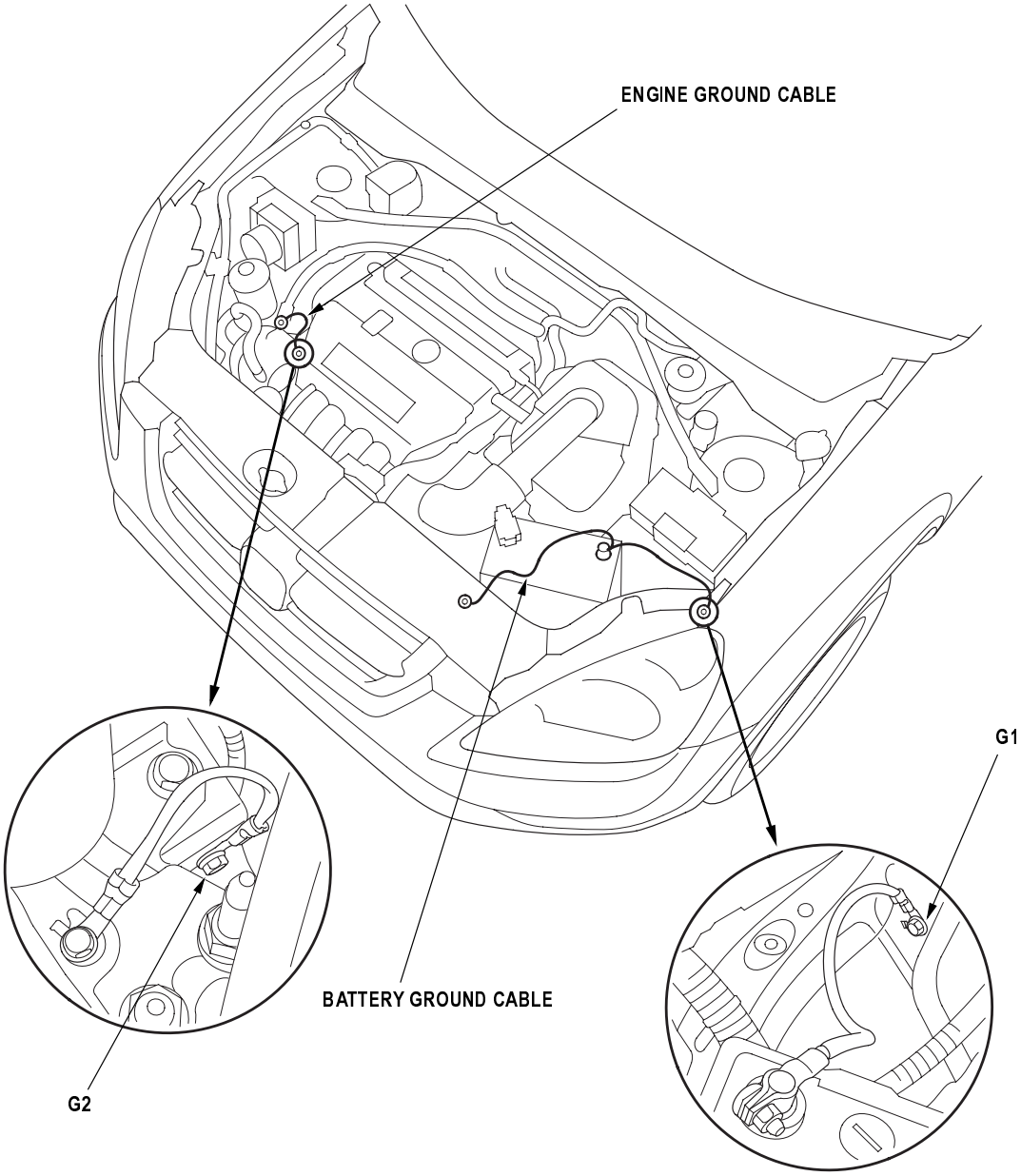
Seat



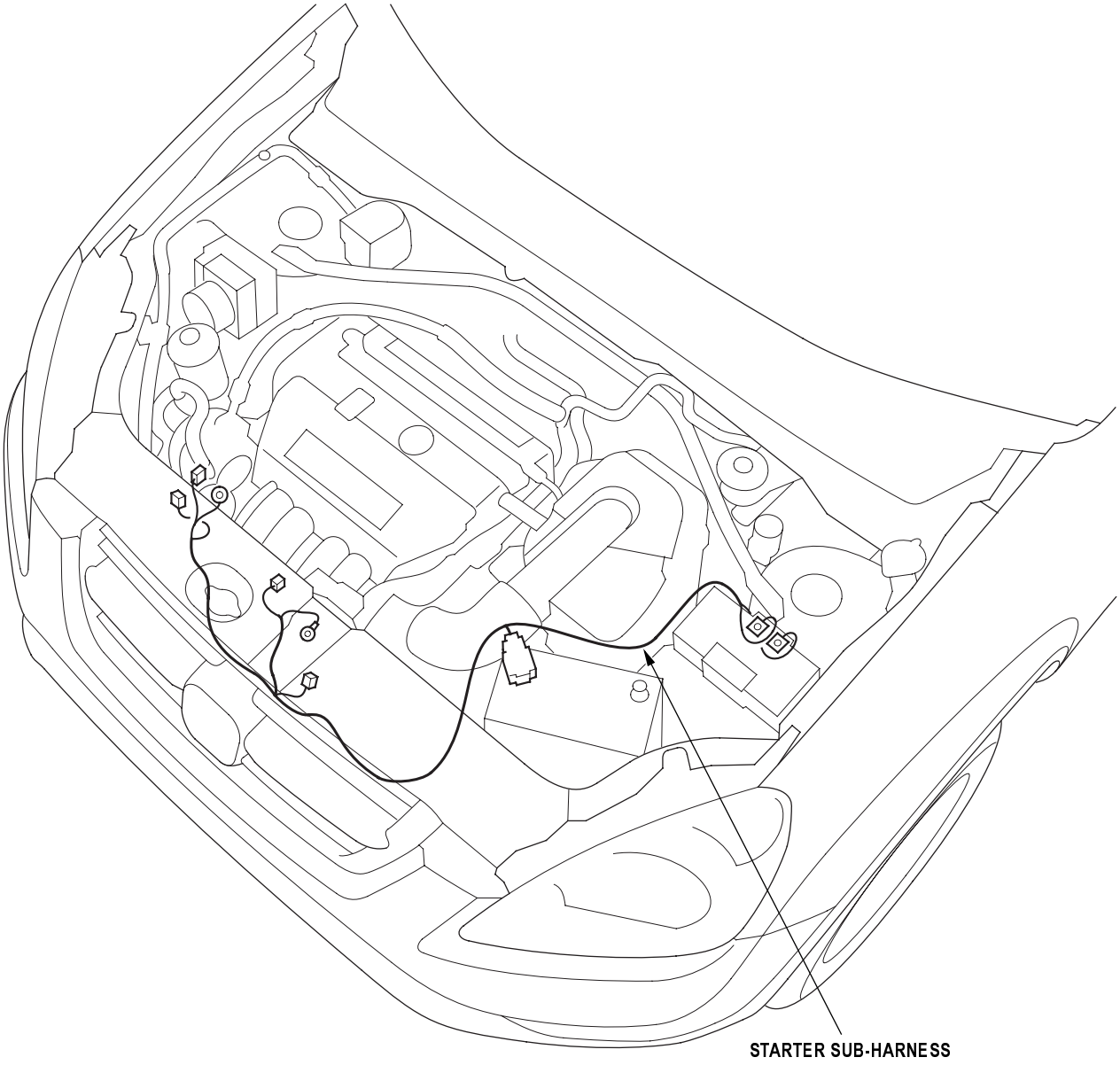
Wire Harness and Ground Locations

Engine Compartment

Note: LHD type is shown, RHD type is similar.



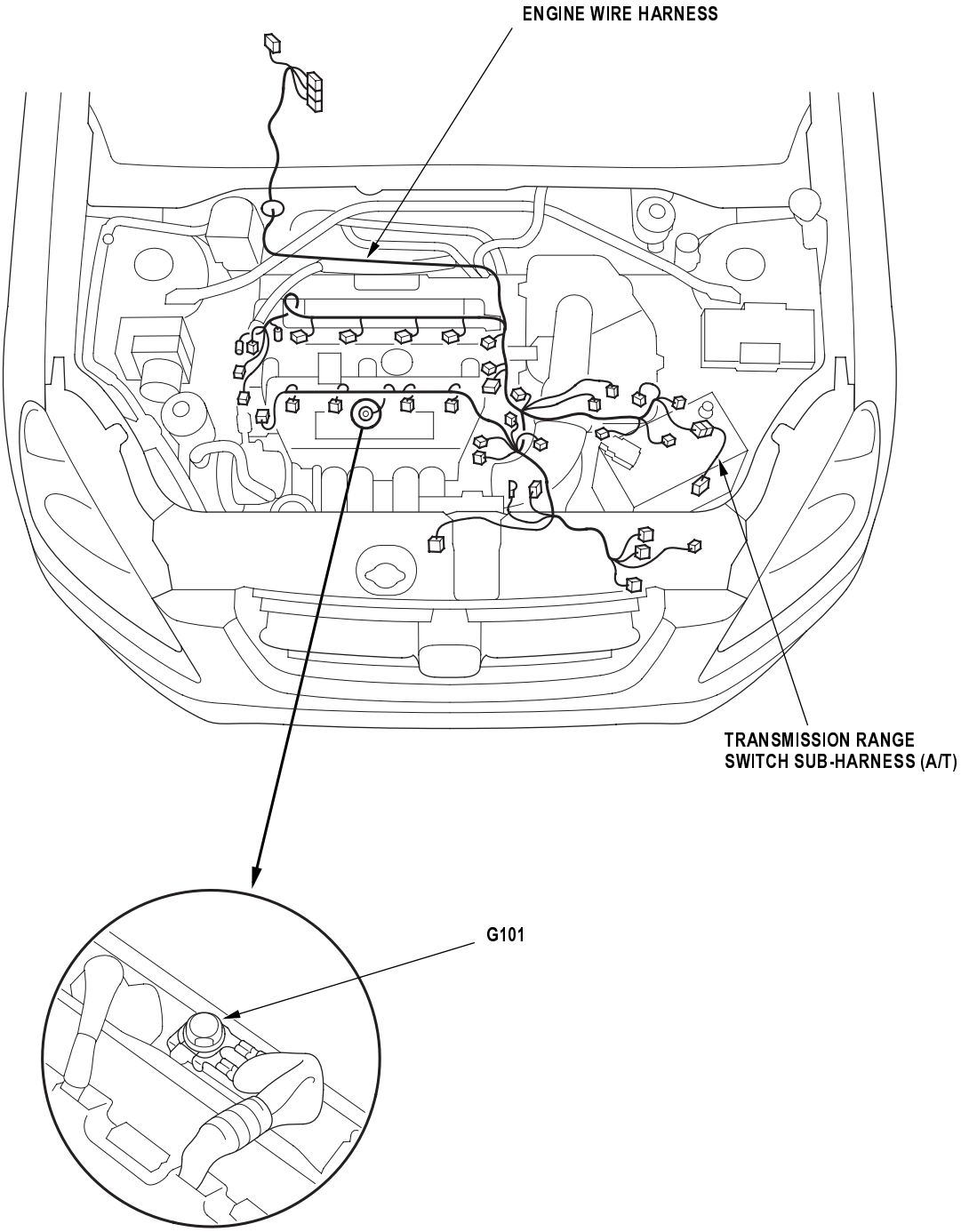
Note: LHD type is shown, RHD type is similar.



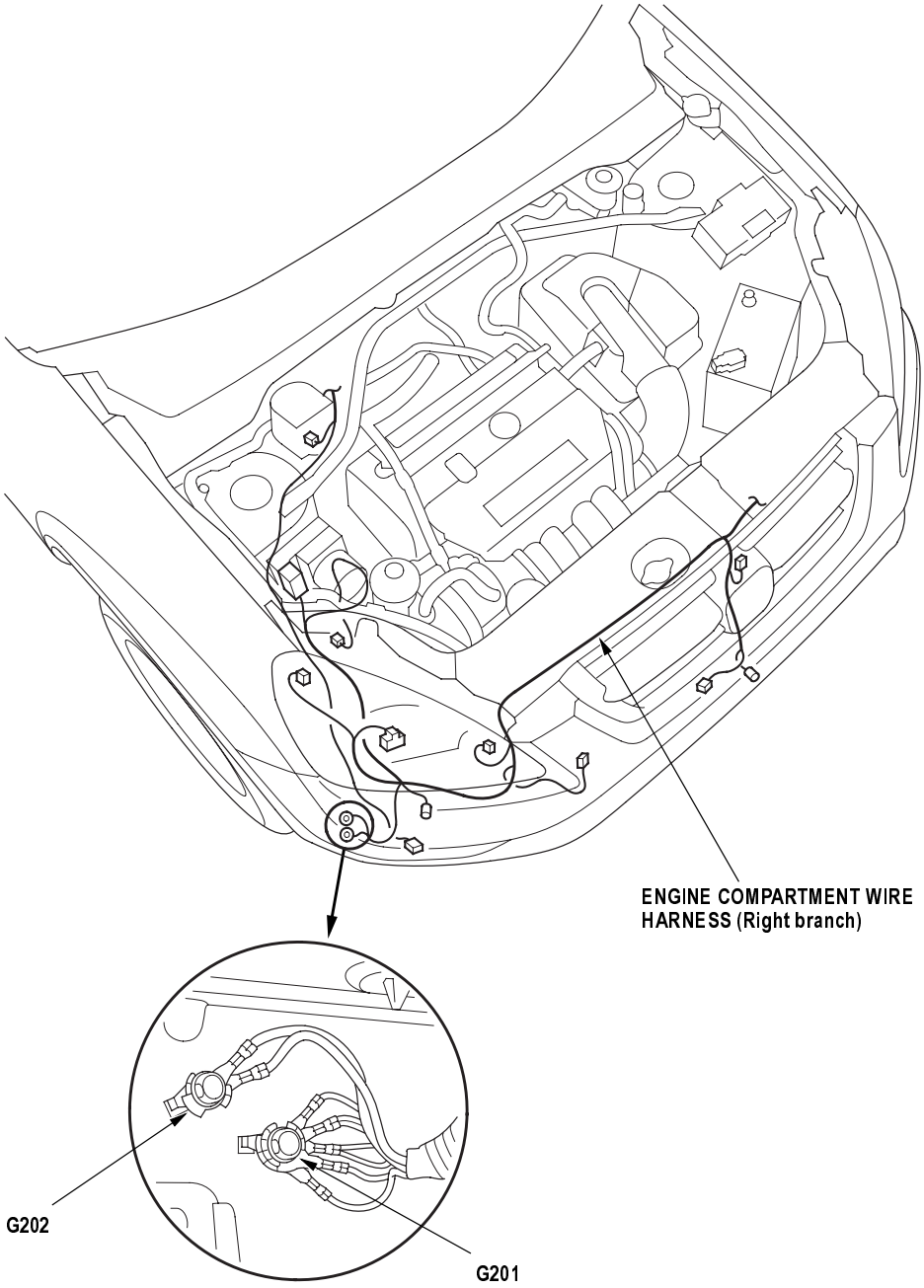
(cont'd)

Engine Compartment (cont'd)

Note: LHD type is shown, RHD type is similar.



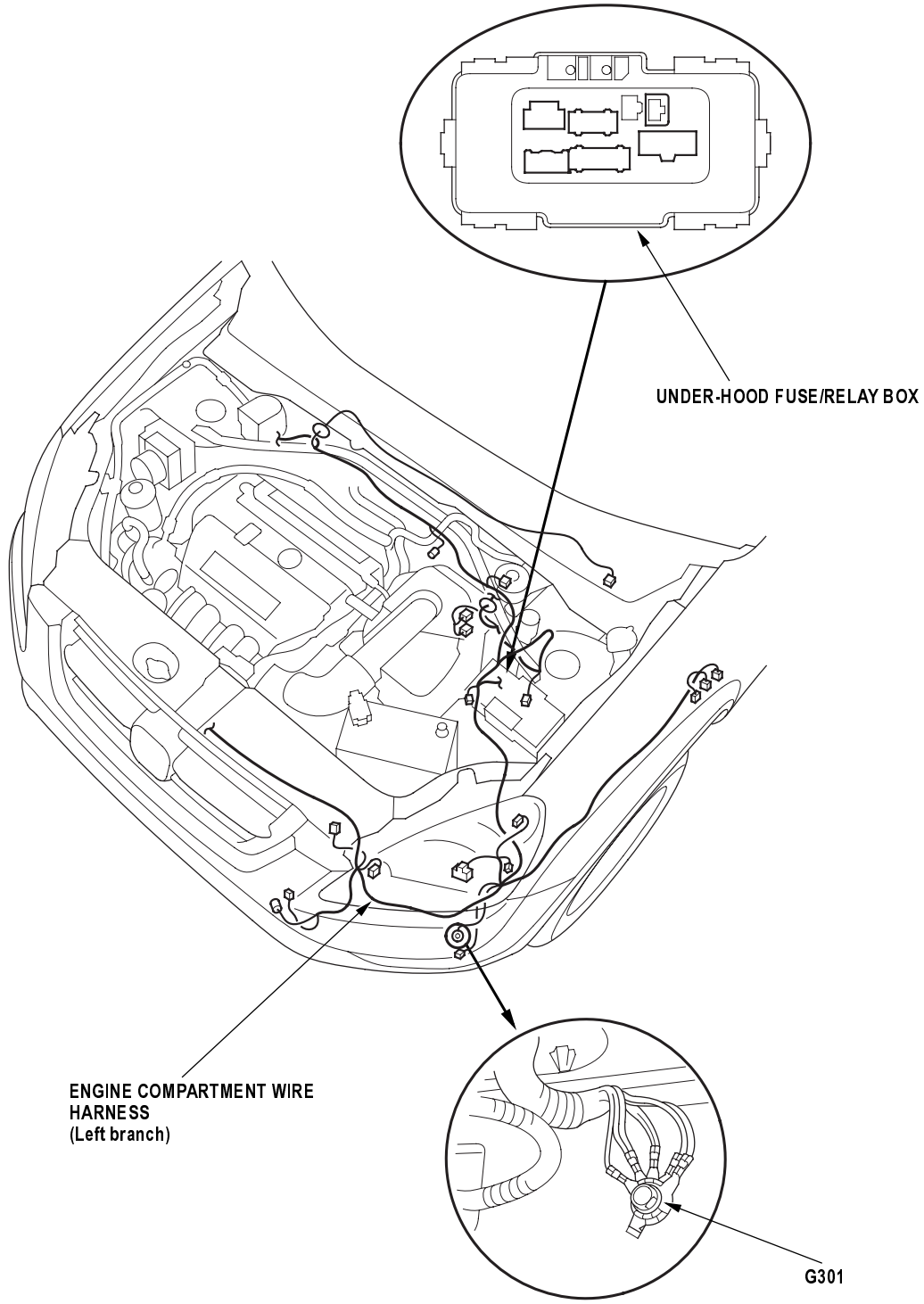
Note: LHD type is shown, RHD type is similar.



(cont'd)

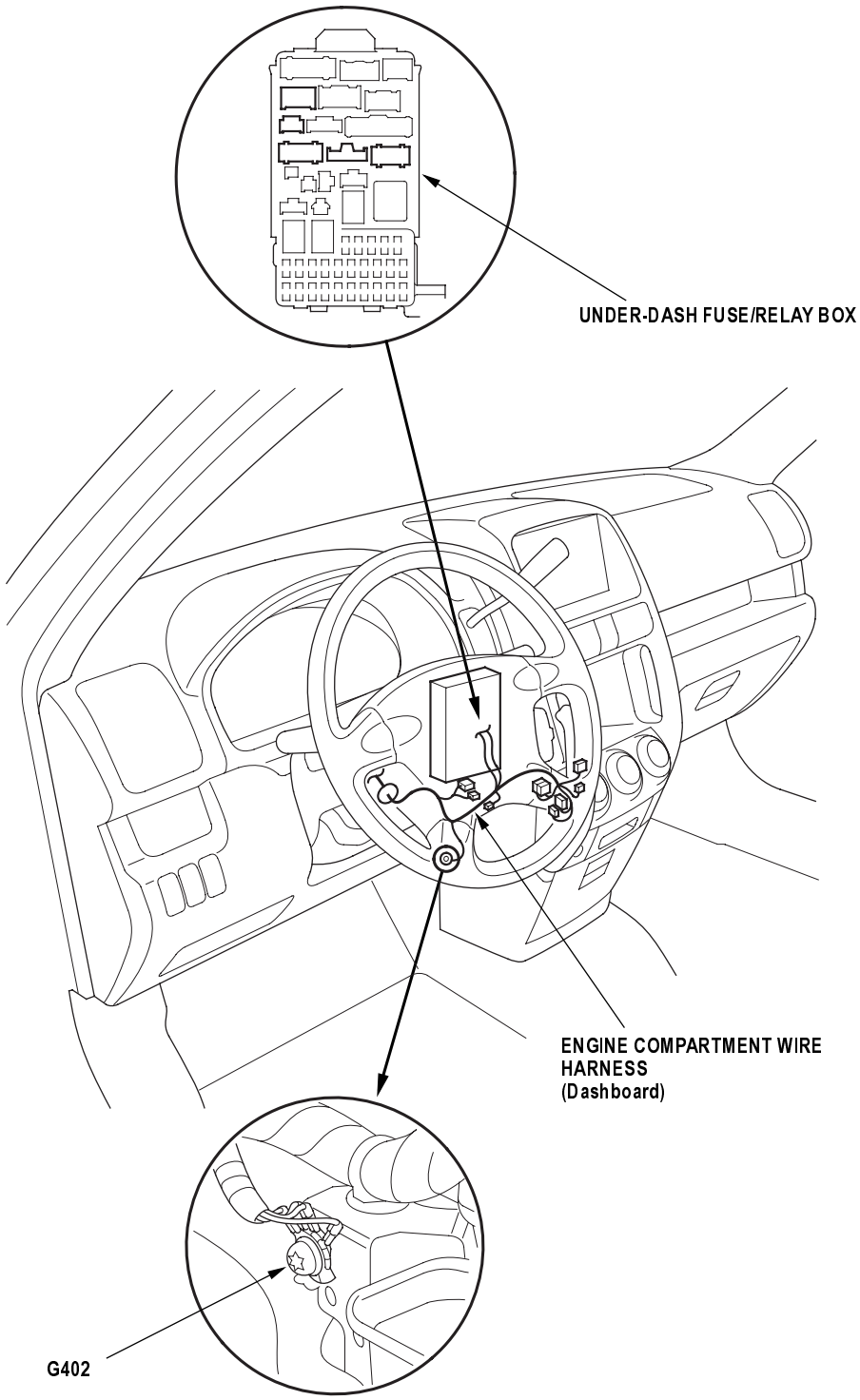
Engine Compartment (cont'd)

Note: LHD type is shown, RHD type is similar.



Dashoard

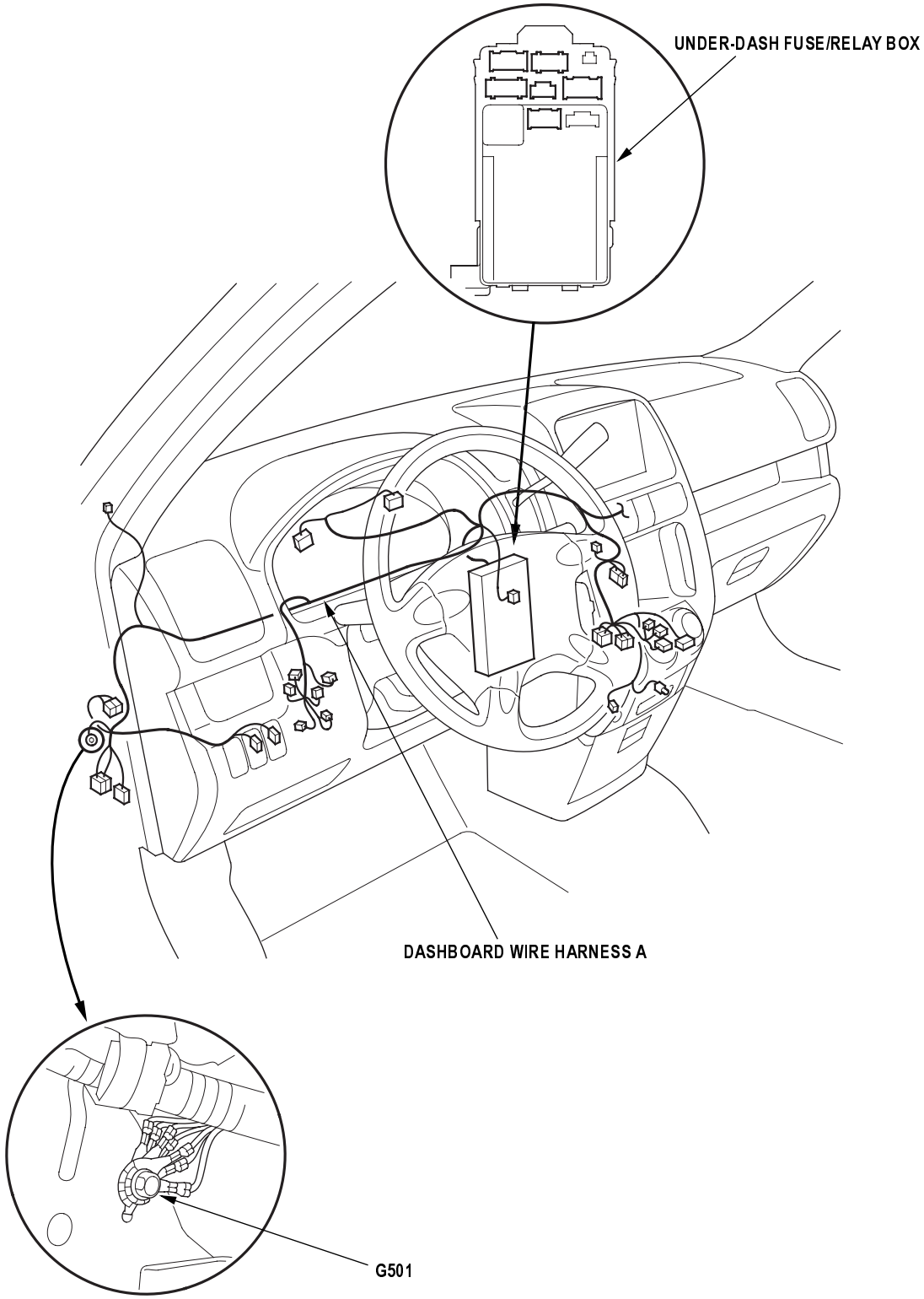
Note: LHD type is shown, RHD type is similar.



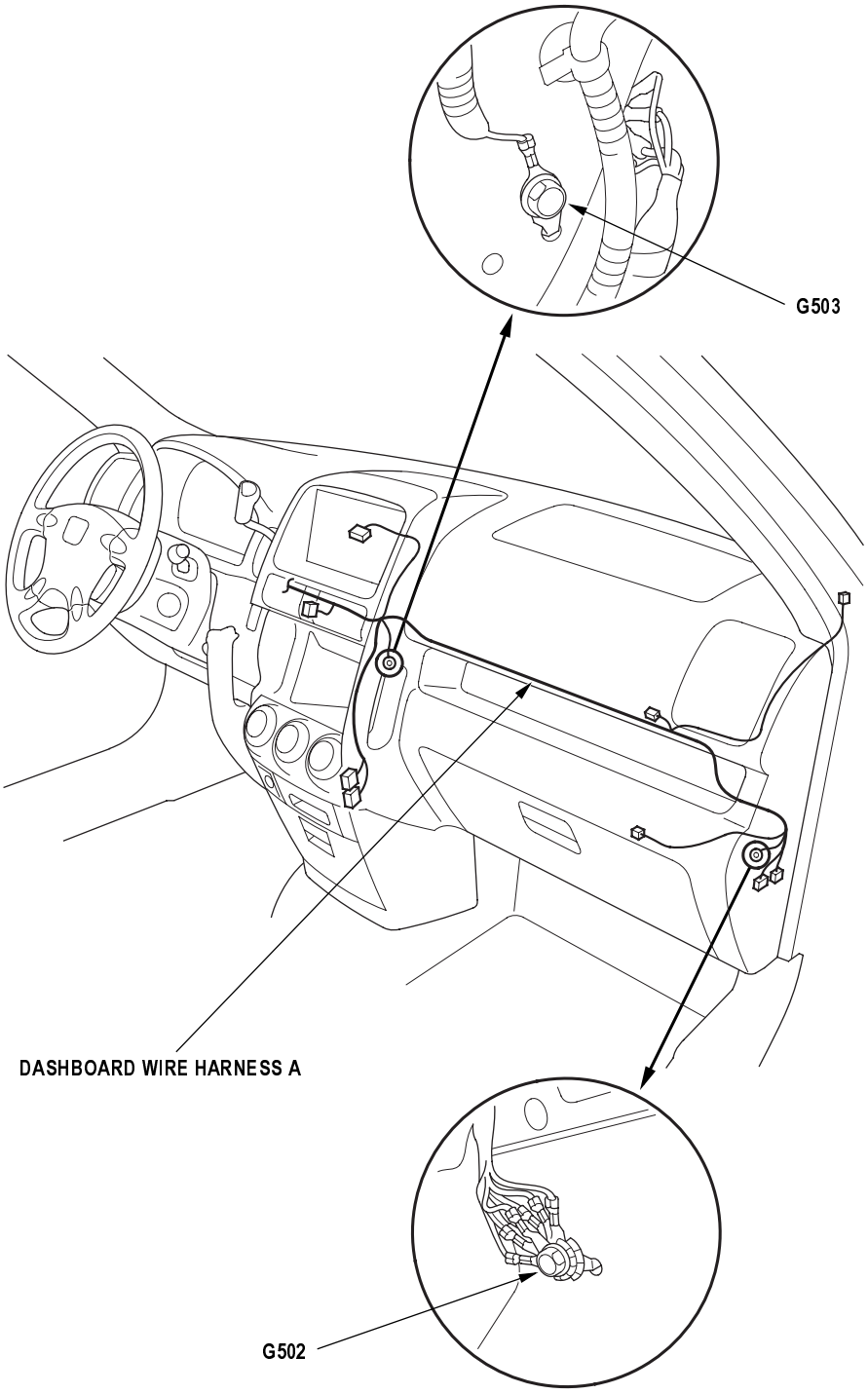
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Dashboard (cont'd)

Note: LHD type is shown, RHD type is similar.



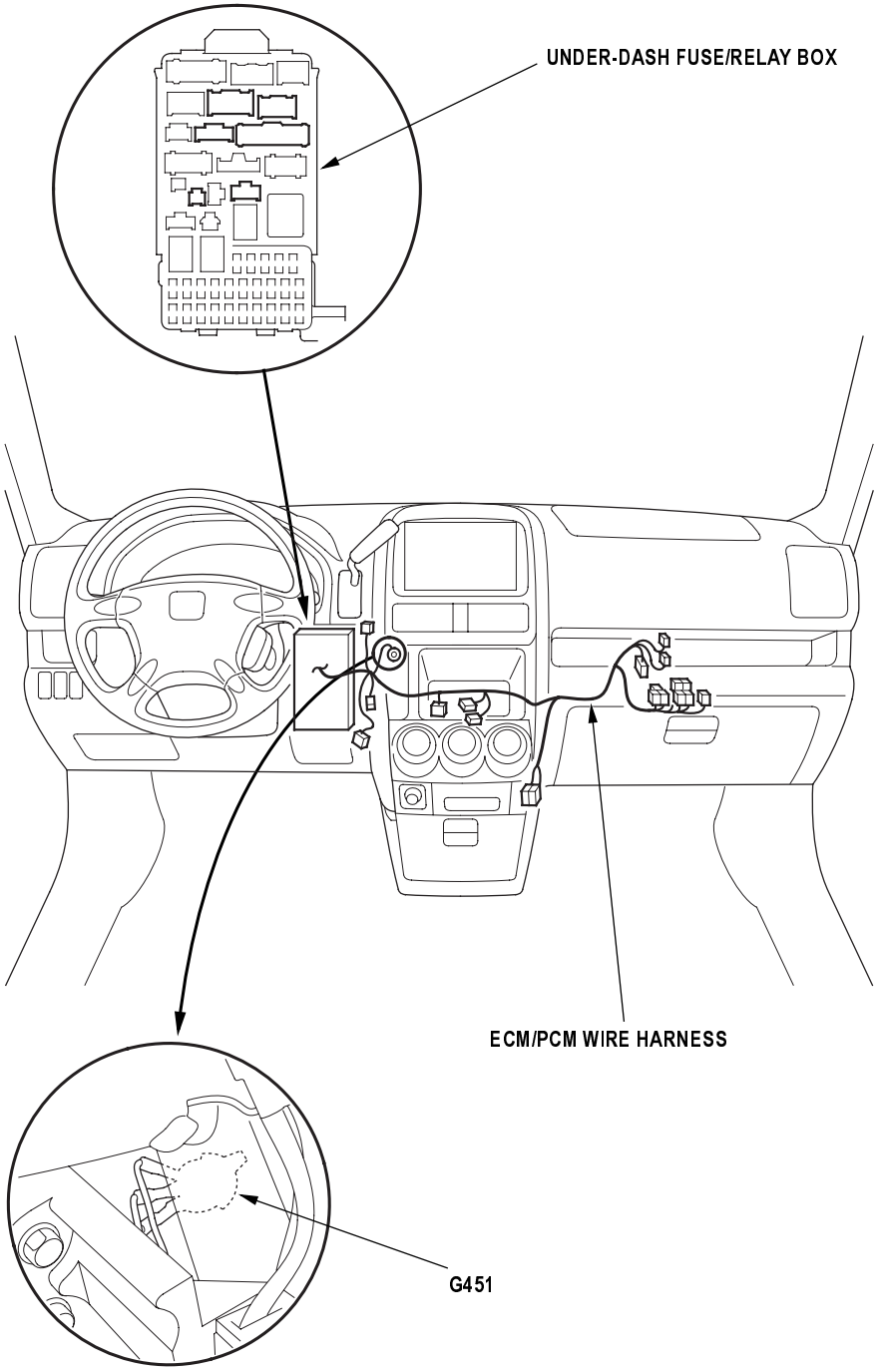
Note: LHD type is shown, RHD type is similar.



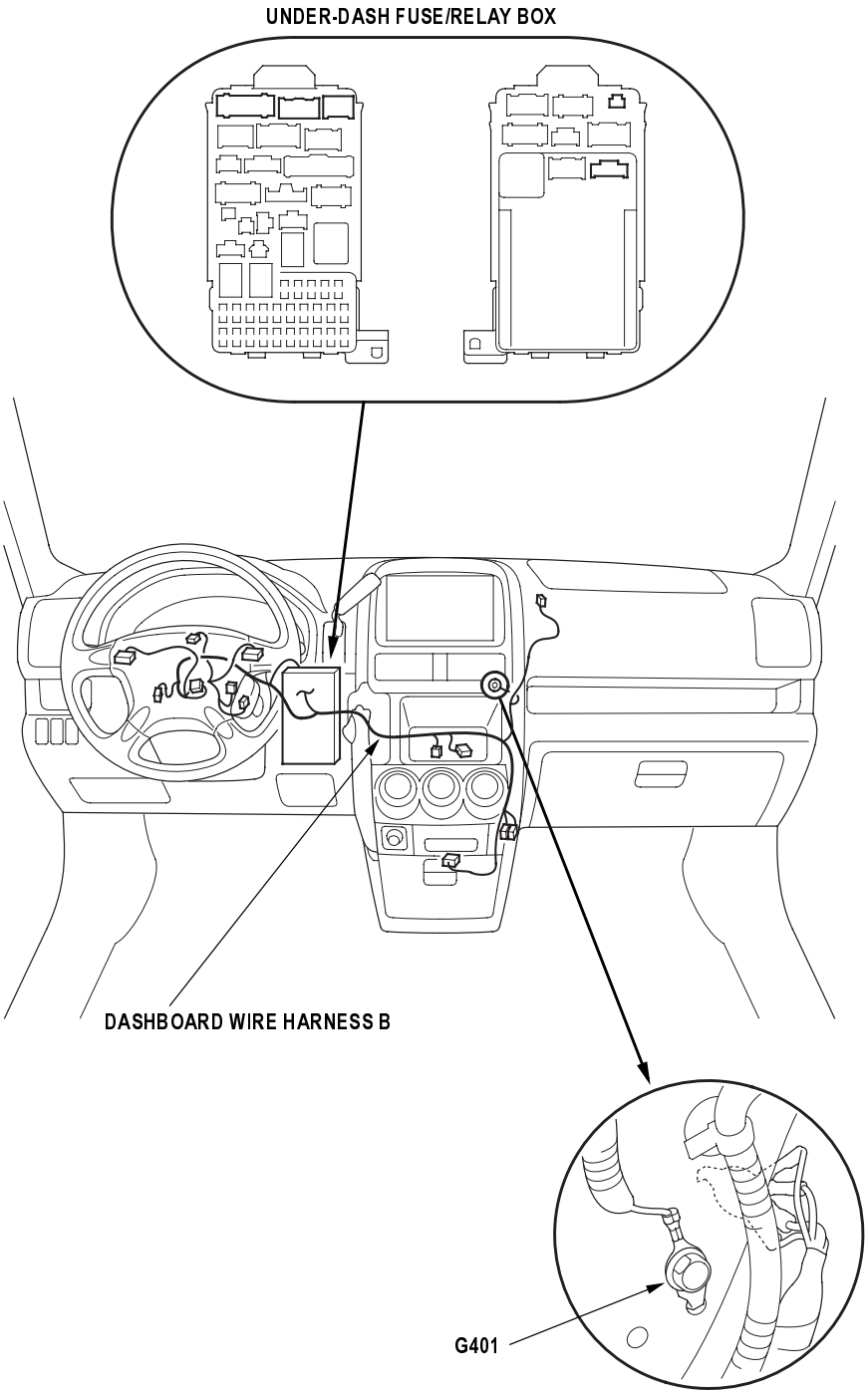
(cont'd)

Dashboard (cont'd)

Note: LHD type is shown, RHD type is similar.

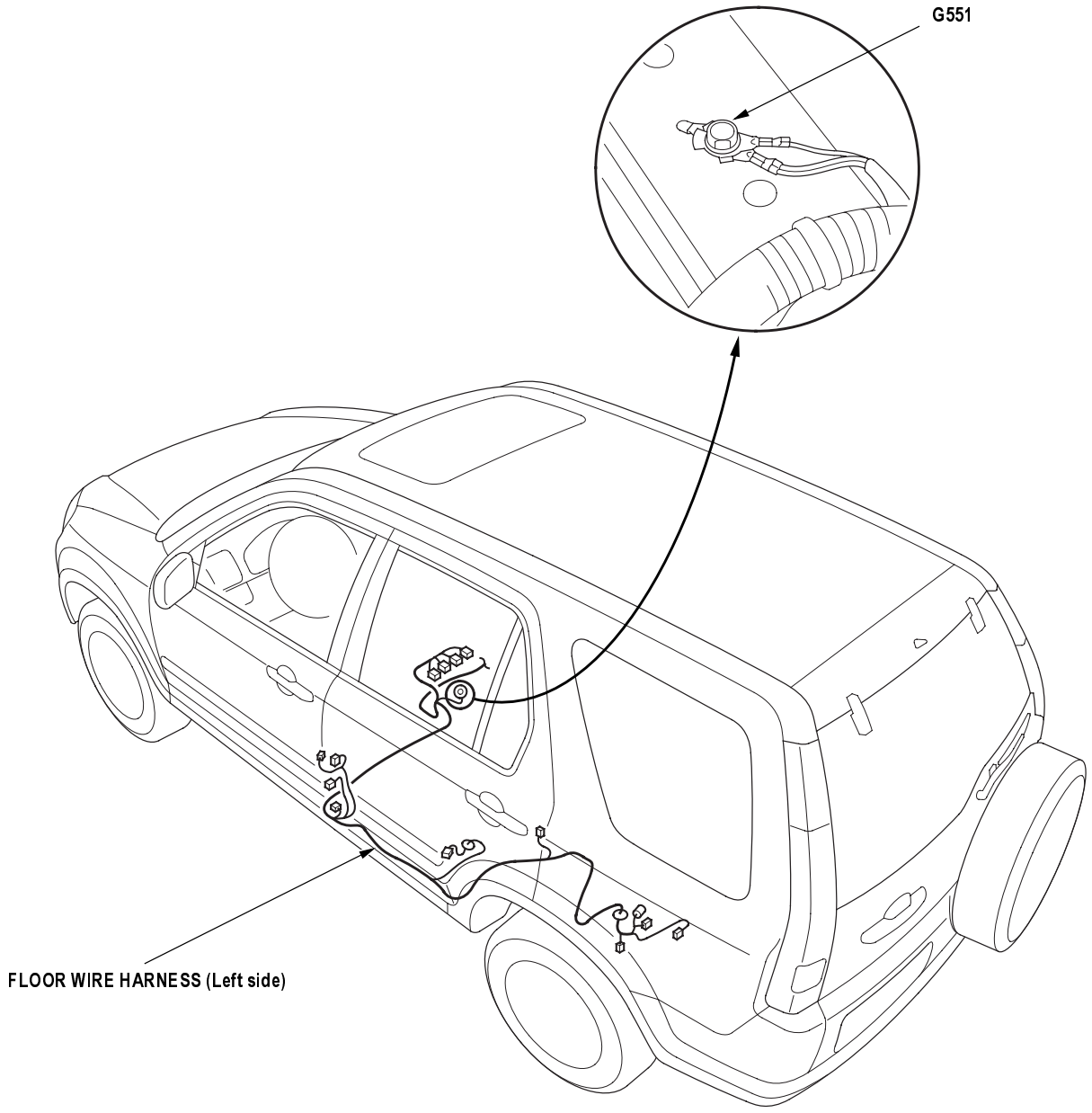


Note: LHD type is shown, RHD type is similar.

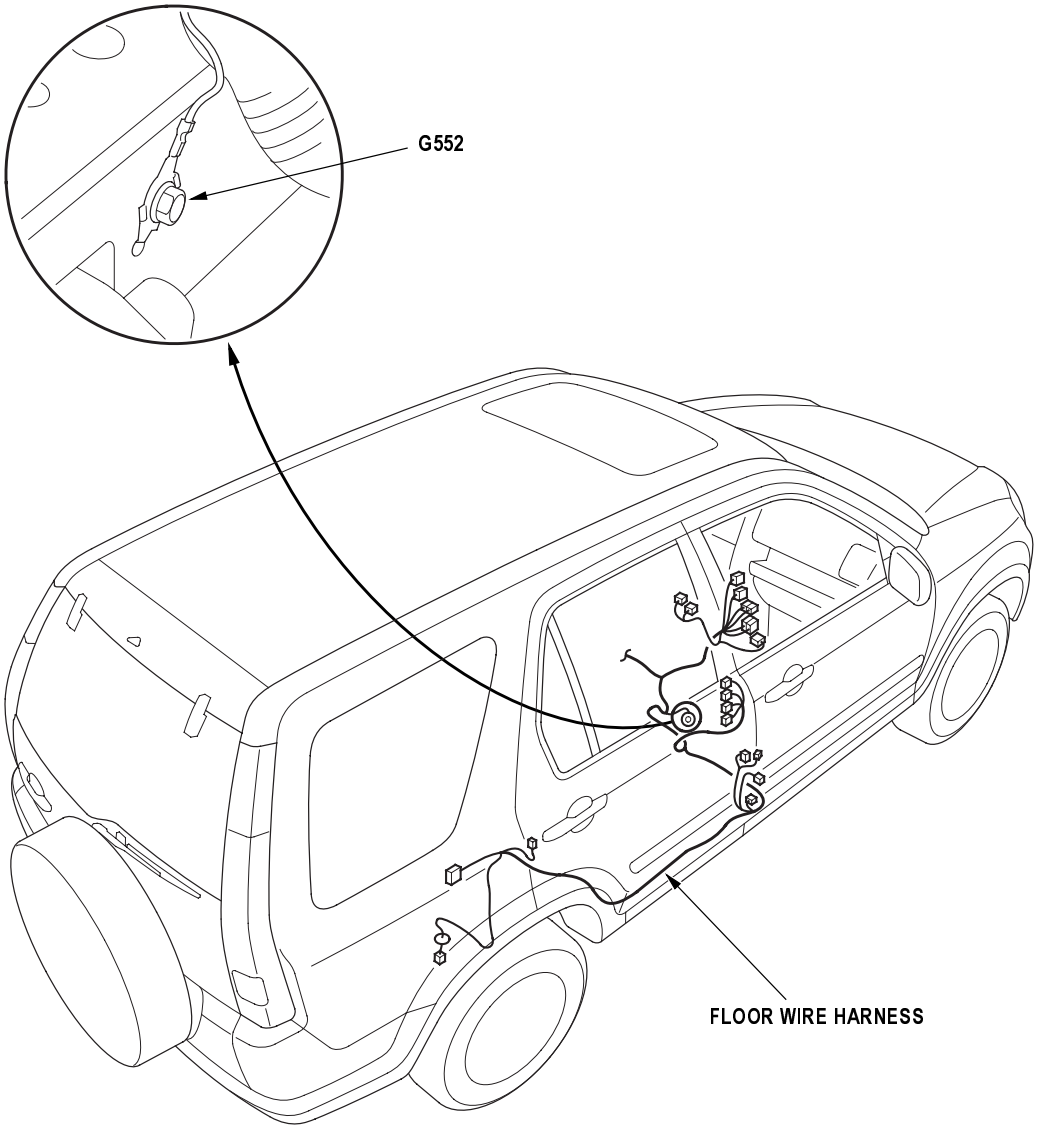


Floor

Note: LHD type is shown, RHD type is similar.

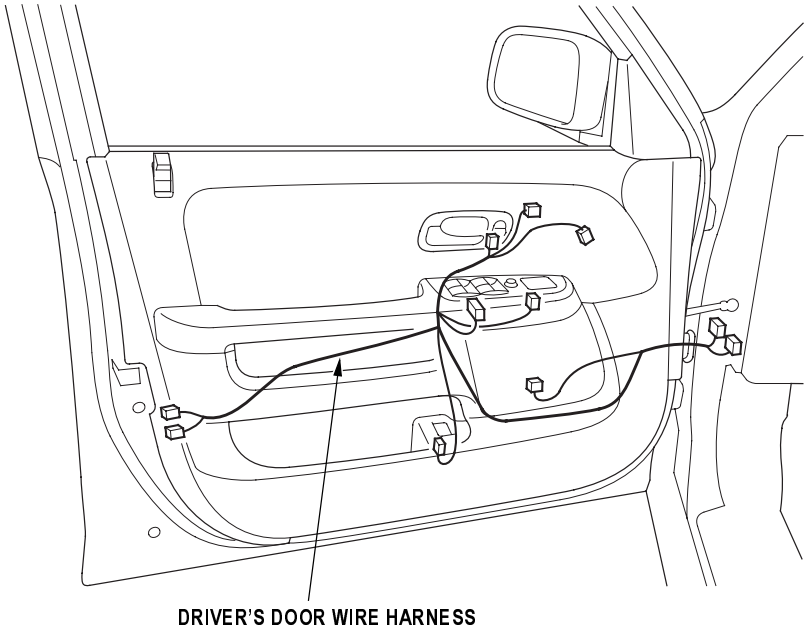


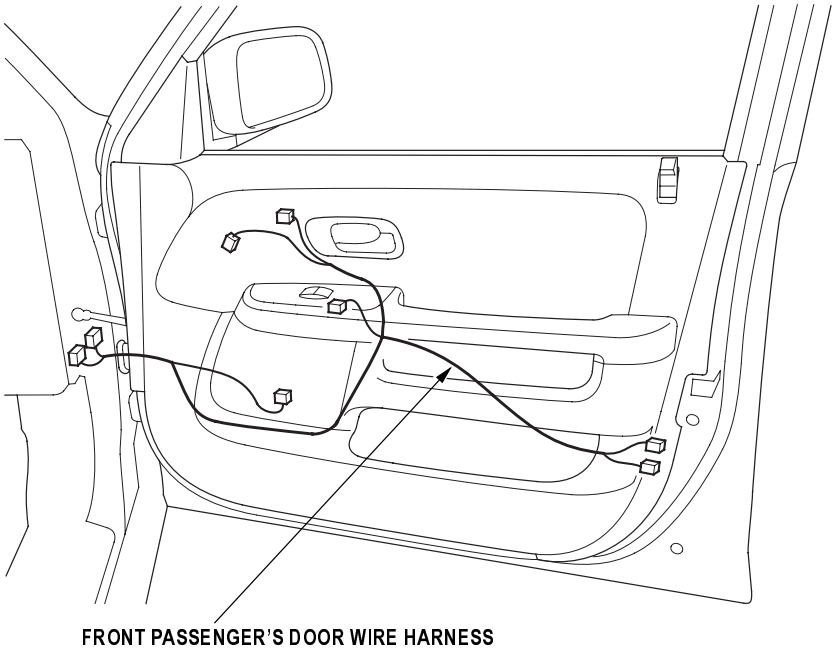
Note: LHD type is shown, RHD type is similar.



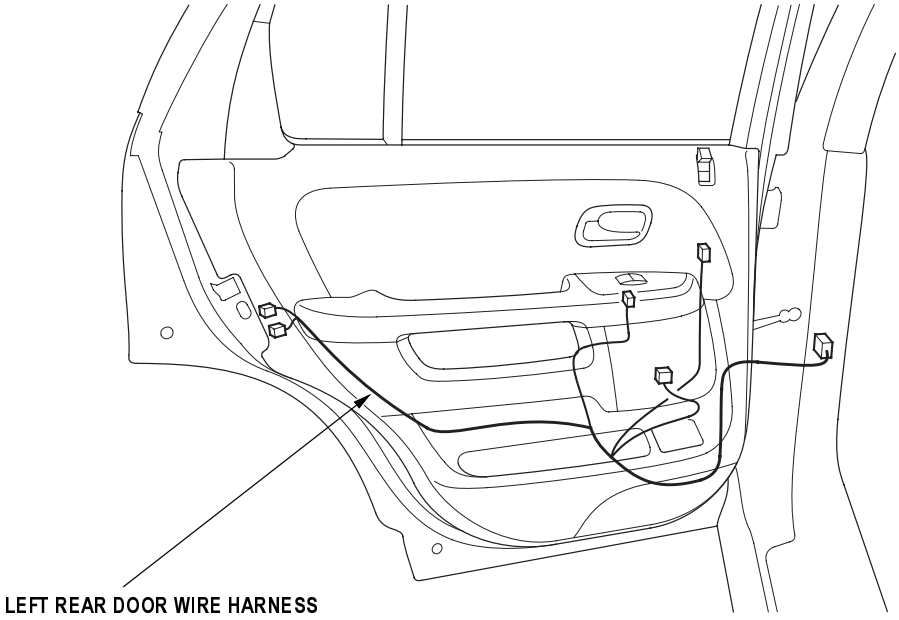
Door

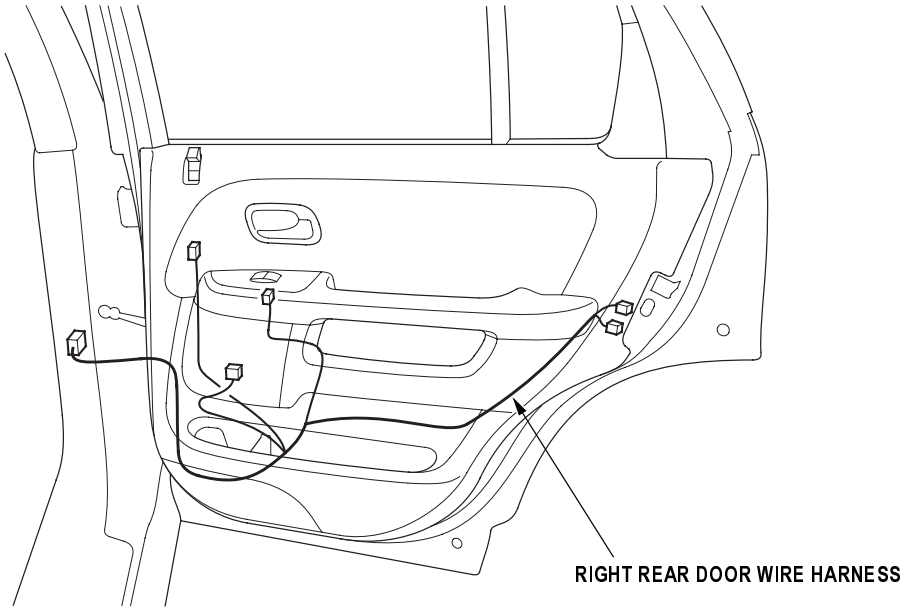
Note: LHD type is shown, RHD type is symmetrical.





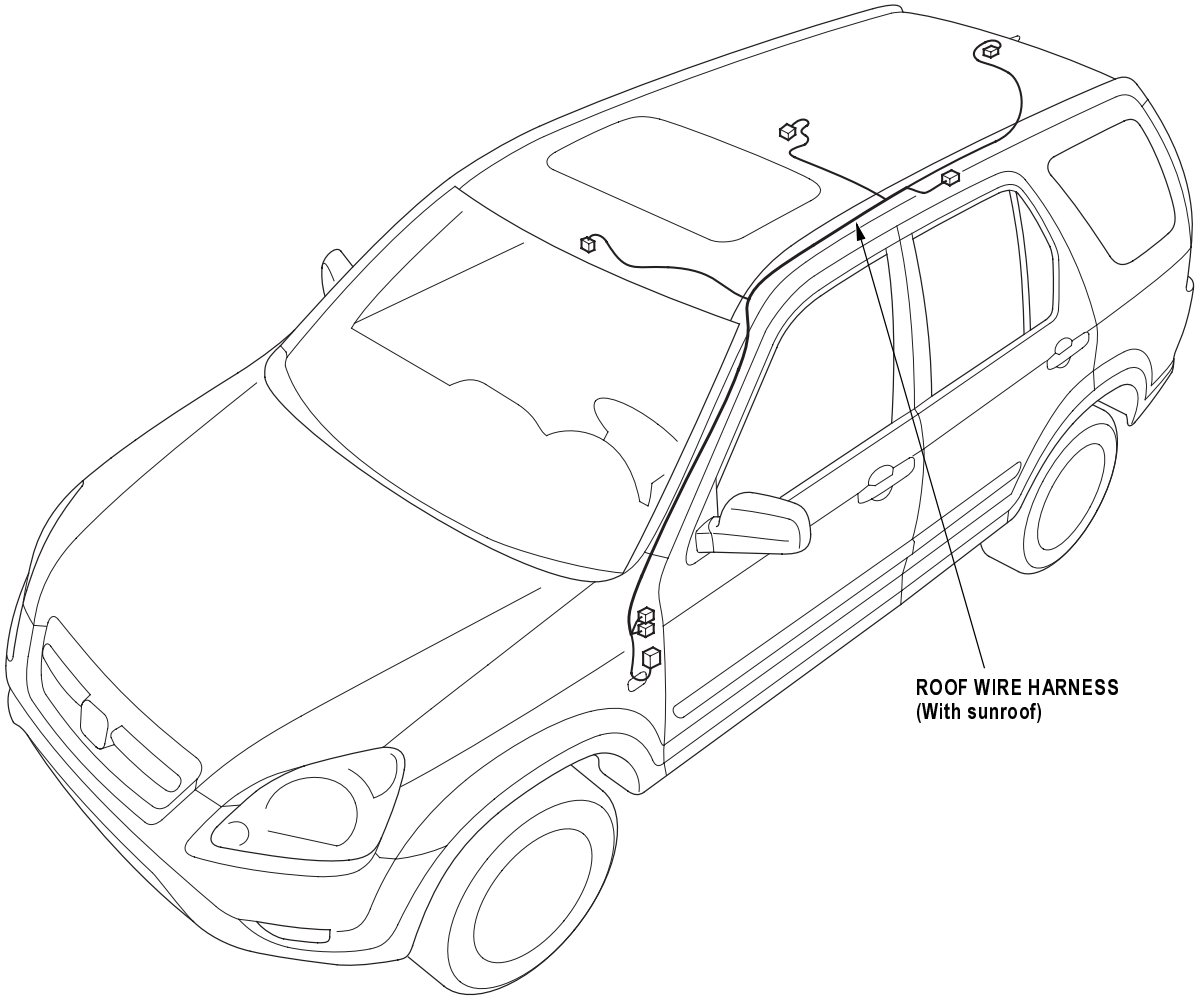
Note: LHD type is shown, RHD type is similar.

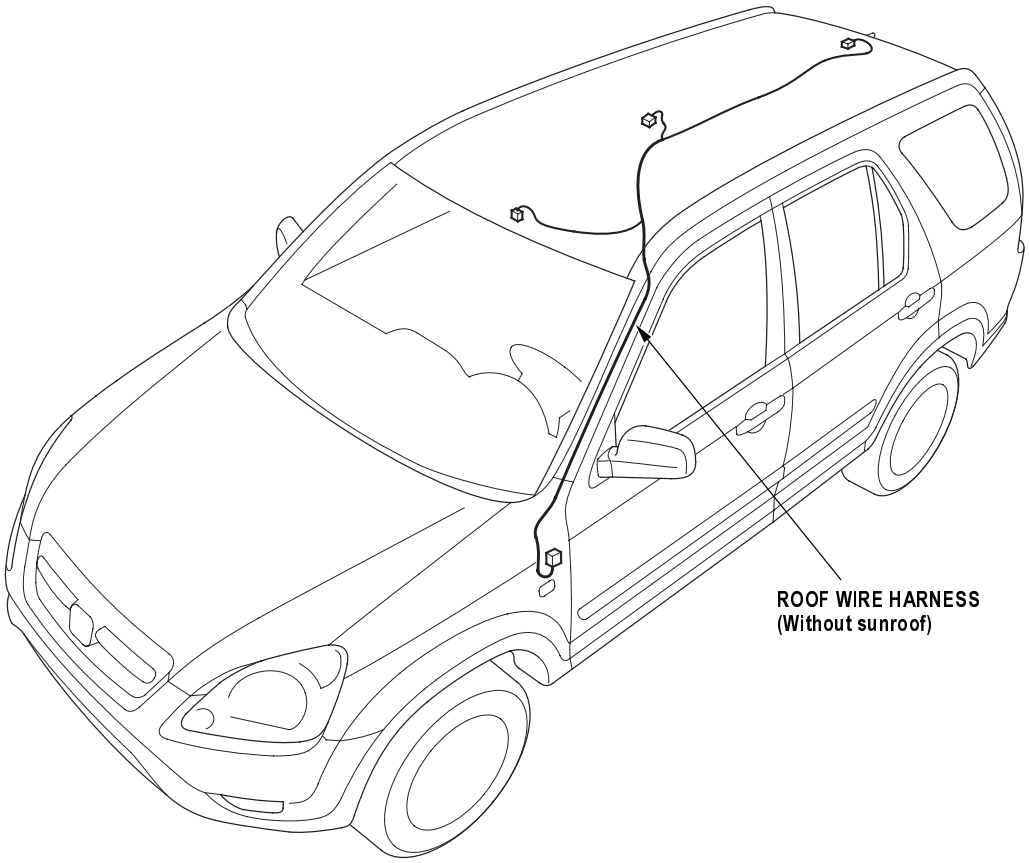




Roof

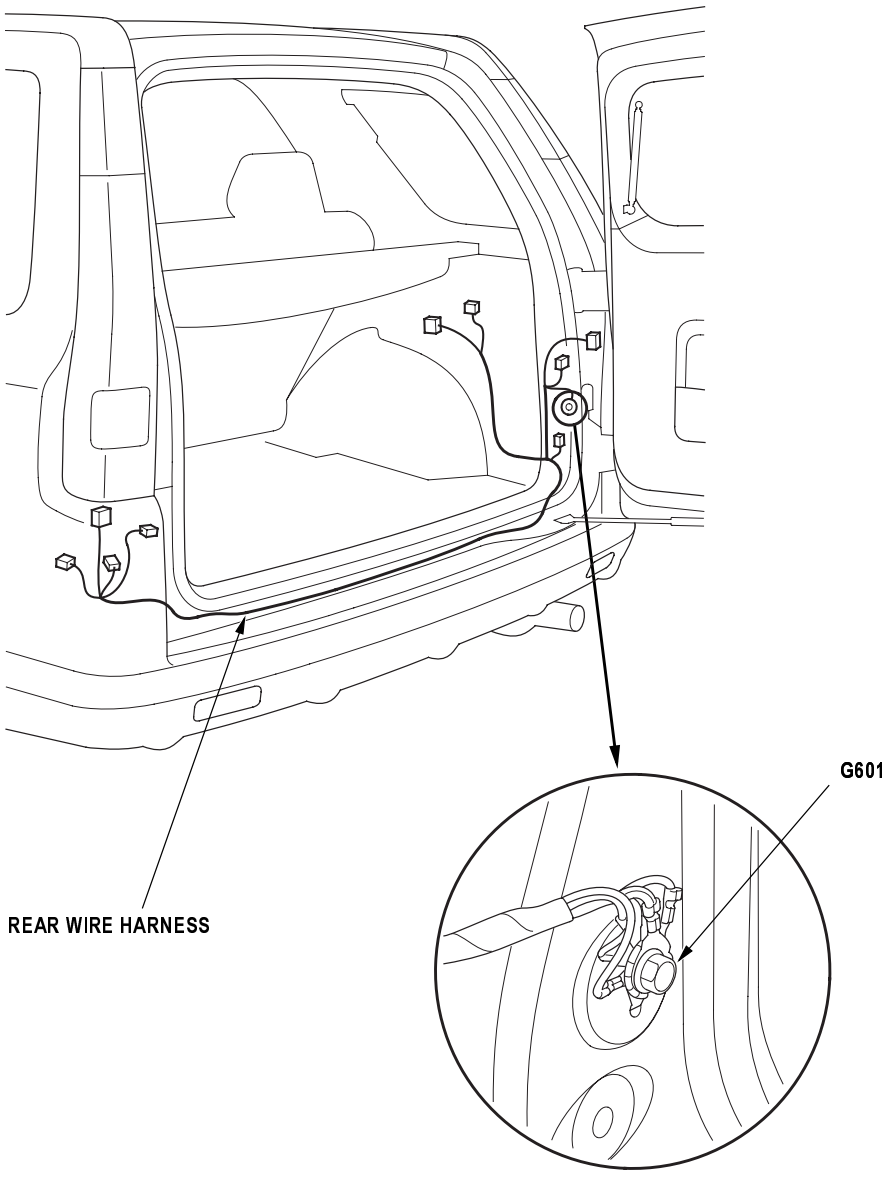
Note: LHD type is shown, RHD type is similar.



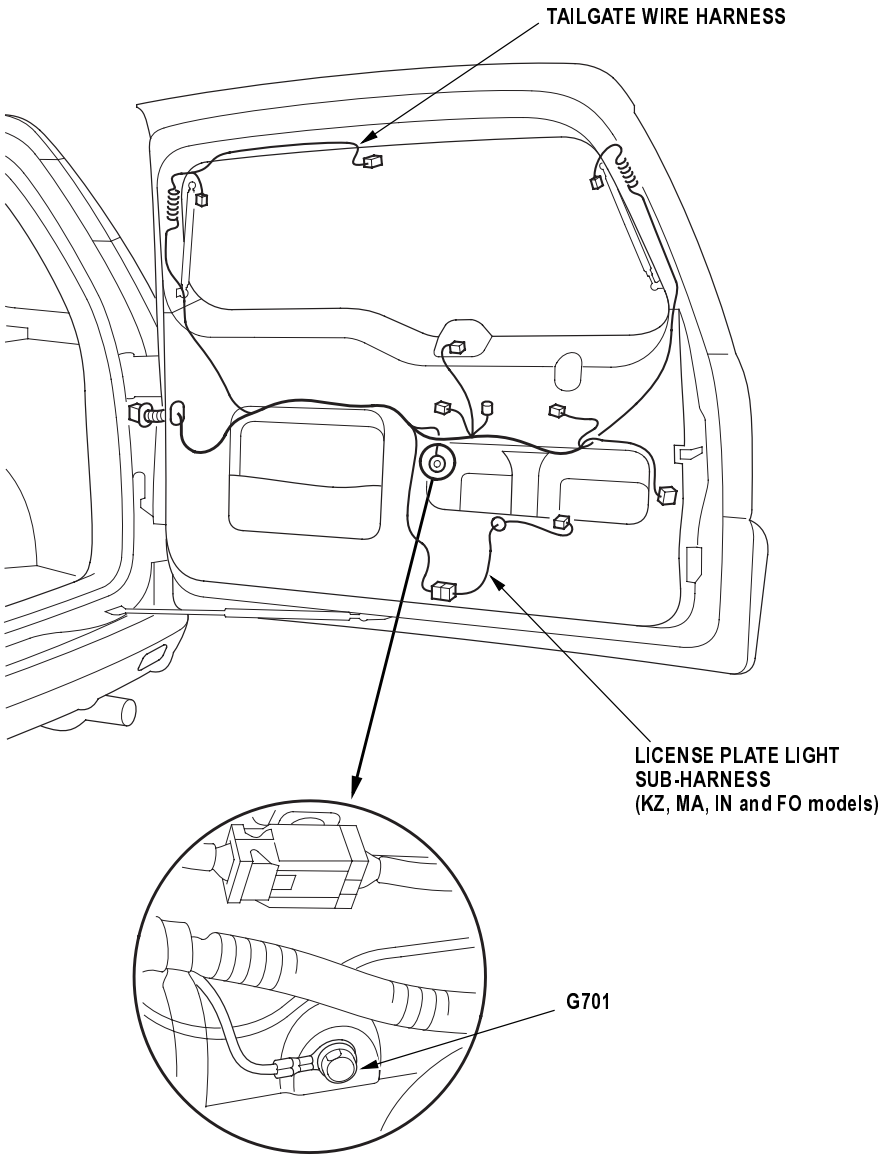

ROOF WIRE HARNESS
(Without sunroof)

Rear/Tailgate

Note: LHD type is shown, RHD type is similar.

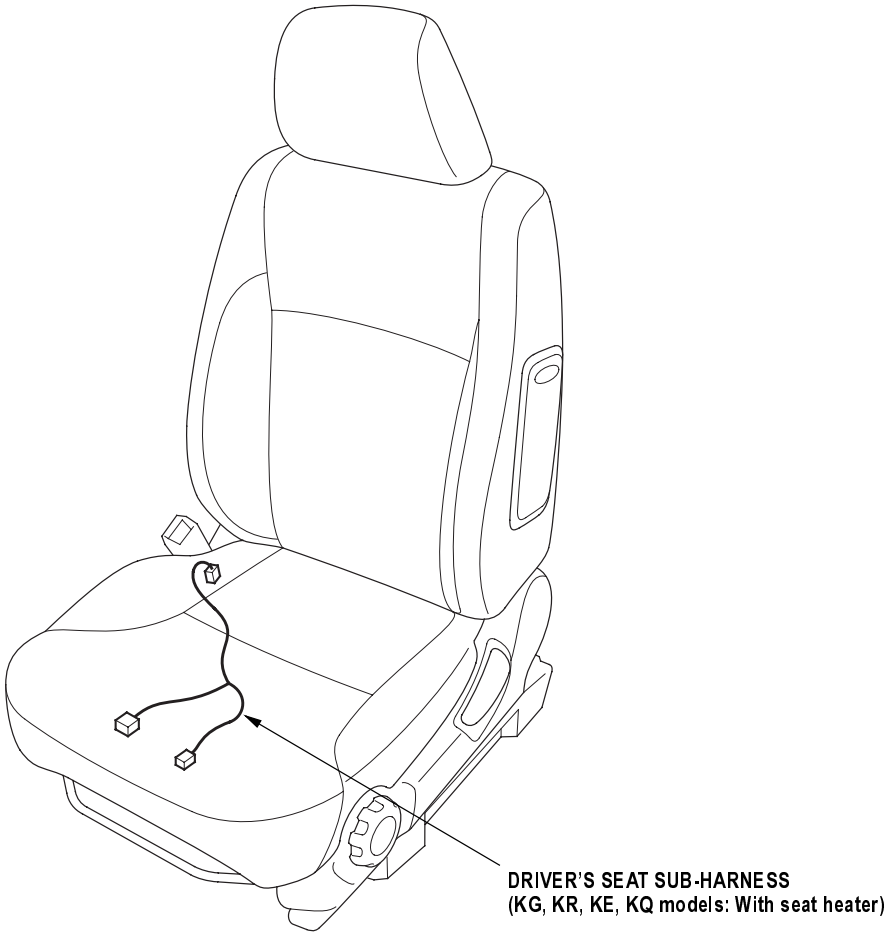


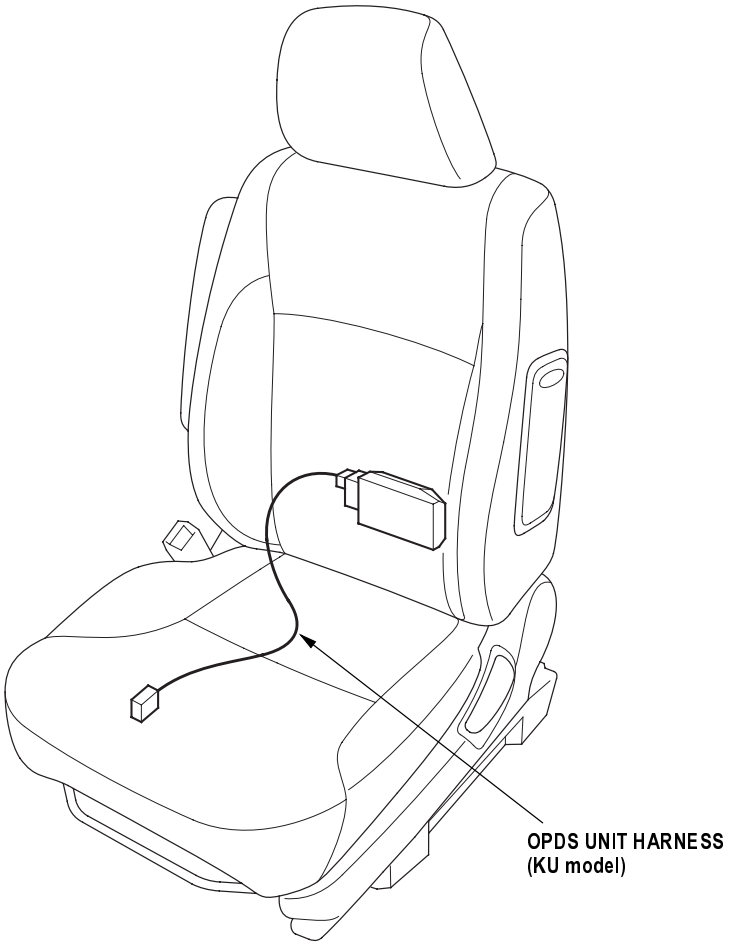
Note: LHD type is shown, RHD type is similar.



Seat

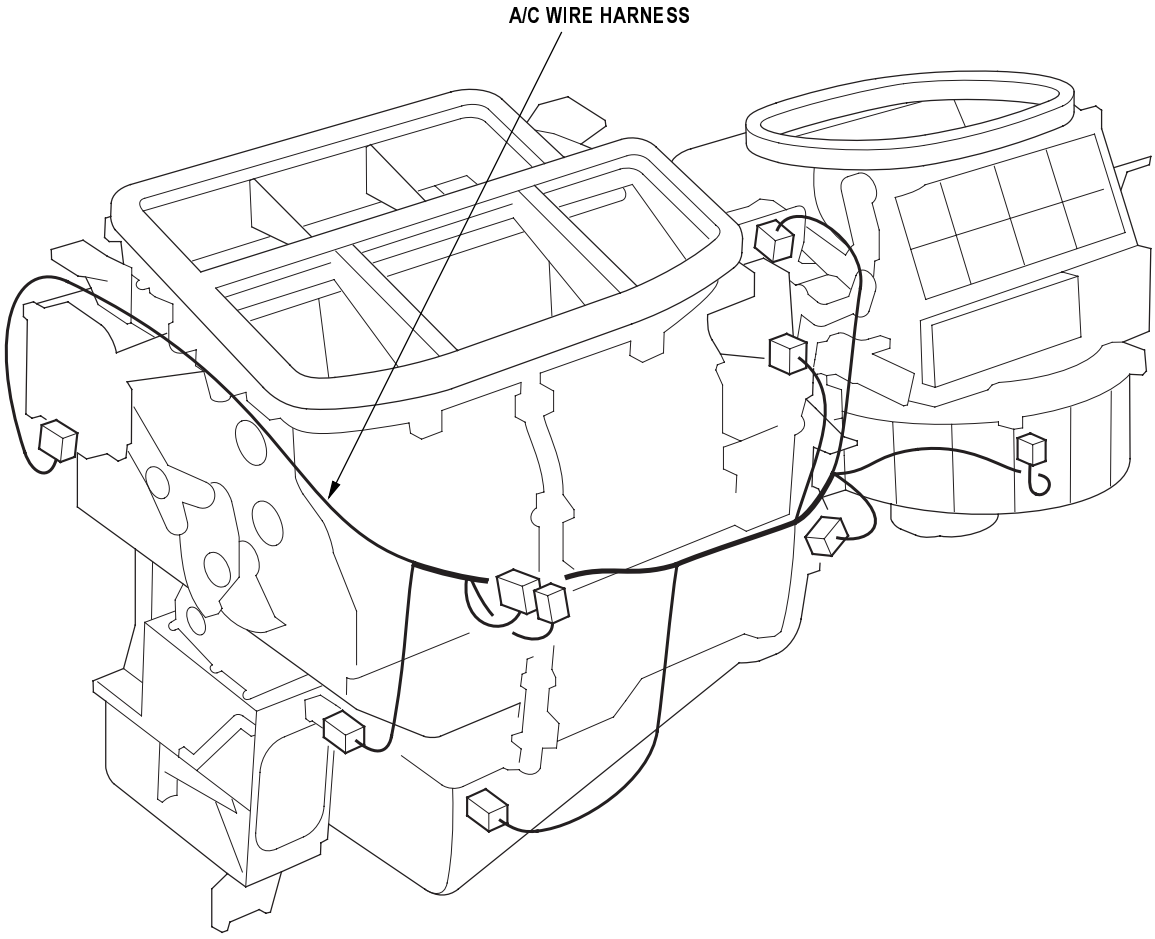
Note: LHD type is shown, RHD type is similar.




OPDS UNIT HARNESS
(KU model)

Blower

Note: LHD type is shown, RHD type is symmetrical.

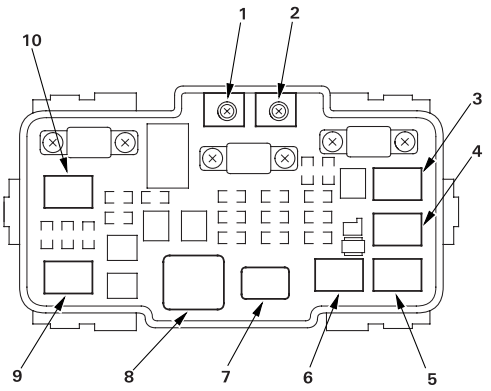


Fuse/Relay Boxes

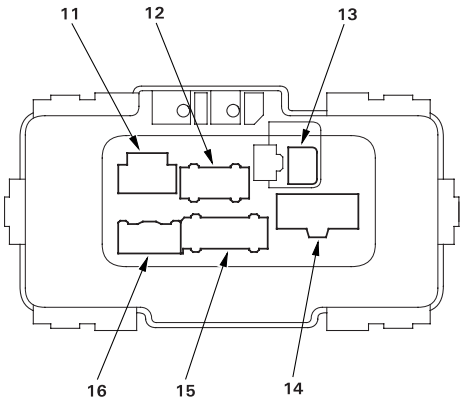
Connector to Fuse/Relay Box Index

Under-hood Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	11	2	Engine compartment wire harness
A/C compressor clutch relay	6	4	
B	16	5	Engine compartment wire harness
Blower motor relay	8	4	
C	12	12	Engine compartment wire harness
Condenser fan relay	3	4	
D	15	14	Engine compartment wire harness
E	14	7	Engine compartment wire harness
ELD unit	13	3	Engine compartment wire harness
Horn relay	4	4	
Headlight relay 1	9	4	
Headlight relay 2	10	4	
Radiator fan relay	5	4	
Rear window defogger relay	7	4	
T1 (Battery)	2		Starter sub-harness
T101 (Alternator)	1		Starter sub-harness



(View of front side)



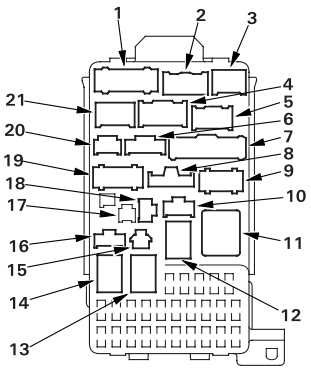
(View of back side)

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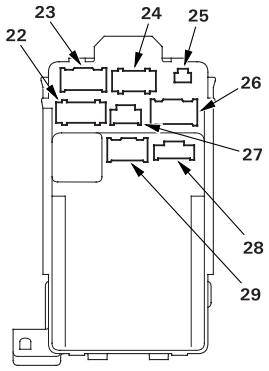
Connector to Fuse/Relay Box Index (cont'd)

Under-dash Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	2	5	Dashboard wire harness
B	3	6	Dashboard wire harness
C	1	14	Dashboard wire harness
D	4	12	ECM/PCM wire harness
E	5	13	ECM/PCM wire harness
F	19	12	Engine compartment wire harness
G	9	10	Engine compartment wire harness
H	8	3	Engine compartment wire harness
I	20	5	Engine compartment wire harness
J	21	8	Engine compartment wire harness
K	23	17	Dashboard wire harness
L	24	10	Dashboard wire harness
M	22	12	Dashboard wire harness
N	27	6	Dashboard wire harness
O	26	12	Dashboard wire harness
P	7	18	ECM/PCM wire harness
Q	6	8	ECM/PCM wire harness
R	10	6	ECM/PCM wire harness
Power Window relay	12	4	
S	25	2	Dashboard wire harness
Starter cut relay	14	4	
T	18	3	Multiplex control unit service check connector
Taillight relay	13	4	
Turn signal/hazard relay	11	3	
U	15	1	Optional connector
V	16	4	Optional connector
W (Memory erase signal (MES) connector)	17	2	ECM/PCM wire harness
X	28	8	Dashboard wire harness B (Plugs directly into the multiplex control unit)
Y	29	13	Dashboard wire harness A (Plugs directly into the multiplex control unit)



(View of front side)



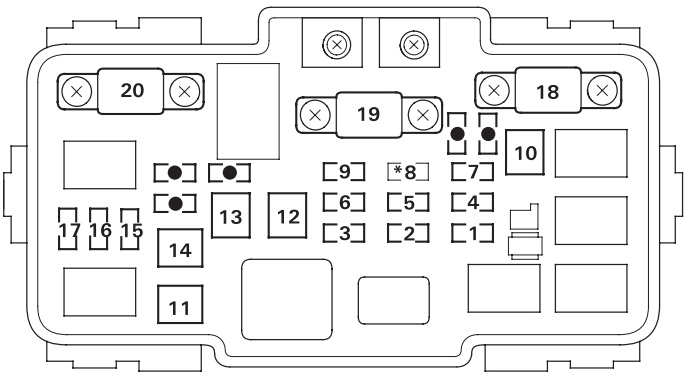
(View of back side)

Power Distribution

Fuse to Component Index

Under-hood Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	20A	BLU/YEL	Condenser fan motor
		BLU/RED	A/C compressor clutch
2	15A	WHT/GRN	Dash lights, Fog light switch, Front parking lights, Front side marker lights, Multiplex control unit (KG model: daytime running lights), License plate lights, Taillights, Taillight relay
3	15A	WHT/BLU	Ceiling lights,Ignition key light, Rear wiper control unit, Spotlights
4	20A	BLU/BLK	Radiator fan motor
5	15A	WHT/BLK	Hazard warning light, Security control unit, Turn signal/hazard relay
6	15A	WHT/BLK	CKP sensor, ECM/PCM, Fuel injectors, IAC valve, Immobilizer control unit-receiver, PGM-FI main relay 1 and 2, TDC sensor
7	15A	WHT/GRN	ABS modulator-control unit, Brake lights, Cruise control unit, ECM/PCM, Security horn relay, Security horn
		BLU/RED	Horn
8	——	——	Not used
9	10A	WHT/RED	AVN unit (With Navigation), Audio unit (Without Navigation), Data link connector, Gauge assembly, Immobilizer control unit-receiver, Keyless receiver unit, Multiplex control unit, Security control unit
10	30A	WHT/RED	ABS modulator-control unit (+B MR)
11	20A	BLK/YEL	Noise condenser, Rear window defogger
12	40A	BLU/WHT	Blower motor
13	40A	WHT/BLK	No. 7, 22, 23, 24, 25 fuses (in the under-dash fuse/relay box)
14	40A	WHT/RED	No. 2, 3, 5, 15, 16 fuses (in the under-dash fuse/relay box)
15	15A	RED/YEL	Headlight washer control unit, High beam indicator light, Left headlight
16	20A	WHT	Multiplex control unit
17	15A	RED	Right headlight
18	30A	WHT/BLU	ABS modulator-control unit (+B FSR)
19	100A	——	Battery, Power distribution
20	50A	WHT	Ignition switch (BAT)



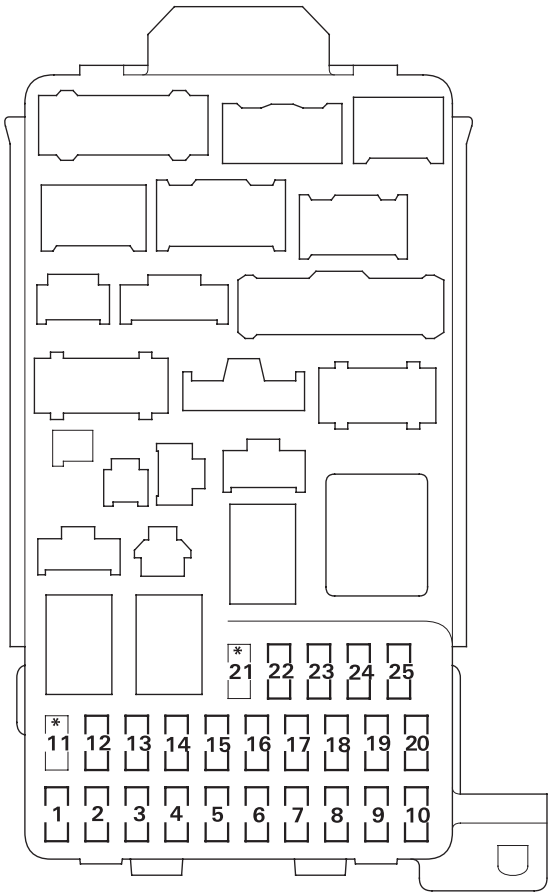
● : Spare fuse
* : Not used

(cont'd)

Fuse to Component Index (cont'd)

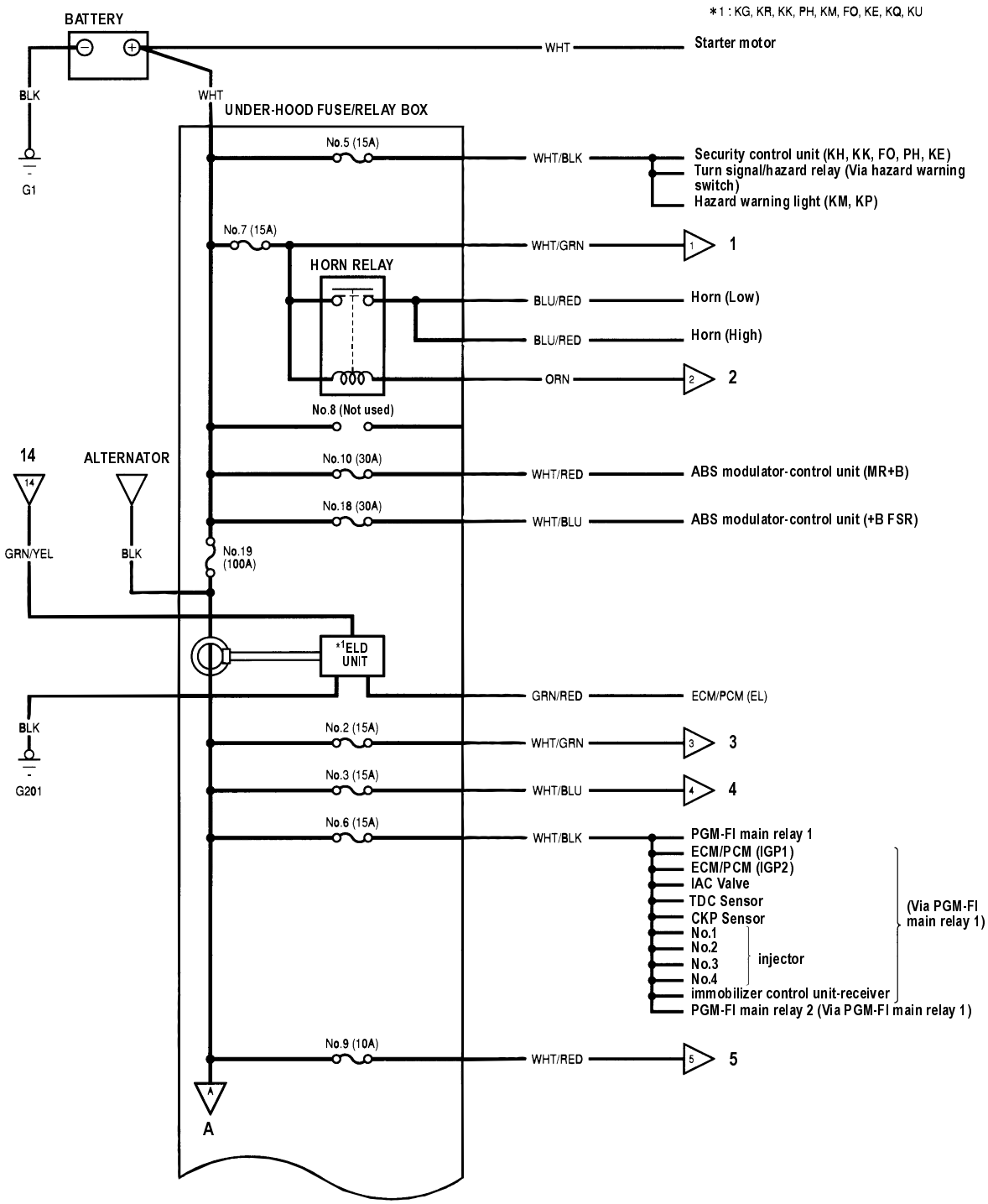
Under-dash Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	15A	BLK/WHT	Ignition coils
2	10A	GRN/WHT	Rear accessory power socket
3	10A	Fuse/relay box socket	Multiplex control unit (KG model: daytime running lights)
	20A	BLU/RED	Front fog lights
4	10A	GRN/YEL	Alternator, Camshaft position (CMP) sensor, Cruise main switch, Cruise control unit, ELD unit, EVAP canister purge valve, Intake manifold runner control (IMRC) solenoid valve, Primary HO2S, Secondary HO2S, Vehicle speed sensor
5	7.5A	Fuse/relay box socket	Multiplex control unit (With rear fog light)
6	7.5A	YEL/GRN	Headlight adjuster switch, Headlight adjuster unit, Power window control unit, Power window relay, Sunroof open relay, Sunroof close relay
7	20A	GRN	Sunroof motor
8	7.5A	Fuse/relay box socket	Option connector, Multiplex control unit
		YEL/RED	AVN unit (With Navigation), Audio unit (Without Navigation), Interlock control unit (KG model: daytime running lights), Key interlock solenoid, Key interlock relay, Shift lock solenoid
9	7.5A	RED/GRN	OPDS unit (With side airbag), Rear wiper control unit, Rear wiper motor, Rear window washer motor
10	7.5A	Fuse/relay box socket	Multiplex control unit
		YEL	ABS modulator-control unit, A/T reverse relay, Back-up lights, Gauge assembly, Keyless receiver unit, Security control unit, Shift lock relay
11	—	—	Not used
12	7.5A	Fuse/relay box socket	Multiplex control unit (KG model: daytime running lights)
13	10A	PNK	SRS unit(VB)
14	10A	Fuse/relay box socket	Option connector
		BLK/YEL	A/C compressor clutch relay, Blower motor relay, Condenser fan relay, Climate control unit (With auto A/C), Heater control panel (Without auto A/C), In-car temperature sensor assembly (LHD type with auto A/C), Power mirror actuator, Power mirror defogger, Radiator fan relay, Rear window defogger relay, Recirculation control motor
15	30A	RED/YEL	Headlight washer motor
16	20A	RED/BLK	Seat heaters
17	15A	BLK/YEL	ECM/PCM, Fuel pump, Inertia switch (KG, KR and KE models), SRS unit (VA)
18	15A	YEL/GRN	Cigarette lighter, Rear accessory power socket relay
19	7.5A	YEL/BLK	Turn signal/hazard relay
20	20A	Fuse/relay box socket	Multiplex control unit
		GRN/BLK	Windshield wiper motor, Windshield washer motor
21	—	—	Not used
22	20A	GRN/BLK	Front passenger's power window motor
23	20A	GRN/WHT	Driver's power window motor
24	20A	YEL/RED	Left rear power window motor
25	20A	YEL/BLU	Right rear power window motor



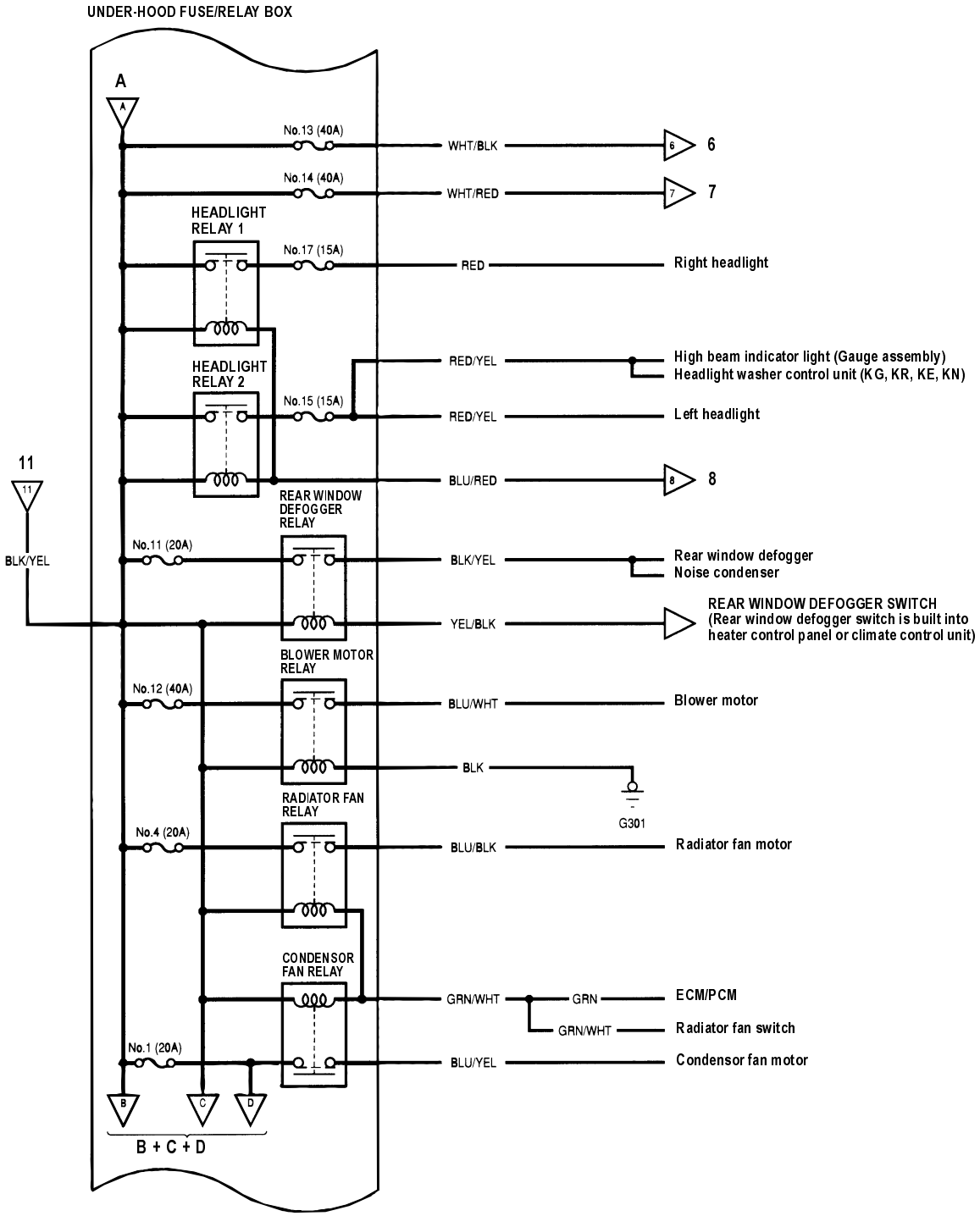
* : Not used

Circuit Identification



1	UNDER-DASH FUSE/RELAY BOX	To page 22A-45
2	UNDER-DASH FUSE/RELAY BOX	To page 22A-47
3	UNDER-DASH FUSE/RELAY BOX	To page 22A-46
4	UNDER-DASH FUSE/RELAY BOX	To page 22A-48
5	UNDER-DASH FUSE/RELAY BOX	To page 22A-47
14	No.4 (10A) UNDER-DASH FUSE/RELAY BOX	From page 22A-43
A		To page 22A-41

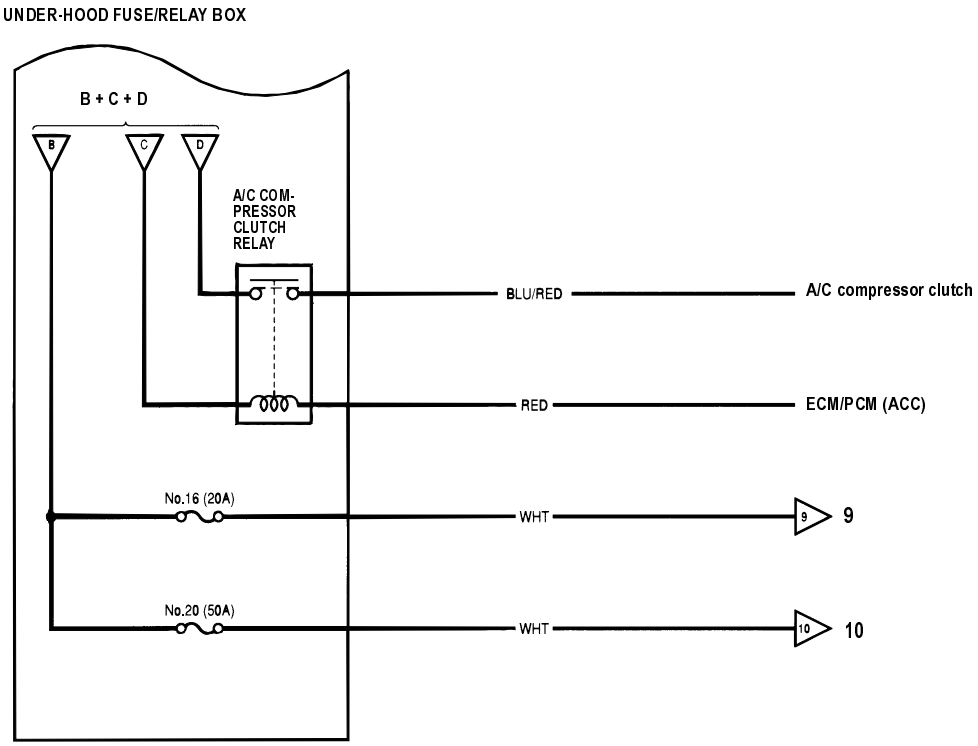
Circuit Identification (cont'd)



6	UNDER-DASH FUSE/RELAY BOX	To page 22A-44
7	UNDER-DASH FUSE/RELAY BOX	To page 22A-45
8	UNDER-DASH FUSE/RELAY BOX	To page 22A-47
11	No.14 (10A) UNDER-DASH FUSE/RELAY BOX	From page 22A-43
B+C+D		To page 22A-42
A		From page 22A-40

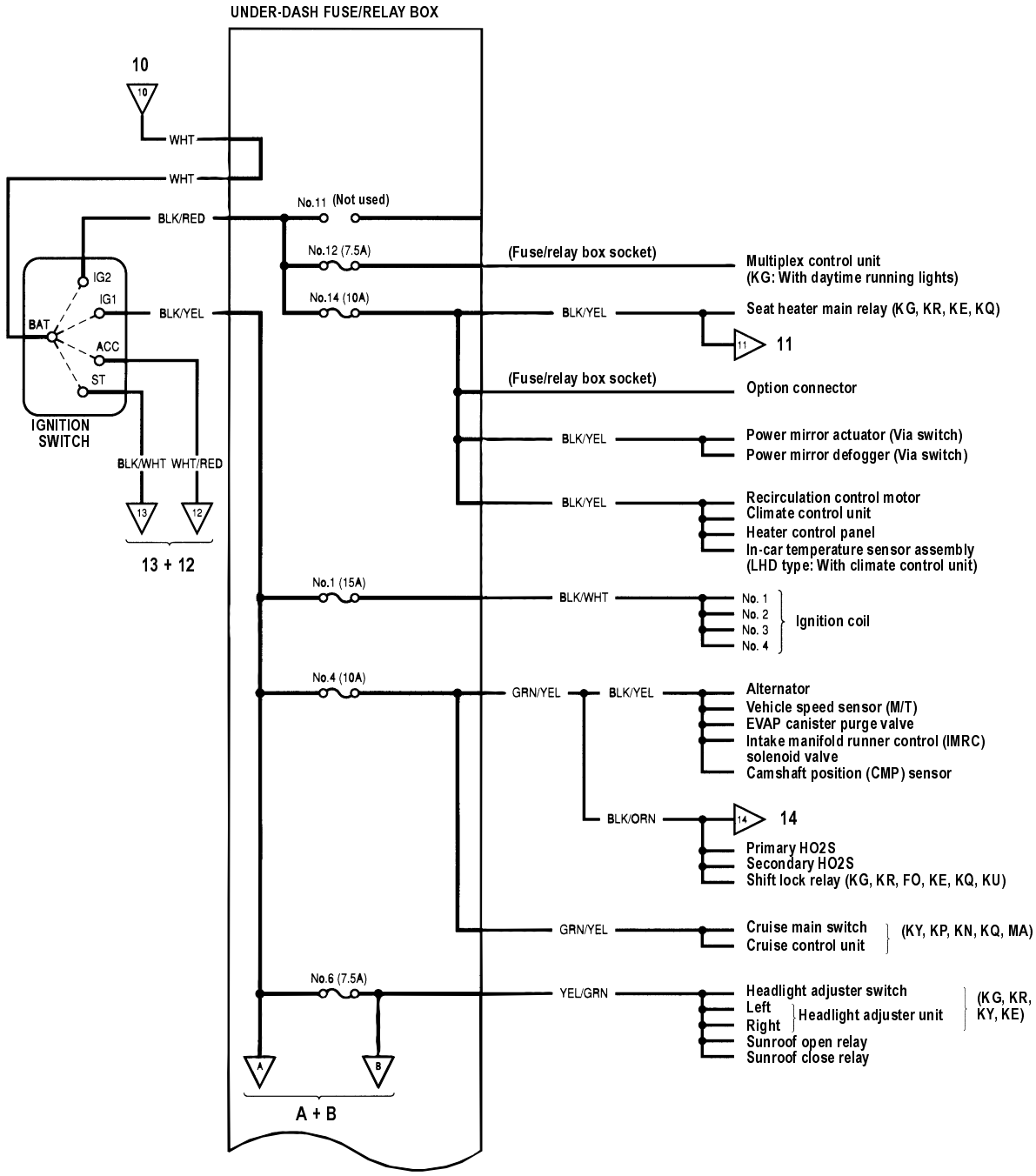
(cont'd)

Circuit Identification (cont'd)



9 UNDER-DASH FUSE/RELAY BOX To page 22A-47
10 UNDER-DASH FUSE/RELAY BOX To page 22A-43
B+C+D From page 22A-41

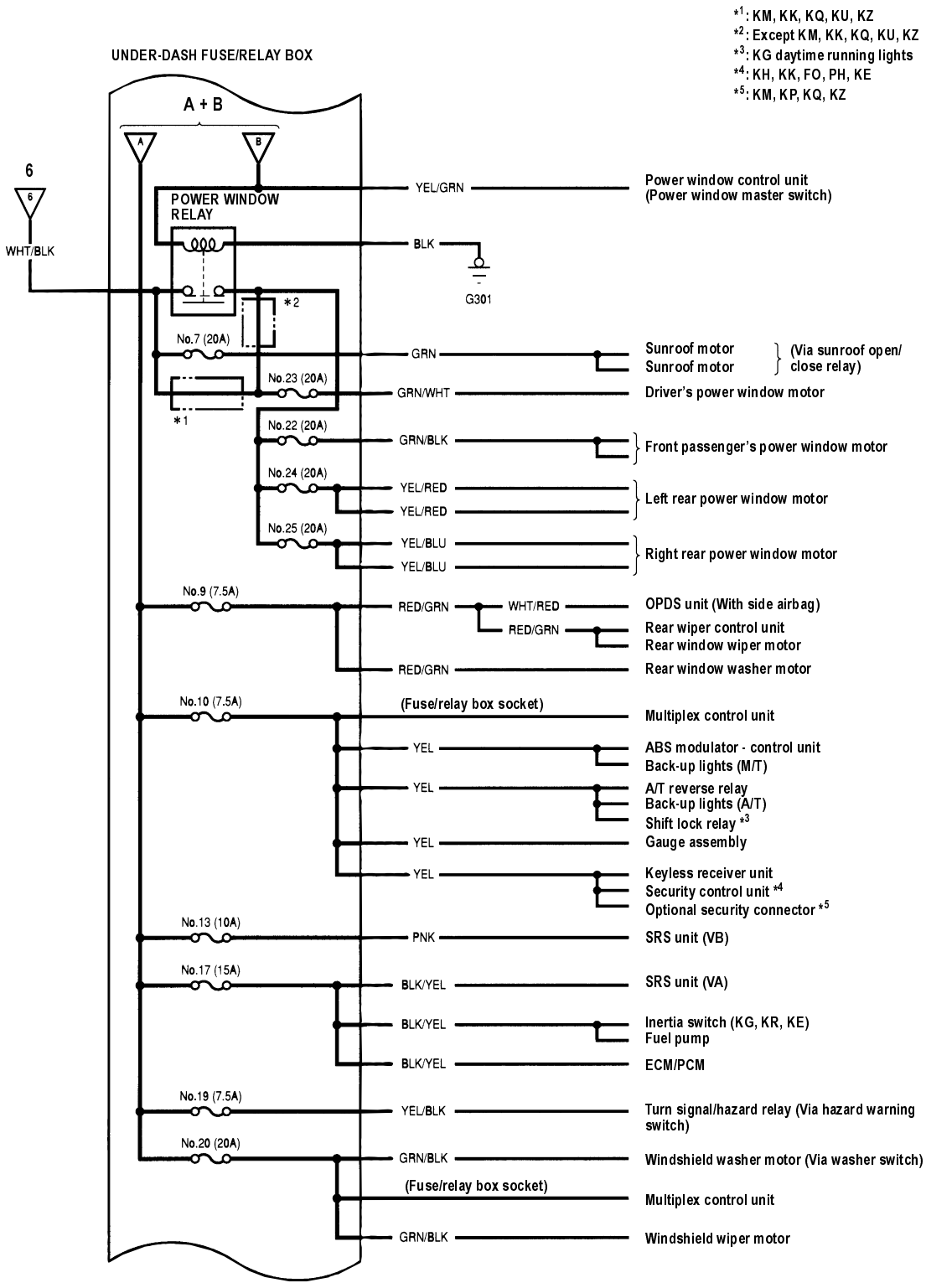
Circuit Identification (cont'd)



10	No. 20 (50A) UNDER-HOOD FUSE/RELAY BOX	From page 22A-42
11	UNDER-HOOD FUSE/RELAY BOX	To page 22A-41
12 + 13	UNDER-DASH FUSE/RELAY BOX	To page 22A-45
14	ELD UNIT	To page 22A-40
A + B		To page 22A-44

(cont'd)

Circuit Identification (cont'd)

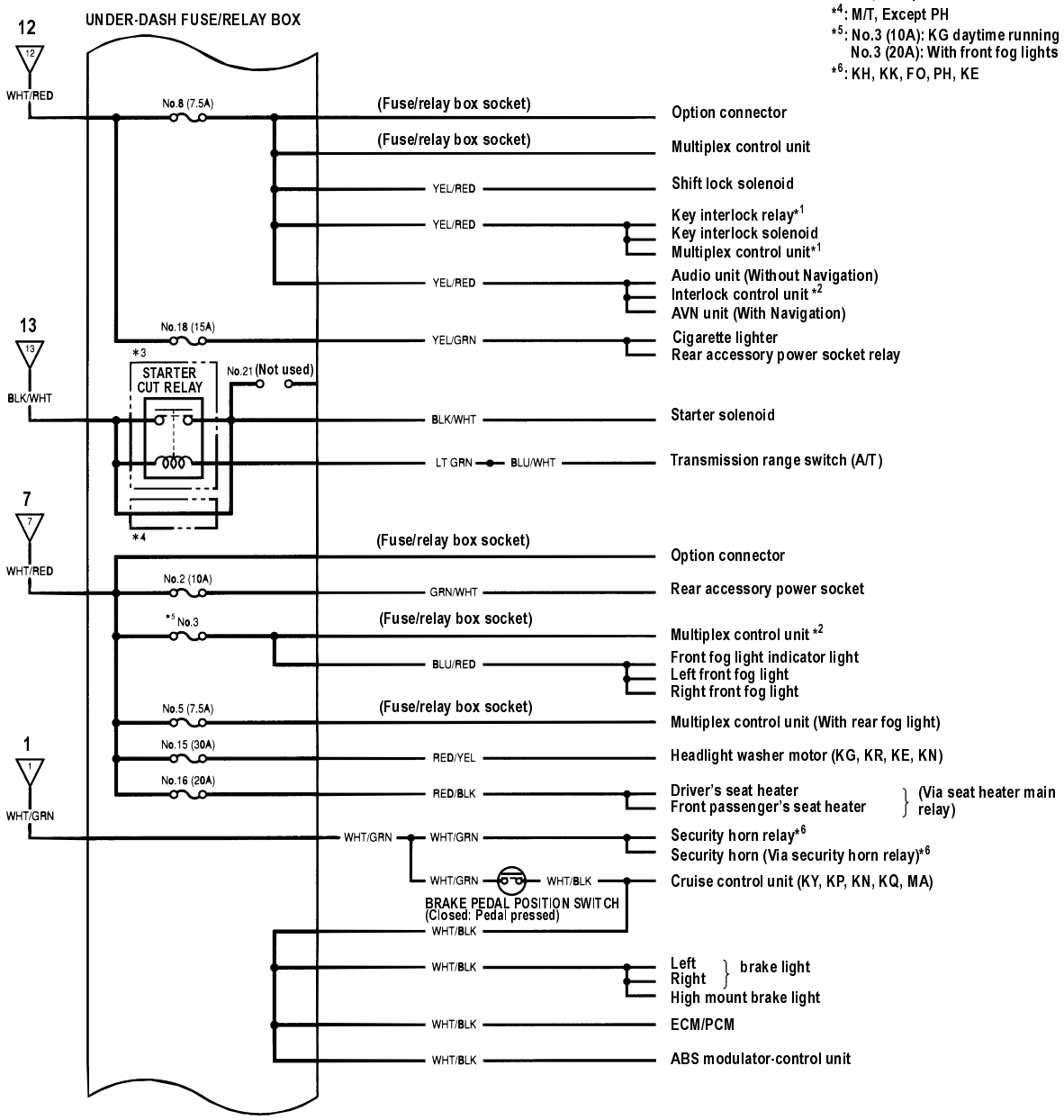


6 No.13 (40A) UNDER-HOOD FUSE/RELAY BOX From page 22A-41

A + B From page 22A-43

Circuit Identification (cont'd)

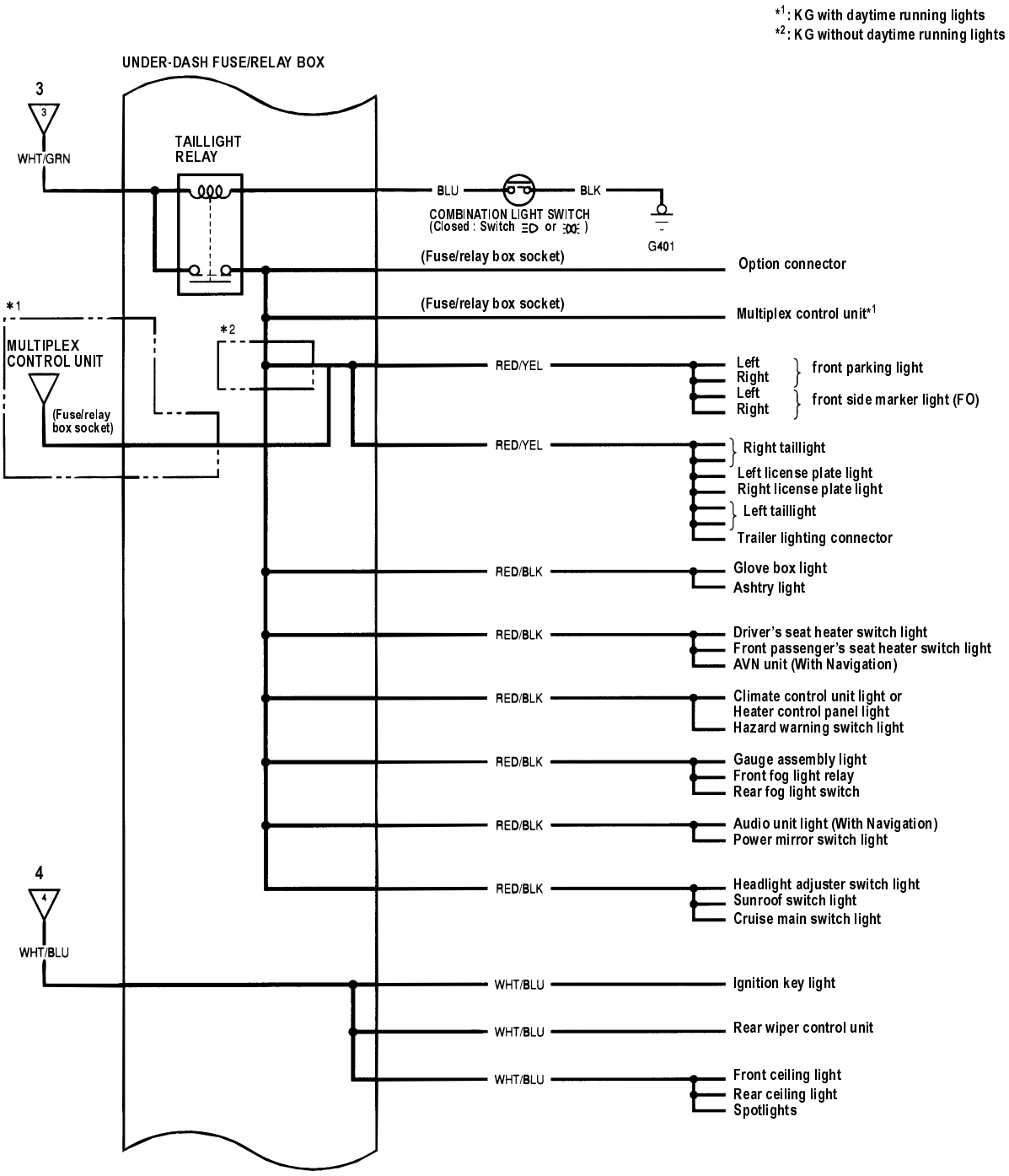
*1: Except KG daytime running lights
*2: KG daytime running lights
*3: A/T, Except PH
*4: M/T, Except PH
*5: No.3 (10A): KG daytime running lights
No.3 (20A): With front fog lights
*6: KH, KK, FO, PH, KE



12	IGNITION SWITCH (ACC) From page 22A-43	7	No.14 (40A) UNDER-HOOD FUSE/ RELAY BOX From page 22A-41
13	IGNITION SWITCH (ST) From page 22A-43	1	No. 7 (15A) UNDER-HOOD FUSE/ RELAY BOX From page 22A-40

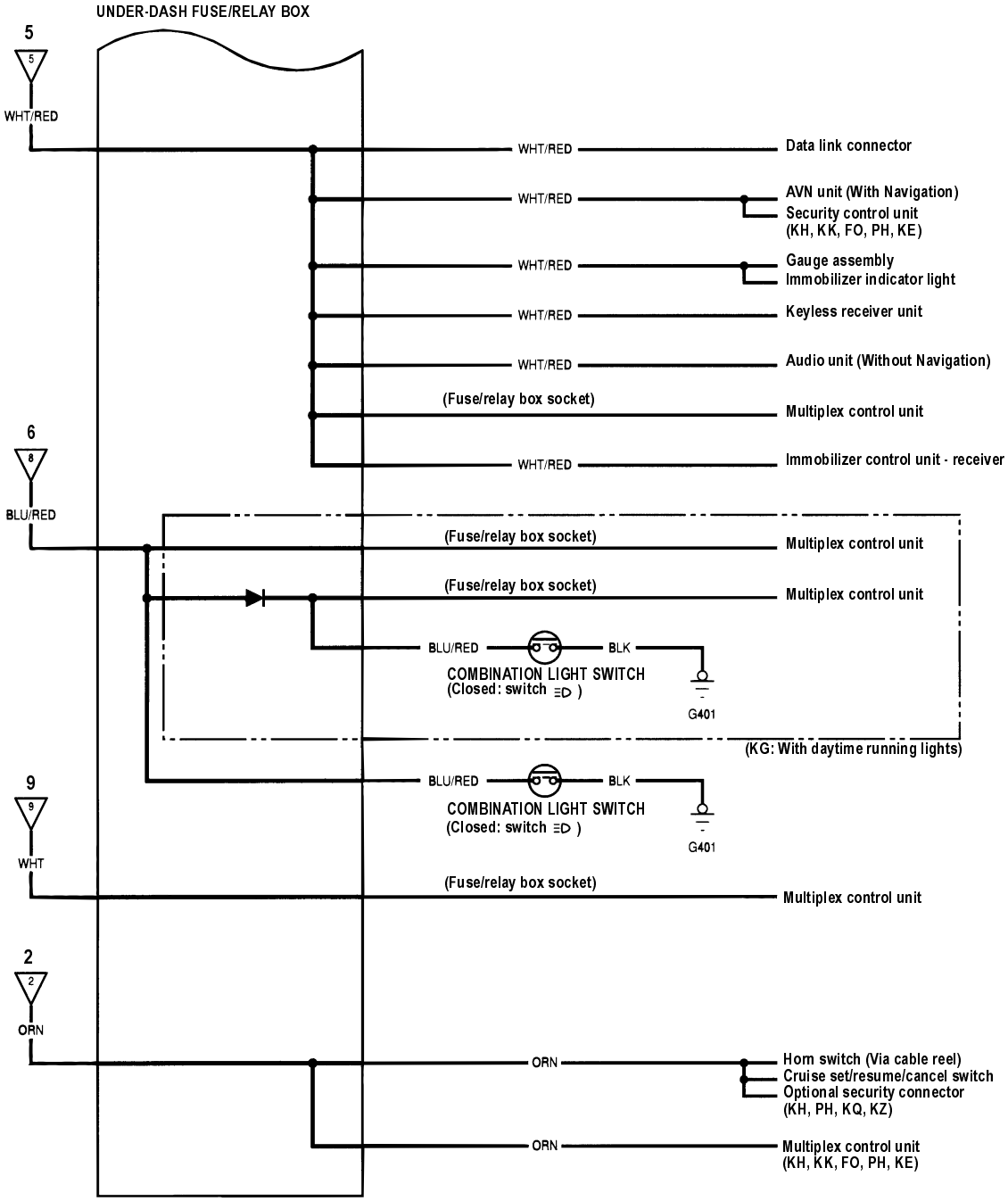
(cont'd)

Circuit Identification (cont'd)



3	No.2 (15A) UNDER-HOOD FUSE/RELAY BOX	From page 22A-40
4	No.3 (15A) UNDER-HOOD FUSE/RELAY BOX	From page 22A-40

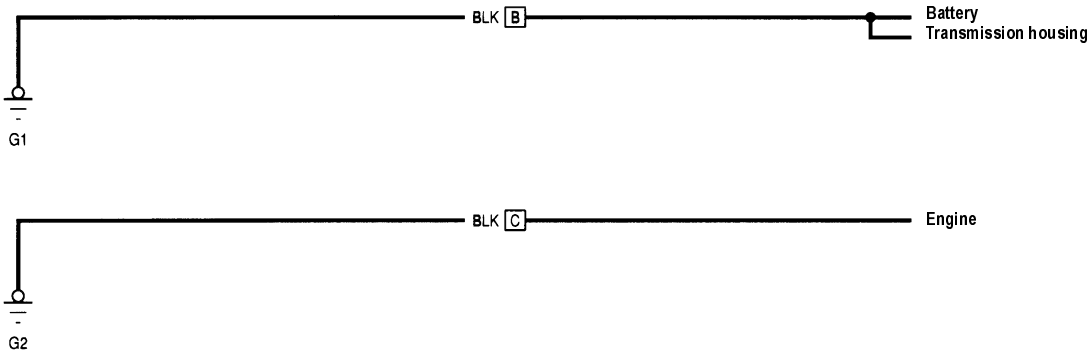
Circuit Identification (cont'd)



5	No.9 (10A) UNDER-HOOD FUSE/RELAY BOX	From page 22A-40
6	HEADLIGHT RELAY 1, 2	From page 22A-41
9	No. 16 (20A) UNDER-HOOD FUSE/RELAY BOX	From page 22A-42
2	HORN RELAY	From page 22A-40

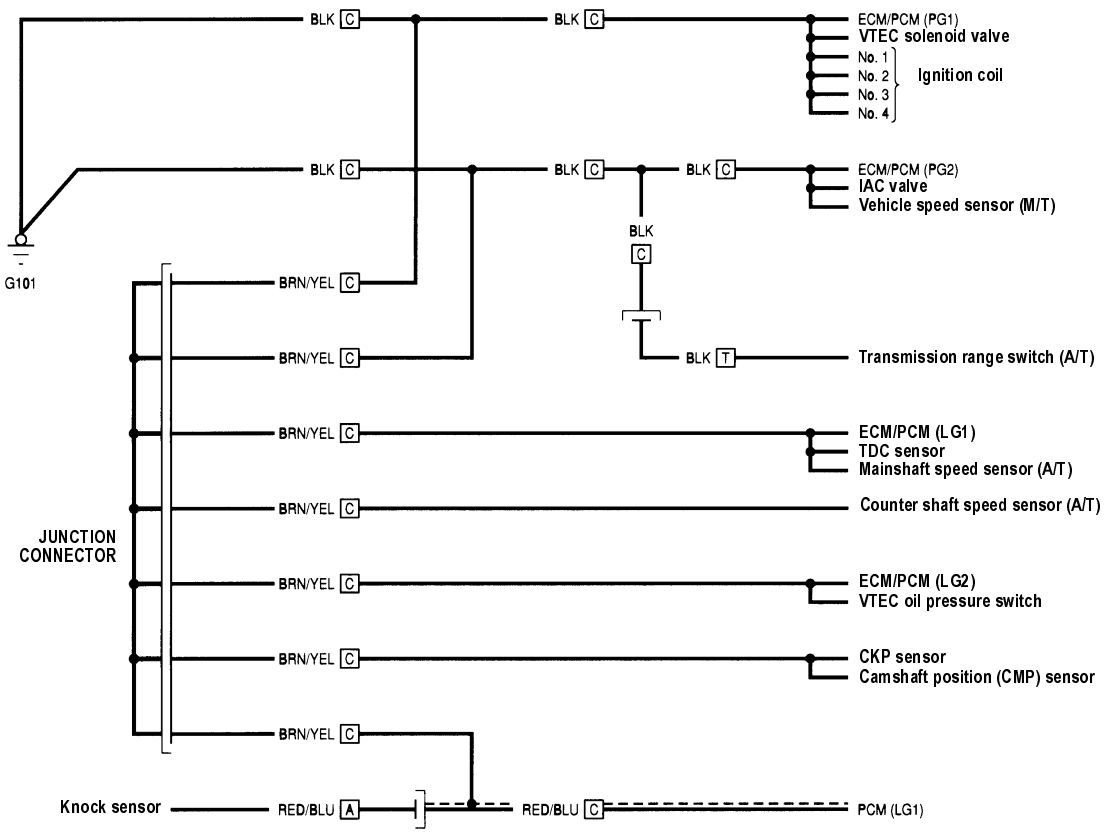
Ground Distribution

Circuit Identification



B : Battery ground cable
C : Engine ground cable

Circuit Identification (cont'd)

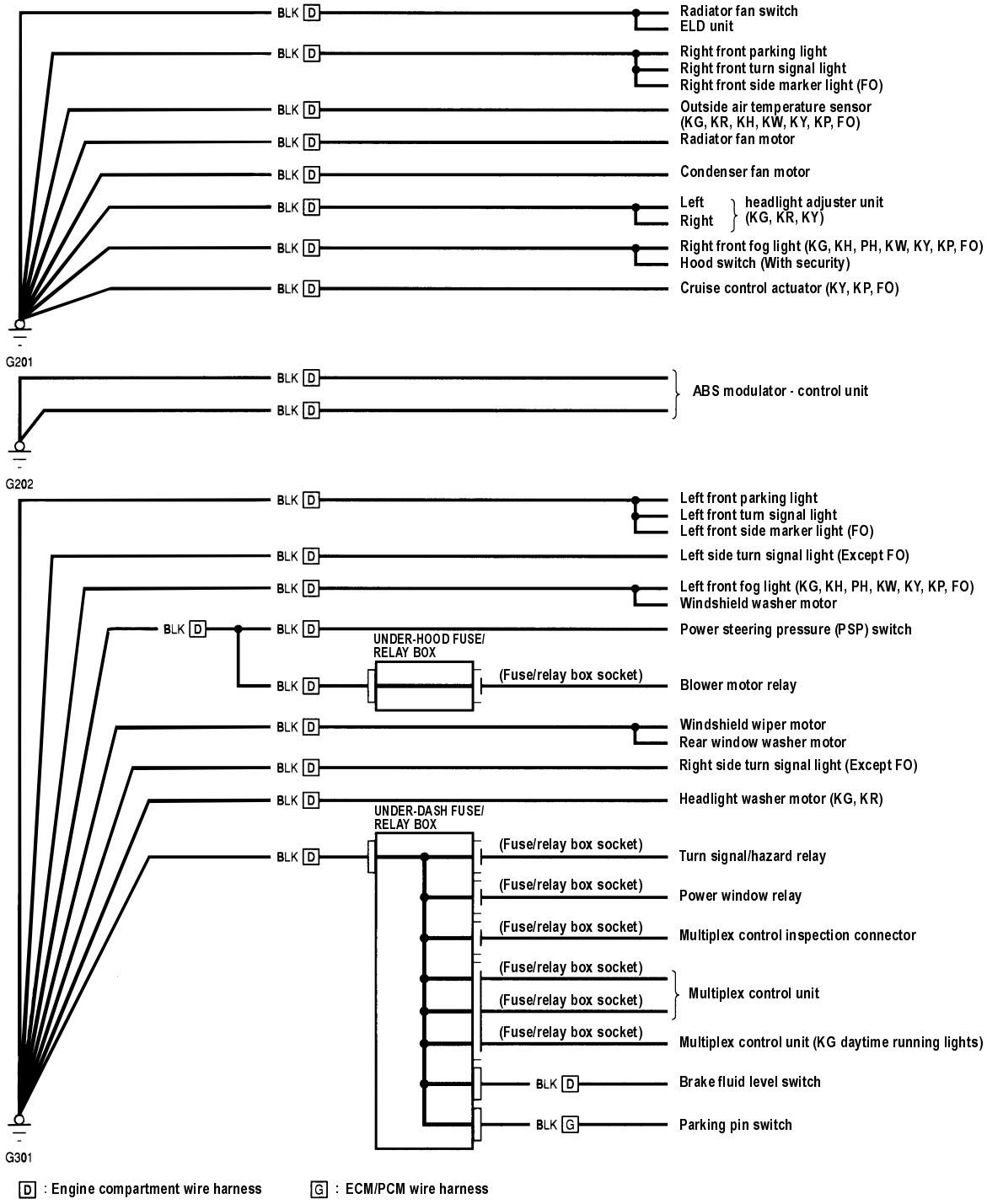


A : Starter sub-harness
C : Engine wire harness
T : Transmission range switch sub-harness
- - - - - - - : Shielding

(cont'd)

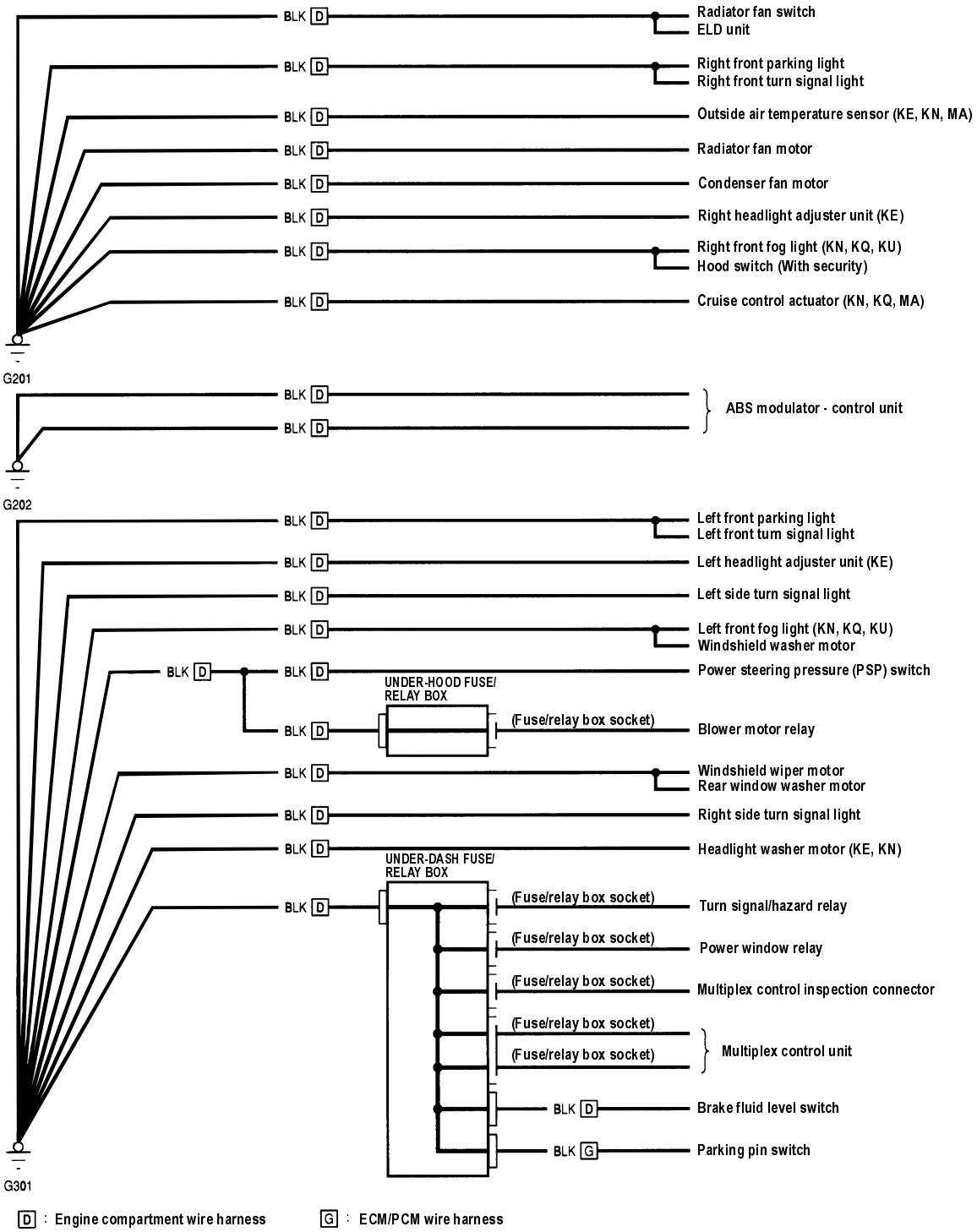
Circuit Identification (cont'd)

LHD type:



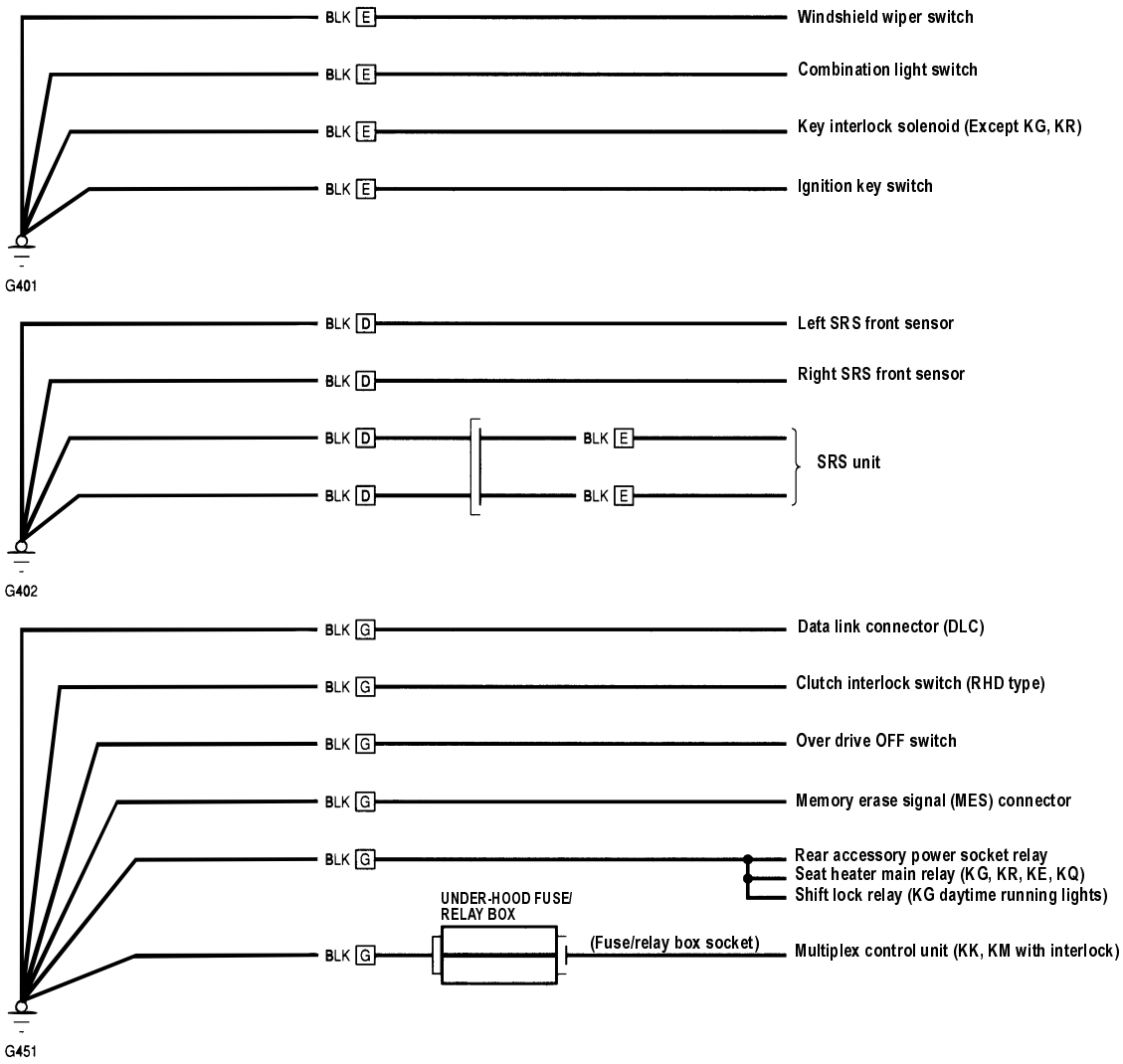
Circuit Identification (cont'd)

RHD type:



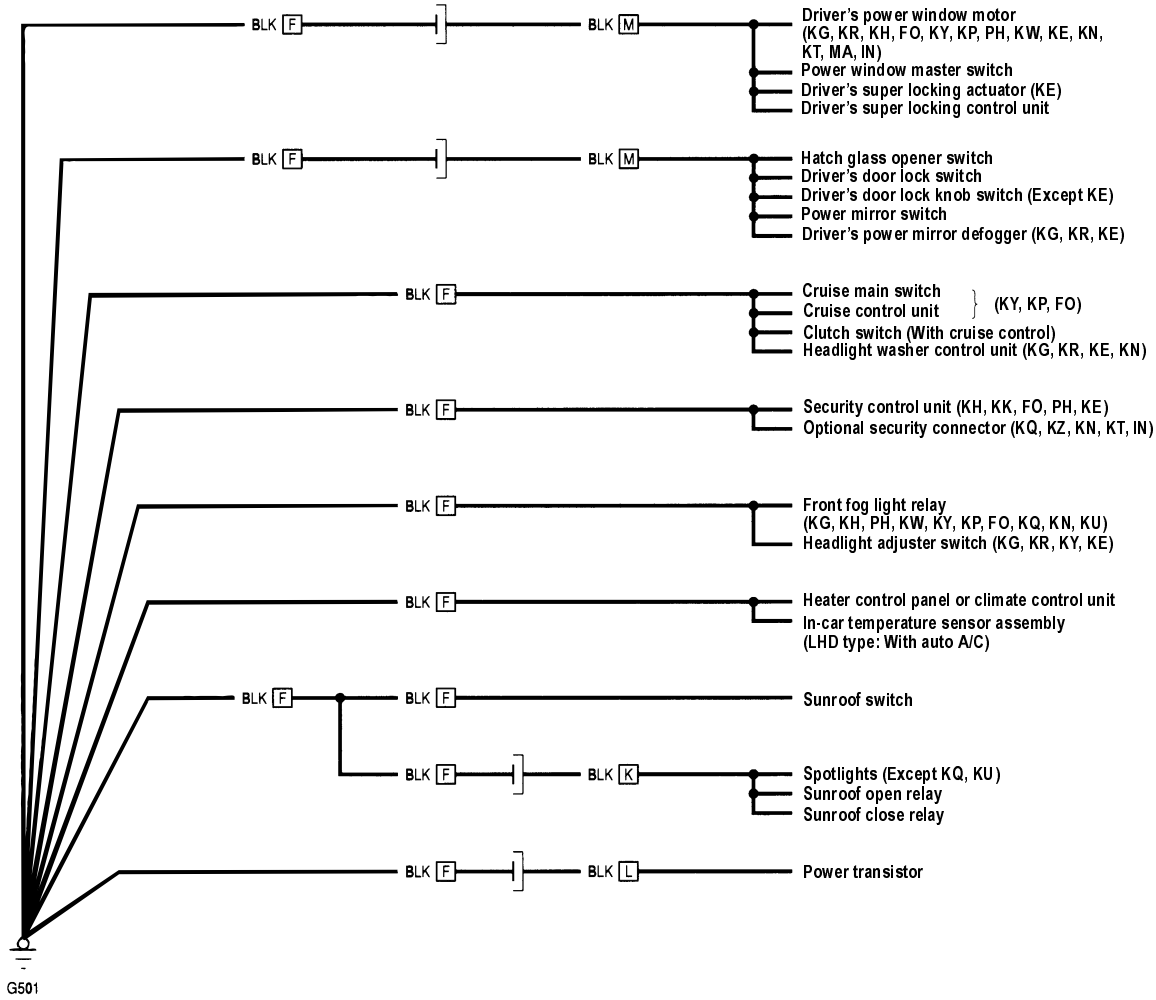
(cont'd)

Circuit Identification (cont'd)



D : Engine compartment wire harness
E : Dashboard wire harness B
G : ECM/PCM wire harness

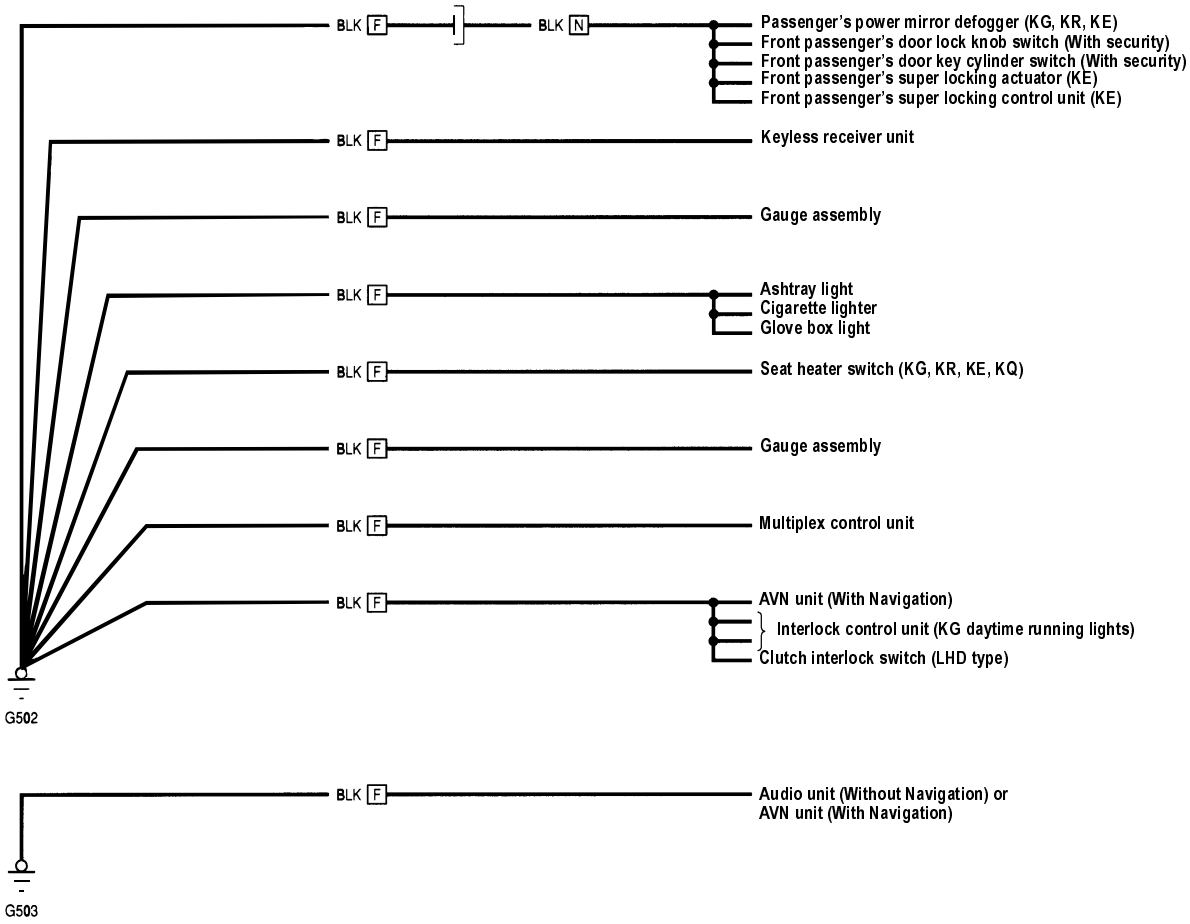
Circuit Identification (cont'd)



F : Dashboard wire harness A
K : Roof wire harness
L : A/C wire harness
M : Driver's door wire harness

(cont'd)

Circuit Identification (cont'd)

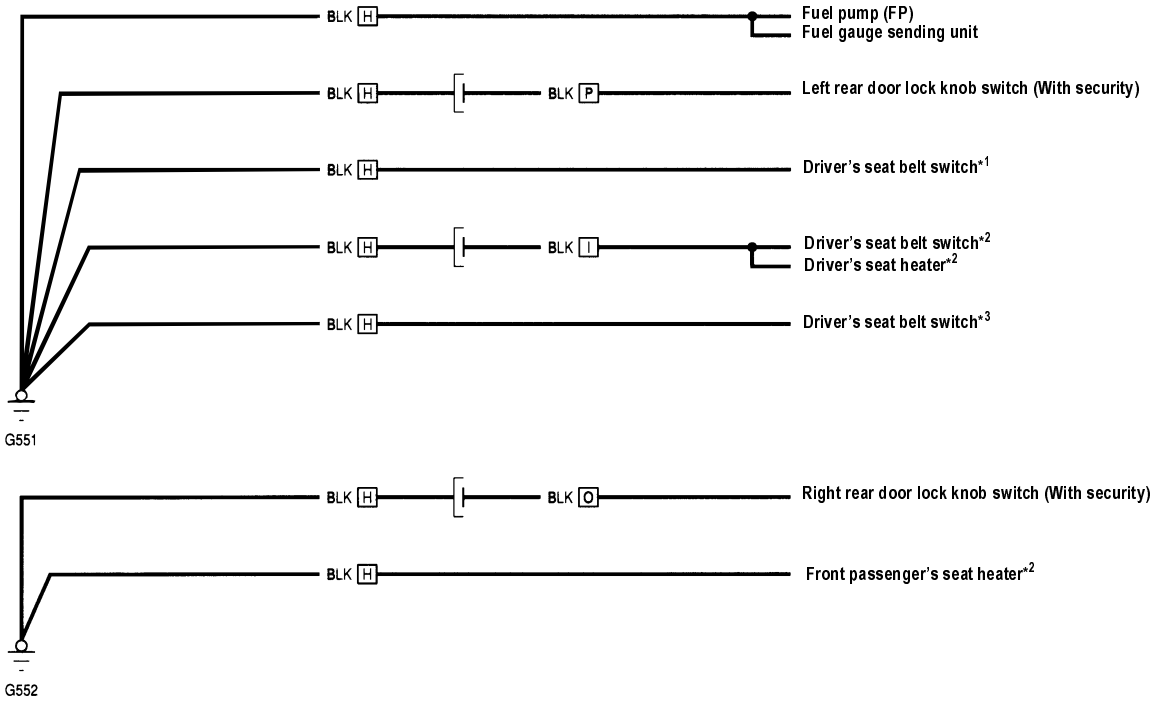


F : Dashboard wire harness A
N : Front passenger's door wire harness

Circuit Identification (cont'd)

LHD type:

*1: KG, KR without seat heater
*2: KG, KR with seat heater
*3: KP, KY, KK, KM, KW, FO, PH



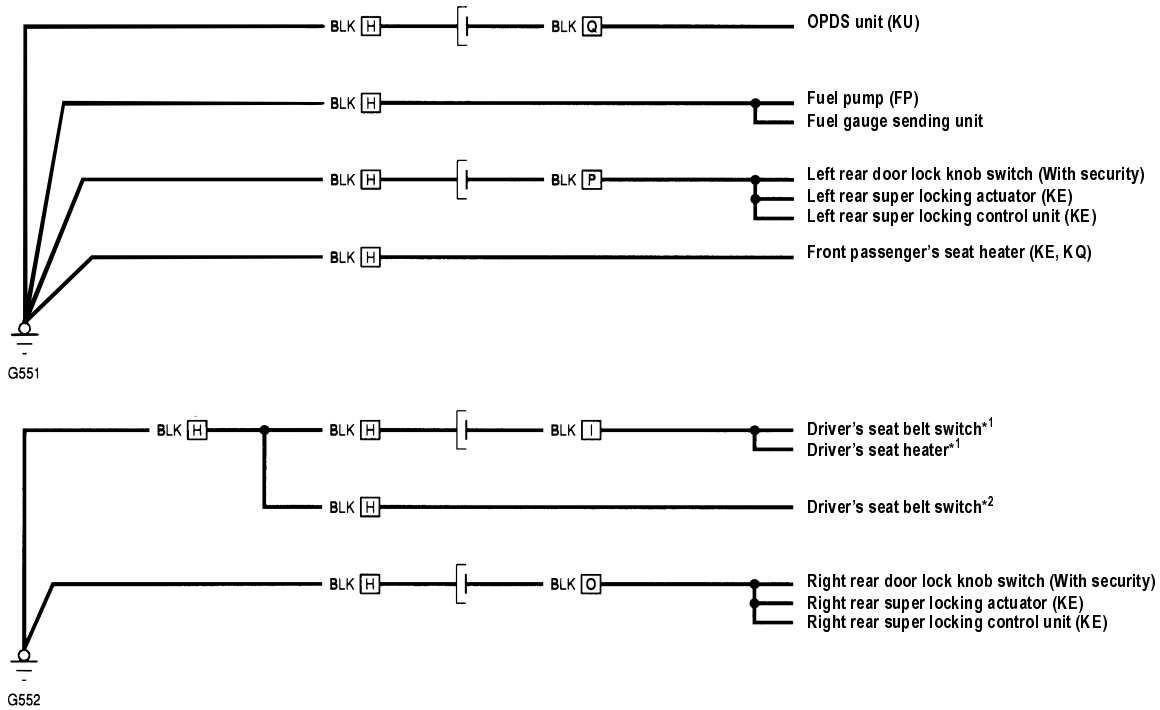
H : Floor wire harness
I : Driver's seat sub-harness
O : Right rear door wire harness
P : Left rear door wire harness

(cont'd)

Circuit Identification (cont'd)

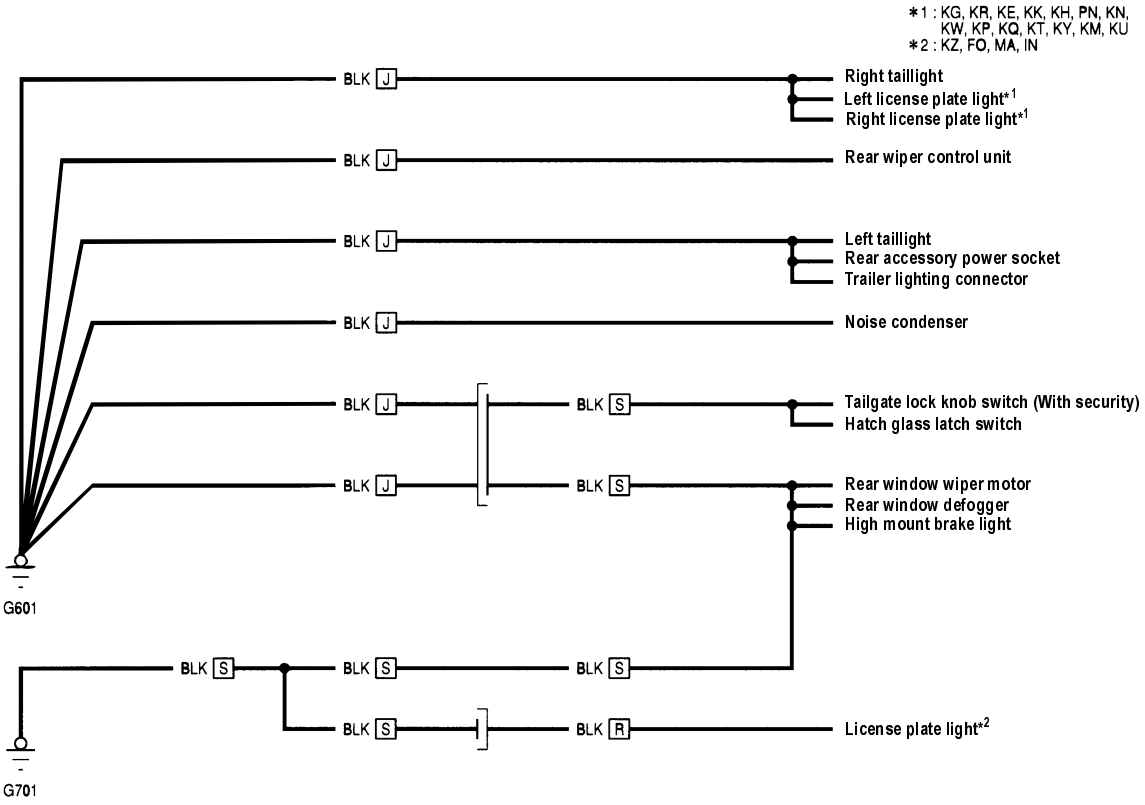
RHD type:

*1: KE, KQ with seat heater
*2: KE, KQ without seat heater, KZ, KN, KU, MA



H : Floor wire harness
I : Driver's seat belt sub-harness
O : Right rear door wire harness
P : Left rear door wire harness
Q : OPDS unit harness

Circuit Identification (cont'd)



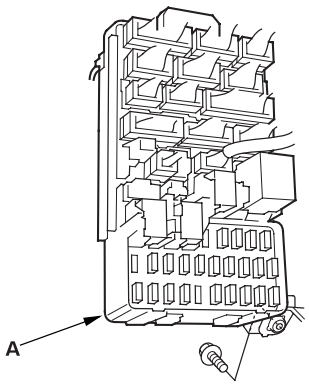
Under-dash Fuse/Relay Box

Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-14), and precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

Removal

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.
3. Remove the dashboard lower cover (see page 20-88).
4. Disconnect the connectors from the fuse side of the under-dash fuse/relay box.



5. Remove the mounting bolt and the under-dash fuse/relay box (A).
6. Disconnect the connectors from the back of the under-dash fuse/relay box, and remove the fuse/relay box.

   NOTE: The SRS connector is a spring-loaded lock type (see page 23-20).

Installation

1. Install the under-dash fuse/relay box in the reverse order of removal and connect all connectors to the under-dash fuse/relay box.
2. Install the dashboard lower cover.
3. Connect both the negative cable and positive cable to the battery.
4. Enter the anti-theft code for the radio, then enter the customer's radio station presets.
5. Confirm that all systems work properly.

Battery

Battery Test

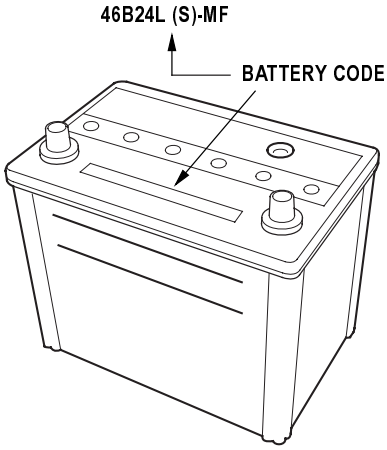
WARNING

A battery can explode if you do not follow the proper procedure, causing serious injury to anyone nearby.
Follow all procedures carefully and keep sparks and open flames away from the battery.

NOTE:
- To get accurate results, the temperature of the electrolyte must be between 21 and 38°C (70 and 100°F) before testing.
- The ECM/PCM memory must be reset after reconnecting the battery (see page 11-4).

Test Equipment Required:

- Battery Tester with:
  Voltmeter with 0 - 18 V scale, ammeter with 0 - 100 A and 0 -- 500 A scales, and a carbon pile with 0 - 300 W
- 12 V Battery Charger: Fast charge capability of 50 A and slow charge capability of 5 A



Test Procedure:

1. Check for damage: If the case is cracked or the terminals are loose, replace the battery.
2. Check indicator (for basic charge condition): Blue or Green is OK. If the indicator is red, peel the tape off, remove the caps, and add distilled water; then reinstall the caps and tape. If the indicator is clear, go to step 3.
3. Test battery load capacity by connecting a battery tester, and applying a load of three times the battery ampere hour rating.

   When the load has been applied for exactly 15 seconds, the battery voltage reading should stay above 9.6 V.
   - If the reading stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.
   - If the reading is between 6.5 and 9.6 V, connect a battery charger and charge the battery for 3 minutes at an initial rate of 40 amps.

CAUTION

Amperage will drop as voltage increases; do not increase the amperage to compensate or you may damage the battery.

   - Watch the battery voltage during the entire 3 minutes; the highest reading should stay below 15.5 V.
     – If the reading stays below 15.5 V, the battery is OK; clean its terminals and case, and reinstall it.
     – If the reading exceeds 15.5 V any time during the 3 minutes of fast charge, the battery is not good; replace it.
   - If the reading drops below 6.5 V, slow-charge the battery by connecting a battery, and charge at 5 amps for no more than 24 hours (or until the indicator shows full charge, or the specific gravity of the electrolyte is at least 1.270).
     Then test load capacity again.
     – If the voltage stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.
     – If the voltage still drops below 6.5 V, the battery is not good; replace it.

Relays

Power Relay Test

Use this chart to identify the type of relay, then do the test listed for it.

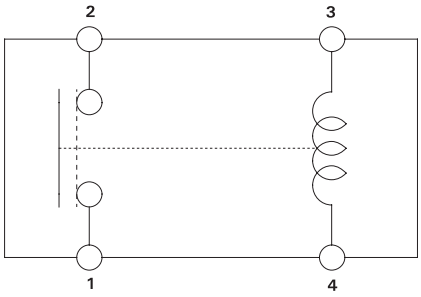
NOTE: See (see page 22A-104) for the turn signal/hazard relay input test.

Relay	Test
A/C compressor clutch relay	Normally-open type A
A/T reverse relay	
Condenser fan relay	
Front fog light relay	
Headlight relay 1	
Headlight relay 2	
Horn relay	
PGM-FI main relay 1	
Power window relay	
Radiator fan relay	
Rear accessory power socket relay	
Seat heater main relay	
Security horn relay	
Starter cut relay (A/T)	
Taillight relay	
Blower motor relay	Normally-open type B
Rear window defogger relay	
PGM-FI main relay 2	Five terminal type
Key interlock relay	
Shift lock relay	
Sunroof open relay	
Sunroof open relay	
Security starter cut relay	

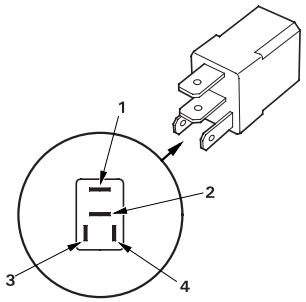
Normally-open type A:

Check for continuity between the terminals.

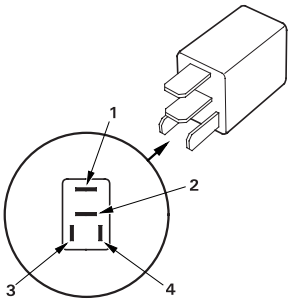
- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 2 terminals when power is disconnected.



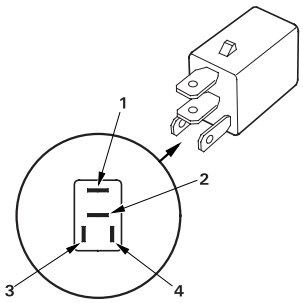
type 1:



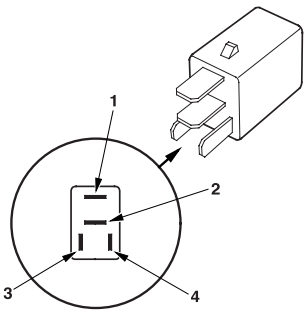
type 2:



PGM-FI main relay 1
type 1:



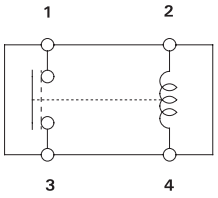
type 2:



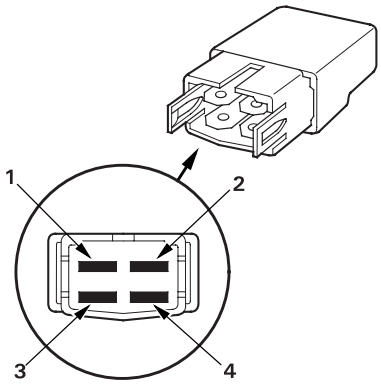
Normally-open type B:

Check for continuity between the terminals.

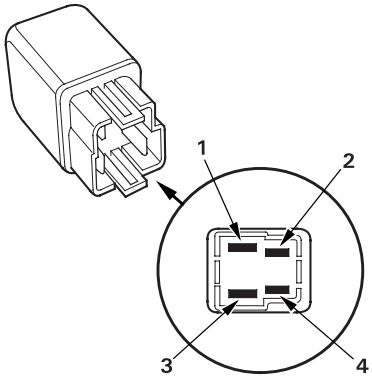
- There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 3 terminals when power is disconnected.



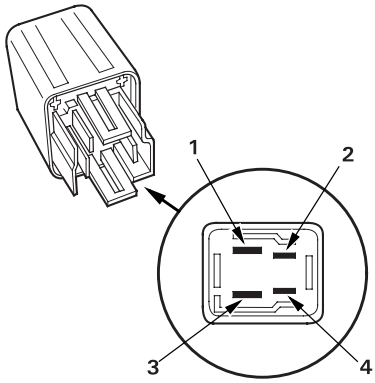
Rear window defogger relay



Blower motor relay type 1:



type 2:



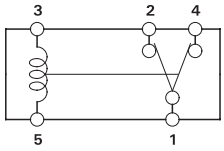
(cont'd)

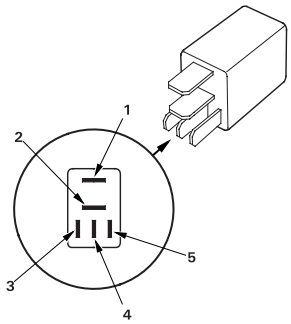
Power Relay Test (cont'd)

Five terminal type

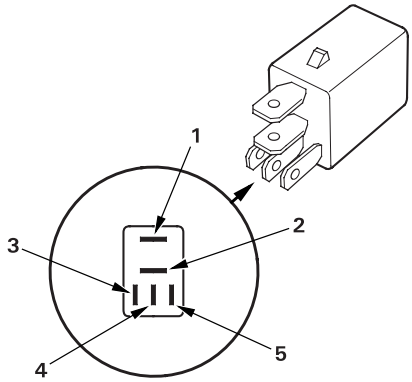
Check for continuity between the terminals.

- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 5 terminals.
- There should be continuity between the No. 1 and No. 4 terminals when power is disconnected.

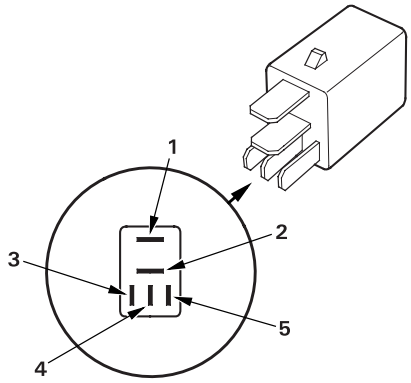




PGM-FI main relay 2
type 1:



type 2:

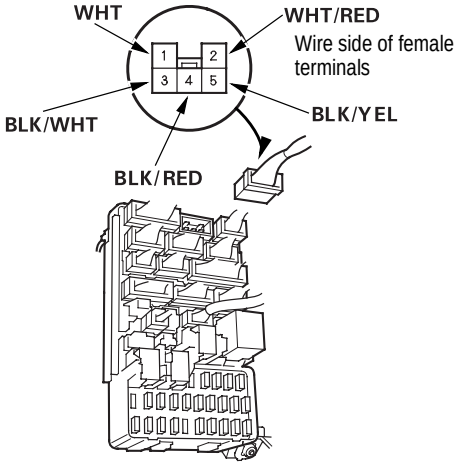


Ignition Switch

Test

SRS components are located in this area. Review the SRS component locations (see page 23-14) and precautions and procedures (see page 23-16) in the SRS section before performing repairs or servicing.

1. Remove the dashboard lower cover (see page 20-88).
2. Disconnect connector A (5P) from the under-dash fuse/relay box.



3. Check for continuity between the terminals in each switch position according to the table.

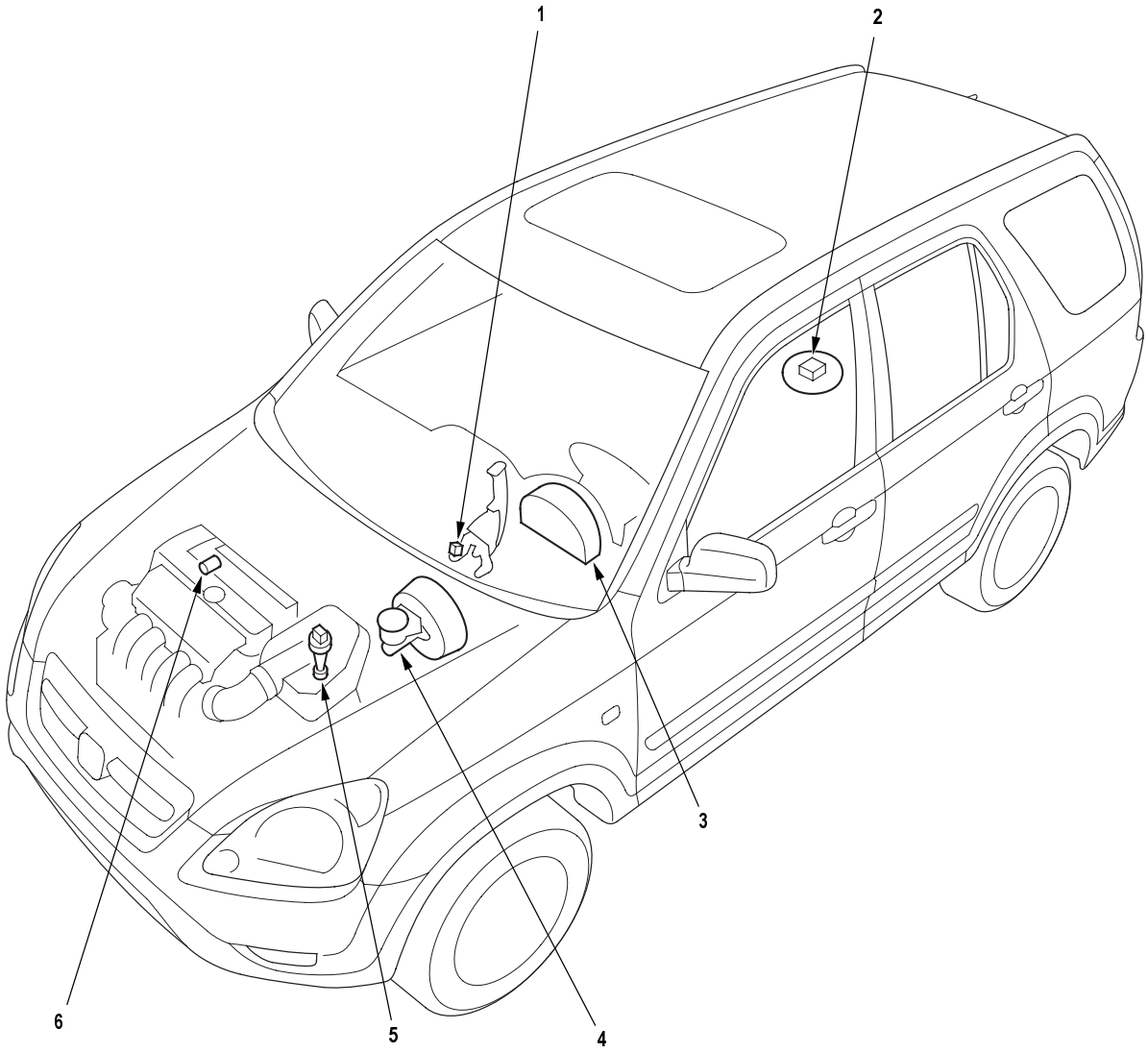
Terminal / Position	WHT/ RED (ACC)	WHT (BAT)	BLK/ YEL (IG1)	BLK/ RED (IG2)	BLK/ WHT (ST)
O (LOCK)					
I (ACC)	○——	——○			
II (ON)	○——		——○	○——	——○
III (START)		○——	——○		——○

4. If the continuity checks do not agree with the table, replace the steering lock assembly (see page 17-27).

Gauges

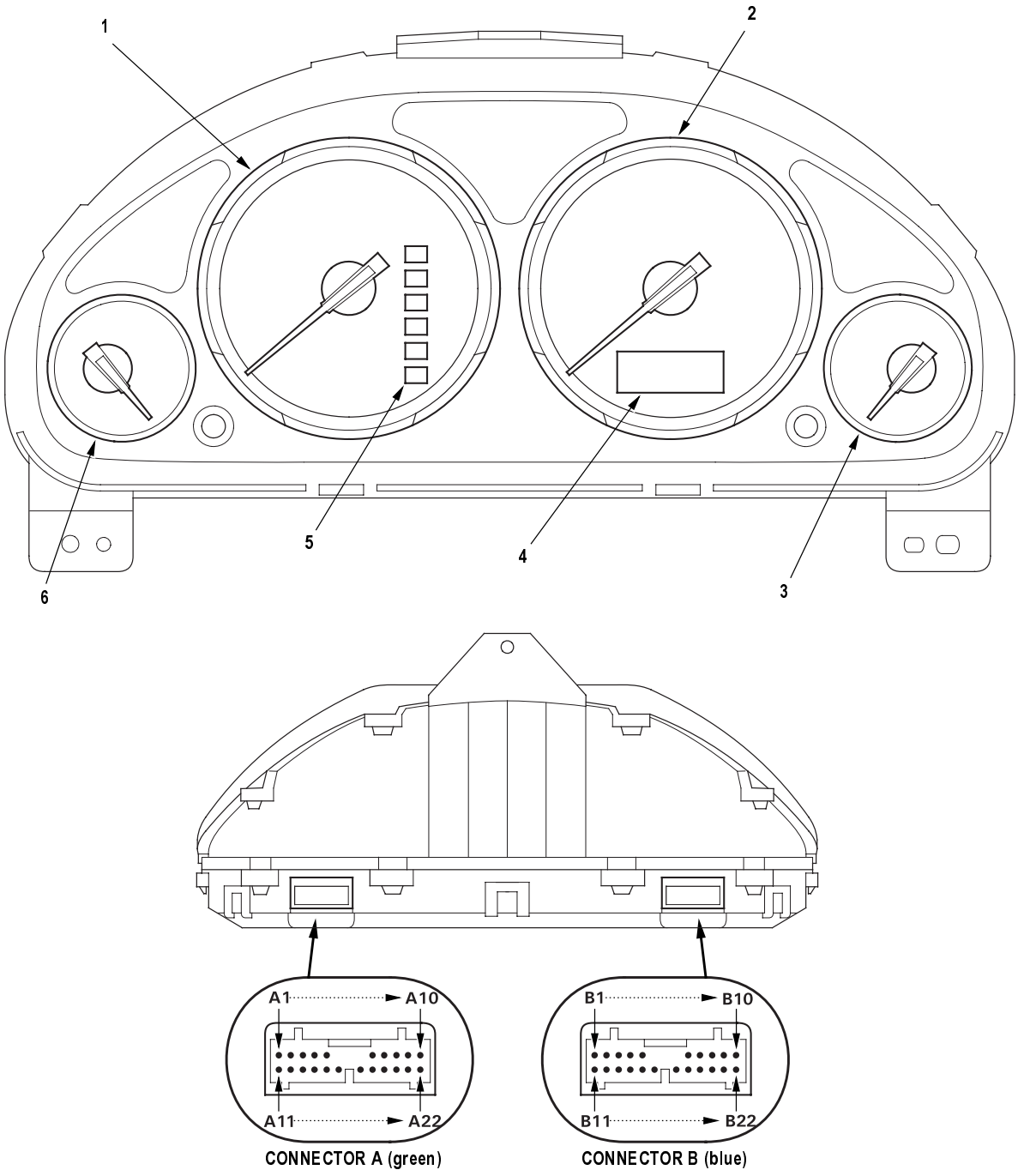
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



1	PARKING BRAKE SWITCH	page 19A-11
2	FUEL GAUGE SENDING UNIT	page 11-173
3	GAUGE ASSEMBLY	Self-diagnosis Procedure, page 22A-66; Outside, Air Temperature Indicator Test, page 22A-78; Gauge Bulb Replacement, page 22A-73; Replacement, page 22A-74; Coolant Temperature Gauge Troubleshooting, page 22A-74
4	BRAKE FLUID LEVEL SWITCH	page 19A-11
5	VEHICLE SPEED SENSOR (VSS) (M/T)	Troubleshooting, page 22A-75; Replacement, page 22A-77
6	ENGINE OIL PRESSURE SWITCH	page 08-4

Gauge/Terminal Location Index



1	TACHOMETER	
2	SPEEDOMETER	Vehicle Speed Signal Circuit Troubleshooting, page 22A-75
3	FUEL GAUGE	Troubleshooting, page 11-173
4	ODO/TRIP/OUTSIDE AIR TEMPERATURE METER	
5	A/T GEAR POSITION INDICATOR	
6	COOLANT TEMPERATURE GAUGE	Troubleshooting, page 22A-74

Self-diagnostic Procedure

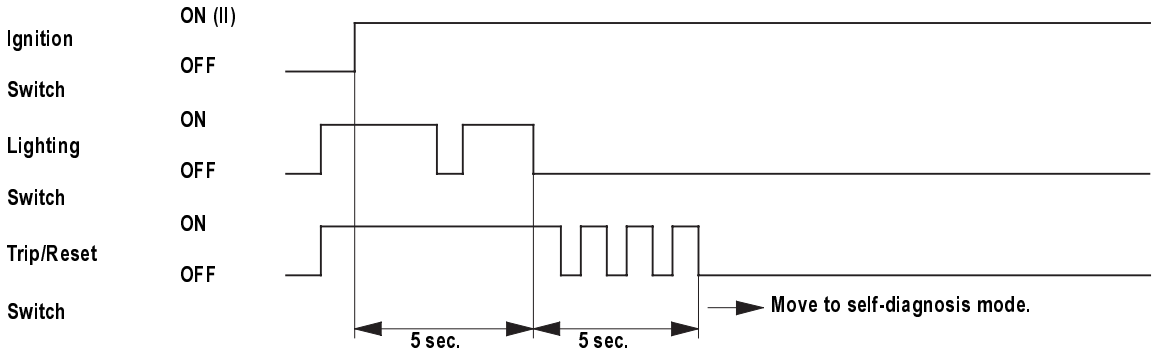
The gauge assembly has a self-diagnosis function that checks these circuits:
- The beeper drive circuit
- The indicator drive circuit
- The LCD segments
- The gauges drive circuit (Speedometer, Tachometer, Fuel gauge, Coolant temperature gauge)
- The communication line (the coolant temperature signal line between the gauge and the ECM/PCM)

Entering the self-diagnosis function:

Before entering the self-diagnosis function, check the No. 9 (10A) fuse in the under-hood fuse/relay box and No. 10 (7.5A) fuse in the under-dash fuse/relay box.

1. Push and hold the trip/reset button.
2. Turn the headlights ON.
3. Turn the ignition switch ON (II).
4. With in 5 sec., turn the headlights OFF, then ON and OFF again.
5. With in 5 sec., release the trip/reset button, then push and release the button four times.

Note:
- While in the self-diagnosis mode, the dash lights brightness controller operates normally.
- While in the self-diagnosis mode, the trip/reset button is used to start the Beeper Drive Circuit Test and the Gauge Drive Circuit Check.
- If the vehicle speed exceeds 1.2 mph (2 km/h) or the ignition switch is turned OFF, the self-diagnosis mode ends.



The Beeper Drive Circuit Check:

When entering the self-diagnosis mode, the beeper sounds five times.

The Indicator Drive Circuit Check:

When entering the self-diagnosis mode, these indicator lights blink:
Seat belt indicator light, Door indicator light, Brake system light, Charging system light, Low fuel indicator light, Tailgace indicator light.
A/T gear position Indicator (except [**P**], [**R**], [**N**])

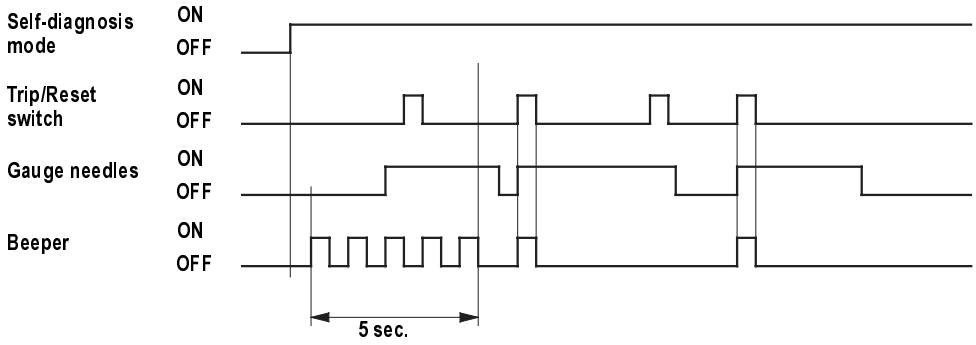
The LCD Segments Check:

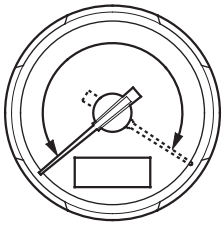
When entering the self-diagnosis mode, the odo/trip segments blinks five times.

The Gauge Drive Circuit Check:

When entering the self-diagnosis mode, the speedometer, the tachometer, the fuel gauge, and the coolant temperature gauge needles move from the minimum position to the maximum position, then return to the minimum position.

Note:
After the beeper stops sounding and the gauge needles return the minimum position, pushing the trip/reset button starts the Beeper Drive Circuit Check (one beep), and the Gauge Drive Circuit Check again.
The check cannot be started until the gauge needles return the minimum position.





The needles sweep from the minimum position to the maximum position, then return to the minimum position.

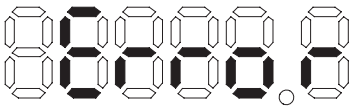
The Communication Line Check:

In the self-diagnosis mode, and after the odo/trip LCD Segments Check, the self-diagnosis starts the Communication Line Check.
If all segments comes on, the communication line is OK.
If the word "Error" is indicated, there is a malfunction in the communication line between the gauge assembly, the multiplex control unit, and the ECM/PCM. Go to Multiplex System Troubleshooting (see page 22A-231).

Normal:



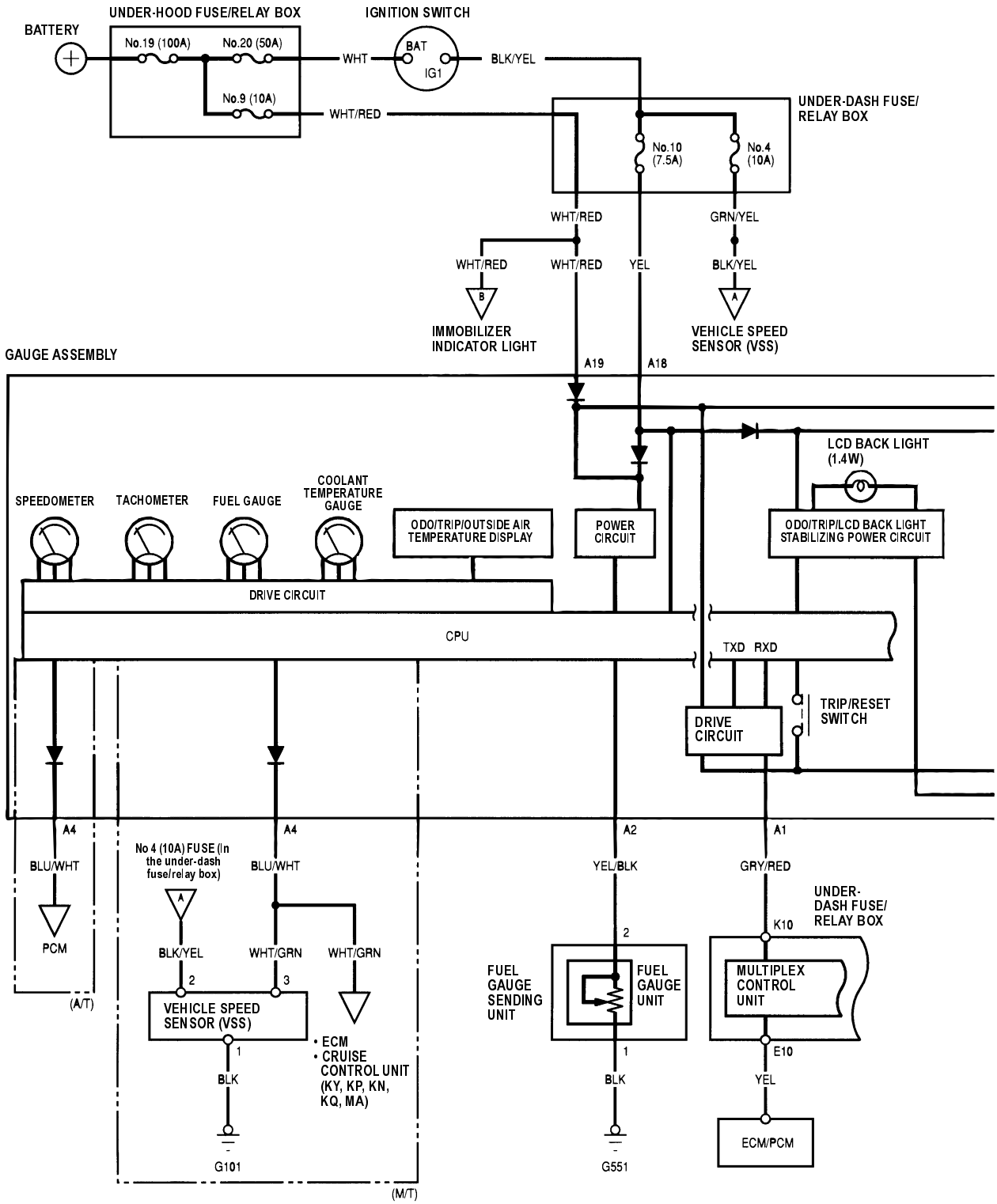
Faulty:



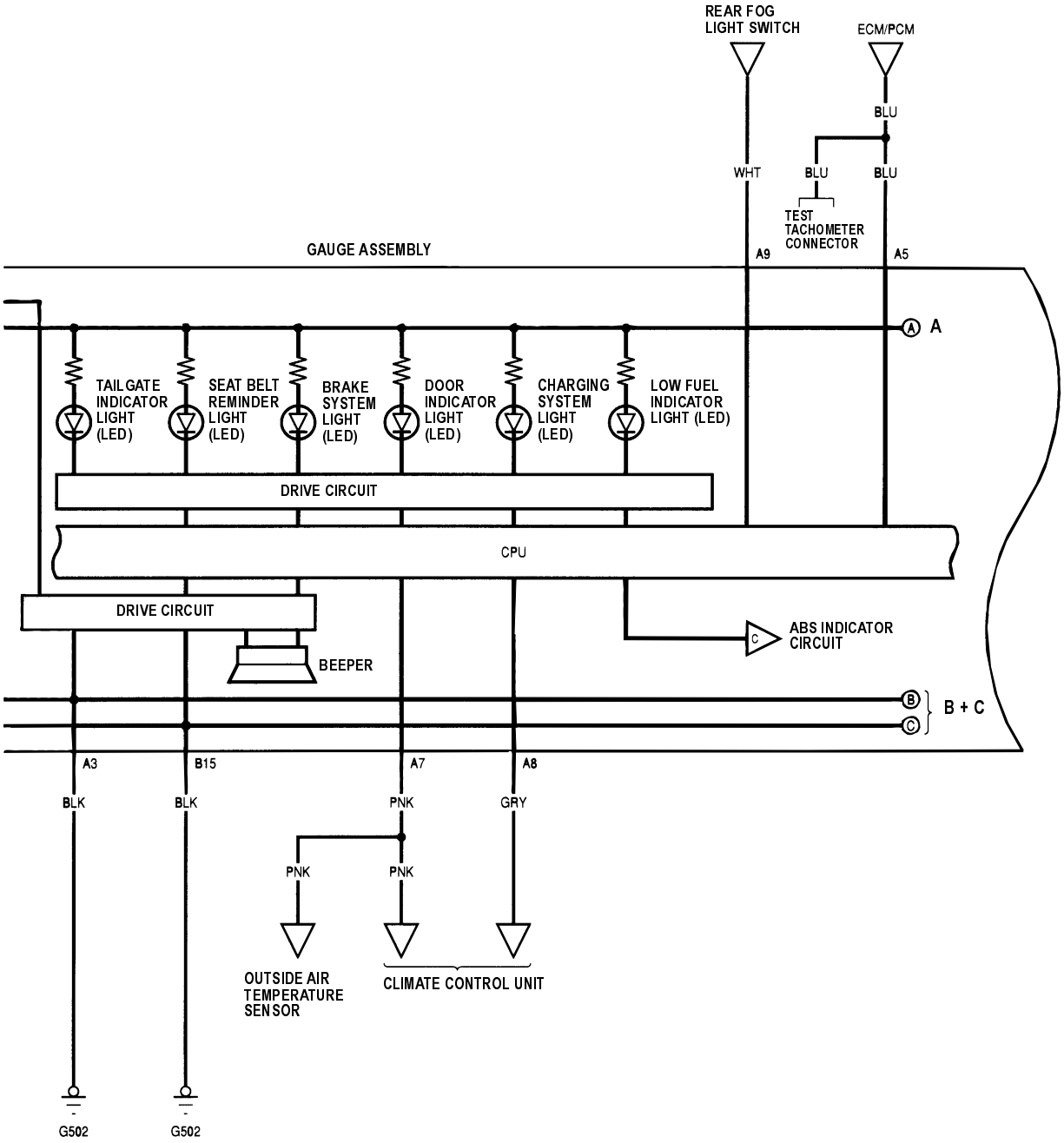
Ending the self-diagnosis function:

Turn the ignition switch OFF.
Note: If the vehicle speed exceeds 1.2 mph (2 km/h), the self-diagnosis function ends.

Circuit Diagram



Circuit Diagram (cont'd)

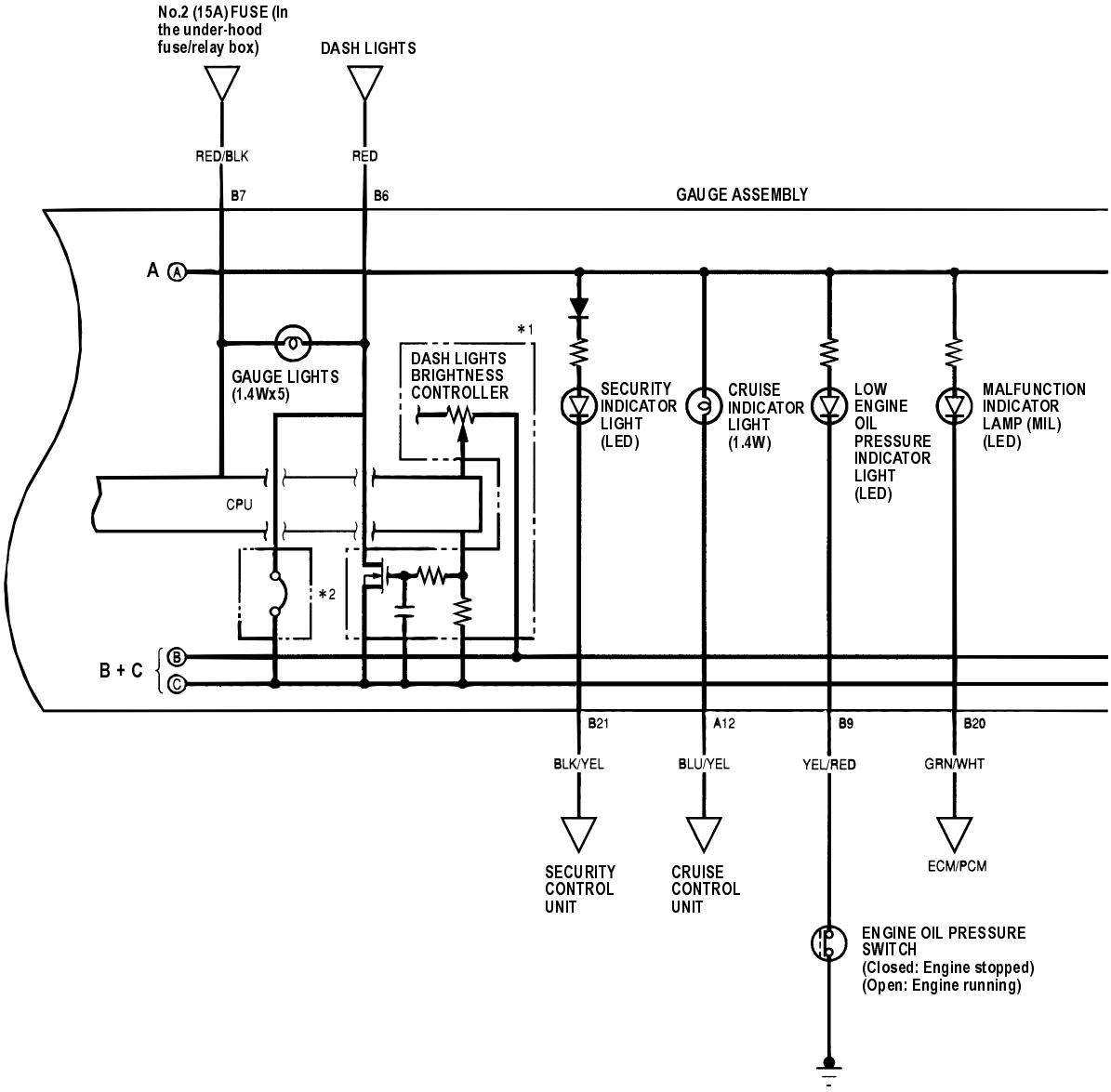


A To page 22A-70

B + C To page 22A-70

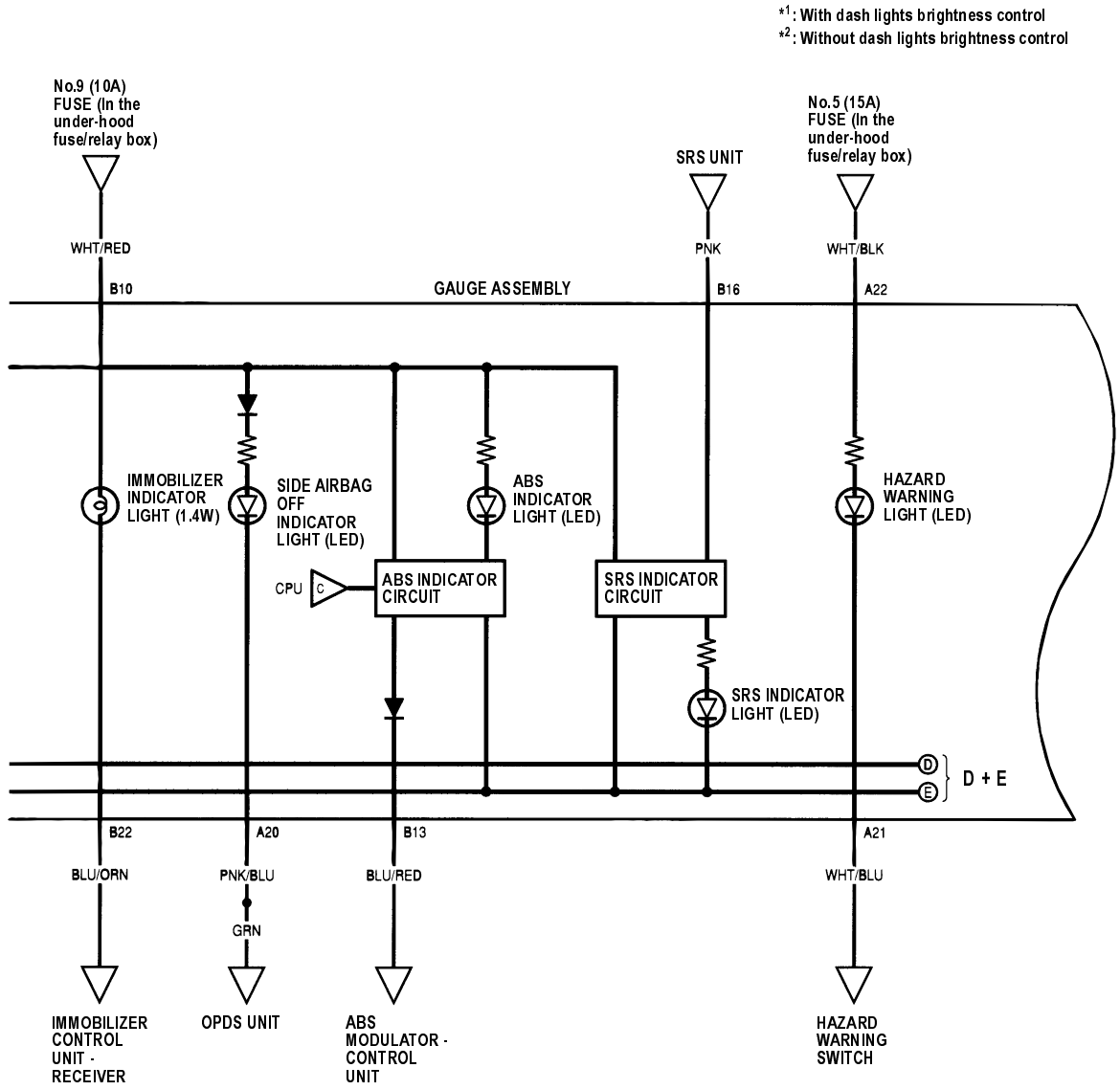
(cont'd)

Circuit Diagram (cont'd)



A From page 22A-69
B + C From page 22A-69

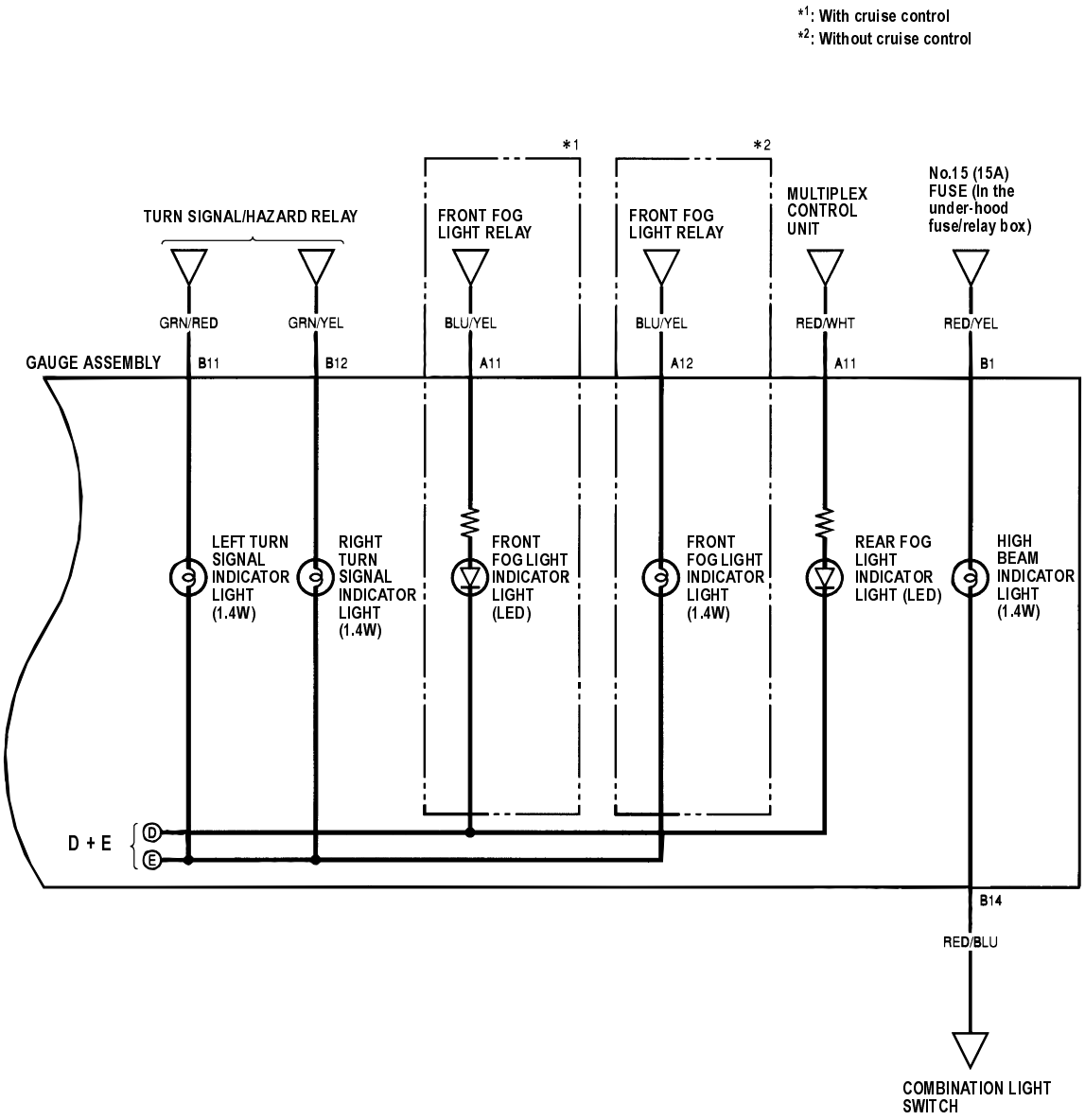
Circuit Diagram (cont'd)



D + E To page 22A-72

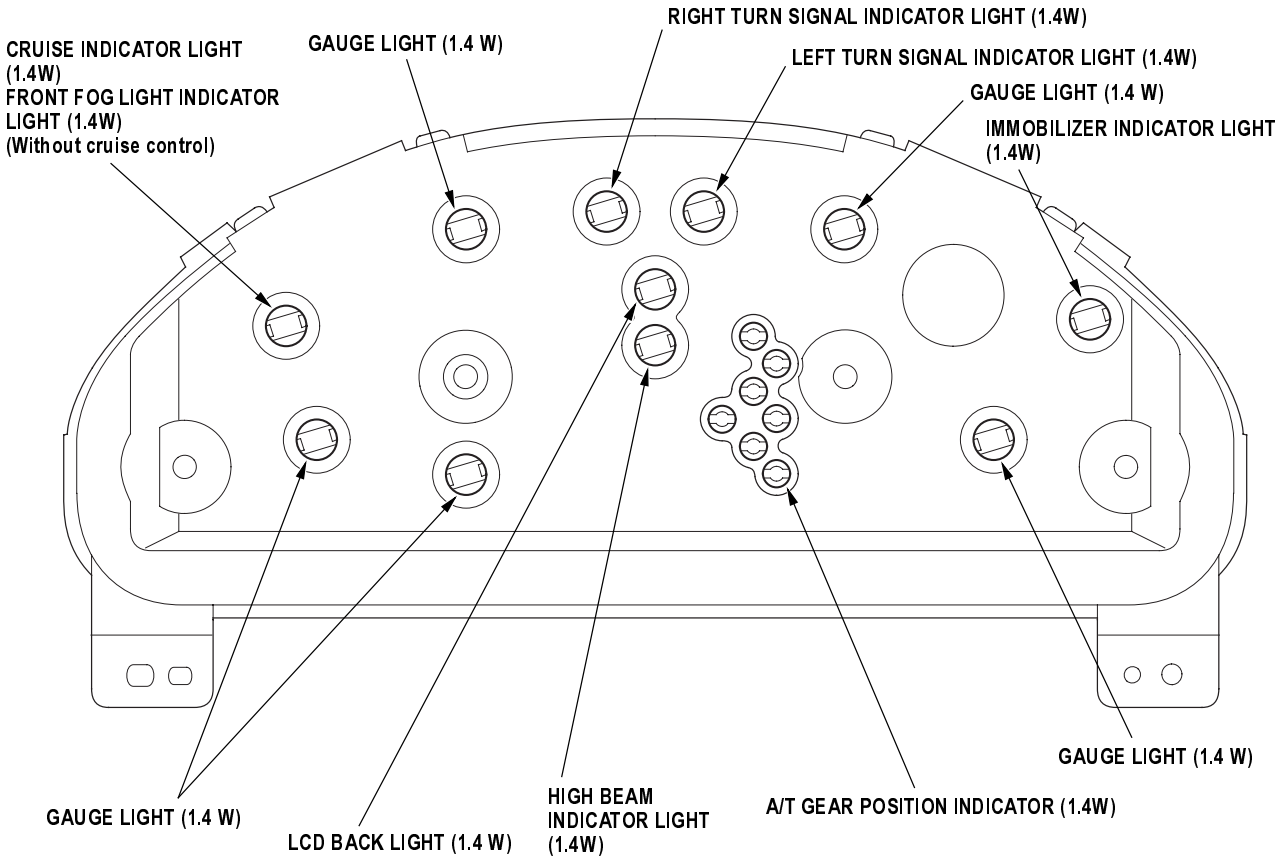
(cont'd)

Circuit Diagram (cont'd)



D + E From page 22A-71

Gauge Bulb Replacement

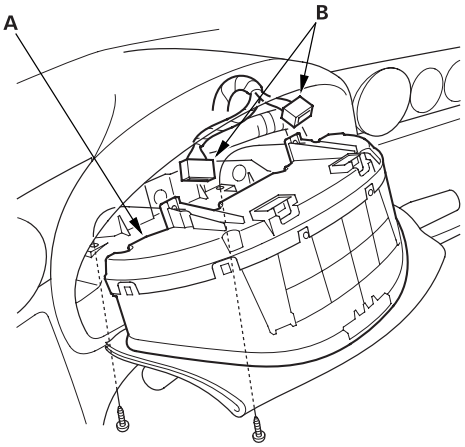


Gauge Assembly Replacement

1. Remove the driver's dashboard lower cover (see page 20-88), then remove the instrument panel (see page 20-87).

   Place a clean shop towel under the gauge assembly to prevent scratching the steering column or dashboard.

2. Remove the three mounting screws from the gauge assembly (A).



3. Disconnect the connectors (B), and remove the gauge assembly.
4. Install the gauge assembly in the reverse order of removal.

Coolant Temperature Gauge Troubleshooting

Before testing, check the No. 9 (10A) fuse in the under-hood fuse/relay box and the No. 10 (7.5A) fuse in the under-dash fuse/relay box.

1. Start the engine, and check the malfunction indicator lamp (MIL).

   Does the MIL come on and stay on?

   Yes Troubleshoot the cause of the ECM/PCM DTC (see page 11-62), and recheck.

   No Go to step 2.

2. Check for a multiplex control unit DTC (see page 22A-231).

   Is a DTC indicated?

   Yes Troubleshooting the cause of the multiplex control unit DTC (see page 22A-231), and recheck.

   No Go to step 3.

3. Do the communication line check with the self-diagnosis procedure (see page 22A-66).

   Is the word "Error" indicated on the odo/trip display?

   Yes The gauge cannot receive the signal from the multiplex control unit and the ECM/PCM. Check for an open in the GRY/RED wire (gauge connector terminal A1).

   No Go to step 4.

4. Do the gauge drive circuit check with the self-diagnosis procedure (see page 22A-66).

   Does the temperature gauge needle sweep from the minimum position to the maximum, then return to the minimum position?

   Yes Go to step 5.

   No Replace the gauge assembly.■

5. Substitute a known-good ECM/PCM, and recheck.

   Did the symptom/indication go away?

   Yes Replace the ECM/PCM.

   No Substitute a known-good gauge assembly. If the symptom/indication goes away, replace the gauge assembly.■

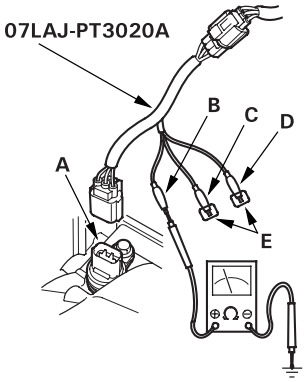
Vehicle Speed Signal Circuit Troubleshooting

Special Tools Required:
Test Harness 07LAJ-PT3020A

M/T:

Before testing, inspect the No. 4 (10A) and No. 10 (7.5A) fuses in the under-dash fuse/relay box.

1. Disconnect the 3P connector from the vehicle speed sensor (VSS) (A).



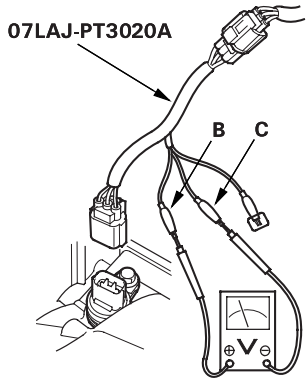
2. Connect the test harness only to the engine wire harness.
3. Connect the RED test harness clip (B) to the positive probe of an ohmmeter. Cover the white (C) and green (D) test harness leads with protective tape (E).
4. Check for continuity between the RED test harness clip and body ground.

   Is there continuity?

   Yes Go to step 5.

   No Repair open in the BLK wire between the VSS and G101.■

5. Connect the WHT test harness clip (B) to the positive probe of a voltmeter, and connect the RED test harness clip (C) to the negative probe.



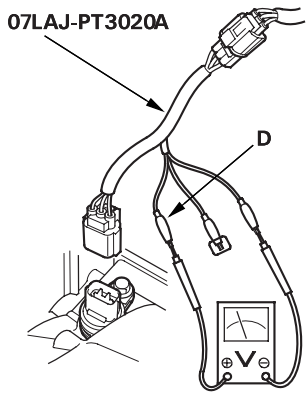
6. Turn the ignition switch ON (II).

   Is there battery voltage?

   Yes Go to step 7.

   No Repair open in the BLK/YEL wire between the VSS and the under-dash fuse/relay box.■

7. Disconnect the WHT test harness clip (B).
8. Connect the GRN test harness clip (D) to the positive probe of a voltmeter.



   Is there 5 V or battery voltage?

   Yes Go to step 9.

   No Repair short or open in the BLU/WHT [WHT/GRN] wire between the VSS and the ECM.■

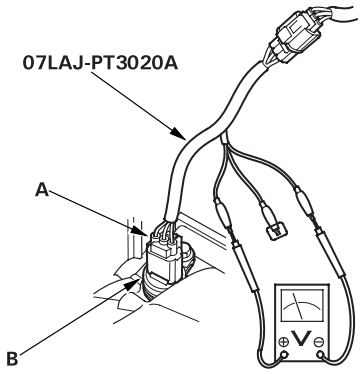
(cont'd)

Vehicle Speed Signal Circuit Troubleshooting (cont'd)

M/T: (cont'd)

9. Turn the ignition switch OFF.

10. Connect the other test harness connector (A) to the VSS (B).



11. Raise the front of the vehicle, and make sure it is securely supported.

12. Put the vehicle in neutral with the ignition switch ON (II).

13. Slowly rotate one wheel with the other wheel blocked.

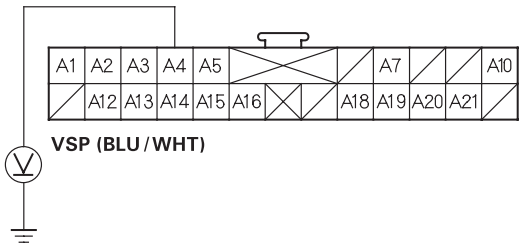
Does the voltage pulse from 0 to about 5 V or battery voltage?

Yes Go to step 14.

No Replace the VSS.■

14. Disconnect the 22P connector "A" from the gauge assembly.

GAUGE ASSEMBLY CONNECTOR A (22P)



Wire side of female terminals

15. Touch the voltmeter positive probe to the gauge assembly A4 terminal, and connect the negative prove to body ground.

16. Slowly rotate one wheel with the other wheel blocked.

Does the voltage pulse from 0 to about 5 V or battery voltage?

Yes Replace the speedometer assembly.■

No Repair open in the BLU/WHT [WHT/GRN] wire between the VSS and the speedometer.■

A/T:

Before testing, check the No. 9 (10A) fuse in the under-hood fuse/relay box and the No. 10 (7.5A) fuse in the under-dash fuse/relay box.

1. Start the engine, and check the malfunction indicator lamp (MIL).

   Does the MIL come on and stay on?

   Yes Troubleshoot the PCM DTC (see page 11-62), and recheck.

   No Go to step 2.

2. Check the multiplex control unit DTC (see page 22A-231).

   Is the DTC indicated?

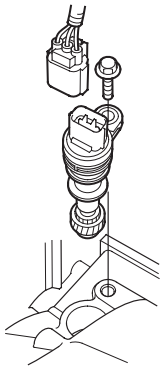
   Yes Troubleshoot the DTC (see page 22A-231), and recheck.■

   No Inspect the connector and socket terminals of the gauge assembly connectors. If the terminals look OK, substitute a known-good gauge assembly and reset. If the problem is fixed, replace the gauge assembly. If the problem is not fixed, replace the PCM.■

VSS Replacement

M/T only:

1. Remove the air cleaner (see page 11-182).
2. Disconnect the 3P connector from the vehicle speed sensor (VSS).



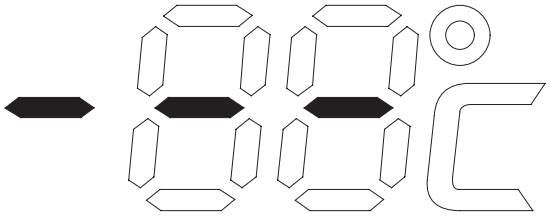
3. Remove the mounting bolt, then remove the VSS.
4. Install the VSS in the reverse order of removal.

Outside Air Temperature Indicator Test

NOTE: To test the outside air temperature sensor (see page 21-90).

Troubleshooting:

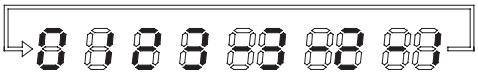
If the indicator displays ”- - -” for more than 2 seconds after selecting the outside air temperature display mode, check for an open in the wire between the gauge and the outside air temperature sensor.



Calibration:

The outside air temperature indicator’s displayed temperature can be recalibrated ± 3° to meet the customer's expectations.

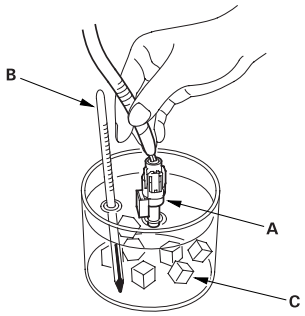
1. Turn the ignition switch ON (II).
2. Push and hold the trip/reset switch for 10 seconds. While you continue to hold the button, the display will scroll through temperature settings from +3° to -3° as shown.



3. When the desired correction value appears on the display, release the buttons, and the recalibrated outside air temperature will be displayed.

   If the outside temperature indicator display is off by more than 3 degrees of the desired value, turn the ignition switch OFF and repeat steps 1-3.

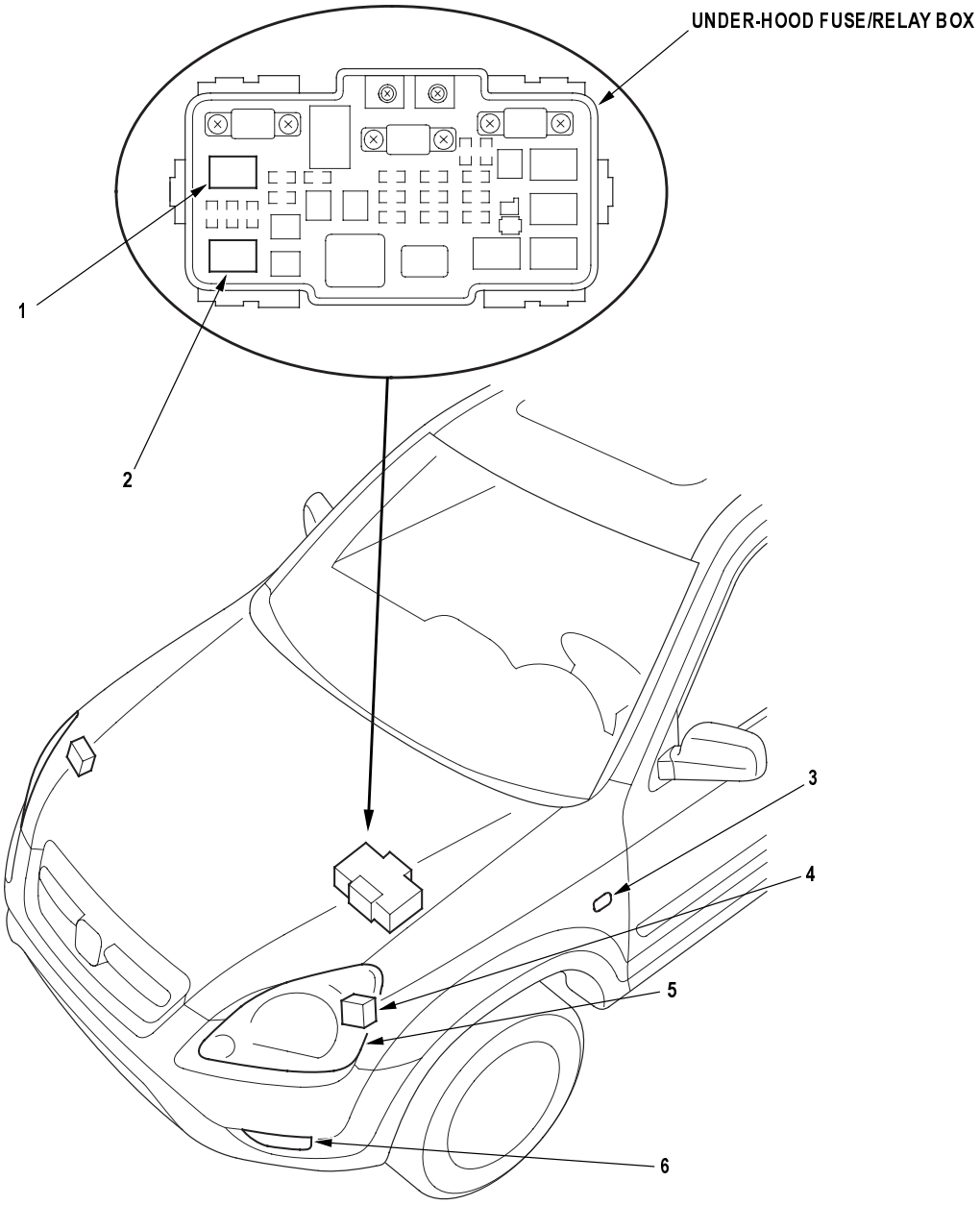
   NOTE: To recalibrate the display to the true temperature, remove the outside air temperature sensor (A), but leave it connected. Submerge the sensor and a thermometer (B) in a container of ice water (C). Select the calibration mode as described above, then recalibrate the display to the true temperature.



Exterior Lights

Component Location Index

NOTE: LHD type is shown, RHD type is similar.

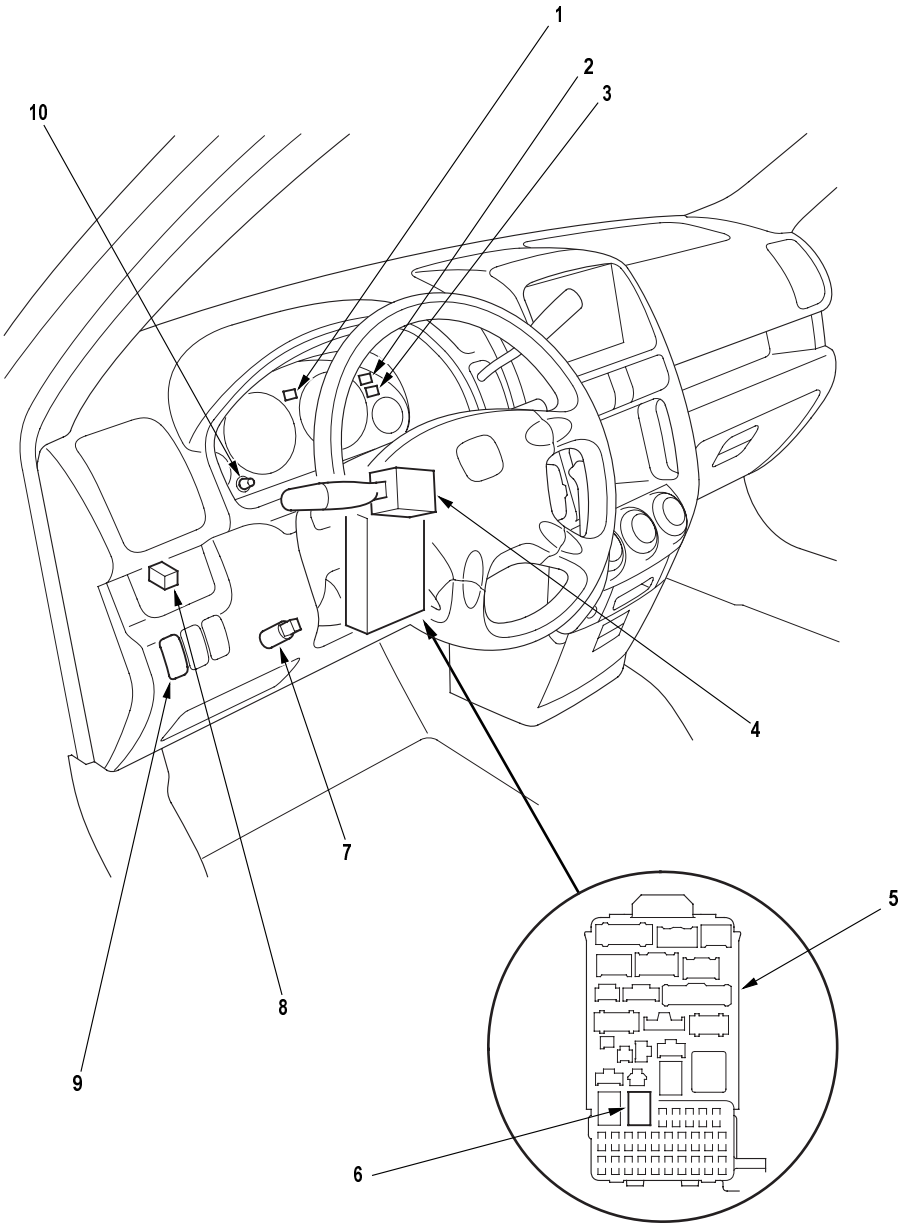


1	HEADLIGHT RELAY 2 (LEFT)	Test, page 22A-60
2	HEADLIGHT RELAY 1 (RIGHT)	Test, page 22A-60
3	SIDE TURN SIGNAL LIGHT	Replacement, page 22A-101
4	HEADLIGHT ADJUSTER UNIT	Troubleshooting, page 22A-94
5	• HEADLIGHTS	Replacement, page 22A-96; Adjustment, page 22A-96; Damaged Headlight Alignment Pin Procedure, page 22A-97
	• FRONT PARKING LIGHT	
	• FRONT TURN SIGNAL/SIDE MARKER LIGHT	
6	FRONT FOG LIGHT	Replacement, page 22A-100; Adjustment, page 22A-100

(cont'd)

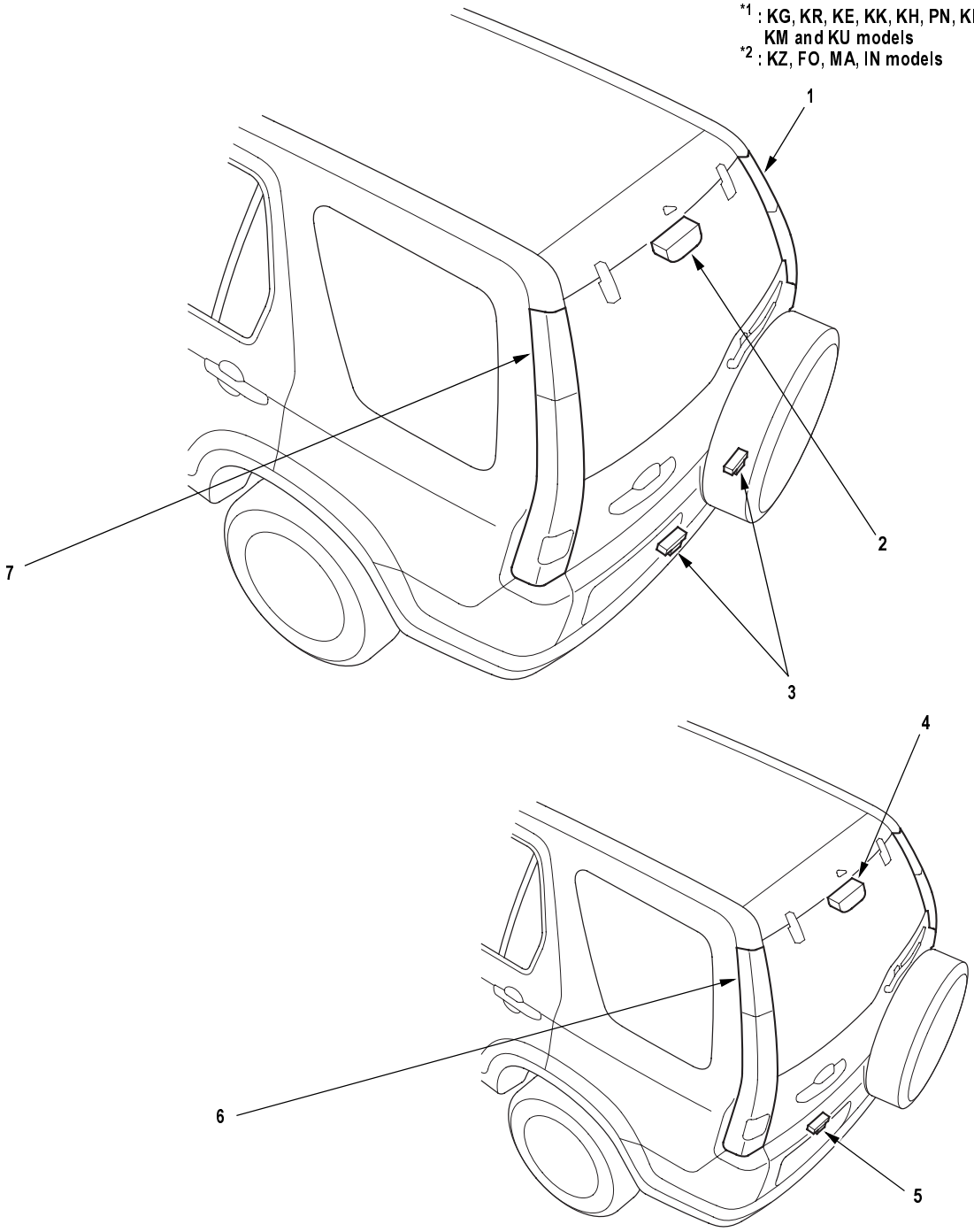
Component Location Index (cont'd)

NOTE: LHD type is shown, RHD type is similar.



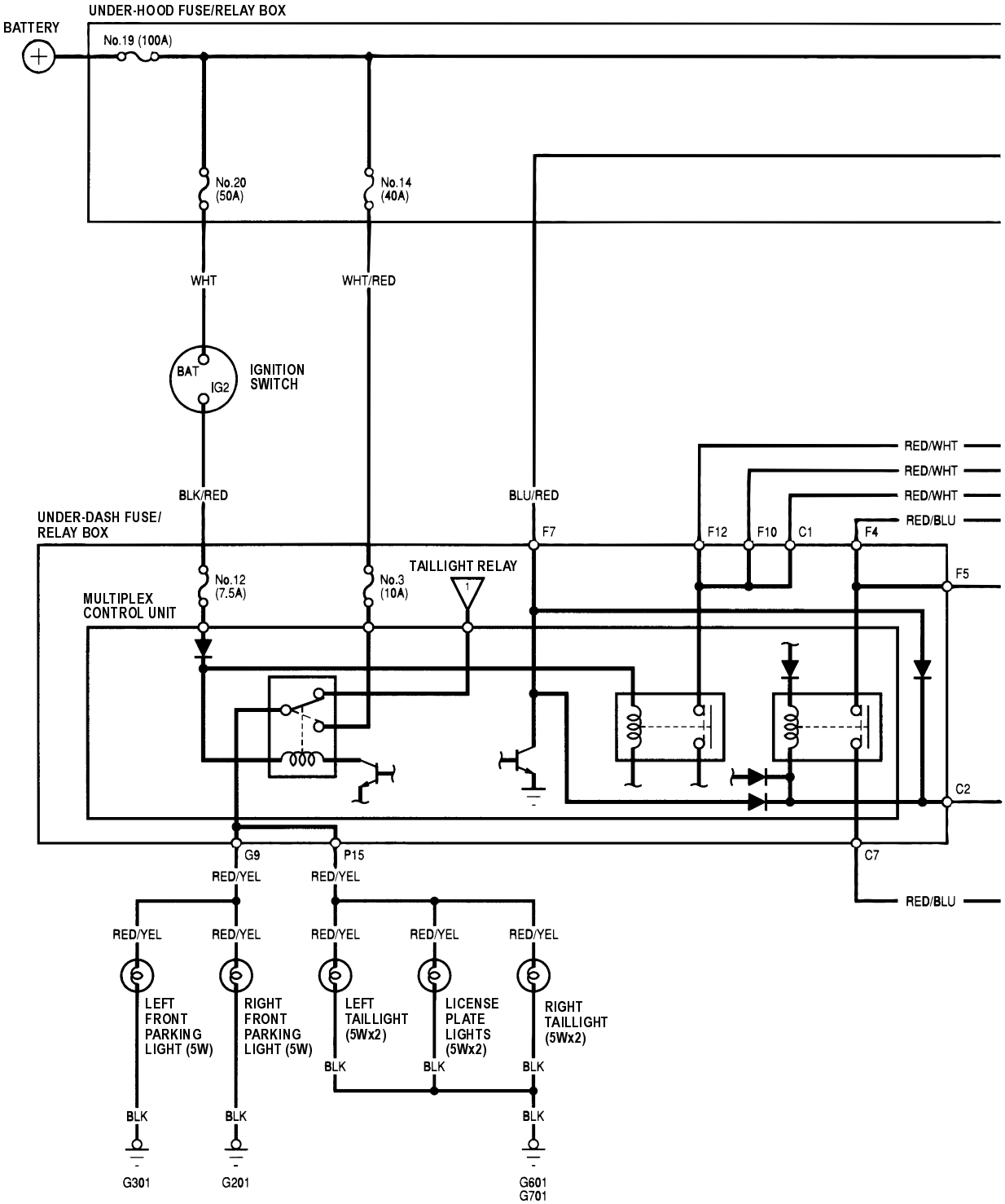
1	HIGH BEAM INDICATOR LIGHT	Bulb Replacement, page 22A-73
2	REAR FOG LIGHT INDICATOR LIGHT	
3	FRONT FOG LIGHT INDICATOR LIGHT	Bulb Replacement, page 22A-73
4	• COMBINATION LIGHT SWITCH	Test, page 22A-92; Replacement, page 22A-92
	• FRONT FOG LIGHT SWITCH	Test, page 22A-92
	• REAR FOG LIGHT SWITCH	Test, page 22A-92
5	UNDER-DASH FUSE/RELAY BOX	
6	TAILLIGHT RELAY	Test, page 22A-60
7	BRAKE PEDAL POSITION SWITCH	Test, page 22A-99
8	FRONT FOG LIGHT RELAY	Test, page 22A-60
9	HEAD LIGHT ADJUSTER SWITCH	Test, page 22A-95
10	DASH LIGHTS BRIGHTNESS CONTROLLER	

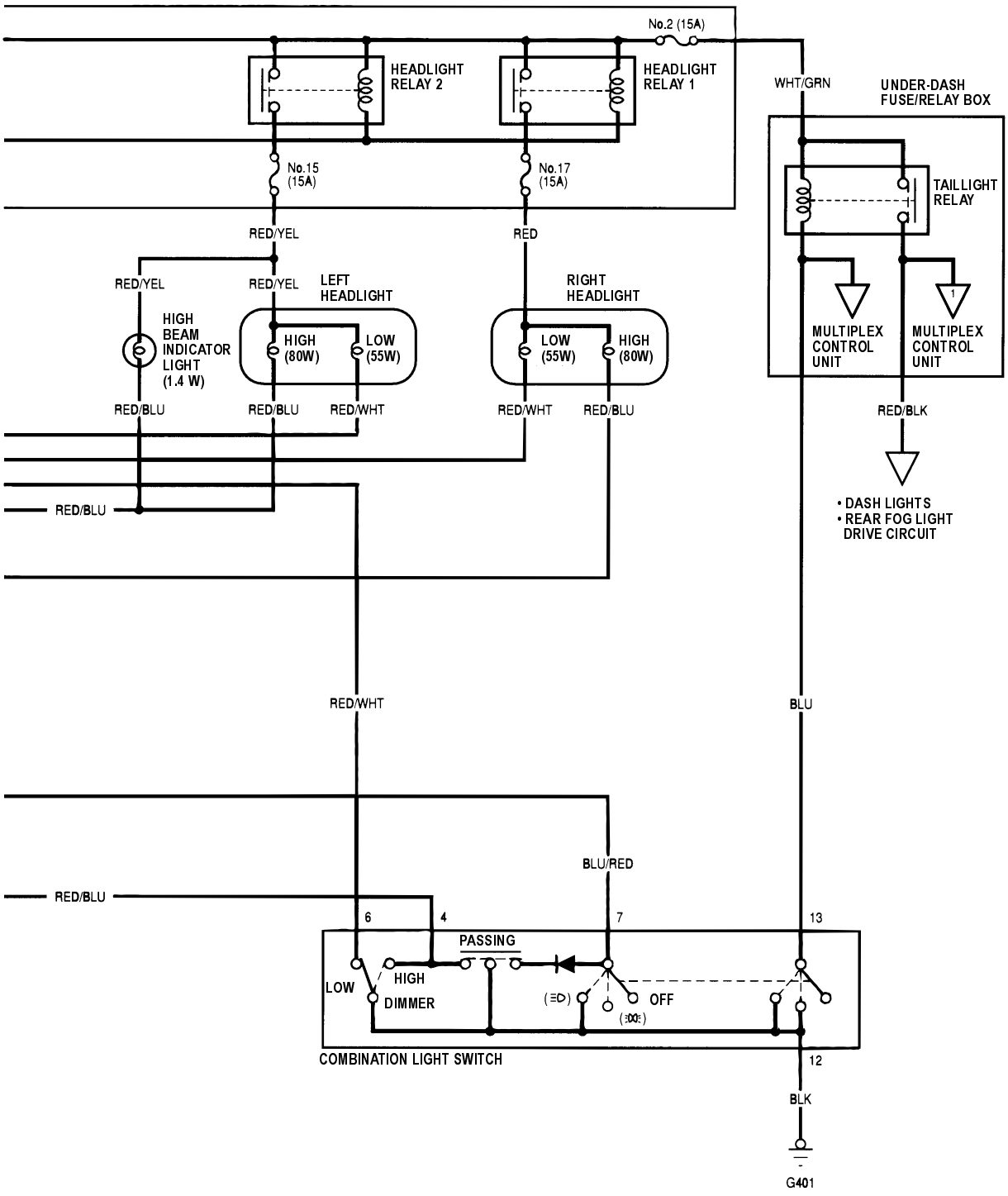
*1 : KG, KR, KE, KK, KH, PN, KN, KW, KP, KQ, KT, KY, KM and KU models
*2 : KZ, FO, MA, IN models



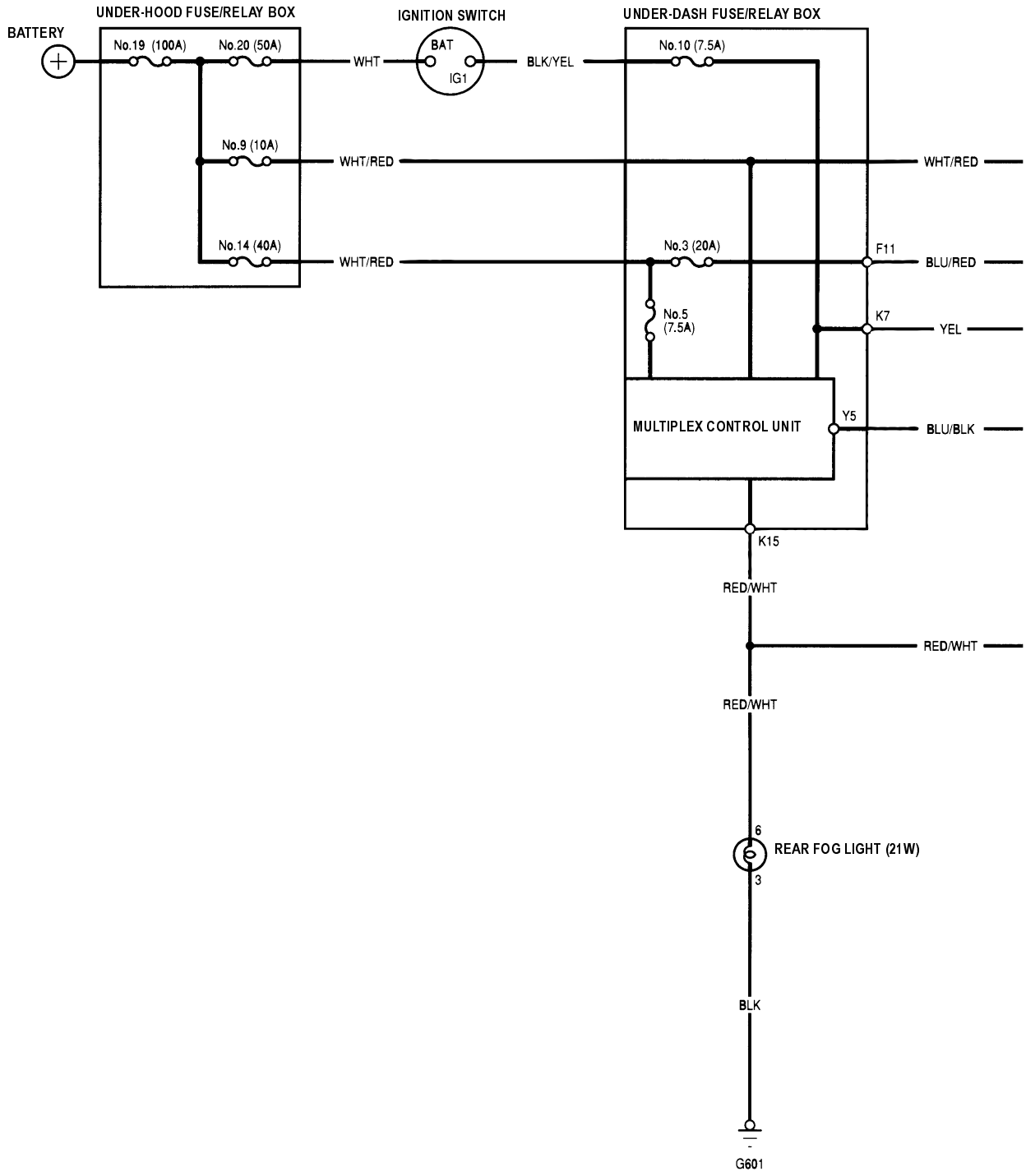
1	• TAILLIGHT/BRAKE LIGHT	Replacement, page 22A-98	6	• TAILLIGHT/BRAKE LIGHT	Replacement, page 22A-98
	• REAR TURN SIGNAL LIGHT	Replacement, page 22A-98		• REAR TURN SIGNAL LIGHT	Replacement, page 22A-98
	• BACK-UP LIGHT	Replacement, page 22A-98		• BACK-UP LIGHT	Replacement, page 22A-98
	• REAR FOG LIGHT (RHD type)	Replacement, page 22A-98	7	• TAILLIGHT/BRAKE LIGHT	Replacement, page 22A-98
2	HIGH MOUNT BRAKE LIGHT	Replacement, page 22A-98		• REAR TURN SIGNAL LIGHT	Replacement, page 22A-98
3	LICENSE PLATE LIGHTS*1	Replacement, page 22A-99		• BACK-UP LIGHT	Replacement, page 22A-98
4	HIGH MOUNT BRAKE LIGHT	Replacement, page 22A-98		• REAR FOG LIGHT (LHD type)	Replacement, page 22A-98
5	LICENSE PLATE LIGHT*2	Replacement, page 22A-99			

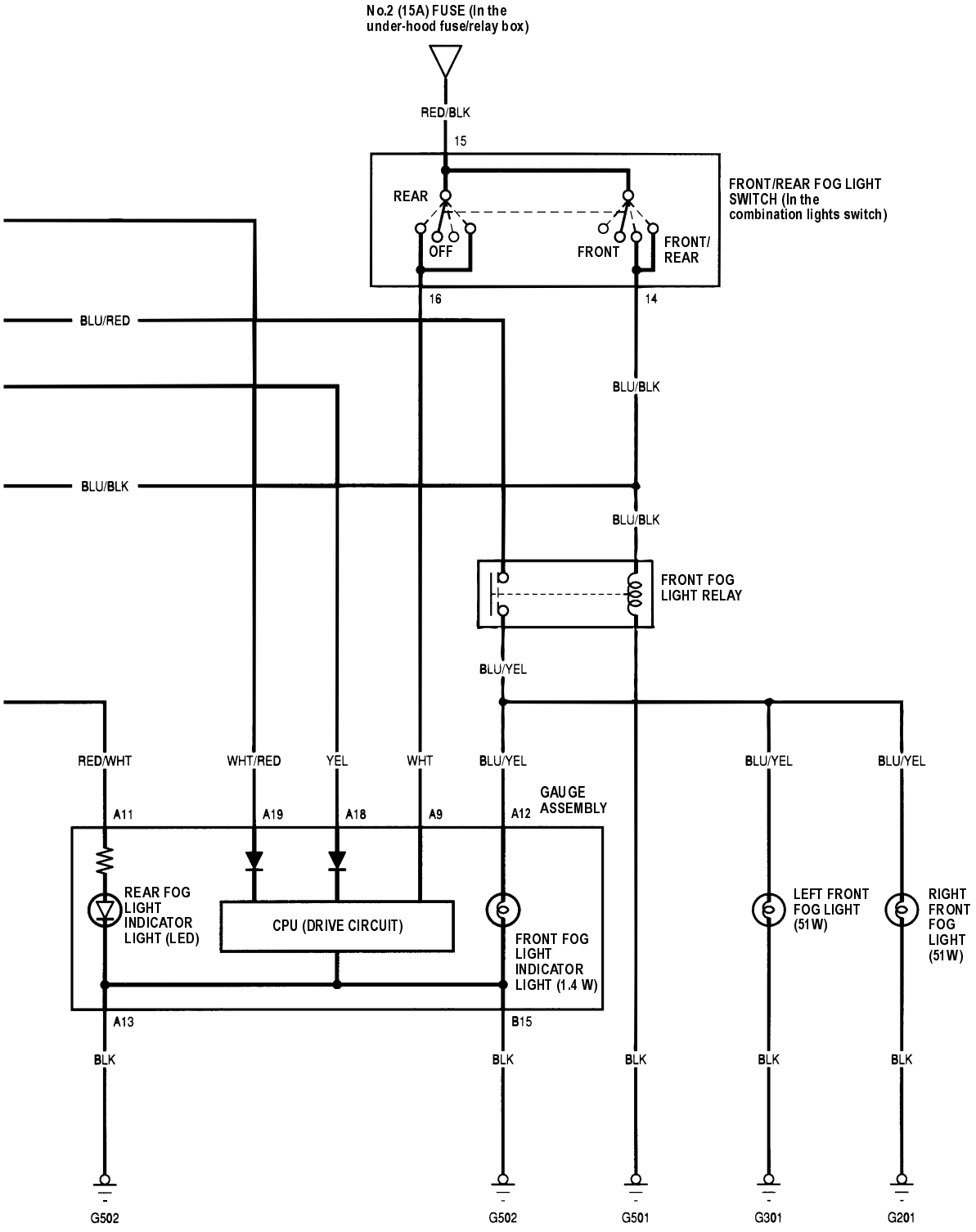
Circuit Diagram - With Daytime Running Lights



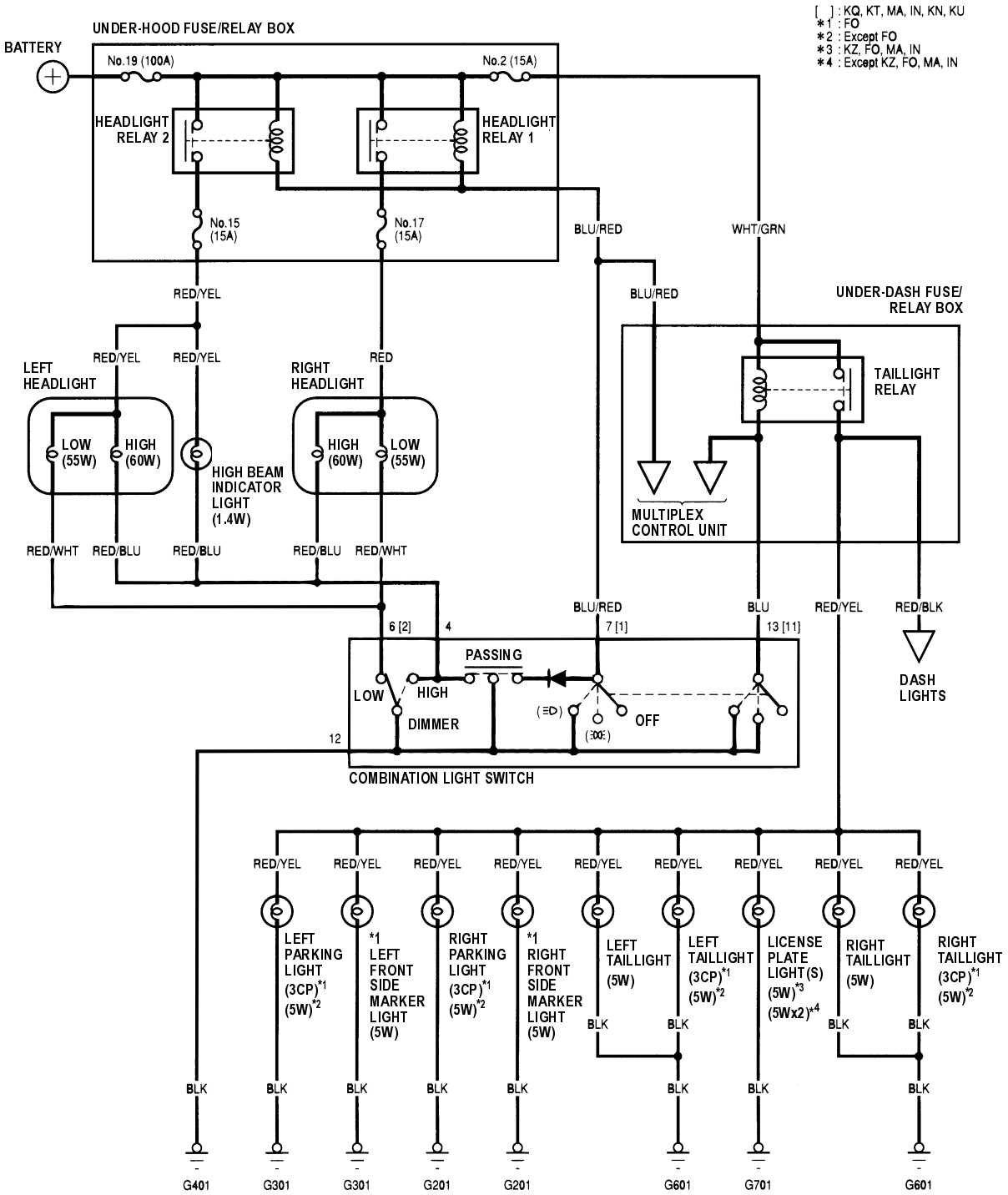

No.2 (15A)
HEADLIGHT RELAY 2
HEADLIGHT RELAY 1
WHT/GRN
UNDER-DASH FUSE/RELAY BOX
No.15 (15A)
No.17 (15A)
TAILLIGHT RELAY
RED/YEL
RED
RED/YEL
RED/YEL
LEFT HEADLIGHT
RIGHT HEADLIGHT
HIGH BEAM INDICATOR LIGHT (1.4 W)
HIGH (80W)
LOW (55W)
LOW (55W)
HIGH (80W)
MULTIPLEX CONTROL UNIT
MULTIPLEX CONTROL UNIT
RED/BLU
RED/BLU
RED/WHT
RED/WHT
RED/BLU
RED/BLK
• DASH LIGHTS
• REAR FOG LIGHT DRIVE CIRCUIT
RED/BLU
RED/WHT
BLU
BLU/RED
RED/BLU
6
4
7
13
PASSING
LOW
HIGH
DIMMER
OFF
COMBINATION LIGHT SWITCH
12
BLK
G401

Circuit Diagram - Front/Rear Fog Lights

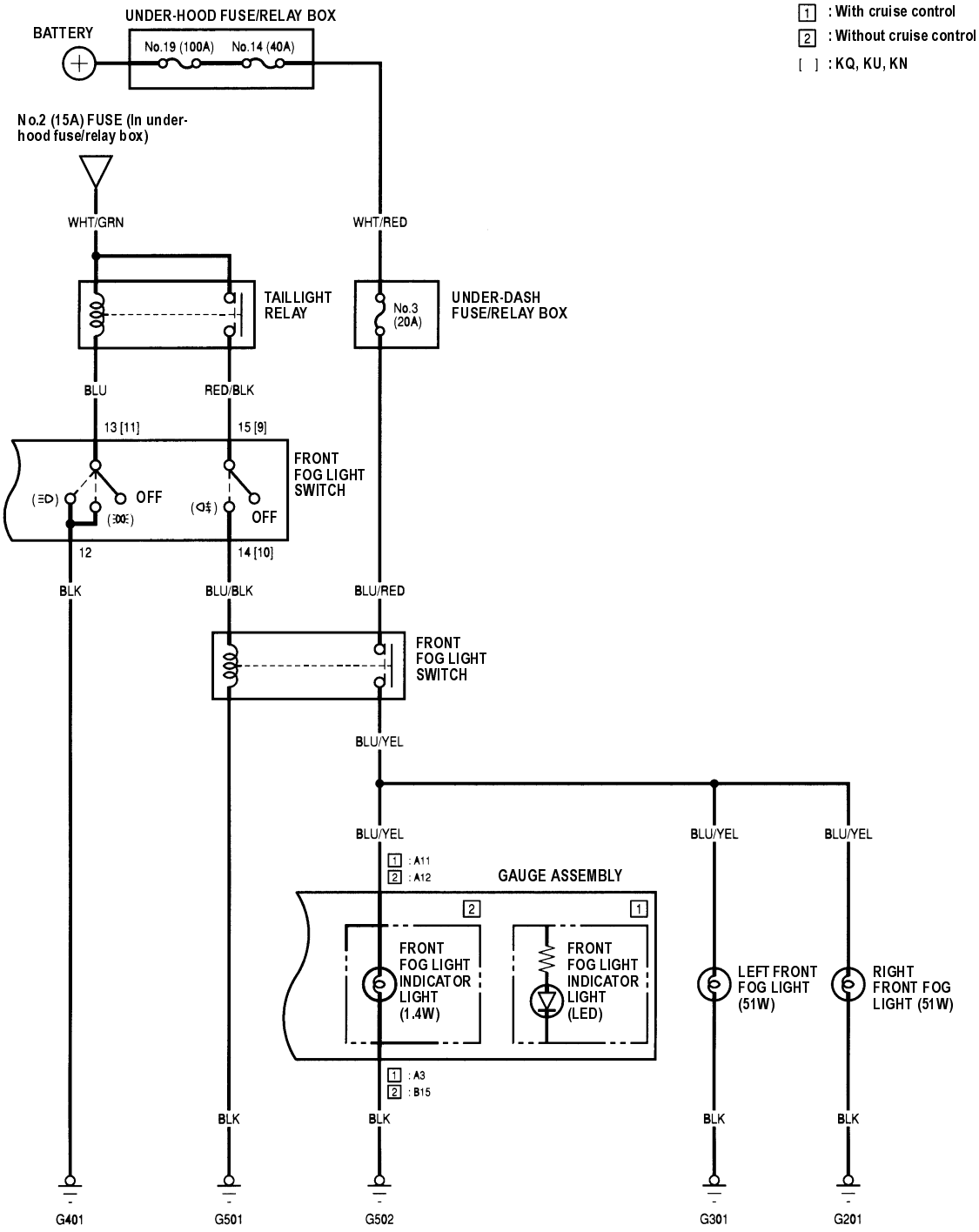



No.2 (15A) FUSE (In the under-hood fuse/relay box)
RED/BLK
15
REAR
OFF
FRONT
FRONT/ REAR
FRONT/REAR FOG LIGHT SWITCH (In the combination lights switch)
16
14
BLU/RED
BLU/BLK
BLU/BLK
BLU/BLK
FRONT FOG LIGHT RELAY
BLU/YEL
RED/WHT
WHT/RED
YEL
WHT
BLU/YEL
BLU/YEL
BLU/YEL
GAUGE ASSEMBLY
A11
A19
A18
A9
A12
REAR FOG LIGHT INDICATOR LIGHT (LED)
CPU (DRIVE CIRCUIT)
FRONT FOG LIGHT INDICATOR LIGHT (1.4 W)
LEFT FRONT FOG LIGHT (51W)
RIGHT FRONT FOG LIGHT (51W)
A13
B15
BLK
BLK
BLK
BLK
BLK
G502
G502
G501
G301
G201

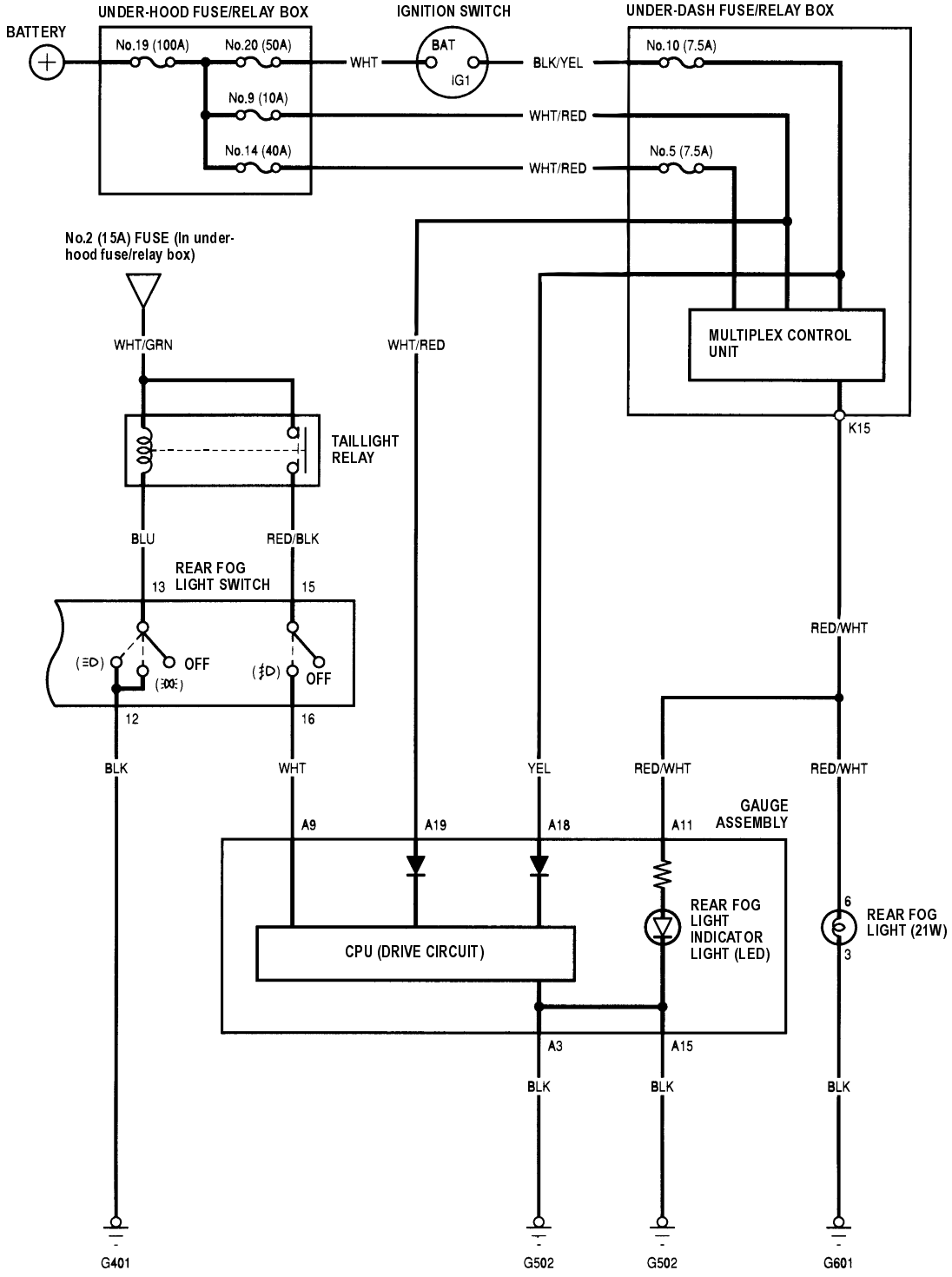
Circuit Diagram



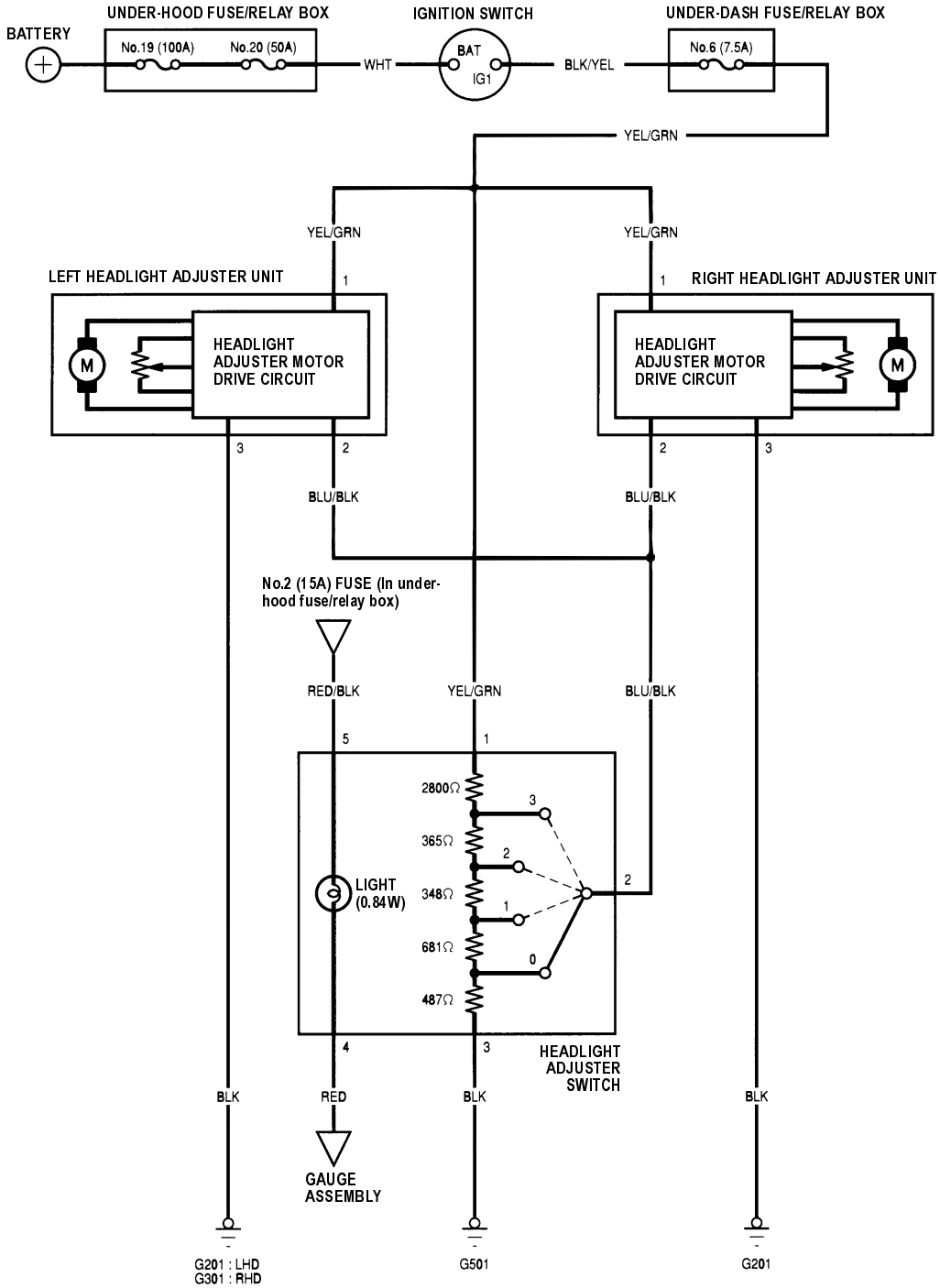
Circuit Diagram - Front Fog Lights



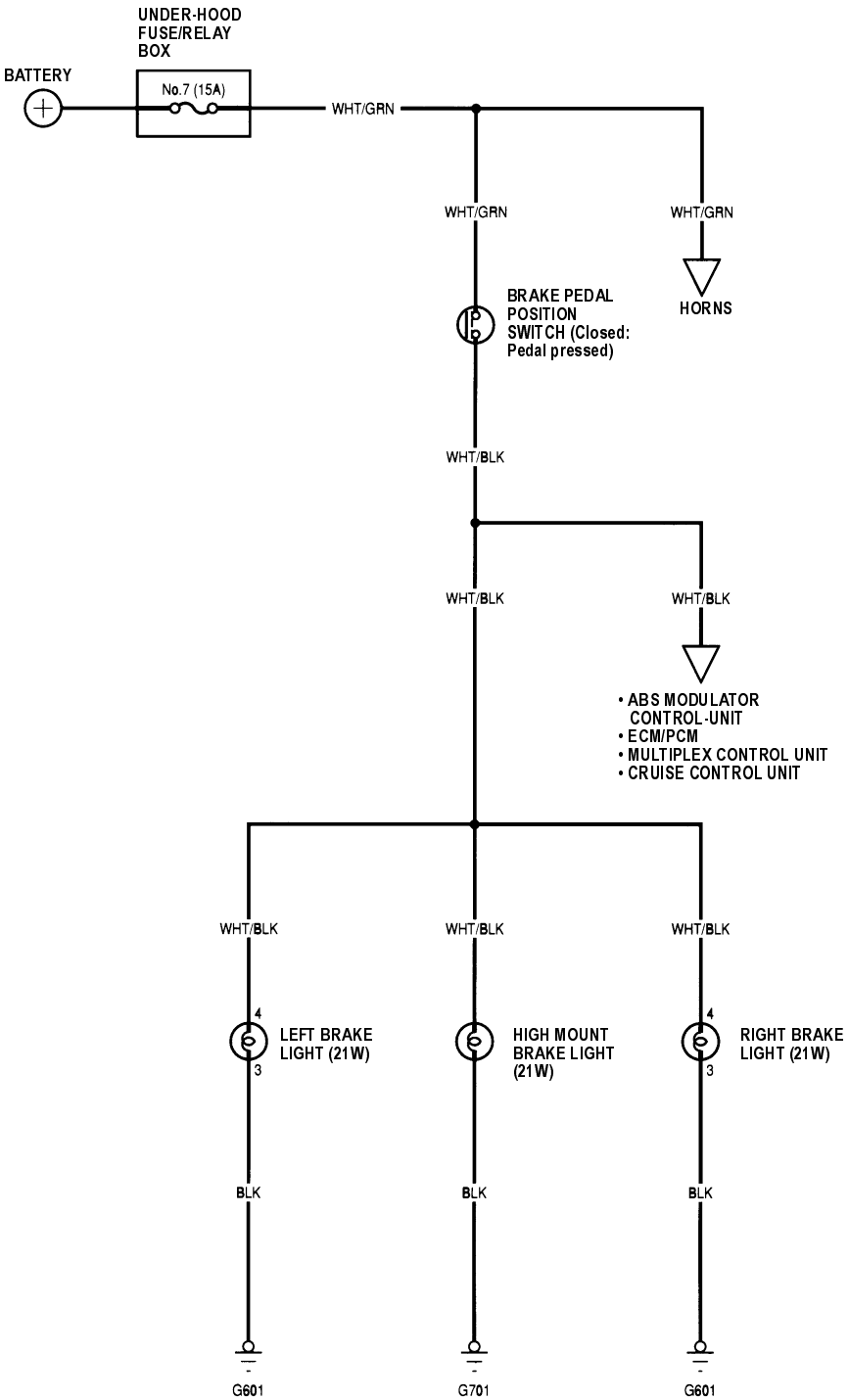
Circuit Diagram - Rear Fog Light



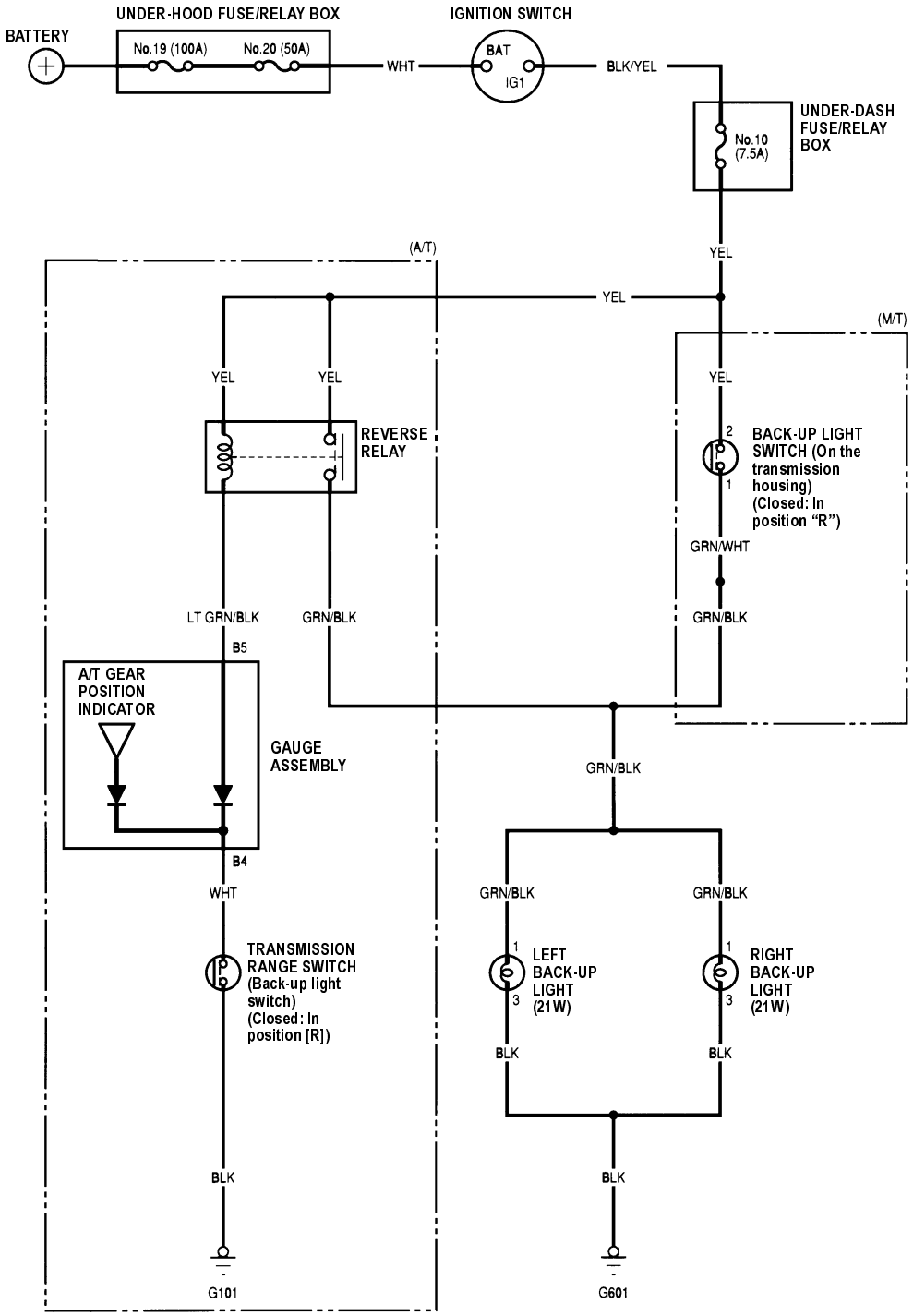
Circuit Diagram - Headlights Adjuster



Circuit Diagram - Brake Lights



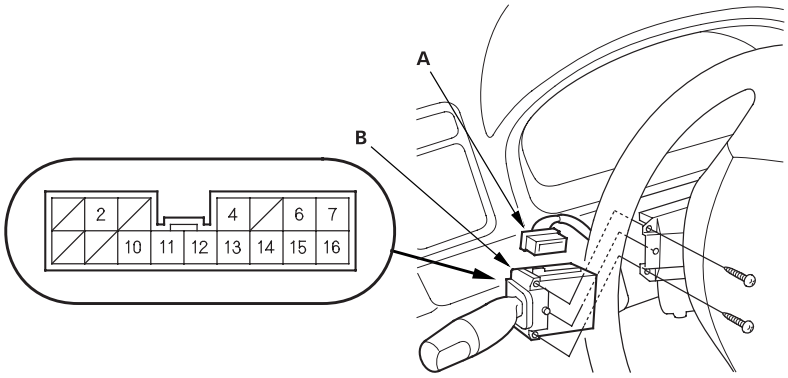
Circuit Diagram - Back-up Lights



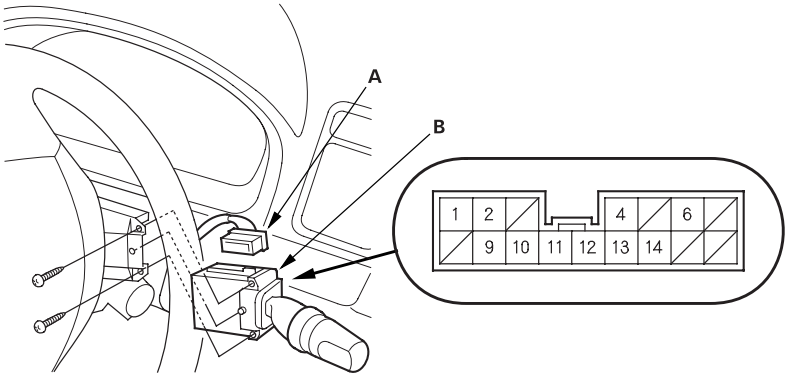
Combination Light Switch Test/Replacement

1. Remove the steering column covers (see page 17-24).
2. Disconnect the 16P connector (A) from the combination light switch (B).

LHD type and KE model:



RHD type:



3. Remove the two screws, then slide out the combination light switch.

4. Inspect the connector terminals to be sure they are all making good contact.
- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, check for continuity between the terminals in each switch position according to the tables.
  - If the continuity is not specified, replace the switch.

Light Switch:

Position \ Terminal			4	6 [2]	7 [1]		12	13 [11]
Headlight switch	OFF			○	—	—	○	
	≡00≡						○	○
	≡D	LOW		○	—	—	○	○
		HIGH	○	—	○	—	○	○
Passing switch	OFF							
	ON		○		○	▷	○	
							○	

[ ] : RHD type

Turn Signal Switch:

Position \ Terminal	2 [13]	10 [14]	11 [6]
LEFT	○	○	
NEUTRAL			
RIGHT		○	○

[ ] : RHD type

Front/Rear Fog Lights Switch:

Position \ Terminal	14	15	16
OFF			
Front ON	○	○	
Rear ON		○	○
Front/Rear ON	○	○	○

Front Fog Lights Switch:

Position \ Terminal	14 [10]	15 [9]
OFF		
ON	○	○

[ ] : RHD type

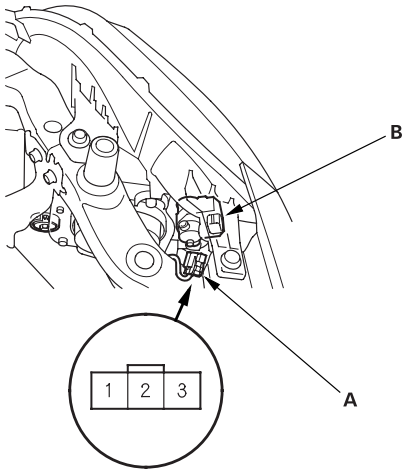
Rear Fog Lights Switch:

Position \ Terminal	15	16
OFF		
ON	○	○

Headlight Adjuster Unit Troubleshooting

NOTE: Before testing, check for a blown No. 6 (7.5A) fuse in the under-dash fuse/relay box.

1. Disconnect the 3P connector (A) from the headlight adjuster unit (B).



Wire side of female terminals

2. Check for continuity between the No. 1 terminal and body ground.

Is there continuity?

Yes Go to step 3.

No Check for these problems:■

- Repair open in the BLK wire between the headlight adjuster unit and body ground.
- Poor ground (G201, G301).

3. Check for voltage between the No. 3 terminal and body ground.

Is there battery voltage?

Yes Go to step 4.

No Repair open in the YEL/GRN wire between the headlight adjuster unit and under-dash fuse/relay box.■

4. Using an ohmmeter, measure resistance between the No. 2 terminal and body ground in position 0 of the headlight adjuster switch.

Is there about 730 Ω?

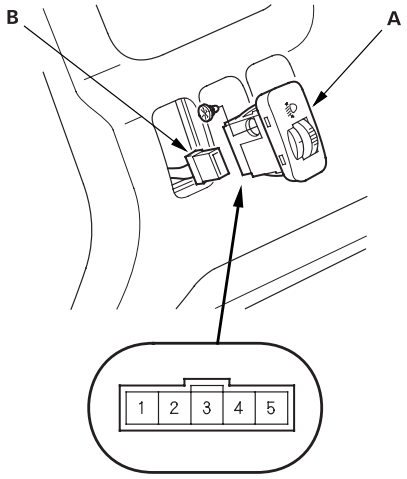
Yes Check for frozen, stuck or improperly installed the headlight adjuster unit. If the mechanical check is OK, replace the headlight adjuster unit.■

No Check for these problems:■

- An open in the BLU/BLK wire between the headlight adjuster unit and headlight adjuster switch.
- A faulty headlight adjuster switch.

Headlight Adjuster Switch Test

1. Remove the dashboard lower cover (see page 20-88).
2. Carefully push out the headlight adjuster switch (A) from behind the dashboard.



3. Disconnect the 5P connector (B) from the switch.
4. Measure resistance between the No. 1 and No. 3 terminals and No. 1 and No. 2 terminals at positions 0, 1, 2, and 3 by moving the switch knob.

Between the No. 1 and No. 3 terminals:
About 4.7 kΩ

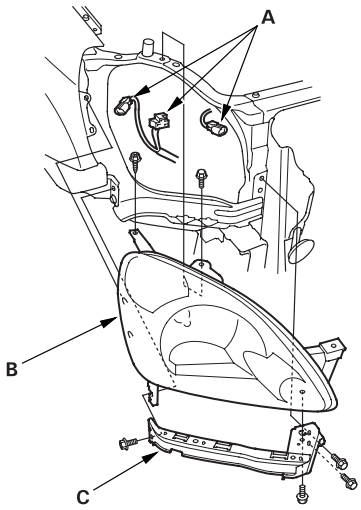
Between the No. 1 and No. 2 terminals:

Knob position	0	1	2	3
Resistance [About (kΩ)]	4.2	3.6	3.2	2.8

Headlight Replacement

1. Remove the front bumper (see page 20-130).
2. Disconnect the connectors (A) from the headlight (B).

   Headlight: 60/55 W
   Front Parking Light: 5 W or 3 CP
   Front Turn Signal Light: 21 W
   Front Turn Signal/Side Maker Light: 21 /5 W



3. Remove the screw and mounting bolts, then remove the corner upper beam (C) and headlight assembly.
4. Install in the reverse order of removal.
5. After replacement, adjust the headlights to local requirements.

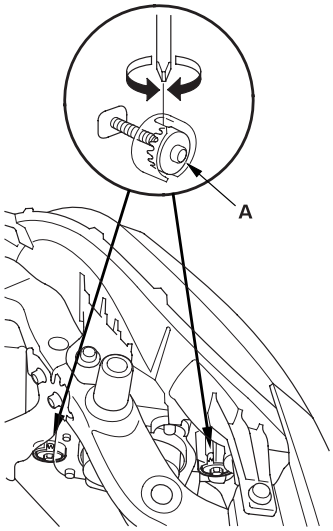
Headlight Adjustment

CAUTION

Headlights become very hot during use; do not touch them or any attaching hardware immediately after they have been turned off.

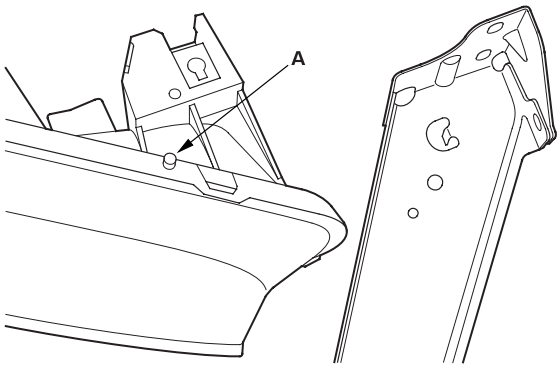
Before adjusting the headlights:
- Park the vehicle on a level surface.
- Make sure the tire pressures are correct.
- The driver or someone who weights the same should sit in the driver's seat.

Adjust the headlights to local requirements by turning the adjusters (A).

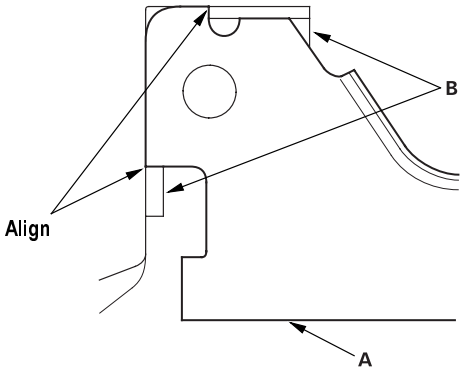


Damaged Headlight Alignment Pin Procedure

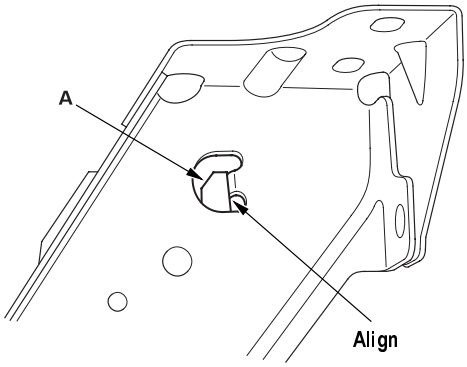
If the alignment pin (A) was broken in a collision and the headlight assembly itself was not damaged, the headlight assembly can be reused.



1. Align the corner upper beam (A) with the guides (B) on the headlight housing.



2. Align the headlight housing with the flange (A) before tightening the bolts.

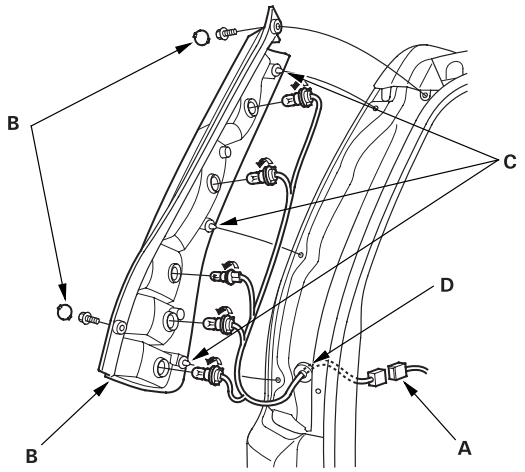


3. Reinstall the headlight assembly, and adjust the headlights to local requirements (see page 22A-86).

Taillight Replacement

1. Open the tailgate.
2. Remove the rear side trim panel (see page 20-77).
3. Disconnect the 6P connector (A) from the taillight.
4. Remove the mounting bolt covers from the taillight.
5. Remove the mounting bolts from the taillight.

Brake/Taillight:	**21/5 W**
Back-up Light:	**21 W**
Rear Turn Signal Light:	**21 W**
Taillight:	**5 W or 3 CP**
Rear Fog Light:	**21 W**



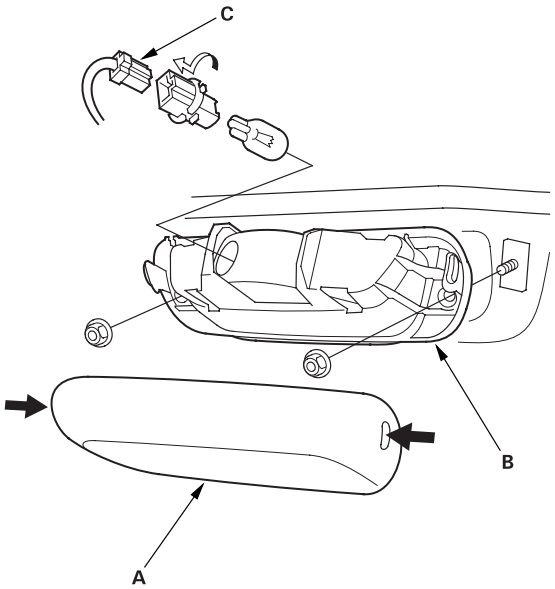
6. Pull the taillight away from the body to disengage the three clips (C).
7. Remove the taillight harness grommet (D) from the body.

   Pull the harness and the 6P connector out of the body, and disconnect the connector. Remove the taillight.
8. Turn the bulb socket 45° counterclockwise to remove the bulb socket.
9. Install the taillight in the reverse order of removal and run water over it to make sure it does not leak.

High Mount Brake Light Replacement

1. Push in on the clips, and remove the cover (A) from the housing (B).

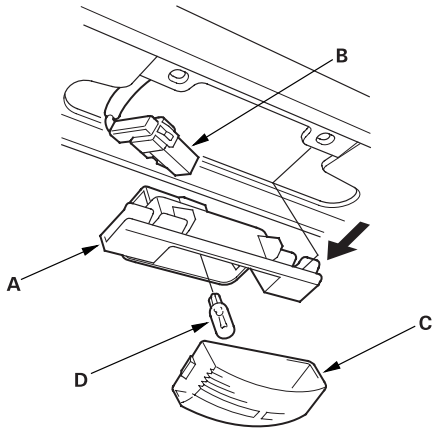
   High Mount Brake Light Bulb: 21 W
2. Disconnect the 2P connector (C).
3. Remove the mounting nuts and the housing.
4. Install the high mount broke light in the reverse order of removal.



License Plate Light Replacement

1. Remove the license plate light (A) from the rear bumper.

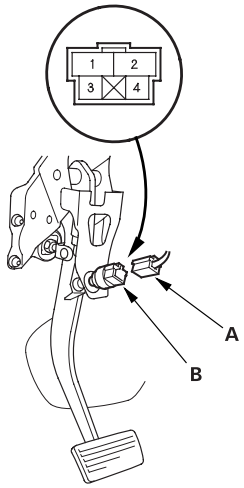
   License Plate Light Bulb: 5 W



2. Disconnect the 2P connector (B) from the light.
3. Take the lens (C) off, then remove the bulb (D).
4. Install the light in the reverse order of removal.

Brake Pedal Position Switch Test

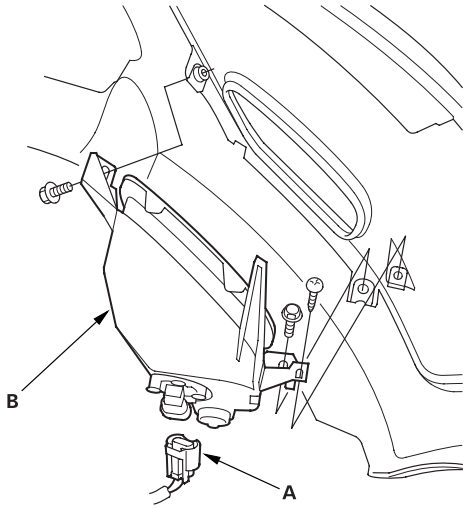
1. Remove the driver's dashboard lower cover (see page 20-88).
2. Disconnect the 4P connector (A) from the brake pedal position switch (B).



3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity when the brake pedal is pressed.
   - There should be no continuity when the brake pedal is released.
4. Check for continuity between the No. 3 and No. 4 terminals (with cruise control).
   - There should be no continuity when the brake pedal is pressed.
   - There should be continuity when the brake pedal is released.
5. If necessary, adjust or replace the switch, or adjust the pedal height (see page 19A-5).

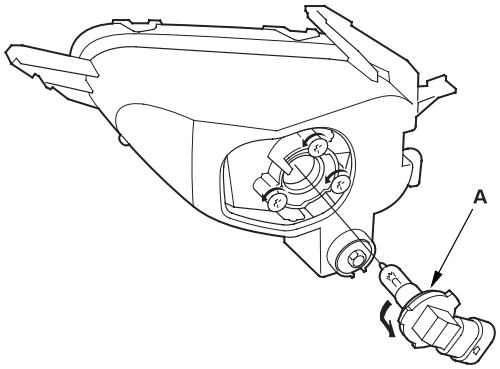
Front Fog Lights Replacement

1. Remove the front bumper (see page 20-130).
2. Disconnect the 2P connector (A) from the front fog light.
3. Remove the screw and mounting bolts from the front fog light (B).



4. Turn the bulb socket (A) 45° counterclockwise to remove the bulb.

Front Fog Light: 51 W



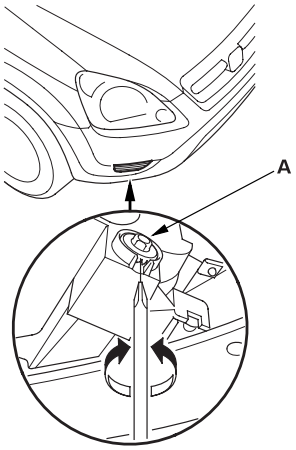
5. Install the light in the reverse order of removal.

Front Fog Lights Adjustment

Before adjusting the fog lights:

- Park the vehicle on a level surface.
- Make sure the tire pressures are correct.
- The driver or someone who weights the same should sit in the driver's seat.

Adjust the fog lights to local requirements by turning the adjuster (A).

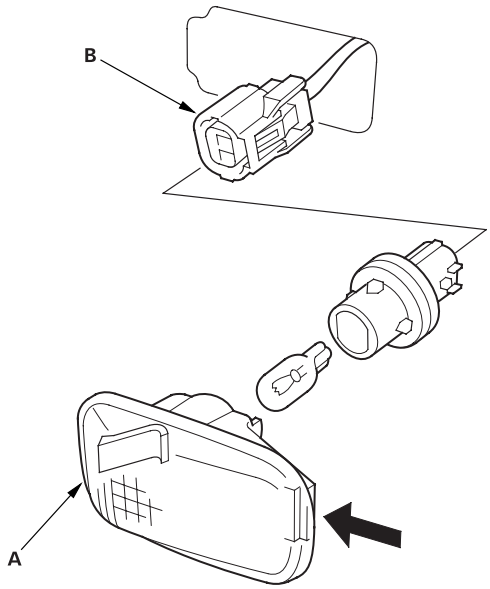


Side Turn Signal Lights Replacement

NOTE: Be careful not to damage the fender.

1. Push the retaining spring, and remove the side turn signal light (A).

   Side Turn Signal Light: 5W

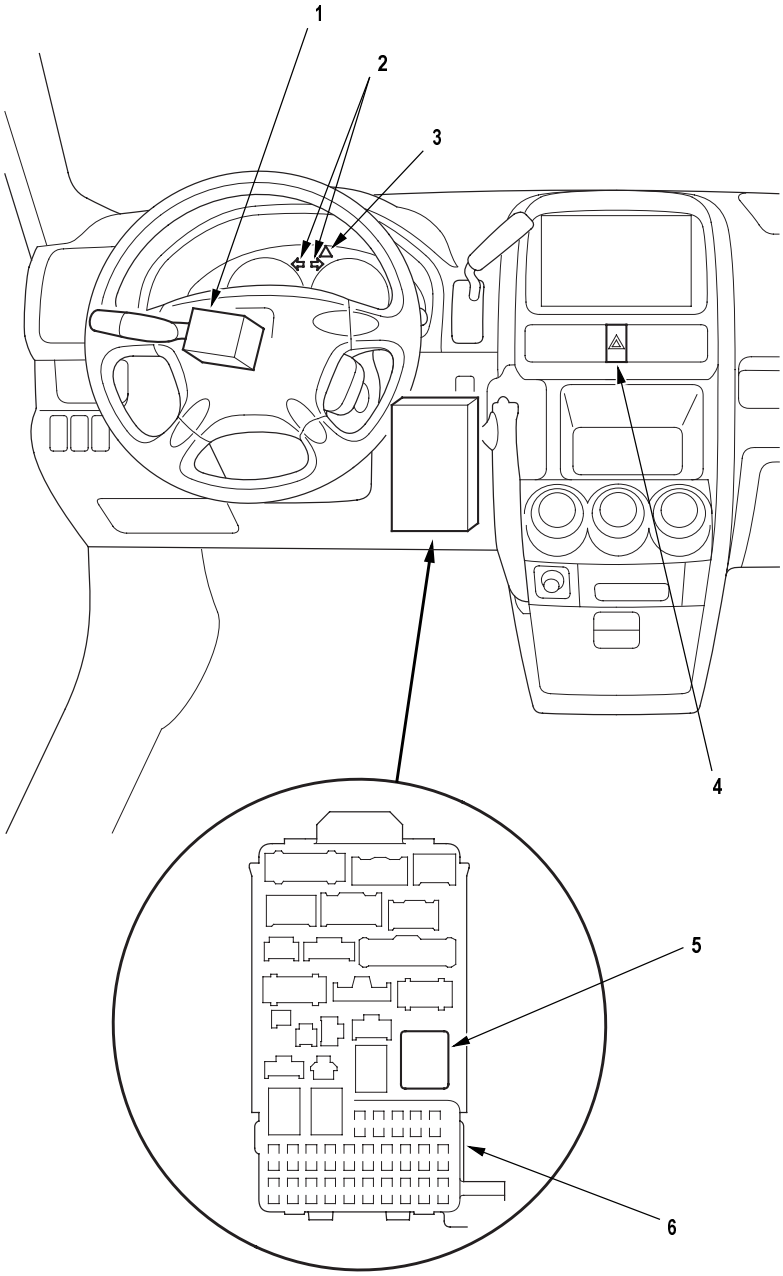


2. Disconnect the 2 P connector (B) from the light.

Turn Signal/Hazard Flasher

Component Location Index

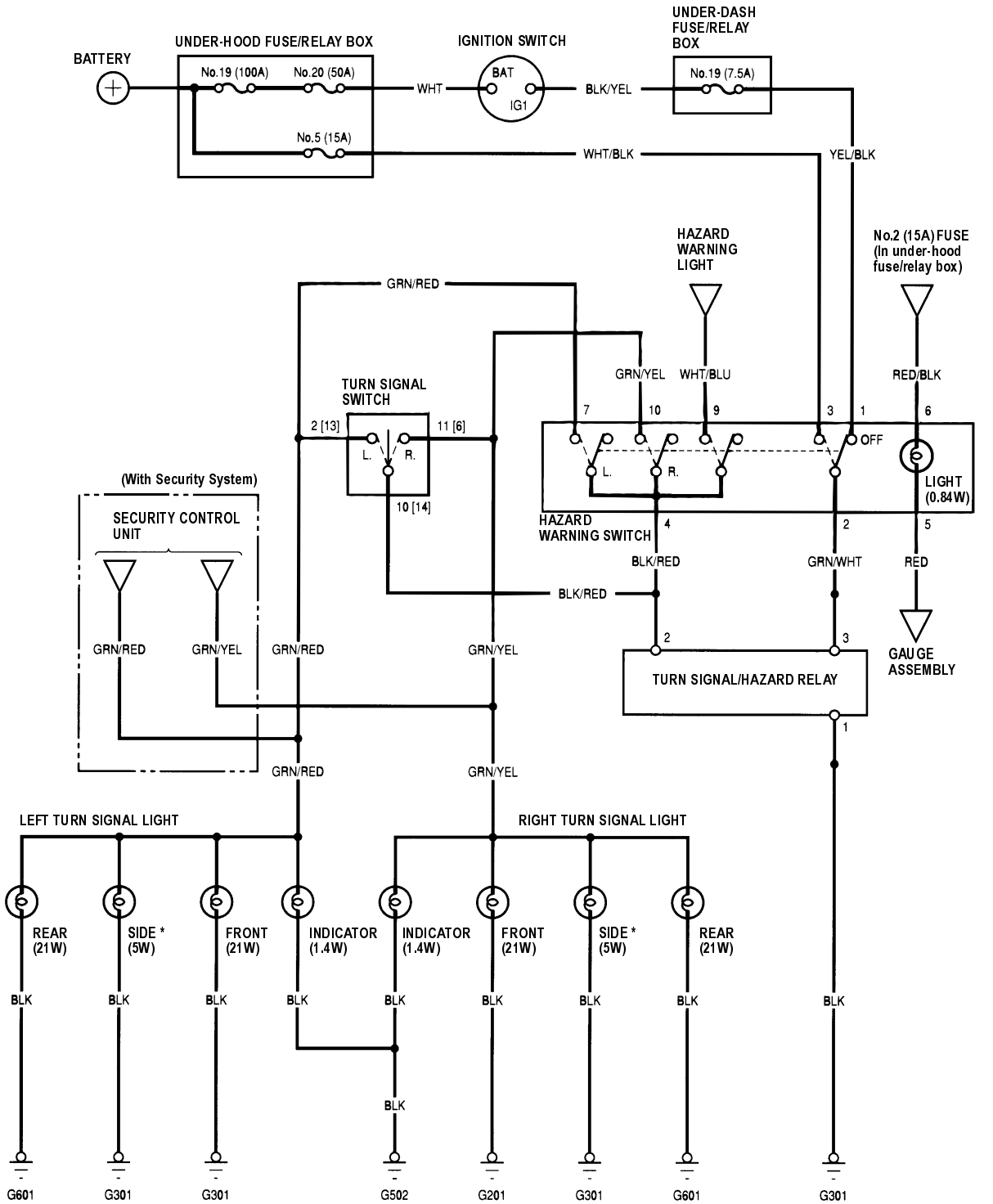
Note: LHD type is shown, RHD type is similar.



1	COMBINATION LIGHT/TURN SIGNAL SWITCH	Test, page 22A-92
2	TURN SIGNAL INDICATOR LIGHTS (In the gauge assembly)	Gauge Bulb Replacement, page 22A-73
3	HAZARD WARNING LIGHT (KM and KP models)	
4	HAZARD WARNING SWITCH	Test, page 22A-105
5	TURN SIGNAL/HAZARD RELAY	Input Test, page 22A-104
6	UNDER-DASH FUSE/RELAY BOX	

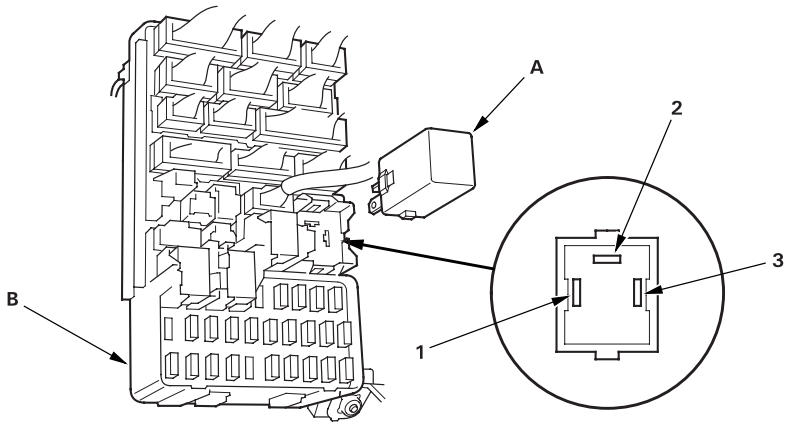
Circuit Diagram

* : Except FO



Turn Signal/Hazard Relay Input Test

1. Remove the turn signal/hazard relay (A) from the under-dash fuse/relay box (B).



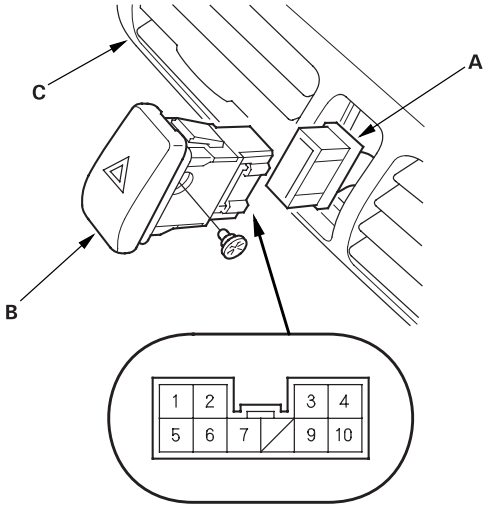
2. Inspect the relay and fuse/relay box socket terminals to be sure they are all making good contact.
- If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, go to step 3.

3. Make these input tests at the fuse/relay box.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the turn signal/hazard relay must be faulty; replace it.

Cavity	Test condition	Test: Desired result	Possible cause if result is not obtained
1	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G301) • An open in the wire
3	Ignition switch ON (II) Hazard warning switch OFF	Check for voltage to ground: There should be battery voltage.	• Blown No. 19 (7.5A) fuse in the under-dash fuse/relay box • Faulty hazard warning switch • An open in the wire
	Hazard warning switch ON Ignition switch OFF	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (15A) fuse in the under-hood fuse/relay box • Faulty hazard warning switch • An open in the wire
2	Ignition switch ON (II) and turn signal switch in Right or Left position	Connect No. 2 terminal to No. 3 terminal: Right or left turn signal lights should come on.	• Poor ground (G201, G301, G502, G601) • Faulty turn signal switch • An open in the wire
	Hazard warning switch ON	Connect No. 2 terminal to No. 3 terminal: Hazard warning lights should come on.	• Poor ground (G201, G301, G502, G601) • Faulty hazard warning switch • An open in the wire

Hazard Warning Switch Test

1. Remove the center panel (see page 20-89).
2. Disconnect the 10P connector (A) from the hazard warning switch (B).



3. Push out the hazard warning switch from behind the center panel (C).
4. Check for continuity between the terminals in each switch position according to the table.

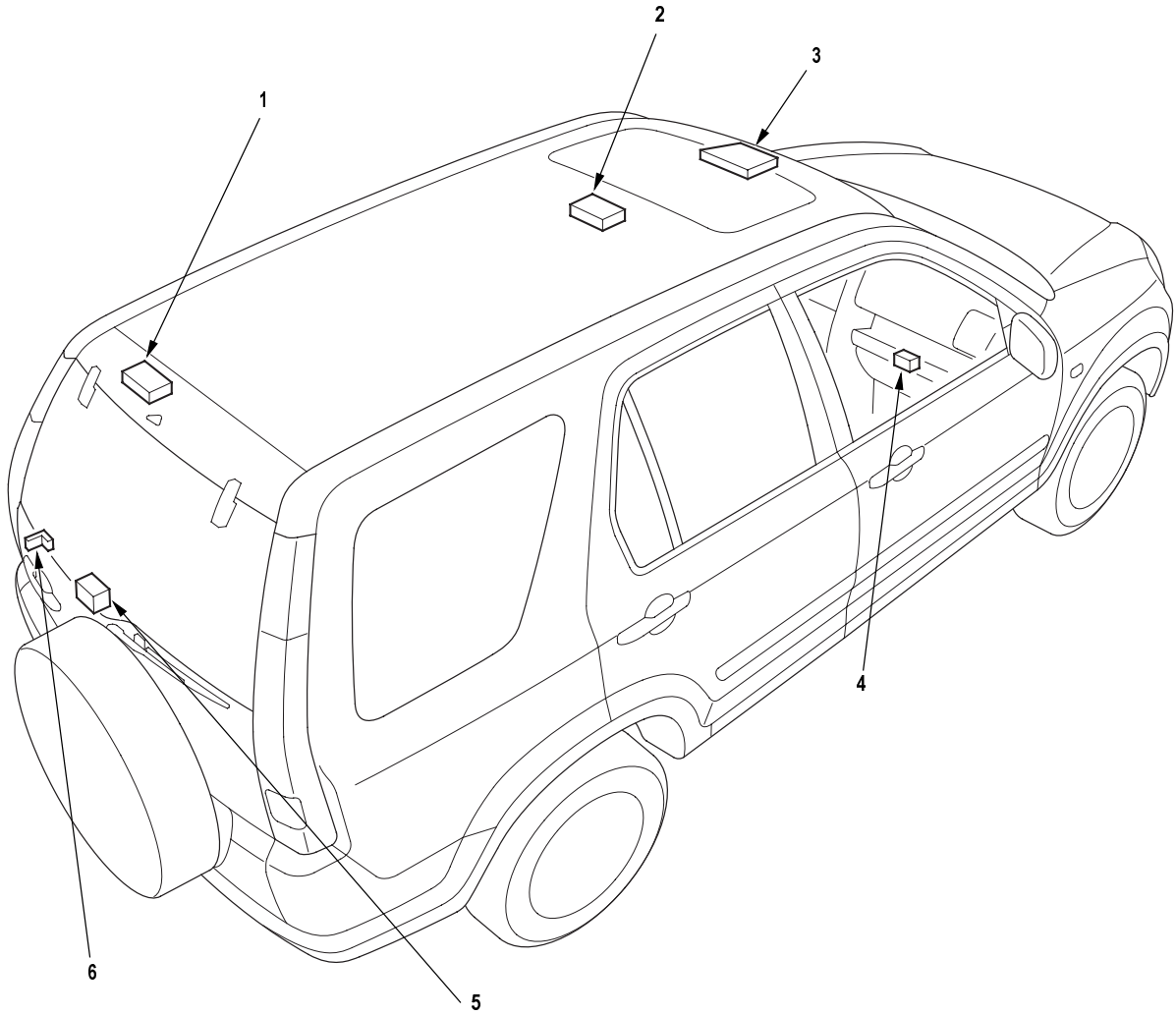
Terminal / Position	5		6	1	2	3	4	7	9	10
OFF	○	⊘	○	○	○					
ON	○	⊘	○		○	○	○	○	○	○

5. If the continuity is not as specified, replace the illumination bulb (D) or the switch.
6. Install the switch in the reverse order of removal.

Interior Lights

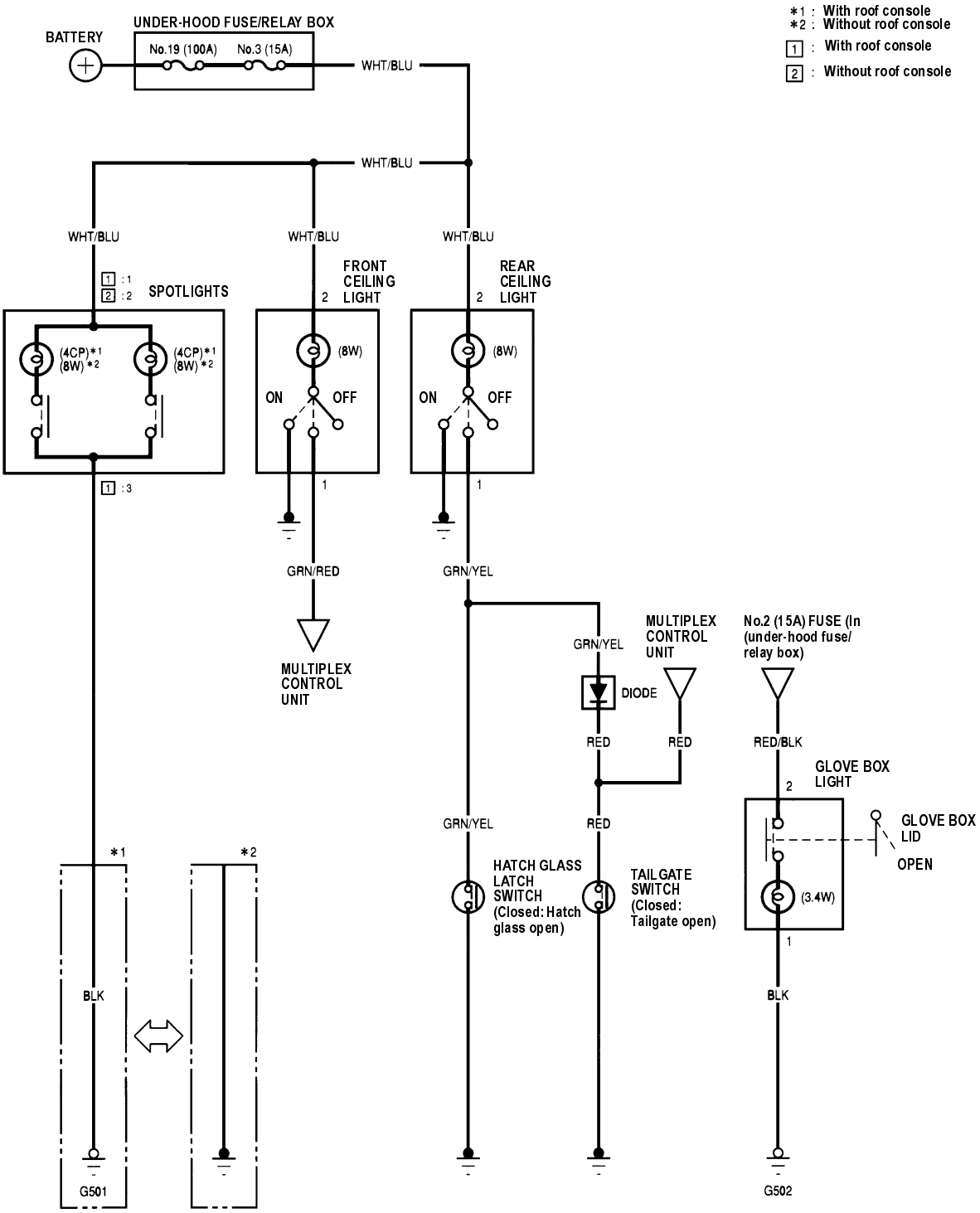
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



1	REAR CEILING LIGHT	Test, page 22A-109; Replacement, page 22A-109
2	FRONT CEILING LIGHT	Test, page 22A-109; Replacement, page 22A-109
3	SPOTLIGHT	Test, page 22A-108; Replacement, page 22A-108
4	GLOVE BOX LIGHT	Test, page 22A-109; Replacement, page 22A-109
5	HATCH GLASS LATCH SWITCH	Test, page 22A-110; Replacement, page 20-166
6	TAILGATE SWITCH	Test, page 22A-110; Replacement, page 22A-110

Circuit Diagram

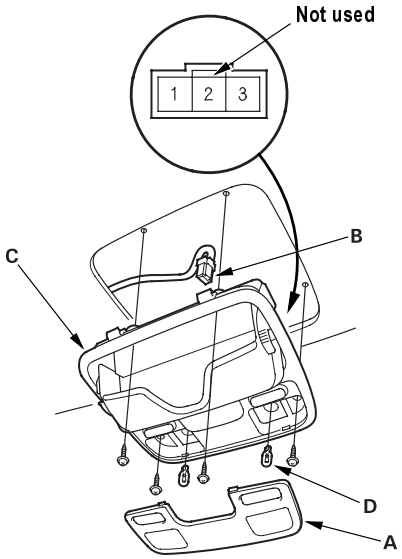


Spotlights Test/Replacement

With Roof Console:

1. Turn the light switch OFF.
2. Carefully pry off the lens (A) with a small screwdriver.

   Spotlight: 4CP



3. Remove the four mounting screws.
4. Disconnect the 3P connector (B) from the housing (C).
5. Check for continuity between the terminals in each switch position according to the table.

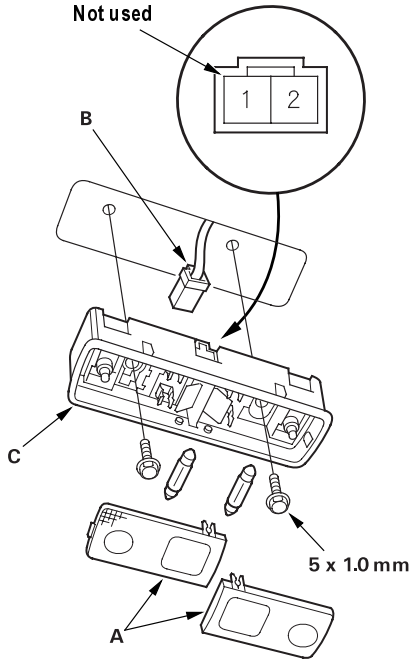
Position	Terminal	1		3
LEFT	ON	○	⊙	○
	OFF			
RIGHT	ON	○	⊙	○
	OFF			

6. If the continuity is not as specified, check the bulb (D). If the bulb is OK, replace the light.

Without Roof Console:

1. Turn the light switch OFF.
2. Carefully pry off the lenses (A) with a small screwdriver.

   Spotlight: 8 W x 2



3. Remove the two mounting bolts.
4. Disconnect the 2P connector (B) from the housing (C).
5. Check for continuity between the terminals in each switch position according to the table.

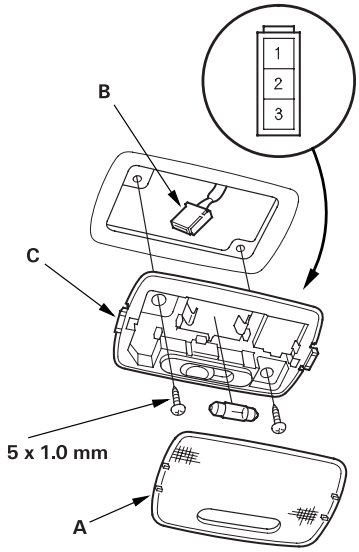
Position	Terminal	2		Body ground
LEFT	ON	○	⊙	○
	OFF			
RIGHT	ON	○	⊙	○
	OFF			

6. If the continuity is not as specified, check the bulb (D). If the bulb is OK, replace the light.
7. When installing the spotlights housing, if the threads in the ET screw are worn out, use an oversized ET screw made specifically for this application.

Ceiling Light Test/Replacement

1. Turn the light switch OFF.
2. Carefully pry off the lens (A) with a small screwdriver.

   Ceiling Light: 8 W



3. Remove the two mounting screws.
4. Disconnect the 3P connector (B) from the housing (C).
5. Check for continuity between the terminals in each switch position according to the table.

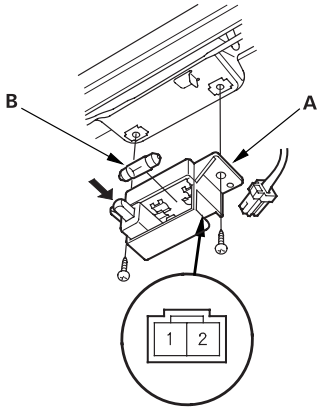
Terminal / Position	1		2		Body ground
OFF					
MIDDLE	○	◊	○		
ON			○	◊	○

6. When installing the ceiling light housing, if the threads in the ET screw are worn out, use an oversized ET screw made specifically for this application.

Glove Box Light Test/Replacement

1. Open the glove box.
2. Disconnect the 2P connector from the glove box light (A).

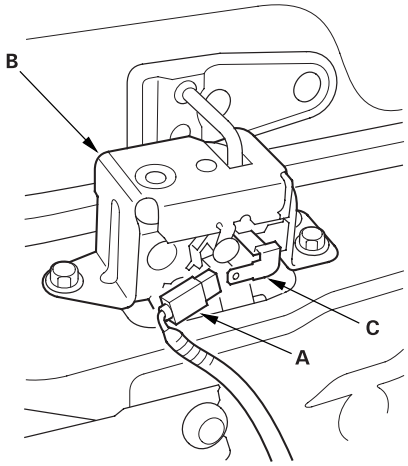
   Glove Box Light: 3.4 W



3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity with the switch released.
   - There should be no continuity with the switch pushed.
4. If the continuity is not as specified, check the bulb (B). If the bulb is OK, replace the light.

Hatch Glass Latch Switch Test

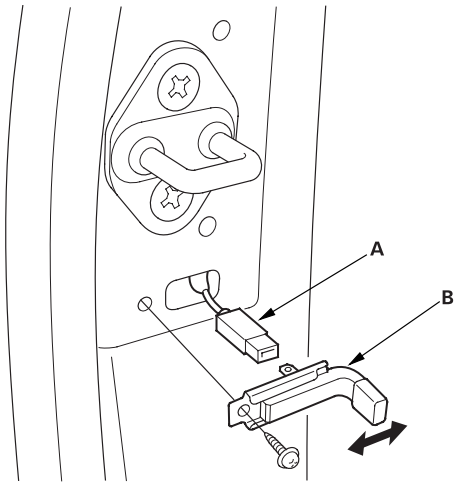
1. Remove the tailgate lower trim panel (see page 20-80).
2. Push the hatch glass opener switch, and open the hatch glass.
3. Disconnect the connector (A) from the hatch glass opener (B).



4. Check for continuity between the opener switch positive terminal (C) and body ground.
   - There should be continuity with the hatch glass opened.
   - There should be no continuity with the hatch glass closed.
5. If the continuity is not as specified, replace the hatch glass latch switch.

Tailgate Switch Test/Replacement

1. Open the tailgate.
2. Remove the mounting screw from the tailgate switch.
3. Disconnect the connector (A) from the tailgate switch (B).

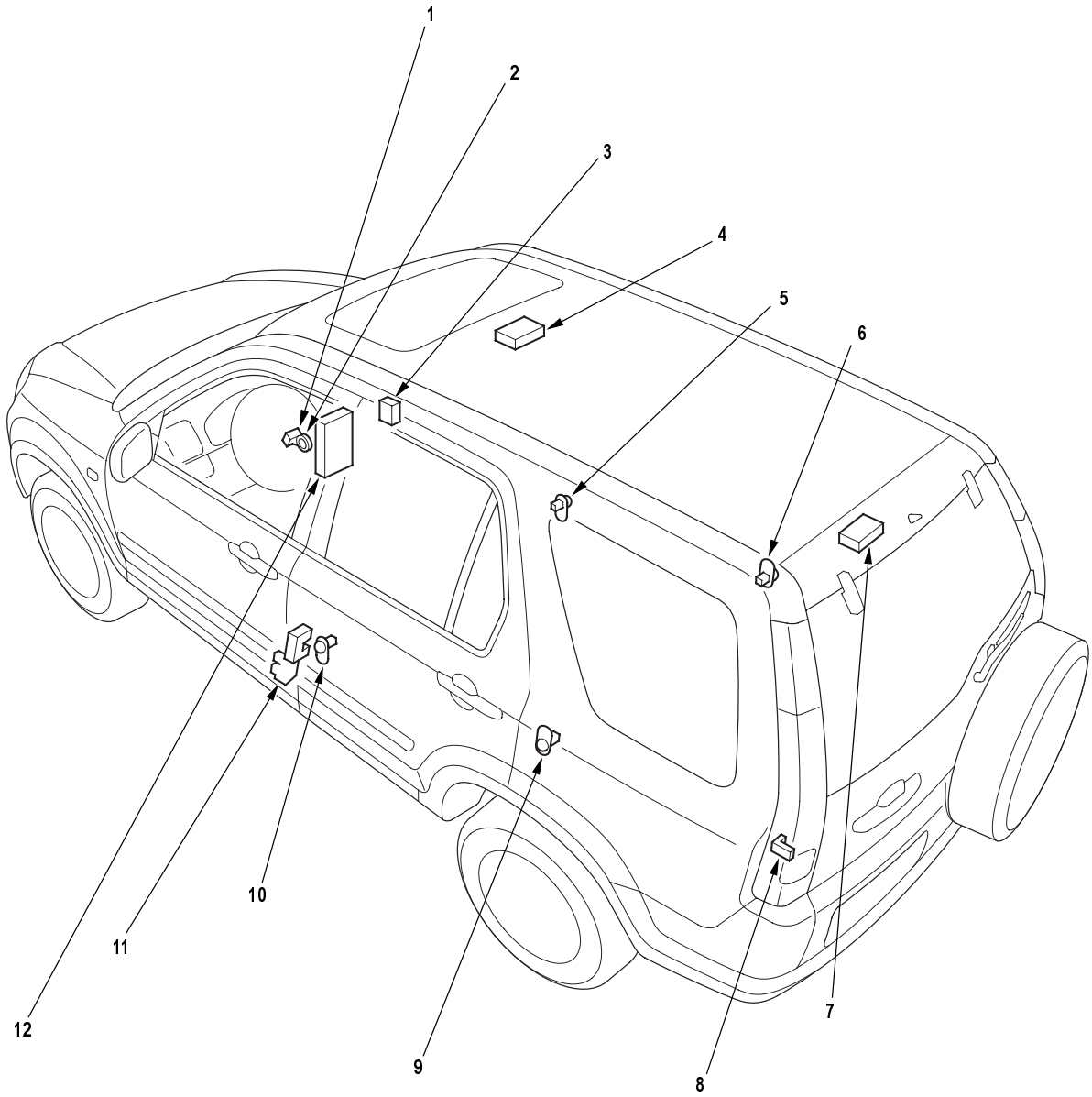


4. Check for continuity between the tailgate switch positive terminal (C) and body ground.
   - There should be continuity with the switch released (tailgate open position).
   - There should be no continuity with the switch pushed (tailgate open position).
5. If the continuity is not as specified, replace the tailgate switch.

Entry Light Control System

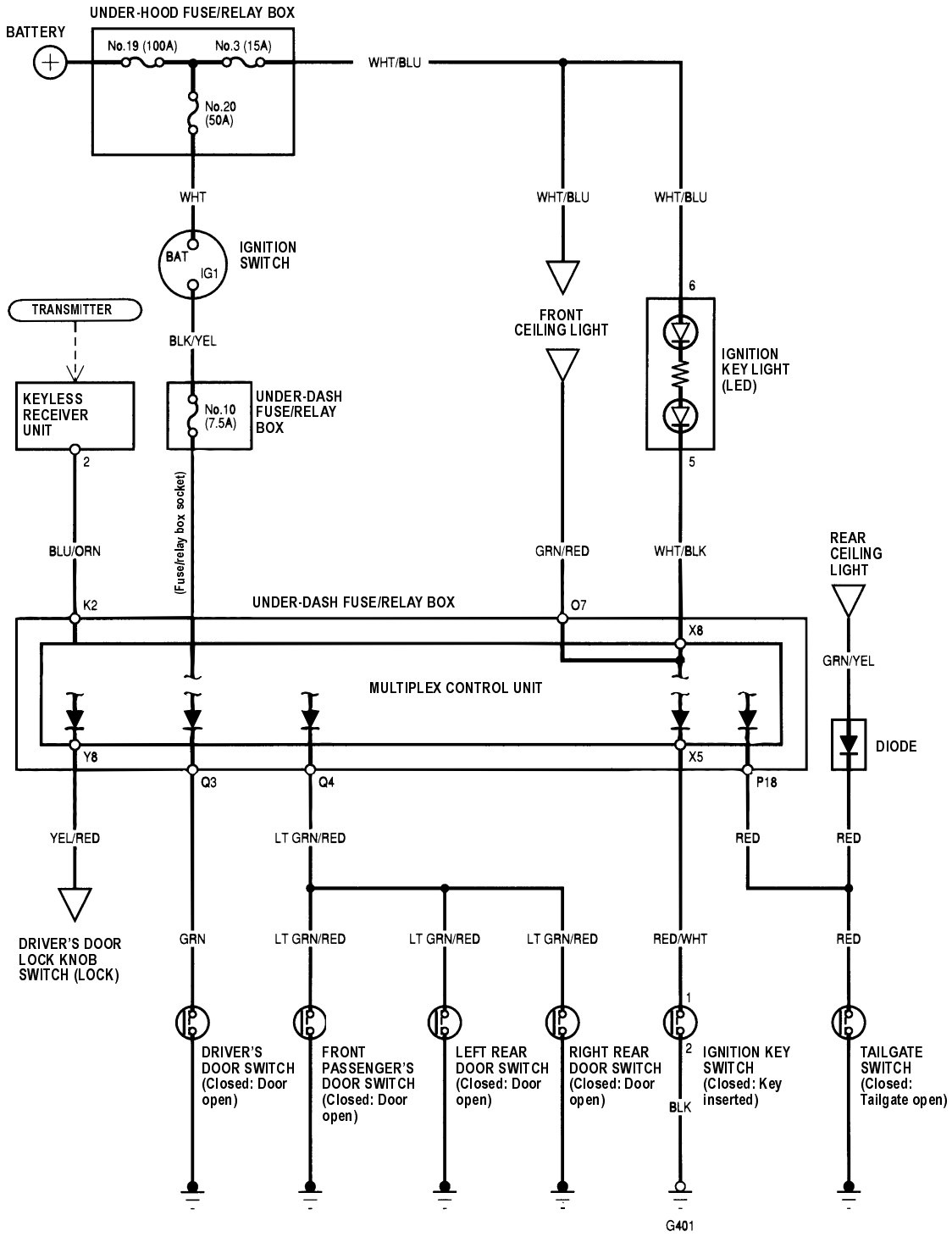
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



1	IGNITION KEY SWITCH	Test, page 22A-113
2	IGNITION KEY LIGHT	Test, page 22A-113
3	KEYLESS RECEIVER UNIT	Input Test, page 22A-165
4	FRONT CEILING LIGHT	Test, page 22A-109; Replacement, page 22A-109
5	FRONT PASSENGER'S DOOR SWITCH	
6	RIGHT REAR DOOR SWITCH	
7	REAR CEILING LIGHT	Test, page 22A-109; Replacement, page 22A-109
8	TAILGATE SWITCH	Test, page 22A-110; Replacement, page 22A-110
9	LEFT REAR DOOR SWITCH	
10	DRIVER'S DOOR SWITCH	
11	DRIVER'S DOOR LOCK KNOB SWITCH	Test, page 22A-202
12	MULTIPLEX CONTROL UNIT	Input Test, page 22A-114

Circuit Diagram

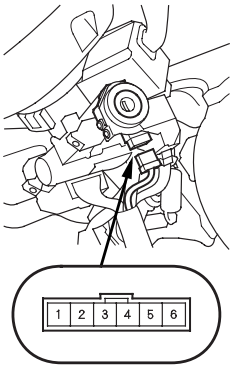


Ignition Key Switch Test

NOTE: For more key-in beeper information, refer to the circuit diagram (see page 22A-112) and input test (see page 22A-114).

When the ignition key is in the ignition switch, the key-in beeper circuit of multiplex control unit senses ground through the closed ignition key switch. When you open the driver's door, the beeper circuit senses ground through the closed door switch. When both switches are closed (driver's door and ignition), the key-in beeper in the gauge assembly is activated.

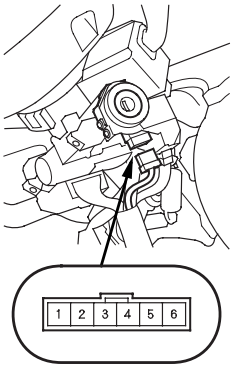
1. Remove the steering column upper and lower covers (see page 17-24).
2. Disconnect the 6P connector.



3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity with the key in the ignition switch.
   - There should be no continuity with the key removed.
4. If the continuity is not as specified, replace the steering lock assembly.

Ignition Key Light Test

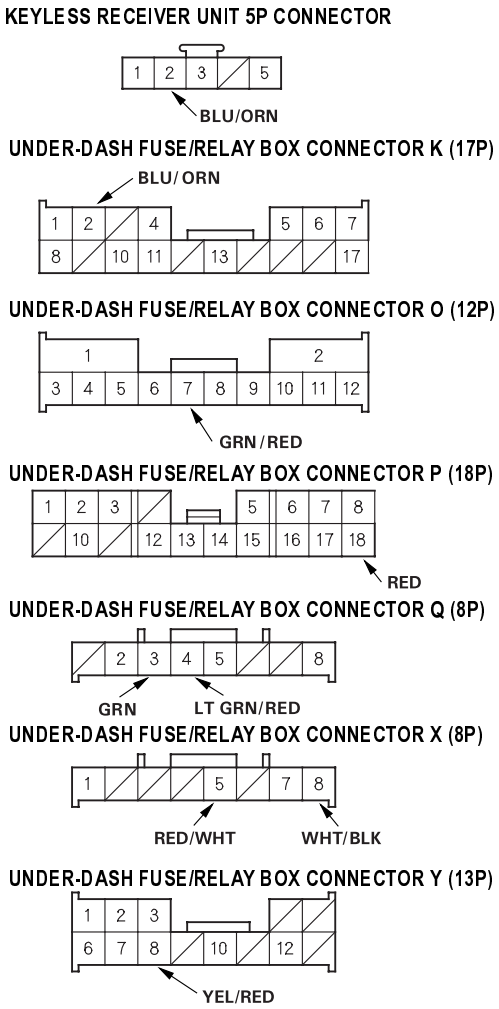
1. Remove the steering column upper and lower covers (see page 17-24).
2. Disconnect the 6P connector.



3. The LED should come on when power is connected to the No. 6 terminal and ground is connected to No. 5 terminal.

Control Unit Input Test

1. Before testing, troubleshoot the multiplex control system (see page 22A-235).
2. Remove the dashboard lower cover.
3. Disconnect the under-dash fuse/relay box connectors.
   NOTE: All connectors are wire side of female terminals.



4. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 5.

5. With the connectors still disconnected, make these input tests at the connector.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
K2	BLU/ORN	Under all conditions	Check for continuity between the K2 terminal and the keyless receiver unit 5P connector No. 2 terminal: There should be continuity.	• An open in the wire
X8	WHT/BLK	Under all conditions	Attach to ground: Ignition key light should come on.	• Blown No. 3 (15A) fuse in the under-hood fuse/relay box • Faulty ignition key light • An open in the wire

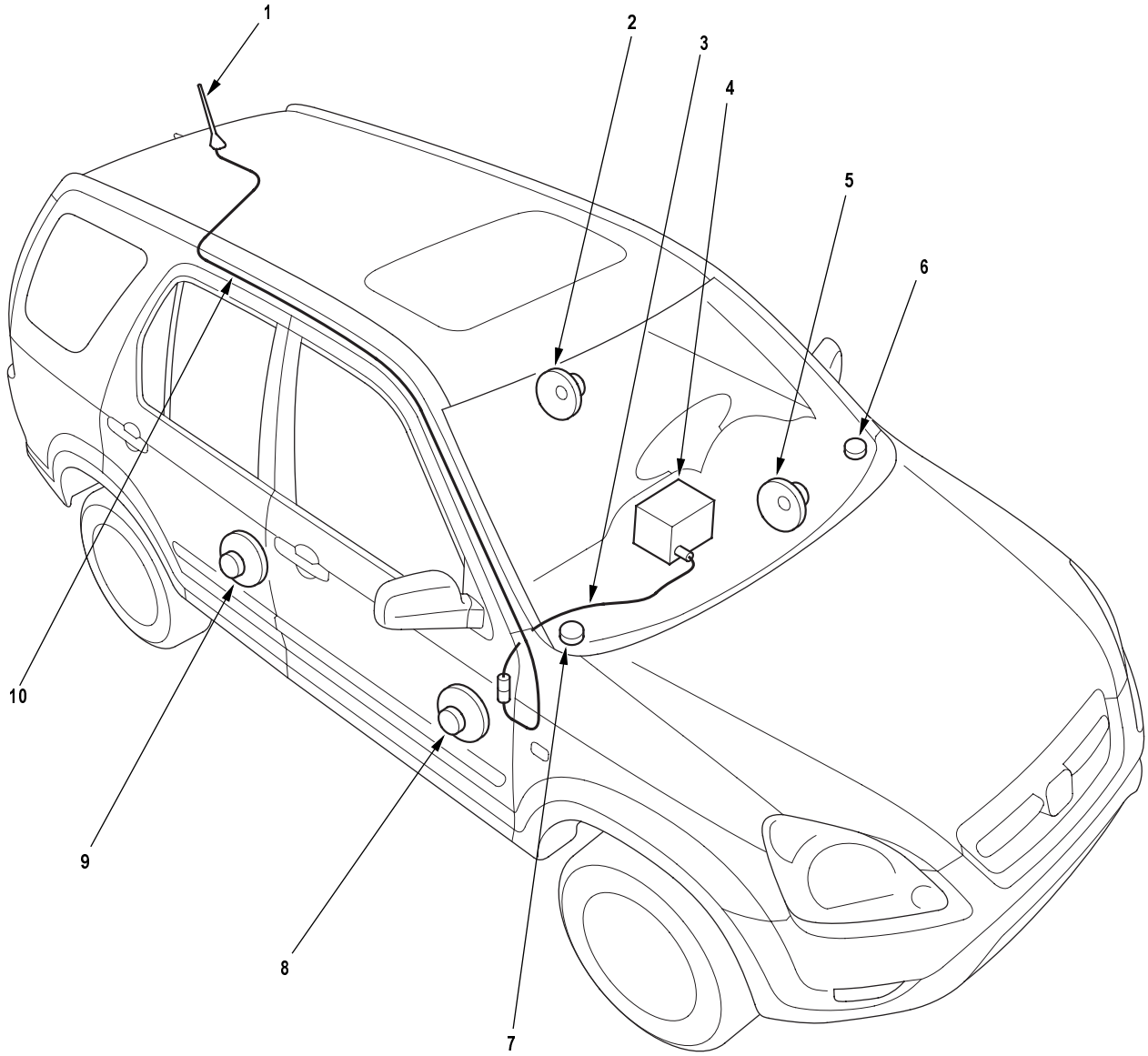
6. Reconnect the connectors to the under-dash fuse/relay box, and make sure these input tests at the appropriate connectors on the under-dash fuse/relay box.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the multiplex control unit must be faulty, replace the under-dash fuse/relay box assembly.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
P18	RED	Tailgate lid open	Check for voltage to ground: There should be 1 V or less.	• Faulty tailgate switch • An open in the wire
		Tailgate closed	Check for voltage to ground: There should be 5 V or more.	• Faulty tailgate switch • Short to ground
Q3	GRN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground
Q4	LT GRN/ RED	Front passenger's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty front passenger's door switch • An open in the wire
		Front passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door switch • Short to ground
		Left (right) rear door open	Check for voltage to ground: There should be 1 V or less.	• Faulty left (right) rear door switch • An open in the wire
		Left (right) rear door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty left (right) rear door switch • Short to ground
X5	RED/WHT	Ignition key inserted into the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire
		Ignition key removed from the ignition switch	Check for voltage to ground: There should be 5 V or more.	• Faulty ignition key switch • Short to ground
Y8	YEL/RED	Driver's door lock knob switch locked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G501) • Faulty driver's door lock knob switch • An open in the wire
		Driver's door lock knob switch unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock knob switch • Short to ground
O7	GRN/RED	Ceiling light switch in middle position, all door closed	Attach to ground: Ceiling light(s) should come on.	• Blown No. 3 (15A) fuse in the under-hood fuse/relay box • Blown bulb • Faulty ceiling light • An open in the wire

Stereo Sound System

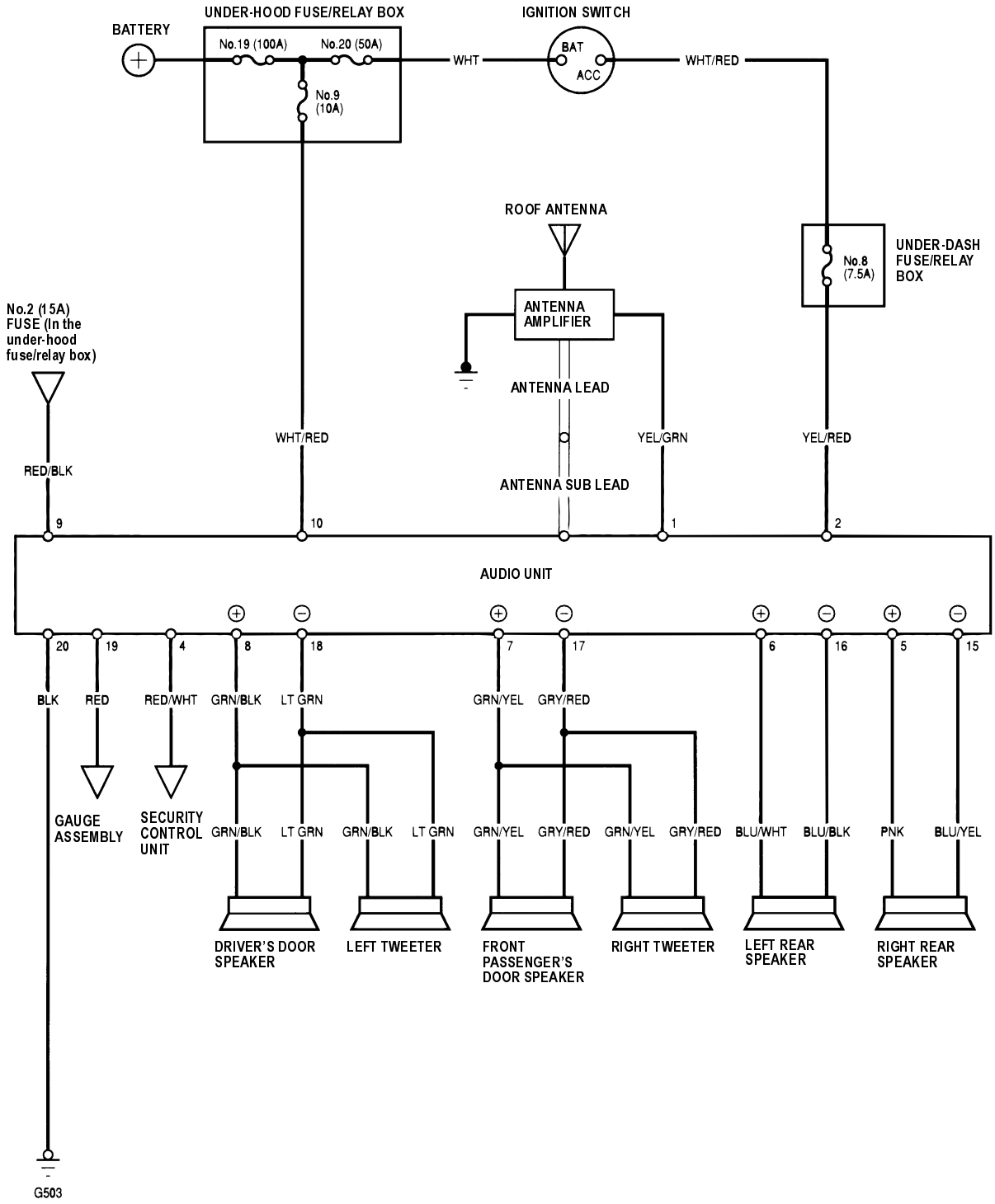
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



1	ROOF ANTENNA	Replacement, page 22A-121
2	LEFT REAR SPEAKER	Replacement, page 22A-120
3	ANTENNA SUB-LEAD	
4	AUDIO UNIT	Removal, page 22A-118; Connector Replacement, page 22A-119
5	DRIVER'S DOOR SPEAKER	Replacement, page 22A-120
6	LEFT TWEETER	Replacement, page 22A-120
7	RIGHT TWEETER	Replacement, page 22A-120
8	FRONT PASSENGER'S DOOR SPEAKER	Replacement, page 22A-120
9	RIGHT REAR SPEAKER	Replacement, page 22A-120
10	ANTENNA LEAD	

Circuit Diagram

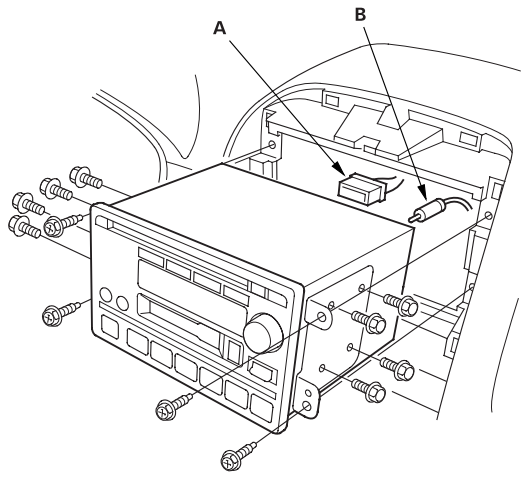


Audio Unit Removal/Installation

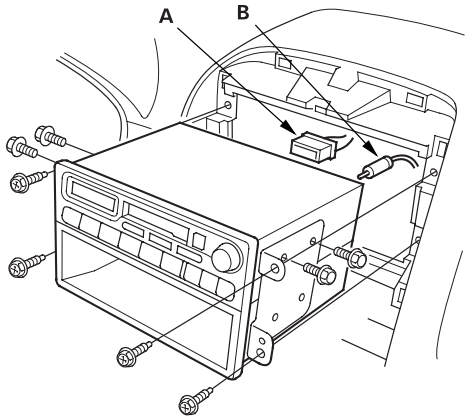
NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the dashboard and related parts.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Remove the dashboard center panel (see page 20-89).
3. Remove the fore mounting bolts, then remove the audio unit.

Type 1:



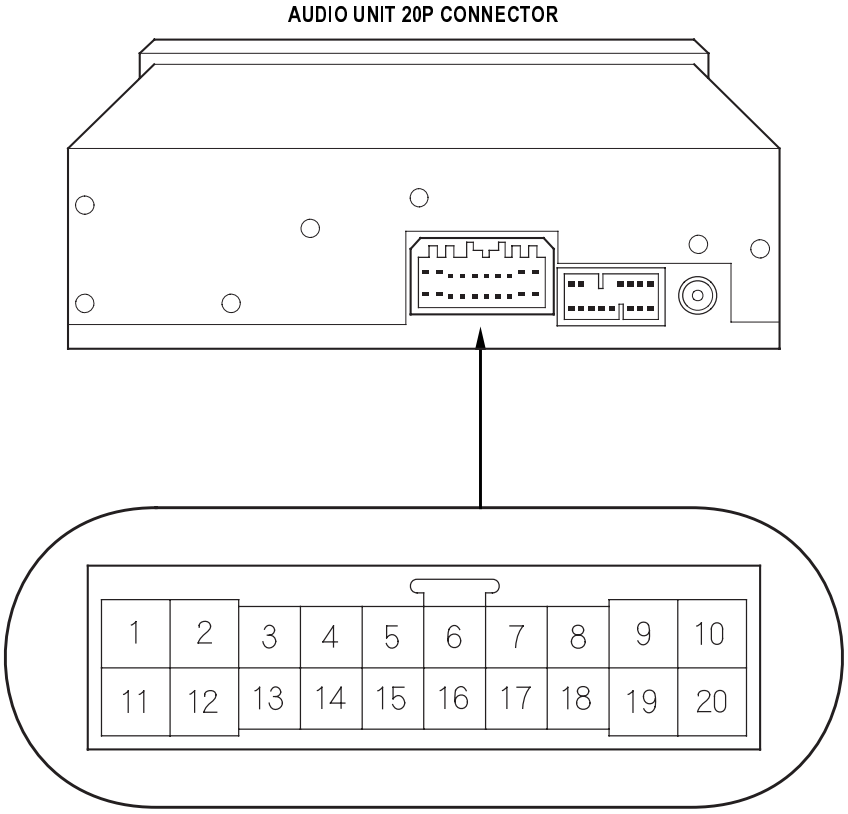
Type 2:



4. Disconnect the connector (A) and the antenna lead (B).
5. Install the audio unit in the reverse order of removal, and note these items:
   - Make sure the audio unit connector is plugged in properly, and the antenna lead is connected properly.
   - Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Audio Unit Connector Replacement

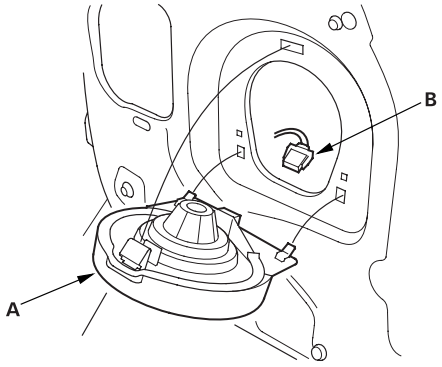
Cavity	Wire	Connects to
1	YEL/GRN	Roof antenna
2	YEL/RED	ACC (Main stereo power supply)
3	———	Not used
4	RED/WHT	Security input
5	PNK	Right rear speaker (+)
6	BLU/WHT	Left rear speaker (+)
7	GRN/YEL	Front passenger's door speaker (+), Right tweeter (+)
8	GRN/BLK	Driver's door speaker (+), Left tweeter (+)
9	RED/BLK	Lights-on signal
10	WHT/RED	Constant power
11	———	Not used
12	———	Not used
13	———	Not used
14	———	Not used
15	BLU/YEL	Right rear speaker (--)
16	BLU/BLK	Left rear speaker (-)
17	GRY/RED	Front passenger's door speaker (-), Right tweeter (-)
18	LT GRN	Driver's door speaker (-), Left tweeter
19	RED	Gauge assembly
20	BLK	Ground (G503)



Speaker Replacement

Door Speaker:

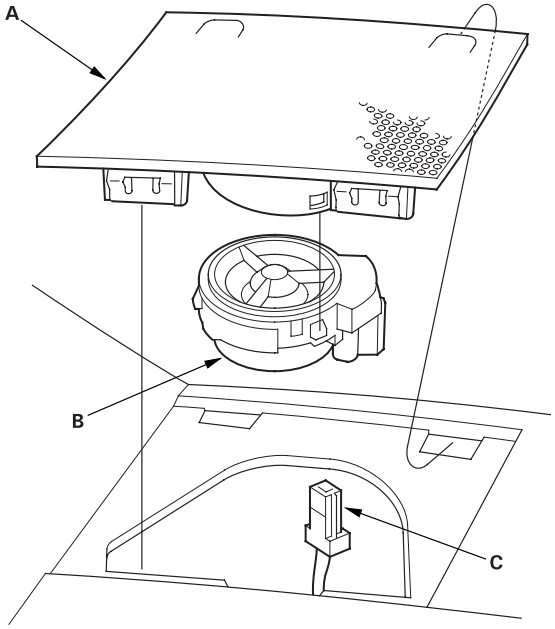
1. Remove the door panel (see page 20-9).
2. Push down on the clip, then pull the top of the speaker (A) straight out just enough to release the upper clip. If you pull the speaker out too far, you will damage the lower clips (C). Then lift the speaker straight up to release the lower clips.



3. Disconnect the 2P connector (B), and remove the speaker.
4. Install the speaker in the reverse order of removal.

Tweeter:

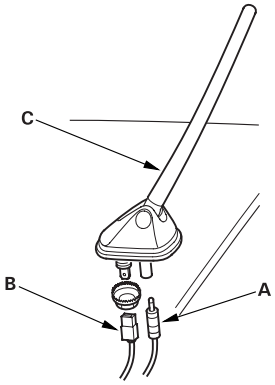
1. Remove the tweeter speaker grille (A) and tweeter (B) as an assembly.
2. Disconnect the 2P connector (C) from the tweeter.
3. Remove the tweeter speaker grille from the tweeter.



4. Install the tweeter in the reverse order of removal.

Roof Antenna Replacement

1. Remove the rear part of headliner (see page 20-81).
2. Disconnect the antenna lead connector (A) and 1P connector (B) from the roof antenna (C).

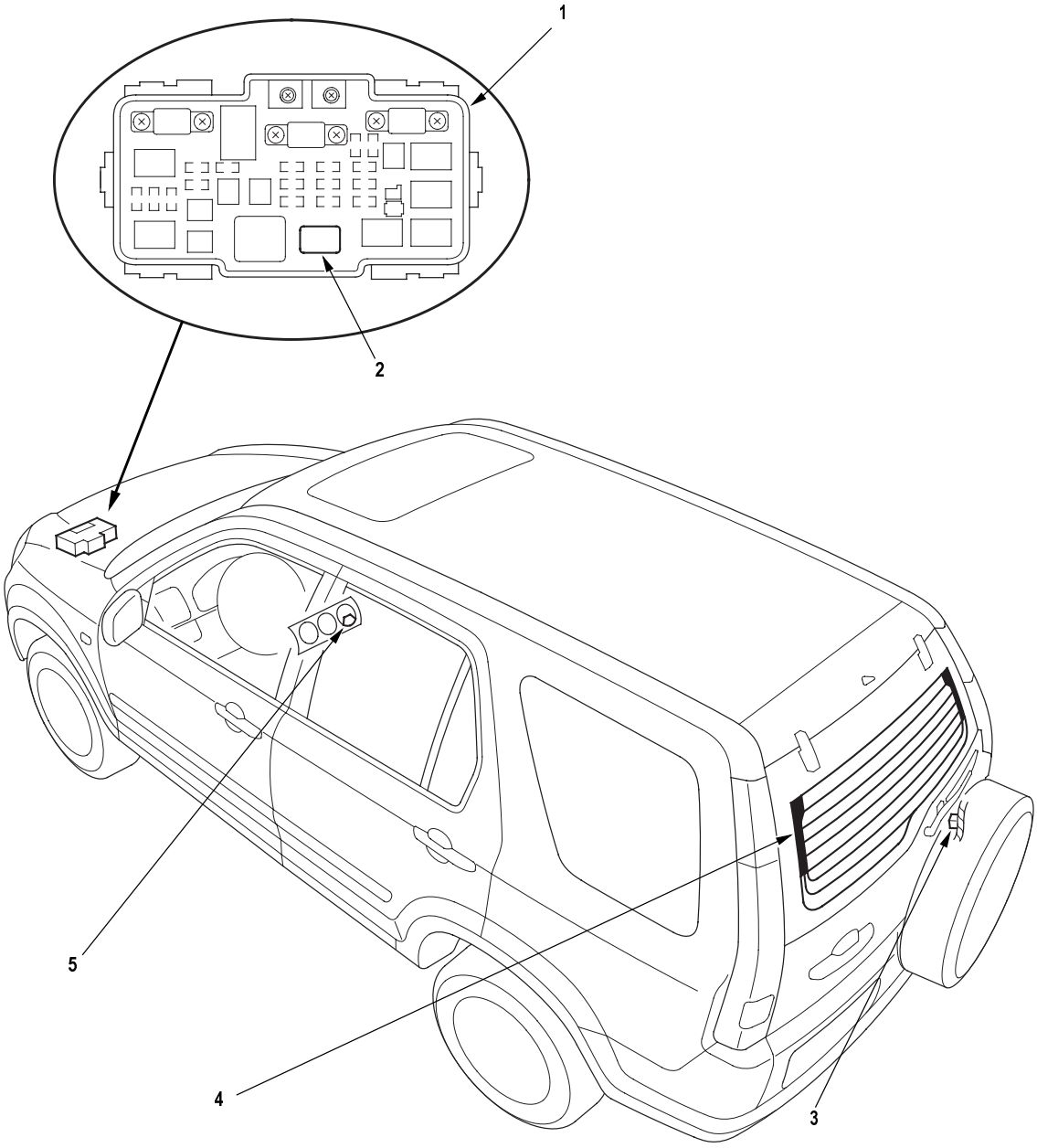


3. Remove the mounting nut and the antenna.

Rear Window Defogger

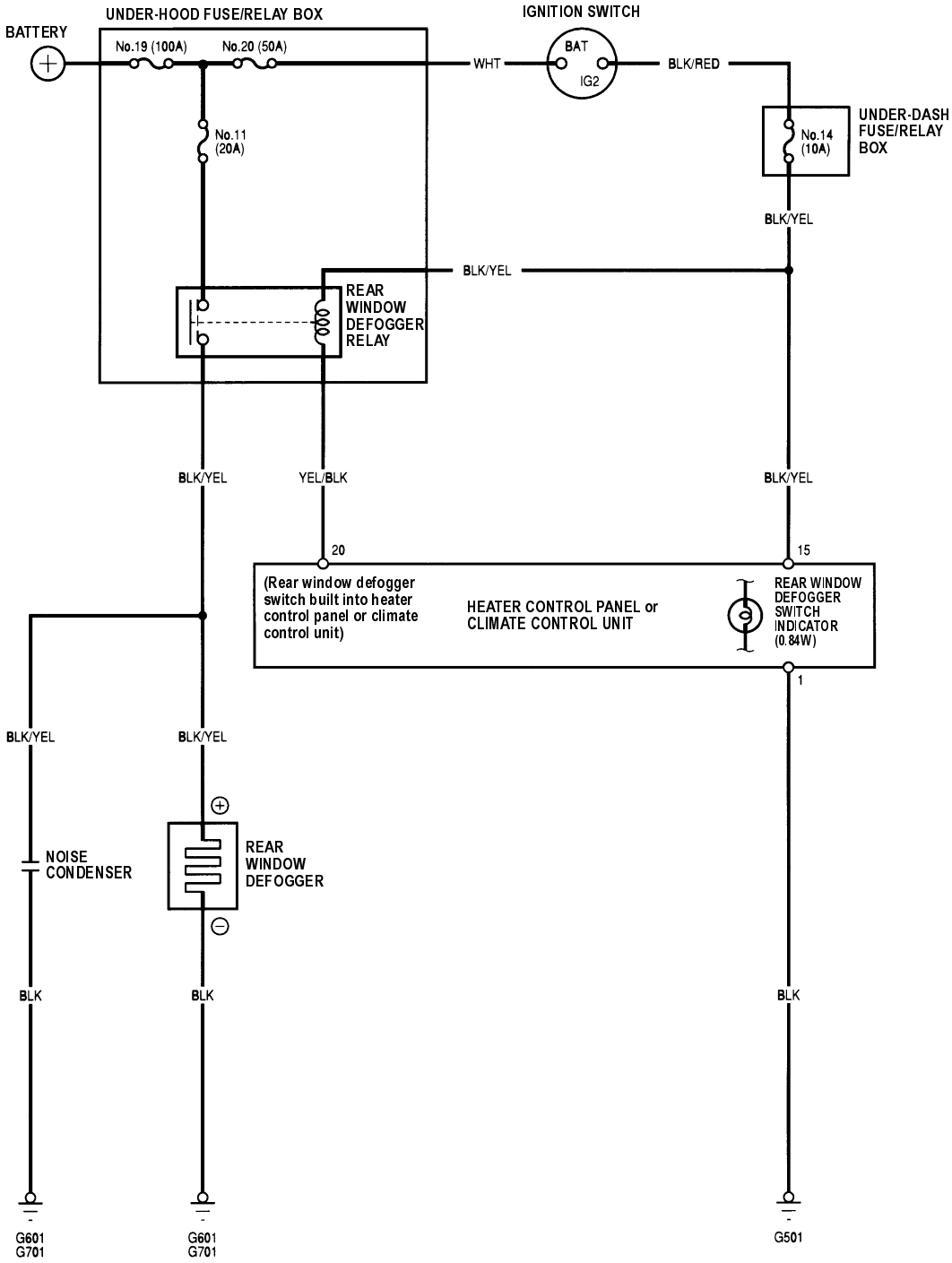
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



1 UNDER-HOOD FUSE/RELAY BOX
2 REAR WINDOW DEFOGGER RELAY Test, page 22A-60
3 NOISE CONDENSER Capacity Test, page 22A-125
4 REAR WINDOW DEFOGGER Function Test, page 22A-124; Defogger Wire Repair, page 22A-124
5 REAR WINDOW DEFOGGER SWITCH
built into the heater control panel or climate control unit

Circuit Diagram



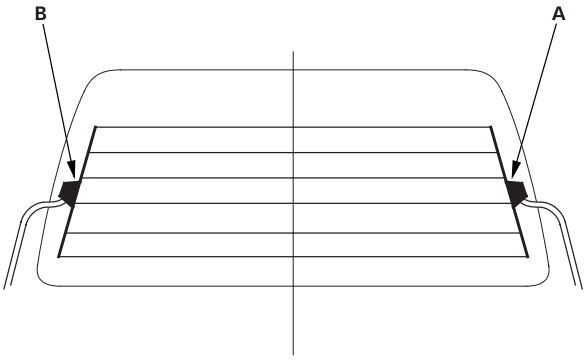
Function Test

NOTE:
- Be careful not to scratch or damage the defogger wires with the tester probe.
- Before testing, check the No. 11 (20A) fuse in the under-hood fuse/relay box and No. 14 (10A) fuse in the under-dash fuse/relay box.

1. Check for voltage between the positive terminal (A) on the right side of the glass and body ground with the ignition switch and defogger switch ON.

There should be battery voltage.

- If there is no voltage, check for:
  - faulty defogger relay.
  - an open in the BLK/RED, BLK/YEL, or YEL/BLK wire.
  - faulty the heater control panel or climate control unit.
- If there is battery voltage, go to step 2.



2. Check for voltage between the positive terminal (A) and the negative terminal (B).

If there is no voltage, check for:

- an open in the BLK wire.
- Poor ground (G601 or G701).

3. Touch the voltmeter positive probe to the halfway point of each defogger wire, and the negative probe to the negative terminal.

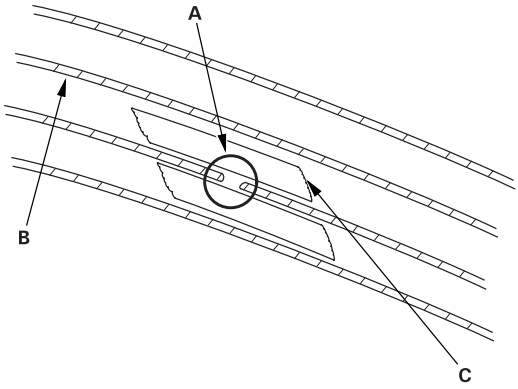
There should be about 6 V with the ignition switch and the defogger switch ON.

- If the voltage is as specified, the defogger wire is OK.
- If the voltage is not as specified, repair the defogger wire.
  - If there is battery voltage, there is a break in the negative half of the grid.
  - If it there is 0 V, there is a break in the positive half of the grid.

Defogger Wire Repair

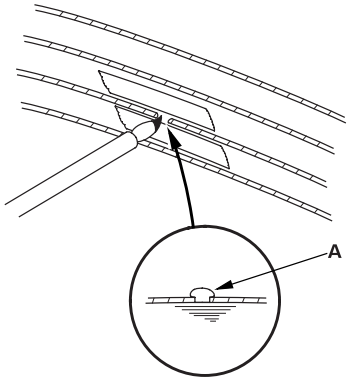
NOTE: To make an effective repair, the broken section must be no longer than 1 inch.

1. Lightly rub the area around the broken section (A) with fine steel wool, then clean it with alcohol.



2. Carefully mask above and below the broken portion of the defogger wire (B) with transparent tape (C).

3. Mix the silver conductive paint thoroughly. Using a small brush, apply a heavy coat of the paint (commercially available defogger grid repair material) extending about 1/8” on both sides of the break. Allow 30 minutes to dry. Mix the paint before use.



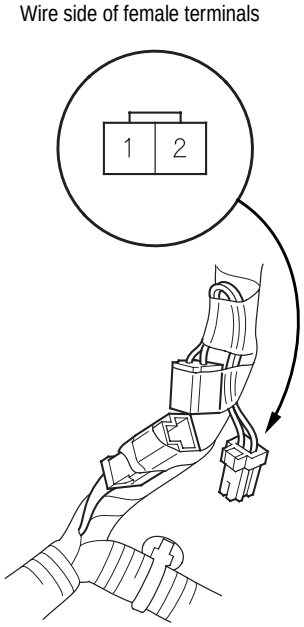
4. Check for continuity in the repaired wire.

5. Apply a second coat of paint in the same way. Let it dry 3 hours before removing the tape.

Noise Condenser Capacity Test

1. Remove the right rear side trim panel (see page 20-77).
2. Disconnect the 2P connector (A) from the noise condenser.

   Noise Condenser capacity: 0.47 ± 0.09 microfarads

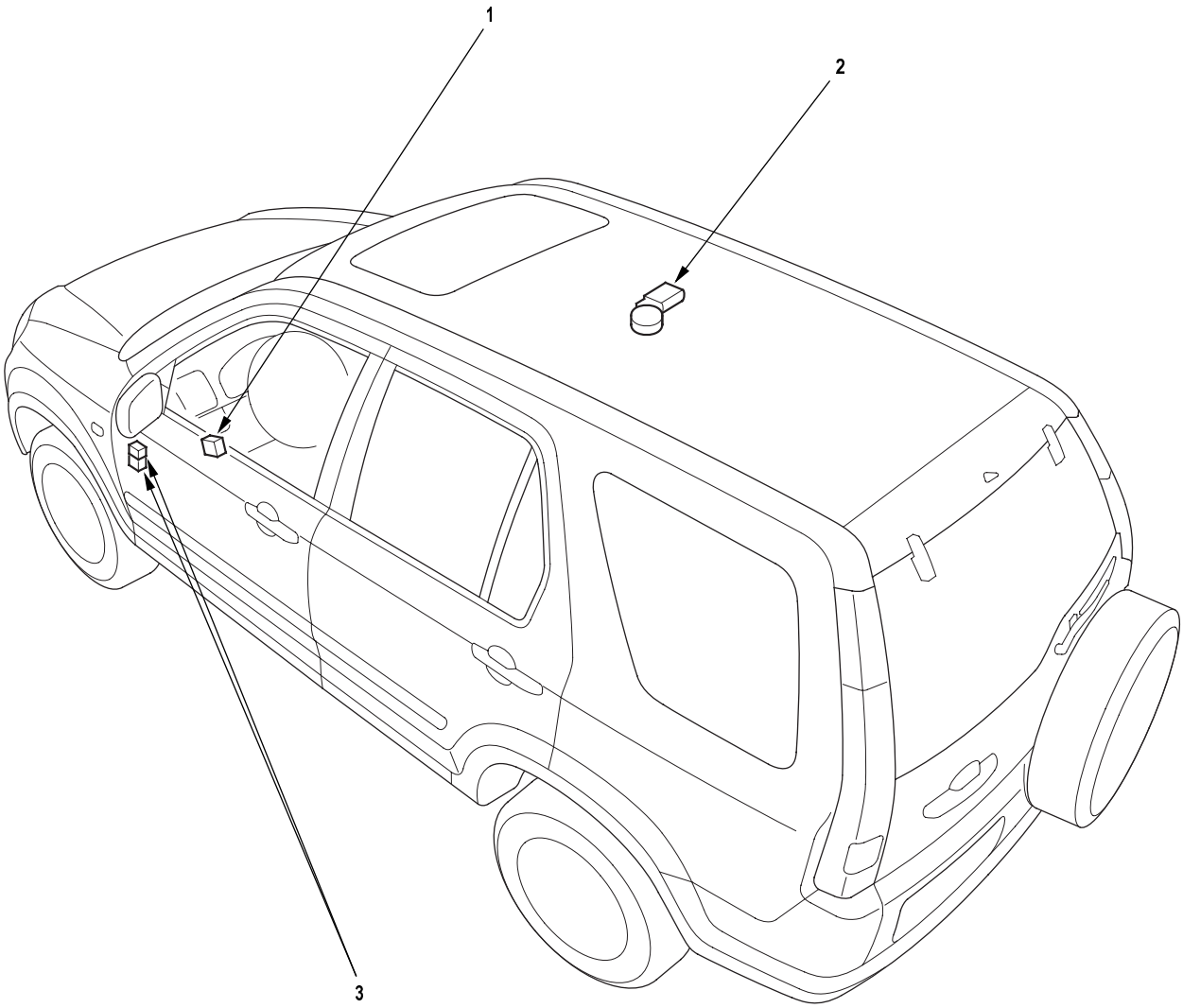


3. Use a commercially available condenser tester. Connect the condenser tester probes, and measure the condenser capacity.
4. If not within the specifications, replace the noise condenser.

Sunroof

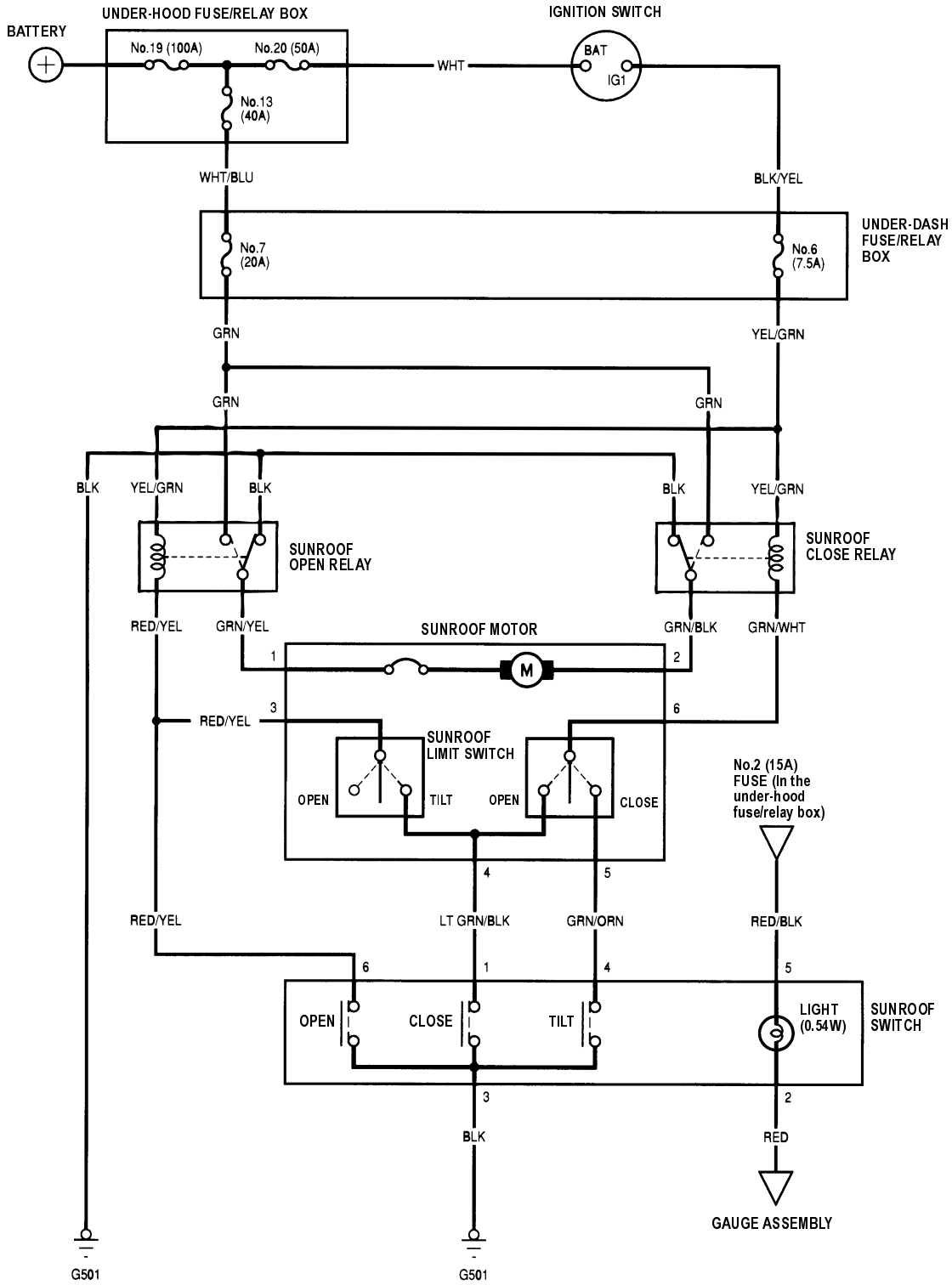
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



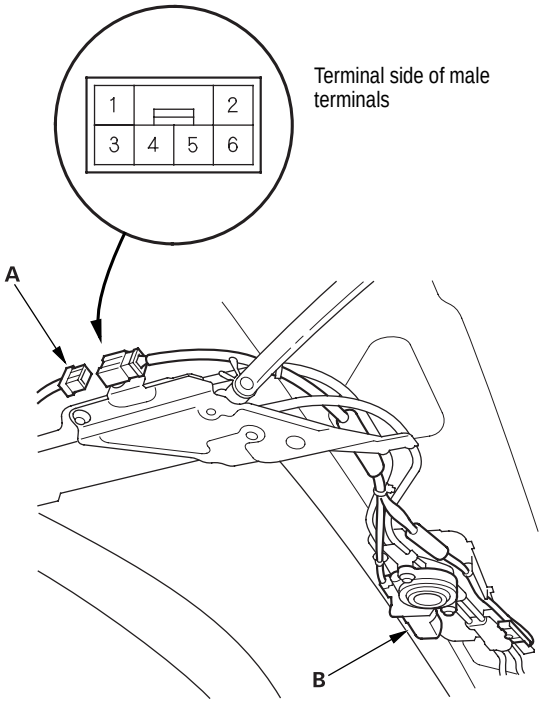
1	SUNROOF SWITCH	Test, page 22A-129
2	SUNROOF MOTOR	Test, page 22A-128 Replacement, page 20-68
3	SUNROOF OPEN RELAY	Test, page 22A-60
	[Wire colors: GRN/YEL, GRN, RED/YEL, BLK and YEL/GRN]	
	SUNROOF CLOSE RELAY	Test, page 22A-60
	[Wire colors: GRN/BLK, GRN, GRN/WHT, BLK and YEL/GRN]	

Circuit Diagram



Motor Test

1. Remove the headliner (see page 20-81).
2. Disconnect the 6P connector (A) from the sunroof motor (B).



Motor test:

3. Check the motor by connecting power and ground according to the table.

Terminal / Position	1	2
OPEN	⊕	⊖
CLOSE	⊖	⊕

4. If the motor does not run or fails to run smoothly, replace it.

   NOTE: See the closing force check (see page 20-74) for the motor clutch test.

Limit switch test:

5. Check for continuity between the terminals in each switch position according to the table.

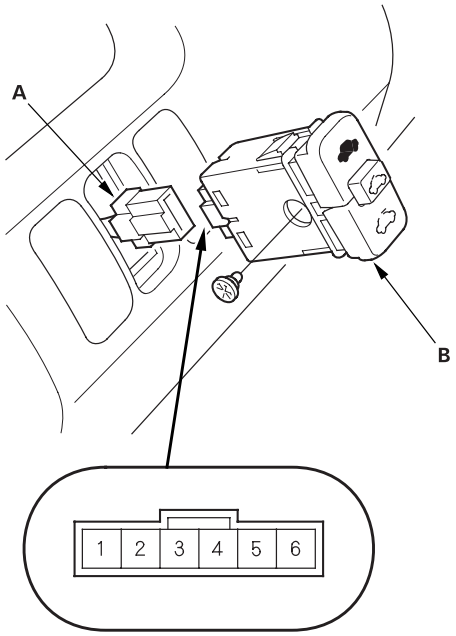
   NOTE: Turn the motor by hand with the wrench.

Terminal / Position	3	4	5	6
TILT	○	○	○	○
OPEN		○		○
CLOSE	○	○	○	○

6. If the continuity is not as specified, adjust the limit switch (see page 20-73), and recheck.
7. If the continuity is still not as specified, replace the moonroof motor.

Switch Test/Replacement

1. Remove the dashboard lower cover (see page 20-88).
2. Disconnect the 6P connector (A) from the sunroof switch (B), and remove the sunroof switch.



3. Check for continuity between the terminals in each switch position according to the table.

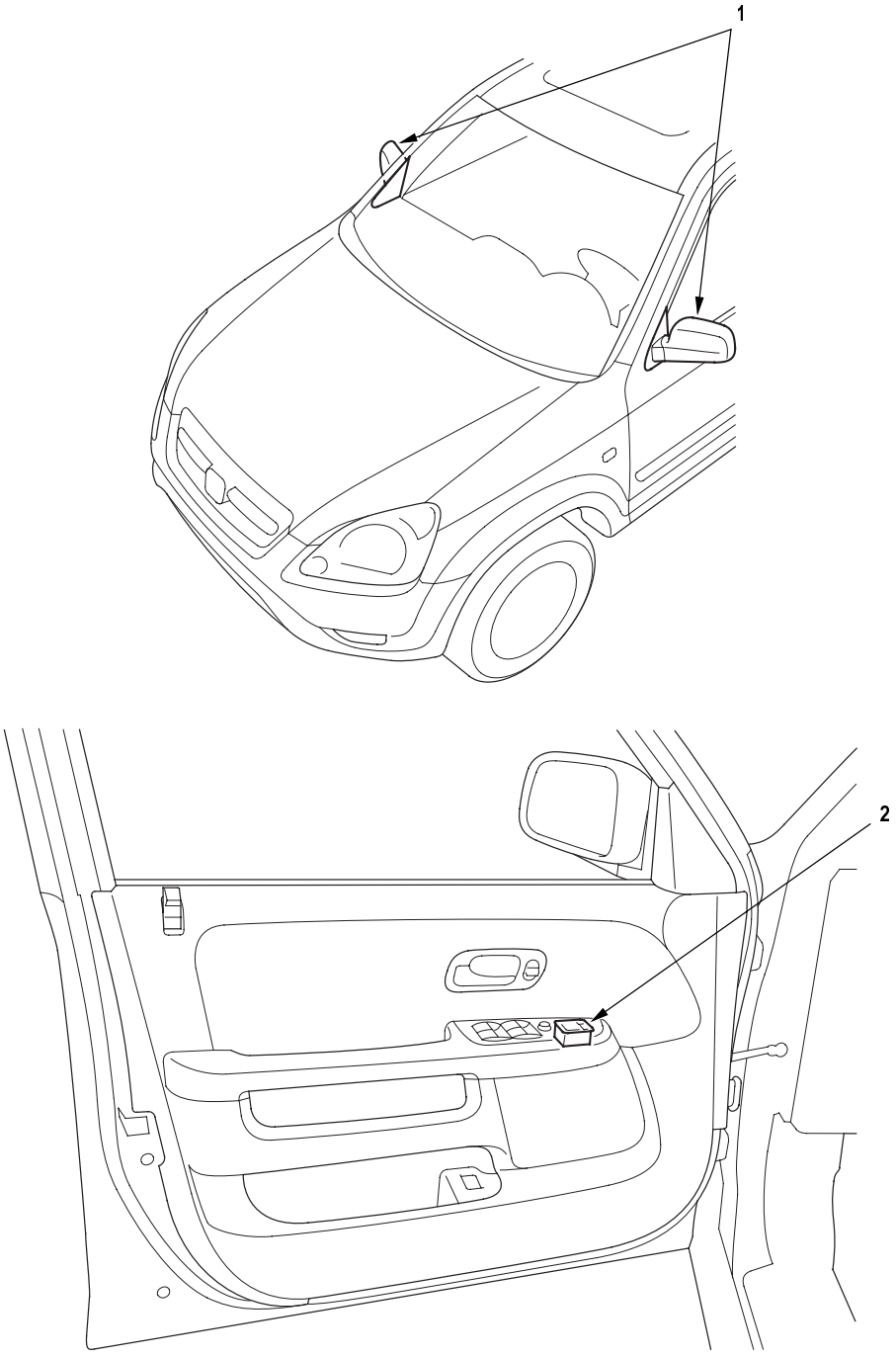
Terminal / Position	2		5	1	3	4	6
CLOSE				○	○		
TILT	○		○		○	○	
OPEN					○		○

4. If the continuity is not specified, replace the bulb (C) or the switch.

Power Mirrors

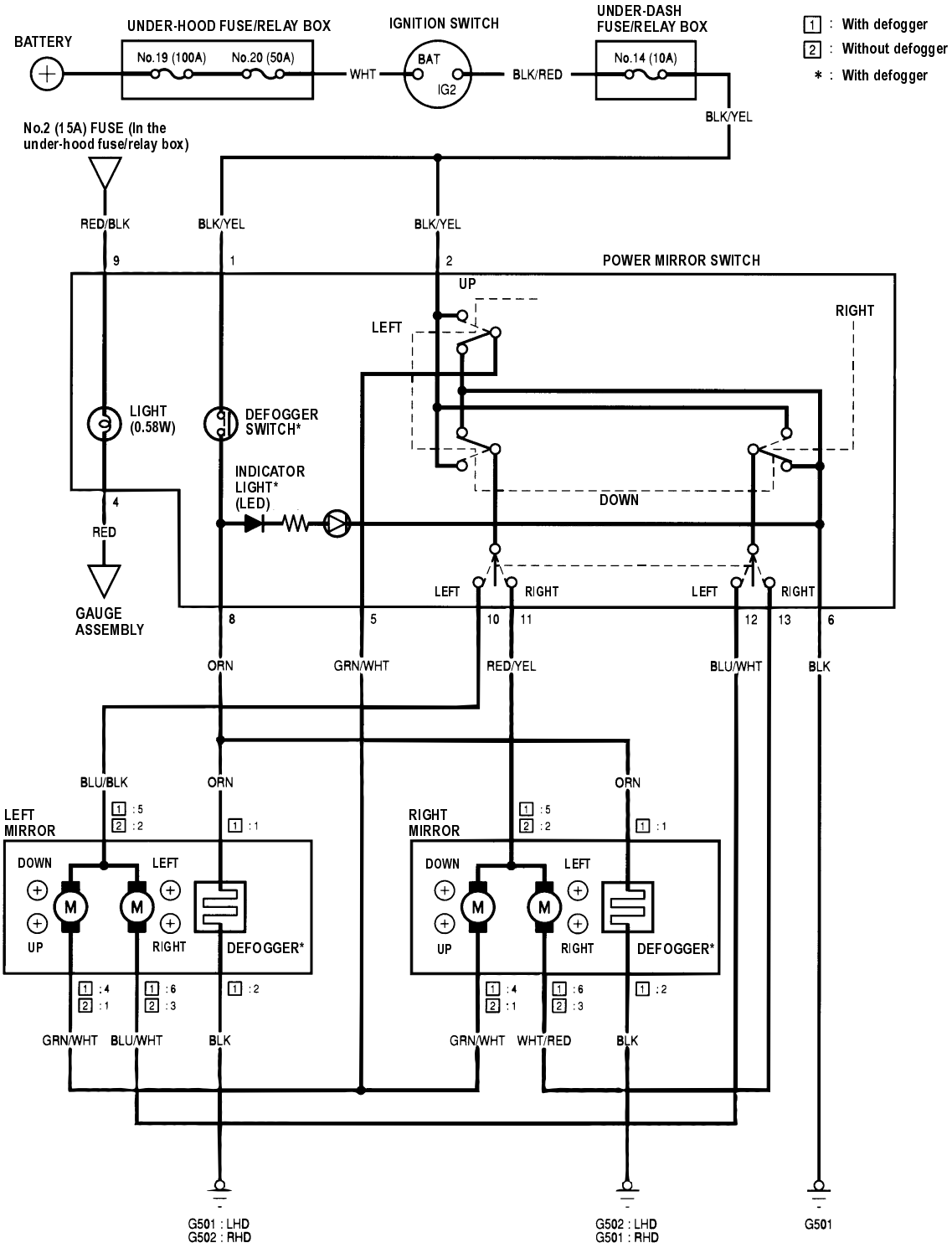
Component Location Index

NOTE: LHD type is shown, RHD type is symmetrical.

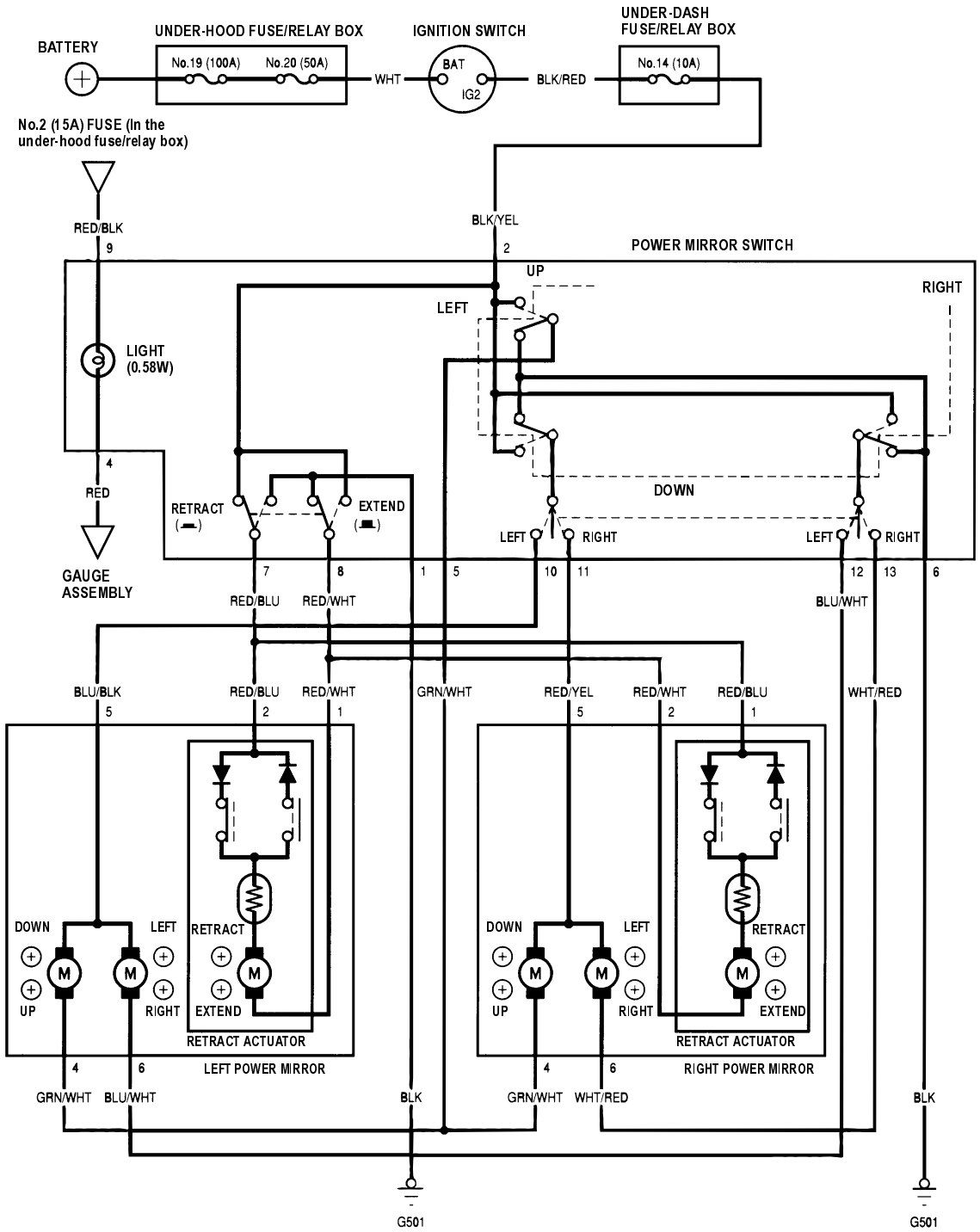


1	POWER MIRRORS	Function Test, page 22A-133; Replacement, page 22A-139; Mirror Actuator Test, page 22A-136; Mirror Actuator Replacement, page 22A-137
2	POWER MIRROR and MIRROR DEFOGGER SWITCH	Test, page 22A-135; Replacement, page 22A-135

Circuit Diagram

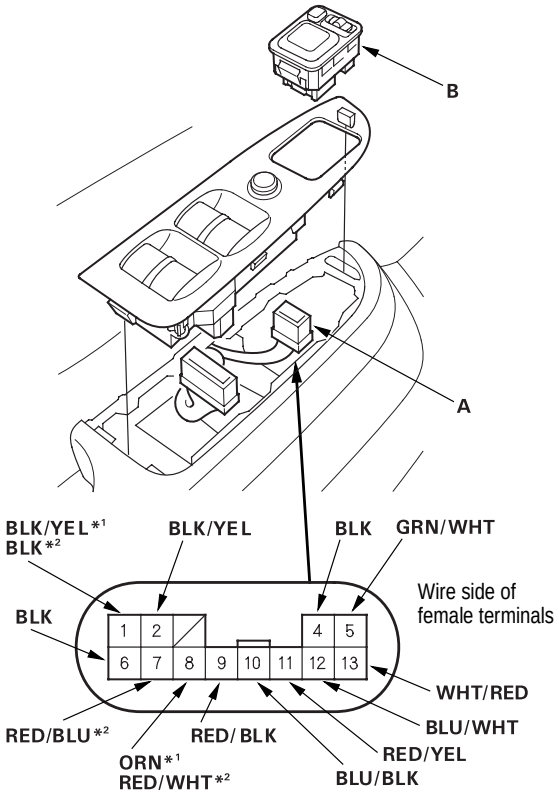


Circuit Diagram - With Retract Power Mirror



Function Test

1. Remove the driver's switch panel (A) (see page 20-9).



*1 : With defogger
*2 : With retract mirror

2. Disconnect the 13P connector (A) from the switch (B).
3. Choose the appropriate test based on the symptom:
   - Both mirrors don't work, go to step 4.
   - Left mirror doesn't work, go to step 6.
   - Right mirror doesn't work, go to step 7.
   - Defoggers don't work, go to step 8.
   - Retract actuators don't work, go to step 9.

Both mirrors

4. Check for voltage between the No. 2 terminal and body ground with the ignition switch ON (II).
   There should be battery voltage.
   - If there is no battery voltage, check for:
     – blown No. 14 (10A) fuse in the under-dash fuse/relay box.
     – an open in the BLK/YEL wire.
   - If there is battery voltage, go to step 5.
5. Check for continuity between the No. 6 terminal and body ground.
   There should be continuity.
   - If there is no continuity, check for:
     – an open in the BLK wire.
     – poor ground (G501).
   - If there is continuity, check both mirrors individually as described in the next column.

Left mirror

6. Connect the No. 2 terminal to the No. 10 terminal, and the No. 5 (or No. 12) terminal to No. 6 terminal with jumper wires. The left mirror should tilt down (or swing left) with the ignition switch ON (II).
   - If the mirror does not tilt down (or does not swing left), check for an open in the GRN/WHT (or BLU/WHT) wire between the left mirror and the 13P connector. If the wire is OK, check the left mirror actuator.
   - If the mirror neither tilts down nor swings left, repair the BLU/BLK wire.
   - If the mirror works properly, check the mirror switch.

Right mirror

7. Connect the No. 2 terminal to the No. 11 terminal, and the No. 5 (or No. 13) terminal to No. 6 terminal with jumper wires. The right mirror should tilt down (or swing left) with the ignition switch ON (II).
   - If the mirror does not tilt down (or does not swing left), check for an open in the GRN/WHT (or WHT/RED) wire between the right mirror and the 13P connector. If the wire is OK, check the right mirror actuator.
   - If the mirror neither tilts down nor swings left, repair the RED/YEL wire.
   - If the mirror works properly, check the mirror switch.

(cont'd)

Function Test (cont'd)

Defogger

8. Connect the No. 1 and No. 8 terminals with a jumper wire, and check for voltage between the BLK wire terminal of the mirror connector and body ground. There should be battery voltage and both mirrors should warm up with the ignition switch ON (II).

- If there is no voltage or neither warms up, check for:
  – an open in the BLK/YEL or ORN wire.
  – blown No. 14 (10A) fuse in the under-dash fuse/relay box.
- If only one fails to warm up, check its defogger.
  – poor ground (G501, G502).
- If both warm up, check the defogger switch.

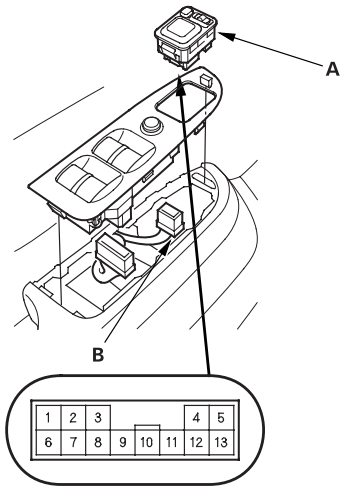
Retractable mirror

9. Connect the No. 2 terminal to the No. 7 (or No. 8) terminal with a jumper wire. The mirrors should retract (or extend) when the ignition switch is turned back and forth between ON (II) and OFF.

- If the mirrors neither retract nor extend, check for an open in the RED/BLU or RED/WHT wire between the switch and the mirrors.
- If one of the mirrors does not retract or extend, check the retractable mirror actuator.

Power Mirror Switch Test/Replacement

1. Remove the driver's switch panel (see page 20-9).
2. Remove the power mirror switch (A).



3. Disconnect the 13P connector (B) from the switch.
4. Check for continuity between the terminals in each switch position according to the table.

Mirror Switch:

	Terminal / Position	2	5	6	10	11	12	13
L	UP	○	○					
	DOWN	○		○	○			
	LEFT	○			○		○	
	RIGHT	○					○	
R	UP	○	○			○		
	DOWN	○		○		○		
	LEFT	○		○		○		○
	RIGHT	○		○		○		○

Defogger Switch:

Terminal / Position	1	8
ON	○	○
OFF		

Retract Switch:

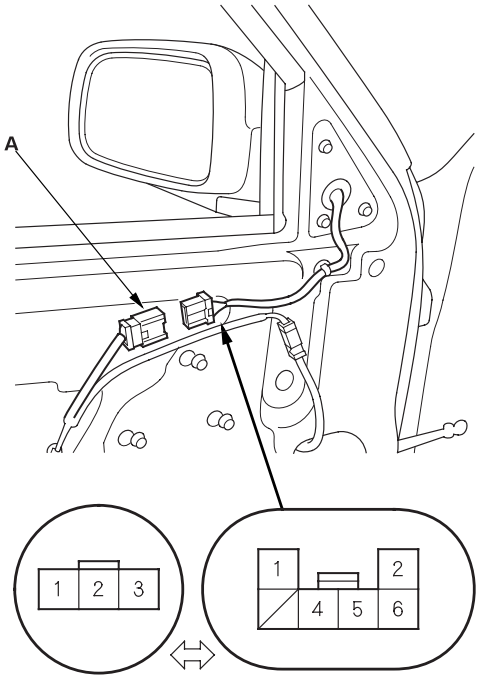
Terminal / Position	1	2	7	8
RETRACT	○	○	○	○
EXTEND	○	○	○	○

5. If the continuity is not as specified, replace the switch.

Power Mirror Actuator Test

1. Remove the door panel (see page 20-9).
2. Disconnect the 6P or 3P connector (A) from the power mirror actuator.

   3P connector: without defogger or retract
   6P connector: with defogger or retract



Wire side of female terminals

3. Check actuator operation by connecting battery power and ground according to the table.

Position \ Terminal	1 [4]	2 [5]	3 [6]
TILT UP	⊕	⊖	
TILT DOWN	⊖	⊕	
SWING LEFT		⊕	⊖
SWING RIGHT		⊖	⊕

[ ] : 6P CONNECTOR

4. If the mirror fails to work properly, replace the mirror actuator (see page 22A-137).

Defogger Test:

5. Check for continuity between the No. 1 and No. 2 terminals of the 6P connector. There should be continuity.
6. If the continuity is not as specified, replace the mirror actuator.

Retract Switch:

7. Check actuator operation by connecting battery power and ground according to the table.

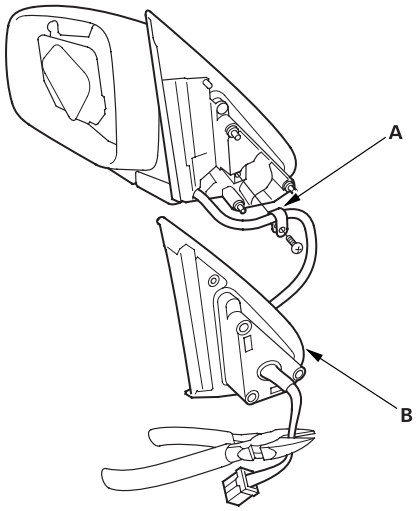
Position \ Terminal	1 [2]	2 [1]
Mirror retracts from extend position.	⊖	⊕
Mirror extends from retract position.	⊕	⊖

[ ] : Right power mirror

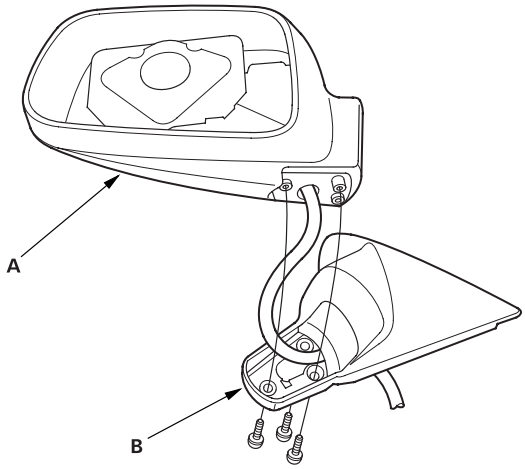
8. If the retract actuator fails to work properly, replace the mirror.

Power Mirror Actuator Replacement

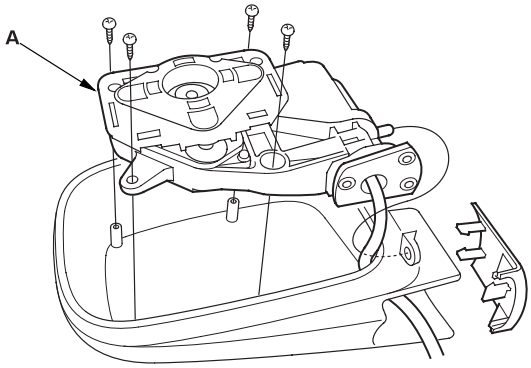
1. Remove the mirror holder, and disconnect the mirror defogger connectors* (see page 20-40).
   *: With defogger
2. Remove the power mirror (see page 20-39).
3. Disconnect the 3P or 6P connector from the mirror.
4. Remove the screw from the harness clip (A).



5. Cut the wire harness with cutter, and remove the gasket (B).
6. Remove the three screws, and separate the mirror housing (A) from the bracket (B).



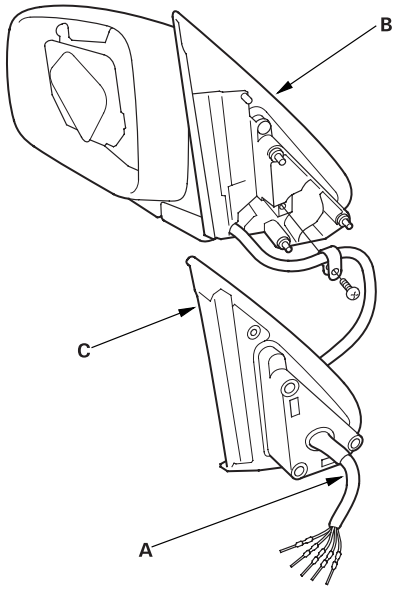
7. Remove the four screws and the actuator (A).



(cont'd)

Power Mirror Actuator Replacement (cont'd)

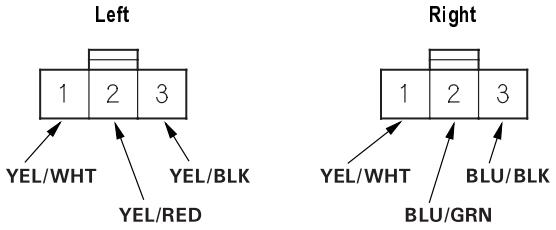
8. Route the wire harness (A) of the new actuator through the hole in the bracket (B) and gasket (C).



9. Install the actuator, bracket, harness clip, and gasket in the reverse order of removal.

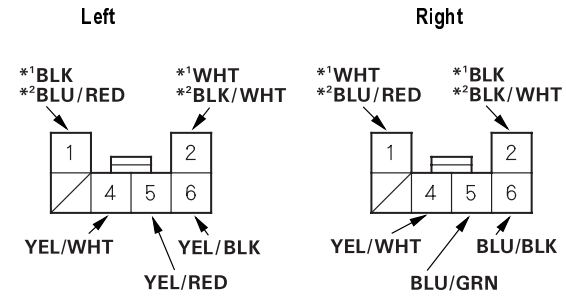
10. Insert the new actuator terminals into the connector in the original arrangement as shown below.

3P CONNECTOR:



Wire side of female terminals

6P CONNECTOR:



*1 : Defogger
*2 : Retract

Wire side of female terminals

11. Apply tape to seal the intersection of the wire harness and the gasket.

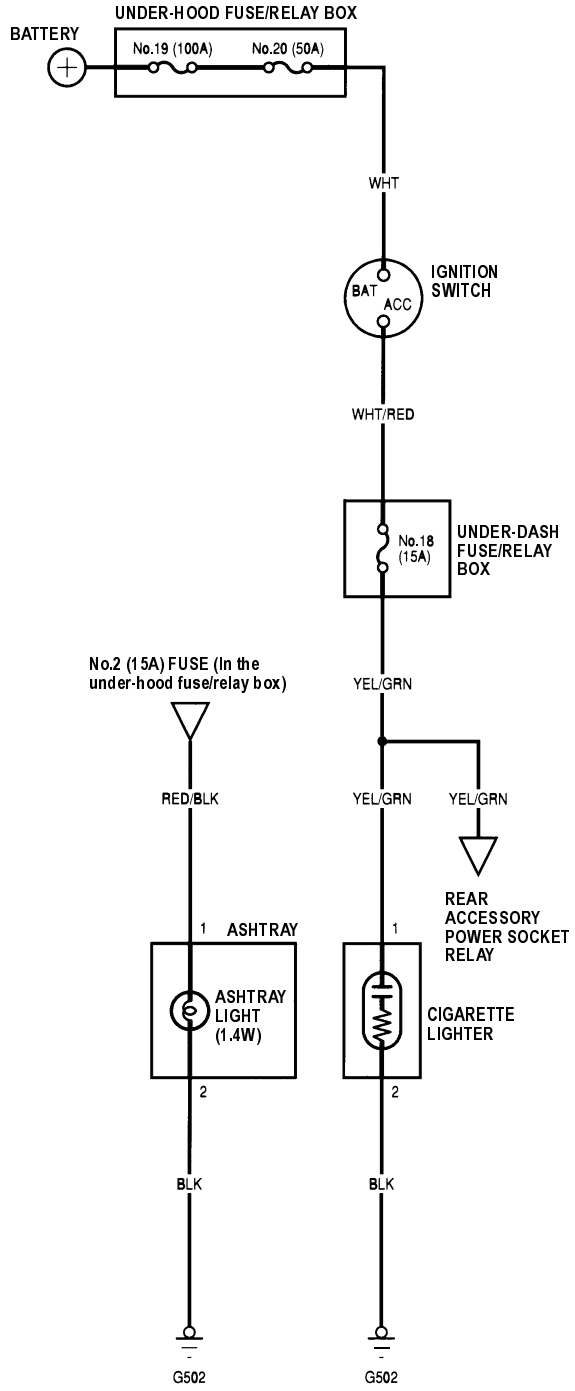
12. Reassemble in the reverse order of disassembly. Be careful not to break the mirror when reinstalling it to the actuator (see page 20-40).

13. Reinstall the mirror assembly to the door.

14. Operate the power mirror to ensure smooth operation.

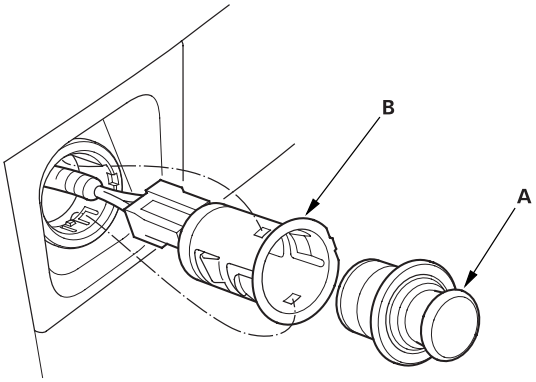
Cigarette Lighter

Circuit Diagram

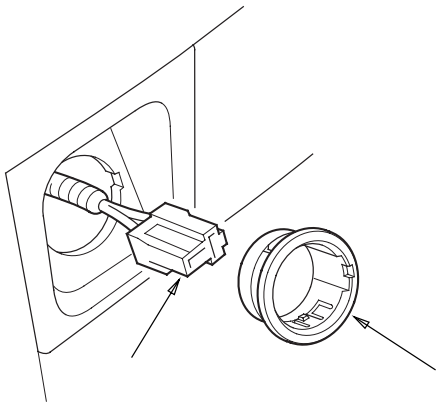


Replacement

1. Remove the cigarette lighter (A) and socket (B).



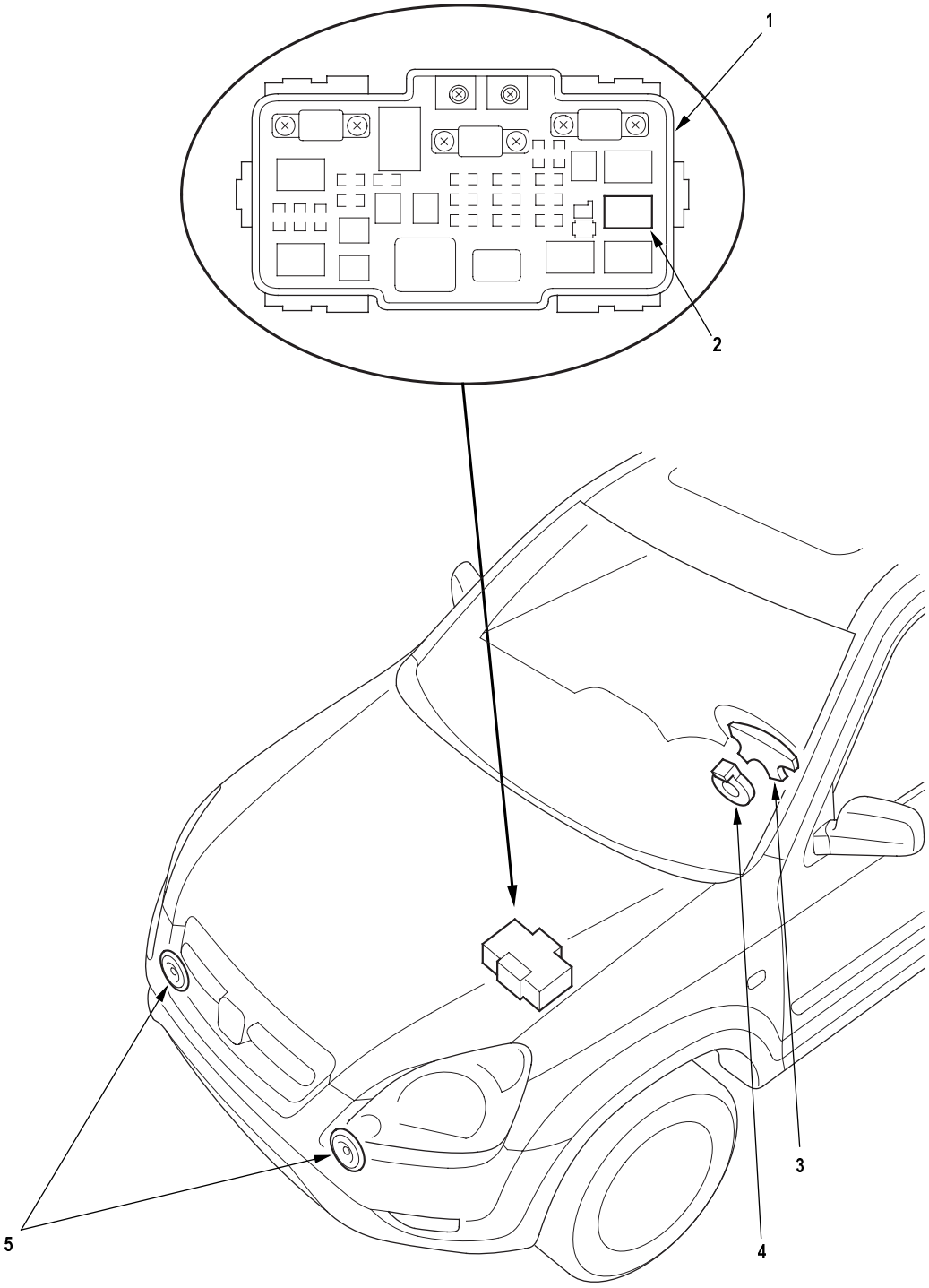
2. Disconnect the 2P connector (A) from the socket.
3. Remove the ring (B) from the dashboard.



Horns

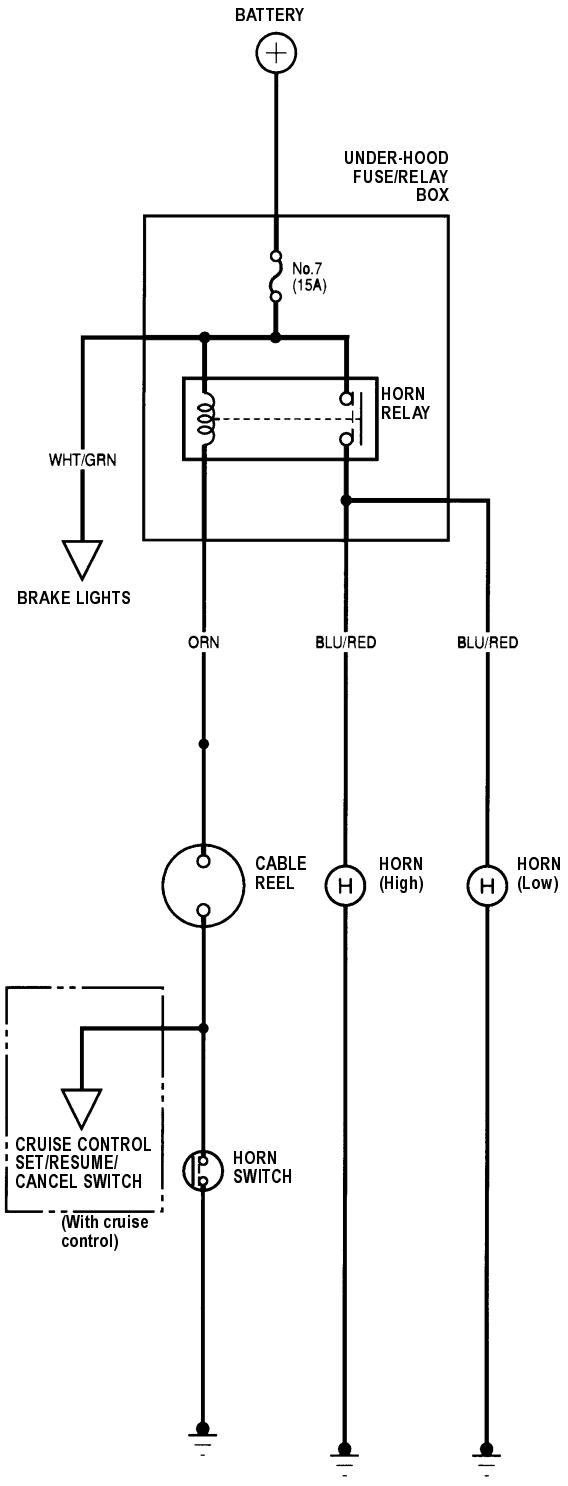
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



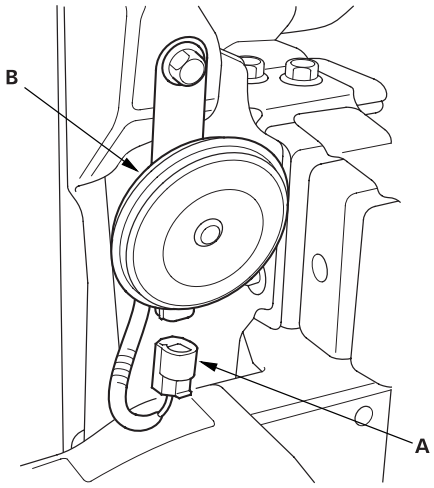
1 UNDER-HOOD FUSE/RELAY BOX
2 HORN RELAY Test, page 22A-60
3 HORN SWITCH Test, page 22A-142
4 CABLE REEL Replacement, page 23-141
5 HORN Test, page 22A-141; Replacement, page 22A-141

Circuit Diagram

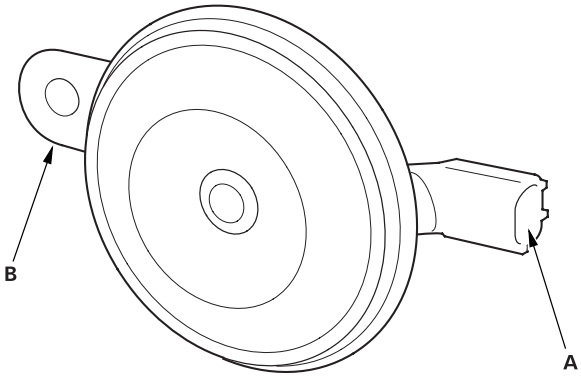


Horn Test/Replacement

1. Remove the front bumper (see page 20-130).
2. Disconnect the 1P connector (A), and remove the horn (B).

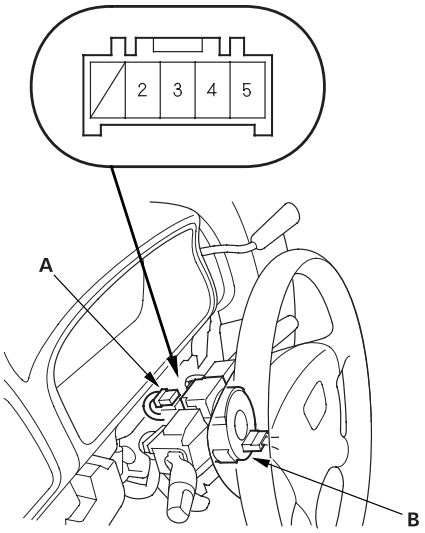


3. Test the horn by connecting battery power to the terminal (A) and ground to the bracket (B). The horn should sound.

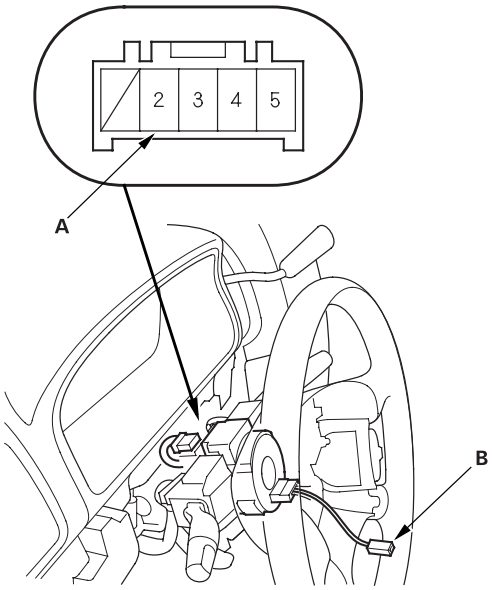


Horn Switch Test

1. Remove the steering column covers (see page 17-24).
2. Disconnect the dashboard wire harness B 5P connector (A) from the cable reel (B).



3. Check for continuity between the cable reel No. 2 terminal and body ground with the horn switch pushed. There should be continuity. If there is no continuity, go to step 4.
4. Remove the driver's airbag assembly (see page 23-135).
5. Disconnect the horn switch positive terminal 1P connector.
6. Check for continuity between the cable reel No.2 terminal (A) and the horn switch positive terminal (B).
   - If there is no continuity, replace the cable reel (see page 23-141).
   - If there is continuity, the cable reel OK, check the steering wheel, the horn switch, and the steering column (ground path).

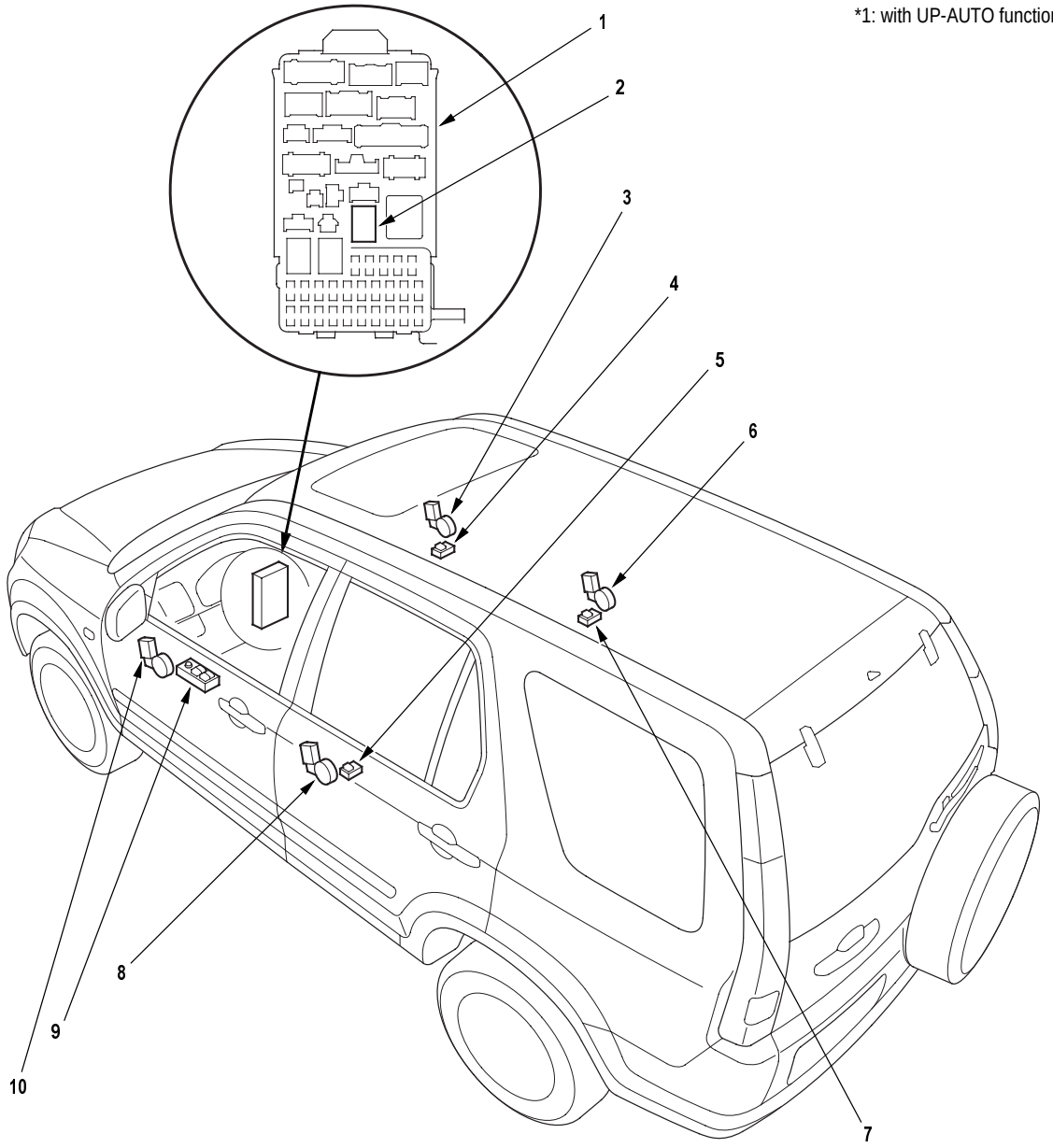


Power Windows

Component Location Index

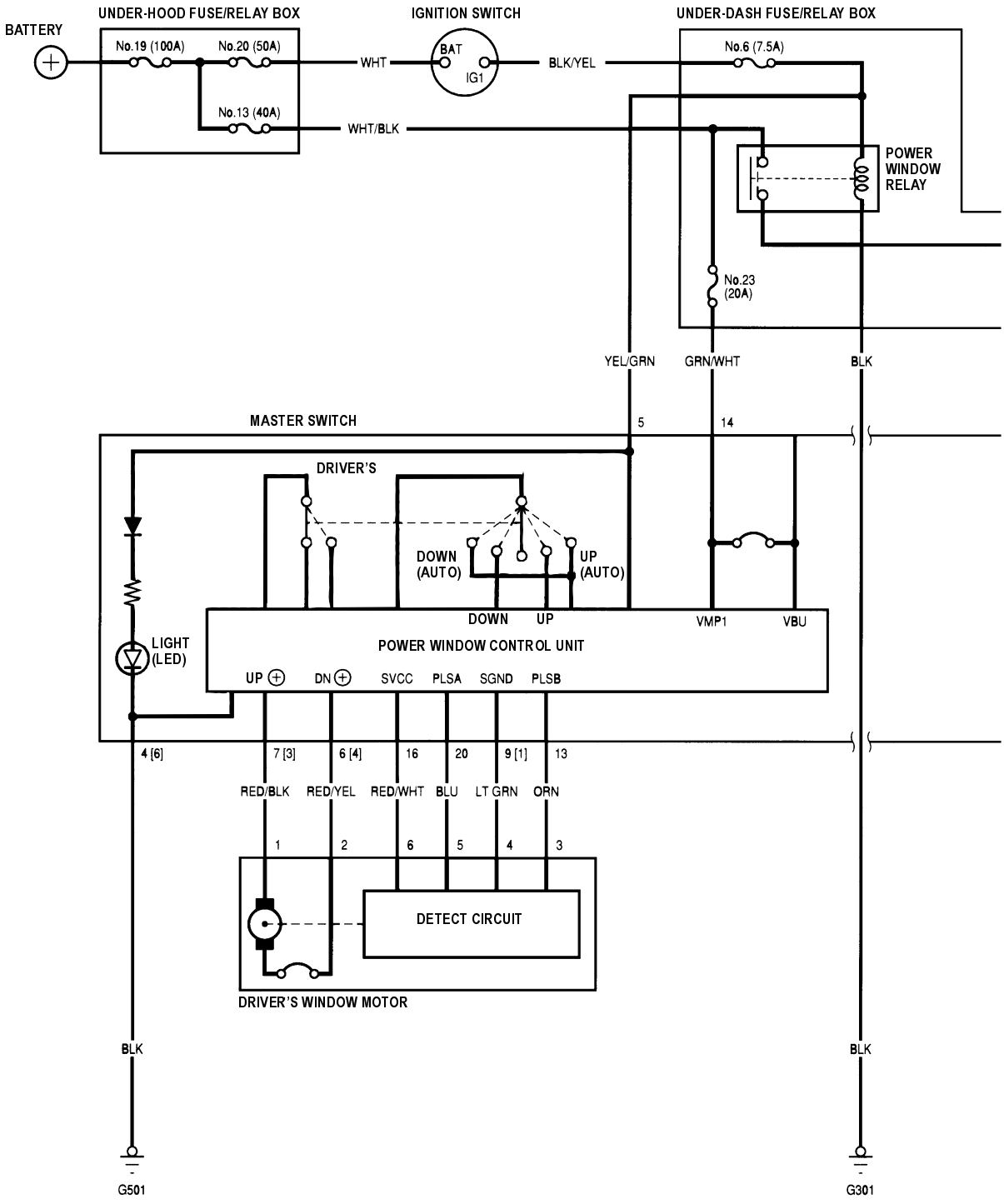
NOTE: LHD type is shown, RHD type is similar.

*1: with UP-AUTO function.

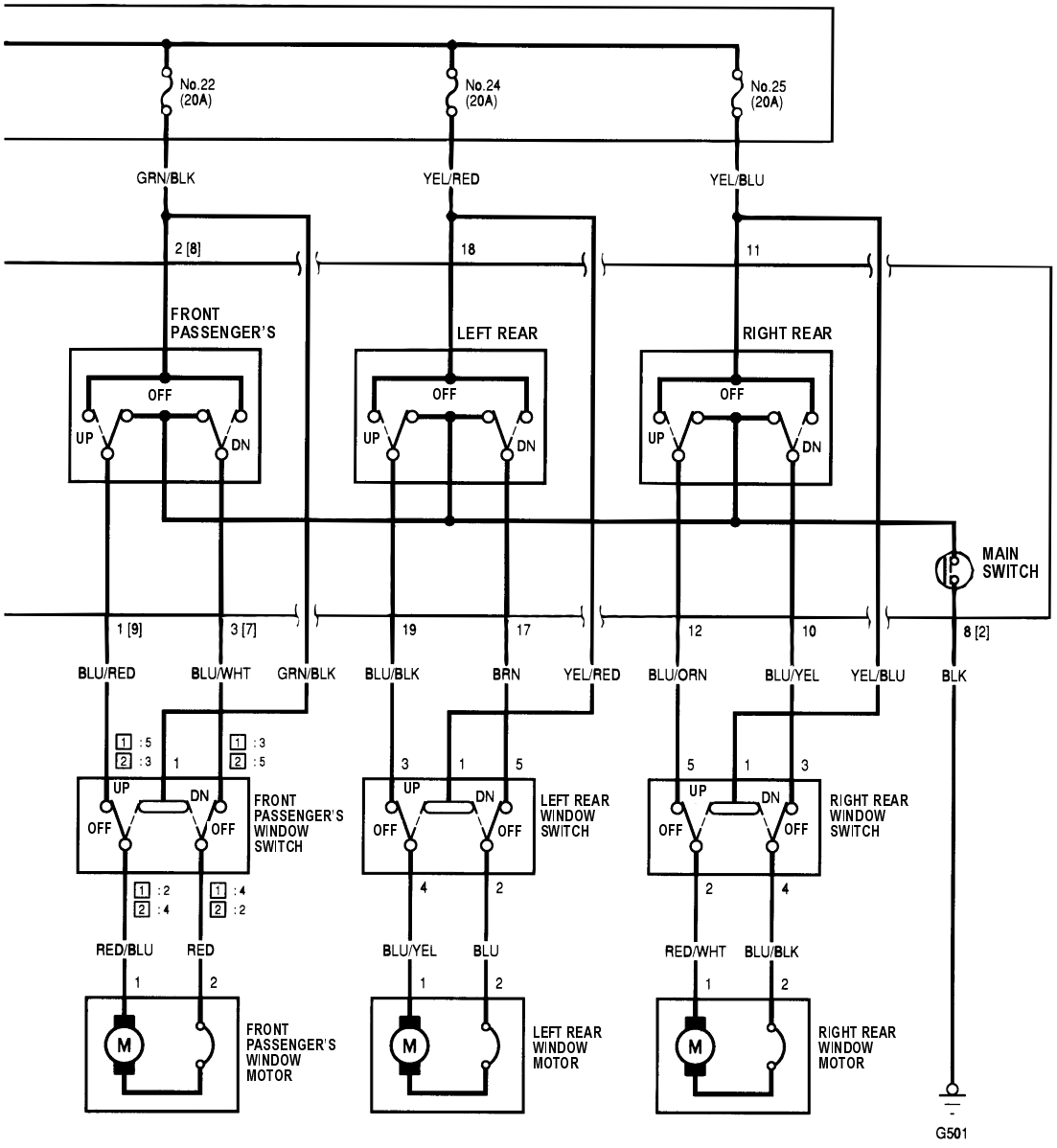


1	UNDER-DASH FUSE/RELAY BOX	
2	POWER WINDOW RELAY	Test, page 22A-60
3	FRONT PASSENGER'S WINDOW MOTOR	Test, page 22A-156
4	FRONT PASSENGER'S WINDOW SWITCH	Test, page 22A-153; Replacement, page 22A-153
5	LEFT REAR WINDOW SWITCH	Test, page 22A-153; Replacement, page 22A-153
6	RIGHT REAR WINDOW MOTOR	Test, page 22A-156
7	RIGHT REAR WINDOW SWITCH	Test, page 22A-153; Replacement, page 22A-153
8	LEFT REAR WINDOW MOTOR	Test, page 22A-156
9	POWER WINDOW MASTER SWITCH	Input Test, page 22A-148; Test, page 22A-152; Replacement, page 22A-148 *1 Resetting the Power Window Control Unit, page 22A-157
10	DRIVER'S WINDOW MOTOR	Test, page 22A-154

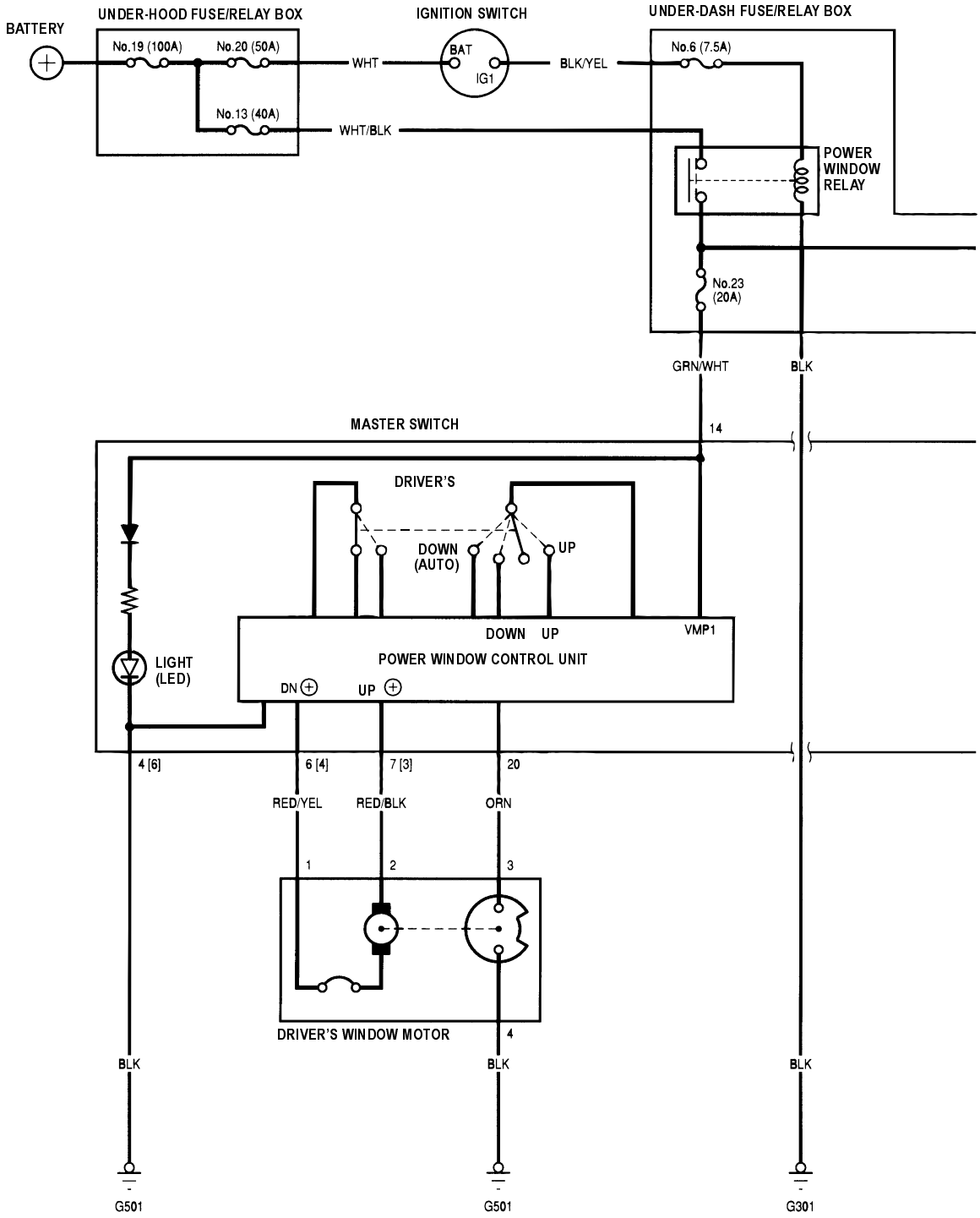
Circuit Diagram - With UP-AUTO Function



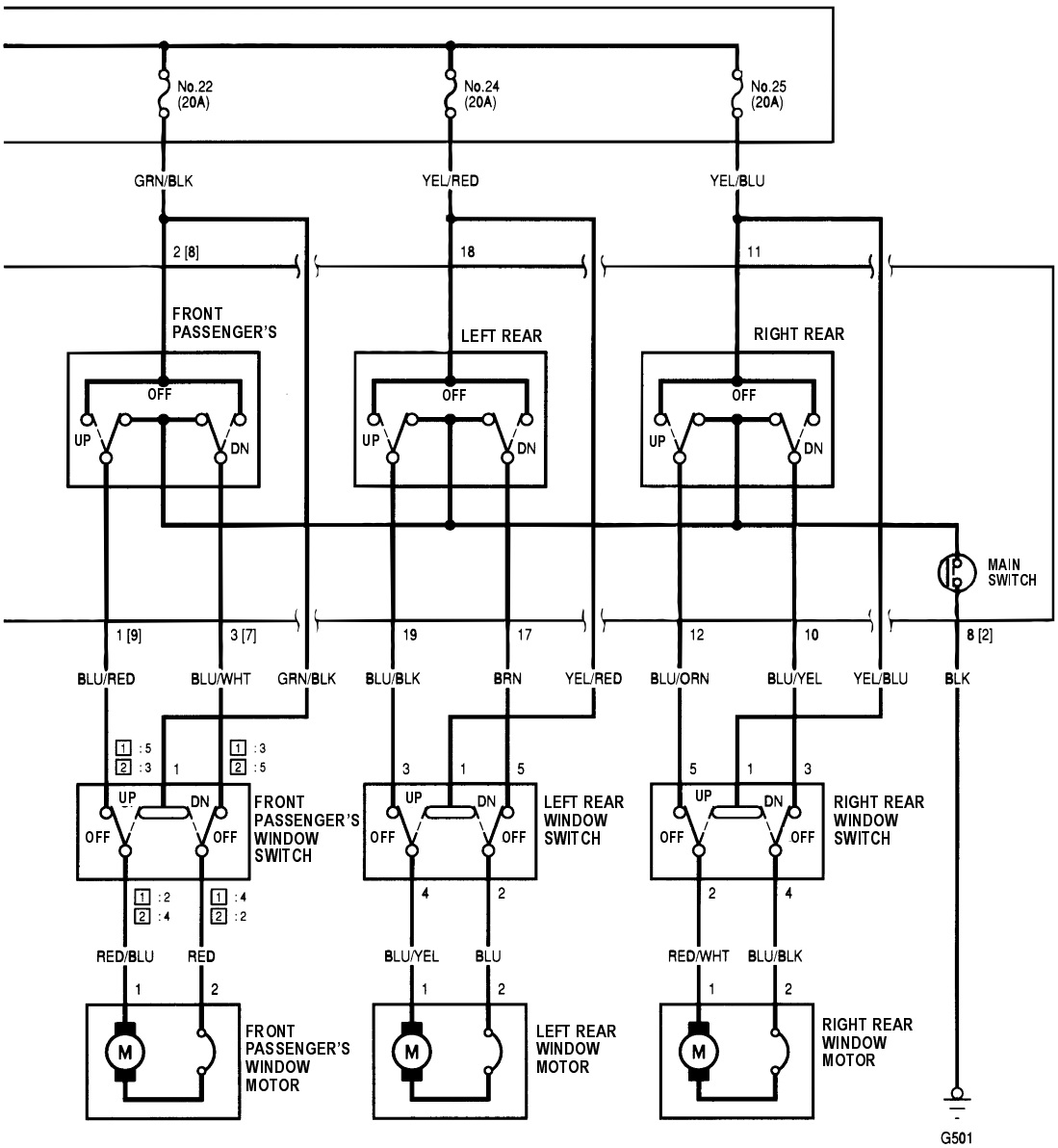
[ ] : RHD type
DN : DOWN
1 : LHD type
2 : RHD type



Circuit Diagram - Without UP-AUTO Function



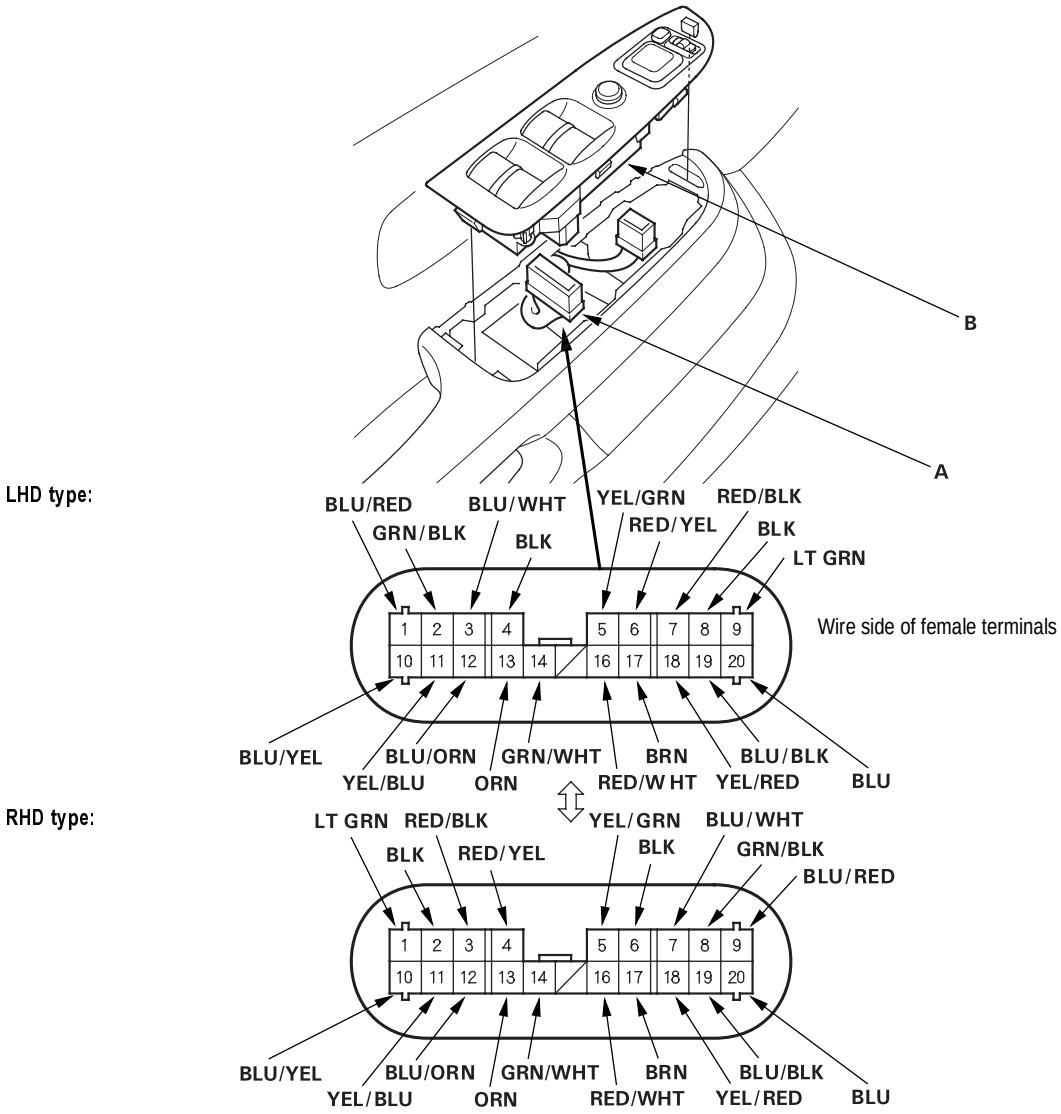
[ ] : RHD type
DN : DOWN
1 : LHD type
2 : RHD type



Master Switch Input Test - With UP-AUTO Function

NOTE: The power window control unit is built into the power window master switch, and it only controls the driver's window operations.

1. Remove the switch panel from the door panel (see page 20-9).
2. Disconnect the 20P connector (A) from the master switch (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     – If a test indicates a problem, find and correct the cause, then recheck the system.
     – If all the input tests prove OK, go to step 4.

4. Reconnect the 20P connector to the switch, and perform the following input tests.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
4[6]	BLK	Ignition switch ON (II), and the master switch ON	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • An open in the wire
8[2]				
14	GRN/WHT	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 23 (20A) fuse in the under-dash fuse/relay box • An open in the wire
5	YEL/GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (7.5A) fuse in the under-dash fuse/relay box • Blown No. 22, 24 or 25 (20A) fuse in the under-dash fuse/relay box • Faulty power window relay • An open in the wire
2[8]	GRN/BLK			
18	YEL/RED			
11	YEL/BLU			
6[4]	RED/YEL	Connect the No. 14 and No. 6 [No. 4] terminals, and the No. 7 [No. 3] and No. 4 [No. 6] terminals, and turn the ignition switch ON (II).	Check for driver's window motor operation: It should run (the driver's window moves down).	• Faulty driver's window motor • An open in the wire
7[3]	RED/BLK			
1[9]	BLU/RED	Connect the No. 2 and No. 3 [No. 7] terminals, and the No. 1 [No. 9] and No. 8 [No. 2] terminals, and turn the ignition switch ON (II).	Check for front passenger's window motor operation: It should run (the front passenger's window moves down).	• Faulty front passenger's window motor • Faulty front passenger's window switch • An open in the wire
3[7]	BLU/WHT			
19	BLU/BLK	Connect the No. 18 and No. 17 terminals, and the No. 19 and No. 8[No. 2]terminals, and turn the ignition switch ON (II).	Check for left rear window motor operation: It should run (the left rear window moves down).	• Faulty left rear window motor • Faulty left rear window switch • An open in the wire
17	BRN			
12	BLU/ORN	Connect the No. 11 and No. 10 terminals, and the No. 12 and No. 8 [No. 2]terminals, and turn the ignition switch ON (II).	Check for right rear window motor operation: It should run (the right rear window moves down).	• Faulty right rear window motor • Faulty right rear window switch • An open in the wire
10	BLU/YEL			

5. Disconnect the 20P connector from the switch connector, and make these input tests at the connector.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the control unit must be faulty; replace the power window master switch.

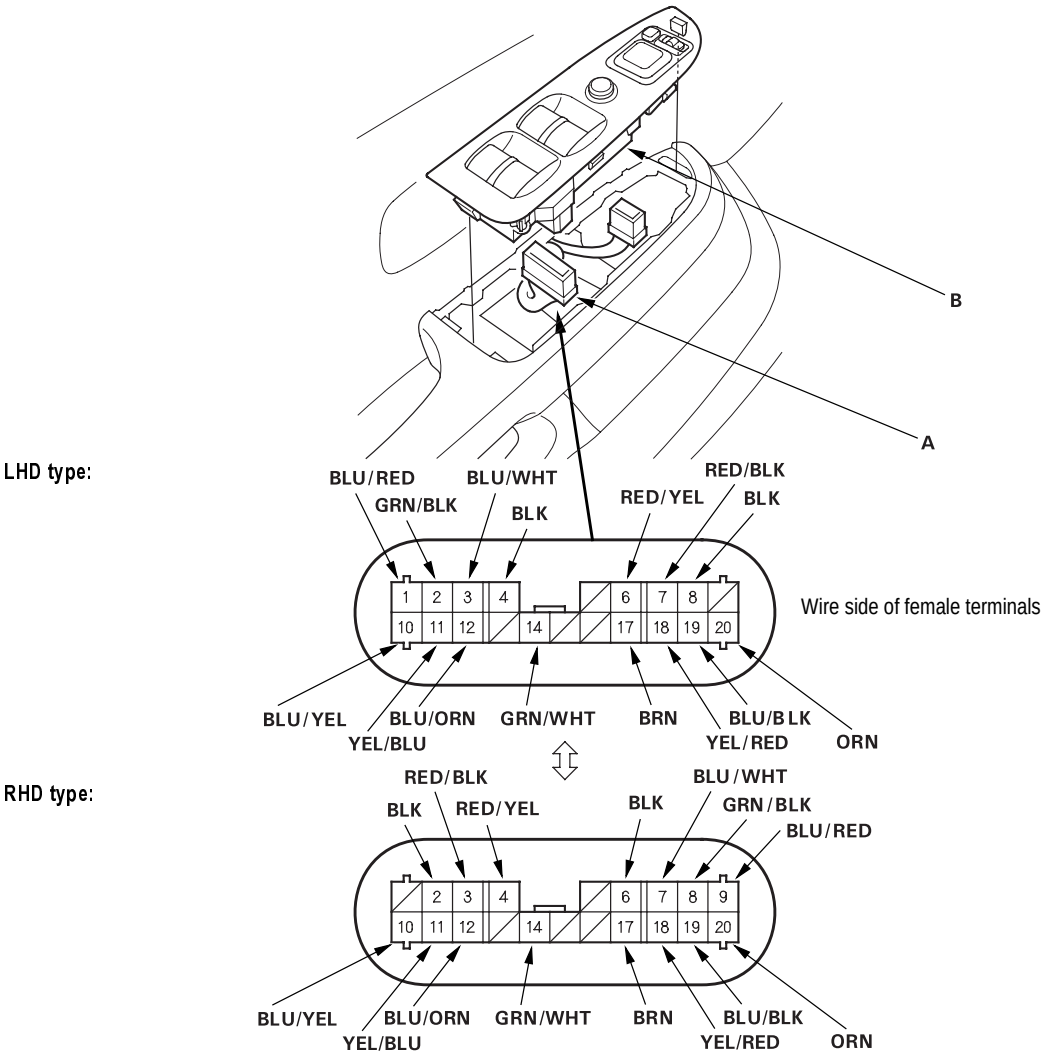
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
16	RED/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Faulty power window master switch • An open in the wire
9[1]	LT GRN	Under all conditions	Check for voltage to ground: There should be battery voltage.	• An open in the wire
20	BLU	Ignition switch ON (II), and the driver's window switch AUTO DOWN	Check for voltage between the No. 20 and No. 4 [No. 1] terminals: There should be 0 V - about 5 V - 0 V - about 5 V repeatedly.	• Blown No. 23 (20A) fuse in the under-dash fuse/relay box • Faulty power window relay • Faulty power window master switch • An open in the wire
13	ORN	Ignition switch ON (II), and the driver's window switch AUTO DOWN	Check for voltage between the No. 13 and No. 4 [No. 1] terminals: There should be 0 V - about 5 V - 0 V - about 5 V repeatedly.	

[ ]:RHD type

Master Switch Input Test - Without UP-AUTO Function

NOTE: The power window control unit is built into the power window master switch, and it only controls the driver's window operations.

1. Remove the switch panel from the door panel (see page 20-9).
2. Disconnect the 20P connector (A) from the master switch (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     – If a test indicates a problem, find and correct the cause, then recheck the system.
     – If all the input tests prove OK, go to step 4.

4. With the connector still disconnected, make these input tests at the connector.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
4[6]	BLK	Under all condition	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
8[2]				
14	GRN/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (7.5A) fuse in the under-dash fuse/relay box • Blown No. 22, 24 or 25 (20A) fuse in the under-dash fuse/relay box • Faulty power window relay • An open in the wire
2[8]	GRN/BLK			
18	YEL/RED			
11	YEL/BLU			
6[4]	RED/YEL	Connect the No. 14 and No. 6 [No. 4] terminals, and the No. 7 [No. 3] and No. 4 [No. 6] terminals, and turn the ignition switch ON (II).	Check for driver's window motor operation: It should run (the driver's window moves down).	• Faulty driver's window motor • An open in the wire
7[3]	RED/BLK			
1[9]	BLU/RED	Connect the No. 2 and No. 3 [No. 7] terminals, and the No. 1 [No. 9] and No. 8 [No. 2] terminals, and turn the ignition switch ON (II).	Check for front passenger's window motor operation: It should run (the front passenger's window moves down).	• Faulty front passenger's window motor • Faulty front passenger's window switch • An open in the wire
3[7]	BLU/WHT			
19	BLU/BLK	Connect the No. 18 and No. 17 terminals, and the No. 19 and No. 8 [No. 2] terminals, and turn the ignition switch ON (II).	Check for left rear window motor operation: It should run (the left rear window moves down).	• Faulty left rear window motor • Faulty left rear window switch • An open in the wire
17	BRN			
12	BLU/ORN	Connect the No. 11 and No. 10 terminals, and the No. 12 and No. 8 [No. 2] terminals, and turn the ignition switch ON (II).	Check for right rear window motor operation: It should run (the right rear window moves down).	• Faulty right rear window motor • Faulty right rear window switch • An open in the wire
10	BLU/YEL			

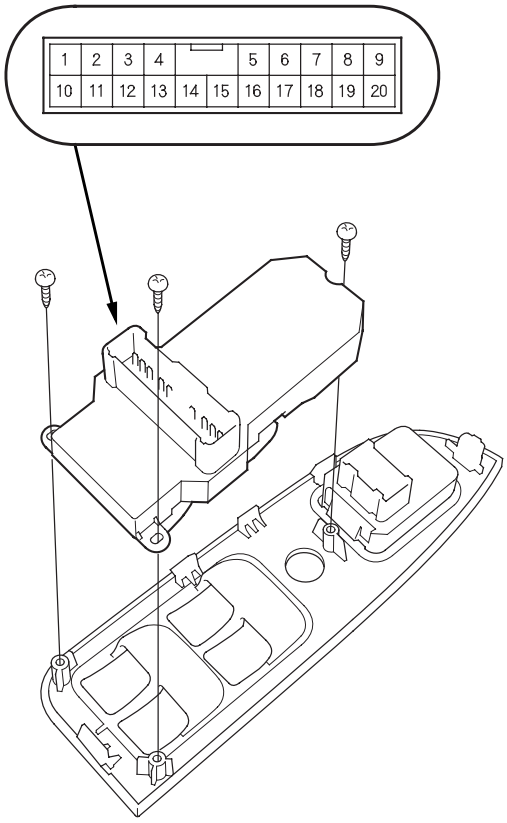
5. Reconnect the 20P connector to the switch, and perform the following input tests.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the control unit must be faulty; replace the power window master switch.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
20	RED/WHT	Connect the No. 14 and No. 6 [No. 4] terminals, and the No. 7 [No. 3] and No. 4 [No. 6] terminals, and turn the ignition switch ON (II).	Check for voltage between the No. 20 and No. 4 [No. 6] terminals: About 6 V should be indicated while the driver's window motor running.	• Faulty driver's window motor • An open in the wire

[ ]:RHD type

Master Switch Test/Replacement

1. Remove the power window master switch.
2. Disconnect the 20P connector from the switch.



Driver's Switch:

The driver's switch is combined with the control unit so you cannot isolate the switch to test it.
Instead, run the master switch input test procedures on page 22A-148. If the tests are normal, the driver's switch must be faulty.

Front Passenger's Switch:

Position \ Terminal / Main Switch		1 [9]	2 [8]	3 [7]	8 [2]
OFF	ON	○		○	○
	OFF	○		○	
UP	ON	○	○		○
	OFF	○	○		
DOWN	ON	○		○	○
	OFF		○	○	

Left Rear Switch:

Position \ Terminal / Main Switch		19	18	17	8 [2]
OFF	ON	○		○	○
	OFF	○		○	
UP	ON	○	○		○
	OFF	○	○		
DOWN	ON	○		○	○
	OFF		○	○	

Right Rear Switch:

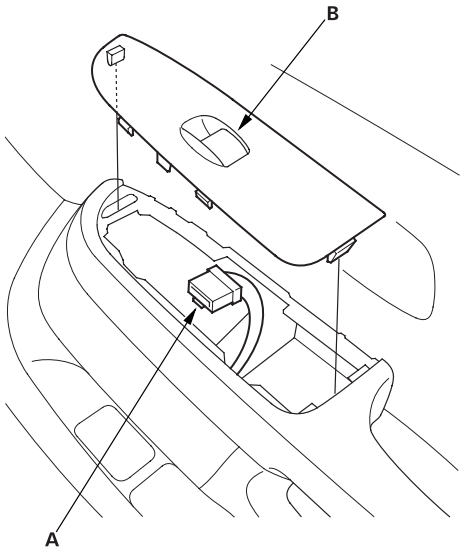
Position \ Terminal / Main Switch		11	12	10	8 [2]
OFF	ON		○	○	○
	OFF		○	○	
UP	ON	○	○		○
	OFF	○	○		
DOWN	ON	○		○	○
	OFF	○		○	

[ ] :RHD type

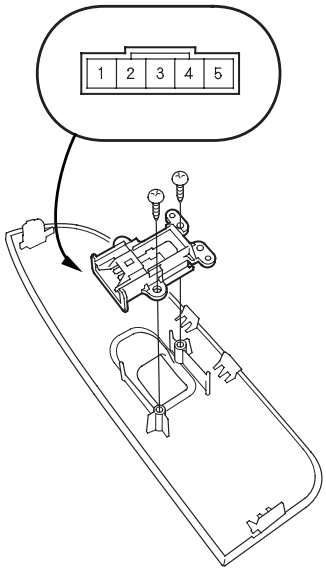
3. If the continuity is not as specified, replace the switch.

Passenger's Window Switch Test/Replacement

1. Remove the switch panel from the door panel (see page 20-9).
2. Disconnect the 5P connector (A) from the power window switch (B).



3. Remove the two screws and the passenger's power window switch.



4. Check for continuity between the terminals in each switch position according to the table.

Front passenger's (LHD type):

Terminal / Position	1	2	3	4	5
UP	○	○		○	
			○		
OFF		○			○
			○	○	
DOWN	○			○	
		○			○

Front passenger's (RHD type):

Terminal / Position	1	2	3	4	5
UP	○			○	
		○			○
OFF			○	○	
		○			○
DOWN	○	○			
			○	○	

Left Rear Window:

Terminal / Position	1	2	3	4	5
UP	○			○	
		○			○
OFF			○	○	
		○			○
DOWN	○	○			
			○	○	

Right Rear Window:

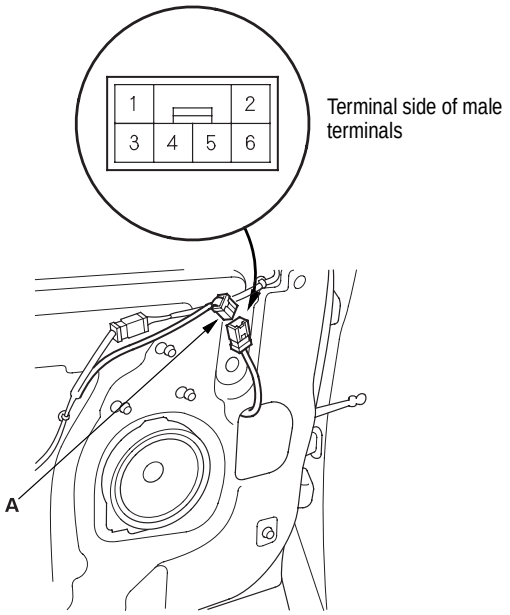
Terminal / Position	1	2	3	4	5
UP	○	○			
			○	○	
OFF		○			○
			○	○	
DOWN	○			○	
		○			○

5. If the continuity is not as specified, replace the switch.

Driver's Window Motor Test - With UP-AUTO Function

Motor Test:

1. Remove the driver's door panel (see page 20-9).
2. Disconnect the 6P connector (A) from the driver's window motor.



3. Test the motor in each direction by connecting battery power and ground according to the table.

NOTICE

To prevent damage to the motor, disconnect one lead as soon as the motor stops running.

Terminal / Direction	1	2
UP	⊕	⊖
DOWN	⊖	⊕

4. If the motor does not run or fails to run smoothly, replace it.

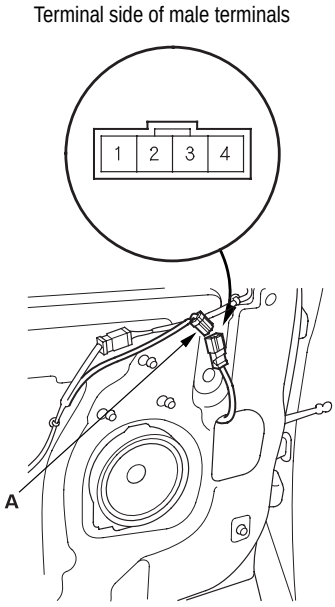
Pulser Test:

1. Reconnect the 6P connector to the window motor, and reconnect the 14P connector to the power window master switch.
2. Check for voltage between the terminals.
   - There should be battery voltage between the No. 6 (+) and No. 4 (-) terminals when the ignition switch is turned ON (II).
   - Connect an analog voltmeter between the No. 5 (+) and No. 4 (-) terminals, and run the window motor down or up. The voltmeter needle should move back and forth alternately between 0 V and about 5 V (a digital voltmeter should show about 2.5 V).
   - Connect an analog voltmeter between the No. 3 (+) and No. 4 (-) terminals, and run the window motor down or up. The voltmeter needle should move back and forth alternately between 0 V and about 5 V (a digital voltmeter should show about 2.5 V).

Driver's Window Motor Test - Without UP-AUTO Function

Motor Test:

1. Remove the door panel (see page 20-9).
2. Disconnect the 4P connector (A) from the driver's window motor.



3. Test the motor in each direction by connecting battery power and ground according to the table.

   NOTICE

   To prevent damage to the motor, disconnect one lead as soon as the motor stops running.

Terminal / Direction	1	2
UP	⊖	⊕
DOWN	⊕	⊖

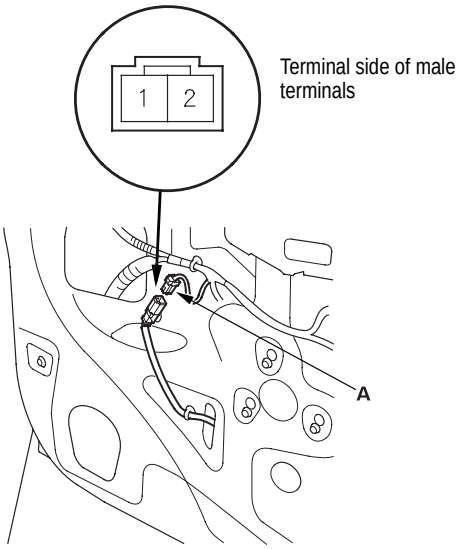
4. If the motor does not run or fails to run smoothly, replace it.

Pulser Test:

1. Remove the 4P conector to the driver's window motor, and reconnect the 20P connector to the power window master switch.
2. Connect the test leads of a voltmeter to the No. 3 and No. 4 terminals of the driver's window motor 4P connector.
3. Run the motor by connecting power and ground to the No. 1 and No. 2 terminals. The voltmeter should read about 6 V.
4. If the voltage is not as specified, check for an open in the wires. If the wires are OK, replace the driver's window motor.

Passenger's Window Motor Test

1. Remove the passenger's door panel (see page 20-9).
2. Disconnect the 2P connector (A) from the passenger's power window motor.



3. Test the motor in each direction by connecting battery power and ground according to the table.

NOTICE

To prevent damage to the motor, disconnect one lead as soon as the motor stops running.

Terminal / Direction	1	2
UP	⊕	⊖
DOWN	⊖	⊕

4. If the motor does not run or fails to run smoothly, replace it.

Resetting the Power Window Control Unit

Resetting the power window control unit is required after performing the following procedures:

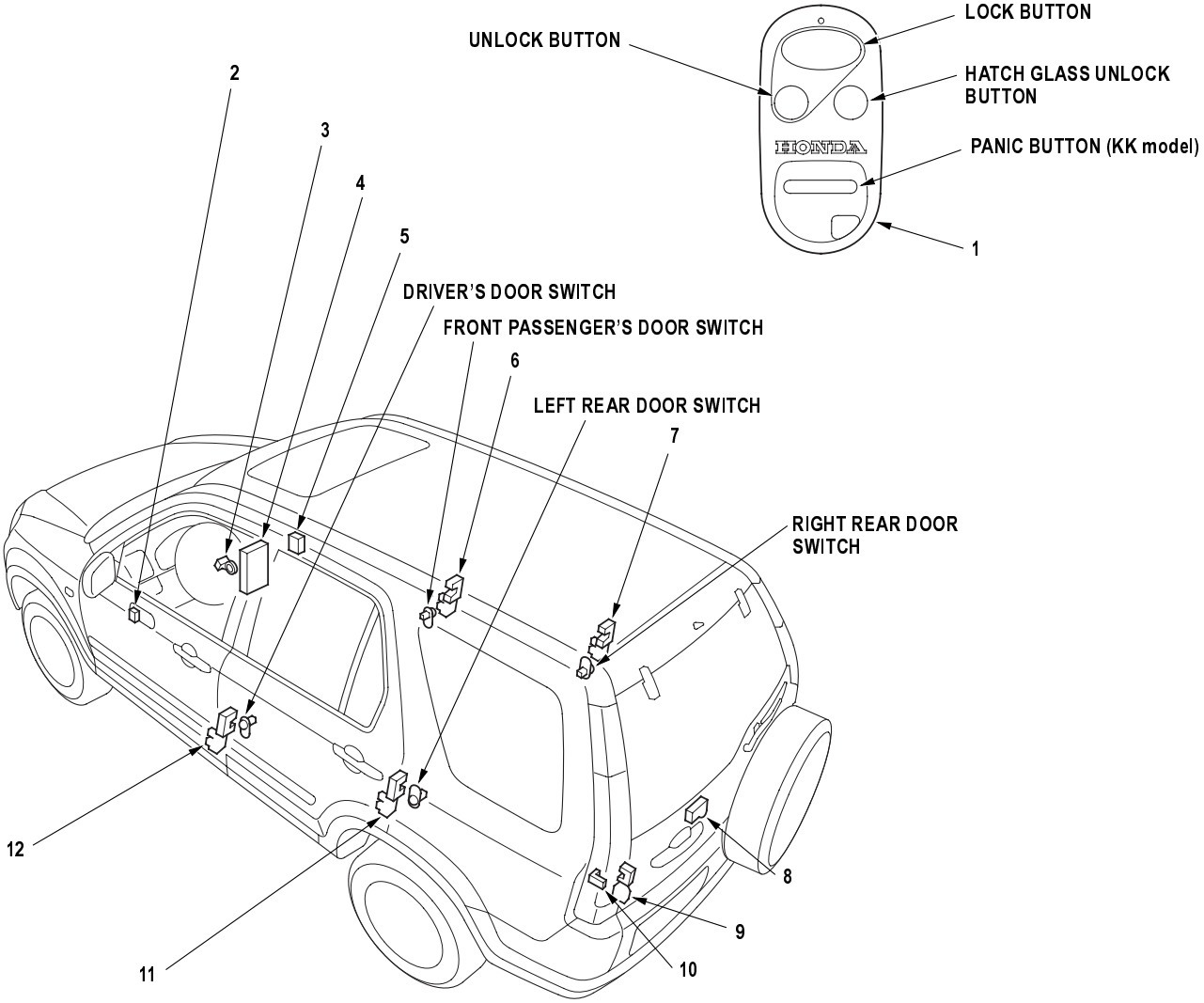
- Loss of battery power
- Loss of power from the No. 6 (7.5A) and/or the No. 23 (20A) fuses in the under-dash fuse/relay box
- Open circuit caused by disconnecting the 20P connector from the power window master switch
- Removal of the regulator, glass, or glass run channel

1. Make sure the glass is installed properly.
2. Close the driver's door.
3. Turn the ignition switch OFF.
4. Remove the No. 23 (20A) fuse in the under-dash fuse/relay box.
5. Turn the ignition switch ON (II).
6. After 1 second, turn the ignition switch OFF.
7. After 5 seconds, install the No. 23 (20A) fuse to the under-dash fuse/relay box.
8. Make sure the driver's window does not work in AUTO with the ignition switch ON (II).
9. Start the engine.
10. Move the driver's window all the way down using the manual DOWN function of the driver's power window switch.
11. Move the driver's window all the way up using the manual UP function of the driver's power window switch, and hold it for 1 second after the window reaches the closed position.
12. If the window does not work in AUTO, repeat steps 2 through 12.

Keyless/Power Door Lock System

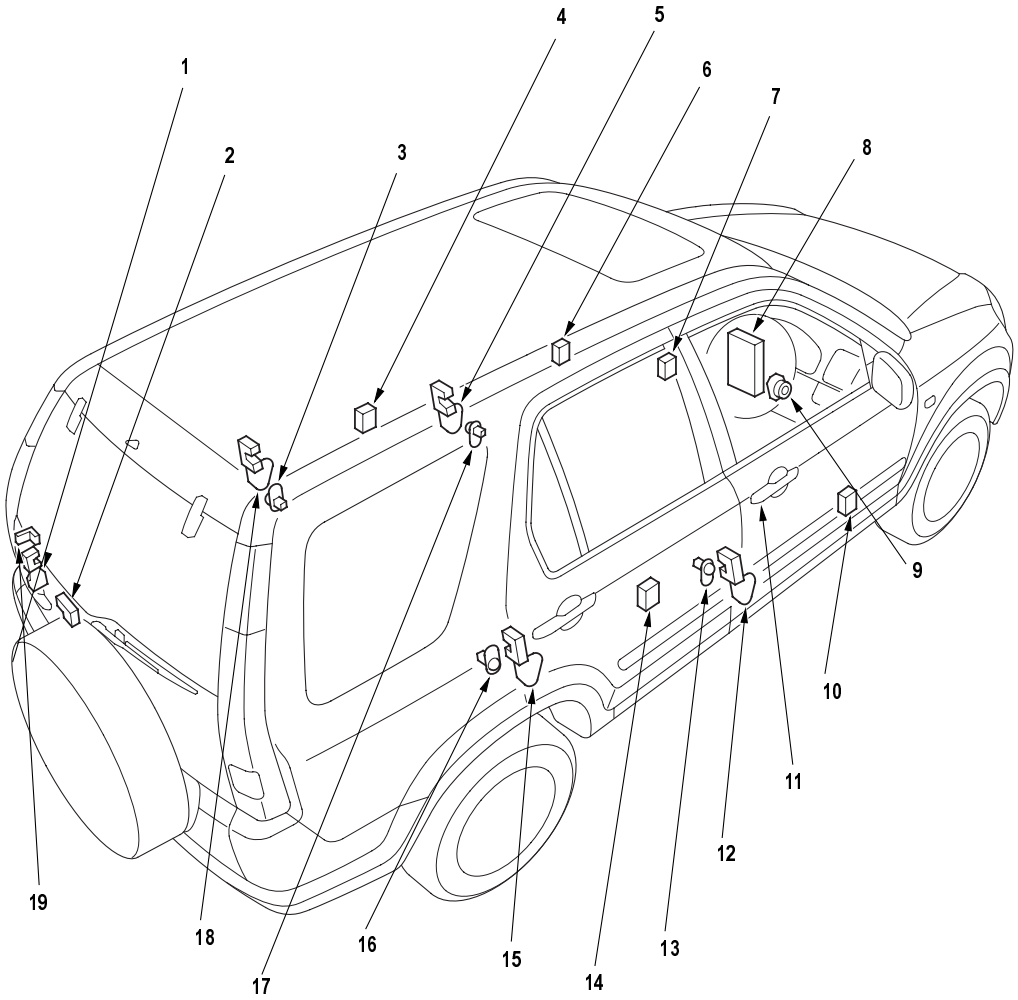
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



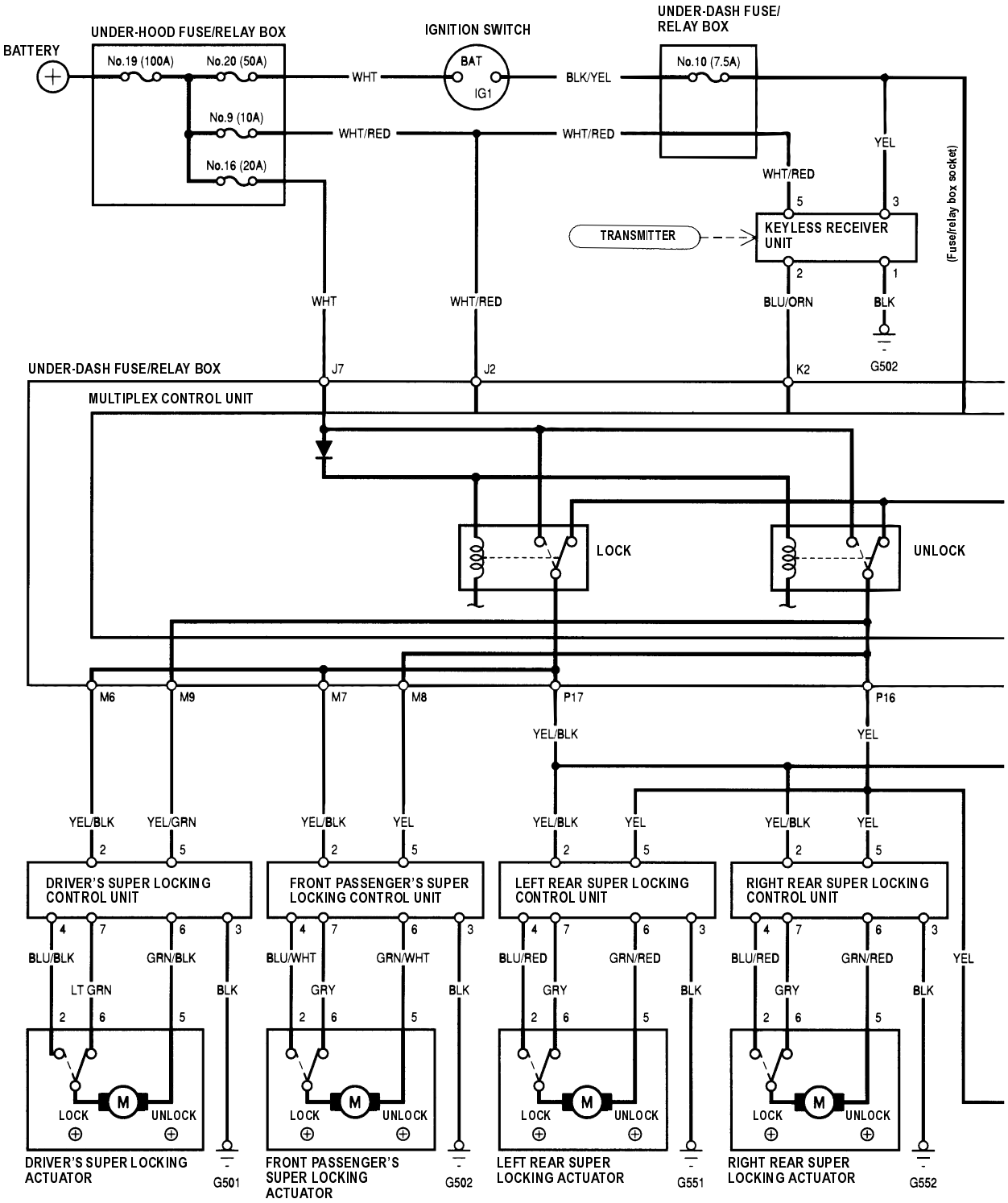
1	TRANSMITTER	Test, page 22A-176 Programming, page 22A-176
2	DRIVER'S DOOR LOCK SWITCH	Test, page 22A-177
3	IGNITION KEY SWITCH	Test, page 22A-113
4	MULTIPLEX CONTROL UNIT	Input Test, page 22A-166
5	KEYLESS RECEIVER UNIT	Input Test, page 22A-165
6	FRONT PASSENGER'S DOOR LOCK ACTUATOR	Test, page 22A-174
7	RIGHT REAR DOOR LOCK ACTUATOR	Test, page 22A-174
8	HATCH GLASS OPENER ACTUATOR	Test, page 22A-178
9	TAILGATE LOCK ACTUATOR	Test, page 22A-178
10	TAILGATE SWITCH	Test, page 22A-110 Replacement, page 22A-110
11	LEFT REAR DOOR LOCK ACTUATOR	Test, page 22A-174
12	DRIVER'S DOOR LOCK ACTUATOR/KNOB SWITCH	Actuator Test, page 22A-174 Knob Switch Test, page 22A-202

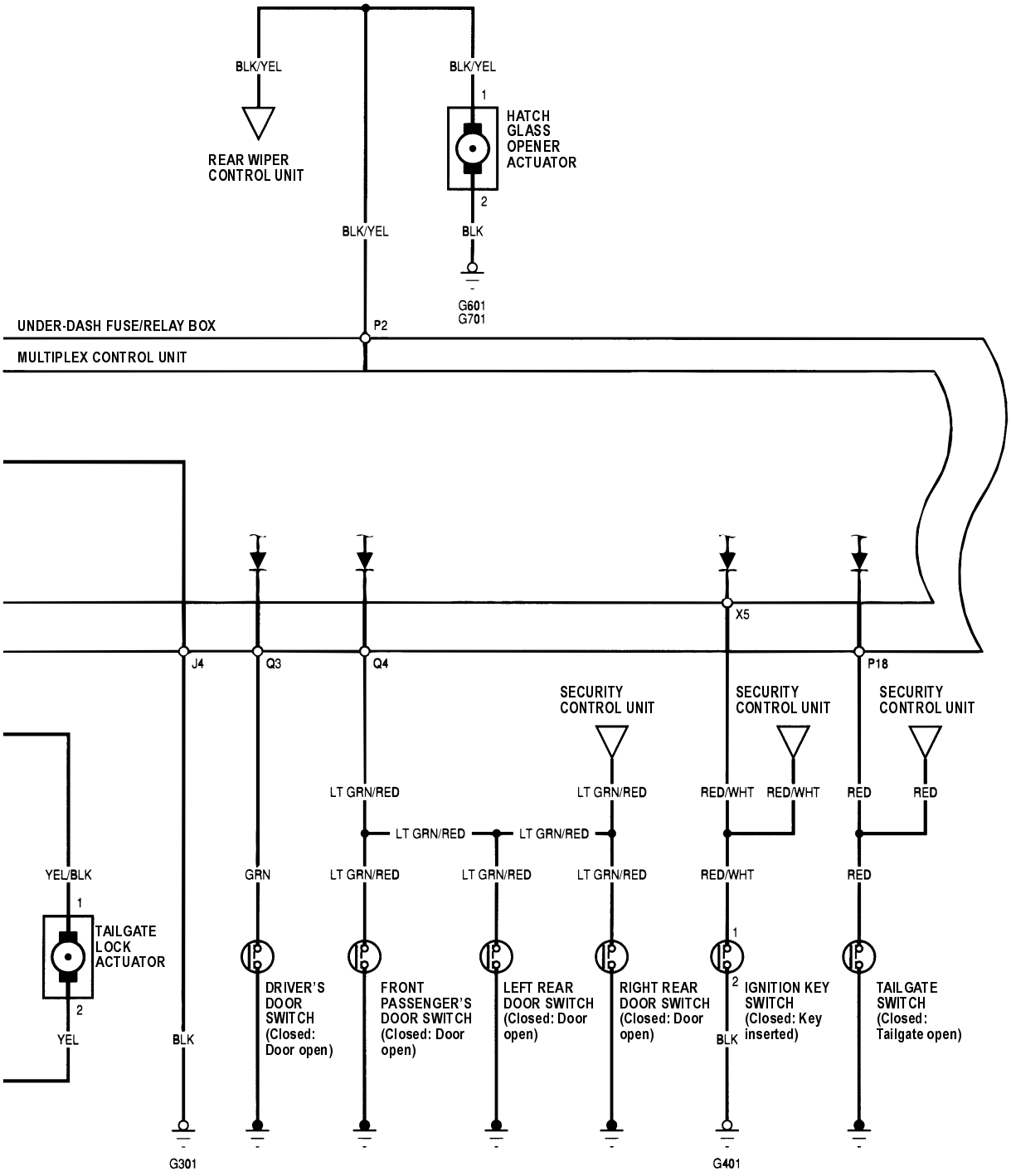
KE model:



1	TAILGATE LOCK ACTUATOR	Test, page 22A-178
	TAILGATE KNOB SWITCH	Test, page 22A-205
2	HATCH GLASS OPENER ACTUATOR	Test, page 22A-178
3	LEFT REAR DOOR SWITCH	
4	LEFT REAR SUPER LOCKING CONTROL UNIT	Input Test, page 22A-172
5	FRONT PASSENGER'S SUPER LOCKING ACTUATOR/KNOB SWITCH	Actuator Test, page 22A-174 Knob Switch Test, page 22A-202
6	FRONT PASSENGER'S SUPER LOCKING CONTROL UNIT	Input Test, page 22A-172
7	KEYLESS RECEIVER UNIT	Input Test, page 22A-165
8	MULTIPLEX CONTROL UNIT	Input Test, page 22A-166
9	IGNITION KEY SWITCH	Test, page 22A-113
10	DRIVER'S SUPER LOCKING CONTROL UNIT	Input Test, page 22A-172
11	DRIVER'S DOOR KEY CYLINDER SWITCH	Input Test, page 22A-204
12	DRIVER'S SUPER LOCKING ACTUATOR/KNOB SWITCH	Actuator Test, page 22A-174 Knob Switch Test, page 22A-202
13	DRIVER'S DOOR SWITCH	
14	RIGHT REAR SUPER LOCKING CONTROL UNIT	Input Test, page 22A-172
15	RIGHT REAR SUPER LOCKING ACTUATOR/KNOB SWITCH	Actuator Test, page 22A-174 Knob Switch Test, page 22A-202
16	RIGHT REAR DOOR SWITCH	
17	FRONT PASSENGER'S DOOR SWITCH	
18	LEFT REAR SUPER LOCKING ACTUATOR/KNOB SWITCH	Actuator Test, page 22A-174 Knob Switch Test, page 22A-202
19	TAILGATE SWITCH	Test, page 22A-110 Replacement, page 22A-110

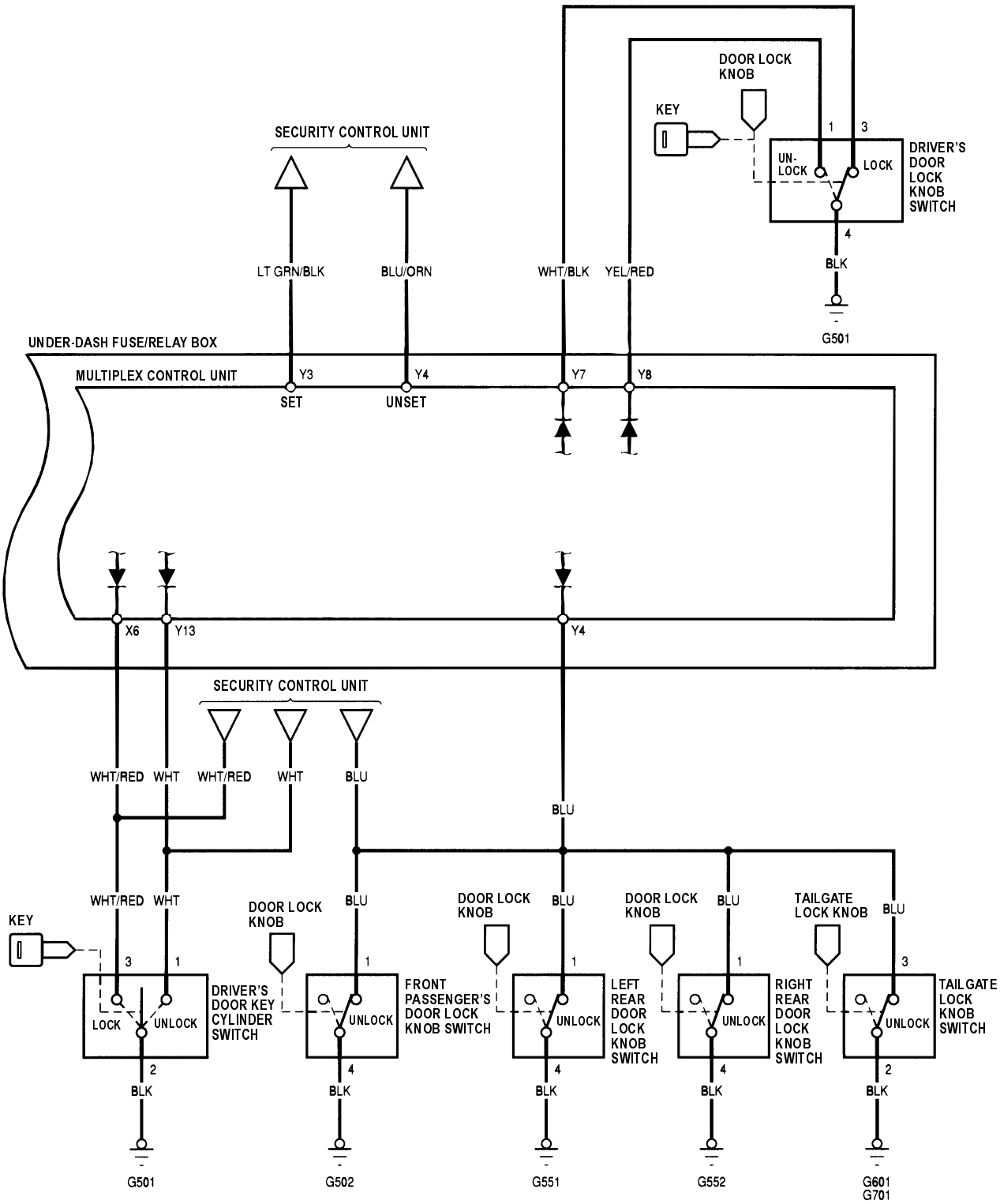
Circuit Diagram - With Super Locking



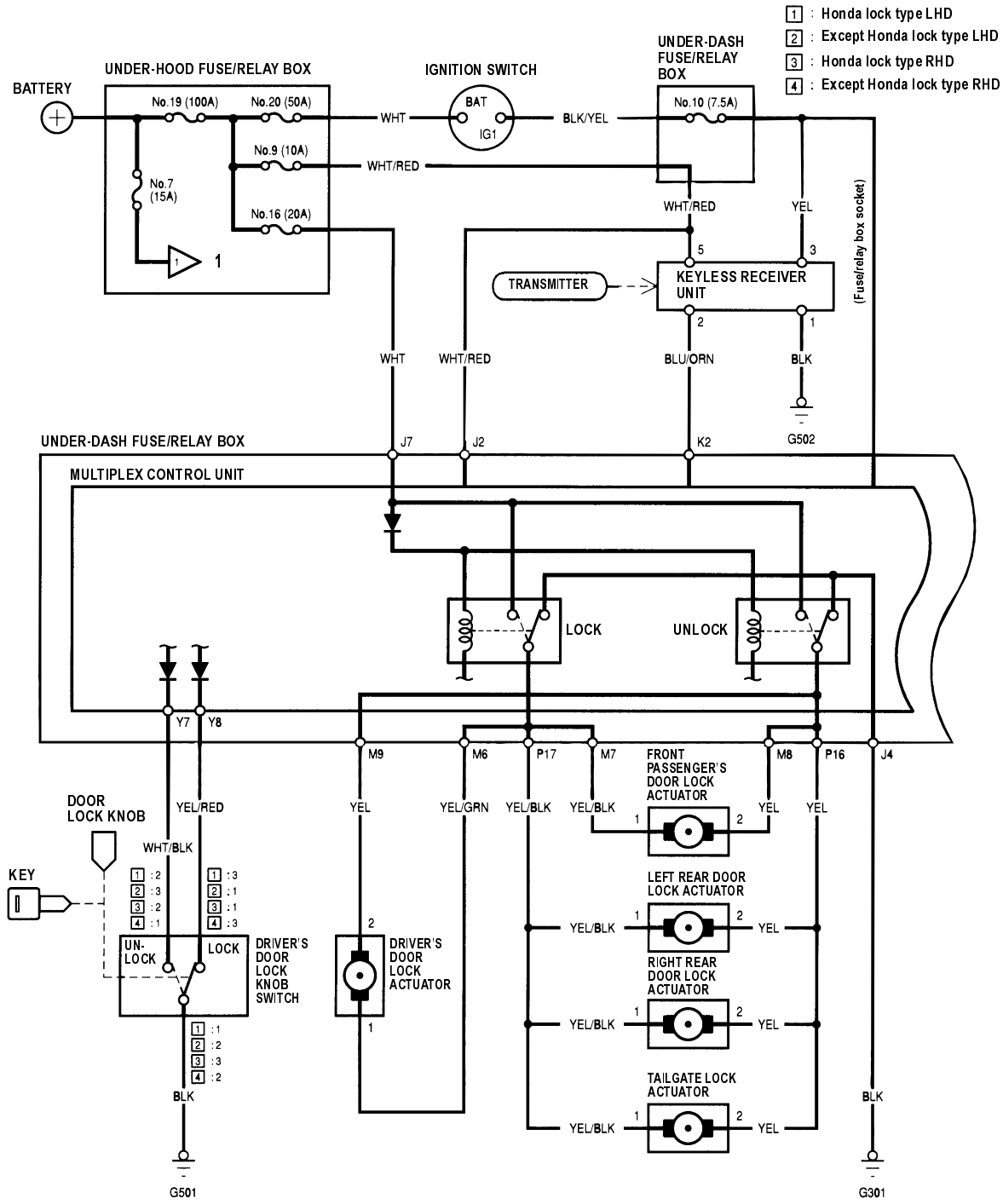

BLK/YEL
REAR WIPER CONTROL UNIT
BLK/YEL
1
HATCH GLASS OPENER ACTUATOR
2
BLK/YEL
BLK
G601
G701
UNDER-DASH FUSE/RELAY BOX
MULTIPLEX CONTROL UNIT
P2
X5
J4
Q3
Q4
P18
SECURITY CONTROL UNIT
SECURITY CONTROL UNIT
SECURITY CONTROL UNIT
LT GRN/RED
LT GRN/RED
RED/WHT
RED/WHT
RED
RED
LT GRN/RED
LT GRN/RED
YEL/BLK
GRN
LT GRN/RED
LT GRN/RED
LT GRN/RED
RED/WHT
RED
1
TAILGATE LOCK ACTUATOR
2
YEL
BLK
DRIVER'S DOOR SWITCH (Closed: Door open)
FRONT PASSENGER'S DOOR SWITCH (Closed: Door open)
LEFT REAR DOOR SWITCH (Closed: Door open)
RIGHT REAR DOOR SWITCH (Closed: Door open)
1
2
IGNITION KEY SWITCH (Closed: Key inserted)
BLK
TAILGATE SWITCH (Closed: Tailgate open)
G301
G401

(cont'd)

Circuit Diagram - With Super Locking (cont'd)



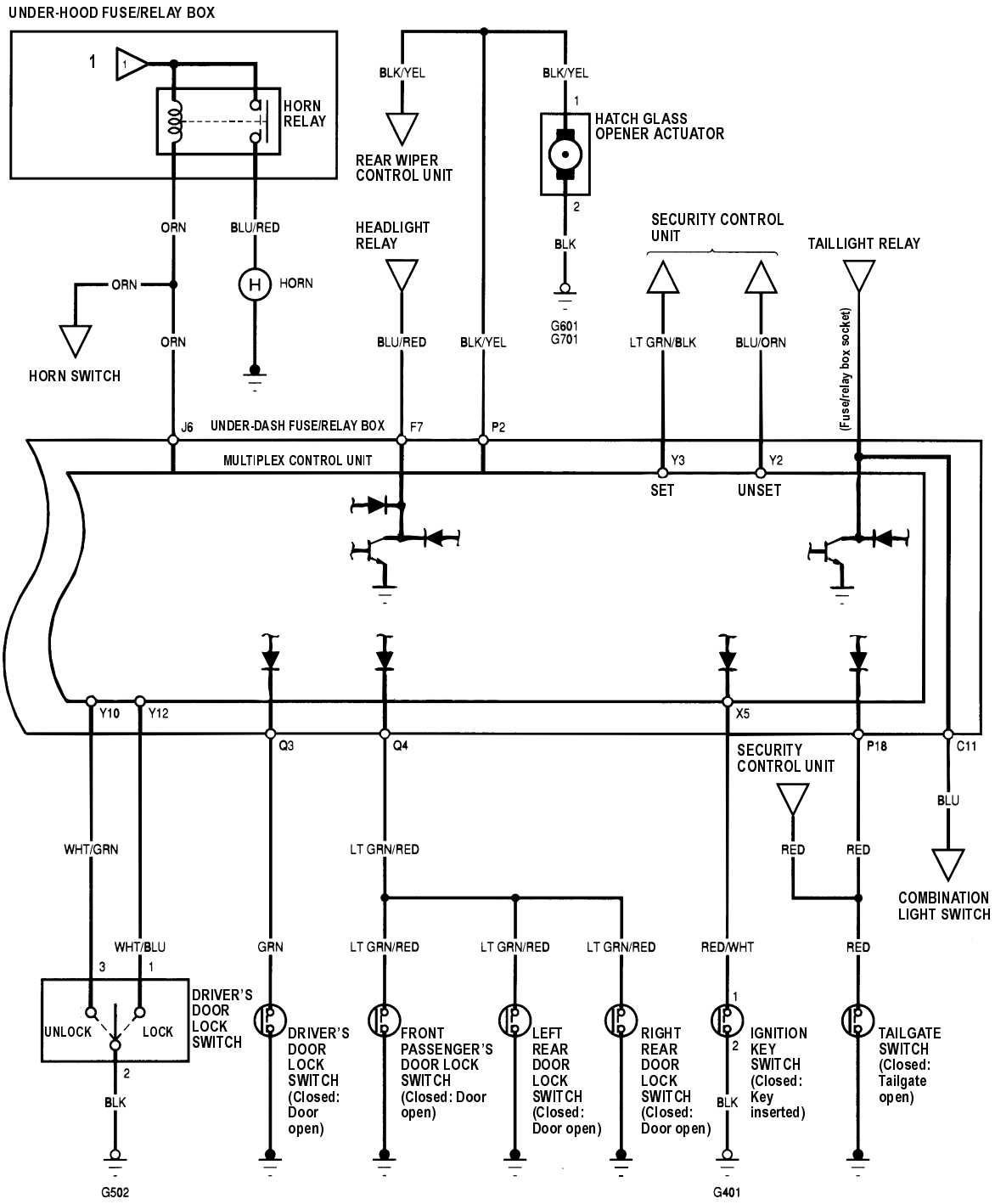
Circuit Diagram - Without Super Locking



1 HORN To page 22A-164

(cont'd)

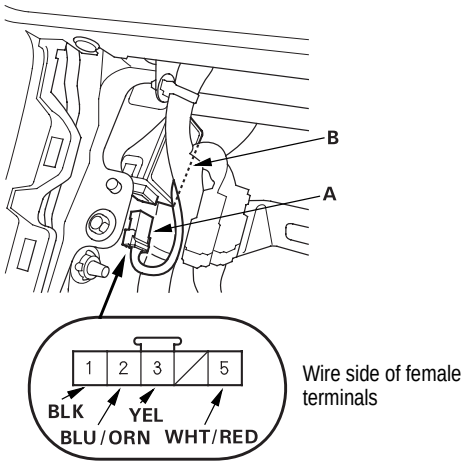
Circuit Diagram - Without Super Locking (cont'd)



1 No.7 (15A) FUSE From page 22A-163

Keyless Receiver Unit Input Test

1. Remove the heater control panel or climate control unit (see page 21-24).
2. Disconnect the 5P connector (A) from the keyless receiver unit (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals are OK, go to step 5.
4. Reconnect the connector, and make these input tests at the connector.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G502) • An open in the wire
3	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (7.5A) fuse in the under-dash fuse/relay box • An open in the wire
		Ignition switch OFF	Check for voltage to ground: There should be no voltage.	• Short to power on No. 10 (7.5A) fuse circuit
5	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the under-hood fuse/relay box • An open in the wire

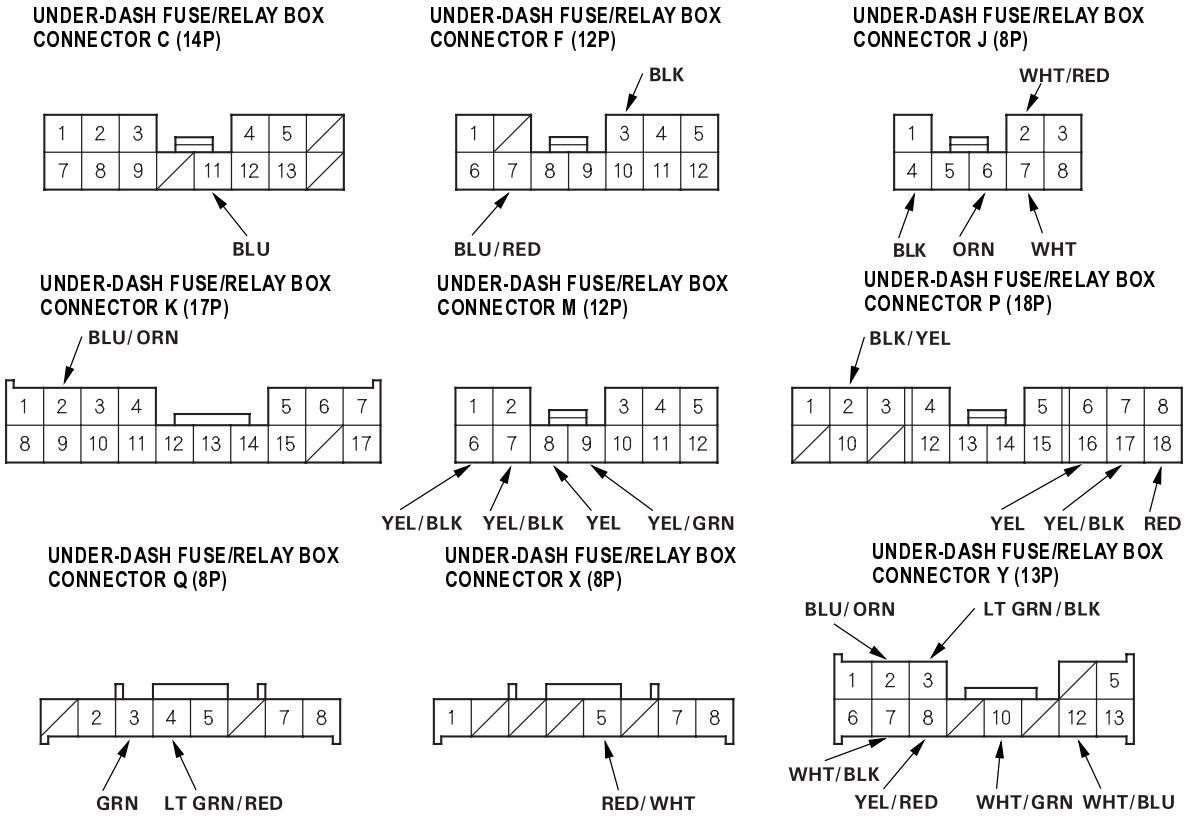
5. Disconnect the connector, and make this input test at the connector.
   - If the test indicates a problem, find and correct the cause, then recheck the system.
   - If the input test prove OK, replace the keyless receiver unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	BLU/ORN	Ignition switch OFF, under-dash fuse/relay box connector K (17P) disconnected	Check for continuity between the No. 2 terminal and the No. 2 terminal of the under-dash fuse/relay box connector K (17P). There should be continuity.	• An open in the wire • A short to ground in the wire
			Check for continuity between the No. 2 terminal and body ground: There should be no continuity.	

Control Unit Input Test - Without Super Locking

NOTE: For the hatch glass unlock button test, refer to the rear wiper control unit input test (see page 22A-220).

1. Before testing, troubleshoot the multiplex control system (see page 22A-231).
2. Remove the dashboard lower cover.
3. Disconnect the under-dash fuse/relay box connectors.
   NOTE: All connectors are wire side of female terminals.



4. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 5.

5. With the connectors still disconnected, make these input tests at the connector.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
J4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G301) • An open in the wire
J2	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the under-hood fuse/relay box • An open in the wire
J7	WHT	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 16 (20A) fuse in the under-hood fuse/relay box • An open in the wire
M7 M9	YEL/BLK YEL/GRN	Connect J7 terminal to M6 [or M9] terminal, and M9 [or M6] terminal to F3 terminal.	Check actuator operation: The driver's door lock actuator should lock [or unlock].	• Blown No. 16 (20A) fuse in the under-hood fuse/relay box • Faulty driver's door lock actuator • An open in the wire
M6 M8	YEL/BLK YEL	Connect J7 terminal to M7 [or M8] terminal, and M8 [or M7] terminal to F3 terminal.	Check actuator operation: The front passenger's door lock actuator should lock [or unlock].	• Blown No. 16 (20A) fuse in the under-hood fuse/relay box • Faulty front passenger's door lock actuator • An open in the wire
P16 P17	YEL YEL/BLK	Connect J7 terminal to P17 [or P16] terminal, and P16 [or P17] terminal to F3 terminal.	Check actuator operation: The both rear door lock actuator should lock [or unlock].	• Blown No. 16 (20A) fuse in the under-hood fuse/relay box • Faulty left or right door lock actuator • An open in the wire
K2	BLU/ORN	Under all conditions	Check for continuity between the K2 terminal and the keyless receiver unit 5P connector No. 2 terminal with 5P connector disconnected: There should be continuity.	• An open in the wire
Y2*	BLU/ORN	Under all conditions	Check for continuity between the Y2 terminal and the security control unit A17 terminal with the security control unit 20P connector disconnected: There should be continuity.	• An open in the wire
Y3*	LT GRN/BLK	Under all conditions	Check for continuity between the Y3 terminal and the security control unit A6 terminal with the security control unit 20P connector disconnected: There should be continuity.	• An open in the wire

*: With security system

(cont'd)

Control Unit Input Test - Without Super Locking (cont'd)

6. Reconnect all connections to the under-dash fuse/relay box, and make sure these input tests at the appropriate connectors on the under-dash fuse/relay box.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the multiplex control unit must be faulty, replace the under-dash fuse/relay box assembly.

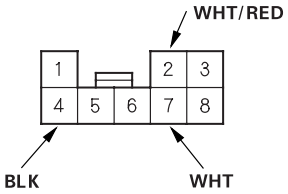
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
P18	RED	Tailgate open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G601 or G553) • Faulty trunk or tailgate switch • An open in the wire
		Tailgate closed	Check for voltage to ground: There should be 5 V or more.	• Faulty trunk switch • Short to ground
Q3	GRN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground
Q4	LT GRN/ RED	Passenger's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty passenger's door switch • An open in the wire
		Passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty passenger's door switch • Short to ground
X5	RED/WHT	Ignition key inserted into the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire
		Ignition key removed from the ignition switch	Check for voltage to ground: There should be 5 V or more.	• Faulty ignition key switch • Short to ground
Y7	WHT/BLK	Driver's door lock knob switch unlocked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • Faulty driver's door lock knob switch • An open in the wire
		Driver's door lock knob switch locked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock knob switch • Short to ground
Y8	YEL/RED	Driver's door lock knob switch locked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G501) • Faulty driver's door lock knob switch • An open in the wire
		Driver's door lock knob switch unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock knob switch • Short to ground
Y10	WHT/GRN	Driver's door lock switch unlocked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G501) • Faulty driver's door lock switch • An open in the wire
		Driver's door lock switch in neutral	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground
Y12	WHT/BLU	Driver's door lock switch locked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G501) • Faulty driver's door lock switch • An open in the wire
		Driver's door lock switch in neutral	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground
P2	BLK/YEL	Press the keyless transmitter hatch glass unlock button	Check for voltage to ground: There should be battery voltage for a moment.	• Poor ground (G601, G701) • Faulty hatch glass opener actuator • An open in a wire
C11	BLU	Under all conditions	Attach to ground: Parking, side marker, license plate lights and taillights should come on.	• Blown No. 2 (15A) fuse in the under-hood fuse/relay box • Faulty taillight relay • Faulty under-dash fuse/relay box • An open in the wire
F7	BLU/RED	Under all conditions	Attach to ground: Headlights should come on.	• Blown No. 15 or 17 (15A) fuse in the under-hood fuse/relay box • Faulty headlight relay 1 or 2 • An open in the wire
J6	ORN	Under all conditions	Attach to ground: The horn should sound.	• Blown No. 7 (15A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty horn • An open in the wire

Control Unit Input Test - With Super Locking

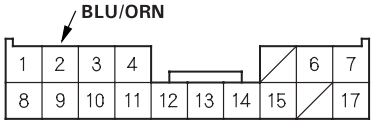
NOTE: For the hatch glass unlock button test, refer to the rear wiper control unit input test (see page 22A-220).

1. Before testing, troubleshoot the multiplex control system (see page 22A-231).
2. Remove the dashboard lower cover.
3. Disconnect the under-dash fuse/relay box connectors.
   NOTE: All connectors are wire side of female terminals.

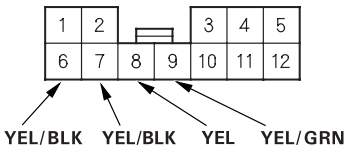
UNDER-DASH FUSE/RELAY BOX CONNECTOR J (8P)



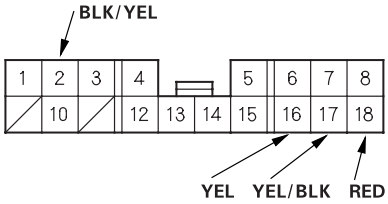
UNDER-DASH FUSE/RELAY BOX CONNECTOR K (17P)



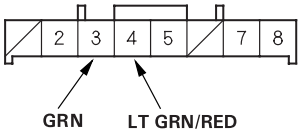
UNDER-DASH FUSE/RELAY BOX CONNECTOR M (12P)



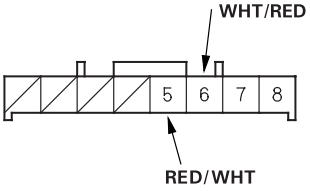
UNDER-DASH FUSE/RELAY BOX CONNECTOR P (18P)



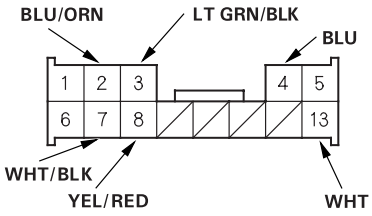
UNDER-DASH FUSE/RELAY BOX CONNECTOR Q (8P)



UNDER-DASH FUSE/RELAY BOX CONNECTOR X (8P)



UNDER-DASH FUSE/RELAY BOX CONNECTOR Y (13P)



4. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 5.

(cont'd)

Control Unit Input Test - With Super Locking (cont'd)

5. Reconnect the connectors, and make these input tests at the connector.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
J2	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the under-hood fuse/relay box • An open in the wire
J7	WHT	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 16 (20A) fuse in the under-hood fuse/relay box • An open in the wire
K2	BLU/ORN	Under all conditions	Check for continuity between the K2 terminal and the keyless receiver unit 5P connector No. 2 terminal with the 5P connector disconnected: There should be continuity.	• An open in the wire
M6	YEL/BLK	Connect J7 terminal to M7 [or M8] terminal, and M8 [or M7] terminal to F3 terminal.	Check actuator operation: The front passenger's door lock actuator should lock [or unlock].	• Blown No. 16 (20A) fuse in the under-hood fuse/relay box • Faulty actuator • Faulty super locking control unit • An open in the wire
M8	YEL			
M7	YEL/BLK	Connect J7 terminal to M6 [or M9] terminal, and M9 [or M6] terminal to F3 terminal.	Check actuator operation: The driver's door lock actuator should lock [or unlock].	• Blown No. 16 (20A) fuse in the under-hood fuse/relay box • Faulty actuator • Faulty super locking control unit • An open in the wire
M9	YEL/GRN			
P17	YEL/BLK	Connect J7 terminal to P17 [or P16] terminal, and P16 [or P17] terminal to F3 terminal.	Check actuator operation: The left rear door, right rear door and tailgate lock actuator should lock [or unlock].	• Blown No. 16 (20A) fuse in the under-hood fuse/relay box • Faulty actuator • Faulty left rear or right rear super locking control unit. • An open in the wire
P16	YEL			
J4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G301) • An open in the wire

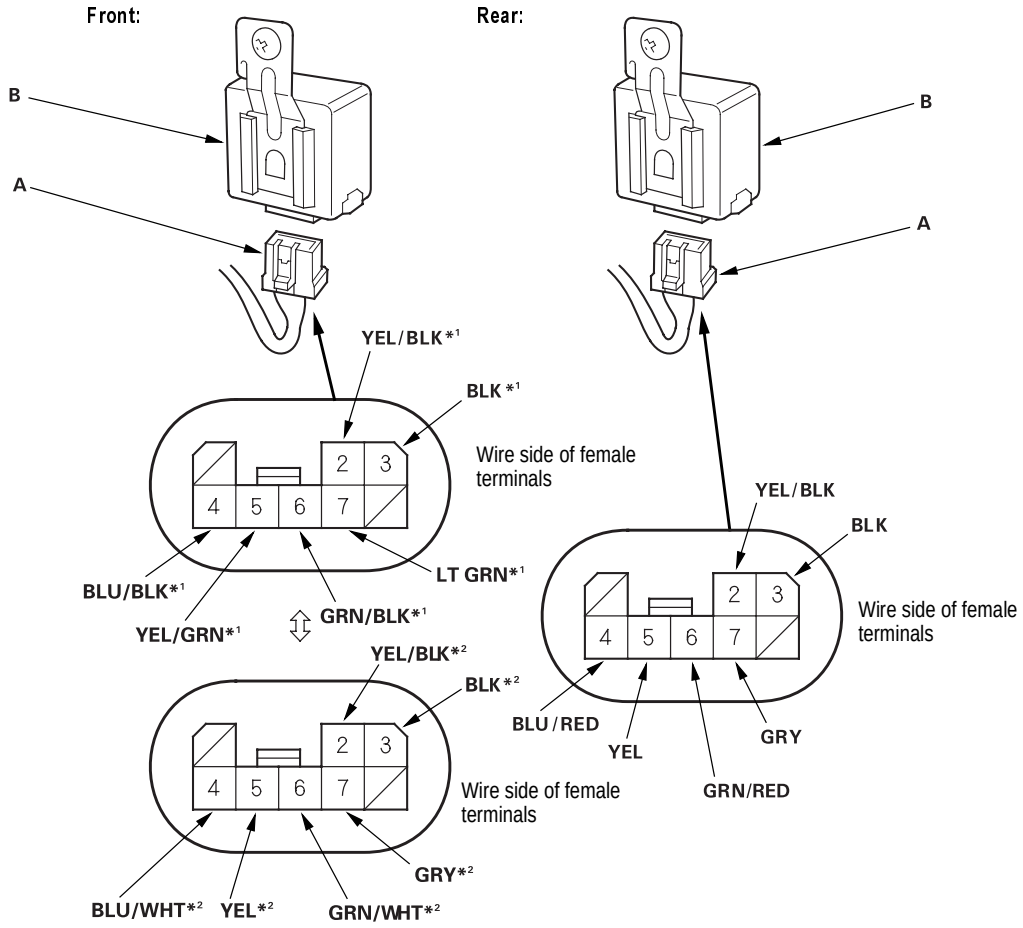
6. Reconnect all connector to the under-dash fuse/relay box, and make sure these input tests at the appropriate connectors on the under-dash fuse/relay box.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the multiplex control unit must be faulty, replace the under-dash fuse/relay box assembly.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
P18	RED	Tailgate open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G601) • Faulty tailgate latch switch • An open in the wire
		Tailgate closed	Check for voltage to ground: There should be 5 V or more.	
X5	RED/WHT	Ignition key inserted into the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire
		Ignition key removed from the ignition switch	Check for voltage to ground: There should be 5 V or more.	
Q3	GRN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	
Q4	LT GRN/ RED	Passengers door open	Check for voltage to ground: There should be 1 V or less.	• Faulty passenger's door switch • An open in the wire
		Passenger's door closed	Check for voltage to ground: There should be 5 V or more.	
Y4	BLU	Front passenger's, tailgate, left rear or right rear door lock knob switch unlocked	Check for voltage to ground: There should be 1 V or less.	• Faulty front passenger's, tailgate, left rear or right rear door lock knob switch • Poor ground (G502, G551, G552, G601, G701) • An open in the wire
X6	WHT/RED	Driver's door key cylinder switch lock	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door key cylinder switch • Poor ground (G501) • An open in the wire
		Driver's door key cylinder switch in neutral	Check for voltage to ground: There should be 5 V or more.	
Y13	WHT	Driver's door key cylinder switch unlocked	Check for voltage to ground: There should be 1 V or less.	
		Driver's door key cylinder switch in neutral	Check for voltage to ground: There should be 5 V or more.	
Y7	WHT/BLK	Driver's door lock knob switch unlocked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • Faulty driver's door lock knob switch • An open in the wire
		Driver's door lock knob switch locked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock knob switch • Short to ground
Y8	YEL/RED	Driver's door lock knob switch locked	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G501) • Faulty driver's door lock knob switch • An open in the wire
		Driver's door lock knob switch unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock knob switch • Short to ground
Y2	BLU/ORN	Under all conditions	Check for continuity between the Y2 terminal and the security control unit A17 terminal with the security control unit 20P connector disconnected: There should be continuity.	• An open in the wire
Y3	LT GRN/ BLK	Under all conditions	Check for continuity between the Y3 terminal and the security control unit A6 terminal with the security control unit 20P connector disconnected: There should be continuity.	• An open in the wire
P2	BLK/YEL	Press the keyless transmitter hatch glass unlock button	Check for voltage to ground: There should be battery voltage for a moment.	• Poor ground (G601, G701) • Faulty hatch glass opener actuator • An open in a wire

Super Locking Control Unit Input Test

1. Remove the each door panel (see page 20-6).
2. Disconnect the 8 P connector (A) from the super locking control unit (B).
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     – If a test indicates a problem, find and correct the cause, then recheck the system.
     – If all the input tests prove OK, the control unit must be faulty, replace it.



*1: Driver's
*2: Front passenger's

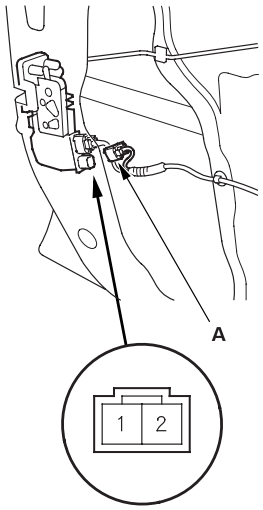
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
3	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501, G502, G551, G552) • An open in the wire
2	YEL/BLK	Connect the No. 2 terminal to the No. 7 terminal and the No. 6 terminal to the No. 3 terminal momentarily with ignition switch ON (II)	Check actuator operation: The actuator should lock.	• Faulty door lock actuator • An open in the wire
7	LT GRN [GRY]			
5	YEL/GRN [YEL]	Connect the No. 5 terminal to the No. 6 terminal and the No. 7 terminal to the No. 3 terminal momentarily with ignition switch ON (II)	Check actuator operation: The actuator should unlock.	
6	GRN/BLK [GRN/WHT or GRN/RED]			
4	BLU/BLK [BLU/WHT or BLU/RED]	Under all conditions	Check for continuity between the No. 4 terminal and No. 2 terminal of the actuator. There should be continuity.	• An open in the wire

[ ]: Passenger's

Door Lock Actuator Test

Driver's Door without Super Locking:

1. Remove the driver's door panel (see page 20-9).
2. Disconnect the 2P connector (A) from the actuator.



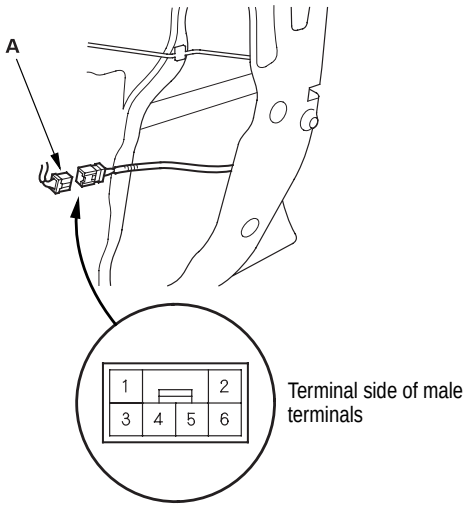
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not work as specified, replace it.

Driver's Door with Super Locking:

1. Remove the driver's door panel (see page 20-9).
2. Disconnect the 6P connector (A) from the actuator.



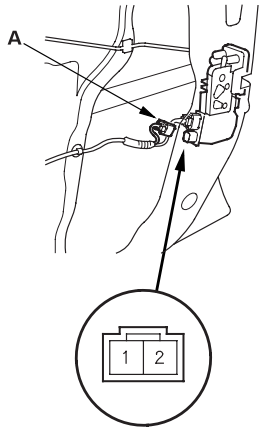
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	5	6
LOCK	⊖	⊕
UNLOCK	⊕	⊖

4. If the actuator does not work as specified, replace it.

Passenger's Door without Super Locking:

1. Remove the passenger's door panel (see page 20-9).
2. Disconnect the 2P connector (A) from the actuator.



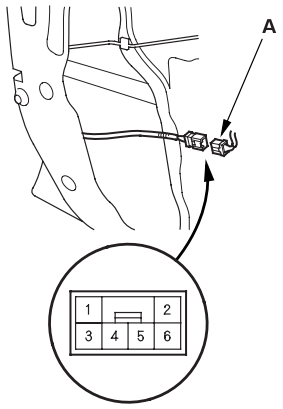
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not work as specified, replace it.

Passenger's Door with Super Locking:

1. Remove the passenger's door panel (see page 20-9).
2. Disconnect the 6P connector (A) from the actuator.



3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	5	6
LOCK	⊖	⊕
UNLOCK	⊕	⊖

4. If the actuator does not work as specified, replace it.

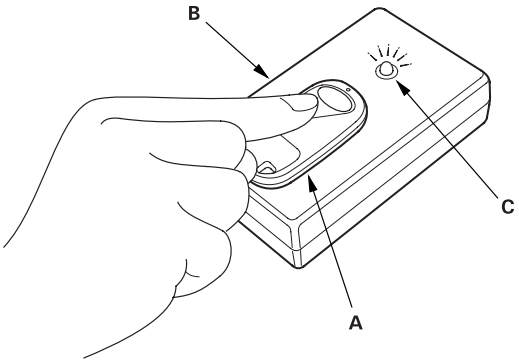
Transmitter Test

NOTE:
- If the doors unlock or lock with the transmitter, but the LED on the transmitter does not come on, the LED is faulty; replace the transmitter.
- If any door is open, you cannot lock the door with the transmitter.
- If you unlocked the doors with the transmitter, but do not open any of the doors within 30 seconds, the doors relock automatically.
- The doors do not lock or unlock with the transmitter if the ignition key is in the ignition switch.

Using a keyless entry checker (07MAJ-SP00300):
Put the transmitter (A) on the keyless entry checker (B) and press the button.

- If the ray indicator light (C) does not come on, check for:
  – a dead or low battery.
  – faulty transmitter.
- If the ray indicator light comes on, the transmitter is OK.

NOTE: When the transmitter battery was replaced, aim the transmitter at the receiver, and press the transmitter button six times. The receiver is located behind the center lower panel. Confirm you can hear the sound of the door lock actuators when you press the sixth time.



Transmitter Programming

Storing transmitter codes:

The codes of up to three transmitters can be programmed into the keyless receiver unit memory. (If a fourth code is stored, the code that was programmed first will be erased.)

NOTE: It is important to maintain the time limits between the steps. Make sure the doors and the tailgate are closed.

1. Turn the ignition switch ON (II).

2. Within 1 to 4 seconds, push the transmitter lock or unlock button.

3. Within 1 to 4 seconds, turn the ignition switch OFF.

4. Within 1 to 4 seconds, turn the ignition switch ON (II).

5. Within 1 to 4 seconds, push the transmitter lock or unlock button.

6. Within 1 to 4 seconds, turn the ignition switch OFF.

7. Within 4 seconds, turn the ignition switch ON (II).

8. Within 1 to 4 seconds, push the transmitter lock or unlock button.

9. Within 1 to 4 seconds, turn the ignition switch OFF.

10. Within 4 seconds, turn the ignition switch ON (II).

11. Within 1 to 4 seconds, push the transmitter lock or unlock button.

12. Confirm you can hear the sound of the door lock actuators. Within 1 to 4 seconds, push the transmitter lock or unlock button again.

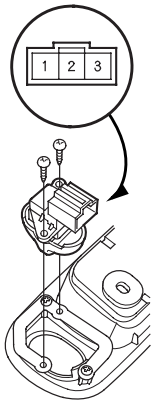
13. Within 10 seconds, press the transmitter lock or unlock buttons on the two additional transmitters. Confirm that you can hear the sound of the door lock actuators after each transmitter code is stored.

14. Turn the ignition switch OFF, and remove the key.

15. Confirm proper operation of the transmitters.

Door Lock Switch Test

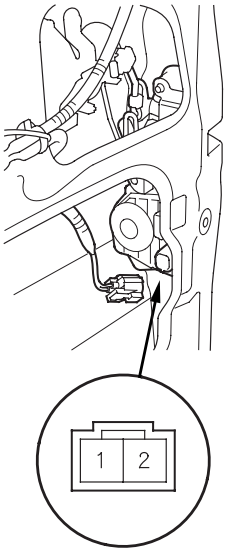
1. Remove the door panel (see page 20-9).
2. Remove the two mounting screws and the door lock switch.



3. Check for continuity between the No. 1 and No. 2 terminals:
   - There should be continuity when the door lock switch is in the LOCKED position.
   - There should be no continuity when the door lock switch is in the UNLOCKED position.
4. Check for continuity between the No. 2 and No. 3 terminals:
   - There should be continuity when the door lock switch is in the UNLOCKED position.
   - There should be no continuity when the door lock switch is in the LOCKED position.
5. If the continuity is not as specified, replace the door lock switch.

Tailgate Lock Actuator Test

1. Remove the tailgate lower trim panel (see page 20-80).
2. Disconnect the 2P connector from the actuator.



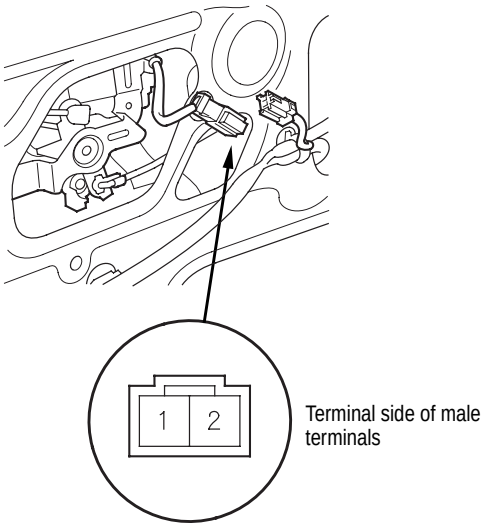
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not operate as specified, replace it.

Hatch Glass Opener Actuator Test

1. Remove the tailgate lower trim panel (see page 20-80).
2. Disconnect the 2P connector from the actuator.

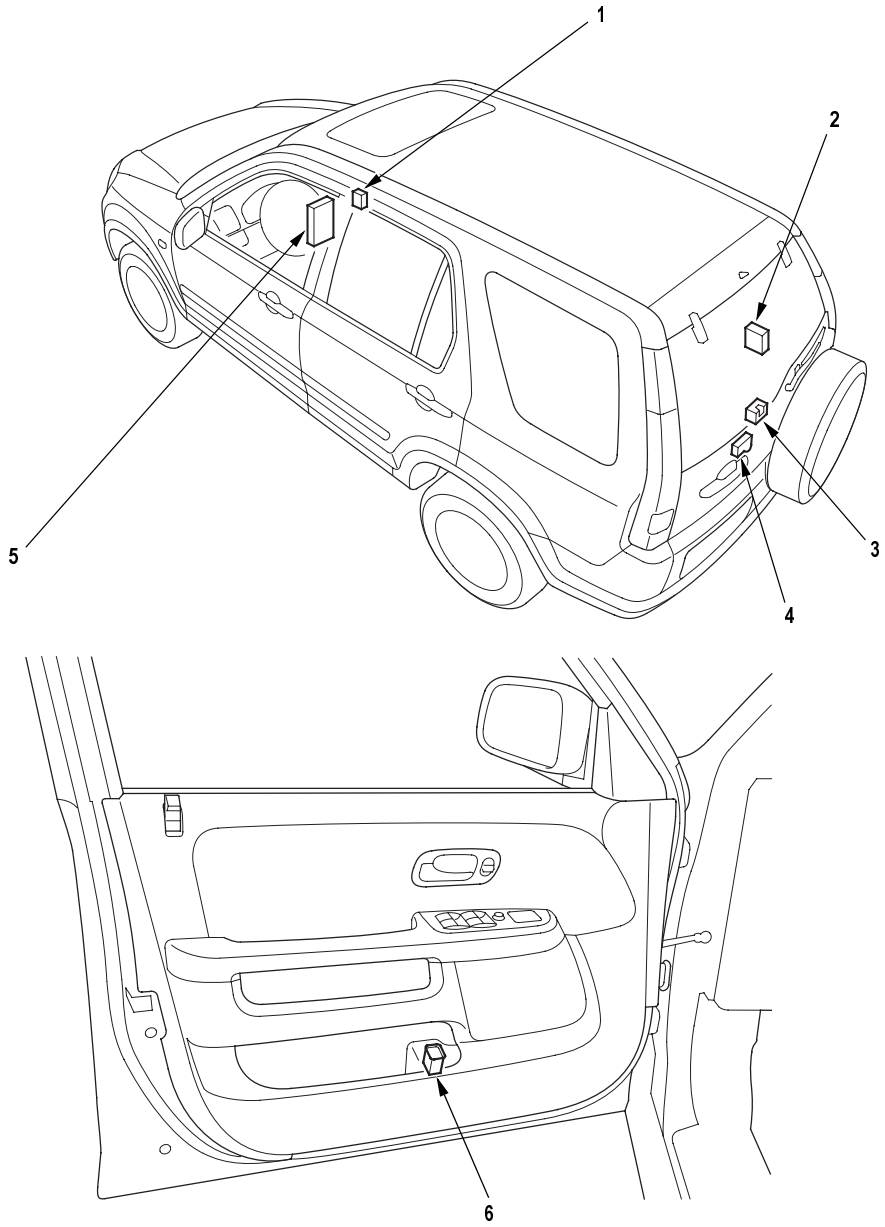


3. Connect power to the No. 1 terminal and ground to the No. 2 terminals momentarily. The actuator should operate.
4. If the actuator does not operate as specified, replace it.

Hatch Glass Opener

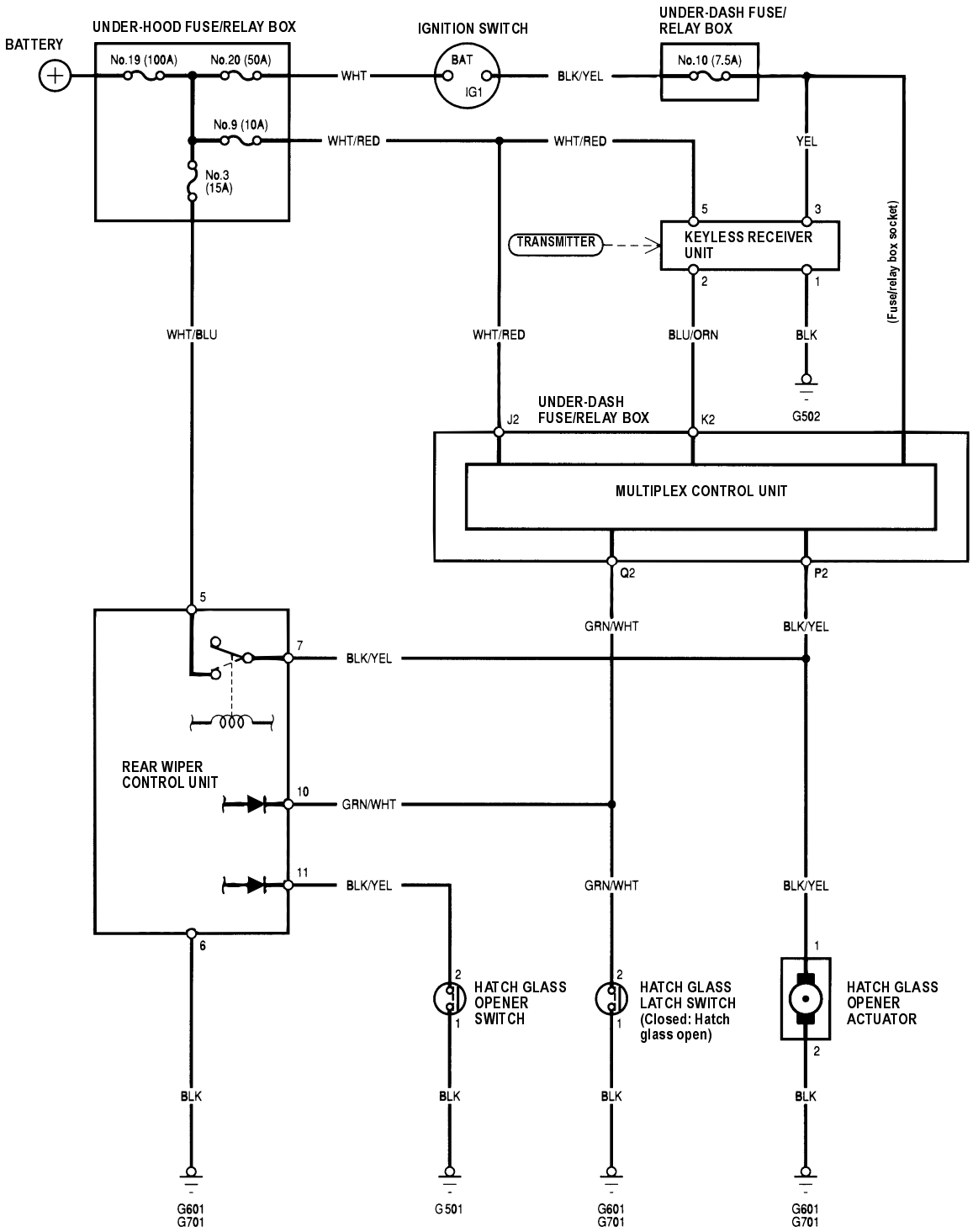
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



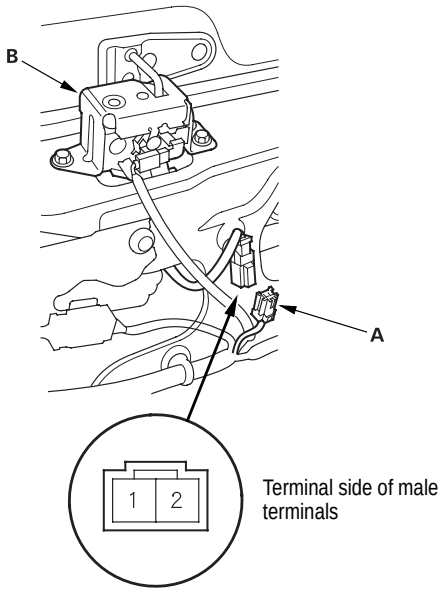
1	KEYLESS RECEIVER UNIT	Input Test, page 22A-165
2	REAR WIPER CONTROL UNIT	Input Test, page 22A-220
3	HATCH GLASS LATCH SWITCH	Test, page 22A-181
4	HATCH GLASS OPENER ACTUATOR	Test, page 22A-178
5	MULTIPLEX CONTROL UNIT	Input Test, page 22A-235
6	HATCH GLASS OPENER SWITCH	Test, page 22A-181 Replacement, page 22A-181

Circuit Diagram



Hatch Glass Latch Switch Test

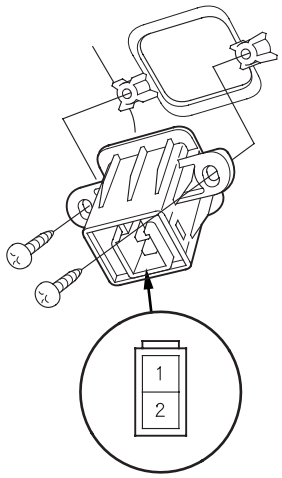
1. Remove the tailgate lower trim panel (see page 20-80).
2. Disconnect the 2P connector (A) from the latch switch (B).



3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity when the hatch glass is open.
   - There should be no continuity when the hatch glass is closed.
4. If the continuity is not as specified, replace the latch switch.

Hatch Glass Opener Switch Test/ Replacement

1. Remove the driver's door panel (see page 20-76).
2. Disconnect the 2P connector from the opener switch.

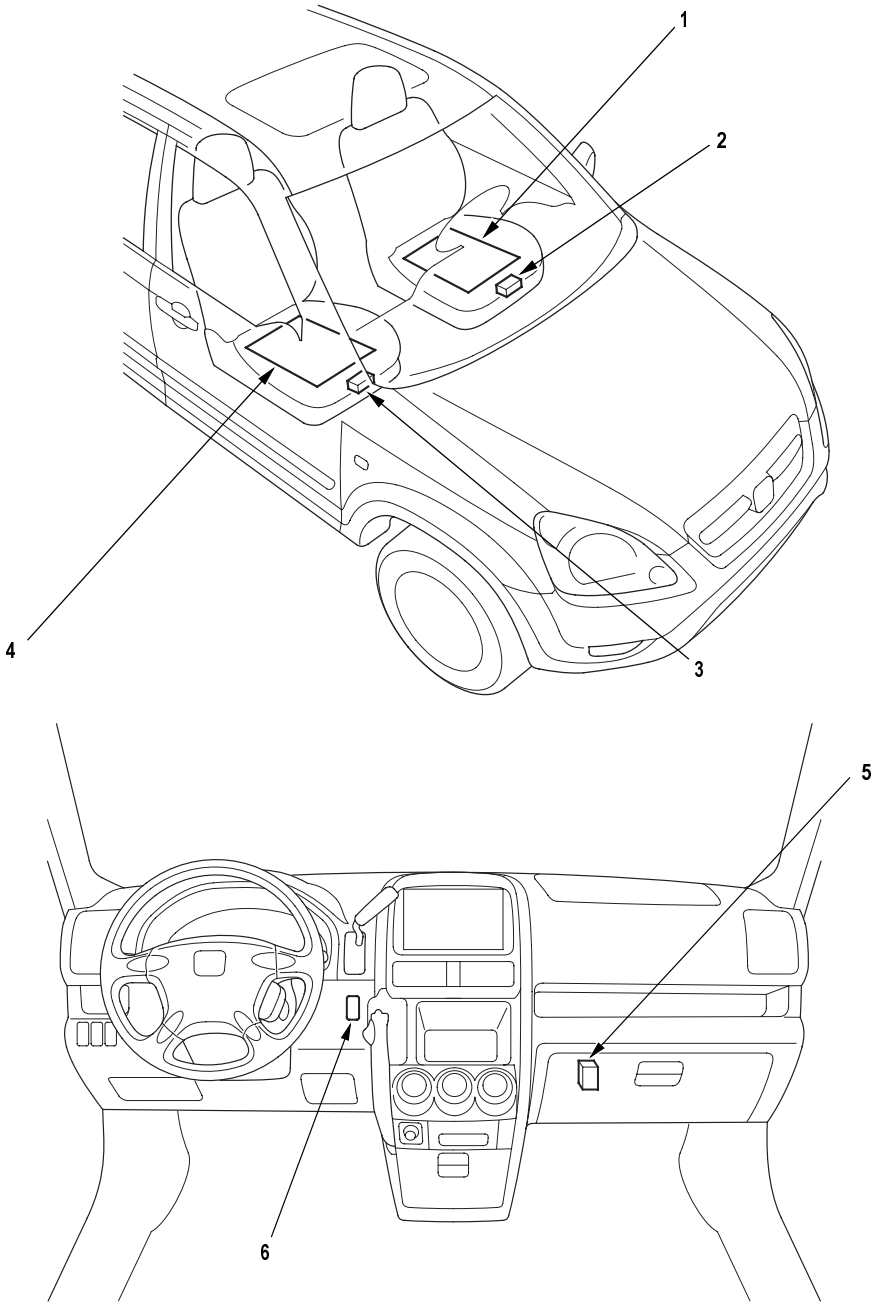


3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity when the opener switch is pushed.
   - There should be no continuity when the opener switch is released.
4. If the continuity is not as specified, replace the opener switch.

Seat Heaters

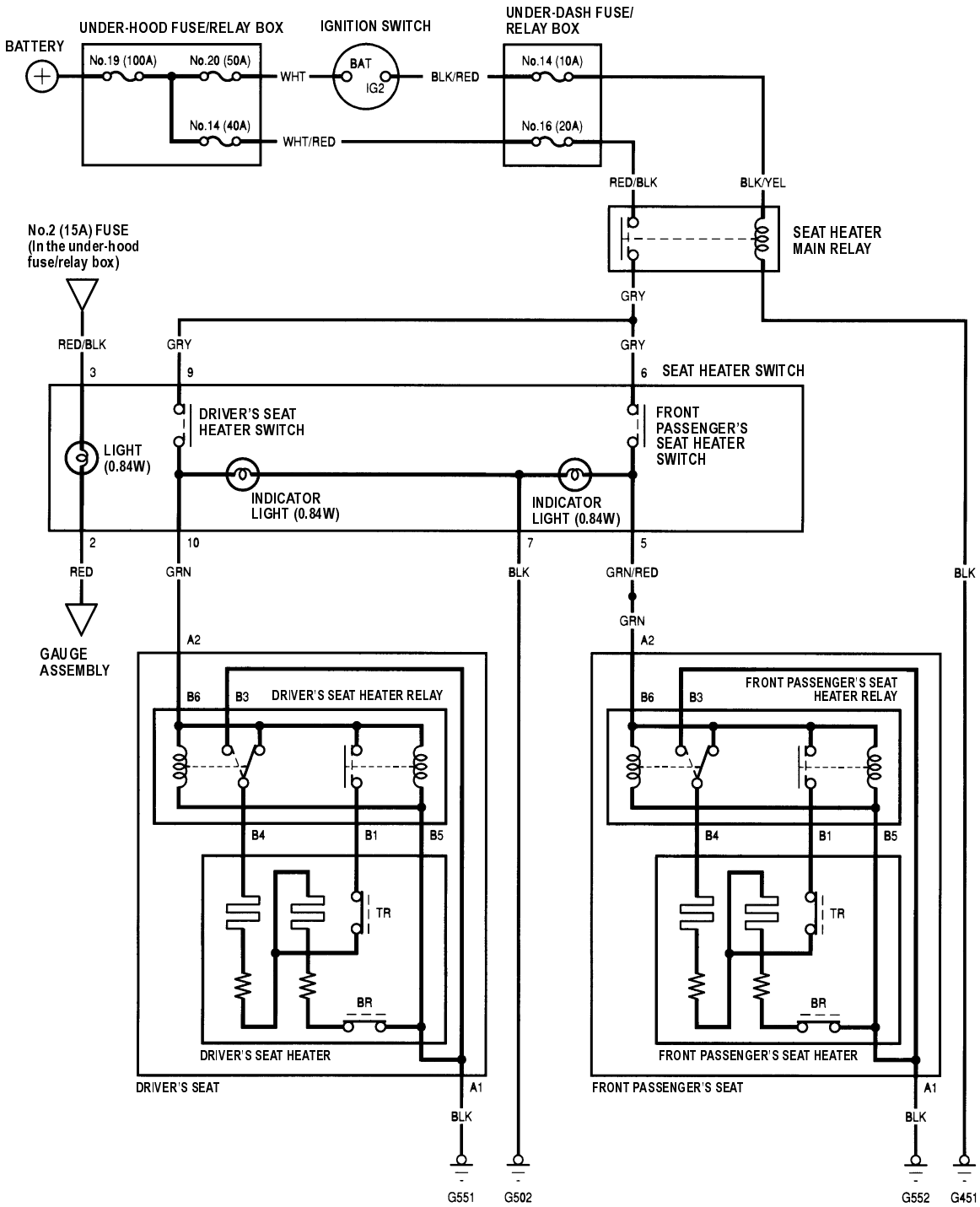
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



1	DRIVER'S SEAT CUSHION HEATER	Test, page 22A-184
2	DRIVER'S SEAT HEATER RELAY	Test, page 22A-184
3	FRONT PASSENGER'S SEAT HEATER RELAY	Test, page 22A-184
4	FRONT PASSENGER'S SEAT CUSHION HEATER	Test, page 22A-184
5	SEAT HEATER MAIN RELAY [Wire colors: GRY, RED/BLK, BLK, BLK/YEL]	Test, page 22A-60
6	SEAT HEATER SWITCH	Test, page 22A-185 Replacement, page 22A-185

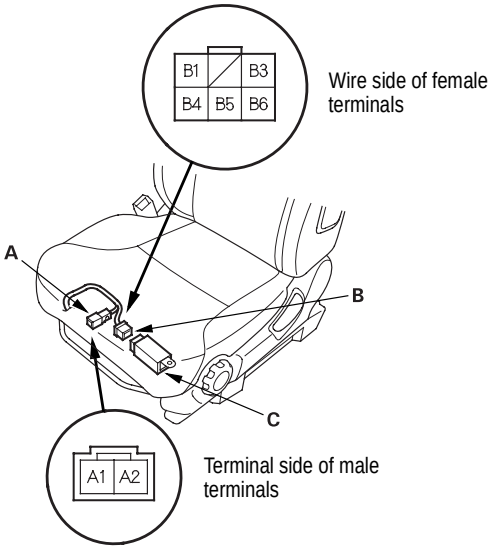
Circuit Diagram



BR : BREAKER [OFF 45 - 55° C (133 - 131°F) ON 25 - 35° C (77 - 95°F)]
TR : THERMOSTAT [OFF 35 - 45°C (95 - 113°F) ON 15 - 25°C (59 - 77°F)]

Seat Heater Test

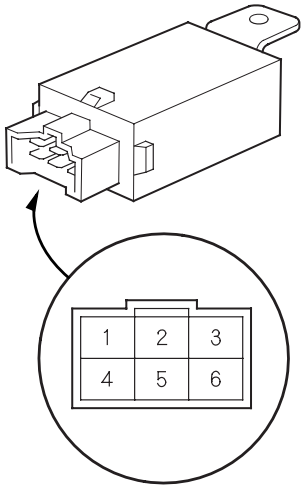
1. Remove the front seat (see page 20-103).
2. Disconnect the seat heater harness 2P connector (A) from the seat sub-harness and the 6P connector (B) from the seat heater relay (C).



3. Check for continuity between the A1 and B3 terminals, and A2 and B6 terminals. There should be continuity.
   If there is no continuity, replace the seat cushion (see page 20-108).
4. Check for continuity between the B1 and B4 terminals, and B1 and B5 terminals. There should be continuity.
   If there is no continuity, replace the seat cushion (see page 20-108).

Seat Heater Relay Test

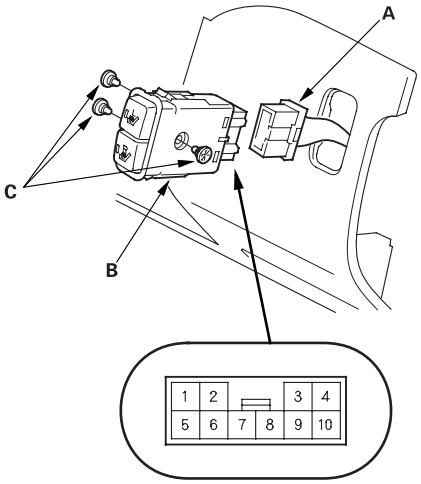
1. Remove the front seat (see page 20-103).
2. Disconnect the 6P connector from the seat heater relay (A).



3. Check for continuity between the No. 6 and No. 5 terminals, and No. 6 and No. 4 terminals. There should be continuity.
   If there is no continuity, replace the seat heater relay.
4. Check for continuity between the No. 1 and No. 6 terminals, and No. 3 and No. 4 terminals when power and ground are connected to the No. 6 and No. 5 terminals. There should be continuity.
   If there is no continuity, replace the seat heater relay.

Seat Heater Switch Test/Replacement

1. Remove the dashboard lower cover (see page 20-88).
2. Disconnect the 10P connector (A) from the seat heater switch (B), and remove the seat heater switch.



3. Check for continuity in each switch position according to the table.

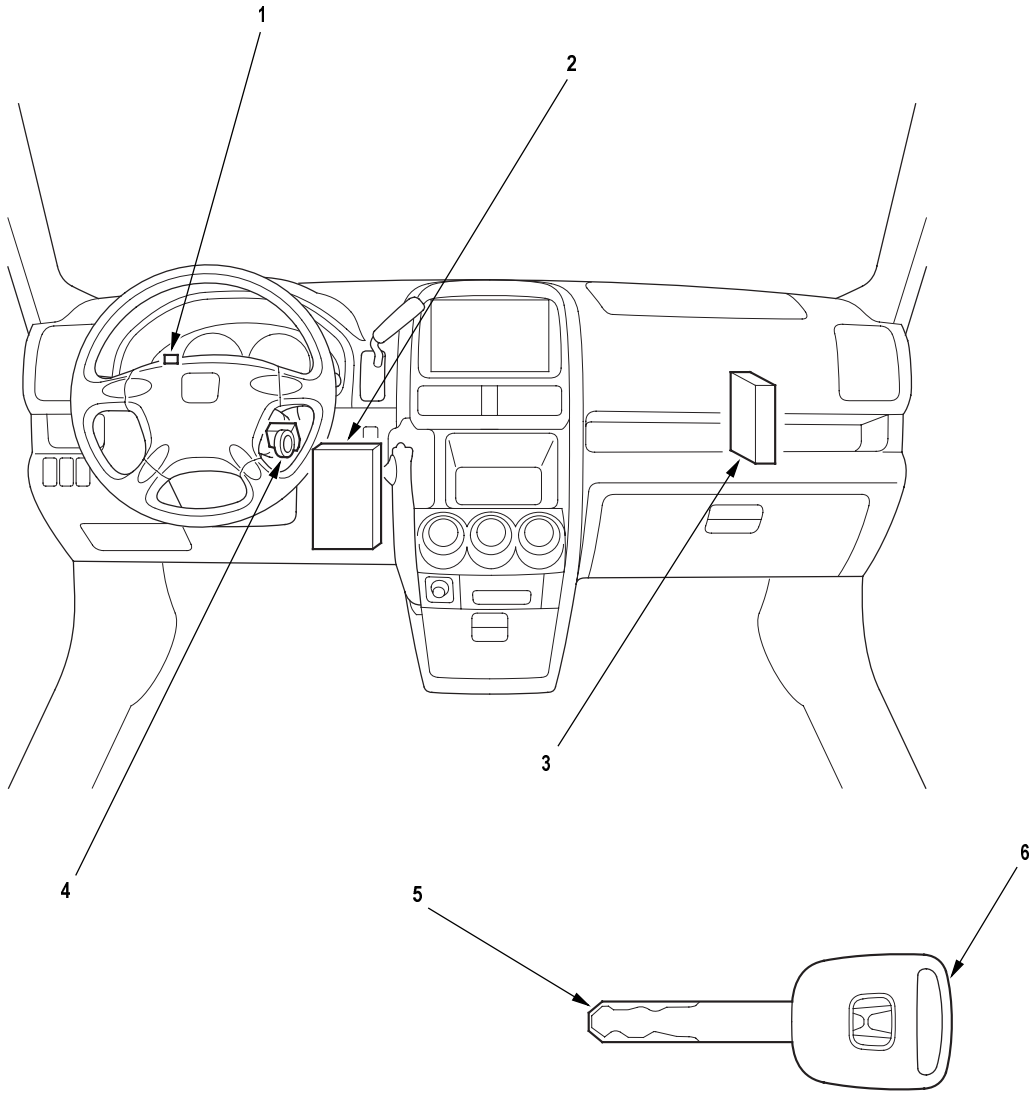
Terminal / Position	2		3	5	6		7		9	10
ON	○	⌇	○	○	○	⌇	○	⌇	○	○
OFF	○	⌇	○	○		⌇	○	⌇		○

4. If the continuity is not as specifed, replace the bulbs (C) or the switch.

Immobilizer System

Component Location Index

NOTE: LHD type is shown, RHD type is similar.

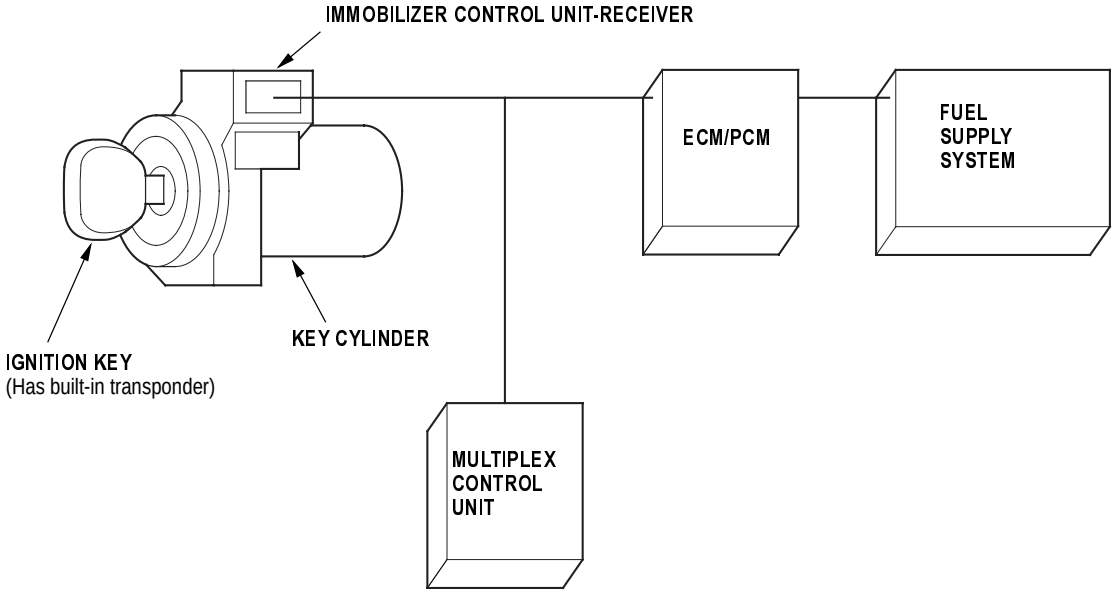


1	IMMOBILIZER INDICATOR LIGHT	Bulb Replacement, page 22A-73
2	MULTIPLEX CONTROL UNIT	Input Test, page 22A-235
3	ECM/PCM	Replacement, page 11-4; Substitute known-good for testing, page 11-5
4	IMMOBILIZER CONTROL UNIT-RECEIVER	Troubleshooting, page 22A-190; Replacement, page 22A-191
5	IGNITION KEY	
6	TRANSPONDER (Built into the ignition key)	

System Description

The vehicle is equipped with an immobilizer system (Type III) that will disable the vehicle unless the proper ignition key is used.
This system consists of a transponder located in the ignition key, an immobilizer control unit-receiver, an indicator light, the multiplex control unit, and the ECM/PCM.

When the key is inserted in the ignition switch and turned to the (II) position, the immobilizer control unit-receiver sends power to the transponder in the ignition key. The transponder then sends a coded signal back through the immobilizer control unit-receiver to the ECM/PCM. The ECM/PCM then energizes the fuel supply system.



(cont'd)

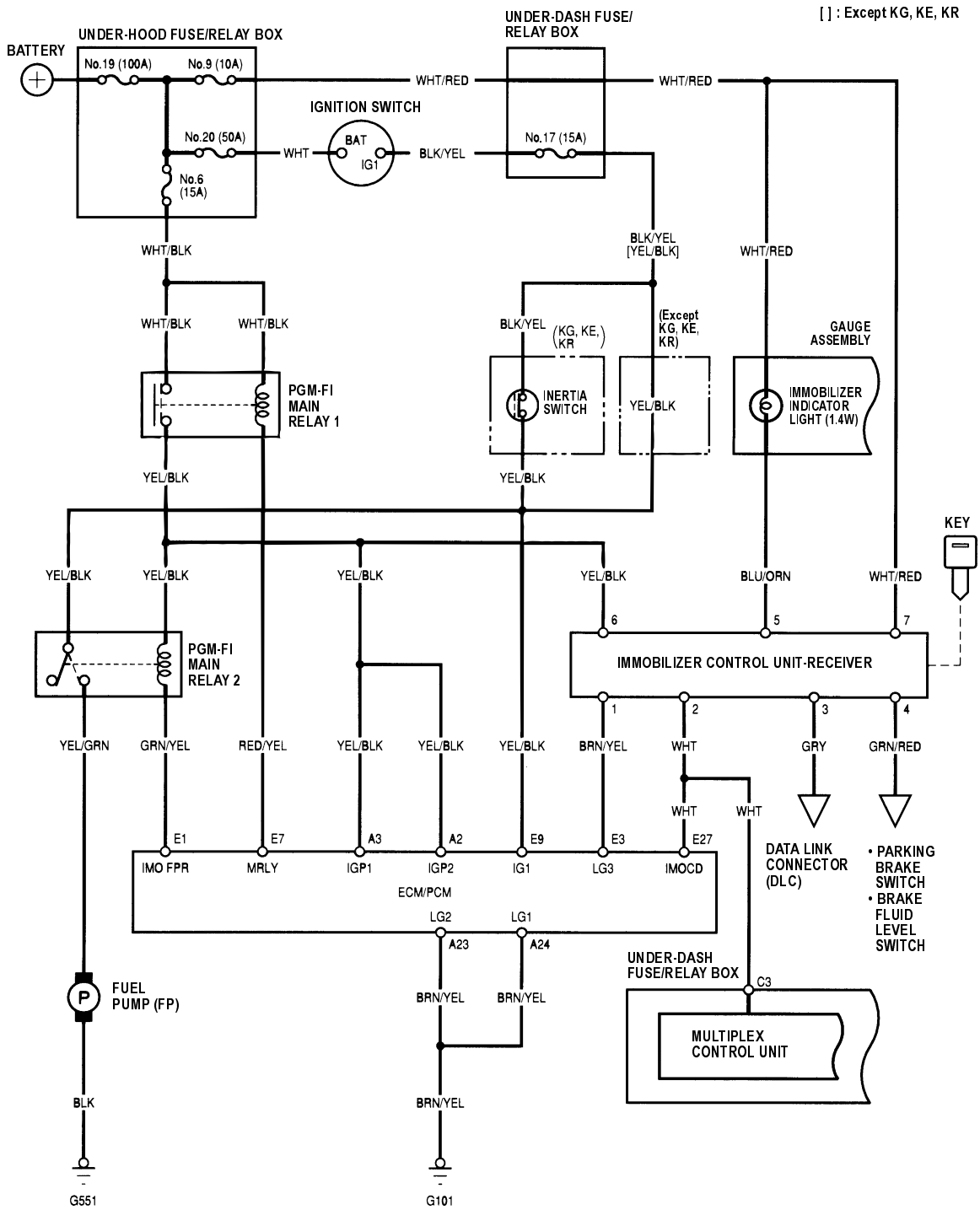
System Description (cont'd)

- If the proper key has been used, the immobilizer indicator light will come on for about 2 seconds, then go off.
- If the wrong key has been used whose code was not received or recognized by the unit, the indicator light will come on for about 2 seconds, then it will blink until the ignition switch is turned OFF. The engine will crank but not start.
- If the ignition switch is turned OFF, the indicator will blink for about 5 seconds to signal that the unit has been set correctly, then the indicator will go off.
- If the customer has lost his key, and cannot start the engine, contact Honda Customer Relations.

IMMOBILIZER INDICATOR LIGHT BLINKING PATTERN:

IGNITION SWITCH		ON OFF
PROPER KEY INSERTED	INDICATOR LIGHT	ON OFF 2 sec 5 sec 1 Hz
WRONG KEY INSERTED	INDICATOR LIGHT	ON OFF 1 Hz

Circuit Diagram



Troubleshooting

Before troubleshooting the immobilizer system, troubleshoot any ECM/PCM with diagnostic trouble codes (DTCs) (see page 11-62),and make sure the ECM/PCM has no malfunction.

Note these items before troubleshooting:

- Due to the action of the immobilizer system, the engine takes slightly more time to start than on a vehicle without an immobilizer system.
- When the system is normal, and the proper key is inserted, the indicator light comes on for 2 seconds, then it will go off.
- If the indicator starts to blink after 2 seconds, or if the engine does not start, repeat the starting procedure. If the engine still does not start, continue with this procedure.

1. Turn the ignition switch ON (II) with programmed key.

2. Check to see if the immobilizer indicator light comes on.

Does the indicator light blink?

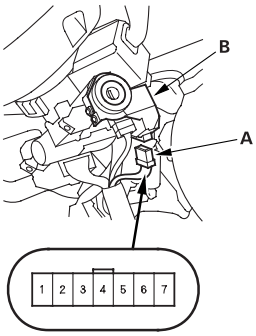
Yes Go to step 3.

No Check for these problems:■

- Blown No. 9 (10A) fuse in the under-hood fuse/relay box.
- An open in the BLU/ORN wire between the gauge assembly and the immobilizer control unit-receiver.
- A faulty immobilizer indicator light.
- An open in the WHT/RED wire between the gauge assembly and the under-hood fuse/relay box.

3. Remove the steering column covers (see page 17-24).

4. Disconnect the 7P connector from the immobilizer control unit-receiver.



5. Check for voltage between the immobilizer control unit-receiver 7P connector No. 7 terminal and body ground.

Is there battery voltage?

Yes Go to step 6.

No Check for these problems:■

- Blown No. 9 (10A) fuse in the under-hood fuse/relay box.
- An open in the WHT/RED wire.

6. Check for voltage between the immobilizer control unit-receiver 7P connector No. 6 terminal and body ground with the ignition switch 0N (II).

Is there battery voltage?

Yes Go to step 7.

No Check for these problems:

- Blown No. 6 (15A) fuse in the under-hood fuse/relay box.
- Faulty PGM-FI main relay 1.
- An open in the YEL/BLK wire.

7. Check for voltage between the immobilizer control-unit receiver 7P connector No. 4 terminal and body ground with the parking brake lever pulled, then released.

Is there 1 V or less, then 5 V or more?

Yes Go to step 8.

No Check for these problems:■

- Faulty parking brake switch or a poor body ground of the parking brake switch.
- Faulty brake fluid level switch.
- An open in the GRN/RED wire.

8. Check for continuity between the immobilizer control unit-receiver 7P connector No. 1 terminal and body ground.

   Is there voltage?

   Yes Go to step 9.

   No Check for these problems:■

   - Poor ground (G101).
   - Faulty ECM/PCM.
   - An open in the BRN/YEL wire.

9. Check for continuity between the immobilizer control unit-receiver 7P connector No. 2 terminal and ECM/PCM terminal E27.

   Is there continuity?

   Yes Go to step 10.

   No Repair open in the WHT wire.■

10. Disconnect the negative cable from the battery.
11. Disconnect the ECM/PCM connector E.
12. Check for continuity between the immobilizer control unit-receiver 7P connector No. 2 terminal and body ground.

    Is there continuity?

    Yes Repair short to ground in the WHT wire.■

    No Go to step 13.

13. Check for continuity between the immobilizer control unit-receiver 7P connector No. 4 terminal and the multiplex control unit (under-dash fuse/relay box connector terminal C3).

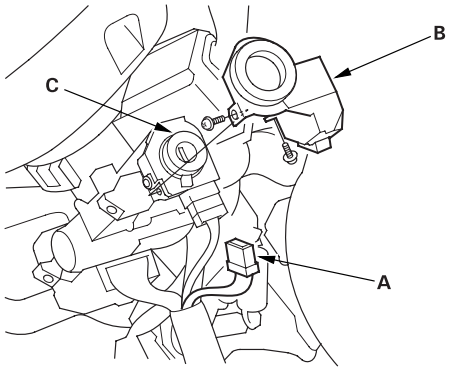
    Is there continuity?

    Yes Replace the immobilizer control unit-receiver. After replacing the immobilizer control unit-receiver, rewrite the unit with a Honda PGM-Tester.■

    No Repair open in the WHT wire. If the harness is OK, check to see if there is any Diagnostic Trouble Code (DTC) for the multiplex control unit. If it is, troubleshoot the multiplex control unit (see page 22A-231), then recheck.■

Immobilizer Control Unit-Receiver Replacement

1. Remove the dashboard lower cover.
2. Remove the steering column covers (see page 17-24).
3. Disconnect the connector (A) from the immobilizer control unit-receiver (B).

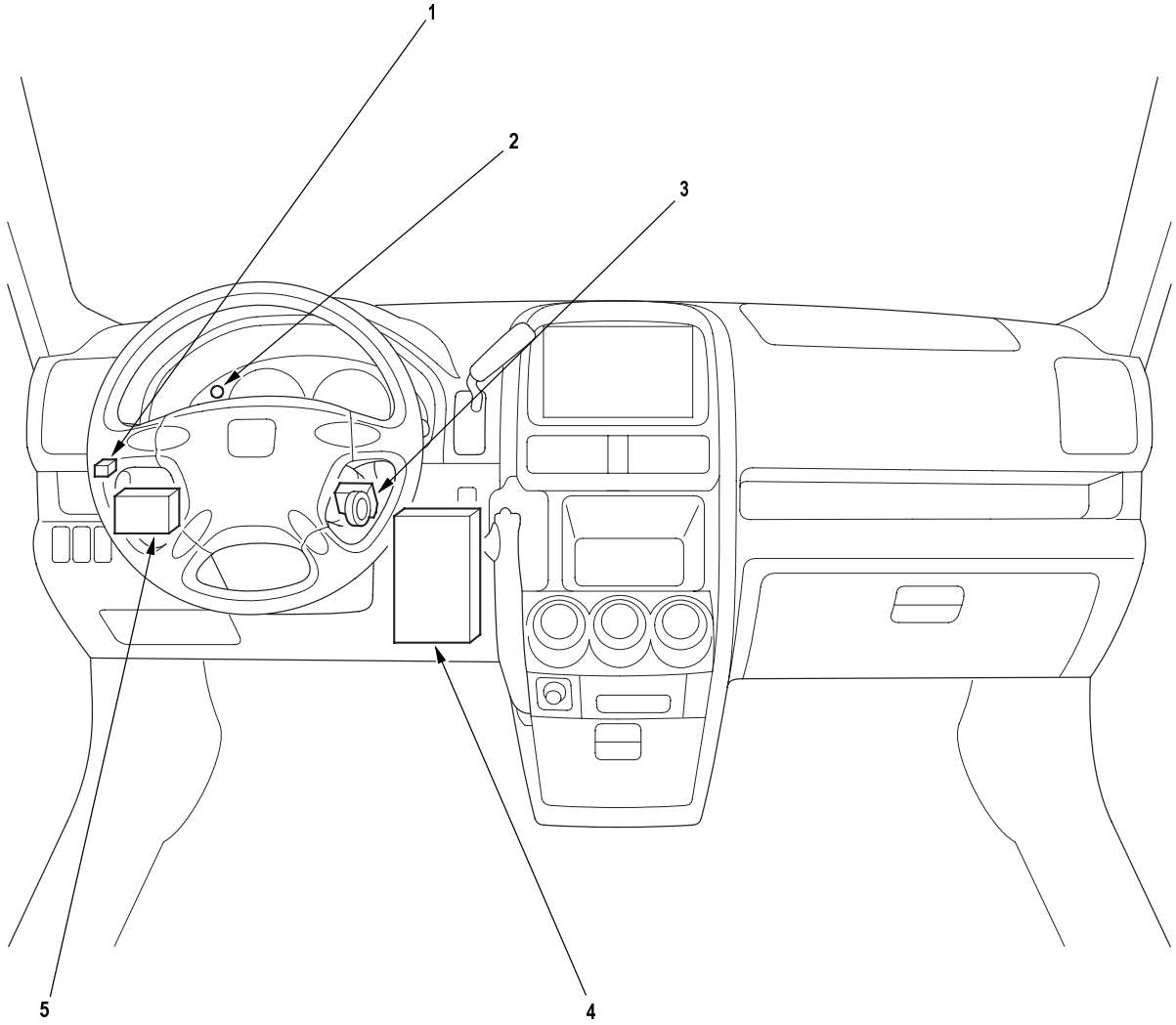


4. Remove the two screws and the immobilizer control unit-receiver from the ignition key cylinder (C).
5. Install the immobilizer control unit-receiver in the reverse order of removal.
6. After replacement, register the immobilizer control unit-receiver with PGM-Tester, then check the immobilizer system.

Security Alarm System

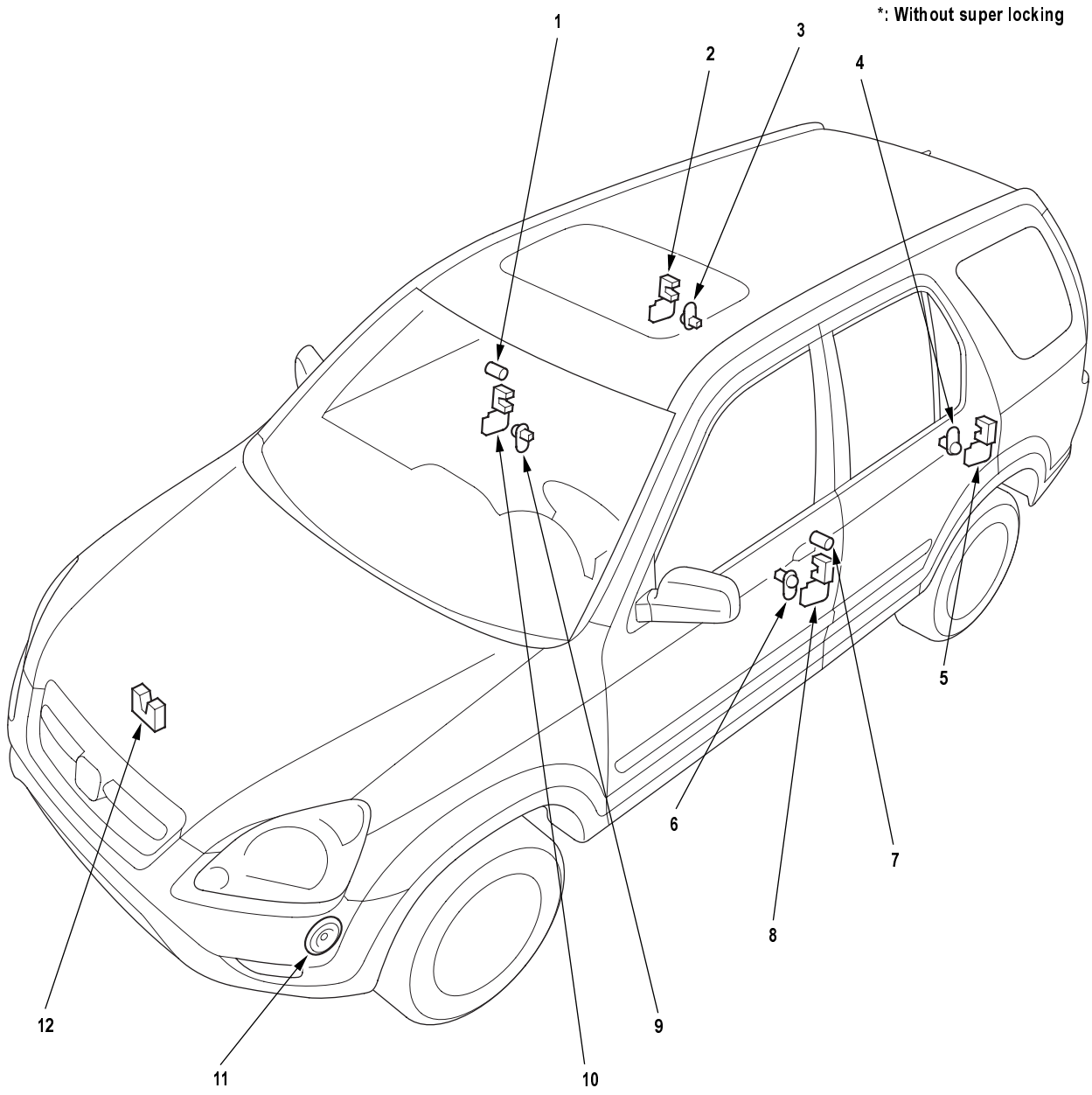
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



1	SECURITY HORN RELAY	Test, page 22A-60
	[Wire colors: BLU/ORN, WHT/GRN, WHT/GRN and GRN]	
2	SECURITY INDICATOR LIGHT	
3	IGNITION KEY SWITCH	Test, page 22A-113
4	MULTIPLEX CONTROL UNIT	Troubleshooting, page 22A-231; Input Test, page 22A-166
5	SECURITY CONTROL UNIT	Input Test, page 22A-199

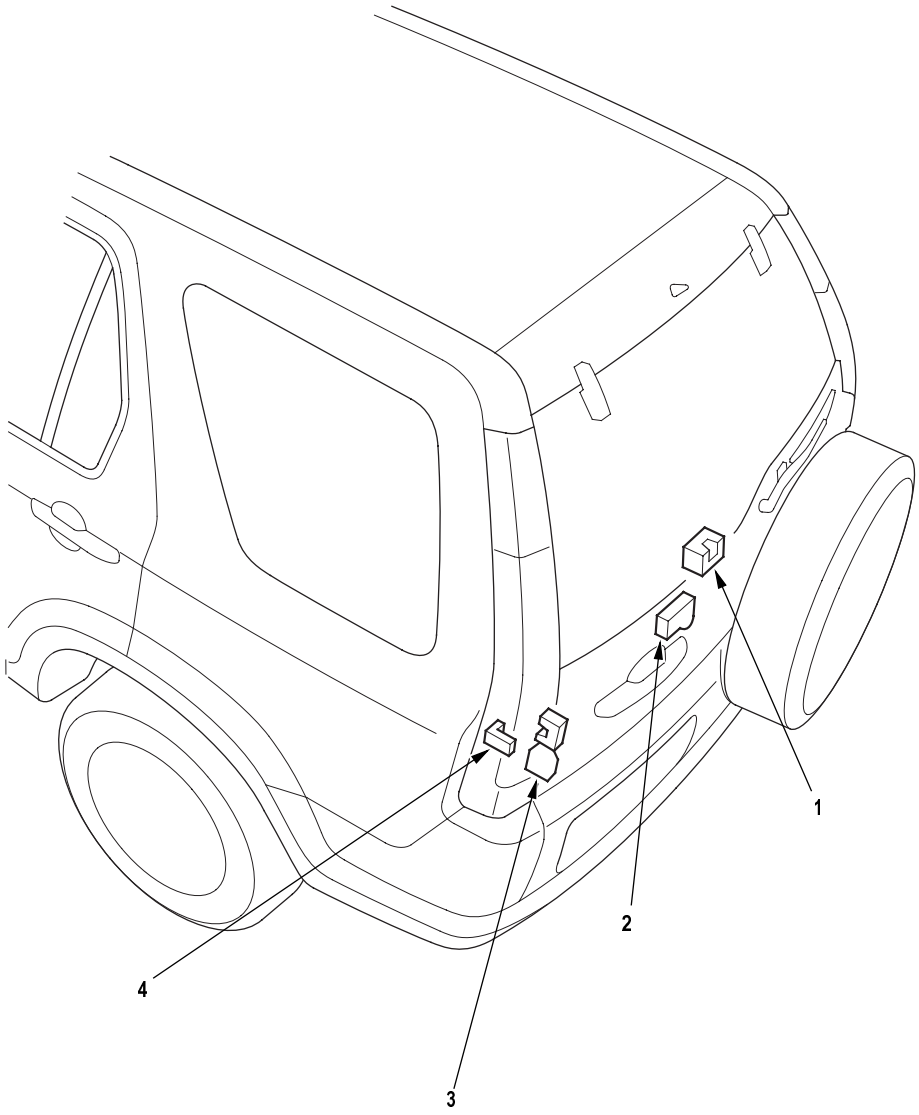
NOTE: LHD type is shown, RHD type is similar.



1	FRONT PASSENGER'S DOOR KEY CYLINDER SWITCH*1	Test, page 22A-204
2	RIGHT REAR DOOR LOCK KNOB SWITCH	Test, page 22A-202
3	RIGHT REAR DOOR SWITCH	
4	LEFT REAR DOOR SWITCH	
5	LEFT REAR DOOR LOCK KNOB SWITCH	Test, page 22A-202
6	DRIVER'S DOOR SWITCH	
7	DRIVER'S DOOR KEY CYLINDER SWITCH	Test, page 22A-204
8	DRIVER'S DOOR LOCK KNOB SWITCH	Test, page 22A-202
9	FRONT PASSENGER'S DOOR SWITCH	
10	FRONT PASSENGER'S DOOR LOCK KNOB SWITCH	Test, page 22A-202
11	SECURITY HORN	Test, page 22A-205
12	HOOD SWITCH	Test, page 22A-204

(cont'd)

Component Location Index (cont'd)



1	HATCH GLASS LATCH SWITCH	Test, page 22A-181
2	HATCH GLASS OPENER ACTUATOR	Test, page 22A-178
3	TAILGATE KNOB SWITCH	Test, page 22A-205
4	TAILGATE SWITCH	Test, page 22A-110; Replacement, page 22A-110

System Description

Security Alarm System

The security alarm system is armed automatically after the doors, hood, and trunk or tailgate are closed and locked. The security indicator on the gauge assembly flashes after the system is armed.

The system is set off when any of these things occur.
- A door is forced open
- A door is unlocked without using the key or the transmitter
- The trunk lid or tailgate is opened without using the key
- The hood is opened
- The engine starter circuit and battery circuit are bypassed by breaking the ignition switch (KH, PH and KK models)

When the system is set off, the alarm sounds and the exterior lights (headlights, parking lights and taillights: FO model or turn signal lights: except (FO model) flash for 2 minutes (FO model) or 30 seconds (Except FO model) or until the system is disarmed by unlocking either door with the key or the transmitter.

For the system to arm, the ignition switch must be off and the key removed. Then, the security control unit must receive signals that the doors, hood, and trunk lid or tailgate are closed and locked. When everything is closed and locked, none of the control unit inputs are grounded.

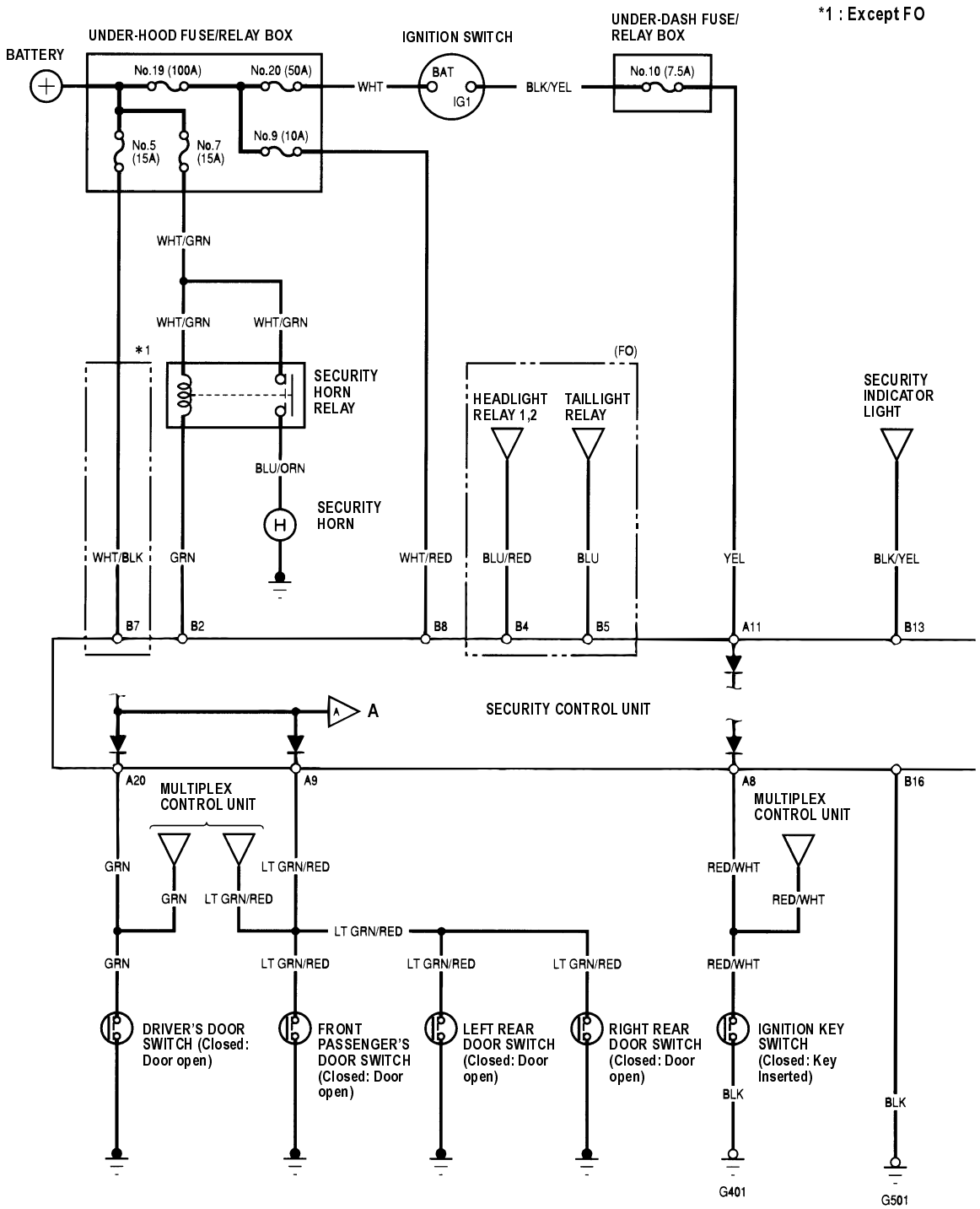
The door switches, hood switch, trunk latch switch or tailgate latch switch, door lock knob switches, and door lock key cylinder switches are all open,. 10 seconds after the doors are locked with the key or the lock knob, or immediately after locking the doors with the remote transmitter, the system arms.

If anything is opened or improperly unlocked after the system is armed, the control unit gets a ground signal from that switch, and the system is set off.

If one of the switches is misadjusted or there is a short in the system, the system will not arm. As long as the control unit continues to get a ground signal, it thinks the vehicle is not closed and locked and will not arm.

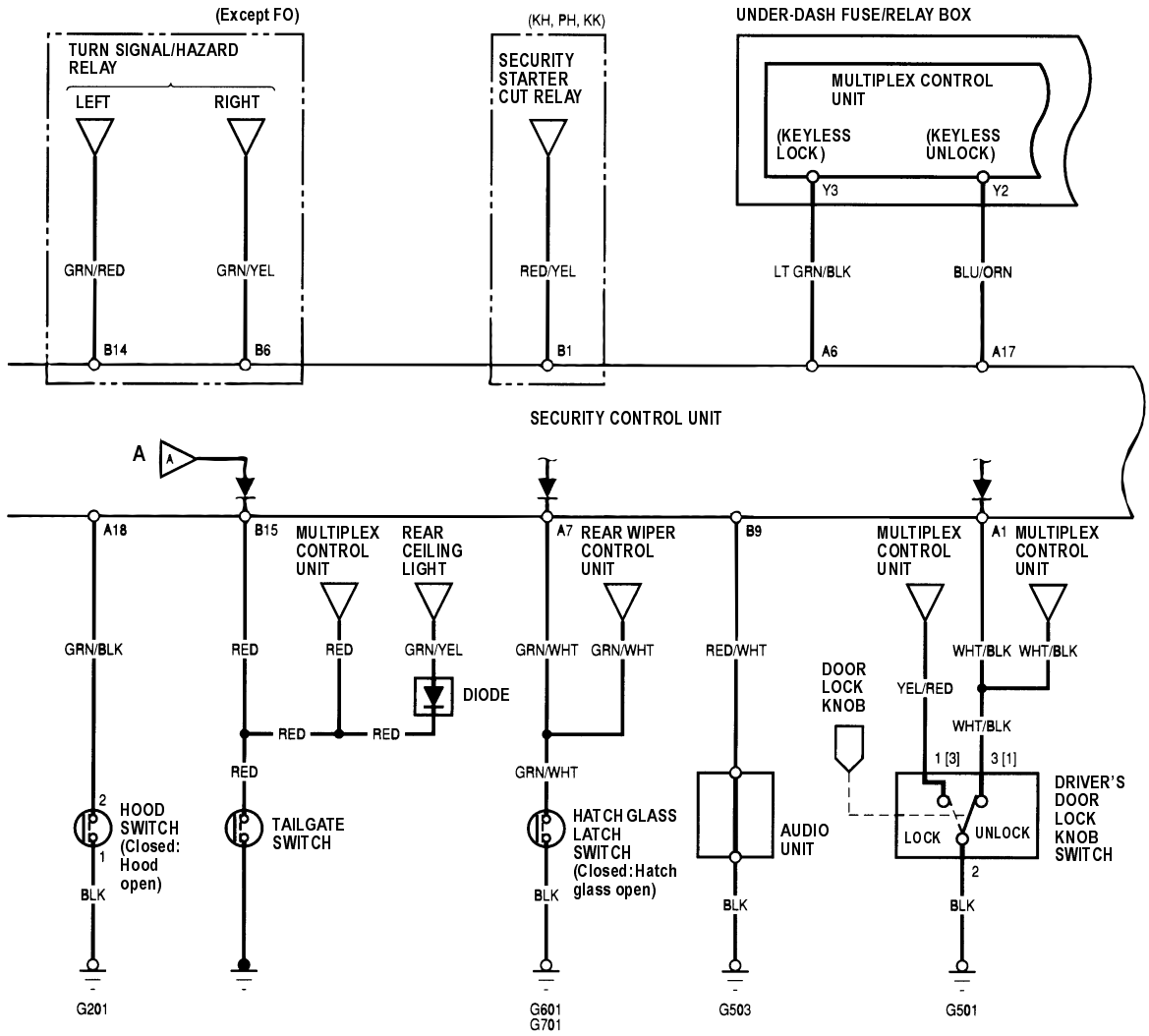
An alarm that sounds for no apparent reason may have been set off by switch that is on the threshold of misadjustment. In this case, it may only take a significant change in outside temperature, the vibration of a passing truck, or someone bumping into the vehicle to make the alarm sound.

Circuit Diagram



A To page 22A-197

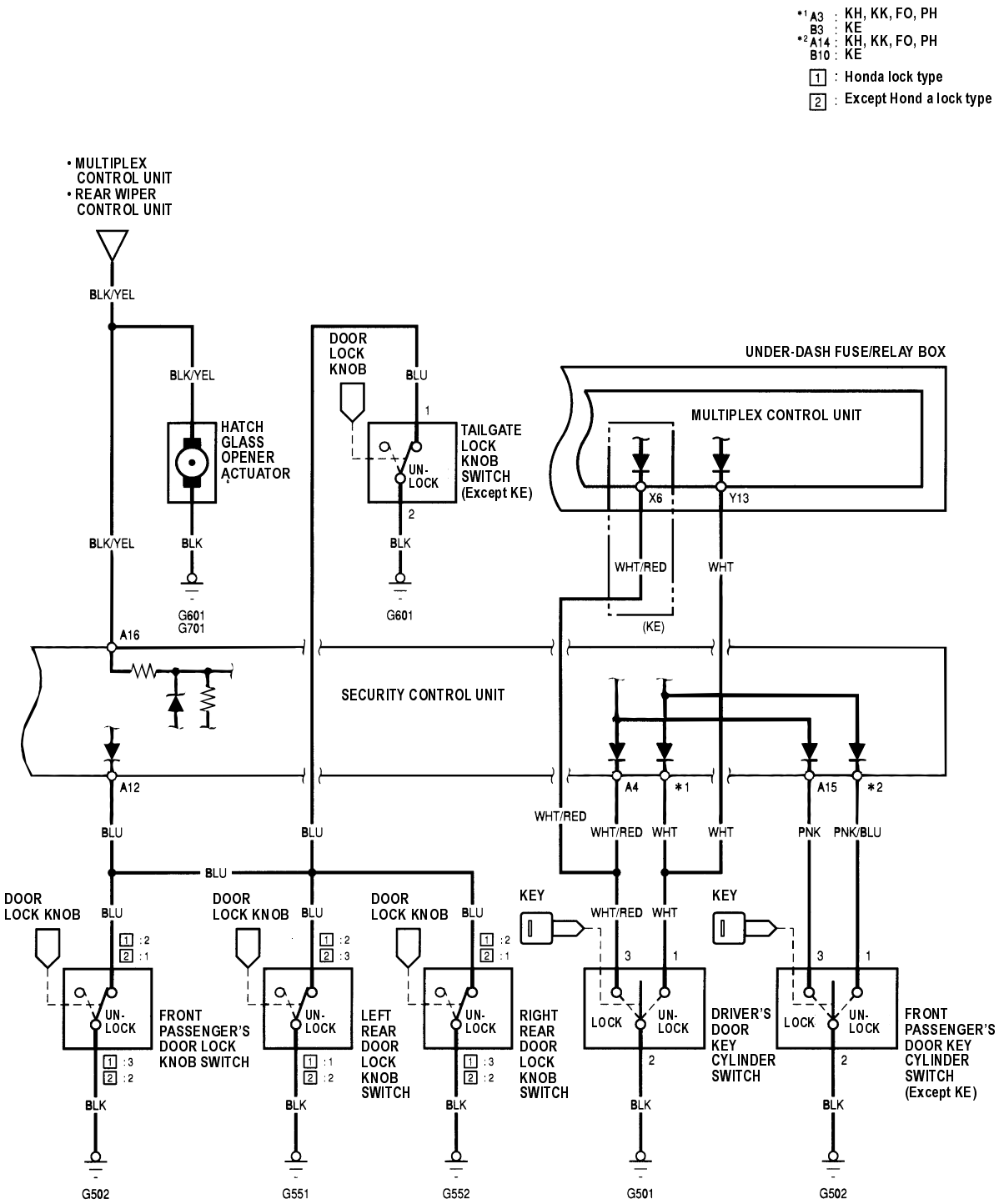
Circuit Diagram (cont'd)



A From page 22A-196

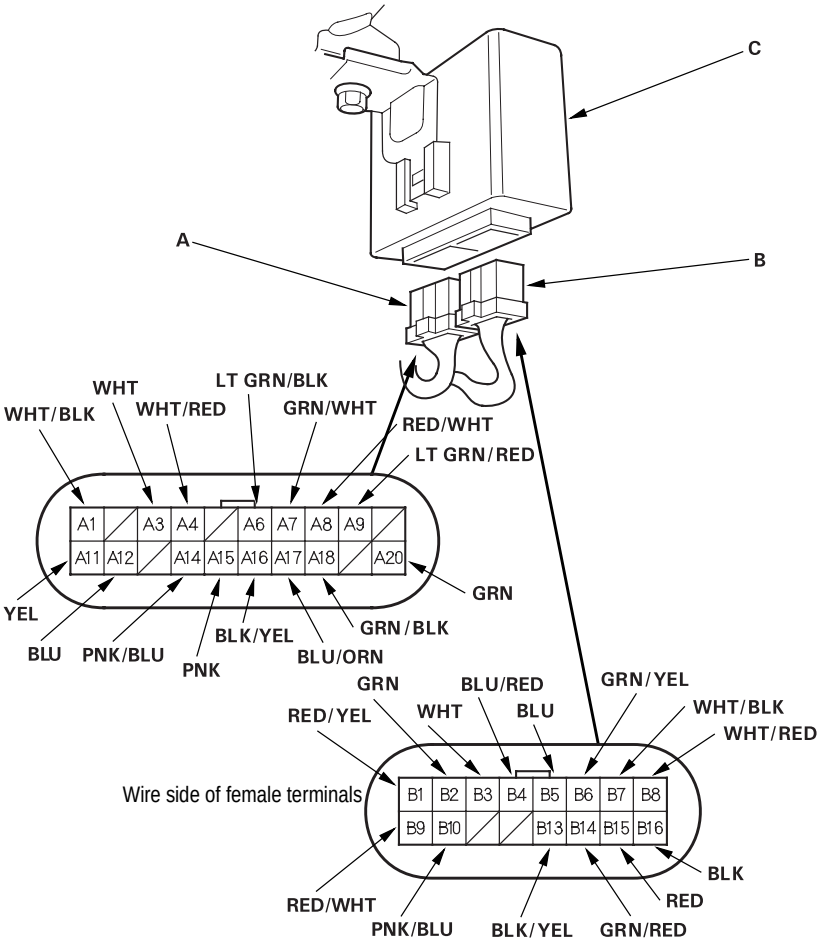
(cont'd)

Circuit Diagram (cont'd)



Security Control Unit Input Test

1. Remove the dashboard lower cover (see page 20-88).
2. Disconnect the 20P connector (A) and 16P connector (B) from the control unit (C).
3. Inspect the all connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.



(cont'd)

Security Control Unit Input Test (cont'd)

4. If any tests indicate a problem, find and correct the cause, then recheck the system.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B8	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the under-hood fuse/relay box • An open in the wire
B7	WHT/BLK	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (15A) fuse in the under-hood fuse/relay box • An open in the wire
A11	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (7.5A) fuse in the under-dash fuse/relay box • An open in the wire
B16	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
B13	BLK/YEL	Under all conditions	Attach to ground: The security indicator should come on.	• Blown No. 10 (7.5A) fuse in the under-dash fuse/relay box • Faulty gauge assembly • An open in the wire
B2	GRN	Under all conditions	Attach to ground: Security horn should sound.	• Blown No. 7 (15A) fuse in the under-hood fuse/relay box • Faulty security horn relay • Faulty security horn • An open in the wire
B4	BLU/RED	Under all conditions	Attach to ground: Headlights should come on.	• Faulty headlight relay 1 or 2 • An open in the wire
B5	BLU	Under all conditions	Attach to ground: The taillights should come on.	• Faulty taillight relay • An open in the wire
B9	RED/WHT	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G503) • Faulty audio unit • An open in the wire
A6	LT GRN/ BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire
A17	BLU/ORN	Under all conditions	Check for continuity to ground: There should be continuity.	• An open in the wire
B1	RED/YEL	Ignition switch START (III)	Starting the engine	• Faulty security starter cut relay • An open in the wire
B14	GRN/RED	Ignition switch OFF	Attach to ground: The turn signal lights should come on.	• Blown No. 5 (15A) fuse in the under-hood fuse/relay box • Faulty turn signal switch • Faulty turn signal/hazard relay • An open in the wire
B6	GRN/YEL	Ignition switch OFF		

5. Reconnect the connectors to the security control unit, and perform the following input tests at the appropriate connector.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If the input tests prove OK, the security control unit internal circuit must be faulty.

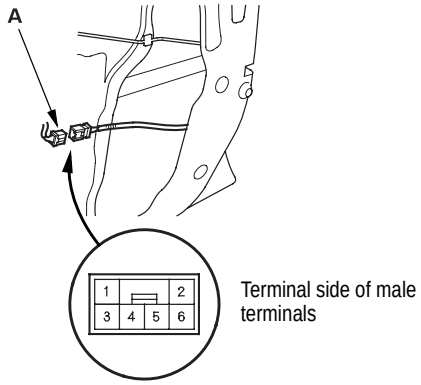
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A20	GRN	Driver's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	
A9	LT GRN/ RED	Passenger's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty passenger's door switch • An open in the wire
		Passenger's door closed	Check for voltage to ground: There should be 5 V or more.	
B15	RED	Tailgate open	Check for voltage to ground: There should be less than 1 V.	• Faulty tailgate switch • An open in the wire
		Tailgate closed	Check for voltage to ground: There should be 5 V or more.	
A7	GRN/WHT	Hatch glass open	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G601, G701) • Faulty hatch glass latch switch • An open in the wire
		Hatch glass closed	Check for voltage to ground: There should be 5 V or more.	

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	RED/WHT	Ignition key is in the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire
		Ignition key is out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	
A18	GRN/BLK	Hood open	Check for voltage to ground: There should be 1 V or less.	• Faulty hood switch • Poor ground (G201) • An open in the wire
		Hood closed	Check for voltage to ground: There should be 5 V or more.	
A1	WHT/BLK	Driver's door lock knob unlocked	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door lock knob switch • Poor ground (G501) • An open in the wire
		Driver's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	
A12	BLU	Front passenger's door lock knob unlocked	Check for voltage to ground: There should be 1 V or less.	• Faulty front passenger's door lock knob switch • Poor ground (G502) • An open in the wire
		Front passenger's door lock knob locked	Check for voltage to ground: There should be 5 V or more.	
		Left rear door lock knob unlocked	Check for voltage to ground: There should be 1 V or less.	• Faulty left rear door lock knob switch • Poor ground (G551) • An open in the wire
		Left rear door lock knob locked	Check for voltage to ground: There should be 5 V or more.	
		Right rear door lock knob unlocked	Check for voltage to ground: There should be 1 V or less.	• Faulty right rear door lock knob switch • Poor ground (G552) • An open in the wire
		Right rear door lock knob locked	Check for voltage to ground: There should be 5 V or more.	
		Tailgate lock knob unlocked	Check for voltage to ground: There should be 1 V or less.	• Faulty tailgate lock knob switch • Poor ground (G601) • An open in the wire
		Tailgate lock knob locked	Check for voltage to ground: There should be 5 V or more.	
A16	BLK/YEL	Hatch glass open	Check for voltage to ground: There should be 1 V or less.	• Faulty hatch glass opener actuator • Poor ground (G601, G701) • An open in the wire
		Hatch glass closed	Check for voltage to ground: There should be 5 V or more.	
A4	WHT/RED	Driver's door key cylinder locked	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door key cylinder switch • Poor ground (G501) • An open in the wire • A short to ground
		Driver's door key cylinder in neutral	Check for voltage to ground: There should be 5 V or more.	
A3 • B3	WHT	Driver's door key cylinder unlocked	Check for voltage to ground: There should be 1 V or less.	
		Driver's door key cylinder in neutral	Check for voltage to ground: There should be 5 V or more.	
A15	PNK	Front passenger's door key cylinder locked	Check for voltage to ground: There should be 1 V or less.	• Faulty front passenger's door key cylinder switch • Poor ground (G502) • An open in the wire • A short to ground
		Front passenger's door key cylinder in neutral	Check for voltage to ground: There should be 5 V or more.	
A14 • B10	PNK/BLU	Front passenger's door key cylinder unlocked	Check for voltage to ground: There should be 1 V or less.	
		Front passenger's door key cylinder in neutral	Check for voltage to ground: There should be 5 V or more.	

Door Lock Knob Switch Test

Driver's Door (With Super Locking System):

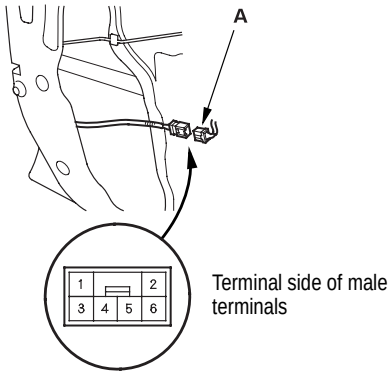
1. Remove the driver's door panel (see page 20-9).
2. Disconnect the 6P connector (A) from the super locking actuator.



3. Check for continuity between the terminals.
   - There should be continuity between the No. 3 and No. 4 terminals when the door lock knob switch is LOCK position.
   - There should be continuity between the No. 1 and No. 4 terminals when the door lock knob switch is UNLOCK position.
4. If the continuity is not as specified, replace the super locking actuator.

Passenger's Door (With Super Locking System):

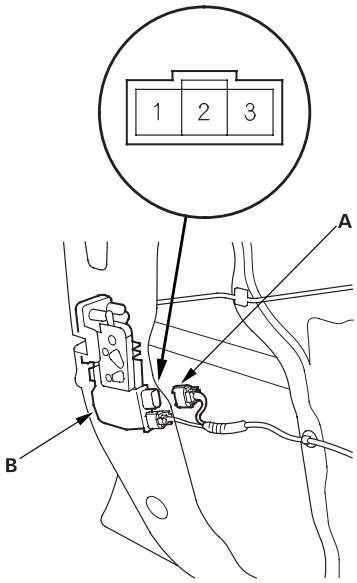
1. Remove the passenger's door panel (see page 20-9).
2. Disconnect the 6P connector (A) from the super locking actuator.



3. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 4 terminals when the door lock knob switch is UNLOCK position.
4. If the continuity is not as specified, replace the super locking actuator.

Driver's Door (Without Super Locking System):

1. Remove the driver's door panel (see page 20-9).
2. Identify the type of door lock actuator (see page 20-14).
3. Disconnect the 3P connector (A) from the actuator (B).



4. Check for continuity between the terminals in each switch position according to the table.

Honda lock type:

Terminal / Position	1 [3]	2	3 [1]
LOCK	○		○
UNLOCK	○	○	

[ ]: RHD type

Except Honda lock type:

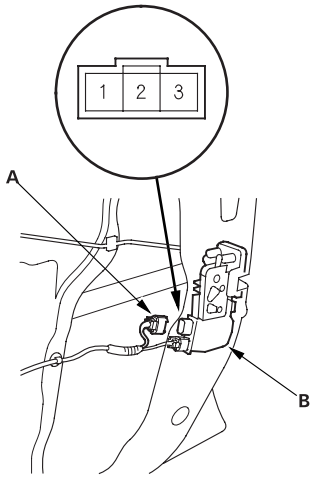
Terminal / Position	1 [3]	2	3 [1]
LOCK	○	○	
UNLOCK		○	○

[ ]: RHD type

5. If the continuity is not as specified, replace the door lock actuator.

Passenger's Door (Without Super Locking System):

1. Remove the passenger's door panel (see page 20-9).
2. Identify the type of door lock actuator (see page 20-14).
3. Disconnect the 3P connector (A) from the actuator.



4. Check for continuity between the terminals in each switch position according to the table.

Front passenger's

Terminal / Position	2 [1]	3 [2]
LOCK		
UNLOCK	○	○

Left rear:

Terminal / Position	1 [2]	2 [3]
LOCK		
UNLOCK	○	○

Right rear:

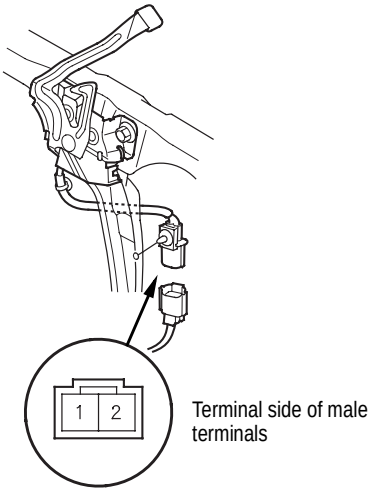
Terminal / Position	2 [1]	3 [2]
LOCK		
UNLOCK	○	○

[ ] : except Honda lock type

5. If the continuity is not as specified, replace the door lock actuator.

Hood Switch Test

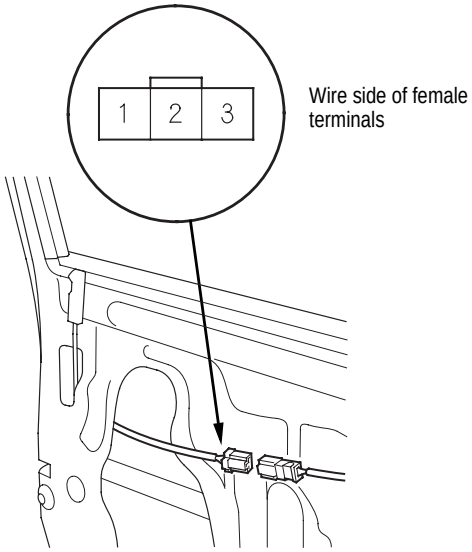
1. Open the hood.
2. Disconnect the 2P connector from the hood switch.



3. Check for continuity between the terminals.
   - There should be continuity between the No. 1 and No. 2 terminals when the hood is opened. (lever released).
   - There should be no continuity between the No. 1 and No. 2 terminals when the hood closed. (lever pushed down).

Door Key Cylinder Switch Test

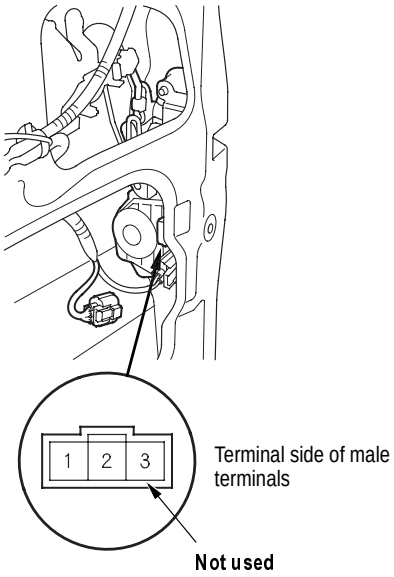
1. Remove the door panel (see page 20-9).
2. Disconnect the 3P connector from the key cylinder switch.



3. Check for continuity between the terminals.
   - There should be continuity between the No. 2 and No. 3 terminals when the door key cylinder switch is LOCK position.
   - There should be continuity between the No. 1 and No. 2 terminals when the door key cylinder switch is UNLOCK position.

Tailgate Lock Knob Switch Test

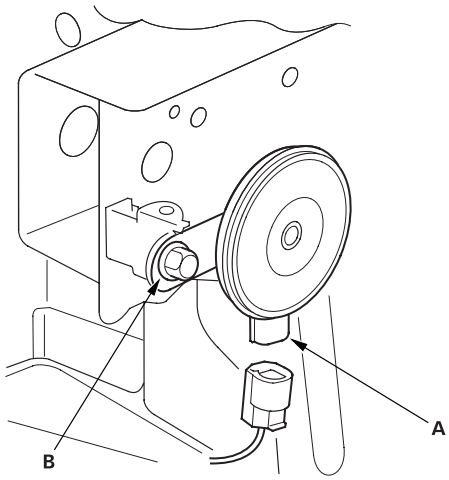
1. Open the tailgate and remove the tailgate trim panel (see page 20-80).
2. Disconnect the 3P connector (A) from the tailgate knob switch (B).



3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity with the tailgate knob switch is UNLOCK.
   - There should be no continuity with the tailgate knob switch is LOCK.

Security Horn Test

1. Remove the front bumper (see page 20-130).
2. Disconnect the 1P connector from the horn.

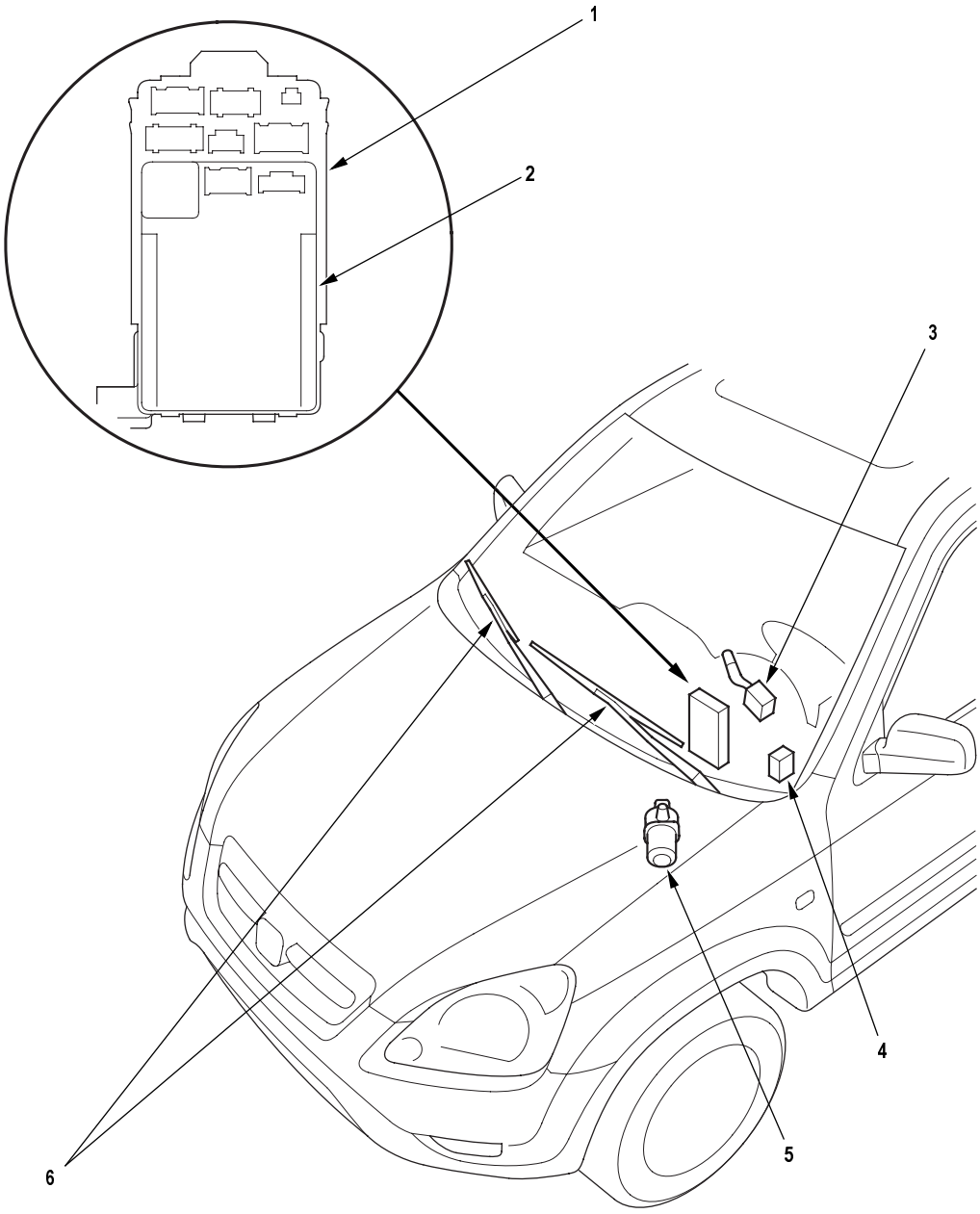


3. Test the horn by connecting battery power to the terminal (A) and grounding the body ground (B). The horn should sound.
4. If the horn fails to sound, check for.
   - faulty security horn relay.
   - faulty mounting bolt.

Wipers/Washers

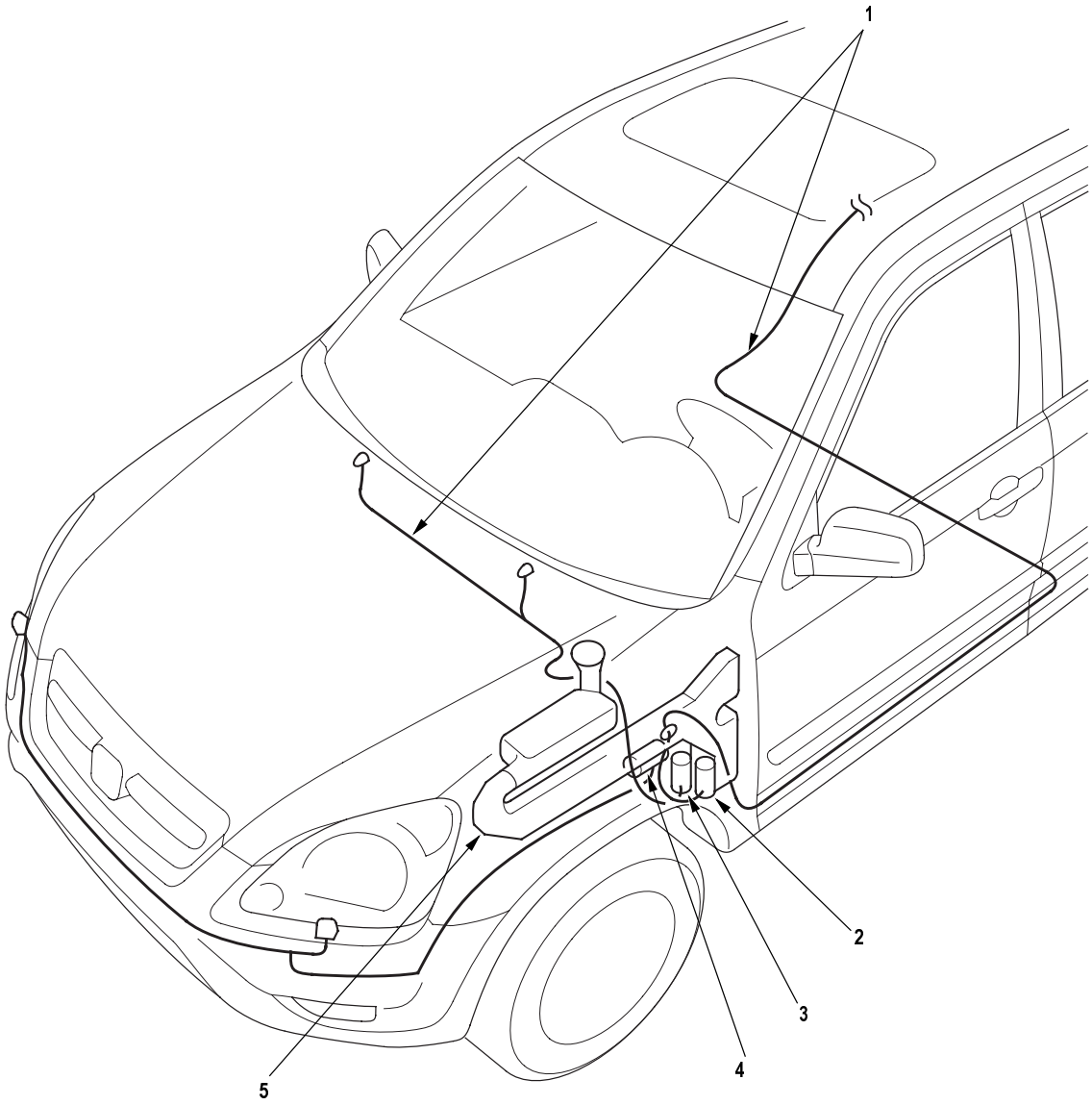
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



1	UNDER-DASH FUSE/RELAY BOX	
2	INTERMITTENT WIPER RELAY CIRCUIT (in the multiplex control unit)	Input Test, page 22A-216
3	WIPER/WASHER SWITCH	Test, page 22A-214; Replacement, page 22A-214
4	HEADLIGHT WASHER CONTROL UNIT	Input Test, page 22A-218
5	WINDSHIELD WIPER MOTOR	Test, page 22A-222; Replacement, page 22A-223
6	WINDSHIELD WIPER ARMS and LINKAGE	Replacement, page 22A-223

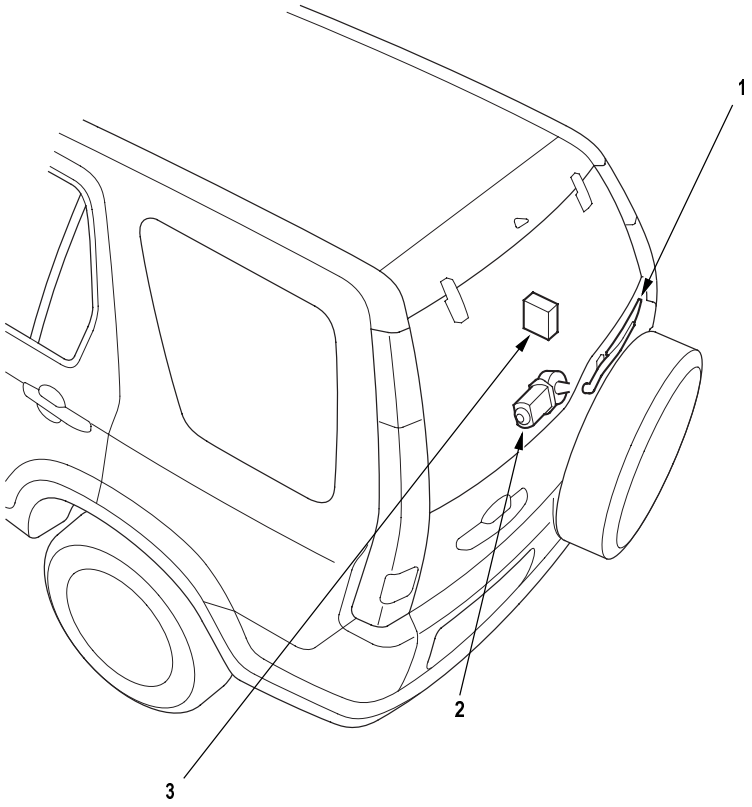
NOTE: LHD type is shown, RHD type is similar.



1	WASHER TUBE	Replacement, page 22A-225
2	REAR WINDOW WASHER MOTOR	Test, page 22A-213
3	WINDSHIELD WASHER MOTOR	Test, page 22A-213
4	HEADLIGHT WASHER MOTOR	Test, page 22A-213
5	WASHER RESERVOIR	Replacement, page 22A-224

(cont'd)

Component Location Index (cont'd)

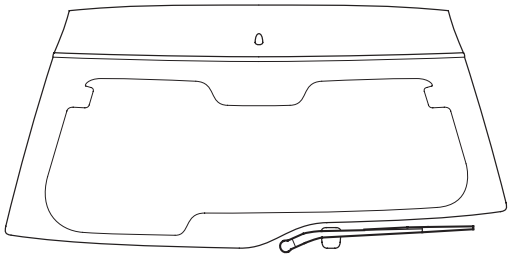


1	REAR WIPER ARM/LINKAGE	Replacement, page 22A-223
2	REAR WINDOW WIPER MOTOR	Test, page 22A-222; Replacement, page 22A-223
3	REAR WINDOW WIPER CONTROL UNIT	Input Test, page 22A-220

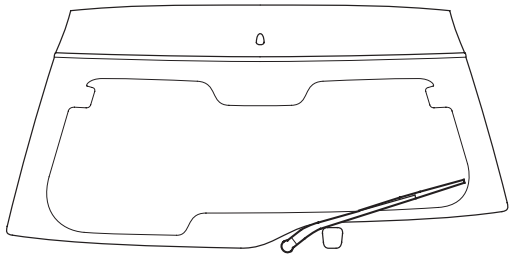
System Description

Intermittent operation:
Rear window wiper switch ON: The wiper operates every seven seconds after completing two sweeps.

Rear window wiper switch OFF: The wiper returns to the park position.



REAR WINDOW WIPER PARK POSITION



REAR WINDOW WIPER STAND-BY POSITION

Washer/Wiper combined system:
Rear window wiper switch ON: The wiper operates continuously while the washer switch is ON.

Rear window wiper switch OFF: After switching OFF the washer switch, the wiper returns to the park position after completing two sweeps.

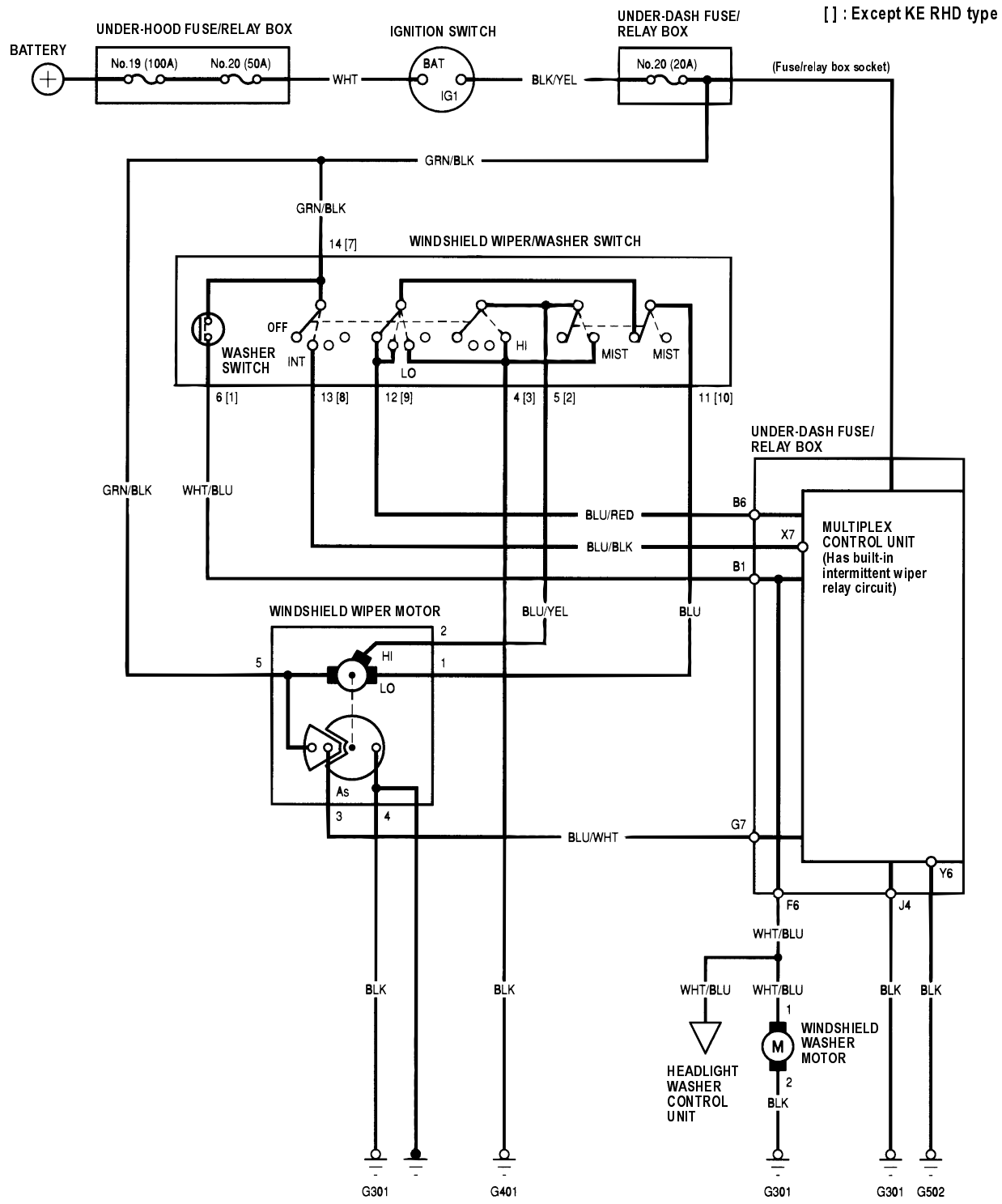
Failsafe Function:
Lock Function: The rear window wiper will not operate if the hatch glass is open.

Emergency Stop Function: If the hatch glass is opened while the rear window wiper is operating, it will automatically stop.

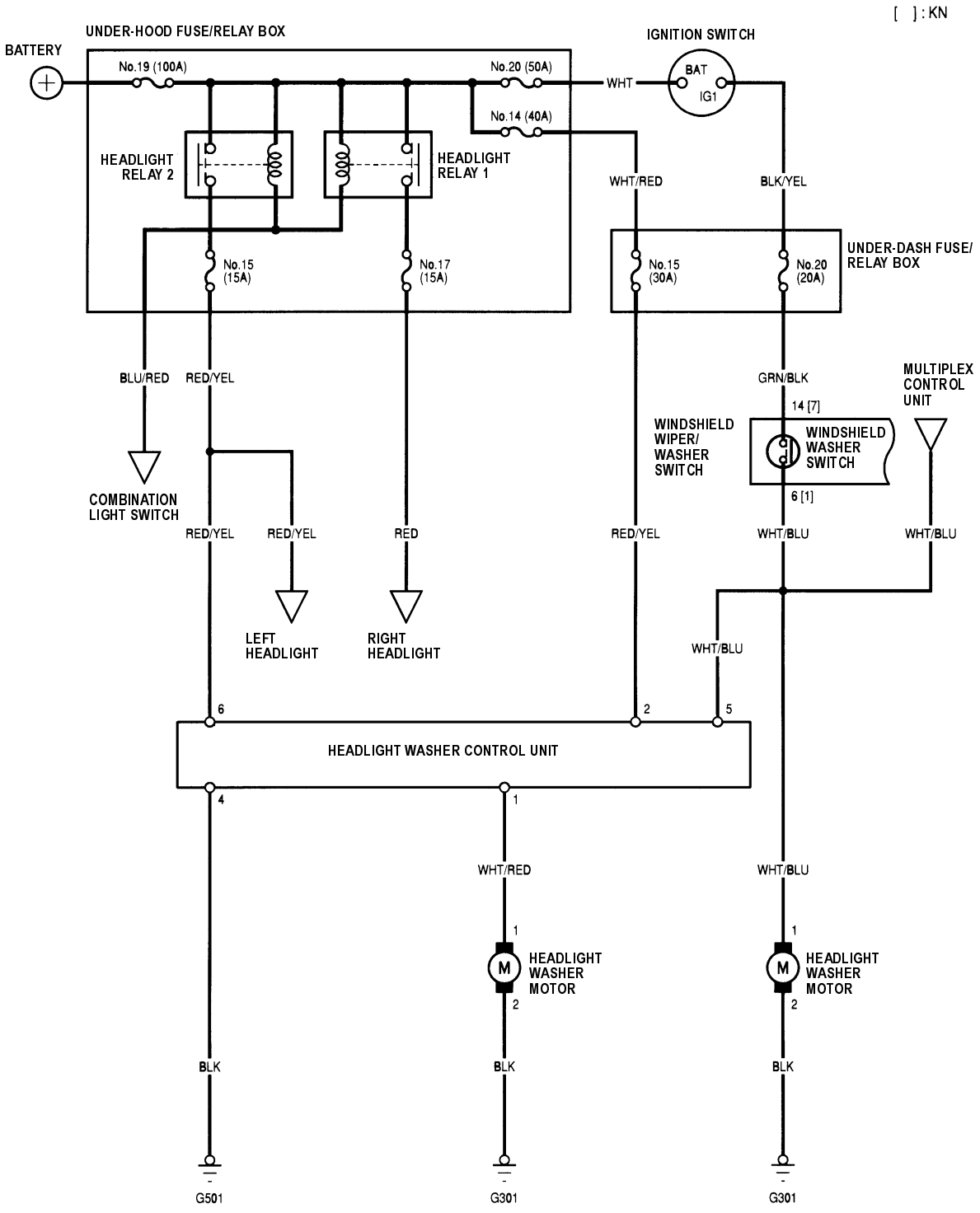
Automatic Park Function: If the ignition switch is turned OFF while the rear window wiper is operating, the wiper will return to the park position.

NOTE: To avoid interference with the vehicle's spare tire, the rear wiper does not fold out as on previous models.

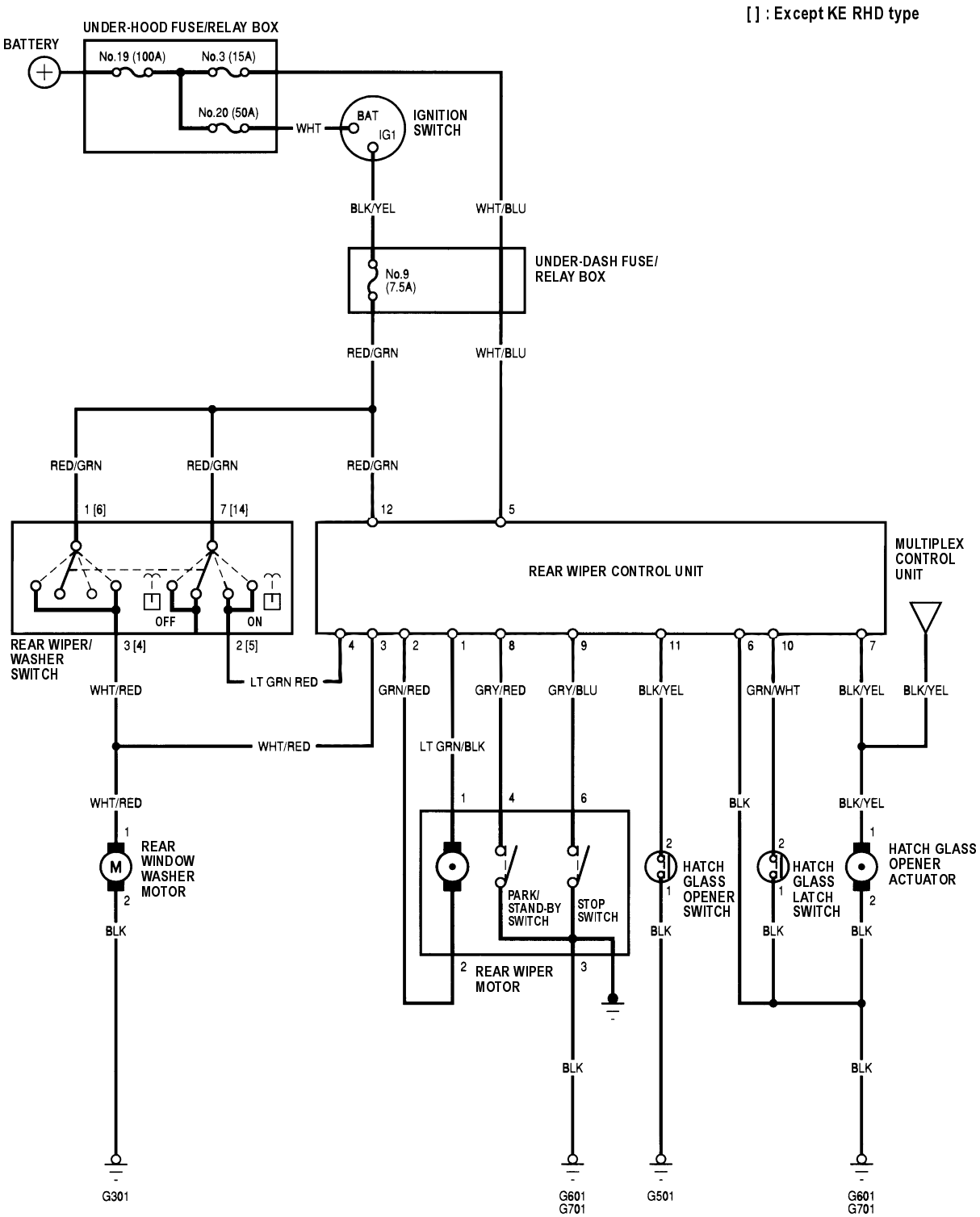
Circuit Diagram - Windshield



Circuit Diagram - Headlight Washer

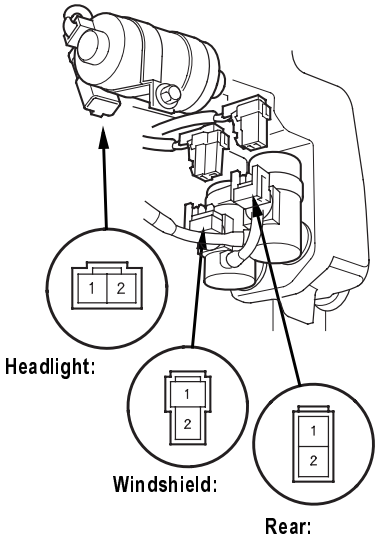


Circuit Diagram - Rear Window



Washer Motor Test

1. Remove the left inner fender (see page 20-155).
2. Disconnect the 2P connector (A) from the washer motor (B).

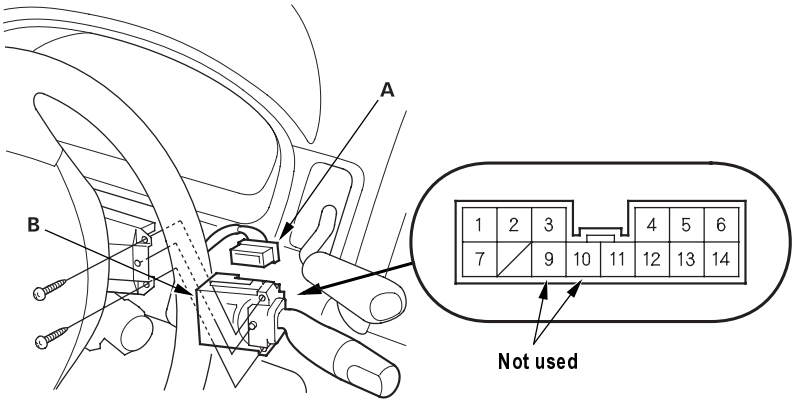


3. Test the motor by connecting battery power to the No. 1 terminal and ground the No. 2 terminal of the washer motor. The motor should run.
   - If the motor does not run or fails to run smoothly, replace it.
   - If the motor runs smoothly, but little or no washer fluid is pumped, check for a disconnected or blocked washer hose, or a clogged pump outlet in the motor.

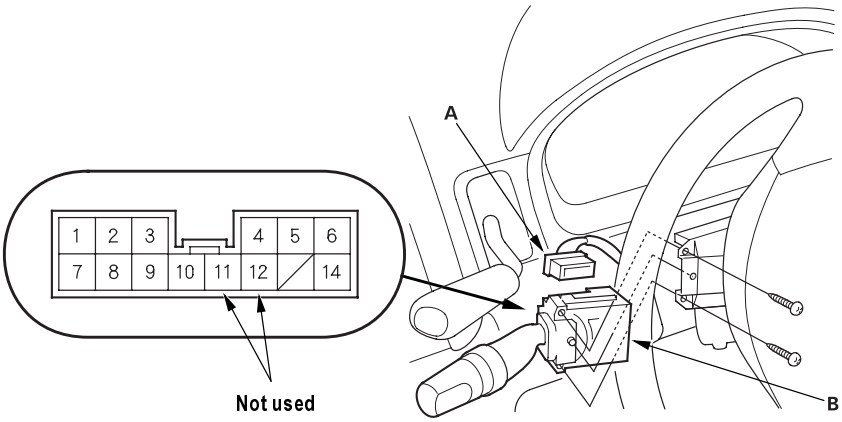
Wiper/Washer Switch Test/Replacement

1. Remove the driver's dashboard lower cover (see page 20-88).
2. Remove the steering column covers (see page 17-24).
3. Disconnect the 14P connector (A) from the wiper/washer switch (B).

LHD type and KE model:



RHD type:



4. Remove the two screws, then pull out the wiper/washer switch.

5. Inspect the connector terminals to be sure they are all making good contact.
- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, check for continuity between the terminals in each switch position according to the tables. If the continuity is not as specified, replace the switch.

Windshield:

Terminal / Position	4 [3]	5 [2]	6 [1]	11 [10]	12 [9]	13 [8]	14 [7]	9 [12]		10 [11]
OFF				○	○					
INT				○	○	○	○			
LO	○			○						
HI	○	○								
Mist switch ON	○	○								
Washer switch ON			○				○			

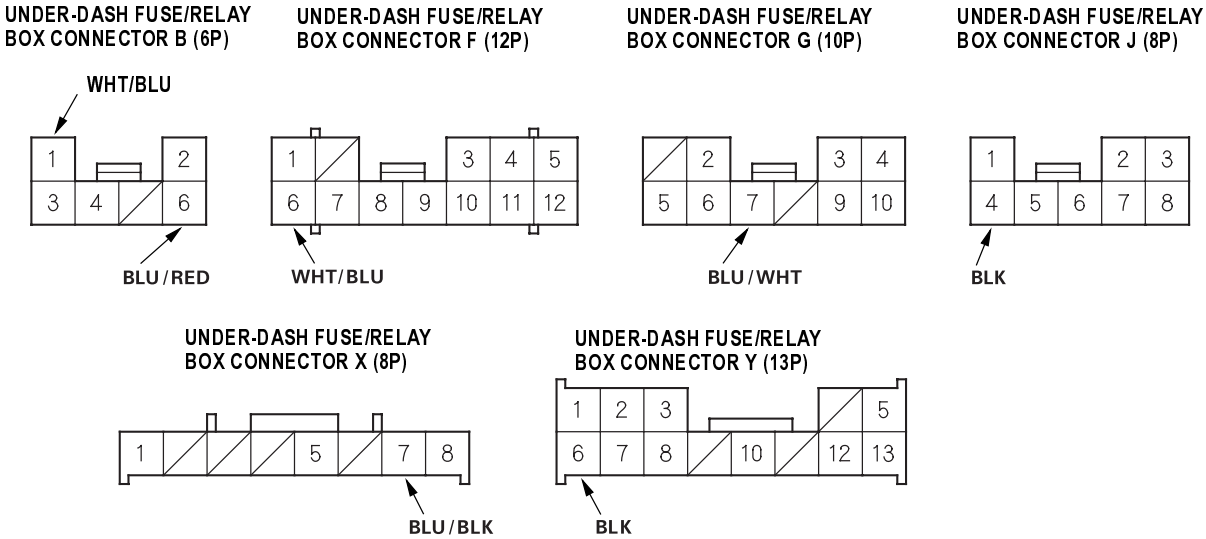
Rear Window:

Terminal / Position	1 [6]	2 [5]	3 [4]	7 [14]
Washer switch ON and wiper switch OFF	○		○	
OFF				
ON		○		○
Wiper and Washer switch ON	○	○	○	○

[ ] : RHD type

Control Unit Input Test

1. Before testing, troubleshoot the multiplex control system (see page 22A-231).
2. Remove the dashboard lower cover.
3. Disconnect the under-dash fuse/relay box connectors B, F, G, J, X and Y.
   NOTE: All connectors are wire side of female terminals.



4. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals are OK, go to step 5.

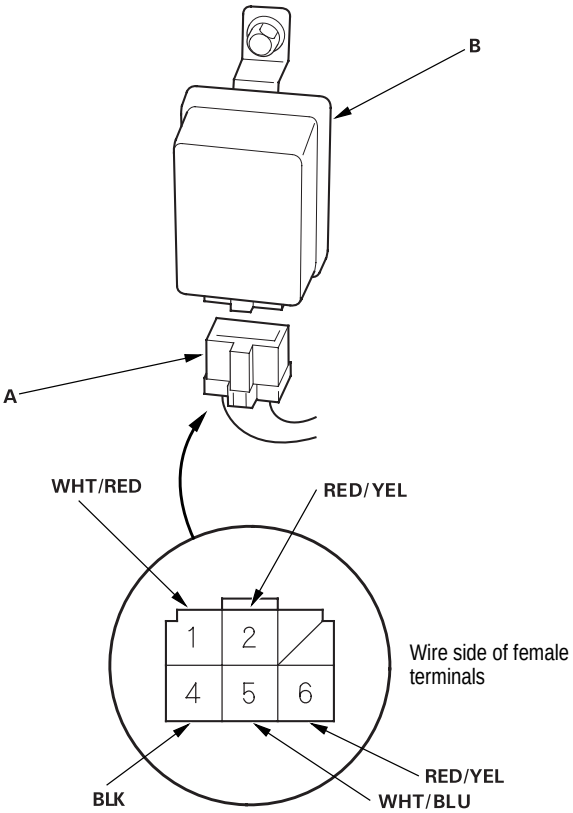
5. Reconnect the connectors, and make these input tests at the connector.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 6.
- If all the input tests prove OK, the multiplex control unit must be faulty; replace the under-dash fuse/relay box assembly.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
J4	BLK	Under all conditions	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G301) • An open in the wire
Y6	BLK	Under all conditions	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G502) • An open in the wire
B1 • F6	WHT/BLU	Ignition switch ON (II) and washer switch ON	Check for voltage to ground: There should be battery voltage. Check windshield washer motor operation: The washer motor should run.	• Poor ground (G301) • Blown No. 20 (20 A) fuse in the under-dash fuse/relay box • Faulty wiper/washer switch • Faulty windshield washer motor • An open in the wire
B6	BLU/RED	Ignition switch ON (II), wiper switch in OFF or INT, jump B6 to ground.	Check for voltage to ground: There should be battery voltage. Check wiper motor operation: The wiper motor should run at low speed.	• Blown No. 20 (20 A) fuse in the under-dash fuse/relay box • Faulty wiper/washer switch • Faulty windshield wiper motor • An open in the wire
G7	BLU/WHT	Ignition switch ON (II) and wipers in park position.	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (20 A) fuse in the under-dash fuse/relay box • Faulty windshield wiper motor • An open in the wire
X7	BLU/BLK	Ignition switch ON (II) and wiper switch in INT	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (20 A) fuse in the under-dash fuse/relay box • Faulty wiper/washer switch • An open in the wire

Headlight Washer Control Unit Input Test

1. Remove the dashboard lower cover.
2. Disconnect the 6P connector (A) from the headlight washer control unit (B).



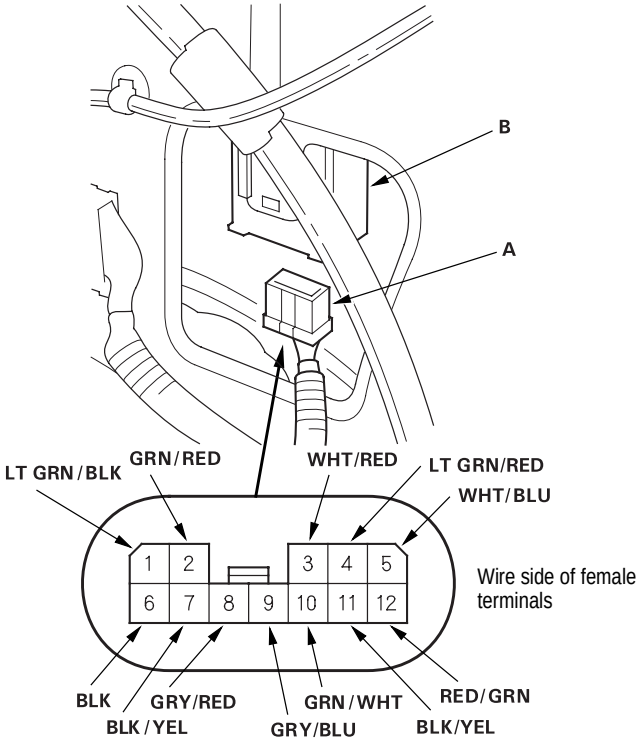
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

4. With the connector still disconnected, make these input tests at the connector.
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, replace the headlight washer control unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	RED/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 14 (40A) fuse in the under-hood fuse/relay box • Blown No. 15 (30A) fuse in the under-dash fuse/relay box • An open in the wire
5	WHT/BLU	Ignition switch ON (II) and washer switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (20A) fuse in the under-dash fuse/relay box • Faulty washer switch • An open in the wire
6	RED/YEL	Headlight switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 15 (15A) fuse in the under-hood fuse/relay box • Faulty headlight relay 2 • Faulty combination light switch • An open in the wire
4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
1	WHT/RED	Connect the No. 1 terminal to the No. 2 terminal with a jumper wire.	Check motor operation: The headlight washer motor should run.	• Faulty headlight washer motor • An open in the wire

Rear Wiper Control Unit Input Test

1. Remove the right rear side trim panel (see page 20-77).
2. Disconnect the 12P connector (A) from the control unit (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.
4. Reconnect the connector, and make these input tests at the connector.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
6	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G601, G701) • An open in the wire
5	WHT/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 3 (15 A) fuse in the under-hood fuse/relay box • An open in the wire
12	RED/GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
4	LT GRN/ RED	Ignition switch ON (II) and rear wiper switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (7.5 A) fuse in the under-dash fuse/relay box • Faulty wiper/washer switch • An open in the wire
8	GRY/RED	Rear wiper in park position	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G601, G701) • Faulty rear wiper motor • An open in the wire
		Rear wiper in stand by position		
9	GRY/BLU	Rear wiper in park position	Check for voltage to ground: There should be less than 1 V.	
		Rear wiper in stand by position	Check for no voltage to ground: There should be 5 V or more.	
10	GRN/WHT	Hatch glass open	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G601, G701) • Faulty hatch glass latch switch • An open in the wire
		Hatch glass closed	Check for voltage to ground: There should be 5 V or more.	• Short to ground • Faulty hatch glass latch switch
11	BLK/YEL	Hatch glass opener switch pushed	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • Faulty hatch glass opener switch • An open in the wire
		Hatch glass opener switch released	Check for voltage to ground: There should be 5 V or more	• Short to ground • Faulty hatch glass opener switch

5. Disconnect the connector, and make these input tests at the connector.

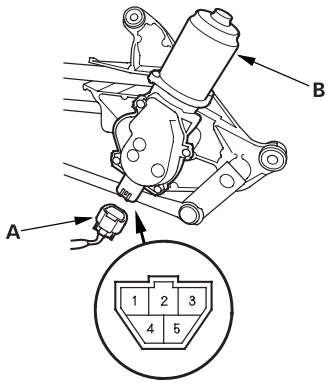
- If all the input tests prove OK, the control unit must be faulty; replace the rear wiper control unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
3	WHT/RED	Connect the No. 5 terminal to No. 3 terminal	Check rear washer motor operation: The rear washer should come on.	• Blown No. 3 (15 A) fuse in the under-dash fuse/relay box • Poor ground (G301) • Faulty rear washer motor • An open in the wire
1	LT GRN/ BLK	Connect the No. 3 terminal to No. 2 terminal, and No. 1 terminal to No. 6 terminal	Check rear wiper motor operation: The rear wiper should come on.	• Blown No. 3 (15 A) fuse in the under-dash fuse/relay box • Poor ground (G601, G701) • Faulty rear wiper motor • An open in the wire
2	GRN/RED			
7	BLK/YEL	Rear wiper park position, connect the No. 5 terminal to No. 7 terminal	Check hatch glass opener actuator operation: The hatch glass should open.	• Poor ground (G601, G701) • Faulty hatch glass opener actuator • An open in the wire

Wiper Motor Test

Windshield:

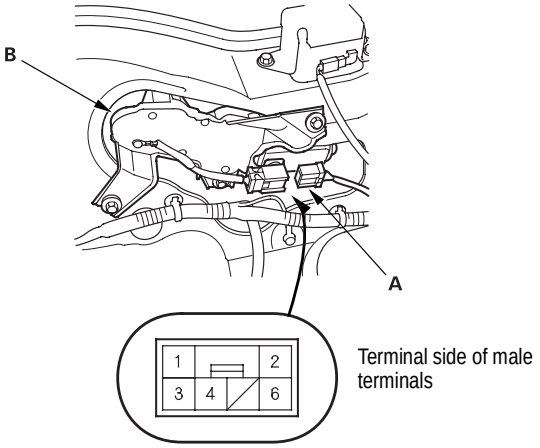
1. Remove the wiper arms, hood seals, and cowl covers (see page 22A-223).
2. Disconnect the 5P connector (A) from the wiper motor (B).



3. Test the motor by connecting battery power to the No. 5 terminal and ground the No. 1 terminal of the wiper motor 5P connector. The motor should run. If the motor does not run or fails to run smoothly, replace the motor.
4. Connect an analog voltmeter between the No. 3 (+) and No. 4 (-) terminals, and run the motor at low or high speed. The voltmeter should indicate 12 V and 4 V or less alternately.

Rear Window:

1. Open the tailgate, and remove the tailgate lower trim panel (see page 20-9).
2. Disconnect the 4P connector (A) from the wiper motor (B).



3. Test the motor by connecting battery power to the No. 2 terminal and ground the No. 1 terminal of the wiper motor. The motor should run. If the motor does not run or fails to run smoothly, replace the motor.
4. Connect an ohmmeter between No. 3 and No. 6 terminal and between No. 3 terminal and No. 4 terminal.

   There should be continuity when the wiper is in the park position.
5. Connect an ohmmeter between No. 3 terminal and No. 6 terminal.

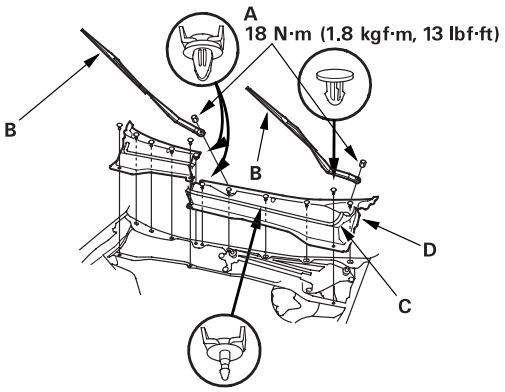
   There should be no continuity when the wiper is in the stand-by position.
6. Connect an ohmmeter between No.3 terminal and No. 4 terminal.

   There should be continuity when the wiper is in the stand-by position.

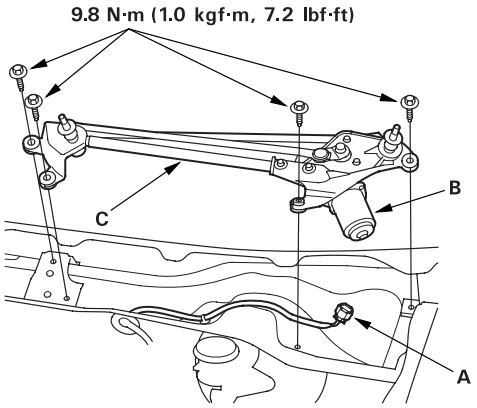
Wiper Motor Replacement

Windshield Wiper Motor:

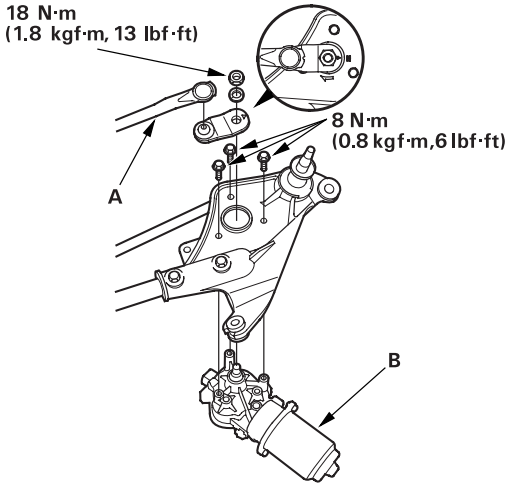
1. Open the hood. Remove the nuts (A) and the windshield wiper arms (B).



2. Remove the hood seals (C) and cowl covers (D).
3. Disconnect the 5P connector (A) from the wiper motor (B).



4. Remove the four bolts and wiper linkage assembly (C).
5. Remove the three mounting bolts and nut from the wiper linkage (A) to remove the wiper motor (B).

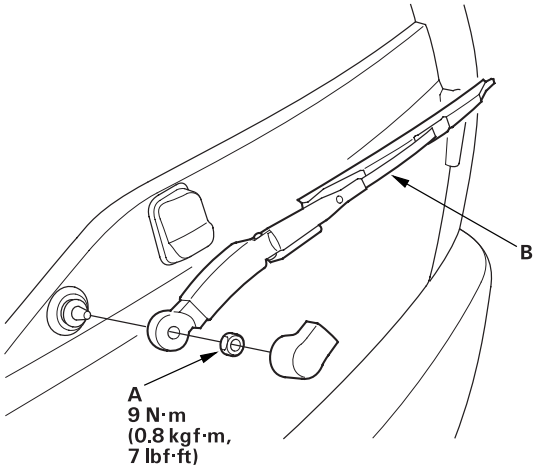


6. Install in the reverse order of removal, and note these items:
   - Grease the moving parts.
   - Before reinstalling the wiper arms, turn the wiper switch ON, then OFF to return the wiper shafts to the park position.
   - If necessary, replace any damaged clips.
   - Check the wiper motor operation.

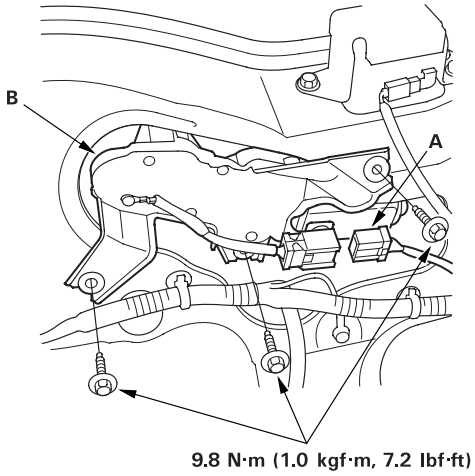
Wiper Motor Replacement (cont'd)

Rear Window Wiper Motor:

1. Remove the mounting nut (A) and the wiper arm (B).



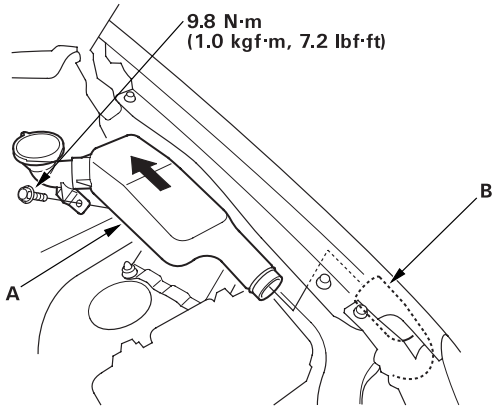
2. Disconnect the 6P connector (A) from the wiper motor (B).



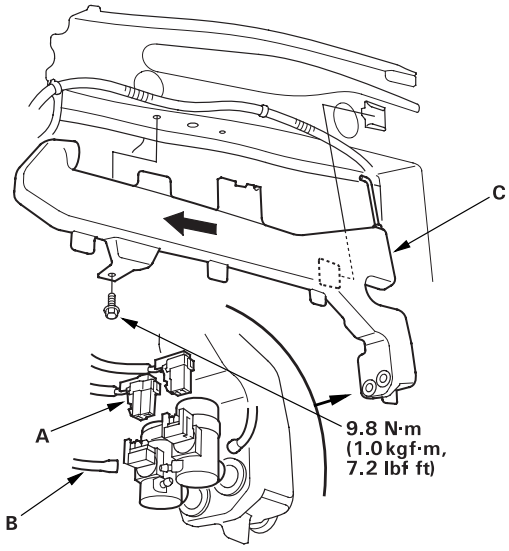
3. Remove the three bolts and the wiper motor.
4. Install in the reverse order of removal. Check the wiper motor operation.

Washer Reservoir Replacement

1. Open the hood.
2. Remove the bolt, then separate and remove the filler neck (A) from the washer reservoir (B).



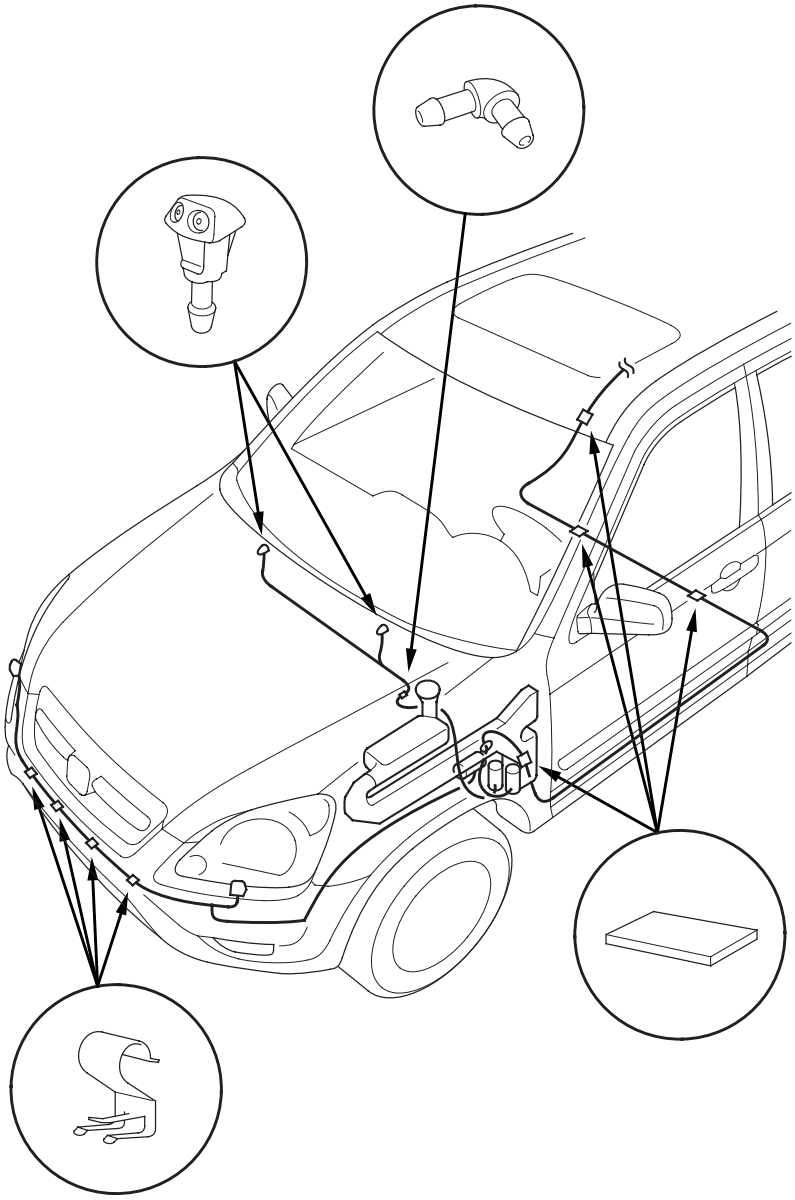
3. Remove the left inner fender (see page 20-155).
4. Disconnect the 2P connectors (A) and washer tubes (B).



5. Remove the bolt and washer reservoir (C).
6. Install the reservoir in the reverse order of removal. Check the the washer motor operation.

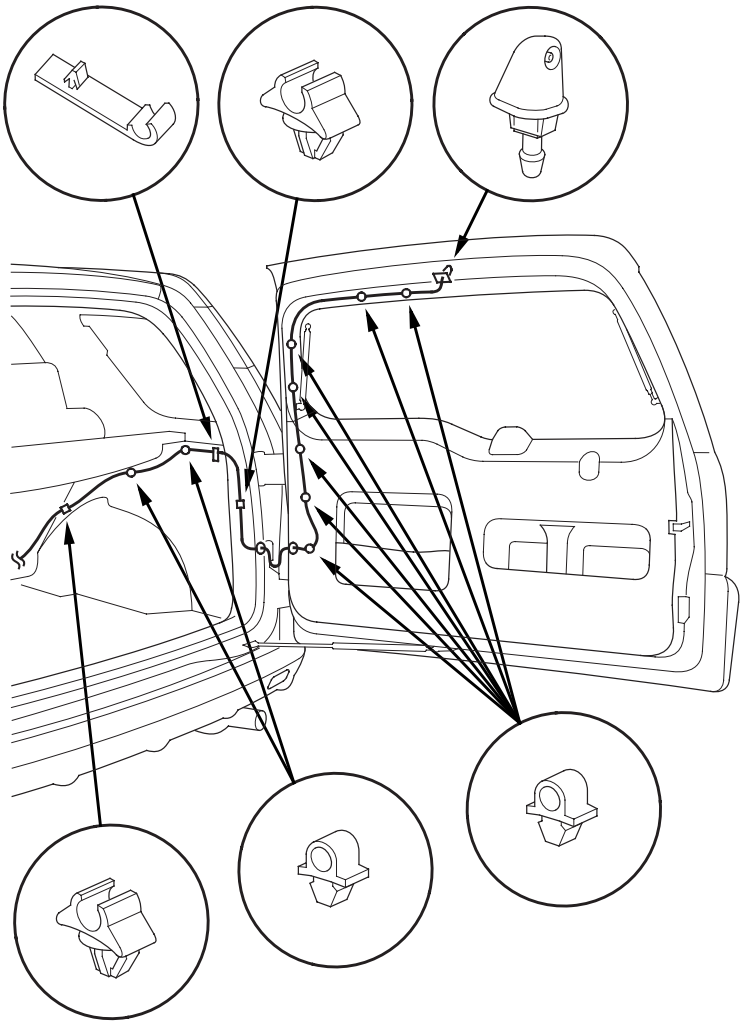
Washer Tubes Replacement

1. Remove the left inner fender (see page 20-155).
2. Remove the windshield washer nozzles and clips, then remove the tubes.



(cont'd)

Washer Tubes Replacement (cont'd)

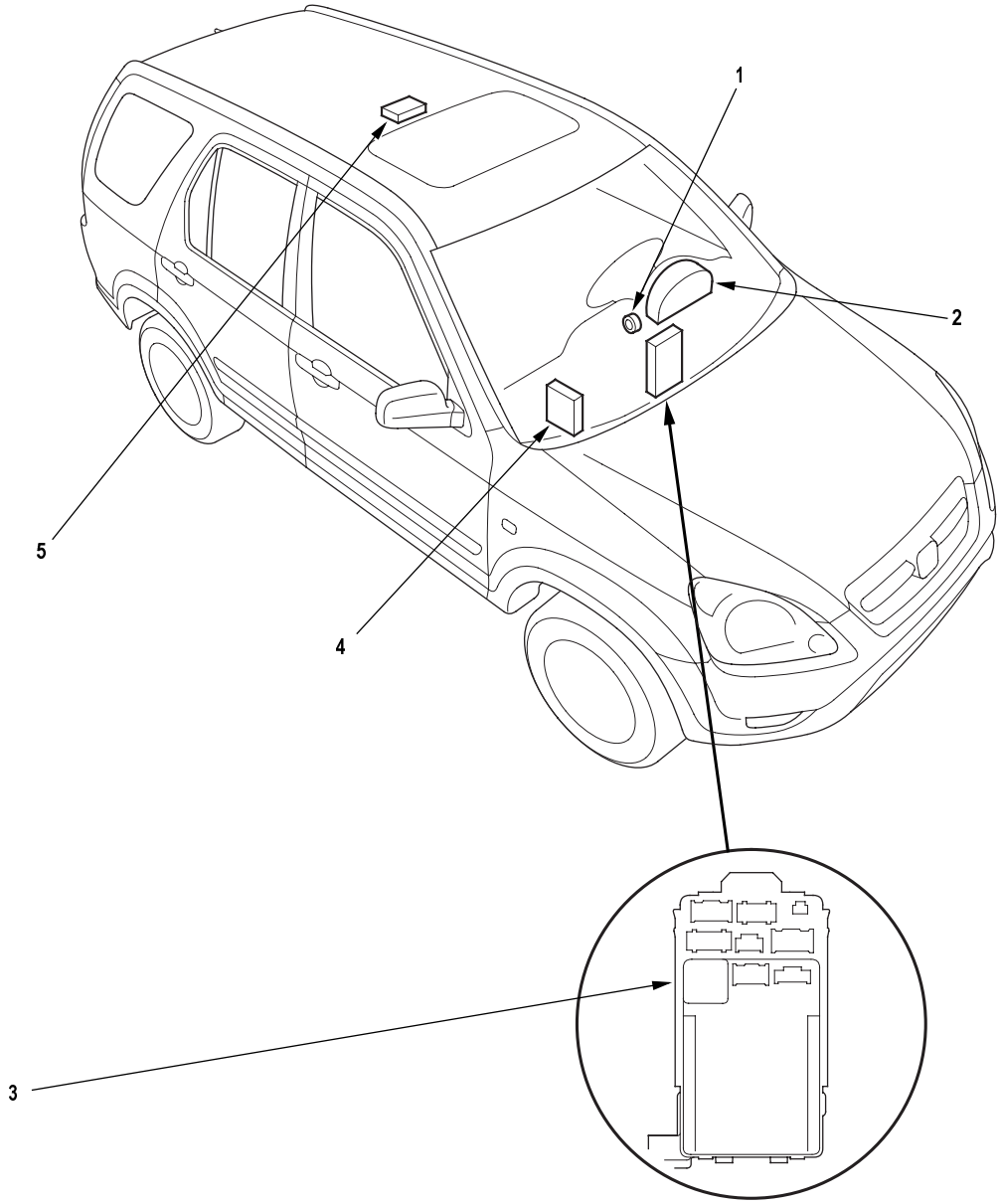


3. Install in the reverse order of removal. Take care not to pinch the washer tubes. Check the windshield washer operation.

Multiplex Control System

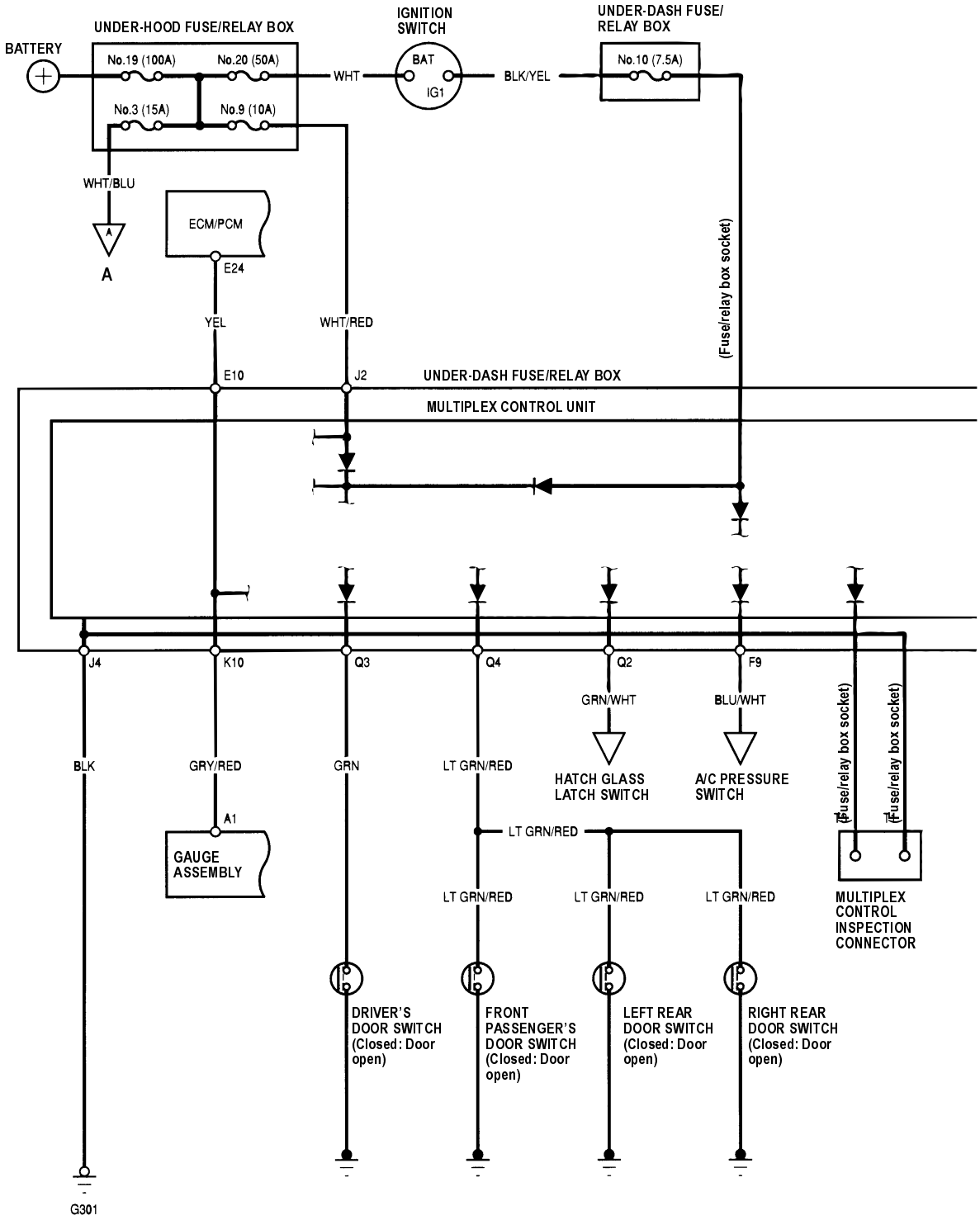
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



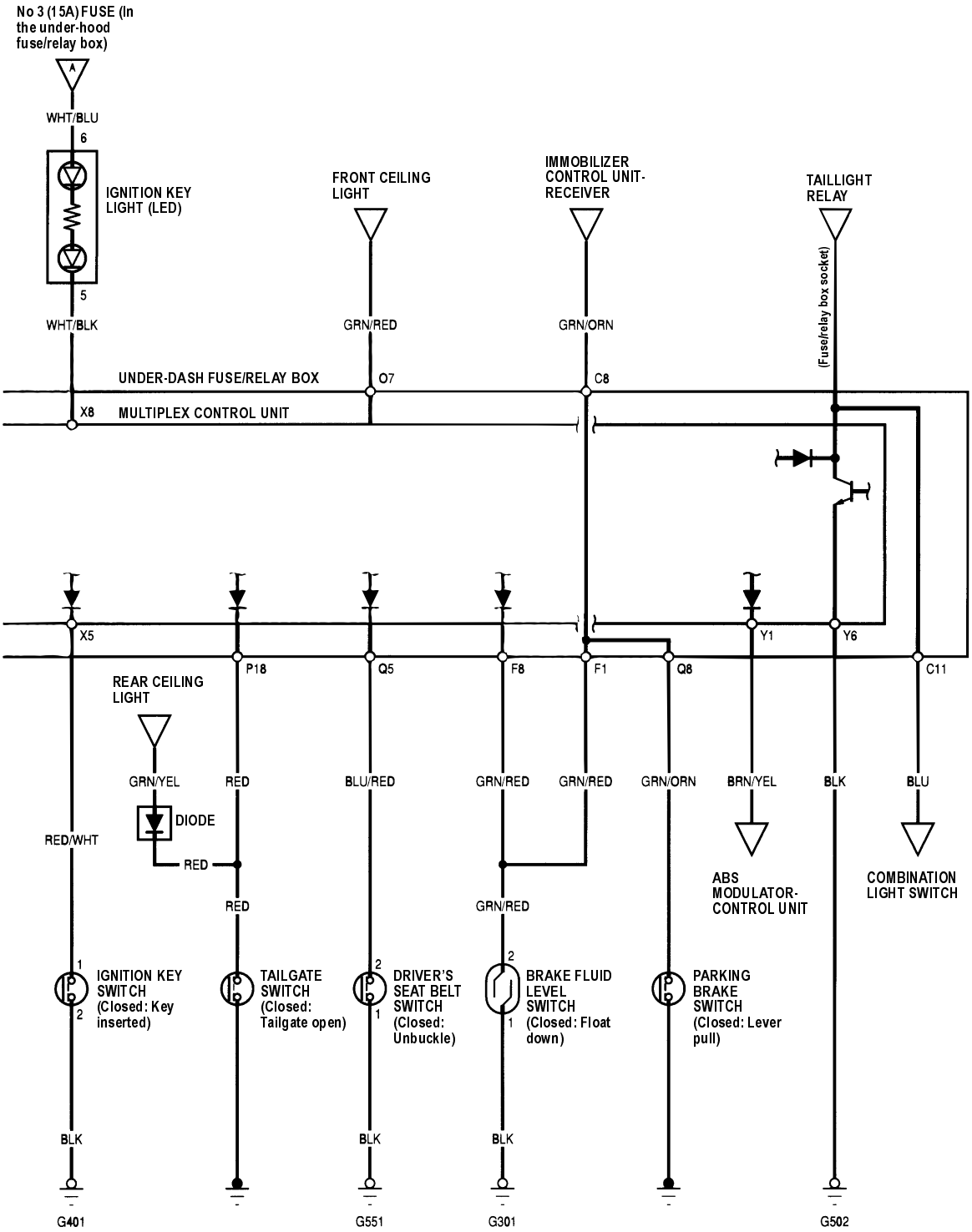
1	IGNITION KEY LIGHT	Test, page 22A-113
2	GAUGE ASSEMBLY	
3	MULTIPLEX CONTROL UNIT (Built into the under-dash fuse/relay box)	Troubleshooting, page 22A-231; Input Test, page 22A-235
4	ECM/PCM	
5	FRONT CEILING LIGHT	Test, page 22A-109

Circuit Diagram



A IGNITION KEY LIGHT To page 22A-229

Circuit Diagram (cont'd)



System Description

The multiplex Control System has four internal functions:
- Multiplexing (send multiple signals over shared wires)
- Wake up/sleep (runs at full power only on demand to reduce battery draw)
- Fail-safe (fixes or ignores faulty signals)
- Self-diagnosis (Mode 1 for system DTCs, Mode 2 for input lines)

The system controls the function of these circuits:
- Entry light control (ignition key light and ceiling light)
- Wiper/washer (intermittent wipe and park functions)
- Interlock system
- Keyless/power Door Lock
- Meter assembly, temperature gauge, and indicator lights
- HVAC (Compressor and fan control)
- Key-in reminder
- Lights-on reminder
- Seat belt reminder
- Daytime running lights
- Rear fog light

Multiplex Communication

To reduce the number of wire harnesses, digital signals are sent via shared multiplex communication lines rather than sending normal electrical signals through individual wires.
- The input signals from each switch are converted to digital signals at the central processing unit (CPU).
- The digital signals are sent from the transmitting unit to the receiving unit as serial signals.
- The transmitted signal is converted to a switch signal at the receiving unit, and it operates the related component or monitors a switch.
- There are exclusive communication lines between the ECM/PCM, the gauge assembly, and the under-dash fuse/relay box.

Wake-up and Sleep

The multiplex control system has ”wake-up’’ and ”sleep’’ functions to decrease parasitic draw on the battery when the ignition switch is OFF.
- In the sleep mode, the multiplex control unit stops functioning (communication and CPU control) when it is not necessary for the system to operate.
- As soon as any operation is requested (for example, a door is unlocked), the related control unit in the sleep mode immediately wakes up and begins to function.
- When the ignition switch is turned OFF, and the driver’s or front passenger’s door is opened, then closed, there is about a 40 second delay before the control unit goes from the wake-up mode to the sleep mode.
- If any door is open, the sleep mode will not function.
- If a key is in the ignition switch, the sleep mode will not function.
- When in sleep mode, the draw is reduced from 70-80 mA to less than 10 mA.

Fail-safe

To prevent improper operation, the multiplex control system has a fail-safe function. In the fail-safe mode, the output signal is fixed when any part of the system malfunctions (for example a faulty control unit or communication line).
Each control unit has a hardware fail-safe function that fixes the output signal when there is any CPU malfunction, and a software fail-safe function that ignores the signal from the malfunctioning control unit and allows the system to operate normally.

Troubleshooting

Special Tool Required:
MPCS Service Connector 07WAZ-0010100

1. Check the No. 9 (10 A) fuse in the under-hood fuse/relay box and the No. 10 (7.5 A) fuse in the under-dash fuse/relay box.

   Are the fuses OK?

   Yes Go to step 2.

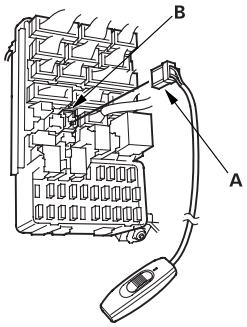
   No Find and repair the cause of the blown fuse.■

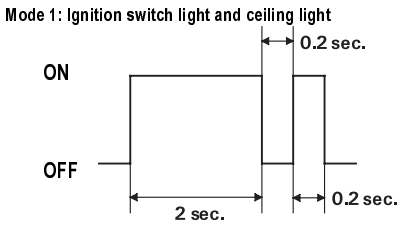
2. Remove the driver's dashboard lower cover (see page 20-88).

3. Switch the ceiling light to the middle position. Close all doors. Turn the ignition switch ON (II).

   If the driver's seatbelt is unbuckled, the beeper will beep five times.

4. Check self-diagnosis function Mode 1 for a diagnostic trouble code (DTC) by connecting the special tool (A) to the multiplex control inspection connector (B). After about 5 seconds, the ignition switch light and ceiling light should come on for 2 seconds, go out, then blink once for 0.2 second. This means that you are in Mode 1 of the self-diagnosis function.





   Did the blinking lights confirm that you are in model?

   Yes Count the blinks, then go to step 5.

   No See if the SCS circuit is working properly. Go to step 6.

5. If there is a DTC, it will blink, pause, then repeat the DTC as long as the ignition switch is ON (II).

   Is there continuity?

   Yes Count the blinks, then go to step 8.

   No Go to step 9.

6. Check for continuity between the inspection connector T1 and body ground.

   Is there continuity?

   Yes Go to step 9.

   No Go to step 7.

7. Check for continuity between the connector J of under-dash fuse/relay box No. 4 terminal and body ground.

   Is there continuity?

   Yes Faulty under-dash fuse/relay box. Replace and check for DTCs.

   No Repair the open in the wire, and recheck for DTCs.■

(cont'd)

Troubleshooting (cont'd)

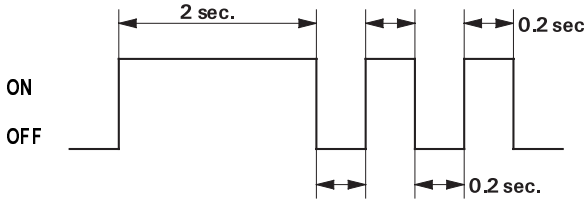
8. About 1 second after you go into self-diagnosis mode 1, the ceiling light will indicate the DTC, and repeat it every 3 seconds. If there is more than one DTC, the system will indicate them in ascending order, beginning from the DTC with the lowest numerical value. Troubleshoot the DTCs as indicated below:

- DTC 1, 2, and 3 (ECM/PCM P0600) simultaneously: Check for a short to body ground in the YEL wire between multiplex control unit terminal E10 and ECM/PCM terminal E24, and in the GRY/RED wire between multiplex control unit terminal K10 and gauge assembly terminal A1. If both wires are OK, substitute a known-good multiplex control unit, gauge assembly, and ECM/PCM one at a time, in that order, and recheck for the DTCs after each substitution.
- DTC 2 and 5 simultaneously: Check for an open in the YEL wire between multiplex control unit terminal E10 and ECM/PCM terminal E24, If the wire is OK, substitute a known-good multiplex control unit, gauge assembly, and ECM/PCM one at a time, in that order, and recheck for the DTCs after each substitution.
- DTC 1, and 6 simultaneously: Check for an open in the GRY/RED wire between multiplex control unit terminal K10 and gauge assembly terminal A1, If the wire is OK, substitute a known-good multiplex control unit, gauge assembly, and ECM/PCM one at a time, in that order, and recheck for the DTCs after each substitution.
- DTC 1 only (no other DTCs present): Substitute a known-good multiplex control unit, and a gauge assembly one at a time, in that order, and recheck for the DTCs after each substitution.
- DTC 2 only (no other DTCs present): Substitute a known-good multiplex control unit and a ECM/PCM one at a time, in that order, and recheck for the DTCs after each substitution.
- DTC 3 only (no other DTCs present): Substitute a known-good multiplex control unit, and recheck for the DTC.
- DTC 5 only (no other DTCs present): Substitute a known-good gauge assembly, and recheck for the DTC.
- DTC 6 only (no other DTCs present): Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM, then recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

DTC	Cause
1	The multiplex control unit cannot receive signals from the gauge assembly.
2	The multiplex control unit cannot receive signals from the ECM/PCM.
3	The multiplex control unit cannot receive signals from itself.
5	The gauge assembly cannot receive signals from multiplex control unit and the ECM/PCM.
6	The ECM/PCM cannot receive signals from multiplex control unit and the gauge assembly.

9. From Mode 1, disconnect the special tool from the multiplex control inspection connector for about 5 to 10 seconds, then reconnect it. The ceiling light should come on for 2 seconds, then blink twice more at 0.2 second intervals. This means the system has gone from Mode 1 to Mode 2.

MODE 2: Ceiling Light Blinking Pattern



NOTE: To cancel Mode 2, disconnect the SCS service connector from the multiplex control inspection connector for more than 10 seconds or turn the ignition switch OFF.

10. Look in the following table for the switches most closely related to the problem. While still in Mode 2, operate the switches and the control unit. If the circuit is OK, the spotlight and ceiling light should blink once. If the circuit is faulty, there will be no indication.

Does the ceiling light blink?

Yes Go to step 12.

No Go to step 11.

In each table below is a list of circuits that can be checked in Mode 2.

Taillight relay
Windshield washer switch (ON)
Windshield wiper motor (INT, Auto stop)
Driver's door switch (door opened)
Front passenger's door switch (door opened)
Left rear door switch (door opened)
Right rear door switch (door opened)
Ignition key switch (key in switch)
Tailgate switch (talgate opened)
Parking brake switch (ON)
Driver's door lock knob switch (LOCK/UNLOCK)
Passenger's door lock knob switch (UNLOCK)(KE model)
Left rear door lock knob switch (UNLOCK)(KE model)
Right rear door lock knob switch (UNLOCK)(KE model)
Driver's door key cylinder switch (LOCK/UNLOCK)
Driver's door lock switch (LOCK/UNLOCK)
Front passenger's door key cylinder switch (LOCK/UNLOCK)
Driver's seat belt switch (UNLATCH)
A/C switch (with fan switch ON)
Combination light switch
ECM/PCM communication line
Gauge assembly communication line
ABS communication
Front fog light switch (KE model)
Hatch glass (open)

11. Check two or three other circuits listed above.

Does the spotlight and ceiling light blink for each circuit?

Yes The additional circuits are OK. Repair the short or open in the circuit that failed the test in step 10.■

No Multiplex failed circuits can mean that the control unit has failed, but without triggering a DTC. Test a few more circuits. If they also fail, test the multiplex control unit inputs (see page 22A-235). If all the input test are OK, substitute a known-good control unit, gauge assembly, or ECM/PCM, one at a time, then recheck. If the system works properly, the original control unit is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely faulty control unit, then recheck. If the system works properly, that control unit is faulty; replace it.■

(cont'd)

Troubleshooting (cont'd)

12. Shift to the sleep mode:
Turn the ignition switch OFF, and remove the key. If the control unit receivers no inputs from the inputs listed below, it will go into the sleep mode after about 20 seconds.

Multiplex Control Unit
Taillight relay (combination switch OFF)
Driver's door switch (door closed)
Front passenger's door switch (door closed)
Left rear door switch (door closed)
Right rear door switch (door closed)
Tailgate switch (tailgate closed)
Driver's door key cylinder switch (LOCK/UNLOCK)
Hatch glass (glass closed)

13. Comfirm the sleep mode:
Check for voltage on the YEL and WHT/GRN wires. There should be battery voltage in the sleep mode. Check the parasitic draw at the battery while shifting into the sleep mode. Amperage should change from about 70 through 80 mA to less than 10 mA.

14. Shift to the wake up mode:

When the ignition switch is turned ON (II), the multiplex control unit, gauge assembly, and ECM/PCM wake up at the same time without "talking" to each other through the communication lines. When any switch in the multiplex system is turned on, it wakes up its related control unit which, in turn, wakes up the other units.

After confirming the sleep mode, look in the following table for the switch most closely related to the problem. Operate that switch and see if its control unit wakes up.

NOTE: If any control unit is faulty and will not wake up, several parts of the system will malfunction at the same time.
In the table below, the control unit is followed by a list of the switches and input signals that can wake it up.

Multiplex Control Unit No. 9 (10 A) under-hood fuse
Communication lines (ECM/PCM, Gauge assembly)
Taillight relay (combination switch ON)
Driver's door switch (door open)
Front passenger's door switch (door open)
Left rear door switch (door open)
Right rear door switch (door open)
Driver's door key cylinder switch (LOCK/UNLOCK)
Driver's door lock knob switch (LOCK/UNLOCK)
Driver's door lock switch (LOCK/UNLOCK)
Front passenger's door key cylinder switch (UNLOCK)
Ignition key switch (key in switch)
Tailgate switch (tailgate open)

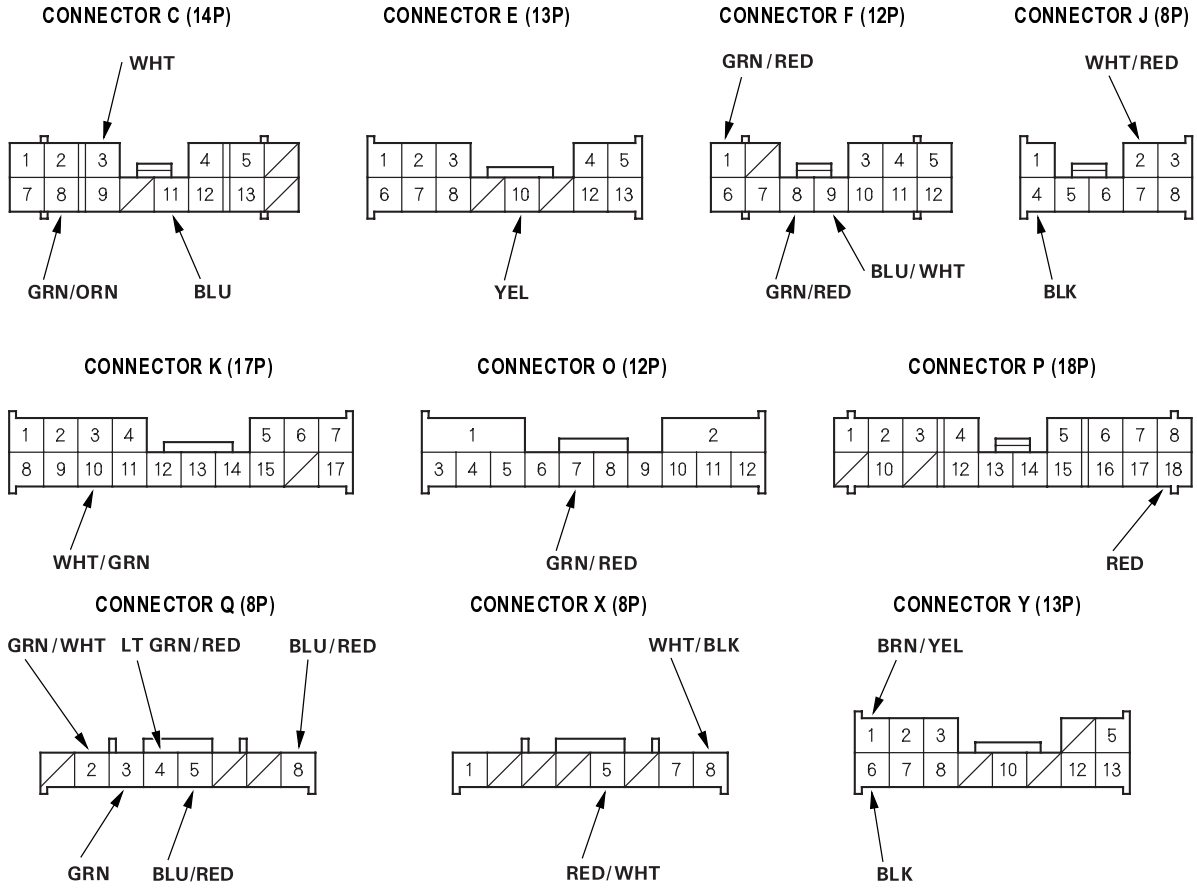
Is the wake-up function OK?

Yes Intermittent failure; the system is OK at this time.

No Test the multiplex control unit inputs (see page 22A-235).

Multiplex Control Unit Input Test

1. Remove the dashboard under cover (see page 20-95).
2. Disconnect the under-dash fuse/relay box connectors C, E, F, J, K, O, P, Q, X and Y.
   NOTE: All connectors are wire side of female terminals.



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

(cont'd)

Multiplex Control Unit Input Test (cont'd)

4. Reconnect the connectors to the under-dash fuse/relay box, and make sure these input tests at the appropriate connectors on the under-dash fuse/relay box.

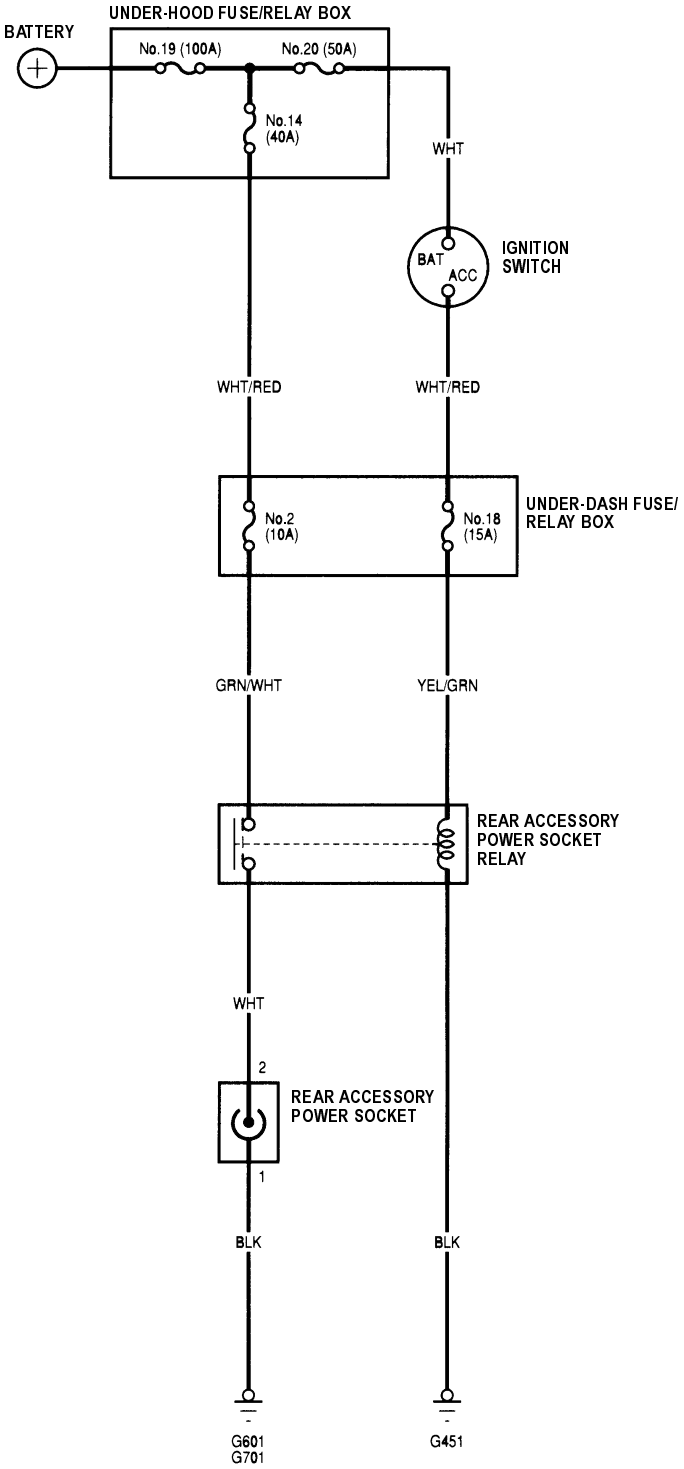
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the multiplex control unit must be faulty, replace the under-dash fuse/relay box assembly.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
J4	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G301) • An open in the wire
Y6	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G502) • An open in the wire
J2	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10A) fuse in the under-hood fuse/relay box • An open in the wire
Q3	GRN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground
Q4	LT GRN/ RED	Passenger's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty passenger's door switch • An open in the wire
		Passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty passenger's door switch • Short to ground
Q8 • C8 • F1	GRN/ORN • GRN/RED	Parking brake lever pulled	Check for voltage to ground: There should be 1 V or less.	• Faulty parking brake switch • An open in the wire
		Parking brake lever released	Check for voltage to ground: There should be 5 V or more.	• Faulty parking brake switch • Short to ground
Q5	BLU/RED	Ignition switch ON (II) Driver's seat belt is unbuckled.	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's seat belt switch • Poor ground (G551) • An open in the wire
		Ignition switch ON (II) Driver's seat belt is buckled.	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's seat belt switch • Short to ground
P18	RED	Tailgate open	Check for voltage to ground: There should be 1 V or less.	• Faulty tailgate switch • An open in the wire
		Tailgate closed	Check for voltage to ground: There should be 5 V or more.	• Faulty tailgate switch • Short to ground
X5	RED/WHT	Ignition key is in the ignition switch	Check for voltage to ground: There should be 1 V or less.	• Faulty ignition key switch • Poor ground (G401) • An open in the wire
		Ignition key is out of the ignition switch	Check for voltage to ground: There should be 5 V or more.	• Faulty ignition key switch • Short to ground
F9	BLU/WHT	Under all conditions	Check for voltage to ground: There should be 5 V or more.	• An open or short in the wire
C3	WHT	Under all conditions	Check for continuity to ground: There should be continuity.	• An open or short in the wire

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
X8	WHT/BLK	Under all conditions	Attach to ground: The ignition key light should come on.	• Blown No. 3 (15A) fuse in the under-hood fuse/relay box • Blown LED • An open in the wire
O7	GRN/RED	Ceiling light switch in the middle position, all doors closed	Attach to ground: The ceiling light, spotlights should come on.	• Blown No. 3 (15A) fuse in the under-hood fuse/relay box • Faulty ceiling light or spotlights • An open in the wire
C11	BLU	Under all conditions	Attach to ground: Dash lights should come on.	• Blown No. 2 (15A) fuse in the under-hood fuse/relay box • Faulty taillight relay • An open in the wire
F8	GRN/RED	Disconnect the brake fluid level switch 2P connector, and jump the GRN/RED and BLK	Check for voltage to ground: There should be less than 1 V.	• Faulty brake fluid level switch • An open in the wire
		Brake fluid level switch connector disconnected, jumper wire removed	Check for voltage to ground: There should be 5 V or more.	• Faulty brake fluid level switch • Short to ground
E10	YEL	All doors, tailgate and hatch glass closed, ignition key removed	Check for voltage to ground: There should be battery voltage in the sleep mode and 3-7 volts when awake.	• An open or short in the wire
K10	GRY/RED	All doors, tailgate and hatch glass closed, ignition key removed	Check for voltage to ground: There should be battery voltage in the sleep mode and 3-7 volts when awake.	• An open or short in the wire
Y1	BRN/YEL	Under all conditions	Check for continuity between the Y1 terminal and the No. 13 terminal of the ABS modulator-control unit. There should be continuity.	• An open in the wire
Q2	GRN/WHT	Hatch glass open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G601, G701) • Faulty hatch glass latch switch • An open in the wire
		Hatch glass closed	Check for voltage to ground: There should be 5 V or more.	• Faulty hatch glass latch switch • Short to ground

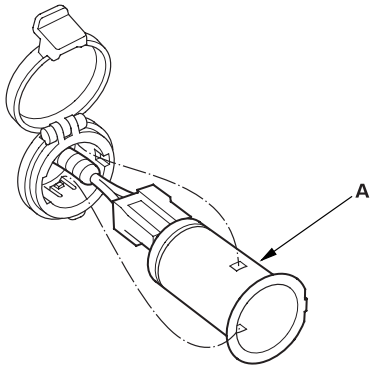
Accessory Power Socket

Circuit Diagram

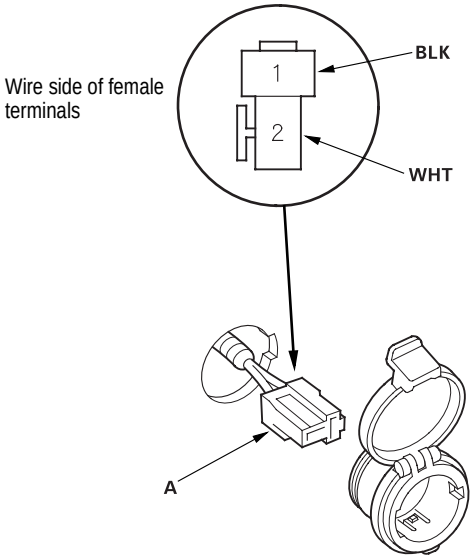


Test/Replacement

1. Carefully pry the accessory power socket (A) out from the left rear side trim panel.



2. Disconnect the 2P connector (A) from the socket.



3. Inspect the connector terminals to be sure they are all making good contact.
- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, go to step 4.

4. Turn the ignition switch to ACC (I), and check for voltage between the No. 1 and No. 2 terminals.
- There should be battery voltage.
- If there is no battery voltage, check for:
  – poor ground (G451, G601, G701).
  – an open in the wire.
  – blown No. 18 (15A) fuse in the under-dash fuse/relay box.
  – blown No. 2 (10 A) fuse in the under-dash fuse/relay box.
  – faulty rear accessory power socket relay.

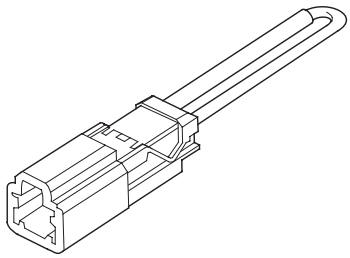
22B

Navigation System

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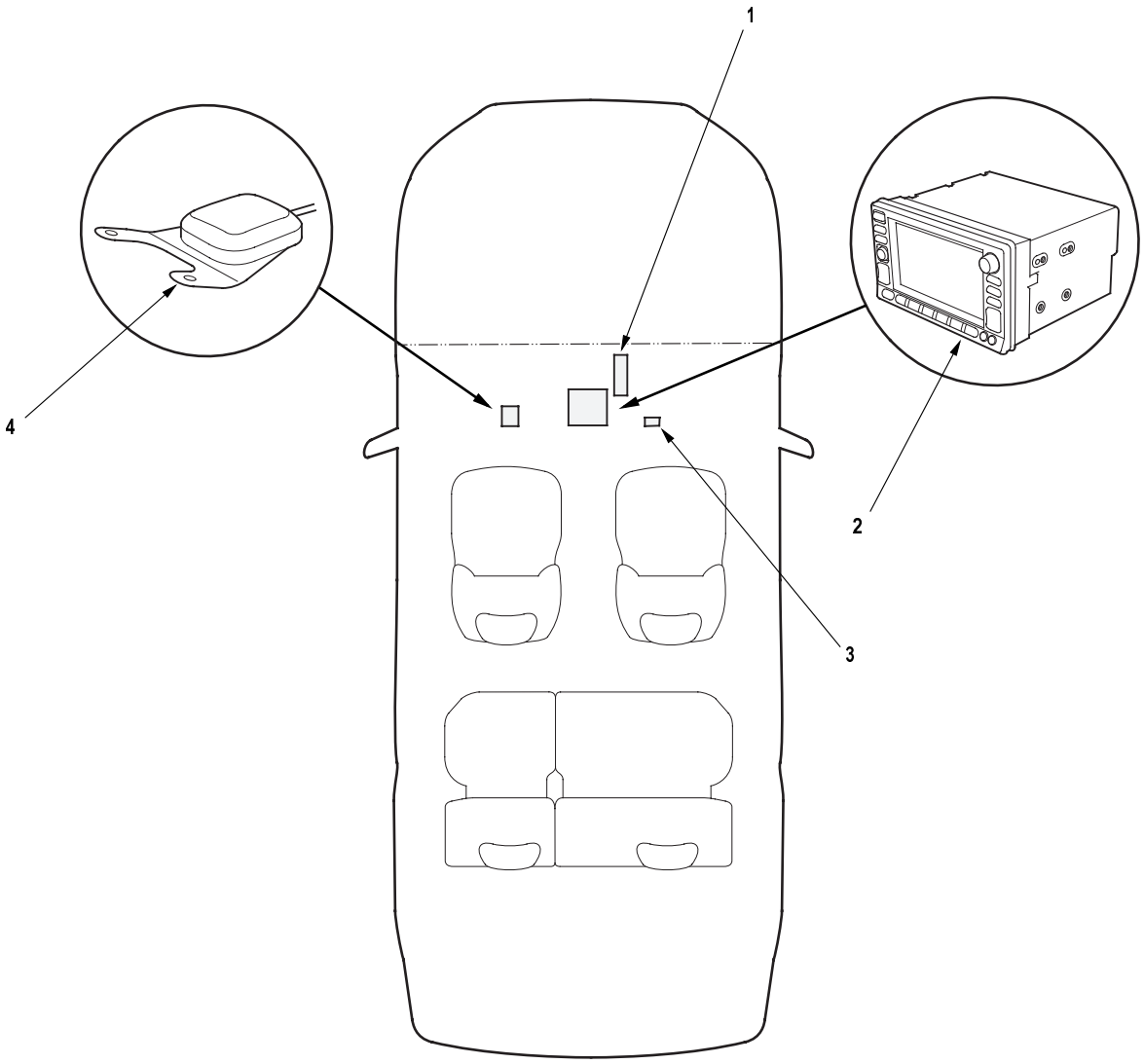
Special Tools

Ref. No.	Tool Number	Description	Qty
1	07PAZ-0010100	SCS Short Connector	1



1

Component Location Index



1	PCM (For Vehicle Speed Pulse (VSP))	
2	AVN UNIT	Removal/Installation, page 22B-26
3	NAVIGATION SERVICE CHECK CONNECTOR	Forced starting of display, page 22B-25
4	GPS ANTENNA	Removal/Installation, page 22B-26

General Troubleshooting Information

General Operation

Refer to the Honda Navigation System Owner's manual for the navigation system operating procedures.

Anti-theft Feature

The navigation system has a coded theft protection circuit. Be sure to get the customer's five-digit security code number before;

- disconnecting the battery
- disconnecting navigation unit connector A (12P)
- removing the No. 9 (10A) fuse from the under-hood fuse/relay box

After service, reconnect power to the navigation unit, and turn the ignition switch ON (II). Enter the five-digit security code.

When replacing the navigation unit, be sure to give the customer the new anti-theft security code.

Symptom Diagnosis

Certain circumstances and system limitations will result in occasional vehicle positioning errors. Some customers may think this indicates a problem with the navigation system when, in fact, the system is normal. Keep the following items in mind when interviewing customers about navigation system symptoms.

Self-Inertial Navigation Limitations

The limitations of the self-inertial portion of the navigation system (the yaw rate sensor and the vehicle speed signal) can cause some discripancies between the vehicle's actual position and the indicated vehicle position (GPS vehicle position). However, if GPS signals cannot be received, you must tune the vehicle position manually.

The following circumstances may cause vehicle positioning errors:

- Moving the vehicle with the engine stopped, such as by ferry or tow truck, or if the vehicle is spun on a turn table
- Tire slippage, changes in tire rolling diameters, and some driving situations may cause discrepancies in travel distances. Examples of this include:
  - Continuous tire slippage on a slippery surface
  - Driving with snow chains mounted
  - Abnormal tire pressure
  - Incorrect tire size
  - Frequent lane changes across a wide highway
  - Continuous driving on a straight or gently curving highway
- Tolerances in the system and map inaccuracies sometimes limit how precisely the vehicle position is indicated. Examples of this include:
  - Driving on roads not shown on the map (map matching is not possible)
  - Driving on a road that winds in one derection, such as a loop bridge, an interchange, or a spiral parking garage
  - Driving on a road with a series of sharp hair-pin turns
  - Driving on one of two close parallel roads
  - After making many 90 degree turns

Global Positioning System (GPS) Limitations

The GPS cannot detect the vehicle's position during the following instances:

- For the first 5 to 10 minutes after reconnecting the battery
- When the satellite signals are blocked by tall building, mountains, tunnels, large trees, or large trucks
- When the GPS antenna is blocked by something on the dashboard
- When there is no satellite signal output (Signal output is sometimes stopped for satellite servicing)
- When the satellite signals are blocked by the operation of some electronic after market accessories.

The accuracy of GPS is reduced during these instances:

- When only two satellite signals can be received (Three satellite signals are required for accurate positioning)
- When the satellite control centers are experiencing problems

LCD Display Unit Limitations

- In cold temperatures, the display may stay dark for the first 2 or 3 minutes until it warms up.
- When the display is too hot because of direct summer sunlight, it will remain dark until the temperature drops.
- When the humidity is high and the interior temperature is low, the display may appear cloudy. The display will clear up after some use.

Symptom Duplication

- When the symptom can be duplicated, follow the self-diagnostic procedures (picture diagnosis mode) and the appropriate troubleshooting procedures.
- When the symptom does not reappear or only reappears intermittently, ask the customer about the conditions when the symptom occured.
  - Try to establish if outside interference may have been the cause.
  - Try to duplicate the symptom under the same conditions the customer was experiencing.
  - Vibration, temperature extremes, and moisture (dew, humidity) are factors that are difficult to duplicate.

Service Precautions

- Before disconnecting the battery, make sure you have the anti-theft codes for the radio and the navigation system, and write down the frequencies for the radio's preset buttons.
- After servicing, park the vehicle in an area where the GPS satellite signals will be unobstructed, and check the satellite mark on the display.
- When the battery is disconnected, the clock is reset to "0:00''. The clock will reset to the correct time after the system receives the GPS satellite signals.
- After reconnecting the battery, you have to wait to get the initial signal from the satellite. It will take about ten minutes.

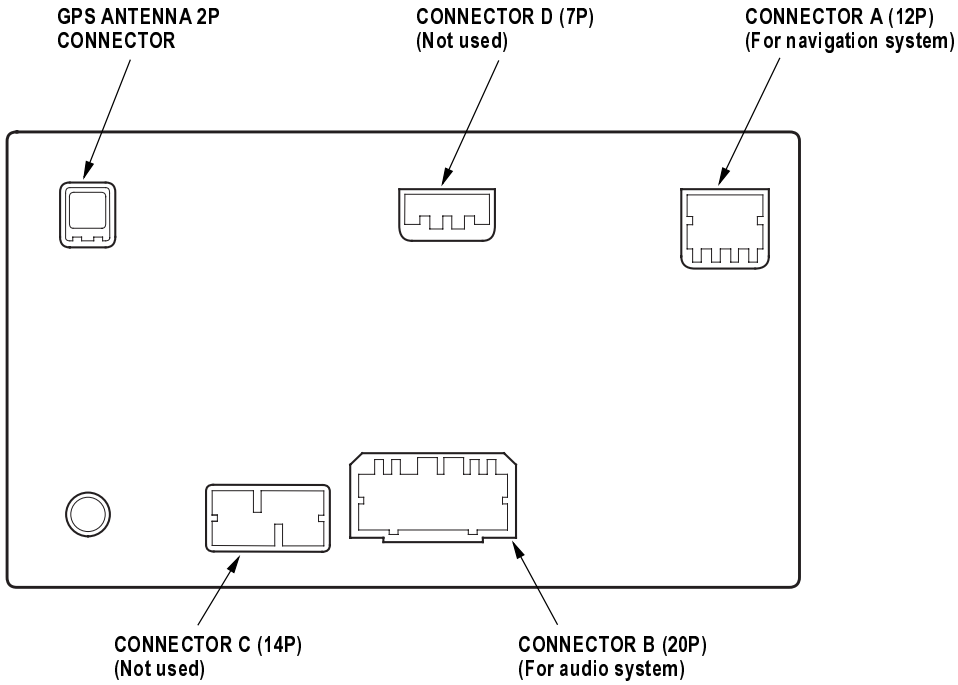
Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
No picture is shown on the display	Troubleshooting (see page 22B-16)	
The picture is missing a color or tone	Troubleshooting (see page 22B-17)	
AVN unit buttons do not work	Replace the AVN unit.	
Satellite mark in the GPS mark is not indicated	Troubleshooting (see page 22B-18)	Electronic after market accessories
Audio driving instructions cannot be heard	Troubleshooting (see page 22B-18)	Vehicle position does not move on the map
Vehicle position does not move on the map	Troubleshooting (see page 22B-19)	

System Description

Connector Locations

AVN unit

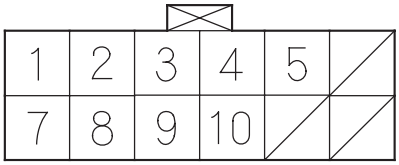


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System Description (cont'd)

AVN Unit Inputs and Outputs for Connector A (12P)

AVN UNIT CONNECTOR A (12P)

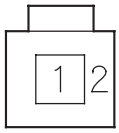


Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
1	WHT/RED	+B	+B power source	Continuous power source
2	YEL/RED	ACC	Accessory	Power source for accessory
3	WHT/BLU	CHG	Charge	Engine ON signal
4	BLK	GND	Ground	Ground for AVN unit
5	RED/BLK	ILL (+)	Illumination positive	Power source for illumination
7	GRN/BLK	BACK LT	Back light	Reverse signal of select lever
8	BLU/WHT	VSP	Vehicle speed pulse	Vehicle speed pulse signal
9	GRN/RED	DIAG (+)	Diagnosis positive	Signal for forced starting of display
10	GRN/YEL	DIAG (-)	Diagnosis negative	Signal for forced starting of display

AVN Inputs and Outputs for GPS antenna 2P Connector

GPS ANTENNA 2P CONNECTOR



Wire side of female terminals

Terminal number	Wire color	Terminal	Terminal name	Description
1	——	GPS	GPS	GPS signal
2	——	GPS GND	GPS ground	Ground for GPS antenna

(cont'd)

System Description (cont'd)

Overview

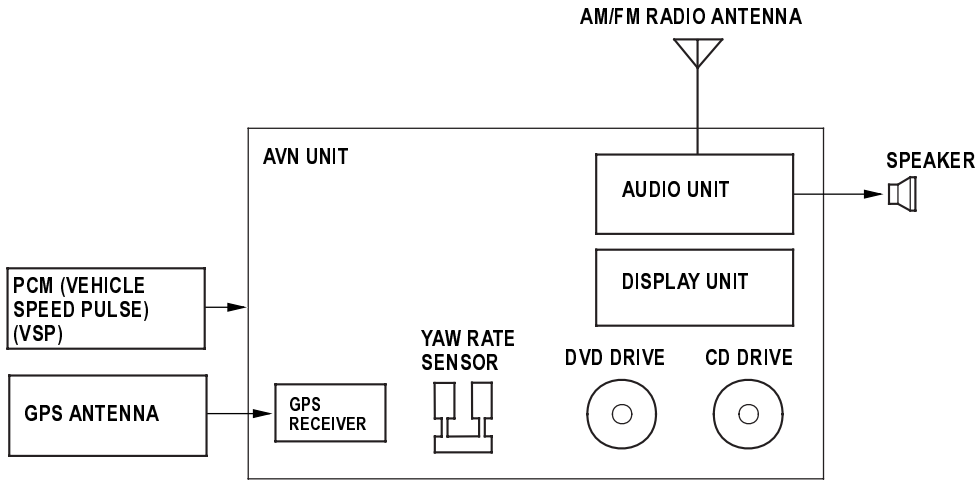
The Honda Navigation System is a highly-sophisticated, hybrid locating system that uses satellites and a map database to show you where you are and to help guide you to a desired destination.

The Navigation System receives signals from the Global Positioning System (GPS), a network of 24 satellites in orbit around the earth. By receiving signals from serveral of these satellites, the Navigation System can determine the latitude and longitude of the vehicle. In addition, signals from the system's yaw rate sensor and the vehicle speed pulse (VSP) sensor enable the system to keep track of the vehicle's direction and speed of travel.

This hybrid system has advantages over a system that is either entirely self-contained or one that relies totally on the GPS. For example, the self-contained portion of the system can keep track of vehicle position even when satellite signals cannot be received, and the GPS can keep track of the vehicle position even when the vehicle is transported by ferry.

The Navigation System applies all this location, direction, and speed information to the maps and calculates a route to the destination entered. As you drive to that destination, the system provides both visual and audio guidance.

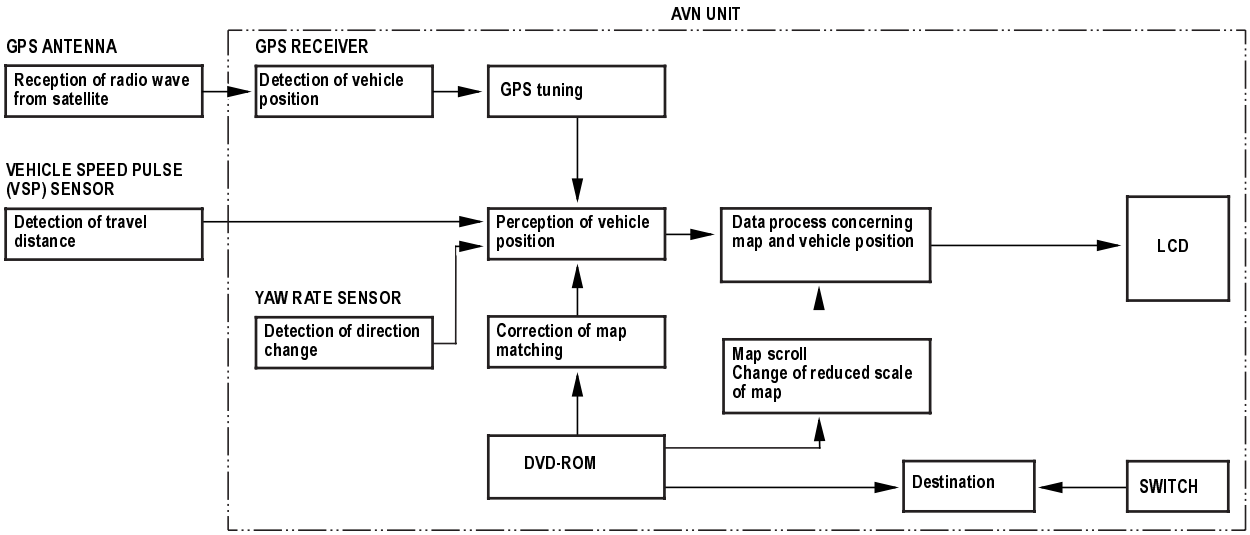
System Diagram



Navigation Function

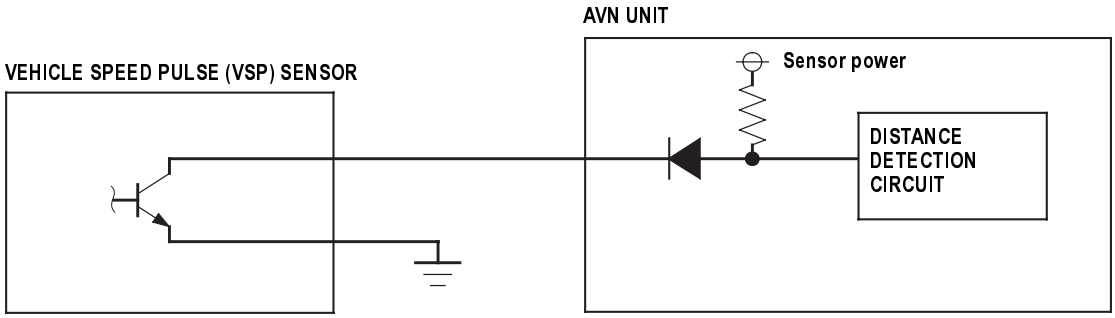
The navigation system is composed of the AVN unit, the PCM vehicle speed pulse (VSP) signal, the GPS antenna.

Function Diagram



Vehicle Speed Pulse (VSP)

The vehicle speed pulse (VSP) is outputted by the PCM. The PCM recieves the signal from the countershaft speed sensor, then the PCM prosesses the signal and transmits it to the speedometer and other systems.



Yaw Rate Sensor

The yaw rate sensor detects the direction change (angular speed) of the vehicle. The sensor is oscillation gyro built into the AVN unit.

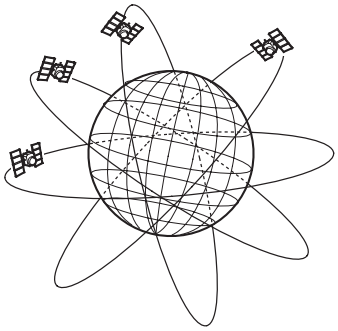
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System Description (cont'd)

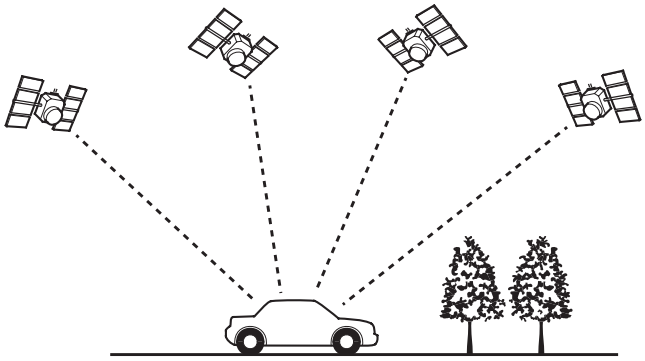
Global Positioning System (GPS)

The Global Positioning System (GPS) enables the navigation system to determine the current position of the vehicle by using the electronic waves transmitted from the satellites in orbit around the earth. The satellites transmit the satellite identification signal, orbit information, transmission time signal, and other information. When the GPS receiver receives the electronic waves from three or more satellites simultaneously, it calculates the current position of the vehicle based on the distance to each satellite and the satellite positions on their respective orbits.

Position detection Image with GPS satellite



NOTE: Four satellites on each of six orbits



Precision of GPS

The precision of the GPS varies according to the number of satellites from which electronic waves are received and the control condition. The precision is indicated by the GPS mark shown on the upper left of the display.

GPS MARK	No. of SATELLITES	CONDITION	DESCRIPTION
No satellite mark → 	Two or less	Impossible to detect vehicle position	The GPS function is normal. The satellite electronic waves that are received by the GPS receiver are to few to determine the vehicle position.
Yellow satellite mark → 	Three	Vehicle position detectable in two dimensions	The longitude and latitude of the vehicle position can be determined. (Less precise than detection in three dimensions)
Green satellite mark → 	Four or more	Vehicle position detectable in three dimensions	The longitude, latitude and the altitude of the vehicle position can be determined. (More precise than detection in two dimensions)
Not indicate	——	Faulty	The GPS can't be used due to a faulty GPS receiver, open in the antenna wire, or other fault.

GPS Antenna

Receiving the electronic waves from the satellites, the GPS antenna amplifies and transmits them to the GPS receiver.

GPS Receiver

The GPS receiver is built in to AVN unit. It calculates the vehicle position by receiving the signal from the GPS antenna. The vehicle position and signal reception condition is transmitted from the GPS receiver to the AVN unit to adjust the vehicle position.

AVN Unit

The AVN unit calculates the vehicle position and guides you to the destination. The unit performs map matching correction, GPS correction, and distance tuning. It also controls the menu functions and the DVD-ROM drive. With control of all these items, the AVN unit makes the navigation picture signal, then it transmits the signal to the display unit and audio driving instructions to the audio unit.

Calculation of Vehicle Position

The AVN unit calculates the vehicle position (the driving direction and the current position) by receiving the directional change signals from the yaw rate sensor and the travel distance signals from the vehicle speed pulse (VSP) sensor.

Map Matching Tuning

The map matching tuning is accomplished by indicating the vehicle position on the roads on the map. The map data transmitted from the DVD-ROM is checked against the vehicle position data, and the vehicle position is indicated on the nearest road. Map matching tuning does not occur when the vehicle travels on a road not shown on the map, or when the vehicle position is far away from a road on the map.

GPS Tuning

The GPS tuning is accomplished by indicating the vehicle position as the GPS's vehicle position. The AVN unit compares its calculated vehicle position data with the GPS vehicle position data. If there is large difference between the two, the indicated vehicle position is adjusted to the GPS vehicle position.

Distance Tuning

The distance tuning reduces the difference between the travel distance signal from the VSP and the distance data on the map. The AVN unit compares its calculated vehicle position data with the GPS vehicle position data. The AVN unit then decreases the tuning value when the vehicle position is always ahead of the GPS vehicle position, and it increases the tuning value when the vehicle position is always behind the GPS vehicle position.

Route Guidance

The AVN unit can calculate different routes to a selected destination. You have four options:

- Direct Route - Calculate a route that is the most direct and will take the least time.
- Easy Route - Calcute a route that minimizes the number of turns needed.
- Minimize Motorways - Calculate a route that avoids motorway travel. If that is not possible, keep the amount of motorway travel to a minimum.
- Minimize Toll Roads - Calculate a route that avoids, or minimizes travel on toll roads.

Audio Guidance

The AVN unit transmits audio driving instructions before entering an intersection or passing a junction.
The audio instructions come through audio unit and the front speakers.

DVD-ROM

The map data (including all scale rates) is stored in the DVD-ROM. The map data includes:

- Road distances, road widths, speed limits, traffic regulations, passing time at junction, distances to junctions, and the driving instructions for audio guidance.
- Latitude and longitude GPS.

(cont'd)

System Description (cont'd)

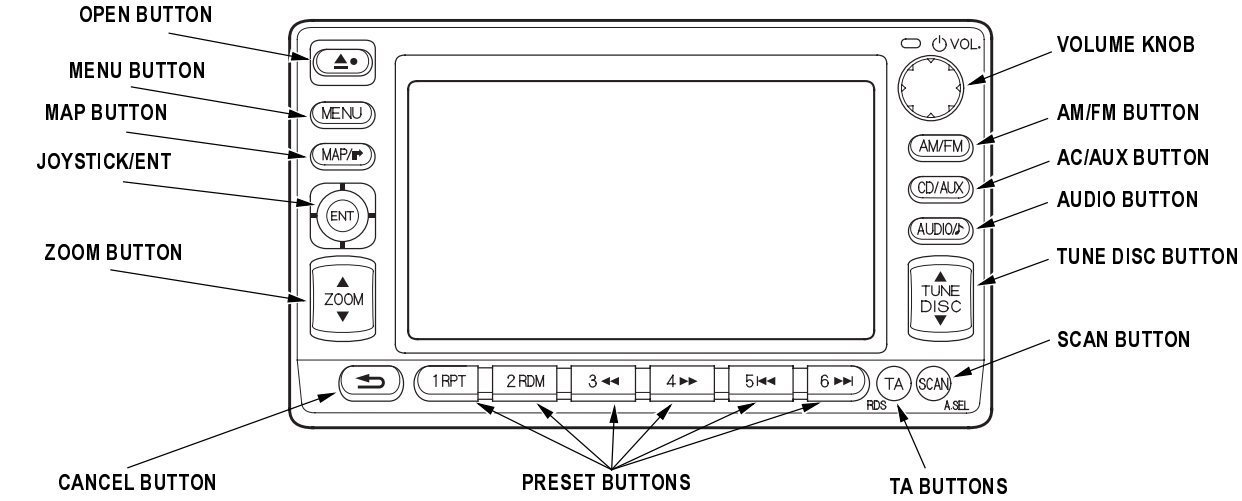
Audio Unit

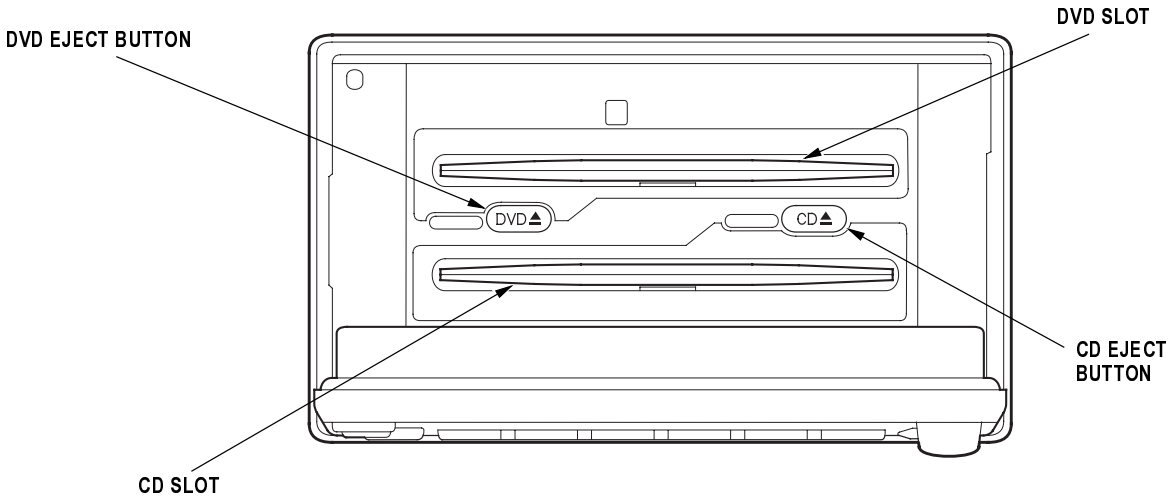
The audio unit built in the AVN unit. It receives the audio driving instructions from the navigation unit and transmits the instructions through the front speakers even when the audio system is in use.

Display Unit

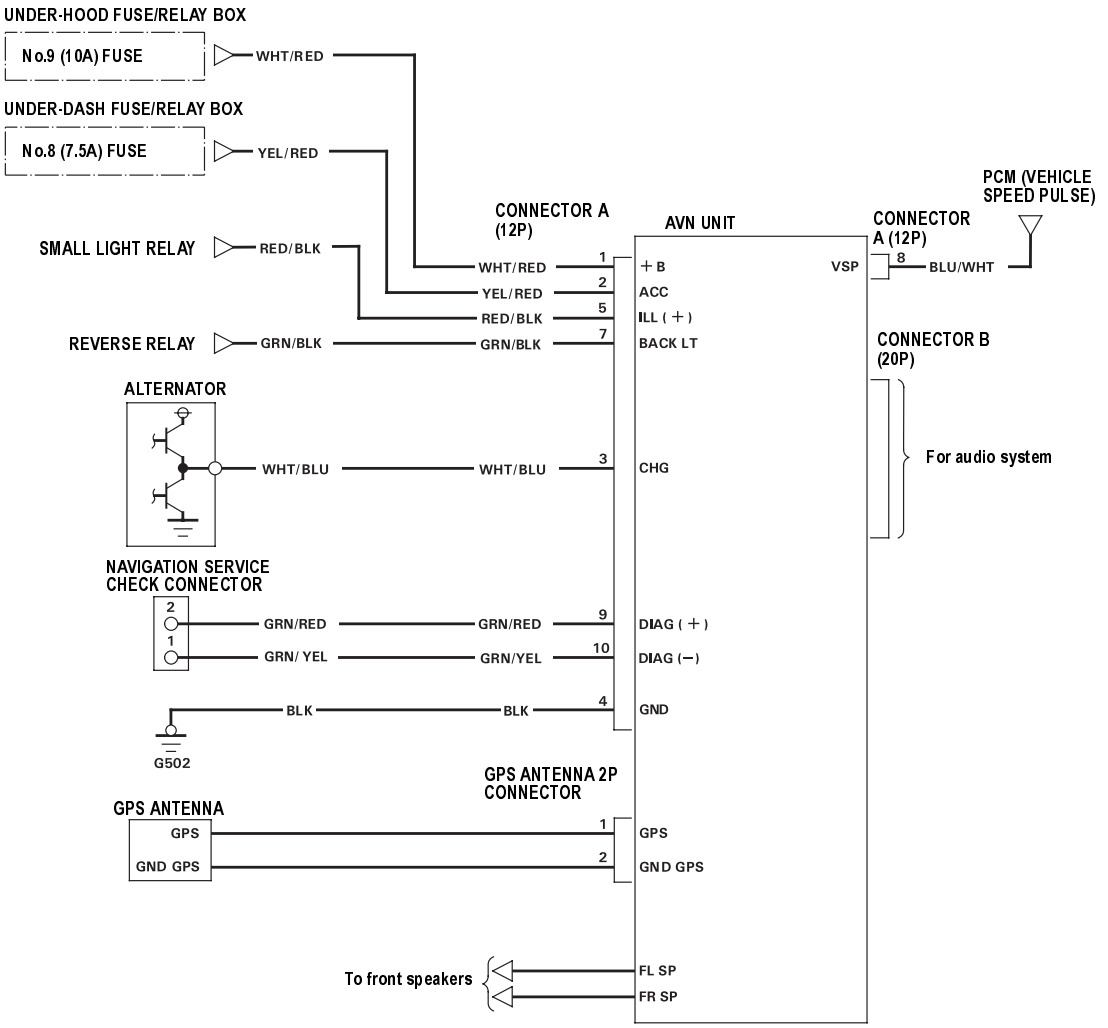
The display unit built in the AVN unit. It uses Liquid Crystal Display (LCD). The LCD is a 6-inch-wide, Thin Film Transistor (TFT), stripe type with about 280,000 picture elements. The color film and fluorecent light are laid out on the back of the liquid crystal film.

Operation keys

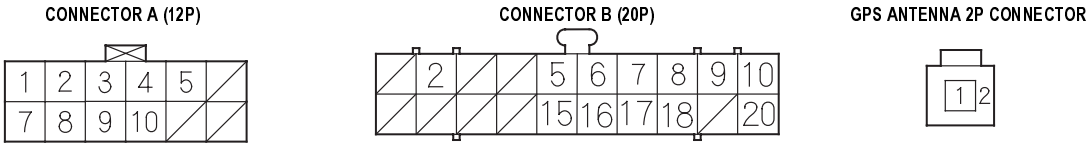




Circuit Diagram



AVN UNIT CONNECTORS



Wire side of female terminals

Symptom Troubleshooting

No picture is shown on the display

1. Check the No. 9 (10A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

Yes Reinstall the fuse, and go to step 2.

No Replace the fuse, and recheck.■

2. Check the No. 8 (7.5A) fuse in the under-dash fuse/relay box.

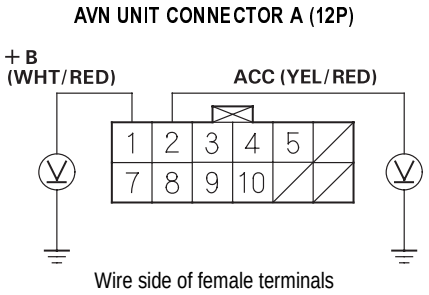
Is the fuse OK?

Yes Reinstall the fuse, and go to step 3.

No Replace the fuse, and recheck.■

3. Turn the ignition switch ON (II).

4. Measure the voltage between body ground and AVN unit connector A (12P) terminals No. 1 and No. 2 individually.

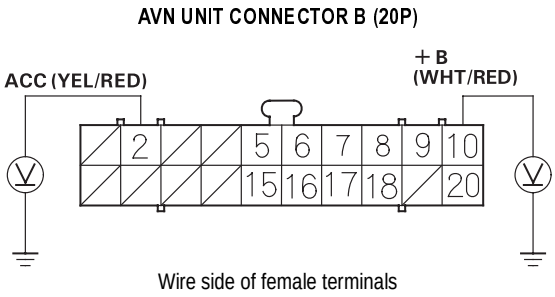


Is there battery voltage?

Yes Go to step 5.

No Repair open in the wire between the fuse/relay box and the AVN unit.■

5. Measure the voltage between body ground and AVN unit connector B (20P) terminals No. 2 and No. 10.



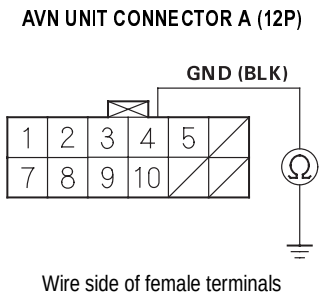
Is there battery voltage?

Yes Go to step 6.

No Repair open in the wire between the fuse/relay box and the AVN unit.■

6. Turn the ignition switch OFF.

7. Check for continuity between AVN unit connector A (12P) terminal No. 4 and body ground.

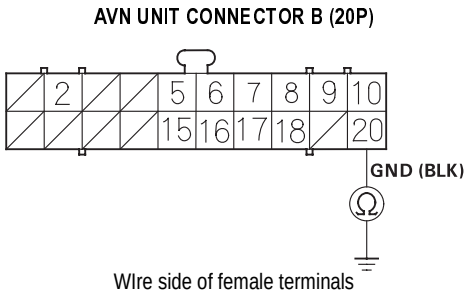


Is there continuity?

Yes Go to step 8.

No Repair open in the wire between the AVN unit and body ground (G502).■

8. Check for continuity between AVN unit connector B (20P) terminal No. 20 and body ground.



Is there continuity?

Yes Go to step 9.

No Repair open in the wire between the AVN unit and body ground (G502).■

9. Perform the forced starting of display (see page 22B-25).

Is the diagnosis menu of the picture diagnosis displayed?

Yes Perform the System Links Test in the Picture Diagnosis Test menu (see page 22B-20).■

No Replace the AVN unit.■

The picture is missing a Red, Green or Blue color or tone

1. Perform the start-up procedure (see page 22B-20). Select the Monitor Check then select the RGB Color (see page 22B-21).

Are the Red, Green, and Blue colored circles shown?

Yes Select the Return. Select the Color Change, and then Select the Default to restore the standard color settings.■

No Replace the AVN unit.■

Symptom Troubleshooting (cont'd)

Satellite mark in the GPS mark is not indicated

1. Perform the System Link check under the picture diagnosis (see page 22B-20).

   Is "NG" indicated?

   Yes Repair as indicated by the system link check.■

   No Check that nothing is blocking the GPS antenna located under the dash board, and recheck where nothing can block the GPS satellite signal.■

Audio driving instructions cannot be heard

1. Check the audio driving instructions volume setting.

   Is it set to OFF?

   Yes Set the volume to an audible level.■

   No Go to step 2.

2. Perform the System Link check under the picture diagnosis (see page 22B-20).

   Can the sound be heard?

   Yes The system is OK at this time.■

   No Go to step 3.

3. Check for open and short to body ground in the speaker circuits.

   Are the circuits OK?

   Yes Go to step 4.

   No Repair open or short to body ground in the wire speaker circuits.■

4. Check the speaker.

   Is the speaker OK?

   Yes Replace the AVN unit.■

   No Replace the speaker.■

Vehicle position does not move on the map

1. Start the engine.
2. Perform the Car Status Test under the Picture Diagnosis Test menu (see page 22B-20).

   Is there vehicle speed pulse signal?

   Yes Replace the AVN unit.■

   No Check the VSP circuit. If the circuit is OK, replace the AVN unit.■

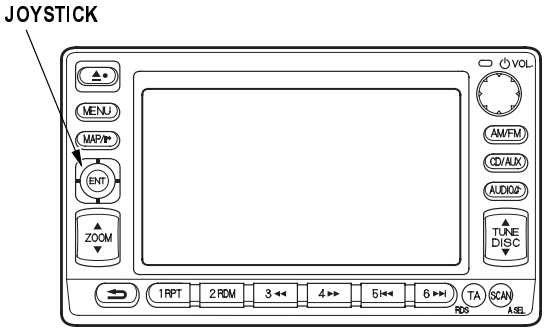
Picture Diagnosis Test

Start-up procedure

1. Turn the ignition switch ON (II), then press and hold the keys in this order: (1) Key 1, (2) Key 2, (3) Key 6, and keep them pressed simultaneously for 5 seconds.

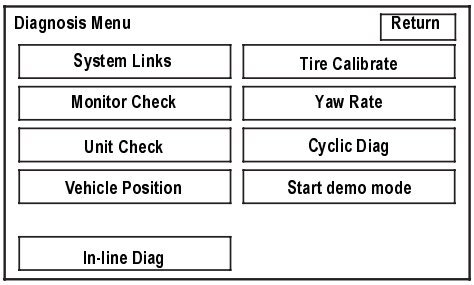
Operation keys

Joystick: Use for select the item



2. After the display changes to the diagnosis menu screen, select the item you want to check, and the check will start. To return to previous screen, select ”Return” on the diagnosis screen.

   When you quit picture diagnosis test, return to standard nevigation screen and then turn the ignition switch OFF. If you turn the ignition switch OFF when the diagnosis screen displayed, the system will not work.



Diagnosis items:

- System Links
- Tire Calibrate
- Monitor Check
- Yaw Rate
- Unit Check
- Cyclic Diag
- Vehicle Position
- Start demo mode
- In-line Diag

Cyclic Diag

This test is for manufacturer’s use only. In this test, the system checks the following items repeatedly:

- AVN unit check
- Monitor check

To exit this test, press the cancel key.

Vehicle Position

When moving the vehicle with the engine stopped such as ferry or tow truck and vehicle positioning error occured, you can adjust the vehicle position using the joystick.

Start demo mode

This test is for manufacturer’s use only. If the indication of this item is changed to ”Stop demo mode”, select this item once and make sure the indication changes to ”Start demo mode”.

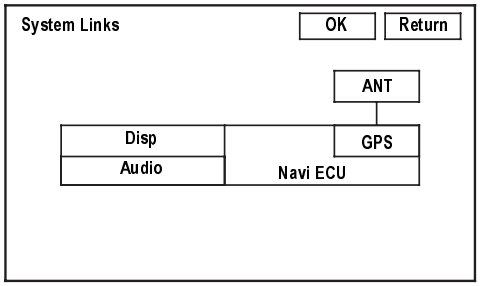
In-line Diag

This test is for manufacturer’s use only. In this test, the system checks the following items:

- System Links
- Car status
- Yaw Rate

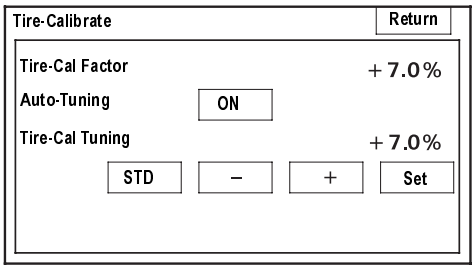
System Links

- If the system is OK, all of the communication lines connecting the components color will not change, the screen will indicate ”OK”, and a tone will sound.
- If there is a problem in the system, the faulty components will change to red, the screen will indicate ”NG”, and tone will sound.
- If the ”GPS” is in red and the screen indicates ”NG”, check the GPS communication line. If the line is OK, replace the GPS antenna.
- If the component exept ”GPS” is in red and the screen indicates ”NG”, replace the AVN unit.



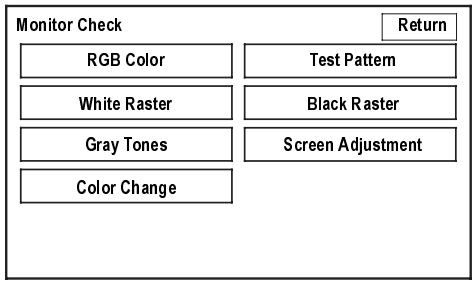
Tire Calibrate

- The ”Auto-Tuning” is factory-set to ”ON”, and it should remain ON. If you find it has been turned OFF, turn it back ON.
- The ”Tire-Cal Tuning” can be used, but it is not recommended. The ”AUTO TUNING” fanction keeps the system in better tune.



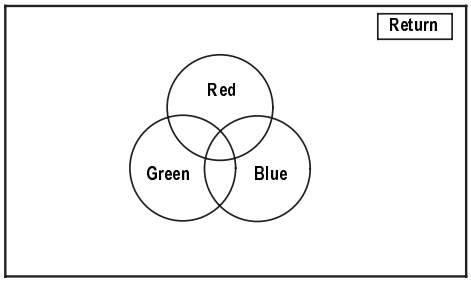
Monitor Check

Select the item you want to check, and the check starts.



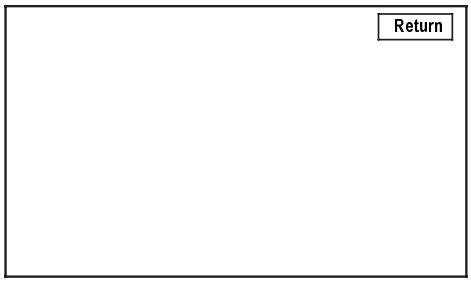
RGB Color

The three primary colors of red, green and blue must be shown.



White Raster

The entire display must be in white.

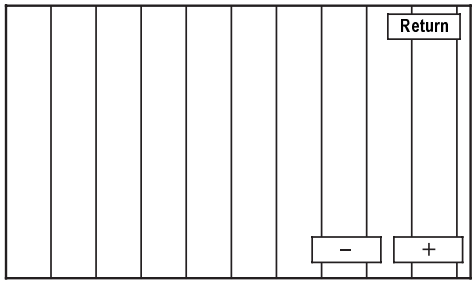


(cont’d)

Picture Diagnosis Test (cont'd)

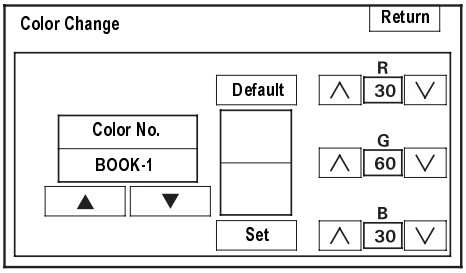
Gray Tones

The gray tone level must be changed smoothly in holyzontal direction. If you want to change the contrast of the screen, select "+" or "-".



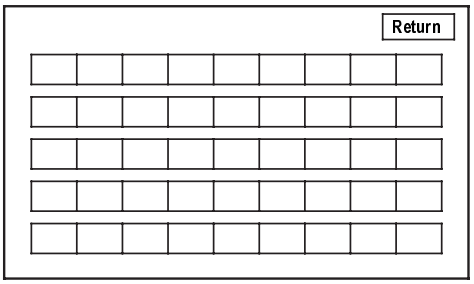
Color Change

This screen is for manufacturer's only.



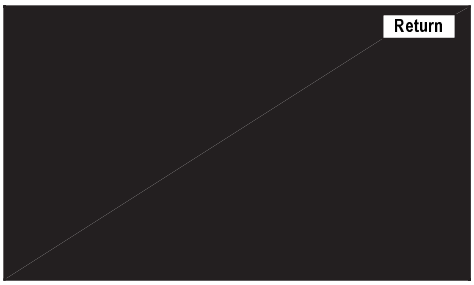
Test Pattern

The system color palette must be indicated.



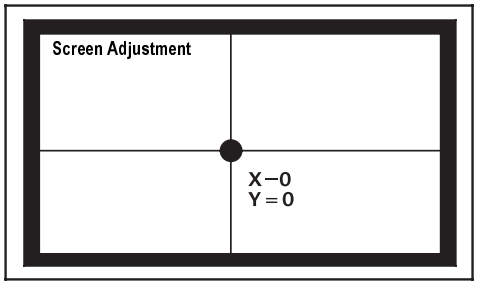
Black Raster

The entire display must be shown in black.



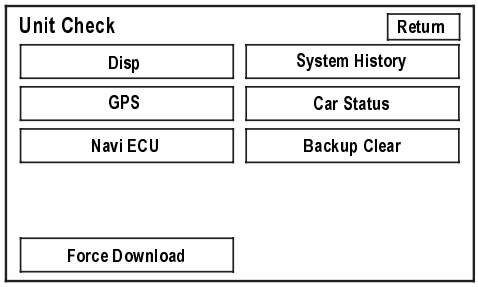
Screen Adjustment

In this screen, you can adjust the screen position in the display. Use the joystick to adjust the screen position.



Unit Check

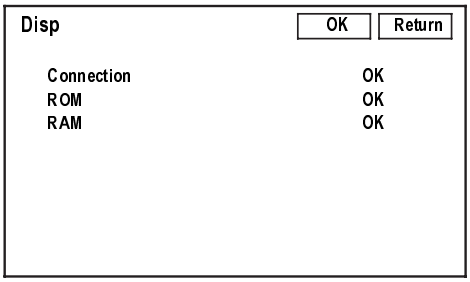
Select the item you want to check, and the check starts.



NOTE: Do not use ”Backup Clear” and ”Force Download”. These commands are for the manufacturer’s use only.

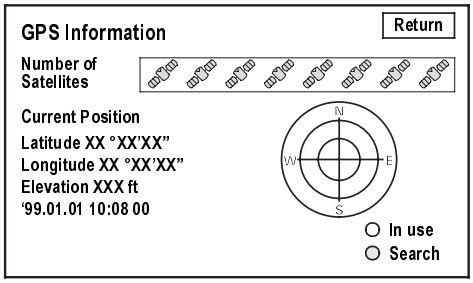
Disp

When any item is ”NG”, replace the AVN unit.



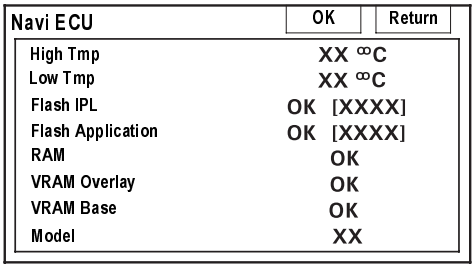
GPS

This screen shows the condition of the GPS reception and the vehicle position.



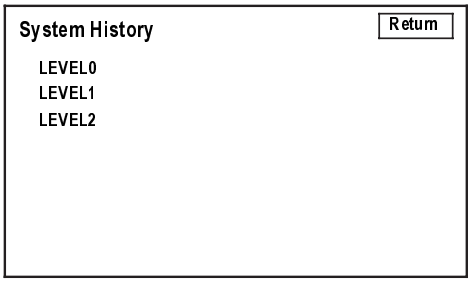
Navi ECU

When any item is ”NG”, replace the AVN unit.



System History

This screen is for manufacturer’s use only.



(cont’d)

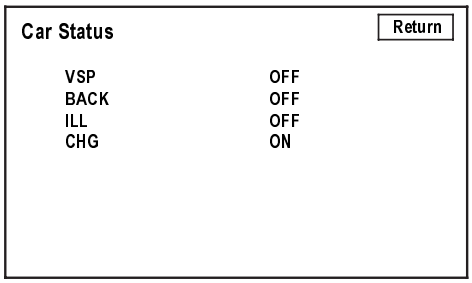
Picture Diagnosis Test (cont'd)

Car Status

Use the car status screen to check each signal.

If the indication does not match the actual vehicle status, check the applicable signal line.

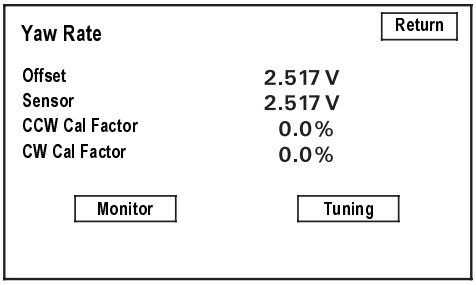
- "VSP" (vehicle speed pulse indication)
  - "OFF" when vehicle is not moving
  - "ON" when vehicle is moving
- "BACK" (reverse indication)
  - "OFF" when shift lever is in any position other than reverse
  - "ON" when shift lever is in reverse
- "ILL" (illumination indication)
  - "OFF" when parking lights or headlights are off
  - "ON" when parking lights or headlights are on
- "CHG" (charging indication)
  - "ON" when engine is running and alternator is charging
  - "OFF" when engine is off or alternator is not charging



Yaw Rate

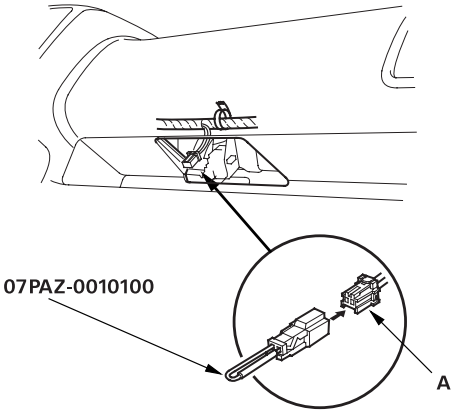
"SENSOR" indicator the voltage output from the yaw rate sensor. It should indicate 1,500 to 3,500 V with the vehicle stopped.

NOTE: Do not try to tune the yaw rate sensor unless instructed by Honda Motor Europe.

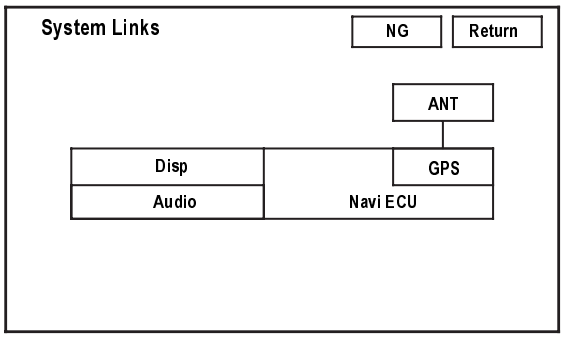


Forced Starting of Display

1. Locate the navigation service check connector (A) upper of the data link connector.



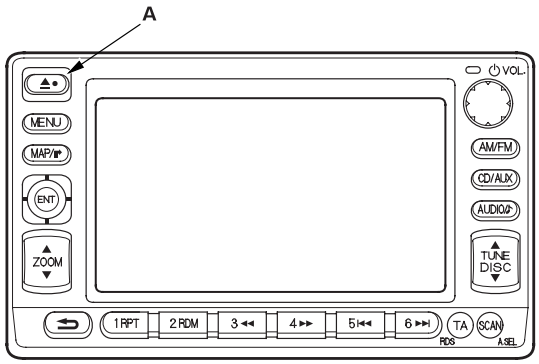
2. Connect the SCS short connector to the navigation service check connector (A).
3. Turn the ignition switch ON (II).



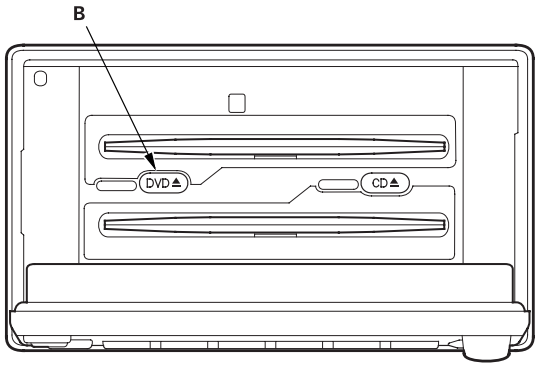
4. Check that the diagnosis menu for the picture diagnosis start up and then changes to the system link screen.

DVD-ROM Replacement

1. Turn the ignition switch ON (II).
2. Push the open key (A) of the AVN unit, then open the front panel.



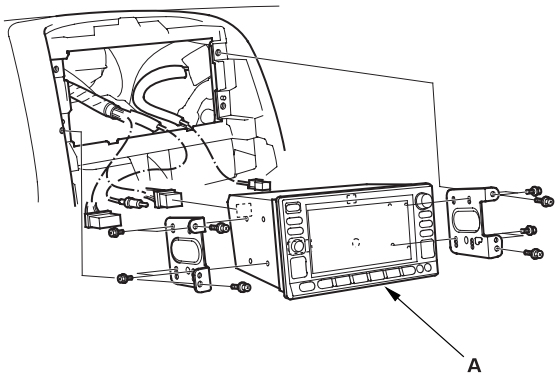
3. Push the DVD EJECT switch (B), then remove the DVD-ROM.



4. Insert the new DVD-ROM.
5. Close the front panel.

AVN Unit Removal/Installation

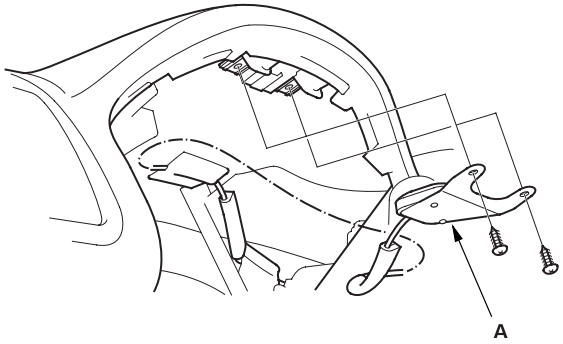
1. Remove the center panel (see page 20-89).
2. Remove the AVN unit (A).



3. Install the parts in the reverse order of removal.

GPS Antenna Removal/Installation

1. Remove the gauge assembly (see page 22A-74).
2. Remove the GPS antenna (A).



3. Install the parts in the reverse order of removal.

Clock Display Size and Location Adjustment

1. Turn the ignition switch ON (II).
2. When the disclaimer is shown on the navigation display unit, select ”OK.”
3. When the ”Enter destination by:” screen is shown, select ”Setup.”
4. When the ”Setup Screen” is shown, select Display ”Off.”
5. Select the numbers of the clock to change the clock size and location.
   - If the clock is small and in the lower right hand corner of the screen, it will increase in size and move to the center of the screen.
   - If the clock is large and in the center of the screen, it will decrease in size and move to the lower right hand corner of the screen.
6. Push the MENU button to return to the ”Enter destination by:” screen. The clock display settings will be saved.

23

Restraints

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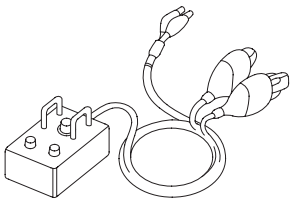
Restraints

Special Tools

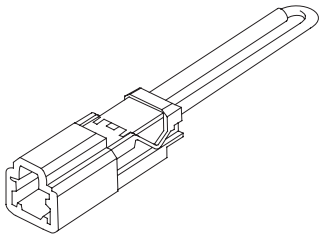
Ref. No.	Tool Number	Description	Qty
1*1	07HAZ-SG00500	Deployment Tool	1
2	07PAZ-0010100	SCS Short Connector	1
3	07SAZ-TB4011A	SRS Inflator Simulator	1
4	07TAZ-SZ5011A	SRS Simulator Lead C	1
5*2	07TAZ-001020A	Backprobe Adapter, 17 mm	2
6	07XAZ-S1A0200	SRS Simulator Lead E	1
7	07XAZ-SZ30100	SRS Simulator Lead F	1
8	07YAZ-S3A0100	SRS Simulator Lead H	1
9	07WAJ-0010100	DLC Pin Box	1

*1: Included in SRS Tool Set 07MAZ-SM5000B

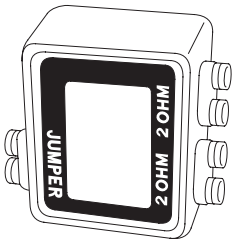
*2: Use with the stacking patch cords from T/N 07SAZ-001000A, Backprobe Set.



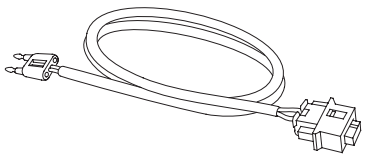
1



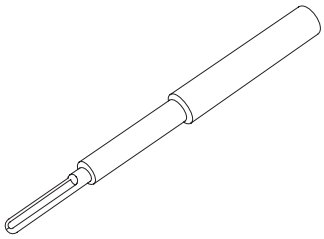
2



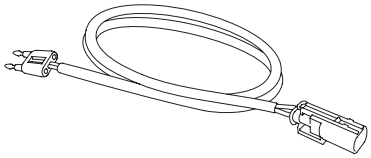
3



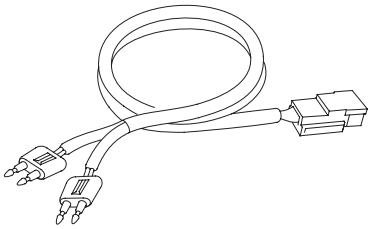
4



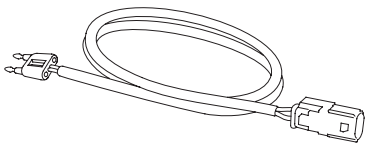
5



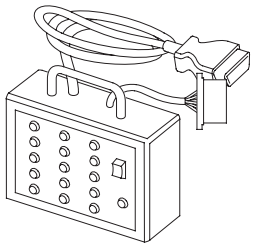
6



7



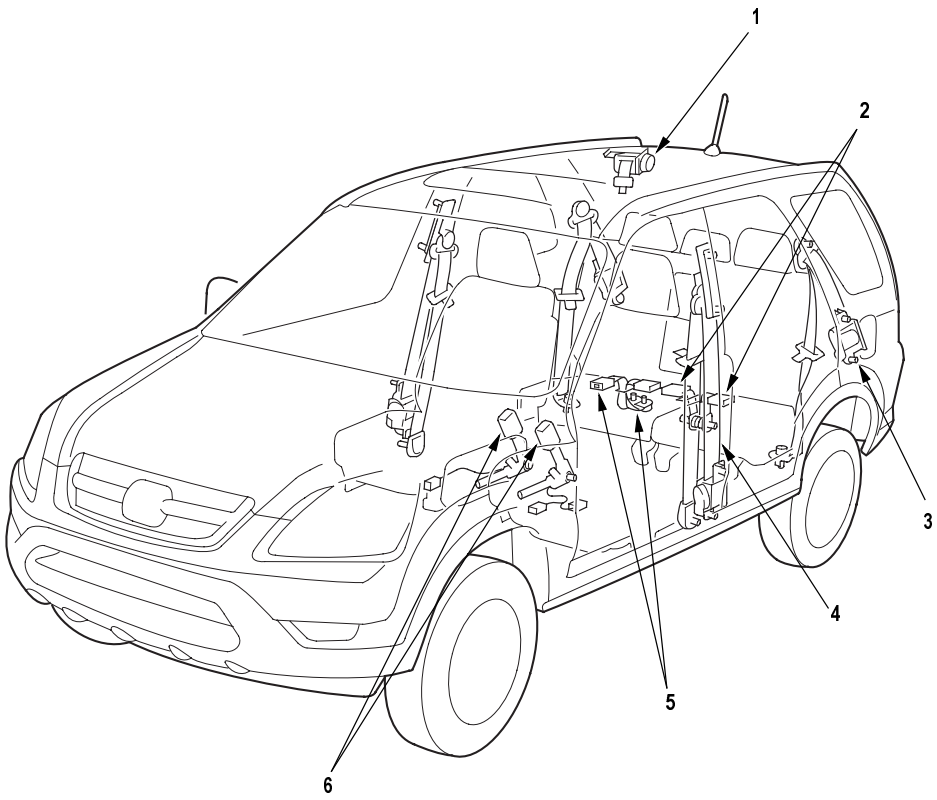
8



9

Seat Belts

Component Location Index



1	REAR CENTER SEAT BELT (DETACHABLE ANCHOR)	Replacement, step 1 on page 23-9; Inspection, page 23-12
2	REAR CENTER SEAT BELT BUCKLE and LEFT REAR SEAT BELT BUCKLE	Replacement, step 1 on page 23-11
3	REAR SEAT BELT	Replacement, page 23-8; Inspection, page 23-12
4	FRONT SEAT BELT	Replacement, page 23-4; Inspection, page 23-12
5	REAR CENTER SEAT BELT/DETACHABLE ANCHOR and RIGHT REAR SEAT BELT BUCKLE	Replacement, step 1 on page 23-10
6	FRONT SEAT BELT BUCKLES	Replacement, step 1 on page 23-6

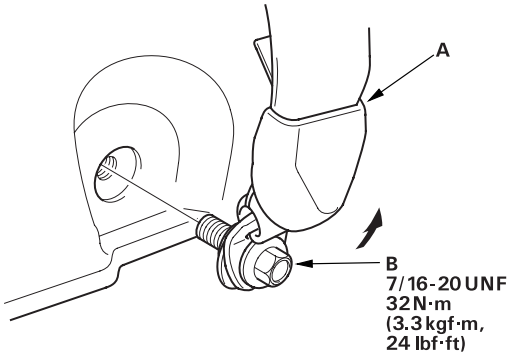
Front Seat Belt Replacement

For some models: SRS components are located in this area. Review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

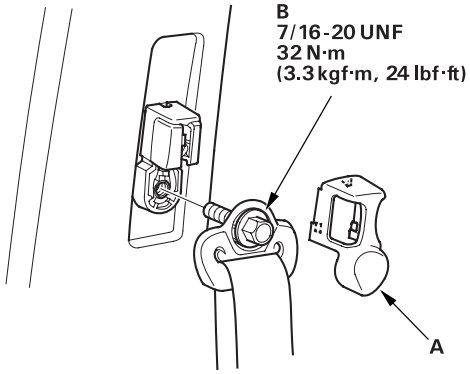
NOTE: Check the front seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Front Seat Belt

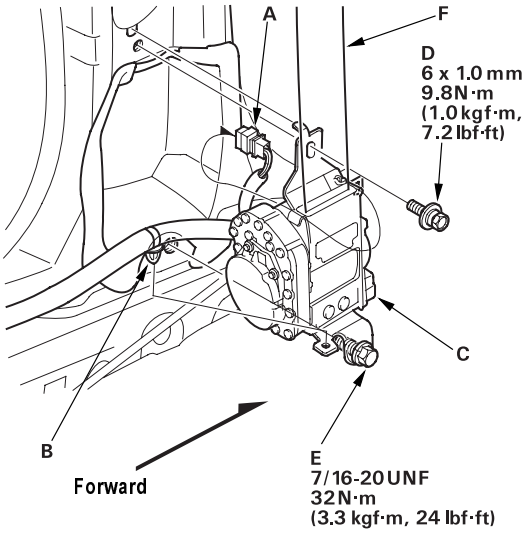
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the preset buttons (for some models).
2. Disconnect the negative battery cable, and wait at least 3 minutes before beginning work.
3. Slide the front seat forward fully.
4. Pull the lower anchor cover (A) back, and remove the lower anchor bolt (B).



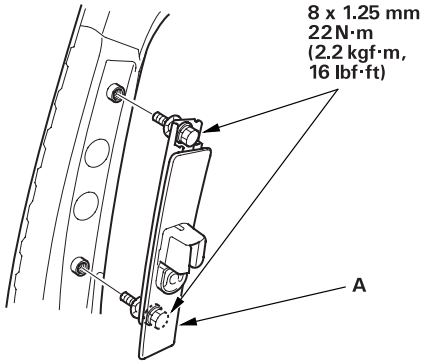
5. Remove the center pillar lower trim panel (see page 20-76).
6. Remove the upper anchor cover (A), and remove the upper anchor bolt (B).



7. Disconnect the seat belt tensioner connector (A), and detach the harness clip (B) from the retractor (C). Remove the upper retractor mounting bolt (D), and the lower retractor bolt (E), then remove the front seat belt (F) and retractor.

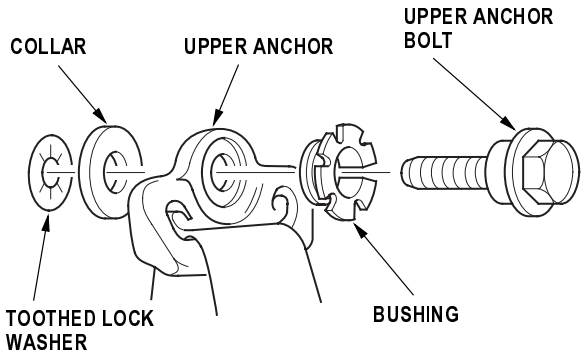


8. Remove the center pillar upper trim (see page 20-76).
9. Remove the shoulder anchor adjuster (A).

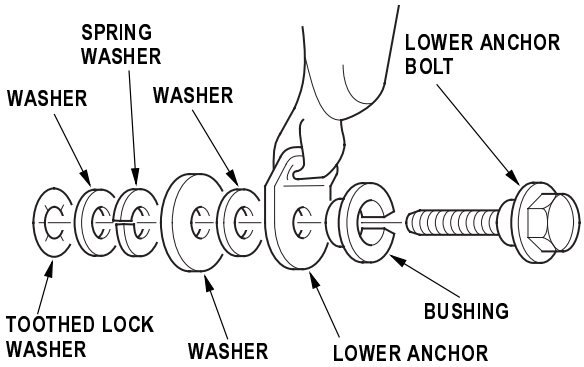


10. Install the seat belt in the reverse order of removal, and note these items:
    - Apply liquid thread lock to the upper anchor bolt before reinstallation.
    - Check that the retractor locking mechanism functions (see page 23-12).
    - Assemble the washers, collar, and bushing on the upper and lower anchor bolts as shown.
    - Before installing the anchor bolts, make sure there are no twists or kinks in the seat belt.
    - Make sure the seat belt tensioner connector is plugged in properly.
    - Reconnect the negative cable to the battery.
    - Enter the anti-theft code for the radio, then enter the customer's radio station presets (for some models).

Upper anchor bolt construction:



Lower anchor bolt construction:



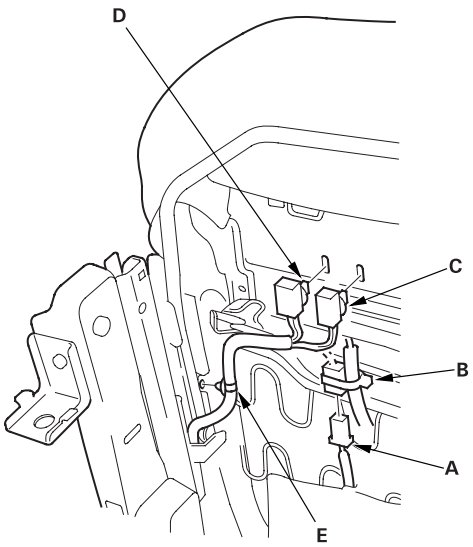
(cont'd)

Front Seat Belt Replacement (cont'd)

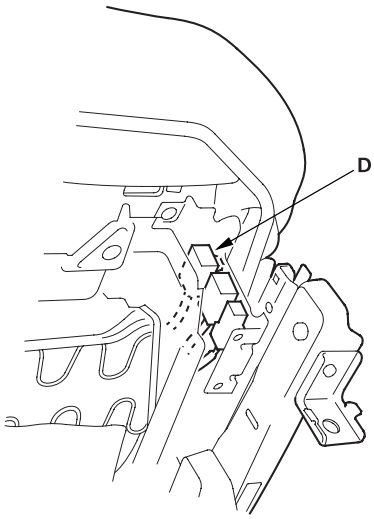
Seat Belt Buckle

1. If equipped with a seat belt buckle tensioner or front seat side airbag, make sure you have the anti-theft code for the radio, then write down the frequencies for the preset buttons.
2. If equipped with a seat belt buckle tensioner or front seat side airbag, disconnect the negative battery cable, and wait at least 3 minutes before beginning work.
3. Remove the front seat (see page 20-103).
4. If equipped, remove the center table (see page 20-106).
5. If equipped, remove the seat under box (see page 20-109).
6. Remove the center cover, with manual height adjustable (see page 20-108), without manual height adjustable (see page 20-109).
7. If equipped with a seat-belt switch and/or seat belt buckle tensioner, disconnect the seat subharness connector (A) (driver's with seat heater), and remove the harness band (B) (driver's with seat heater and seat belt buckle tensioner), and detach the seat belt switch connector clip (C), seat belt buckle tensioner connector clip (D), and harness clip (E). LHD is shown, RHD is symmetrical.

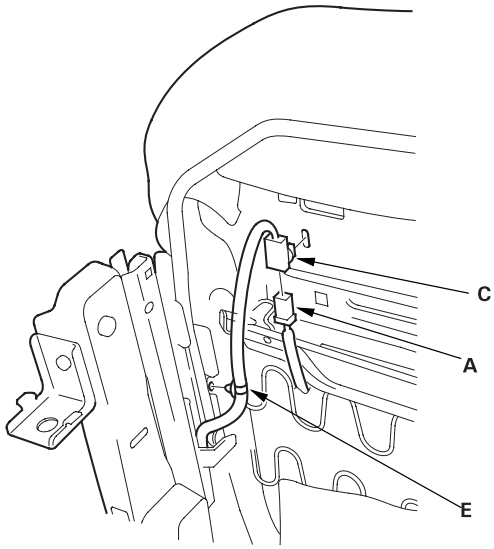
With seat belt buckle tensioner (driver's):



With seat belt buckle tensioner (passenger's):

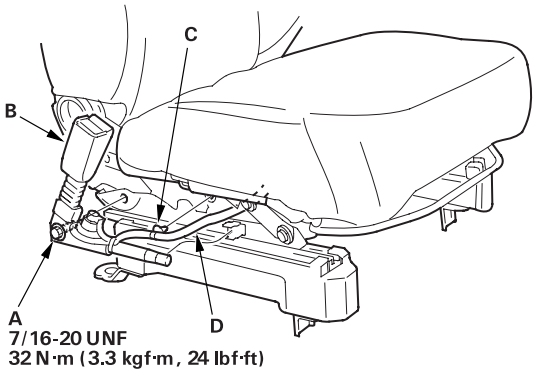


Without seat belt buckle tensioner (driver's):

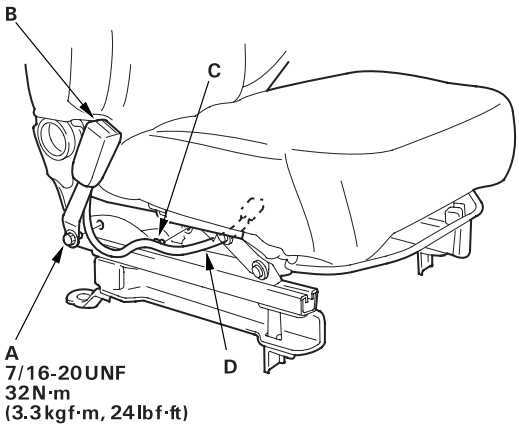


8. Remove the center anchor bolt (A), and remove the seat belt buckle (B).

With seat belt buckle tensioner:



Without seat belt buckle tensioner:

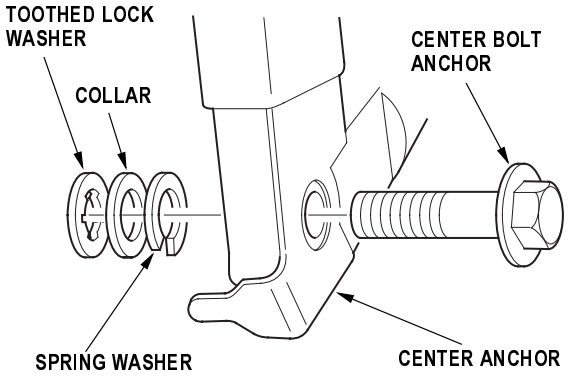


9. Detach the harness clip (C), and pull the seat belt switch/tensioner harness (D) out through the hole on the seat track.

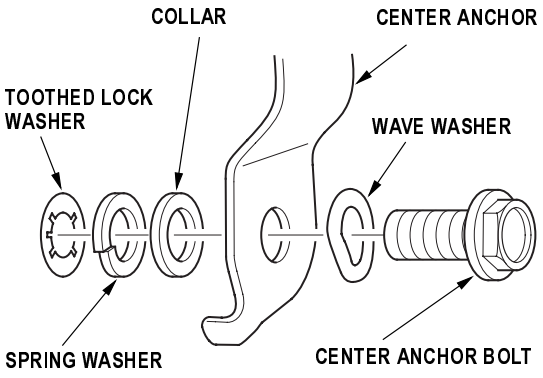
10. Install the buckle in the reverse order of removal, and note these items:

- If equipped with a seat belt buckle tensioner, apply liquid thread lock to the center anchor bolt before reinstallation.
- Assemble the washers on the center anchor bolt as shown.
- If equipped with a seat belt buckle tensioner or front seat side airbag, reconnect the negative cable to the battery.
- If equipped with a seat belt buckle tensioner or front seat side airbag, enter the anti-theft code for the radio, then enter the customer's radio stations presets.

With seat belt buckle tensioner:



Without seat belt buckle tensioner:

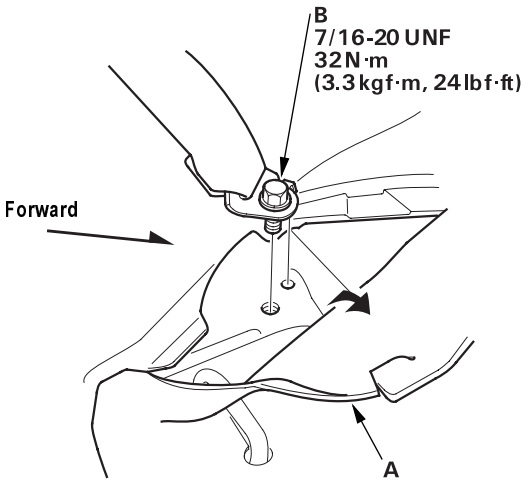


Rear Seat Belt Replacement

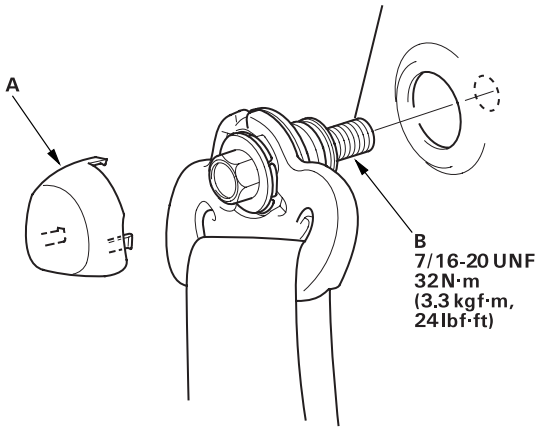
NOTE: Check the rear seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Rear Seat Belt

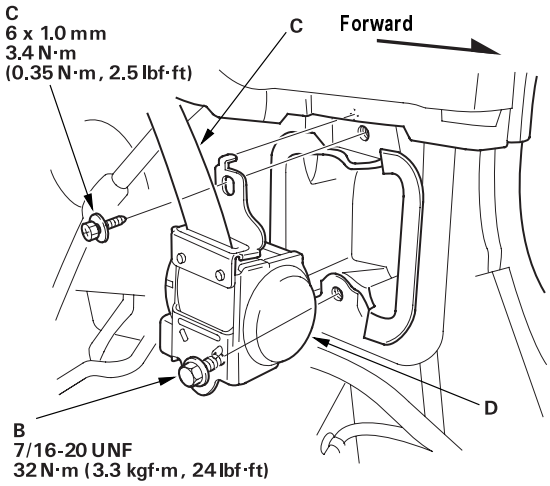
1. Fold the rear seat up.
2. Pull the carpet (A) back as necessary, and remove the lower anchor bolt (B).



3. Remove the rear side trim panel (see page 20-77).
4. Remove the upper anchor cap (A), and remove the upper anchor bolt (B).

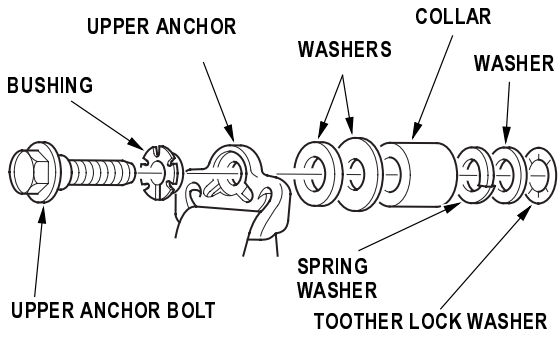


5. Remove the retractor mounting self-tapping ET screw (A), and the retractor bolt (B), then remove the rear seat belt (C) and retractor (D).



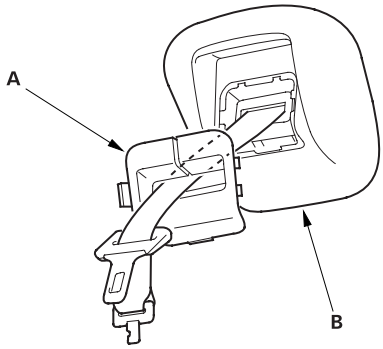
6. Install the seat belt in the reverse order of removal, and note these items:
   - If the threads on the retractor mounting self-tapping ET screw are worn out, use an oversized self-tapping ET screw made specifically for this application.
   - Check that the retractor locking mechanism functions as described (see page 23-12).
   - Assemble the washers, collar, and bushing on the upper anchor bolt as shown.
   - Before installing the anchor bolt, make sure there are no twists or kinks in the seat belt.

Upper anchor bolt construction:

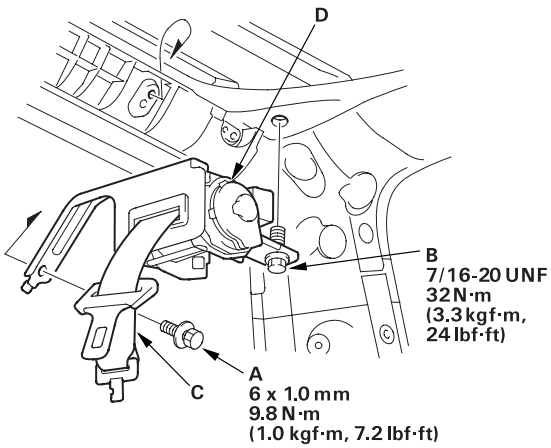


Center Rear Seat Belt (Detachable Anchor)

1. Remove the cap (A) from the retractor cover (B).



2. Remove the headliner (see page 20-77).
3. Remove the retractor mounting bolt (A) and retractor bolt (B), then remove the center seat belt (C) and retractor (D).



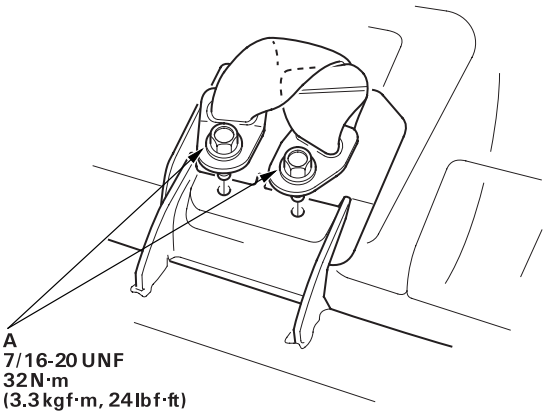
4. Install the center seat belt and retractor in the reverse order of removal, and check that the retractor locking mechanism functions (see page 23-12).

(cont'd)

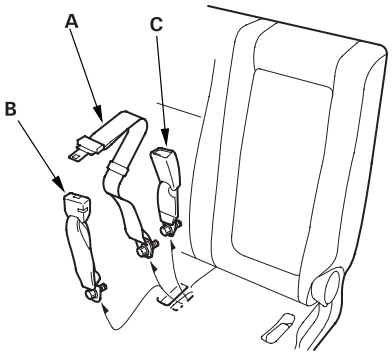
Rear Seat Belt Replacement (cont'd)

Rear Center Seat Belt/Detachable Anchor and Right Rear Seat Belt Buckle

1. Remove the rear seat (see page 20-114).
2. Remove the under cover from the rear seat (see page 20-119).
3. Remove the center anchor bolts (A) from under the seat cushion.

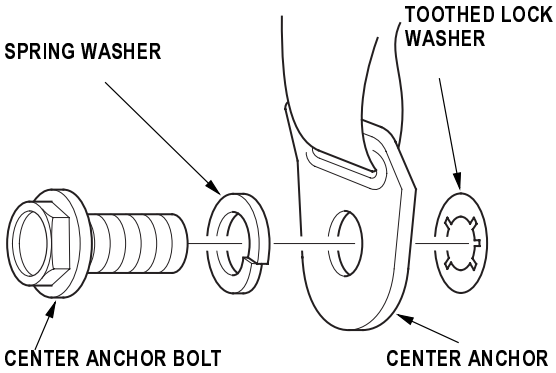


4. Pull the rear center seat belt (A) or rear center seat belt detachable anchor (B) and right rear seat belt buckle (C) out.



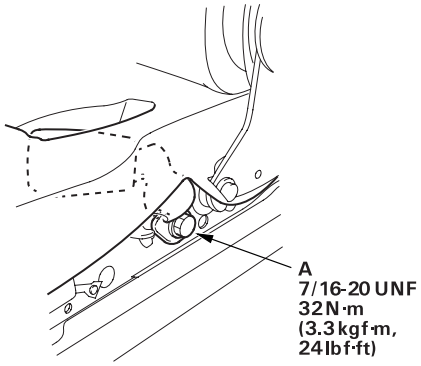
5. Install the center belt and buckle in the reverse order of removal, and note these items:
   - Assemble the washers on the center anchor bolt as shown.
   - Make sure there are no twists or kinks in the center belt and seat belt buckle.

Center anchor bolt construction:

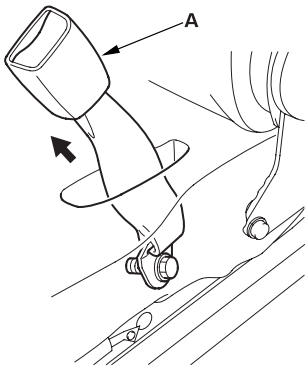


Rear Center Seat Belt Buckle and Left Rear Seat Belt Buckle

1. Fold the rear seat up (one side).
2. Remove the center cover, right rear seat (see page 20-119), left rear seat (see page 20-123).
3. Remove the center anchor bolt (A).

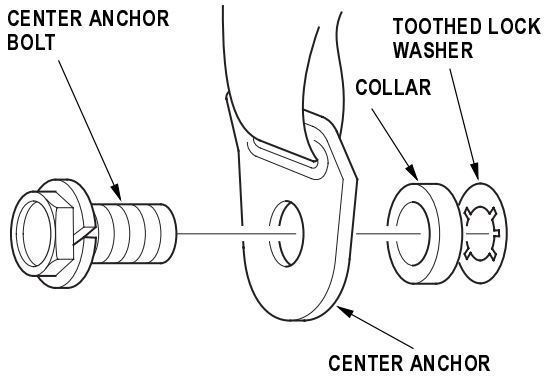


4. Pull the rear center seat belt buckle (A) (right rear seat) or left rear seat belt buckle (left rear seat) out.



5. Install the buckle in the reverse order of removal, and note these items:
   - Assemble the collar and washer on the center anchor bolt as shown.
   - Make sure there are no twists or kinks in the seat belt buckle.

Center anchor bolt construction:



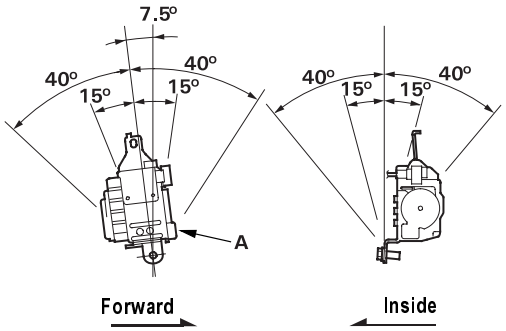
Inspection

For front seat belt retractor with seat belt tensioner, review the SRS component locations (see page 23-14) and the precautions and procedures (see page 23-16) in the SRS section before performing repairs or service.

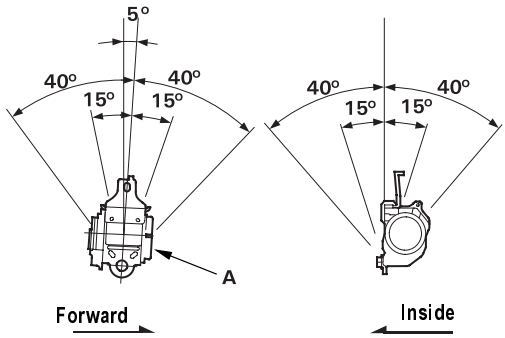
Retractor

1. Before installing the retractor, check that the seat belt can be pulled out freely.
2. Make sure that the seat belt does not lock when the retractor (A) is leaned slowly up to 15° from the mounted position. The seat belt should lock when the retractor is leaned over 40°. Do not attempt to disassemble the retractor.

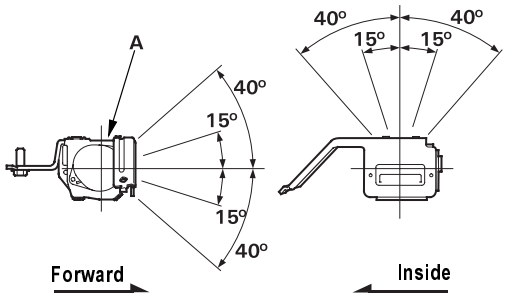
Front:



Rear:



Rear center:



3. Replace the seat belt with a new assembly if there is any abnormality. Do not disassemble any part of the seat belt for any reason.

In-vehicle

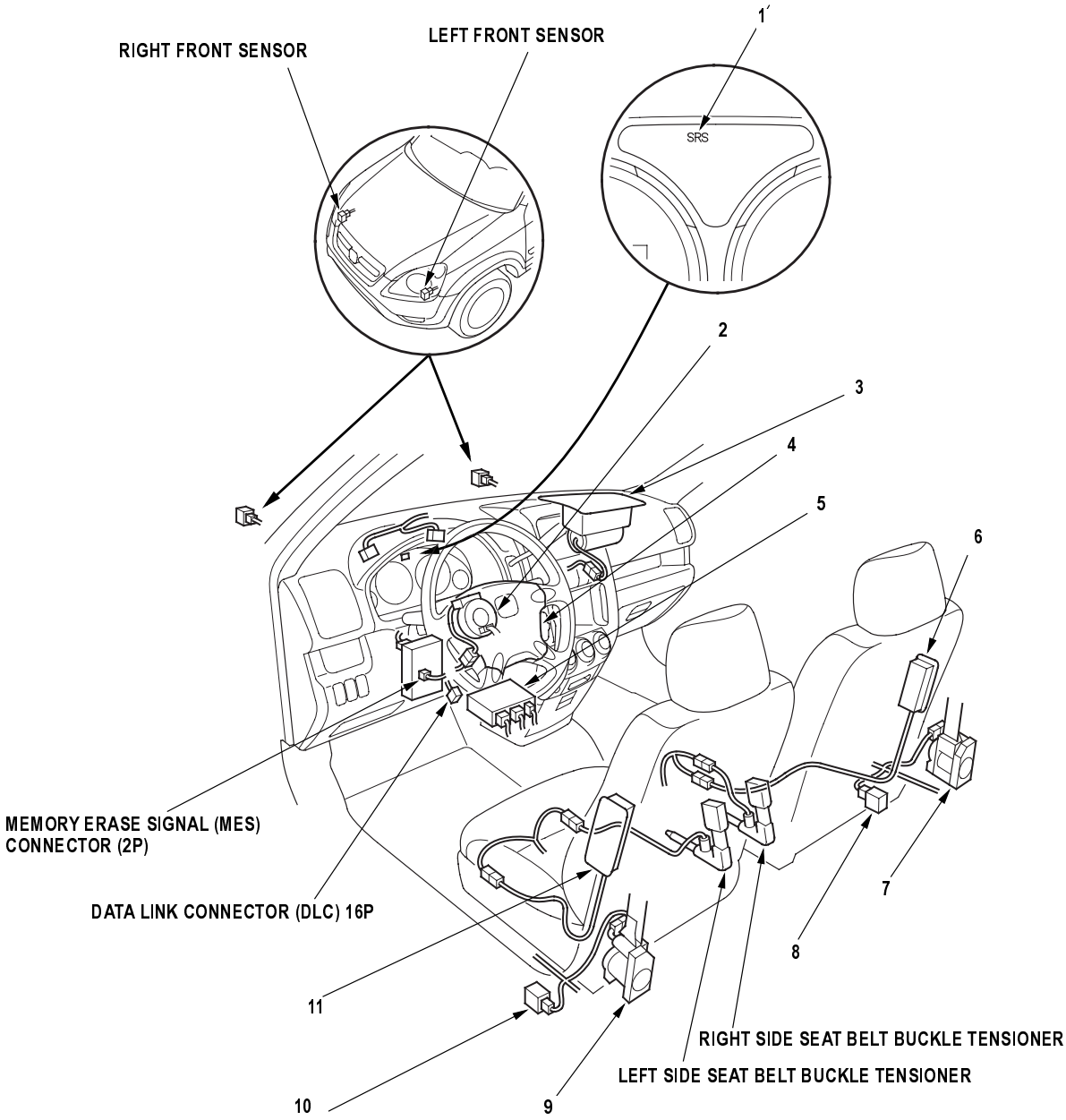
1. Check that the seat belt is not twisted or caught on anything.
2. After installing the anchors, check for free movement on the anchor bolts. If necessary, remove the anchor bolts and check that the washers and other parts are not damaged or improperly installed.
3. Check the seat belts for damage or discoloration. Clean with a shop towel if necessary. Use only soap and water to clean.

   NOTE: Dirt build-up in the metal loops of the upper anchors can cause the seat belts to retract slowly. Wipe the inside of the loops with a clean cloth dampened in isopropyl alcohol.
4. Check that the seat belt does not lock when pulled out slowly. The seat belt is designed to lock only during a sudden stop or impact.
5. Make sure that the seat belt will retract automatically when released.
6. For rear passenger's seat belt, check the seat belt retractor locking mechanism ALR (automatic locking retractor). This function is for securing child seats:
   1 Pull the seat belt all the way out to engaga the ALR. The seat belt should retract with a ratcheting sound, but not extend. This is normal.
   2 To disengaga the ALR, release the seat belt and allow it to fully retract, then pull the seat belt out part-way. The seat belt should retract and extend normally.
7. Replace the seat belt with a new assembly if there is any abnormality. Do not disassemble any part of the seat belt for any reason.

SRS

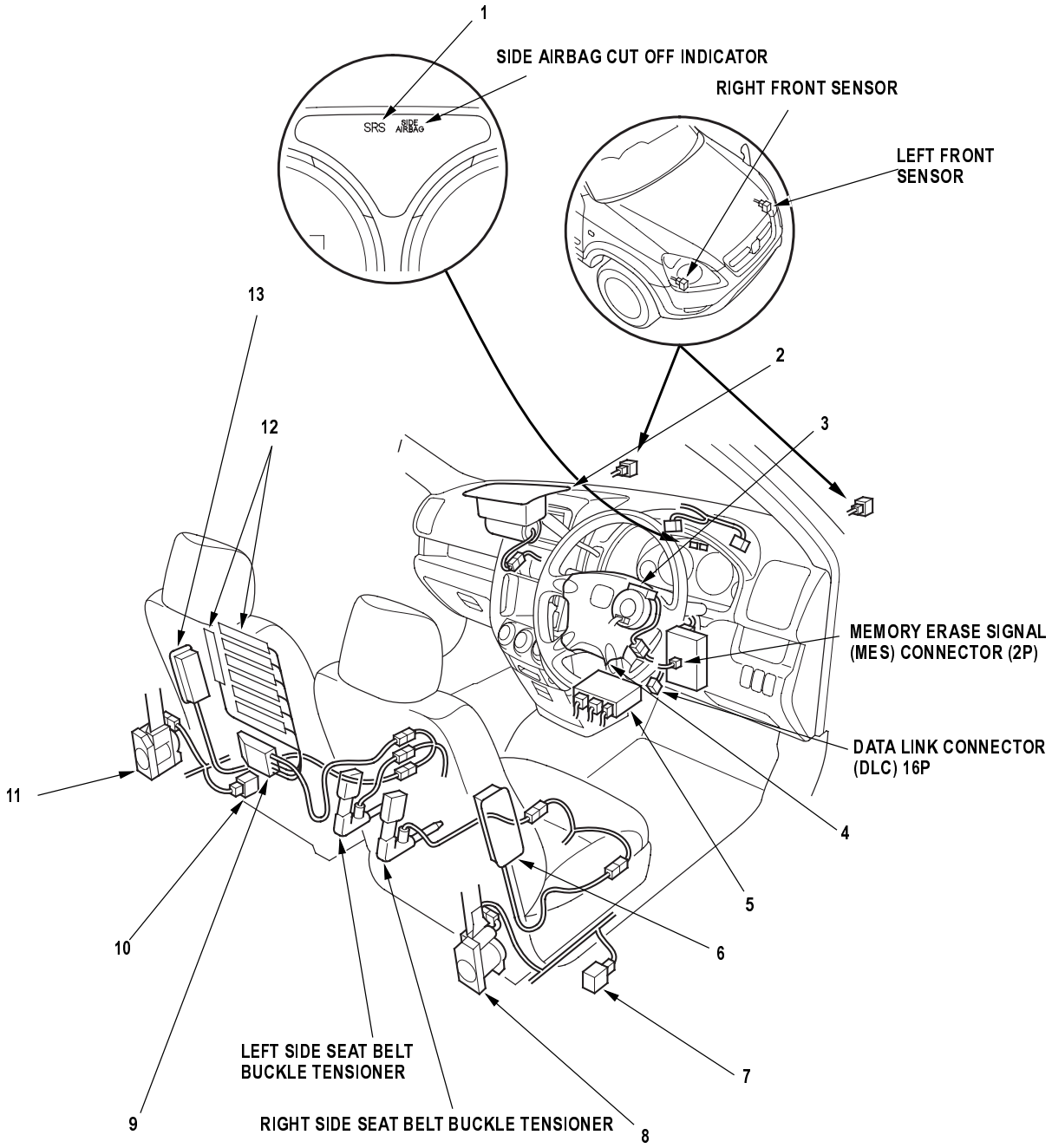
Component Location Index

LHD:



1	SRS INDICATOR	Troubleschooting, page 23-124	7	RIGHT SIDE SEAT BELT TENSIONER	Replacement, page 23-4 Disposal, page 23-138
2	CABLE REEL	Replacement, page 23-141	8	FRONT PASSENGER'S SIDE IMPACT SENSOR	Replacement, page 23-145
3	FRONT PASSENGER'S AIRBAG	Replacement, page 23-136 Disposal, page 23-138	9	LEFT SIDE SEAT BELT TENSIONER	Replacement, page 23-4 Disposal, page 23-138
4	DRIVER'S AIRBAG	Replacement, page 23-135 Disposal, page 23-138	10	DRIVER'S SIDE IMPACT SENSOR	Replacement, page 23-145
5	SRS UNIT	Replacement, page 23-144	11	DRIVER'S SIDE AIRBAG	Replacement, page 23-137 Disposal, page 23-138
6	FRONT PASSENGER'S SIDE AIRBAG	Replacement, page 23-137 Disposal, page 23-138			

RHD



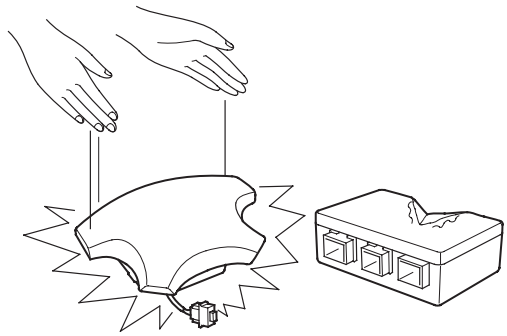
1	SRS INDICATOR	Troubleschooting, page 23-124	8	RIGHT SIDE SEAT BELT TENSIONER	Replacement, page 23-4 Disposal, page 23-138
2	FRONT PASSENGER'S AIRBAG	Replacement, page 23-136 Disposal, page 23-138	9	OPDS UNIT (KU)	Initialization, page 23-30 Replacement, page 23-146
3	CABLE REEL	Replacement, page 23-141	10	FRONT PASSENGER'S SIDE IMPACT SENSOR	Replacement, page 23-145
4	DRIVER'S AIRBAG	Replacement, page 23-135 Disposal, page 23-138	11	LEFT SIDE SEAT BELT TENSIONER	Replacement, page 23-4 Disposal, page 23-138
5	SRS UNIT	Replacement, page 23-144	12	OPDS SENSOR/SEAT BACK (KU)	Replacement, page 20-110
6	DRIVER'S SIDE AIRBAG	Replacement, page 23-137 Disposal, page 23-138	13	FRONT PASSENGER'S SIDE AIRBAG	Replacement, page 23-137 Disposal, page 23-138
7	DRIVER'S SIDE IMPACT SENSOR	Replacement, page 23-145			

Precautions and Procedures

General Precautions

Please read the following precautions carefully before performing airbag system service. Observe the instructions described in this manual, or the airbags could accidentally deploy and cause damage or injuries.

- Except when performing electrical inspections, always turn the ignition switch OFF, disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.
  NOTE: The memory is not erased even if the ignition switch is turned OFF or the battery cables are disconnected from the battery.
- Use replacement parts which are manufactured to the same standards and quality as the original parts. Do not install used SRS parts from another vehicle. Use only new parts when making SRS repairs.
- Carefully inspect any SRS part before you install it. Do not install any part that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.



- Before removing any SRS parts (including the disconnection of connectors), always disconnect the SRS connector.
- Use only a digital multimeter to check the system. If it is not a Honda multimeter, make sure its output is 10 mA (0.01 A) or less when switched to the lowest value in the ohmmeter range. A tester with a higher output could cause accidental deployment and possible injury.
- Do not put objects on the front passenger's airbag.

Steering-related Precautions

Cable Reel Alignment

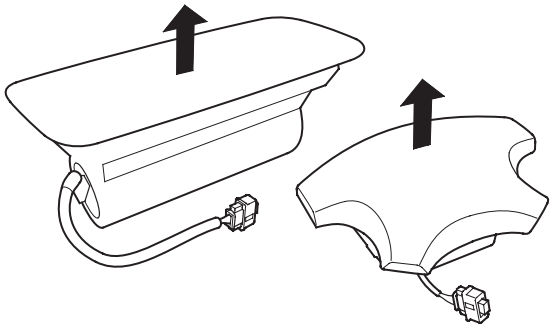
- Misalignment of the cable reel could cause an open in the wiring, making the SRS system and the horns inoperative. Center the cable reel whenever the following is performed (see step 6 on page 23-143).
  - Installation of the steering wheel
  - Installation of the cable reel
  - Installation of the steering column
  - Other steering-related adjustment or installation
- Do not disassemble the cable reel.
- Do not apply grease to the cable reel.
- If the cable reel shows any signs of damage, replace it with a new one. For example, it does not rotate smoothly.

Airbag Handling and Storage

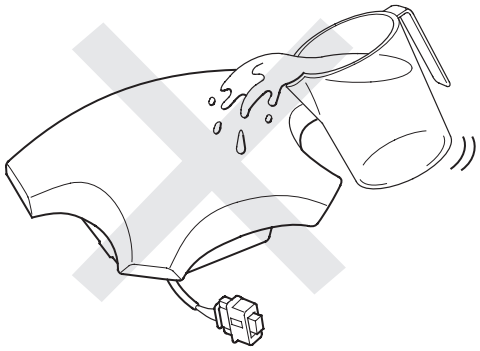
Do not disassemble an airbag. It has no serviceable parts. Once an airbag has been deployed, it cannot be repaired or reused.

For temporary storage of airbag during service, observe the following precautions.

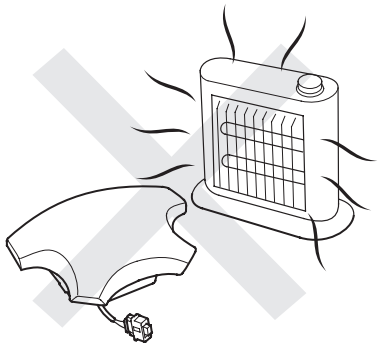
- Store the removed airbag with the pad surface up. Never put anything on the airbag.



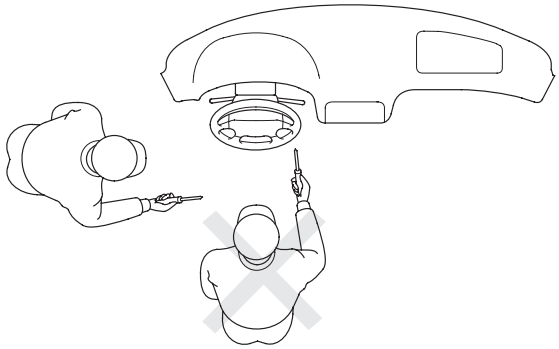
- To prevent damage to the airbag assembly, keep free from any oil, grease, detergent, or water.



- Store the removed airbag on a secure, flat surface away from any high heat source (exceeding 200°F/93°C).



- Never perform electrical inspections to the airbags, such as measuring resistance.
- Do not position yourself in front of the airbag assembly during removal, inspection, or replacement.



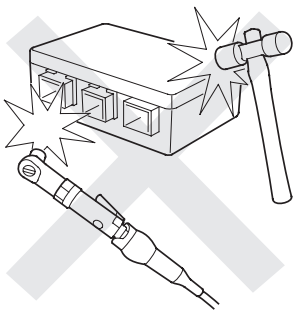
- Refer to the scrapping procedures for disposal of a damaged airbag.

(cont'd)

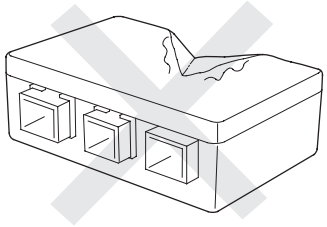
Precautions and Procedures (cont'd)

SRS Unit, Front Sensors and Side Impact Sensors

- Be careful not to bump or impact the SRS unit, front sensors, or the side impact sensors whenever the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF.
- During installation or replacement, be careful not to bump (by impact wrench, hammer, etc.) the area around the SRS unit, front sensors, and the side impact sensor. The airbags could accidentally deploy and cause damage or injury.



- After a collision in which any airbags or seat belt tensioners were deployed, replace the SRS unit, front sensors, and other related components (see page 23-134). After a collision in which a side airbag was deployed, replace the side impact sensor on the deployed side and the SRS unit. After a collision in which the airbags or the side airbags did not deploy, inspect for any damage or any deformation on the SRS unit, front sensors, and the side impact sensors. If there is any damage, replace the SRS unit and/or the side impact sensors.

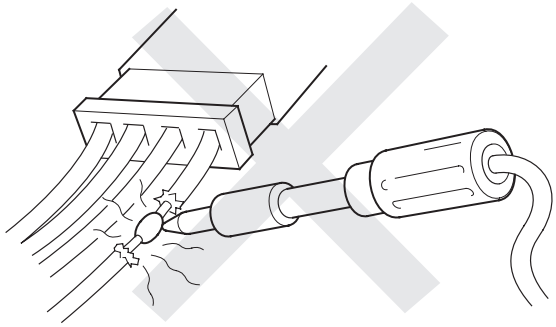


- Do not disassemble the SRS unit or the side impact sensors.
- Turn the ignition switch OFF, disconnect the battery negative cable, and wait at least 3 minutes before beginning installation or replacement of the SRS unit, or disconnecting the connectors from the SRS unit.
- Be sure the SRS unit and side impact sensors are installed securely, with the mounting bolts torqued to 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
- Do not spill water or oil on the SRS unit or the side impact sensors, and keep them away from dust.
- Store the SRS unit and the side impact sensors in a cool (less than 104°F/40°C) and dry (less than 80 % relative humidity, no moisture) area.

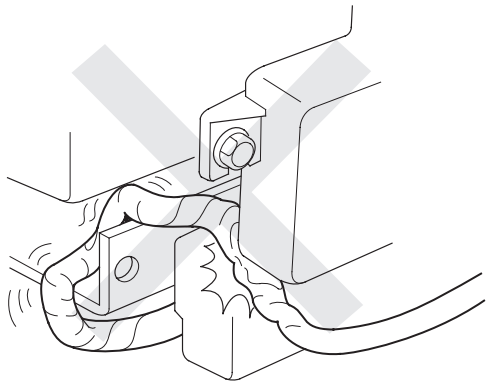
Wiring Precautions

Some of the SRS wiring can be identified by special yellow outer covering, and the SRS connectors can be identified by their yellow color.
Observe the instructions described in this section.

- Never attempt to modify, splice, or repair SRS wiring. If there is an open or damage in SRS wiring, replace the harness.



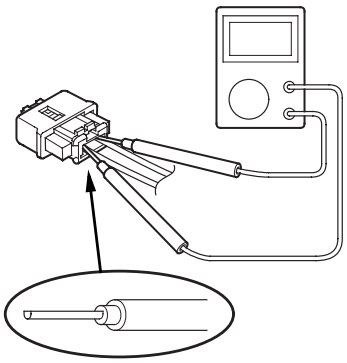
- Be sure to install the harness wires so they do not get pinched or interfere with other parts.



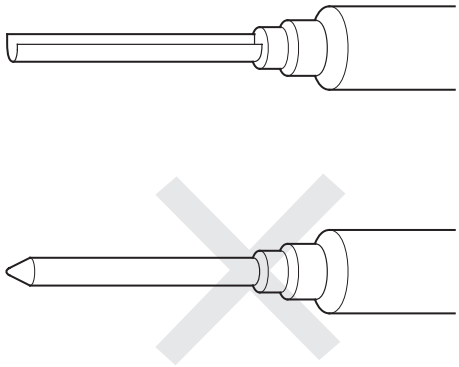
- Make sure all SRS ground locations are clean, and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

Precautions for Electrical Inspections

- When using electrical test equipment, insert the probe of the tester into the wire side of the connector. Do not insert the probe of the tester into the terminal side of the connector, and do not tamper with the connector.



- Use a U-shaped probe. Do not insert the probe forcibly.



- Use specified service connectors in troubleshooting. Using improper tools could cause an error in inspection due to poor metal-to-metal contact.

(cont'd)

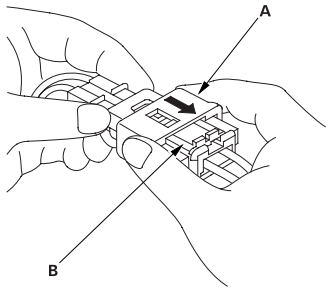
Precautions and Procedures (cont'd)

Spring-loaded Lock Connector

Some SRS system connectors have a spring-loaded lock.

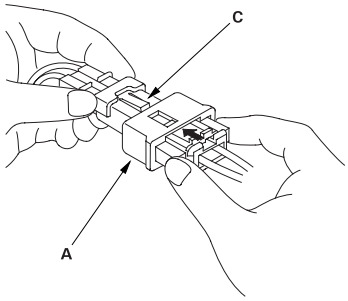
Front Airbag Connectors:

Disconnecting
To release the lock, pull the spring-loaded sleeve (A) toward the stop (B) while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector.

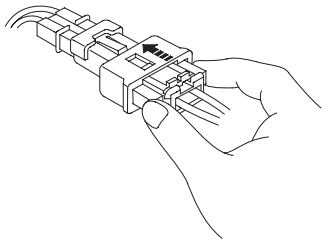


Connecting

1. To reconnect, hold the pawl-side connector, and press on the back of the sleeve-side connector in the direction shown. As the two connector halves are pressed together, the sleeve (A) is pushed back by the pawl (C). Do not touch the sleeve.

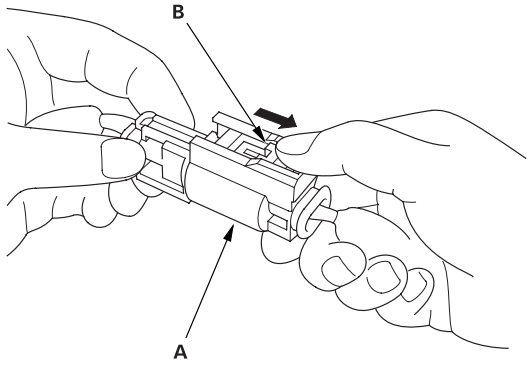


2. When the connector halves are completely connected, the pawl is released, and the spring-loaded sleeve locks the connector.

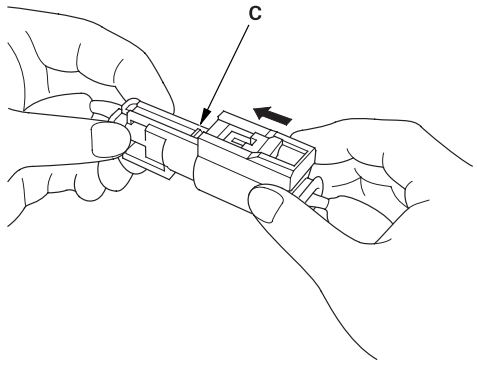


Side Airbag Connector:

Disconnecting
To release the lock, pull the spring-loaded sleeve (A) and the slider (B) while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector half.



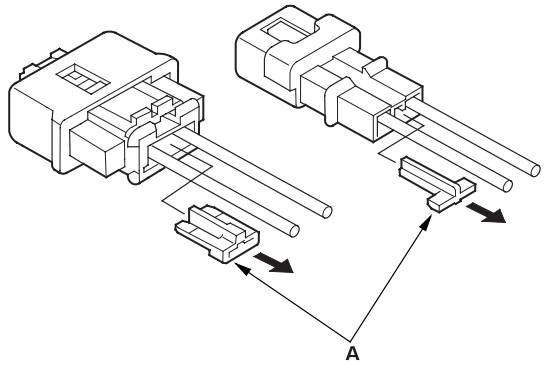
Connecting
Hold both connector halves, and press them firmly together until the projection (C) of the sleeve-side connector clicks.



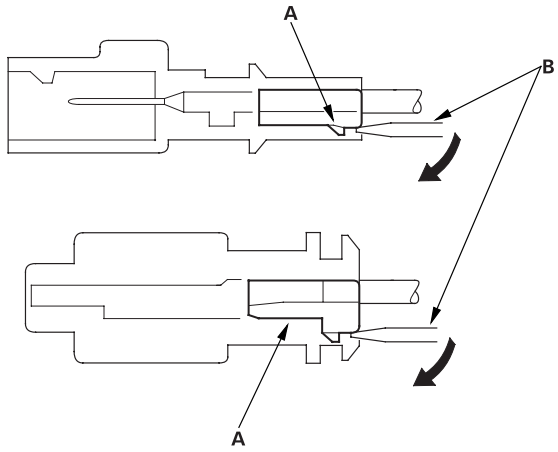
Backprobing Spring-loaded Lock Connectors

When checking voltage or resistance on this type of connector the first time, you must remove the retainer to insert the tester probe from the wire side.

NOTE: It is not necessary to reinstall the removed retainer; the terminals will stay locked in the connector housing.



To remove the retainer (A), insert a flat-tip screwdriver (B) between the connector body and the retainer, then carefully pry out the retainer. Take care not to break the connector.



Seats with Side Airbags

Seats with side airbags have a ''SIDE AIRBAG'' label on the seat-back. Because the component parts (seat-back cover, cushion, etc.) of seats with and without airbags are different, make sure you install only the correct replacement parts.



- When cleaning, do not saturate the seat with liquid, and do not spray steam on the seat.
- Do not repair a torn or frayed seat-back cover. Replace the seat-back cover.
- After a collision in which the side airbag was deployed, replace the side airbag with new parts. If the seat-back cushion is split, it must be replaced. If the seat-back frame is deformed, it must be replaced.
- Never put aftermarket accessories on the seat (covers, pads, seat heaters, lights, etc.).

(cont'd)

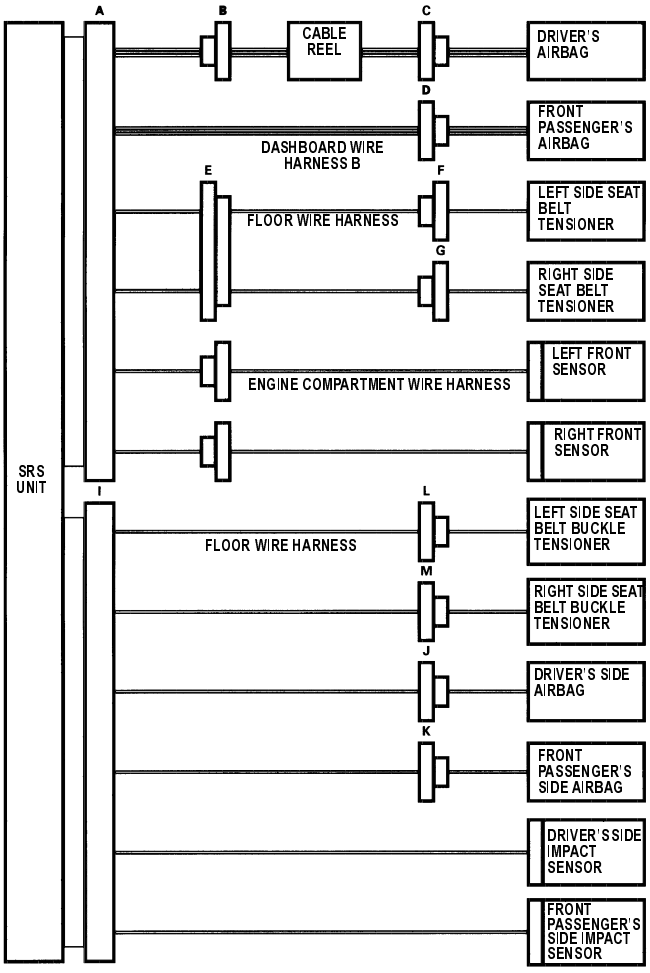
Precautions and Procedures (cont'd)

Seats with Side Airbags (cont'd)

Disconnecting the Airbag Connectors, Side Airbag Connectors, Seat Belt Buckle Tensioner Connectors and Seat Belt Tensioner Connectors

Before removing a front airbag, side airbag or other SRS related devices (the SRS unit, the cable reel, the side impact sensors, the seat belt buckle tensioners and the seat belt tensioner connector), disconnecting connectors from related devices, or removing the dashboard or the steering column, disconnect the airbag connectors or the side airbag connectors to prevent accidental deployment.
Turn the ignition switch OFF and disconnect the negative cable from the battery, and wait at least 3 minutes before beginning the following procedures.

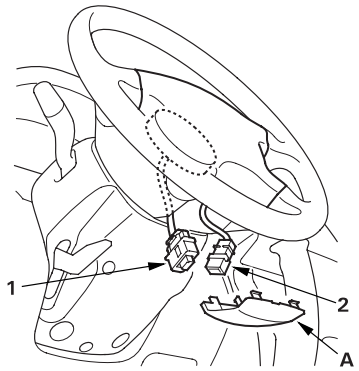
- Before disconnecting the dashboard wire harness B 18P connector (A) from the SRS unit, disconnect the driver's airbag 2P connector (C), the front passenger's airbag 2P connector (D), the left side seat belt tensioner 2P connector (F), and the right side seat belt tensioner 2P connector (G).
- Before disconnecting the floor wire harness 18P connector (I) from the SRS unit, disconnect both side airbag 2P connectors (J, K) and both seat belt buckle tensioner 4P connector (L, M).
- Before disconnecting the cable reel 4P connector (B), disconnect the driver's airbag 2P connector (C).
- Before disconnecting the floor wire harness 4P connector (E), disconnect both seat belt tensioner 2P connectors (F, G).



1. Disconnect the negative battery cable, and wait at least 3 minutes.

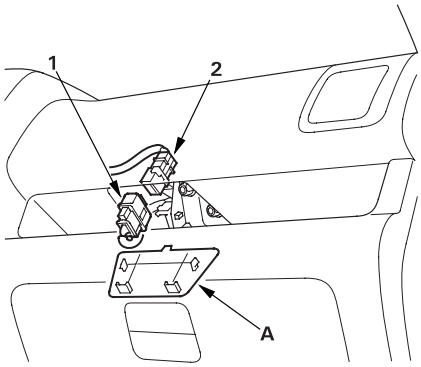
Driver's Airbag

2. Remove the access panel (A) from the steering wheel, then disconnect the driver's airbag 2P connector (1) from the cable reel 2P connector (2).



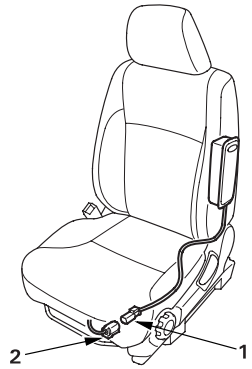
Front Passenger's Airbag

3. Remove the access panel (A), then disconnect the front passenger's airbag 2P connector (1) from the dashboard wire harness B 2P connector (2).



Side Airbag

4. Disconnect both side airbag 2P connectors (1) from the floor wire harness 2P connectors (2).



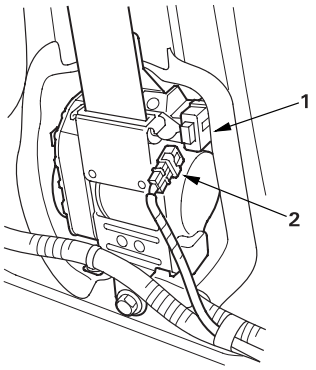
(cont'd)

Precautions and Procedures (cont'd)

Seats with Side Airbags (cont'd)

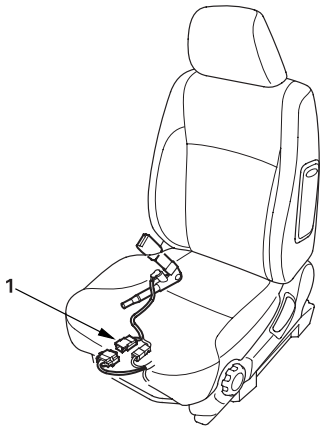
Seat Belt Tensioner

5. Disconnect both seat belt tensioner 2P connectors (1) from the floor wire harness 2P connector (2).



Seat Belt Buckle Tensioner

6. Disconnect both seat belt buckle tensioner 4P connectors (1).



General Troubleshooting Information

DTC (Diagnostic Trouble Codes)

The self-diagnostic function of the SRS system allows it to locate the causes of system problems and then store this information in memory. For easier troubleshooting, this data can be retrieved via a data link circuit.

- When you turn the ignition switch ON (II), the SRS indicator will come on. If it goes off after 6 seconds, the system is normal.
- If there is an abnormality, the system locates and defines the problem, stores this information in memory, and turns the SRS indicator on. The data will remain in the memory even when the ignition switch is turned off or if the battery is disconnected.
- When you connect the Honda PGM Tester to the 16P data link connector (DLC) to short the SCS terminal, and turn the ignition switch ON (II), the SRS indicator will indicate the diagnostic trouble code (DTC) by the number of blinks.
- After reading and recording the DTC, proceed with the troubleshooting procedure for this code.

Precautions

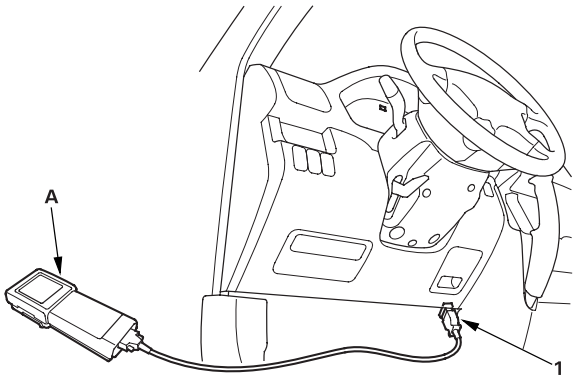
- Use only a digital multimeter to check the system. If it's not a Honda multimeter, make sure it's output is 10 mA (0.01A) or less when switched to the smallest value in the ohmmeter range. A tester with a higher output could damage the airbag circuit or cause accidental airbag deployment and possible injury.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than 3 minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- Before you remove the SRS main harness, disconnect the driver's airbag connector, the front passenger's airbag connector, both side airbag connectors, both seat belt buckle tensioner connectors, and both seat belt tensioner connectors.
- Make sure the battery is sufficiently charged. If the battery is dead or low, measuring values won't be correct.
- Do not touch a tester probe to the terminals in the SRS unit or harness connectors, and do not connect the terminals with a jumper wire. Use only the backprobe set and the Honda PGM Tester. Backprobe spring-loaded lock type connectors correctly.

Reading the DTC

When the SRS indicator is on, read the DTC using either of the following methods:

PGM Tester "SRS" Menu Method

Connect the Honda PGM Tester (A) to the 16P Data Link Connector (DLC)(1), and follow the Tester's prompts in the "SRS" menu. If the Tester indicates no DTC, DTC 3-6 to 3-10, DTC 4-6 to 4-10, DTC 9-1, or DTC 9-2, double-check by selecting "SCS" on the display, and watching the SRS indicator.



(cont'd)

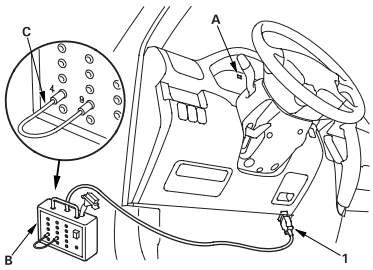
General Troubleshooting Information (cont'd)

DTC (Diagnostic Trouble Codes) (cont'd)

"SCS" Menu Method (retrieving the flash codes):

The SRS indicator (A) indicates the DTC by the number of blinks when the DTC pin box (B) is connected to the Data Link Connector (DLC)16P (1).

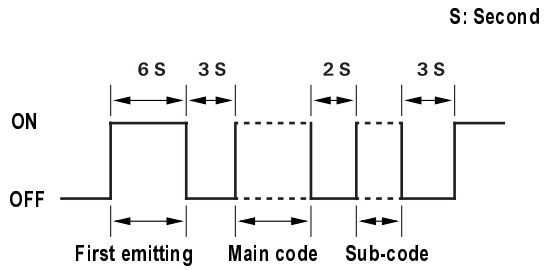
1. Make sure the ignition switch is OFF, and wait for 10 seconds. Then connect the DLC pin box (A) to the Data Link Connector (DLC) 16P. If you don't wait 10 seconds, the SRS unit won't be completely reset or output DTCs.



2. Connect the DLC pin box terminals No. 4 and No. 9 with a jumper wire (C), and push the operation switch.
3. Turn the ignition switch ON (II). The SRS indicator comes on for about 6 seconds, and then goes off. Then it will indicate the DTC.
4. Read the DTC.
5. Turn the ignition switch OFF, and wait for 10 seconds. Then disconnect the DLC pin box from the Data Link Connector (DLC) 16P.
6. Proceed with the troubleshooting procedure for this DTC.

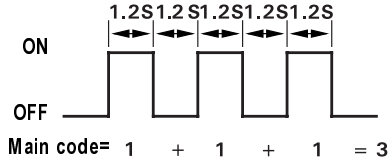
Patterns of DTC Indications:

The DTC consists of a main code and sub-code

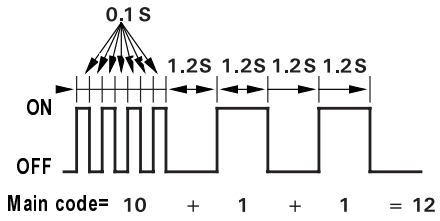


Reading the main code:

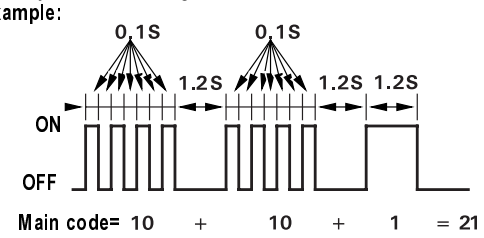
In case of 1 ~ 10
Count the number of blinks.
Example:



In case of 11 ~ 15
Four continious blinks count as 10.
Add any further blinks togeter as shown.
Example:



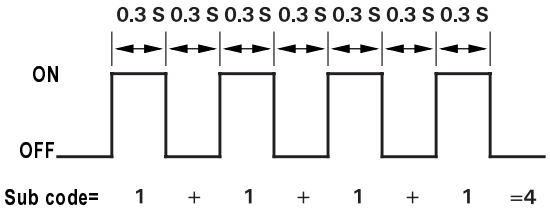
In case of 20 or more
Two sets of four continious blinks count as 20.
Add any further blinks togeter as shown.
Example:



Reading the sub code:

Count the number of blinks.

Example:

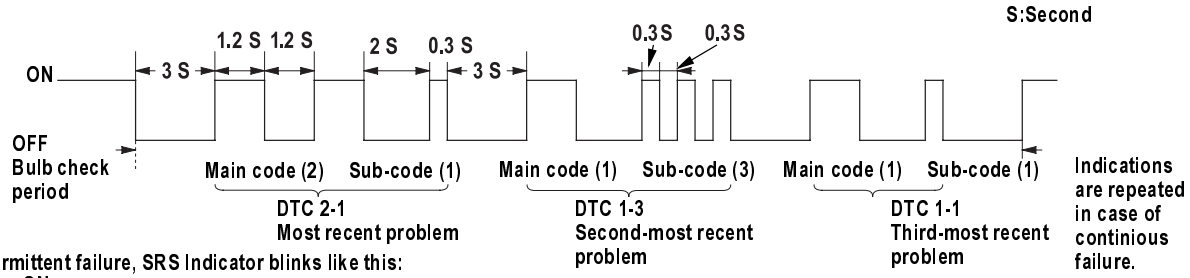


If the main code is '3', and the sub code is '4', record a DTC 3-4.

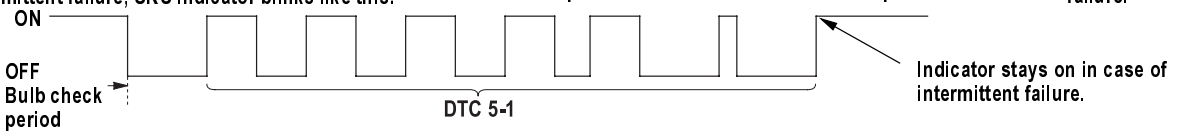
- Including the most recent problem, up to three different DTCs can be indicated (see example 1 below).
- In case of a continuous failure, the DTC will be indicated repeatedly (see example 1 below).
- In case of an intermittent failure, the SRS indicator will indicate the DTCs one time, then it will stay on (see example 2 below).
- If both a continuous and an intermittent failure occur, both DTCs will be indicated as continuous failures.
- When the system is normal (no DTCs), the SRS indicator will stay on (see example 3).
- If the SRS indicator comes on continuously without a DTC, there may be a problem with the system.
- If the SRS indicator does not come on as indicated above, always check for an open or a short to ground in the SCS circuit before troubleshooting the system.

Example of DTC Indications:

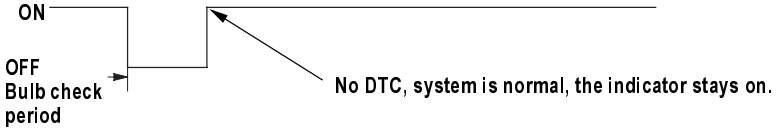
1. Continious failure, SRS Indicator blinks like this:



2. Intermittent failure, SRS Indicator blinks like this:



3. Normal (no failure), SRS Indicator blinks like this:



(cont'd)

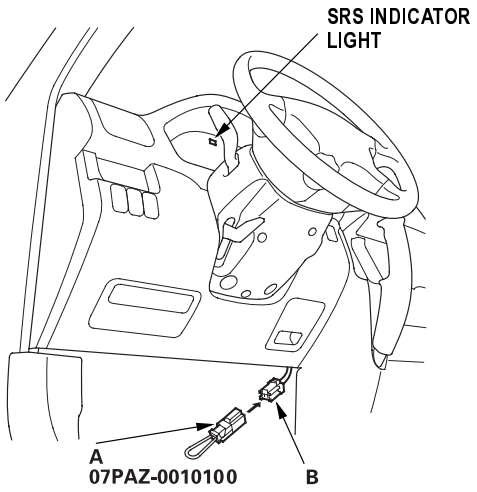
General Troubleshooting Information (cont'd)

DTC (Diagnostic Trouble Codes) (cont'd)

Reading the SRS Indicator Method (with service check connector (2P) models):

The SRS indicator indicates the DTC by the number of blinks when the SCS short connector is connected to the service check connector (2P).

1. Make sure the ignition switch is OFF, and wait for 10 seconds. Then connect the SCS short connector (A) to the service check connector (2P) (B). If you don't wait 10 seconds, the SRS unit won't be completely reset or output DTCs.



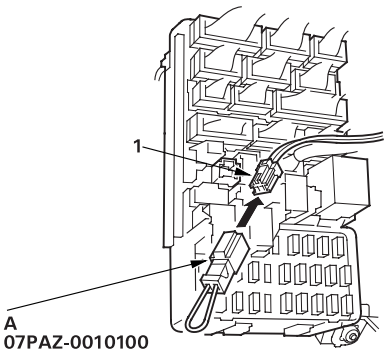
2. Turn the ignition switch ON (II). The SRS indicator comes on for about 6 seconds, and then goes off. Then it will indicate the DTC.
3. Read the DTC.
4. Turn the ignition switch OFF, and wait for 10 seconds. Then disconnect the SCS short connector from the service check connector (2P).

Erasing the DTC Memory

Special Tools Required
SCS short connector 07PAZ-0010100

To erase the DTC(s) from the SRS unit, use a Honda PGM Tester (see the Honda PGM Tester SRS vehicle System Supplement) or the following procedure.

1. Make sure the ignition switch is OFF.
2. Connect the SCS short connector (A) to the MES connector (2P) (1). Do not use a jumper wire.



3. Turn the ignition switch ON (II).
4. The SRS indicator will come on for about 6 seconds, and then go off. Remove the SCS short connector from the MES connector (2P) within 4 seconds after the indicator goes off.
5. The SRS indicator will come on again. Reconnect the SCS short connector to the MES connector (2P) within 4 seconds after the indicator comes on.
6. When the SRS indicator goes off, remove the SCS short connector from the MES connector (2P) within 4 seconds.
7. The SRS indicator will blink two times indicating that the memory has been erased.
8. Turn the ignition switch OFF, and wait for 10 seconds.
9. Turn the ignition switch ON (II) again. The SRS is OK if the SRS indicator comes on for 6 seconds and then goes off.

Troubleshooting Intermittent Failures

If there was a malfunction, but it doesn't recur, it will be stored in the memory as an intermittent failure, and the SRS indicator will come on.

After checking the DTC, troubleshoot as follows:

1. Read the DTC (see “Reading the DTC”).
2. Erase the DTC memory (see “Erasing the DTC Memory”).
3. With the shift lever in Park or neutral, start the engine, and let it idle.
4. The SRS indicator will come on for about 6 seconds and then go off.
5. Shake the wire harness and the connectors, take a test drive (quick acceleration, quick braking, cornering), turn the steering wheel fully left and right, and hold it there for 5 to 10 seconds. If the problem recurs, the SRS indicator will come on.
6. If you can't duplicate the intermittent failure, the system is OK at this time.

(cont’d)

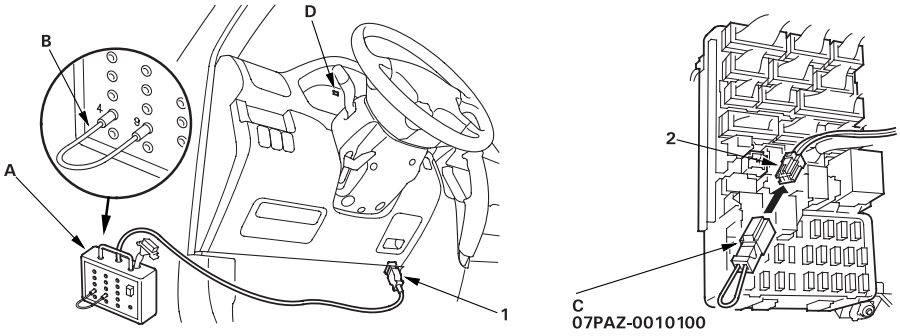
General Troubleshooting Information (cont'd)

Initializing the OPDS (Occupant Position Detection System) Unit

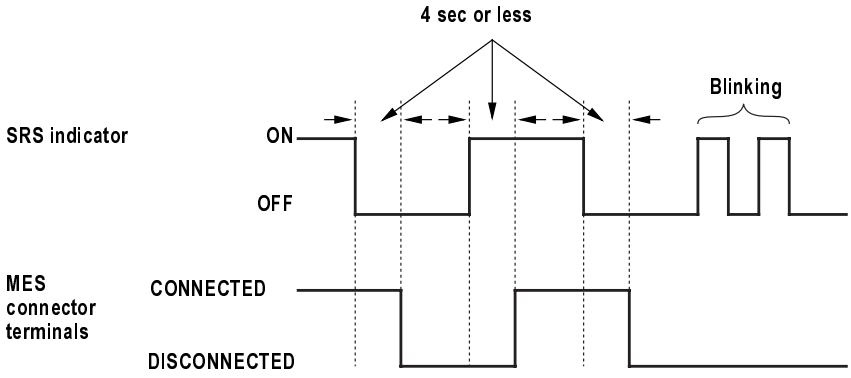
Special Tools Required
SCS short connector 07PAZ-0010100
DLC pin box 07WAJ-0010100

When a seat-back cover, seat-back cushion, and/or OPDS unit is replaced, initialize the OPDS by following the procedure below.
NOTE: Make sure the passenger's seat is dry. Set the seat-back in the normal position, and make sure there is nothing on the front passenger's seat.

1. Make sure the ignition switch is OFF.
2. Connect a DLC pin box (A) to the DLC (16P) (1), and connect the DLC pin box terminals No.4 and No.9 with a jumper wire (B), and push the operation switch.
3. Connect the SCS short connector (C) to the MES connector (2P) (2). Do not use a jumper wire.



4. Turn the ignition switch ON (II).
5. The SRS indicator (D) comes on for about 6 seconds and goes off. Remove the SCS short connector from the MES connector within 4 seconds after the SRS indicator went off.
6. The SRS indicator comes on again. Reconnect the SCS short connector to the MES connector within 4 seconds after the SRS indicator comes on.
7. The SRS indicator goes off. Remove the SCS short connector from the MES connector within 4 seconds.
8. Watch the SRS indicator.
   - If the indicator blinks two times and then stays on, the OPDS is initialized, but the DTCs need to be erased. Go to step 9, then erase the DTCs.
   - If the indicator blinks two times and then goes off, the OPDS unit is initialized. Go to step 9.
   - If the indicator stays on without first blinking, the OPDS is not initialized. Read the DTC, and go to the appropriate page in the DTC Troubleshooting Index.
9. Turn the ignition switch off, and disconnect the DLC pin box from the DLC (16P).



DTC Troubleshooting Index

Without Side Airbag and Seat belt buckle tensioner Model(DENSO)

DTC	Detection Item	Notes
1-1	Open in driver's airbag inflator	(see page 23-45)
1-2	Increased resistance in driver's airbag inflator	(see page 23-45)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-48)
1-4	Short to power in driver's airbag inflator	(see page 23-50)
1-5	Short to ground in driver's airbag inflator	(see page 23-52)
2-1	Open in front passenger's airbag inflator	(see page 23-54)
2-2	Increased resistance in front passenger's airbag inflator	(see page 23-54)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-55)
2-4	Short to power in front passenger's airbag inflator	(see page 23-57)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-58)
3-1	Open in left side seat belt tensioner	(see page 23-60)
3-2	Increased resistance in left side seat belt tensioner	(see page 23-60)
3-3	Short to another wire or decreased resistance in left side seat belt tensioner	(see page 23-62)
3-4	Short to power in left side seat belt tensioner	(see page 23-64)
3-5	Short to ground in left side seat belt tensioner	(see page 23-66)
4-1	Open in right side seat belt tensioner	(see page 23-74)
4-2	Increased resistance in right side seat belt tensioner	(see page 23-74)
4-3	Short to another wire or decreased resistance in right side seat belt tensioner	(see page 23-76)
4-4	Short to power in right side seat belt tensioner	(see page 23-78)
4-5	Short to ground in right side seat belt tensioner	(see page 23-80)
5-1	Internal failure of SRS unit NOTE: Before troubleshooting DTCs 5-1 through 8-6, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-88)
5-2		
5-4		
6-4		
7-1		
7-2		
7-3		
8-1		
8-2		
8-3		
8-4		
8-5		
8-6		
9-1	Internal failure of the SRS unit. If intermittent, could mean internal failure of the unit or a faulty indicator circuit. Refer to Troubleshooting Intermittent Failures (see page 23-29).	(see page 23-88)
9-2	Internal failure of the SRS unit. If intermittent, could mean internal failure of the power supply (VB line). Refer to Troubleshooting Intermittent Failures (see page 23-29).	
9-6	Faulty left front sensor	(see page 23-90)
9-7	Faulty right front sensor	(see page 23-93)

(cont'd)

DTC Troubleshooting Index (cont'd)

With Seat belt buckle tensioner, without Side Airbag Model (DENSO)

DTC	Detection Item	Notes
1-1	Open in driver's airbag inflator	(see page 23-45)
1-2	Increased resistance in driver's airbag inflator	(see page 23-45)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-48)
1-4	Short to power in driver's airbag inflator	(see page 23-50)
1-5	Short to ground in driver's airbag inflator	(see page 23-52)
2-1	Open in front passenger's airbag inflator	(see page 23-54)
2-2	Increased resistance in front passenger's airbag inflator	(see page 23-54)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-55)
2-4	Short to power in front passenger's airbag inflator	(see page 23-57)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-58)
3-1	Open in left side seat belt tensioner	(see page 23-60)
3-2	Increased resistance in left side seat belt tensioner	(see page 23-60)
3-3	Short to another wire or decreased resistance in left side seat belt tensioner	(see page 23-62)
3-4	Short to power in left side seat belt tensioner	(see page 23-64)
3-5	Short to ground in left side seat belt tensioner	(see page 23-66)
21-1	Open in left side seat belt buckle tensioner	(see page 23-68)
21-2	Increased resistance in left side seat belt buckle tensioner	(see page 23-68)
21-3	Short to another wire or decreased resistance in left side seat belt buckle tensioner	(see page 23-69)
21-4	Short to power in left side seat belt buckle tensioner	(see page 23-71)
21-5	Short to ground in left side seat belt buckle tensioner	(see page 23-72)
4-1	Open in right side seat belt tensioner	(see page 23-74)
4-2	Increased resistance in right side seat belt tensioner	(see page 23-74)
4-3	Short to another wire or decreased resistance in right side seat belt tensioner	(see page 23-76)
4-4	Short to power in right side seat belt tensioner	(see page 23-78)
4-5	Short to ground in right side seat belt tensioner	(see page 23-80)
22-1	Open in right side seat belt buckle tensioner	(see page 23-82)
22-2	Increased resistance in right side seat belt buckle tensioner	(see page 23-82)
22-3	Short to another wire or decreased resistance in right side seat belt buckle tensioner	(see page 23-83)
22-4	Short to power in right side seat belt buckle tensioner	(see page 23-85)
22-5	Short to ground in right side seat belt buckle tensioner	(see page 23-86)

DTC	Detection Item	Notes
5-1	Internal failure of SRS unit NOTE: Before troubleshooting DTCs 5-1 through 8-6, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-88)
5-2		
5-4		
6-4		
7-1		
7-2		
7-3		
8-1		
8-2		
8-3		
8-4		
8-5		
8-6		
9-1	Internal failure of the SRS unit. If intermittent, could mean internal failure of the unit or a faulty indicator circuit. Refer to Troubleshooting Intermittent Failures (see page 23-29).	(see page 23-88)
9-2	Internal failure of the SRS unit. If intermittent, could mean internal failure of the power supply (VB line). Refer to Troubleshooting Intermittent Failures (see page 23-29).	
9-6	Faulty left front sensor	(see page 23-90)
9-7	Faulty right front sensor	(see page 23-93)

(cont'd)

DTC Troubleshooting Index (cont'd)

With Seat belt buckle tensioner and Side Airbag, without OPDS Unit Model (KEIHIN, SIEMENS)

DTC	Detection Item	Notes
1-1	Open or increased resistance in driver's airbag inflator	(see page 23-45)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-48)
1-4	Short to power in driver's airbag inflator	(see page 23-50)
1-5	Short to ground in driver's airbag inflator	(see page 23-52)
2-1	Open or increased resistance in front passenger's airbag inflator	(see page 23-54)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-55)
2-4	Short to power in front passenger's airbag inflator	(see page 23-57)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-58)
3-1	Open or increased resistance in left side seat belt tensioner	(see page 23-60)
3-3	Short to another wire or decreased resistance in left side seat belt tensioner	(see page 23-62)
3-4	Short to power in left side seat belt tensioner	(see page 23-64)
3-5	Short to ground in left side seat belt tensioner	(see page 23-66)
21-1	Open or increased resistance in left side seat belt buckle tensioner	(see page 23-68)
21-3	Short to another wire or decreased resistance in left side seat belt buckle tensioner	(see page 23-69)
21-4	Short to power in left side seat belt buckle tensioner	(see page 23-71)
21-5	Short to ground in left side seat belt buckle tensioner	(see page 23-72)
4-1	Open or increased resistance in right side seat belt tensioner	(see page 23-74)
4-3	Short to another wire or decreased resistance in right side seat belt tensioner	(see page 23-76)
4-4	Short to power in right side seat belt tensioner	(see page 23-78)
4-5	Short to ground in right side seat belt tensioner	(see page 23-80)
22-1	Open or increased resistance in right side seat belt buckle tensioner	(see page 23-82)
22-3	Short to another wire or decreased resistance in right side seat belt buckle tensioner	(see page 23-83)
22-4	Short to power in right side seat belt buckle tensioner	(see page 23-85)
22-5	Short to ground in right side seat belt buckle tensioner	(see page 23-86)
5-1	Internal failure of SRS unit NOTE: Before troubleshooting DTCs 5-1 through 8-6, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-88)
5-2		
5-4		
5-8		
6-3		
6-4		
6-7		
6-8		
7-1		
7-2		
7-3		
8-1		
8-2		
8-3		
8-4		
8-5		
8-6		

DTC	Detection Item	Notes
9-1	Internal failure of the SRS unit. If intermittent, could mean internal failure of the unit or a faulty indicator circuit. Refer to Troubleshooting Intermittent Failures (see page 23-29).	(see page 23-88)
9-2	Internal failure of the SRS unit. If intermittent, could mean internal failure of the power supply (VB line). Refer to Troubleshooting Intermittent Failures (see page 23-29).	
9-6	Faulty left front sensor	(see page 23-90)
9-7	Faulty right front sensor	(see page 23-93)
10-1	Seat belt tensioners (and airbag(s)) deployed	(see page 23-88)
10-2	Left side airbag deployed	
10-3	Seat belt tensioners (and airbag(s)) and left side airbag deployed	
10-4	Right side airbag deployed	
10-5	Seat belt tensioners (and airbag(s)) and front right side airbag deployed	
10-6	Side airbags deployed	
10-7	Seat belt tensioners (and airbag(s)) and side airbags deployed	
11-1	Open or increased resistance in left side airbag inflator	(see page 23-102)
11-3	Short to another wire or decreased resistance in left side airbag inflator	(see page 23-103)
11-4	Short to power in left side airbag inflator	(see page 23-105)
11-5	Short to ground in left side airbag inflator	(see page 23-106)
12-1	Open or increased resistance in right side airbag inflator	(see page 23-96)
12-3	Short to another wire or decreased resistance in right side airbag inflator	(see page 23-97)
12-4	Short to power in right side airbag inflator	(see page 23-99)
12-5	Short to ground in right side airbag inflator	(see page 23-100)
13-1	Internal failure of the left side impact sensor	(see page 23-89)
13-2		
13-3	No signal from the left side impact sensor	(see page 23-111)
13-4	Faulty power supply to the left side impact sensor	(see page 23-112)
14-1	Internal failure of the right side impact sensor	(see page 23-89)
14-2		
14-3	No signal from the right side impact sensor	(see page 23-108)
14-4	Faulty power supply to the right side impact sensor	(see page 23-109)

(cont'd)

DTC Troubleshooting Index (cont'd)

Side Airbag with OPDS Unit Model (KEIHIN)

DTC	Detection Item	Notes
1-1	Open or increased resistance in driver's airbag inflator	(see page 23-45)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-48)
1-4	Short to power in driver's airbag inflator	(see page 23-50)
1-5	Short to ground in driver's airbag inflator	(see page 23-52)
2-1	Open or increased resistance in front passenger's airbag inflator	(see page 23-54)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-55)
2-4	Short to power in front passenger's airbag inflator	(see page 23-57)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-58)
3-1	Open or increased resistance in left side seat belt tensioner	(see page 23-60)
3-3	Short to another wire or decreased resistance in left side seat belt tensioner	(see page 23-62)
3-4	Short to power in left side seat belt tensioner	(see page 23-64)
3-5	Short to ground in left side seat belt tensioner	(see page 23-66)
4-1	Open or increased resistance in right side seat belt tensioner	(see page 23-74)
4-3	Short to another wire or decreased resistance in right side seat belt tensioner	(see page 23-76)
4-4	Short to power in right side seat belt tensioner	(see page 23-78)
4-5	Short to ground in right side seat belt tensioner	(see page 23-80)
5-1	Internal failure of SRS unit NOTE: Before troubleshooting DTCs 5-1 through 8-6, check battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS.	(see page 23-88)
5-2		
5-4		
5-8		
6-3		
6-4		
6-7		
6-8		
7-1		
7-2		
7-3		
8-1		
8-2		
8-3		
8-4		
8-5		
8-6		

DTC	Detection Item	Notes
9-1	Internal failure of the SRS unit. If intermittent, could mean internal failure of the unit or a faulty indicator circuit. Refer to Troubleshooting Intermittent Failures (see page 23-29).	(see page 23-88)
9-2	Internal failure of the SRS unit. If intermittent, could mean internal failure of the power supply (VB line). Refer to Troubleshooting Intermittent Failures (see page 23-29).	
9-6	Faulty left front sensor	(see page 23-90)
9-7	Faulty right front sensor	(see page 23-93)
10-1	Seat belt tensioners (and airbag(s)) deployed	(see page 23-88)
10-2	Driver's side airbag deployed	
10-3	Seat belt tensioners (and airbag(s)) and driver's side airbag deployed	
10-4	Front passenger's side airbag deployed	
10-5	Seat belt tensioners (and airbag(s)) and front passenger's side airbag deployed	
10-6	Driver's and front passenger's side airbags deployed	
10-7	Seat belt tensioners (and airbag(s)) and driver's and front passenger's side airbags deployed	
11-1	Open or increased resistance in driver's side airbag inflator	(see page 23-96)
11-3	Short to another wire or decreased resistance in driver's side airbag inflator	(see page 23-97)
11-4	Short to power in driver's side airbag inflator	(see page 23-99)
11-5	Short to ground in driver's side airbag inflator	(see page 23-100)
12-1	Open or increased resistance in front passenger's side airbag inflator	(see page 23-102)
12-3	Short to another wire or decreased resistance in front passenger's side airbag inflator	(see page 23-103)
12-4	Short to power in front passenger's side airbag inflator	(see page 23-105)
12-5	Short to ground in front passenger's side airbag inflator	(see page 23-106)
13-1	Internal failure of the driver's side impact sensor	(see page 23-89)
13-2		
13-3	No signal from the driver's side impact sensor	(see page 23-108)
13-4	Faulty power supply to the driver's side impact sensor	(see page 23-109)
14-1	Internal failure of the front passenger's side impact sensor	(see page 23-89)
14-2		
14-3	No signal from the front passenger's side impact sensor	(see page 23-111)
14-4	Faulty power supply to the front passenger's side impact sensor	(see page 23-112)
15-1	Faulty OPDS unit or OPDS not initialized	(see page 23-114)
15-2	Faulty side airbag cutoff indicator light circuit	(see page 23-118)
15-3	Faulty OPDS sensor	(see page 23-123)

Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
SRS indicator doesn't come on	SRS Indicator Troubleshooting (see page 23-124)	
SRS indicator stays on when in "SCS" menu method	SRS Indicator Troubleshooting (see step 1 on page 23-127)	• Inability to retrieve DTCs with the PGM Tester. Retrieve the flash codes using the SCS menu method (see page 23-26).
Side airbag cutoff indicator stays on after bulb check (If the indicator stays on, it does not set a DTC)	• Make sure nothing is on the front passenger's seat. • Make sure the front passenger's seat isn't wet. If the seat is wet, start the engine, and turn on the air conditioning system for 30 minutes to dry any moisture from the seat. • If the side airbag cutoff indicator stays on after the ignition switch is turned ON (II), initialize the OPDS unit (see page 23-30). - If the side airbag cutoff indicator operates normally, the system is OK. - If the side airbag cutoff indicator stays on, replace the OPDS sensor (see section 20). The sensor is part of the seatback pad.	

System Description

SRS Components

Airbags

The SRS is a safety device which, when used with the seat belt, is designed to help protect the driver and front passenger in a frontal impact exceeding a certain set limit. The system consists of the SRS unit, including safing sensor and impact sensor (A), the cable reel (B), the driver's airbag (C), the front passenger's airbag (D), side airbags (E), seat belt tensioners (I), and front impact sensors (J).

Side Airbags

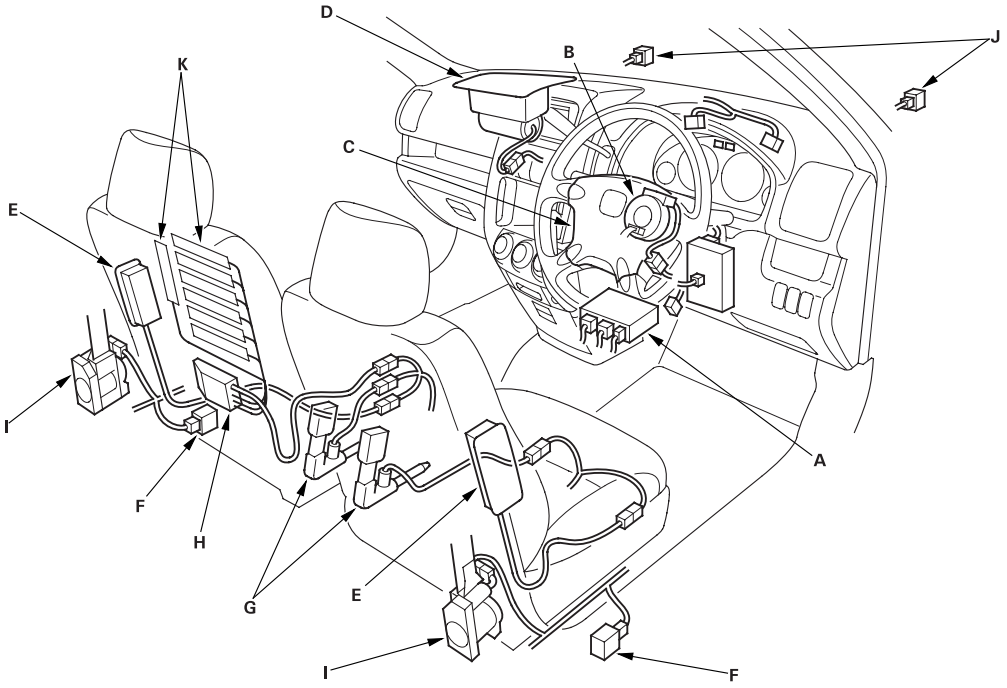
The side airbags (E) are in each front seat-back. They help protect the upper torso of the driver or front seat passenger during a moderate to severe side impact. Side impact sensors (F) in each door sill and in the SRS unit detect such an impact and instantly inflate the driver's or the passenger's side airbag. Only one side airbag will deploy during a side impact. If the impact is on the passenger's side, the passenger's side airbag will deploy even if there is no passenger.

Seat Belt and Seat Belt Buckle Tensioners

The seat belt and seat belt buckle tensioners (G) are linked with the SRS airbags to further increase the effectiveness of the seat belt. In a front-end collision, the tensioners instantly retract the belt and buckle firmly to secure the occupants in their seats.

OPDS

The side airbag system also includes an Occupant Position Detection System (OPDS). This system consists of sensors (K) and a OPDS unit (H) in the front passenger's seat-back. The OPDS unit sends occupant height and position data to the SRS unit. If the SRS unit determines that the front passenger is of small stature (for example, a child) and the front passenger is leaning into the side airbag deployment path, it will automatically disable the airbag. The SRS unit will also disable the airbag when the OPDS detects certain objects on the seat. When the side airbag is disabled, the Side Airbag Cutoff indicator on the instrument panel alerts the driver that the passenger's side airbag will not deploy in a side impact. When the object is removed, or the passenger sits upright, the Side Airbag Cutoff indicator will go off, alerting the driver that the side airbag will deploy in a side impact.



SRS Operation

The main circuit in the SRS unit senses and judges the force of impact and, if necessary, ignites the inflator charges. If battery voltage is too low or power is disconnected due to the impact, the voltage regulator and the back-up power circuit, respectively, will keep voltage at a constant level.

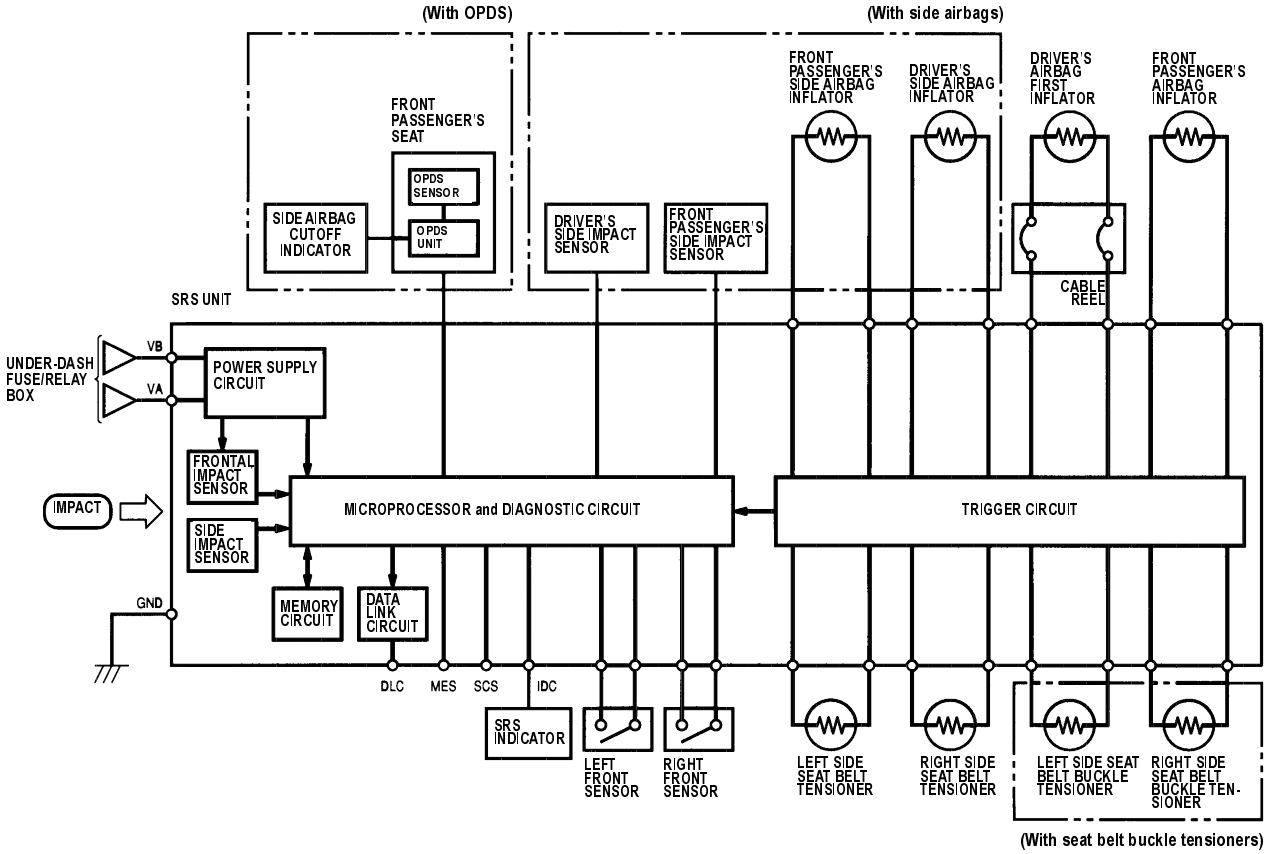
For the SRS to operate:

Driver's and Front Passenger's Airbag(s)

(1) The frontal impact sensor must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals, and depending on the severity of the collision and whether the seat belt buckle switch is ON or OFF, it sends the appropriate signals to the airbag inflator(s).
(3) The inflators that received signals must ignite and deploy the airbag (s).

Side Airbag(s)

(1) The side impact sensors must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals and send them to the side airbag inflator(s). However, the microprocessor cuts off the signals to the front passenger's side airbag if the SRS unit determines that the front passenger's head is in the deployment path of the side airbag.
(3) The inflator that received the signal must ignite and deploy the side airbag.(With Side airbags)

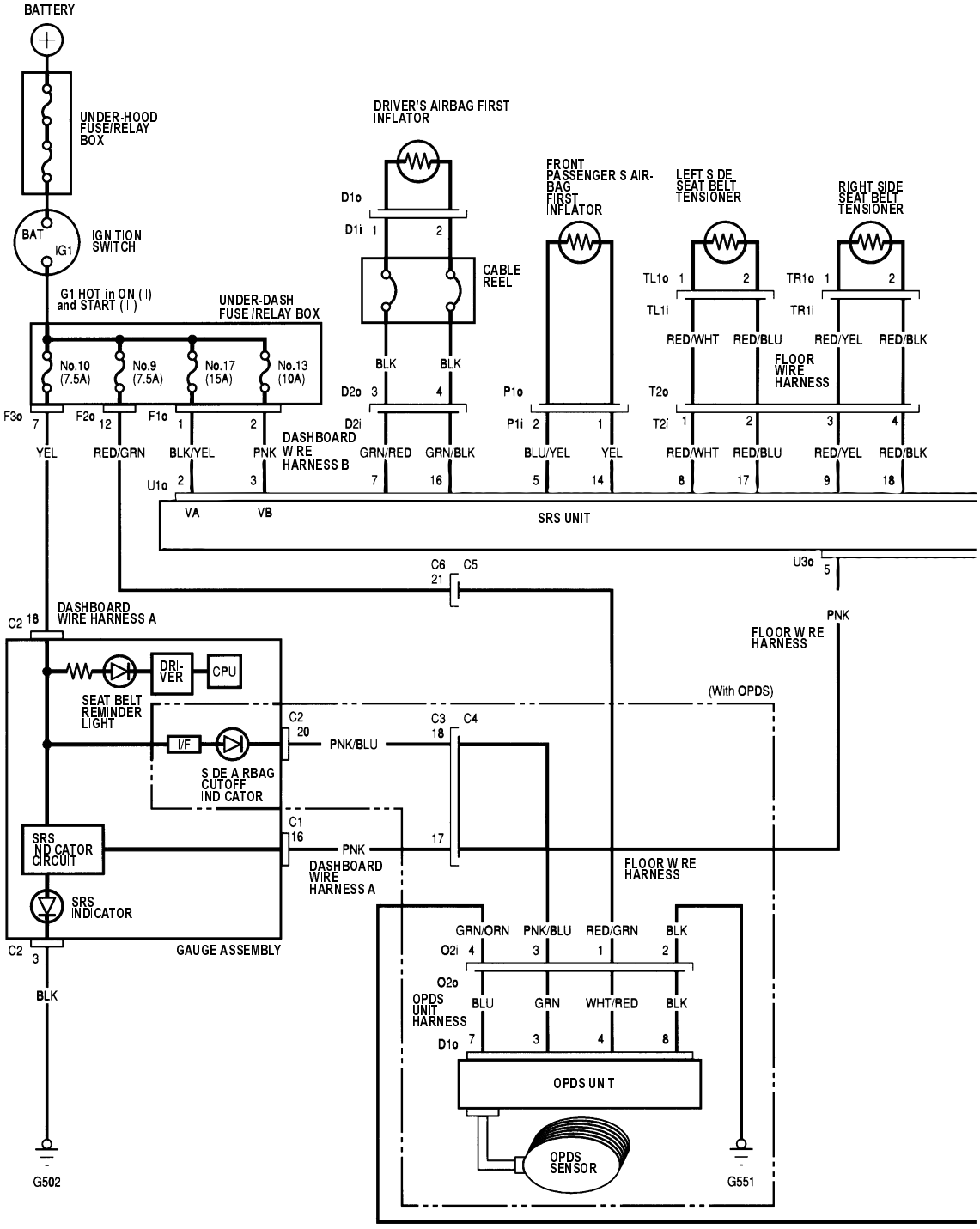


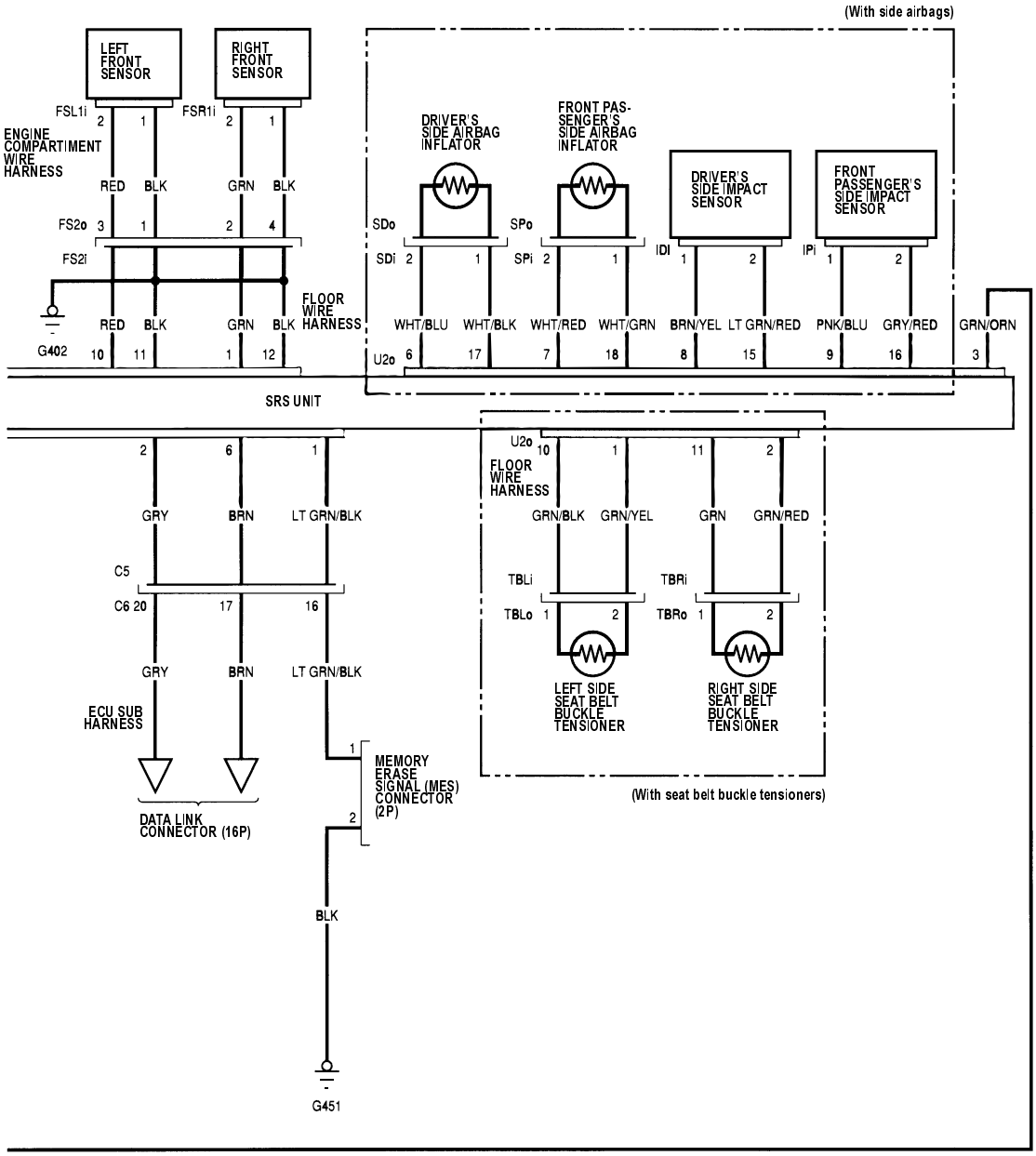
Self-diagnosis System

A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator comes on and goes off after about 6 seconds if the system is operating normally.
If the light does not come on, or does not go off after 6 seconds, or if it comes on while driving, it indicates an abnormality in the system. The system must be inspected and repaired as soon as possible.

For better serviceability, the SRS unit memory stores a DTC that relates to the cause of the malfunction, and the unit is connected to the data link connector (DLC). This information can be read with the Honda PGM Tester when it is connected to the DLC (16P).

Circuit Diagram



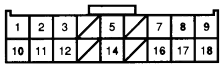

(With side airbags)
LEFT FRONT SENSOR
RIGHT FRONT SENSOR
FSL1i
FSR1i
ENGINE COMPARTMENT WIRE HARNESS
RED BLK GRN BLK
FS2o
FS2i
G402
FLOOR WIRE HARNESS
DRIVER'S SIDE AIRBAG INFLATOR
FRONT PASSENGER'S SIDE AIRBAG INFLATOR
DRIVER'S SIDE IMPACT SENSOR
FRONT PASSENGER'S SIDE IMPACT SENSOR
SDo
SDi
SPo
SPi
IDI
IPi
WHT/BLU WHT/BLK WHT/RED WHT/GRN BRN/YEL LT GRN/RED PNK/BLU GRY/RED GRN/ORN
U2o
SRS UNIT
GRY BRN LT GRN/BLK
C5
C6
ECU SUB HARNESS
DATA LINK CONNECTOR (16P)
MEMORY ERASE SIGNAL (MES) CONNECTOR (2P)
BLK
G451
GRN/BLK GRN/YEL GRN GRN/RED
TBLi
TBLo
TBRi
TBRo
LEFT SIDE SEAT BELT BUCKLE TENSIONER
RIGHT SIDE SEAT BELT BUCKLE TENSIONER
(With seat belt buckle tensioners)

Connectors

Connector No. *1		Wire harness and connector	Terminal		Note *2	Ref. No.
			Male	Female		
U1o		Dashboard wire harness B18P connector		o	(1)	1
U2o		Floor wire harness 18P connector		o	(1)	2
U3o		Floor wire harness 8P connector		o	(1)	3
F1o		Dashboard wire harness B 2P connector		o	(1)	4
F2o		Floor wire harness 18P connector		o		5
F3o		Dashboard wire harness A17P connector		o		6
D1	D1o	Driver's airbag 2P connector		o	(1)(2)	10
	D1i	Cable reel 2P connector	o			9
D2	D2o	Cable reel 4P connector		o	(1)	8
	D2i	Dashboard wire harness B 4P connector	o			7
P1	P1o	Front passenger's airbag 2P connector		o	(1)(2)	10
	P1i	Dashboard wire harness B 2P connector	o			9
TL1	TL1o	Left side seat belt tensioner 2P connector			(1)(2)	10
	TL1i	Floor wire harness 2P connector	o			9
TR1	TR1o	Right side seat belt tensioner 2P connector			(1)(2)	10
	TR1i	Floor wire harness 2P connector	o			9
T2	T2o	Floor wire harness 4P connector	o		(1)	10
	T2i	Dashboard wire harness B 4P connector		o		9
TB	TBLi	Floor wire harness 4P connector		o	(1)	8
	TBLo	Left side seat belt buckle tensioner 4P connector	o			7
	TBRi	Floor wire harness 4P connector		o		8
	TBRo	Right side seat belt buckle tensioner 4P connector	o			7
SD	SDo	Driver's side airbag 2P connector	o		(1)(2)(3)	11
	SDi	Floor wire harness 2P connector		o		12
SP	SPo	Front passenger's side airbag 2P connector	o		(1)(2)(3)	11
	SPi	Floor wire harness 2P connector		o		12
FS	FSL1i	Engine compartment wire harness 2P connector		o	(1)(3)	13
	FSR1i	2P connector		o		13
FS2	FS2o	Engine compartment wire harness 4P connector		o	(1)	8
	FS2i	Dashboard wire harness B 4P connector	o			7
IDi		Floor wire harness 2P connector		o	(1)(3)	13
IPi		Floor wire harness 2P connector		o		13
O1i		OPDS unit harness 8P connector		o		14
O2	O2o	OPDS unit harness 4P connector	o			16
	O2i	Floor wire harness 4P connector		o		15
C1		Dashboard wire harness A 22P connector		o		17
C2		Dashboard wire harness A 22P connector		o		18
C3		Dashboard wire harness A18P connector		o		19
C4		Floor wire harness A18P connector		o		20
C5		Floor wire harness 21P connector		o		21
C6		ECU wire harness 21P connector	o			22

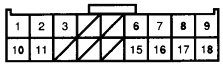
*1: The connector numbers are original in this section that are different from other sections.
*2: Note
(1) Spring loaded lock connector
(2) With built-in short contact connector
(3) Waterproof connector

1. U1o



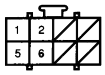
Wire side of female terminals.

2. U2o



Wire side of female terminals.

3. U3o



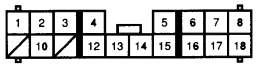
Wire side of female terminals.

4. F1o



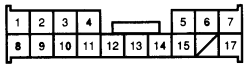
Wire side of female terminals.

5. F2o



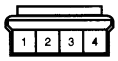
Wire side of female terminals.

6. F3o



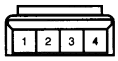
Wire side of female terminals.

7. D2i, T2o, FS2i, TBLo, TBRo



Terminal side of male terminals.

8. D2o, T2i, FS2o, TBLi, TBRi



Terminal side of male terminals.

9. D1i, P1i, TL1i, TR1i



Terminal side of male terminals.

10. D1o, P1o, TL1o, TR1o



Wire side of female terminals.

11. SDo, SPo



Terminal side of male terminals.

12. SDi, SPi



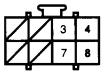
Terminal side of male terminals.

13. IDi, IPi, FSL1i, FSR1i



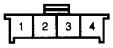
Wire side of female terminals.

14. O1i



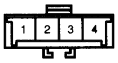
Wire side of female terminals.

15. O2i



Wire side of female terminals.

16. O2o



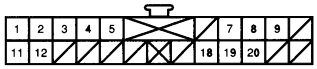
Terminal side of male terminals.

17. C1



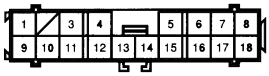
Wire side of female terminals.

18. C2



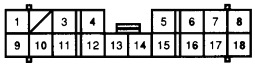
Wire side of female terminals.

19. C3



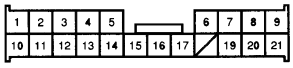
Terminal side of male terminals.

20. C4



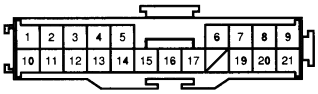
Wire side of female terminals.

21. C5



Wire side of female terminals.

22. C6



Terminal side of male terminals

DTC Troubleshooting

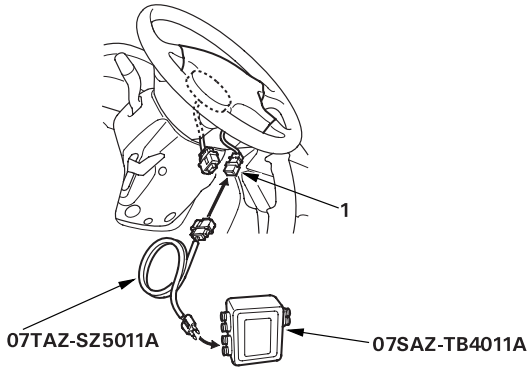
DTC 1-1: Open in Driver's Airbag Inflator
DTC 1-2: Increased Resistance in Driver's Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.
   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the D1o connector from the D1i connector (1).



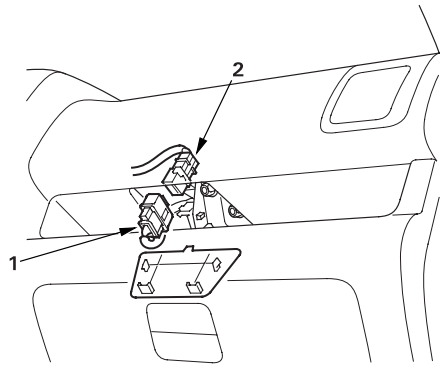
5. Connect the special tool (2 Ω connector) to the D1i connector.

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

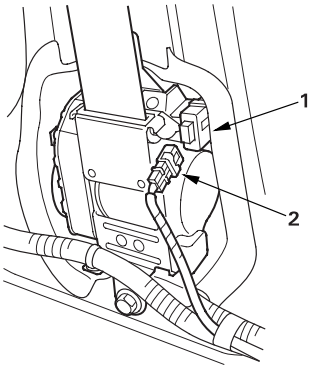
   Is DTC 1-1 or DTC 1-2 indicated?

   Yes Go to step 9.

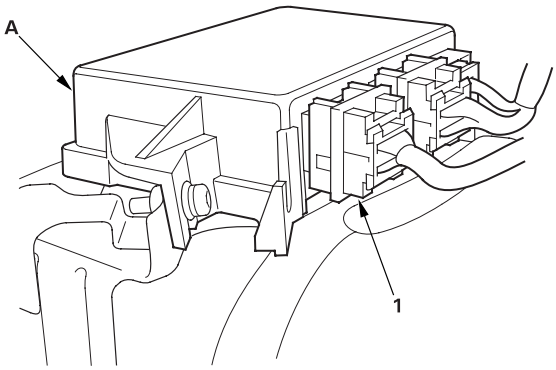
   No Open or increased resistance in the driver's airbag inflator; replace the driver's airbag (see page 23-135).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the P1o connector (1) from the P1i connector (2).



11. Disconnect the TL1o and TR1o connectors (1) from the TL1i and TR1i connectors (2).

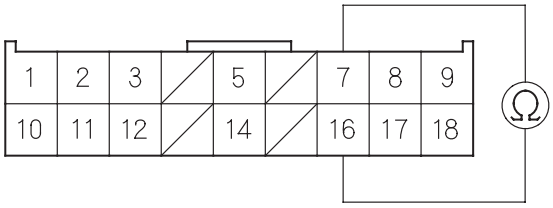


12. Disconnect the U1o connector (1) from the SRS unit (A).



13. Check resistance between the No. 7 and the No. 16 terminals of U1o connector. There should be 2.0 - 3.0 Ω.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit or poor contact at the U1o connector and the SRS unit, check the connection between the U1o connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in dashboard wire harness B or the cable reel; replace dashboard wire harness B or the cable reel.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 1-3: Short to Another Wire or Decreased Resistance in Driver's Airbag Inflator

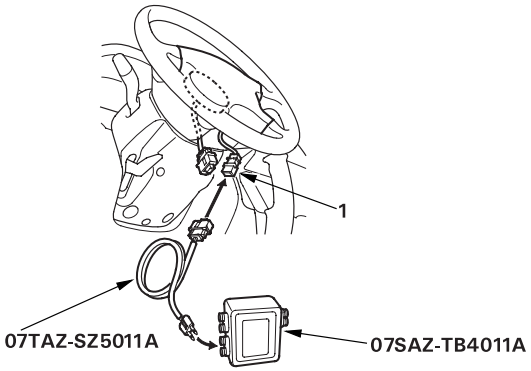
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the D1o connector from the D1i connector (1).

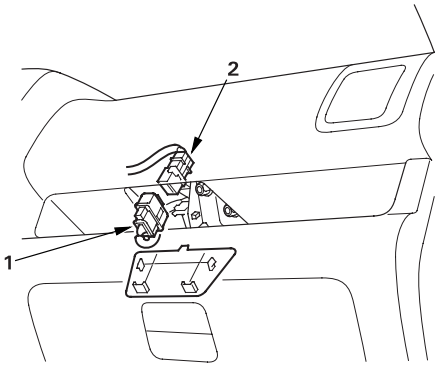


5. Connect the special tool (2 Ω connector) to the D1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

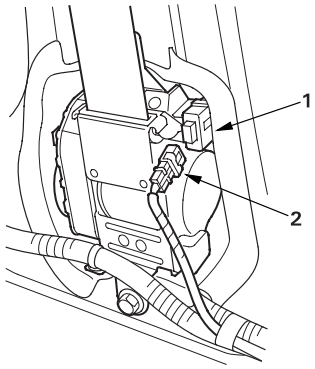
   Is DTC 1-3 indicated?

   Yes Go to step 9.

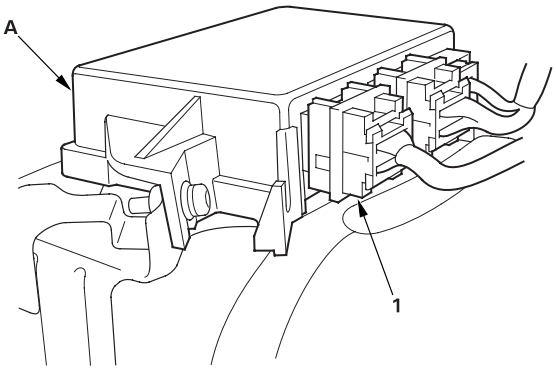
   No Short in the driver's airbag; replace the driver's airbag (see page 23-135).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the P1o connector (1) from the P1i connector (2).



11. Disconnect the TL1o and TR1o connectors (1) from the TL1i and TR1i connectors (2).



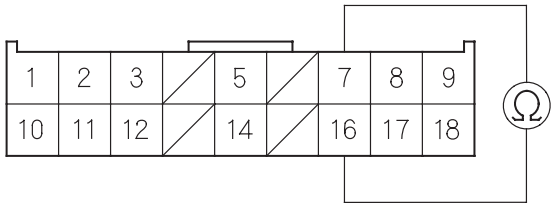
12. Disconnect the U1o connector (1) from the SRS unit (A).



13. Disconnect the special tool from the D1i connector.

14. Check resistance between the No. 7 and the No. 16 terminals of the U1o connector. There should be 1 M Ω or more.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Go to step 15.

15. Disconnect the cable reel from dashboard wire harness B. Check resistance between the No. 7 and the No. 16 terminals of the U1o connector. There should be 1 M Ω or more.

Is the resistance as specified?

Yes Replace the cable reel.■

No Replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 1-4: Short to Power in Driver's Airbag Inflator

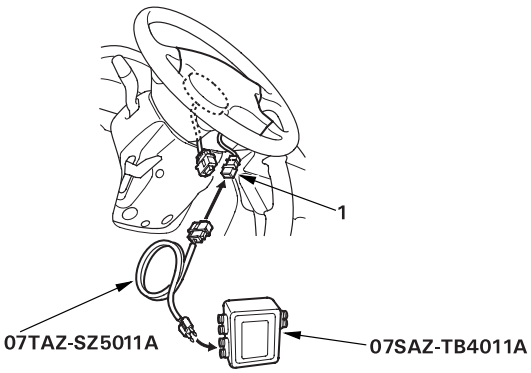
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the D1o connector from the D1i connector (1).

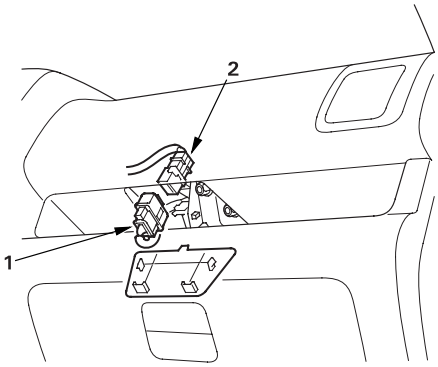


5. Connect the special tool (2 Ω connector) to the D1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

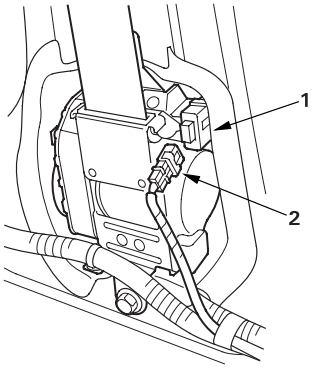
   Is DTC 1-4 indicated?

   Yes Go to step 9.

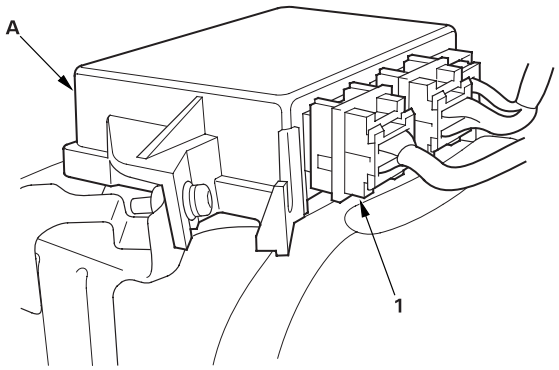
   No Short to power in the driver's airbag; replace the driver's airbag (see page 23-135).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the P1o connector (1) from the P1i connector (2).



11. Disconnect the TL1o and TR1o connectors (1) from the TL1i and TR1i connectors (2).



12. Disconnect the U1o connector (1) from the SRS unit (A).

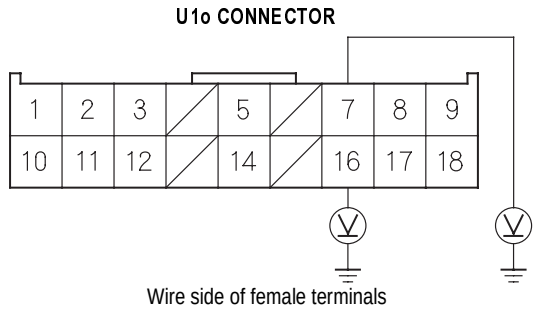


13. Disconnect the special tool from the D1i connector.

14. Reconnect the battery negative cable.

15. Turn the ignition switch ON (II).

16. Check for voltage between the No. 7 terminal of U1o connector and body ground, between the No. 16 terminal and body ground. There should be 0.5 V or less.



Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Go to step 17.

17. Turn the ignition switch OFF.

18. Disconnect the cable reel from the dashboard wire harness.

19. Turn the ignition switch ON (II).

20. Check for voltage between the No. 7 terminal of U1o connector and body ground, between the No. 16 terminal and body ground. There should be 0.5 V or less.

Is the voltage as specified?

Yes Replace the cable reel.■

No Replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 1-5: Short to Ground in Driver's Airbag Inflator

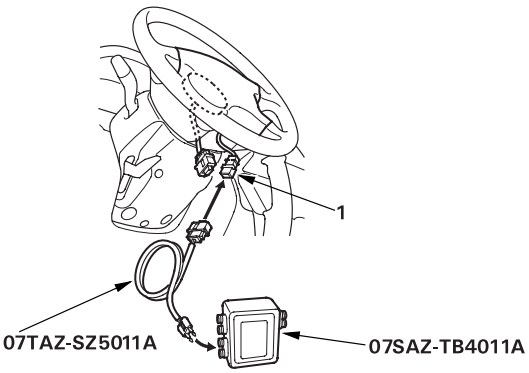
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the D1o connector from the D1i connector (1).

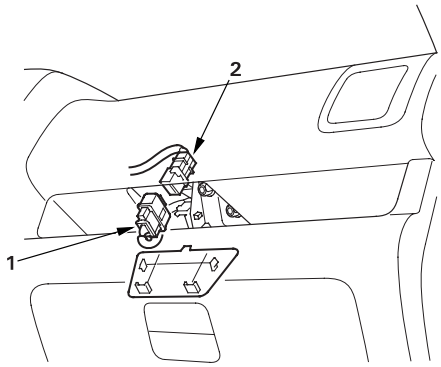


5. Connect the special tool (2 Ω connector) to the D1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

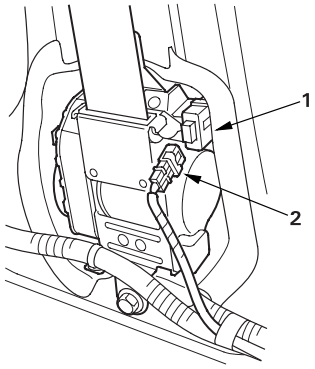
   Is DTC 1-5 indicated?

   Yes Go to step 9.

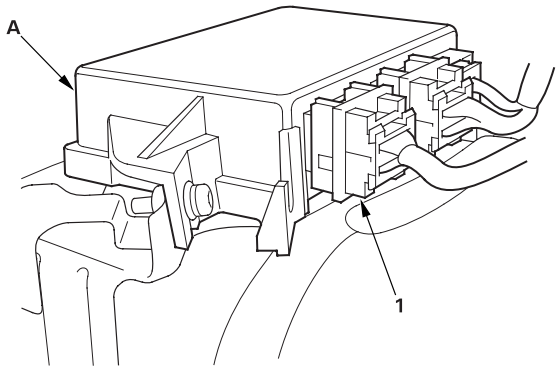
   No Short to ground in the driver's airbag inflator; replace the driver's airbag (see page 23-135).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the P1o connector (1) from the P1i connector (2).



11. Disconnect the TL1o and TR1o connectors (1) from the TL1i and TR1i connectors (2).

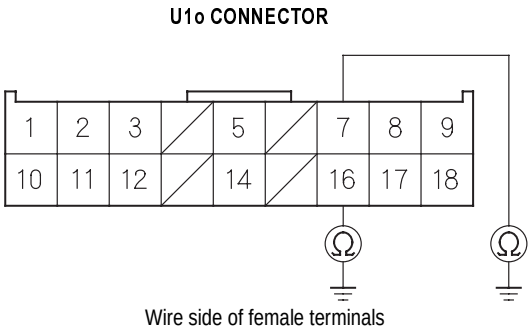


12. Disconnect the U1o connector (1) from the SRS unit (A).



13. Disconnect the special tool from the D1i connector.

14. Check resistance between the No. 7 terminal of U1o connector and body ground, between the No.16 terminal and body ground. There should be 1 M Ω or more.



Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Go to step 15.

15. Disconnect the cable reel from the dashboard wire harness.

16. Check resistance between the No. 7 terminal of U1o connector and body ground, between the No. 16 terminal and body ground. There should be 1 M Ω or more.

Is the resistance as specified?

Yes Replace the cable reel.■

No Replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 2-1: Open in Front Passenger's Airbag Inflator
DTC 2-2: Increased Resistance in Front Passenger's Airbag Inflator

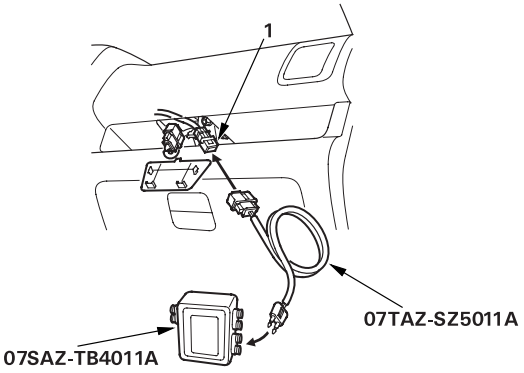
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time.Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the P1o connector from the P1i connector (1).

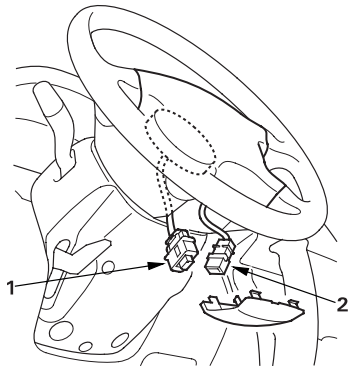


5. Connect the special tool (2 Ω connector) to the P1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

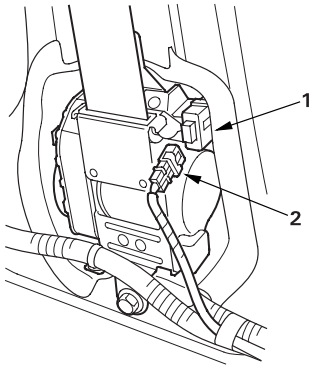
   Is DTC 2-1 or DTC 2-2 indicated?

   Yes Go to step 9.

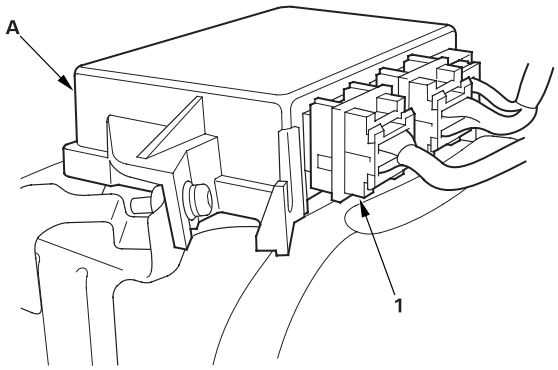
   No Open or increased resistance in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-136).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the D1o connector (1) from the D1i connector (2).



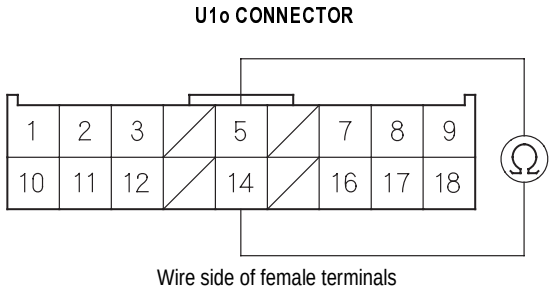
11. Disconnect the TL1o and TR1o connectors (1) from the TL1i and TR1i connectors (2).



12. Disconnect the U1o connector (1) from the SRS unit (A).



13. Check resistance between the No. 5 and No. 14 terminals of U1o connector. There should be 2.0 - 3.0 Ω.



Is the resistance as specified?

Yes Faulty SRS unit or poor contact at the U1o connector; check the connection between U1o connector and the SRS unit. If the connector is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in the dashboard wire harness B; replace dashboard wire harness B.■

DTC 2-3: Short to Another Wire or Decreased Resistance in Front Passenger's Airbag Inflator

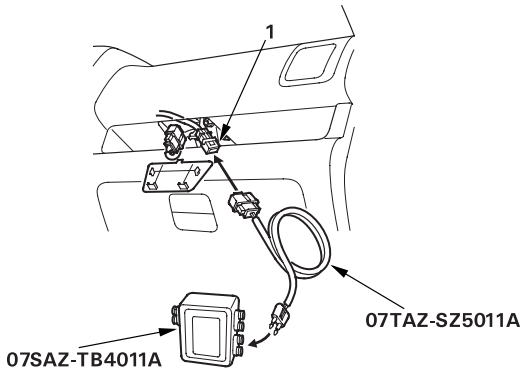
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time.Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the P1o connector from the P1i connector (1).



5. Connect the special tool (2 Ω connector) to the P1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

(cont'd)

DTC Troublshooting (cont'd)

8. Read the DTC.

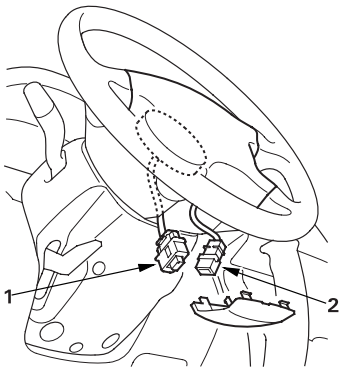
Is DTC 2-3 indicated?

Yes Go to step 9.

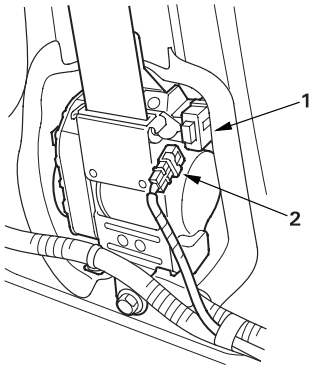
No Short in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-136).■

9. Disconnect the battery negative cable, and wait for 3 minutes.

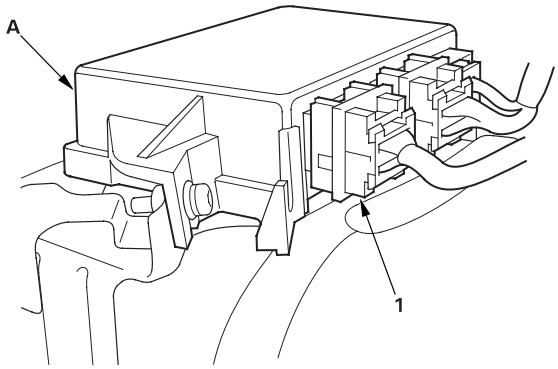
10. Disconnect the D1o connector (1) from the D1i connector (2).



11. Disconnect the TL1o and TR1o connectors (1) from the TL1i and TR1i connectors (2).



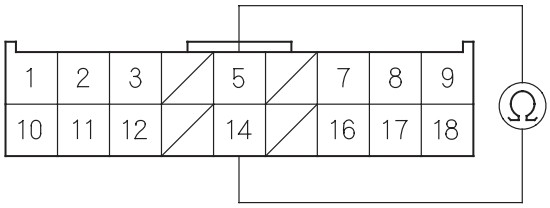
12. Disconnect the U1o connector (1) from the SRS unit (A).



13. Disconnect the special tool from the P1i connector.

14. Check resistance between the No. 5 and No. 14 terminals of U1o connector. There should be 1 Ω or more.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short in dashboard wire harness B; replace dashboard wire harness B.■

DTC 2-4: Short to Power in Front Passenger's Airbag Inflator

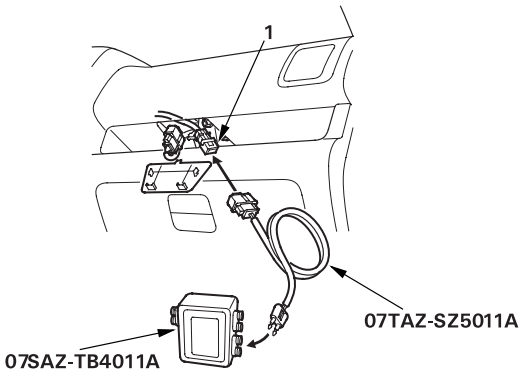
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time.Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the P1o connector from the P1i connector (1).

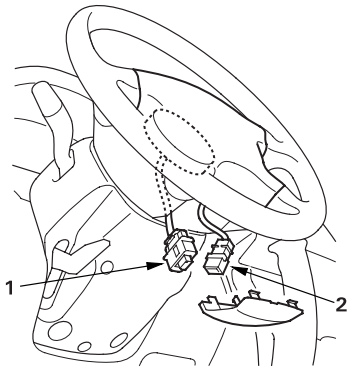


5. Connect the special tool (2 Ω connector) to the P1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

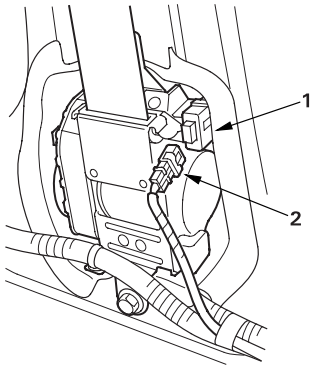
   Is DTC 2-4 indicated?

   Yes Go to step 9.

   No Short to power in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-136).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the D1o connector (1) from the D1i connector (2).



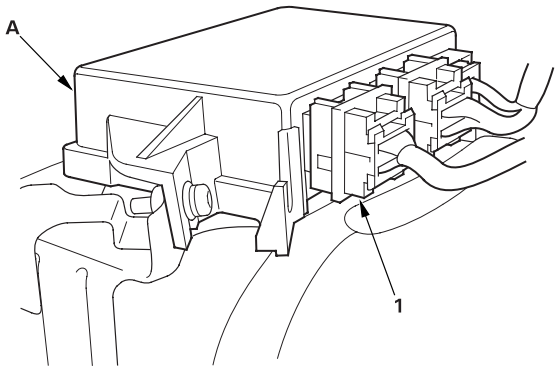
11. Disconnect the TL1o and TR1o connectors (1) from the TL1i and TR1i connectors (2).



(cont'd)

DTC Troubleshooting (cont'd)

12. Disconnect the U1o connector (1) from the SRS unit (A).

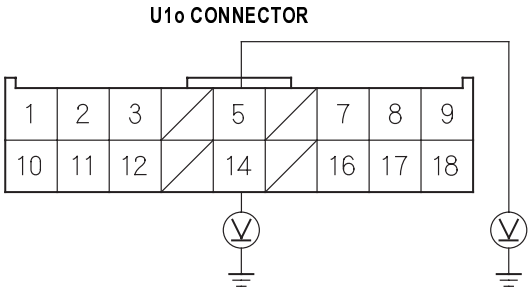


13. Disconnect the special tool from the P1i connector.

14. Reconnect the battery negative cable.

15. Turn the ignition switch ON (II).

16. Check for voltage between the No. 5 terminal of the U1o connector and body ground, and between the No. 14 terminal and body ground. There should be 0.5 V or less.



Wire side of female terminals

Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to power in the dashboard wire harness B; replace the dashboard wire harness B.■

DTC 2-5: Short to Ground in Front Passenger's Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A

1. Erase the DTC memory (see page 23-29).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

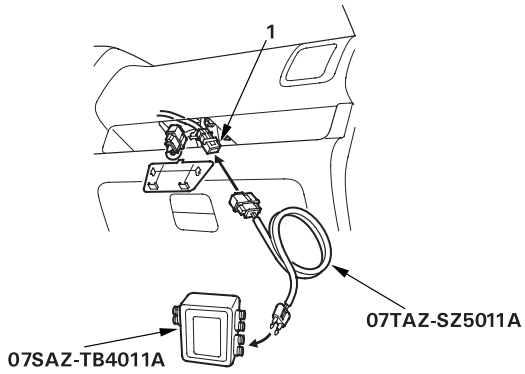
Does the SRS indicator stay on?

Yes Go to step 3.

No Intermittent failure, system is OK at this time.Go to Troubleshooting Intermittent Failures (see page 23-29).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the P1o connector from the P1i connector (1).



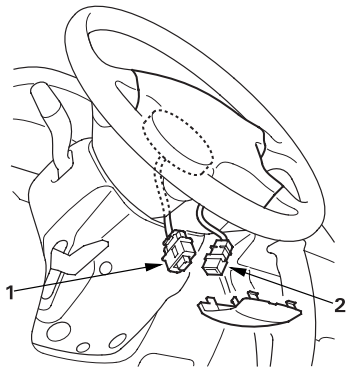
5. Connect the special tool (2 Ω connector) to the P1i connector.

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

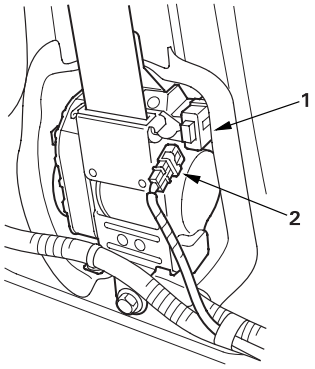
   Is DTC 2-5 indicated?

   Yes Go to step 9.

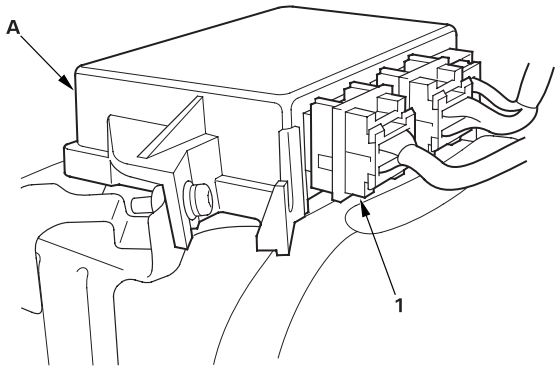
   No Short to ground in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-136).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the D1o connector (1) from the D1i connector (2).



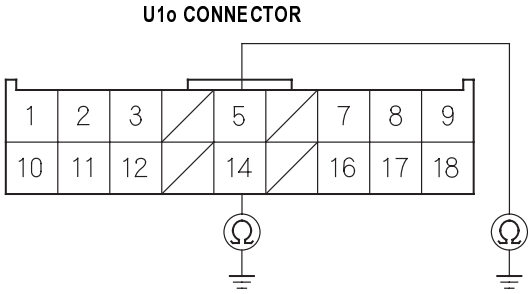
11. Disconnect the TL1o and TR1o connectors (1) from the TL1i and TR1i connectors (2).



12. Disconnect the U1o connector (1) from the SRS unit (A).



13. Disconnect the special tool from the P1i connector.
14. Check resistance between the No. 5 terminal of the U1o connector and body ground, and between the No. 14 terminal and body ground. There should be 1 M Ω or more.



Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to ground in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 3-1: Open in Left Side Seat Belt Tensioner
DTC 3-2: Increased Resistance in Left Side Seat Belt Tensioner

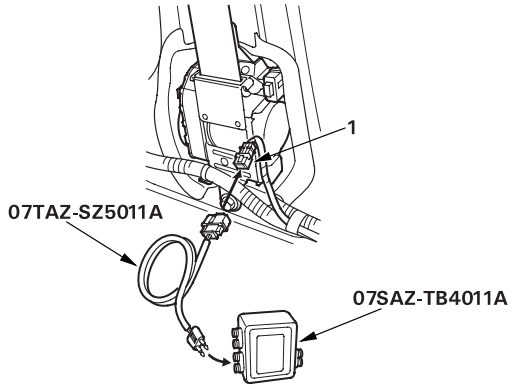
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TL1o connector from the TL1i connector (1).

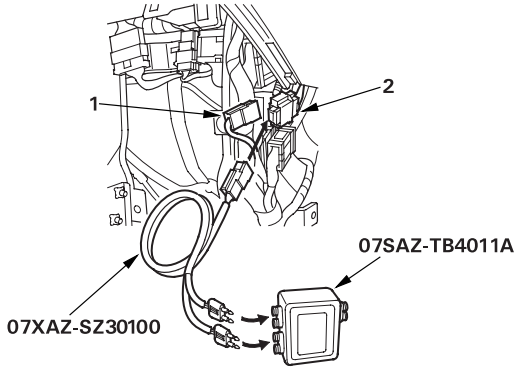


5. Connect the special tool (2 Ω connector) to the TL1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-1 or DTC 3-2 indicated?

   Yes Go to step 9.

   No Open or increased resistance in the left side seat belt tensioner; replace the left side seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the T2o connector (1) from the T2i connector (2).



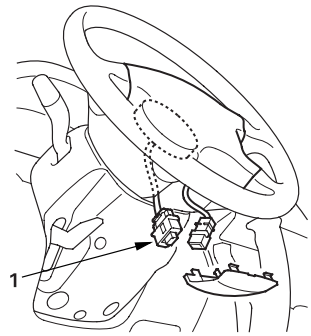
11. Connect the special tool (2 Ω connectors) to the T2i connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

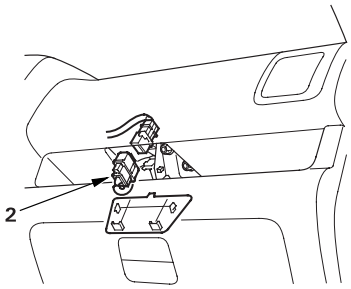
    Is DTC 3-1 or DTC 3-2 indicated?

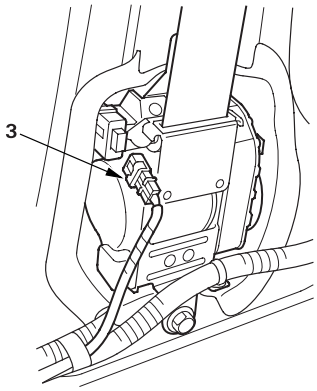
    Yes Go to step 15.

    No Open or increased resistance in the floor wire harness; replace the floor wire harness.■
15. Disconnect the battery negative cable, and wait for 3 minutes.

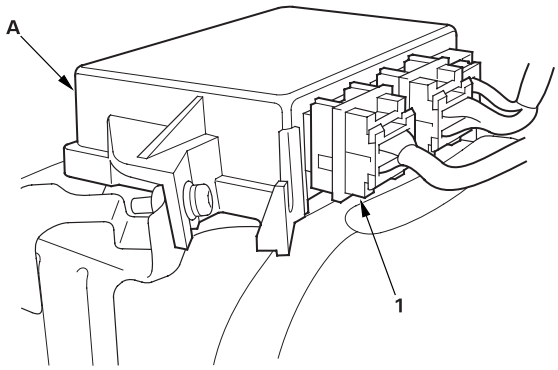
16. Disconnect the D1o connector (1), P1o connector (2), and TR1i connector (3).





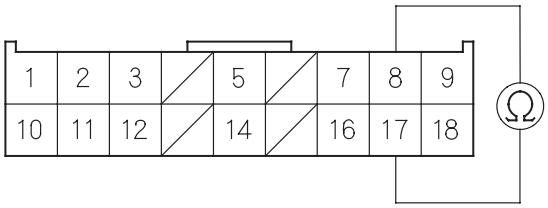


17. Disconnect the U1o connector (1) from the SRS unit (A).



18. Check resistance between the No. 8 terminal and the No. 17 terminal of U1o connector. There should be 2.0 - 3.0 Ω.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit or poor contact at U1o connector and the SRS unit. Check the connection between the connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 3-3: Short to Another Wire or Decreased Resistance in Left Side Seat Belt Tensioner

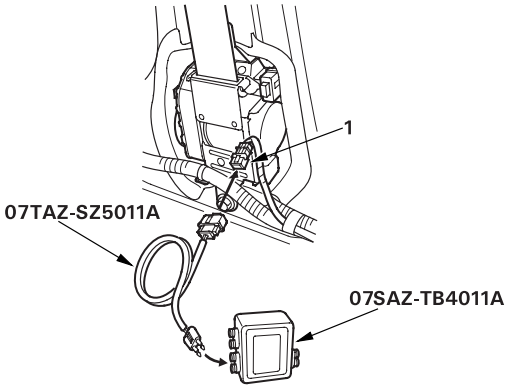
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TL1o connector from the TL1i connector (1).

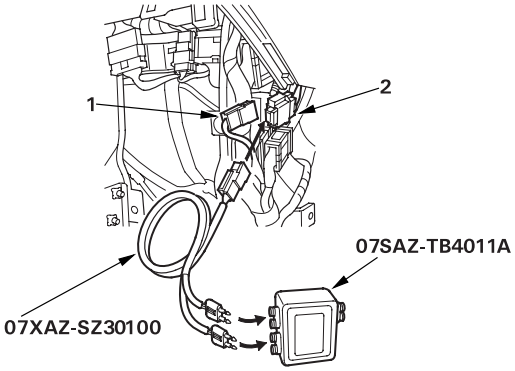


5. Connect the special tool (2 Ω connector) to the TL1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-3 indicated?

   Yes Go to step 9.

   No Short in the left side seat belt tensioner; replace the left side seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the T2o connector (1) from the T2i connector (2).



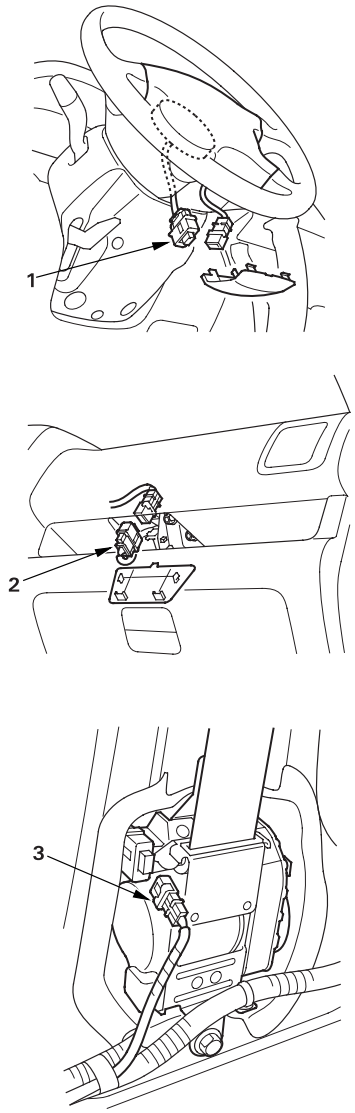
11. Connect the special tool (2 Ω connectors) to the T2i connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-3 indicated?

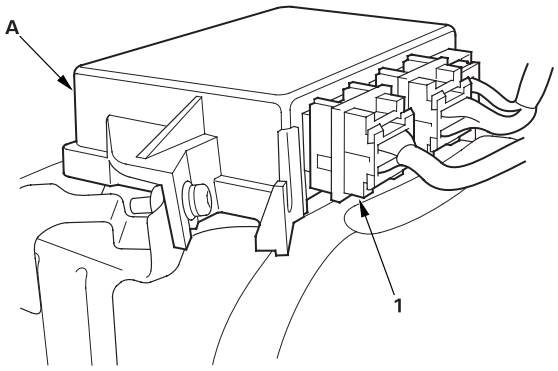
    Yes Go to step 15.

    No Short in the floor wire harness; replace the floor wire harness.■
15. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the D1o connector (1), P1o connector (2), and TR1i connector (3).



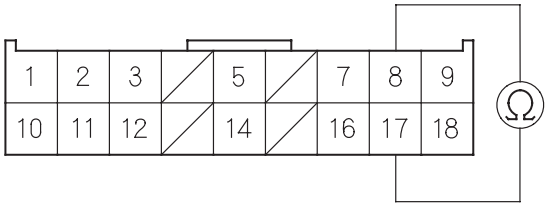
17. Disconnect the U1o connector (1) from the SRS unit (A).



18. Disconnect the special tool from the T2i connector.

19. Check resistance between the No. 8 terminal and the No. 17 terminal U1o connector. There should be 1 M Ω or more.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 3-4: Short to Power in Left side Seat Belt Tensioner

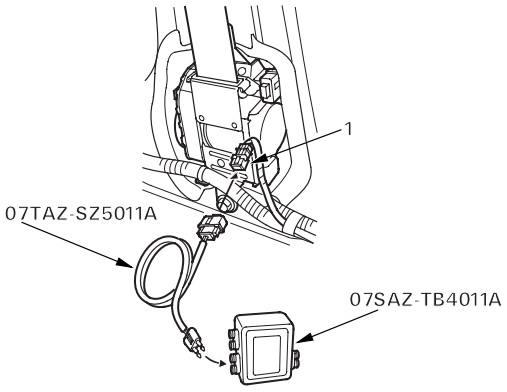
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TL1o connector from the TL1i connector (1).

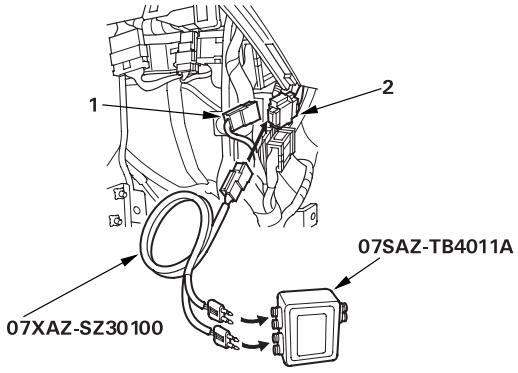


5. Connect the special tool (2 Ω connector) to the TL1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-4 indicated?

   Yes Go to step 9.

   No Short to power in the left side seat belt tensioner; replace the left side seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the T2o connector (1) from the T2i connector (2).



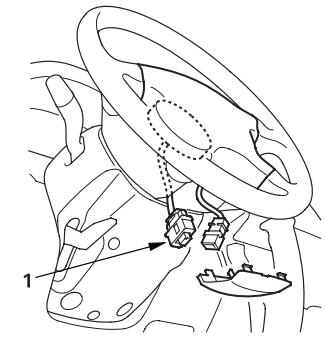
11. Connect the special tool (2 Ω connectors) to the T2i connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

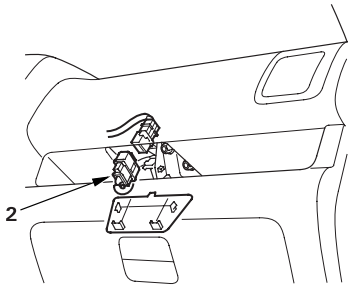
    Is DTC 3-4 indicated?

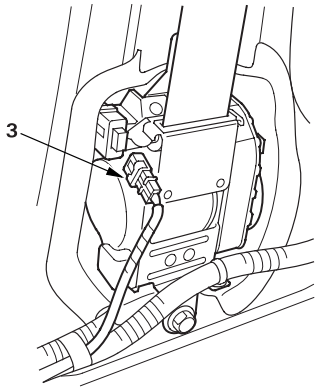
    Yes Go to step 15.

    No Short to power in the floor wire harness; replace the floor wire harness.■
15. Disconnect the battery negative cable, and wait for 3 minutes.

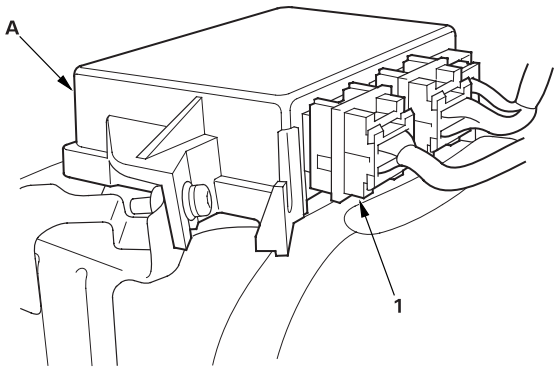
16. Disconnect the D1o connector (1), P1o connector (2), and TR1i connector (3).







17. Disconnect the U1o connector (1) from the SRS unit (A).



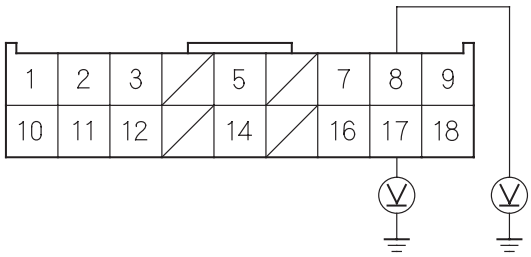
18. Disconnect the special tool (2 Ω) from the T2i connector.

19. Reconnect the battery negative cable.

20. Turn the ignition switch ON (II).

21. Check for voltage between the No. 8 terminal of U1o connector and body ground, and between the No. 17 terminal and body ground. There should be 0.5 V or less.

U1o CONNECTOR



Wire side of female terminals

Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to power in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 3-5: Short to Ground in Left Side Seat Belt Tensioner

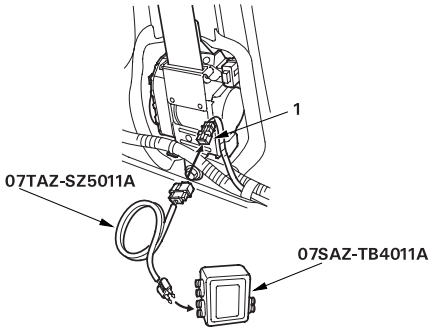
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TL1o connector from the TL1i connector (1).

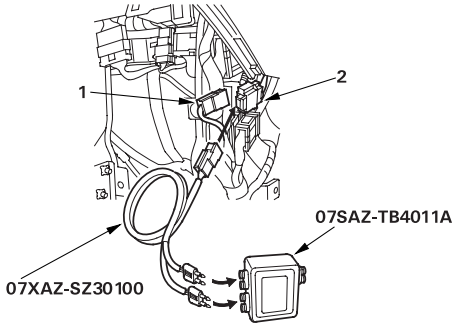


5. Connect the special tool (2 Ω connector) to the TL1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-5 indicated?

   Yes Go to step 9.

   No Short to ground in the left side seat belt tensioner; replace the left side seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the T2o connector (1) from the T2i connector (2).



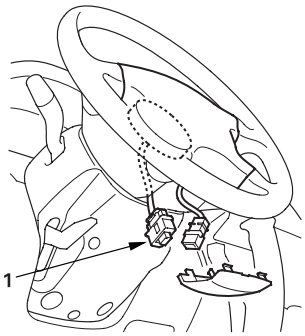
11. Connect the special tool (2 Ω connectors) to the T2i connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

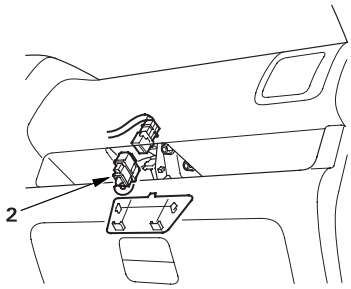
    Is DTC 3-5 indicated?

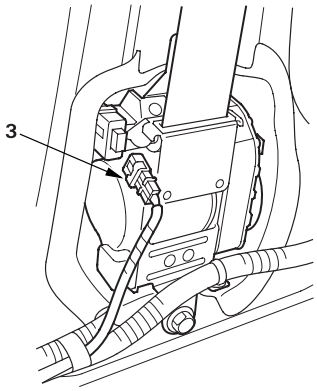
    Yes Go to step 15.

    No Short to ground in the floor wire harness; replace the floor wire harness.■
15. Disconnect the battery negative cable, and wait for 3 minutes.

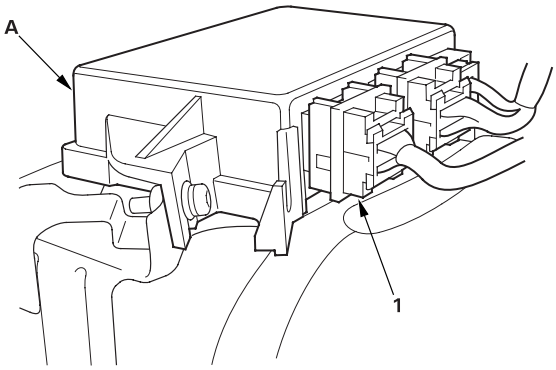
16. Disconnect the D1o connector (1), P1o connector (2), and TR1i connector (3).







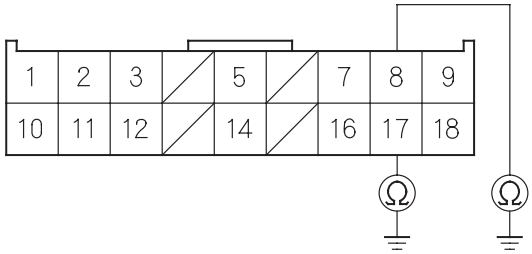
17. Disconnect the U1o connector (1) from the SRS unit (A).



18. Disconnect the special tool from the T2i connector.

19. Check resistance between the No. 8 terminal of U1o connector and body ground, and between the No. 17 terminal and body ground. There should be 1 M Ω or more.

U1o CONNECTOR



Wire side of female terminal

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to ground in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 21-1: Open in Left Side Seat Belt Buckle Tensioner
DTC 21-2: Increased Resistance in Left Side Seat Belt Buckle Tensioner

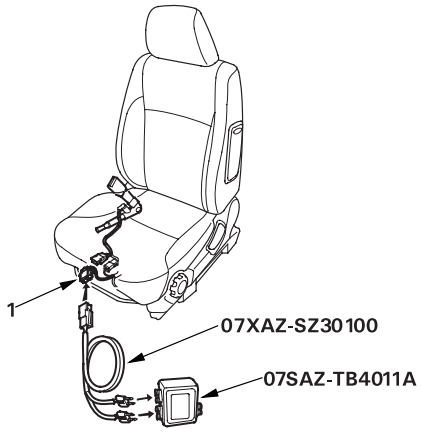
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TBLo connector from the TBLi connector (1).

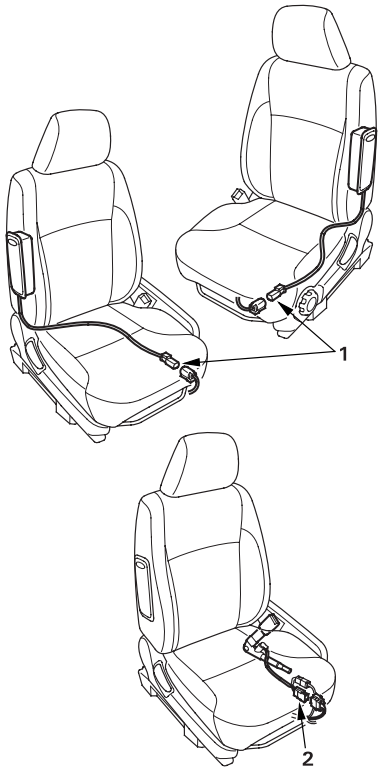


5. Connect the special tool (2 Ω connectors) to the TBLi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

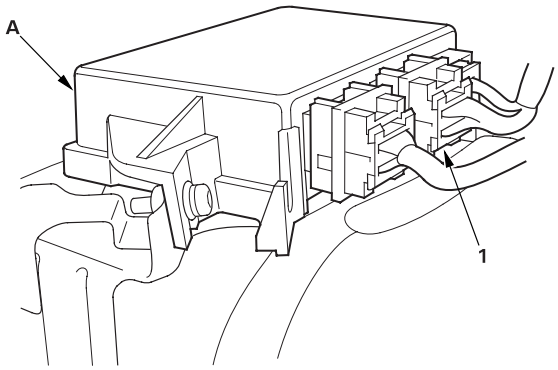
   Is DTC 21-1 or DTC 21-2 indicated?

   Yes Go to step 9.

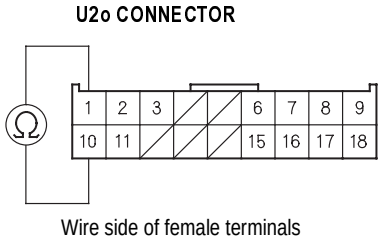
   No Open or increased resistance in the left side seat belt buckle tensioner; replace the left side seat belt buckle.■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SDo and SPo connectors (1) and the TBRo connector (2).



11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Check resistance between the No. 1 and No. 10 terminals of the U2o connector. There should be 2.0 - 3.0 Ω.



Is the resistance as specified?

Yes Faulty SRS unit or poor contact at U2o connector and at the SRS unit. Check the connection between the connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in the floor wire harness; replace the floor wire harness.■

DTC 21-3: Short to Auother Wire or Decreased Resistance in Left Side Seat Belt Buckle Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

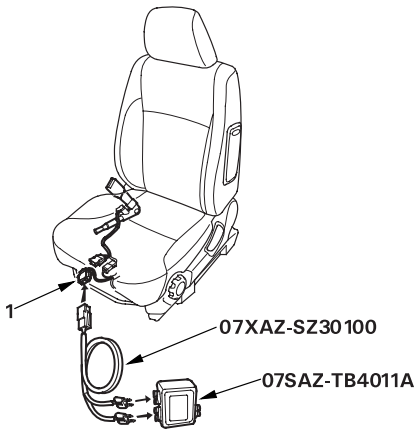
Does the SRS indicator stay on?

Yes Go to step 3.

No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the TBLo connector from the TBLi connector (1).



5. Connect the special tool (2 Ω connectors) to the TBLi connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

8. Read the DTC.

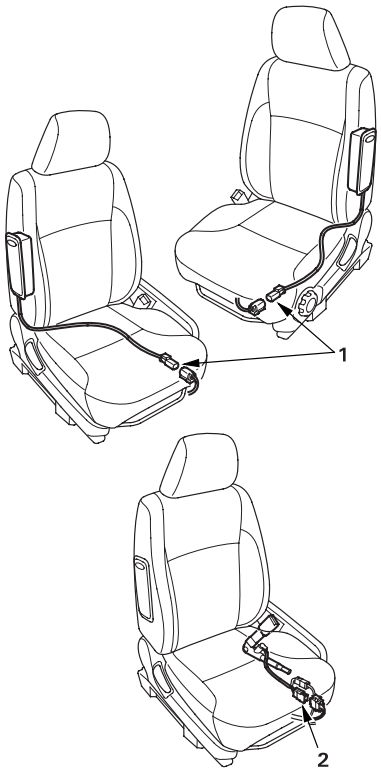
Is DTC 21-3 indicated?

Yes Go to step 9.

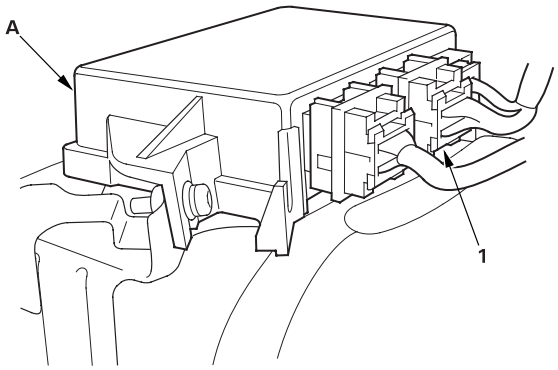
No Open or increased resistance in the left side seat belt buckle tensioner; replace the left side seat belt buckle.■

9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SDo and SPo connectors (1) and the TBRo connector (2).



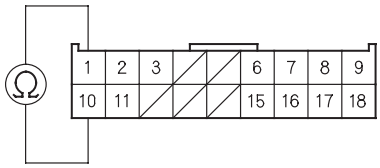
11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Disconnect the special tool (2 Ω connectors) from the TBLi connecto.

13. Check resistance between the No. 1 and No. 10 terminals of the U2o connector. There should be 2.0 - 3.0 Ω.

U2o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit or poor contact at U2o connector and at the SRS unit. Check the connection between the connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in the floor wire harness; replace the floor wire harness.■

DTC 21-4: Short to Power in Left Side Seat Belt Buckle Tensioner

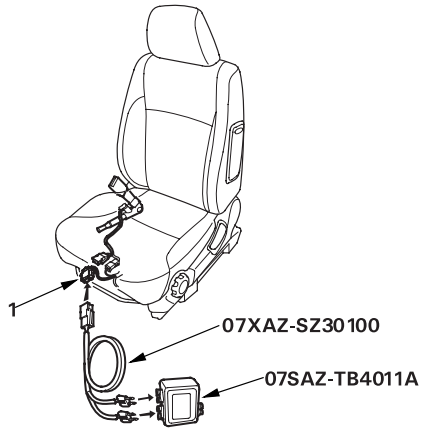
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TBLo connector from the TBLi connector (1).

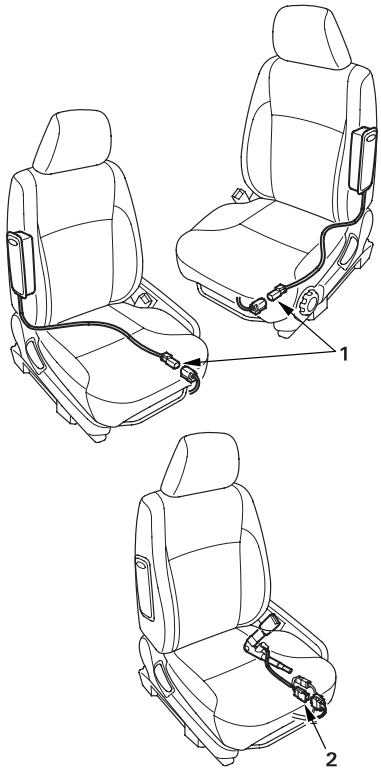


5. Connect the special tool (2 Ω connectors) to the TBLi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-9 or 21-4 indicated?

   Yes Go to step 9.

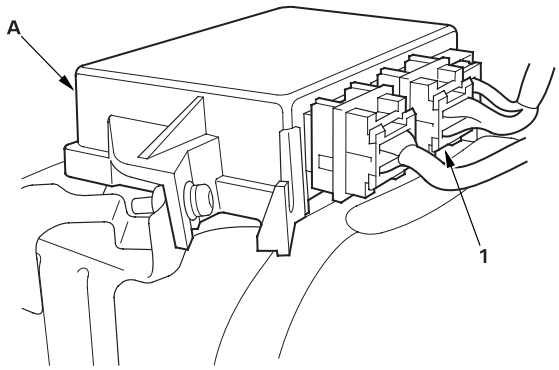
   No Short to power in the left side seat belt buckle tensioner; replace the left side seat belt buckle.■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SDo and SPo connectors (1) and the TBRo connector (2).



(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the U2o connector (A) from the SRS unit (A).

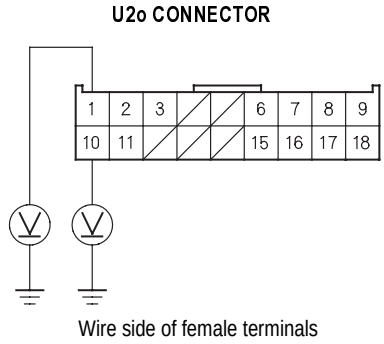


12. Disconnect the special tool (2 Ω connectors) from the TBLi connector.

13. Reconnect the battery negative cable.

14. Turn the ignition switch ON (II).

15. Check for voltage between the No. 1 terminal of the U2o connector and body ground. and between the No. 10 terminal and body ground. There should be 0.5 V or less.



Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to power in the floor wire harness; replace the floor wire harness.■

DTC 21-5: Short to Ground in Left Side Seat Belt Buckle Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).

2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about 6 seconds and then goes off.

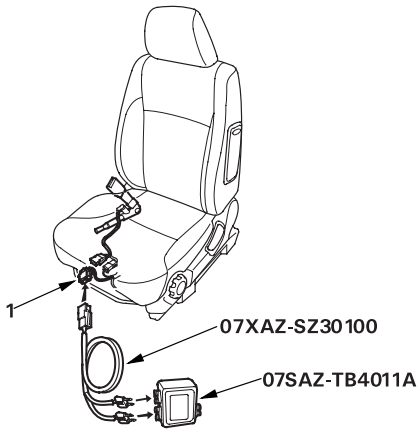
Does the SRS indicator light stay on?

Yes Go to step 3.

No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the TBLo connector from the TBLi connector (1).



5. Connect the special tool (2 Ω connectors) to the TBLi connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

8. Read the DTC.

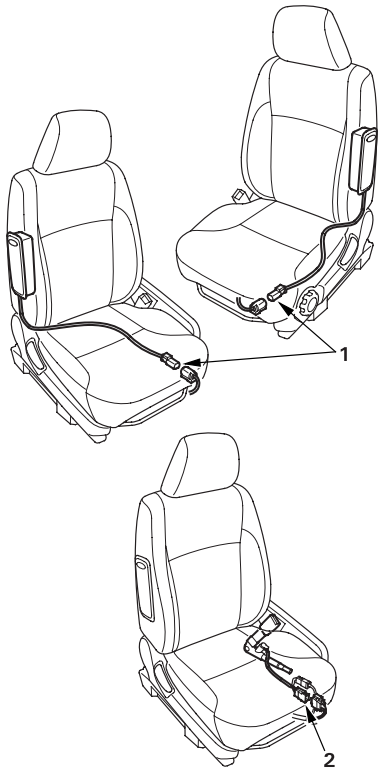
Is DTC 21-5 indicated?

Yes Go to step 9.

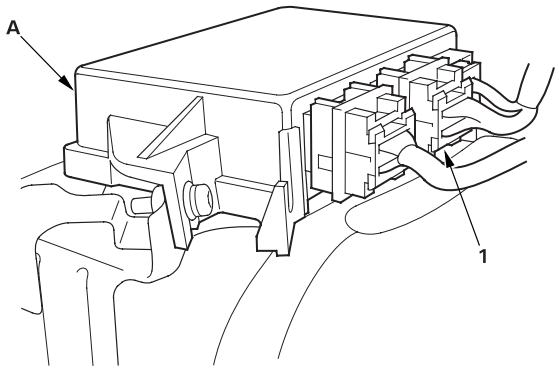
No Short to ground in the left side seat belt buckle tensioner; replace the left side seat belt buckle.■

9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SDo and SPo connectors (1) and the TBRo connector (2).



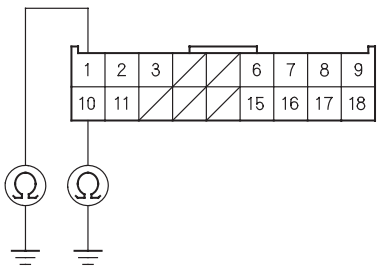
11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Disconnect the special tool (2 Ω connectors) from the TBLi connector.

13. Check resistance between the No. 1 terminal of the U2o connector and body ground. and between the No. 10 terminal and body ground. There should be 1 M Ω or more.

U2o CONNECTOR



Wire side of female terminal

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to ground in the floor wire harness; replace the floor wire harness.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 4-1: Open in Right Side Seat Belt Tensioner
DTC 4-2: Increase Resistance in Right Side Seat Belt Tensioner

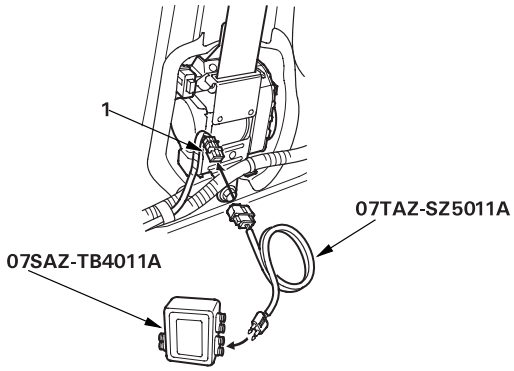
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TR1o connector from the TR1i connector (1).

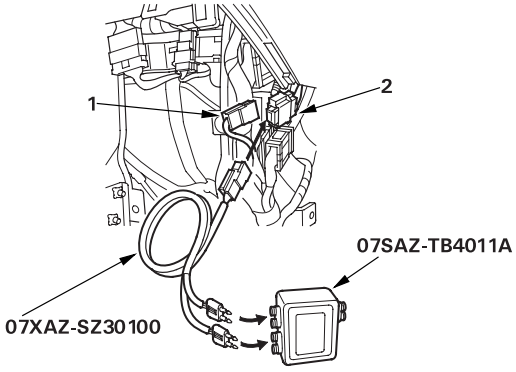


5. Connect the special tool (2 Ω connector) to the TR1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-1 or DTC 4-2 indicated?

   Yes Go to step 9.

   No Open or increased resistance in the right side seat belt tensioner; replace the right side seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for three minutes.
10. Disconnect the T2o connector (1) from the T2i connector (2).



11. Connect the special tool (2 Ω connectors) to the T2i connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

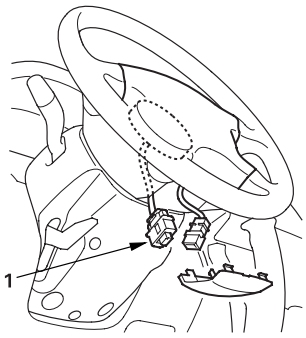
    Is DTC 4-1 indicated?

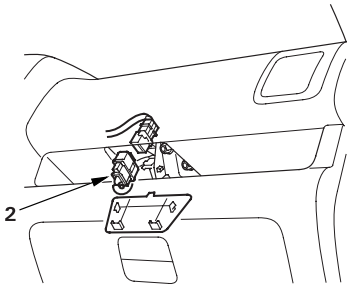
    Yes Go to step 15.

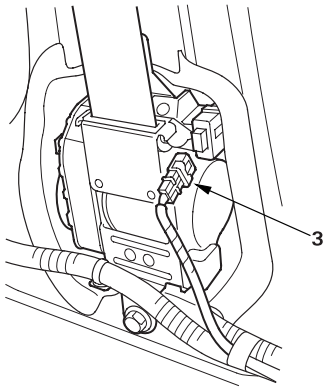
    No Open or increased resistance in the floor wire harness; replace the floor wire harness.■

15. Disconnect the battery negative cable, and wait for 3 minutes.

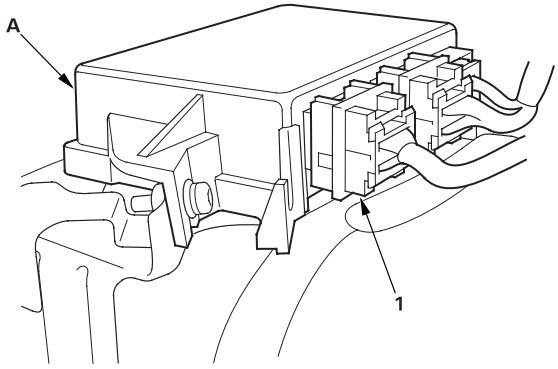
16. Disconnect the D1o connector (1), P1o connector (2), and TL1i connector (3).





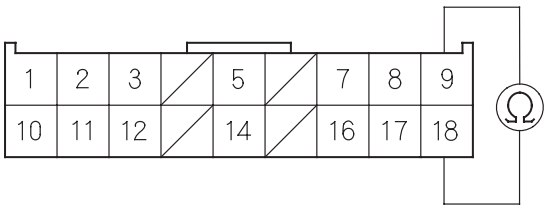


17. Disconnect the U1o connector (1) from the SRS unit (A).



18. Check resistance between the No. 9 terminal and the No. 18 terminal of U1o connector. There should be 2.0 - 3.0 Ω.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit or poor contact at U1o connector and the SRS unit. Check the connection between connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 4-3: Short to Another Wire or Decreased Resistance in Right Side Seat Belt Tensioner

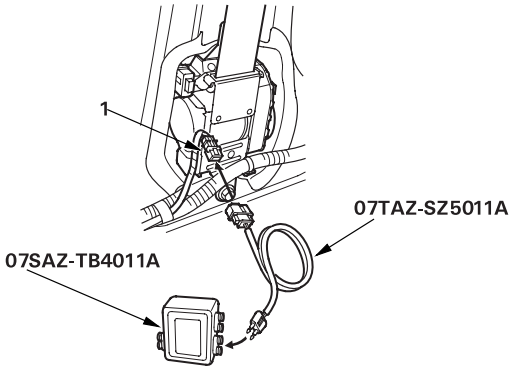
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TR1o connector from the TR1i connector (1).

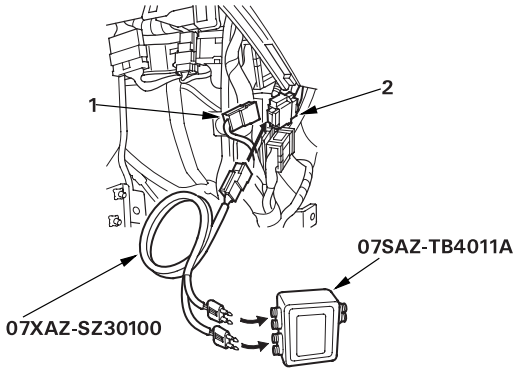


5. Connect the special tool (2 Ω connector) to the TR1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-3 indicated?

   Yes Go to step 9.

   No Short in the right side seat belt tensioner; replace the right side seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the T2o connector (1) from the T2i connector (2).



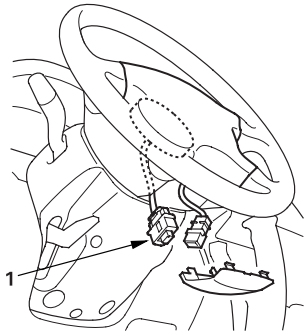
11. Connect the special tool (2 Ω connectors) to the T2i connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

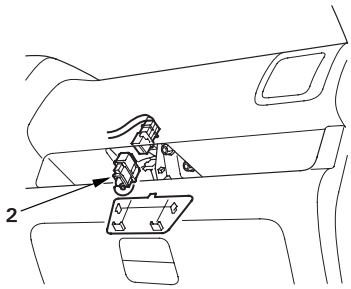
    Is DTC 4-3 indicated?

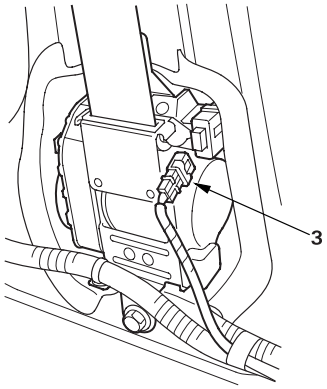
    Yes Go to step 15.

    No Short in the floor wire harness; replace the floor wire harness.■
15. Disconnect the battery negative cable, and wait for 3 minutes.

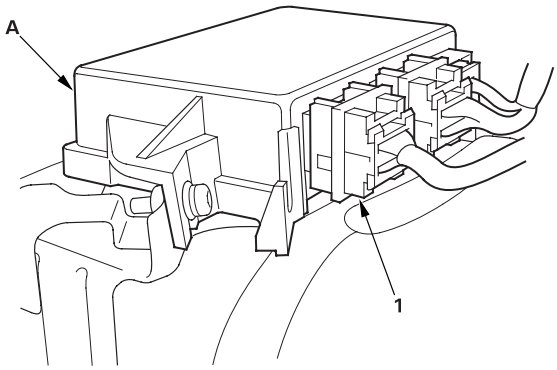
16. Disconnect the D1o connector (1), P1o connector (2), and TL1i connector (3).







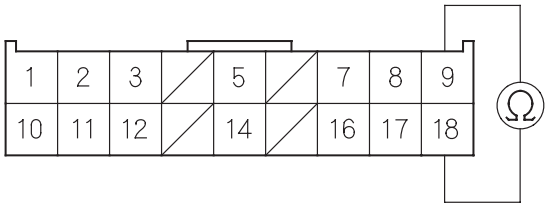
17. Disconnect the U1o connector (1) from the SRS unit (A).



18. Disconnect the special tool from the T2i connector.

19. Check resistance between the No. 9 terminal and the No. 18 terminal of U1o connector. There should be 1 M Ω or more.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 4-4: Short to Power in Right Side Seat Belt Tensioner

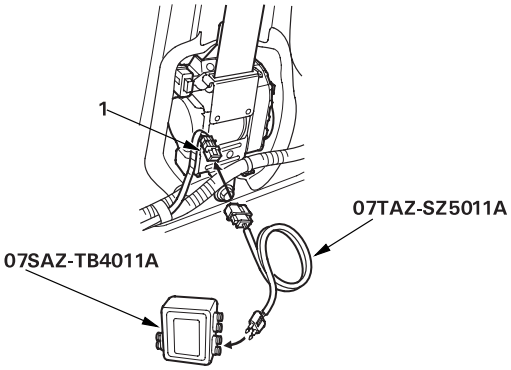
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TR1o connector from the TR1i connector (1).

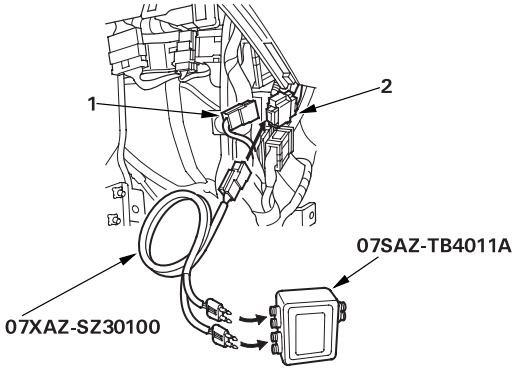


5. Connect the special tool (2 Ω connector) to the TR1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-4 indicated?

   Yes Go to step 9.

   No Short to power in the right side seat belt tensioner; replace the right side seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the T2o connector (1) from the T2i connector (2).



11. Connect the special tool (2 Ω connectors) to the T2i connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

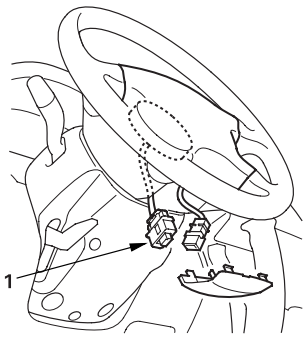
    Is DTC 4-4 indicated?

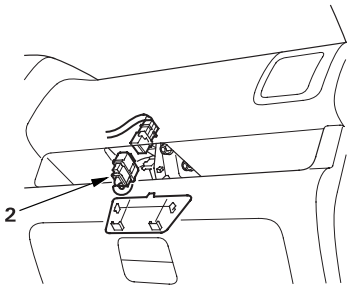
    Yes Go to step 15.

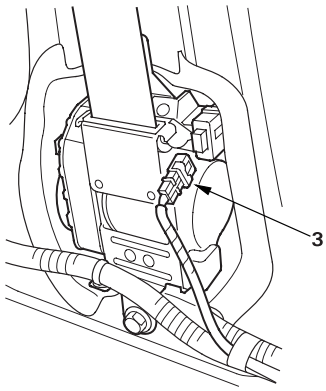
    No Short to power in the floor wire harness; replace the floor wire harness.■

15. Disconnect the battery negative cable, and wait for 3 minutes.

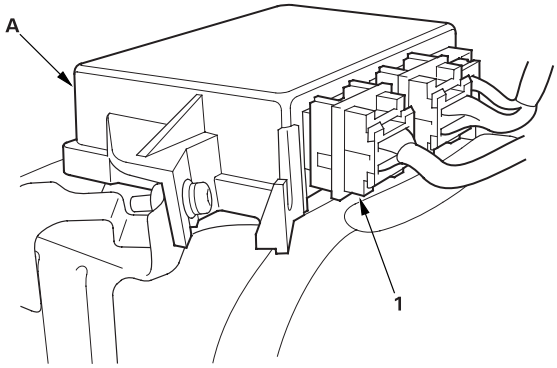
16. Disconnect the D1o connector (1), P1o connector (2), and TL1i connector (3).







17. Disconnect the U1o connector (1) from the SRS unit (A).



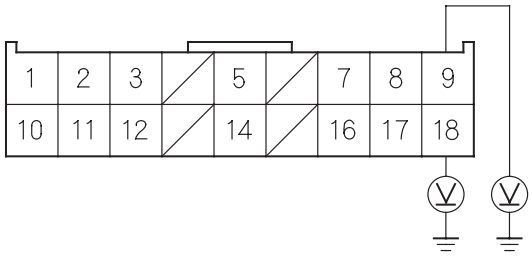
18. Disconnect the special tool from the T2i connector.

19. Reconnect the battery negative cable.

20. Turn the ignition switch ON (II).

21. Check for voltage between the No. 9 terminal of U1o connector and body ground, and between the No. 18 terminal and body ground. There should be 0.5 V or less.

U1o CONNECTOR



Wire side of female terminals

Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to power in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 4-5: Short to Ground in Right Side Seat Belt Tensioner

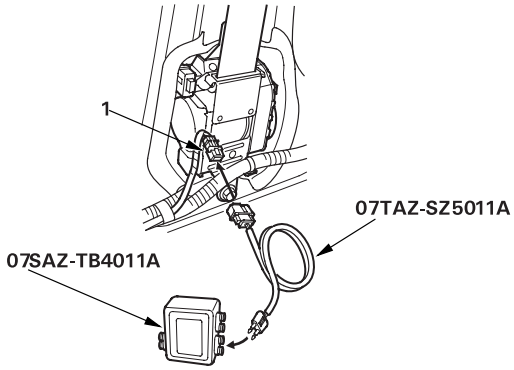
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead C 07TAZ-SZ5011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TR1o connector from the TR1i connector (1).

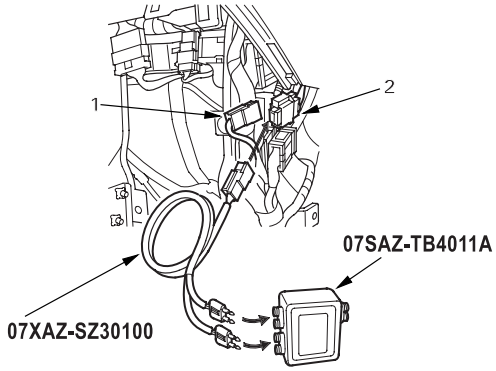


5. Connect the special tool (2 Ω connector) to the TR1i connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-5 indicated?

   Yes Go to step 9.

   No Short to ground in the right side seat belt tensioner; replace the right side seat belt (see page 23-4).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the T2o connector (1) from the T2i connector (2).



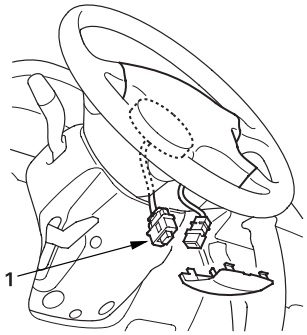
11. Connect the special tool (2 Ω connectors) to the T2i connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

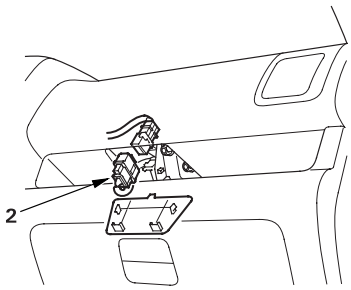
    Is DTC 4-5 indicated?

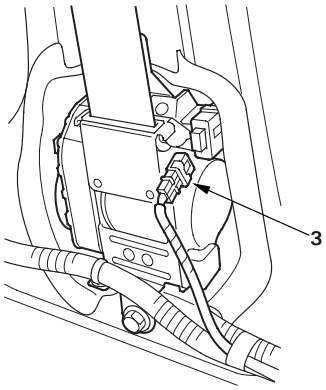
    Yes Go to step 15.

    No Short to ground in the floor wire harness; replace the floor wire harness.■
15. Disconnect the battery negative cable, and wait for 3 minutes.

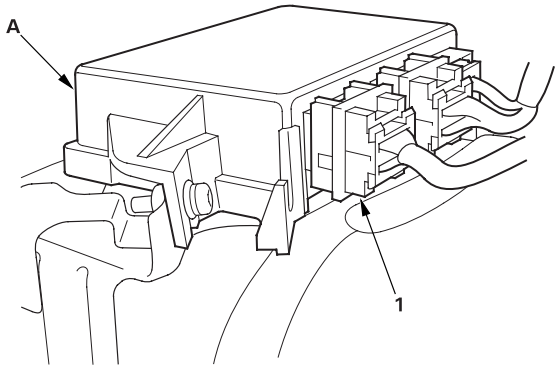
16. Disconnect the D1o connector (1), P1o connector (2), and TL1i connector (3).







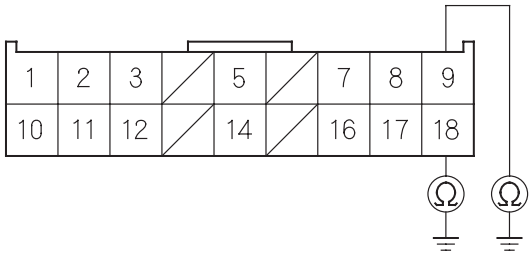
17. Disconnect the U1o connector (1) from the SRS unit (A).



18. Disconnect the special tool (2 Ω) from the T2i connector.

19. Check resistance between the No. 9 terminal of U1o connector and body ground, and between the No. 18 terminal and body ground. There should be 1 M Ω or more.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to ground in dashboard wire harness B; replace dashboard wire harness B.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 22-1: Open in Right Side Seat Belt Buckle Tensioner
DTC 22-2: Increased Resistance in Right Side Seat Belt Buckle Tensioner

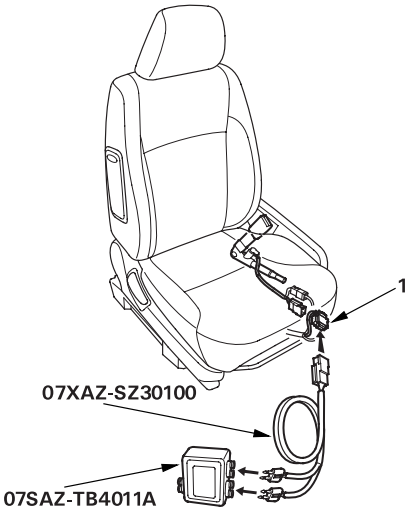
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TBRo connector from the TBRi connector (1).

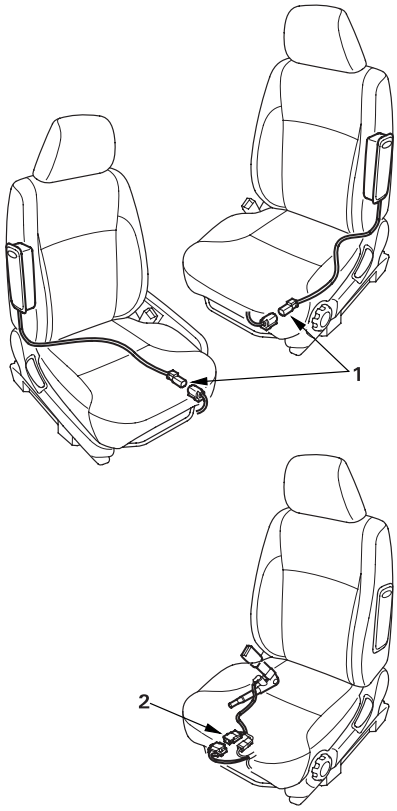


5. Connect the special tool (2 Ω connectors) to the TBRi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

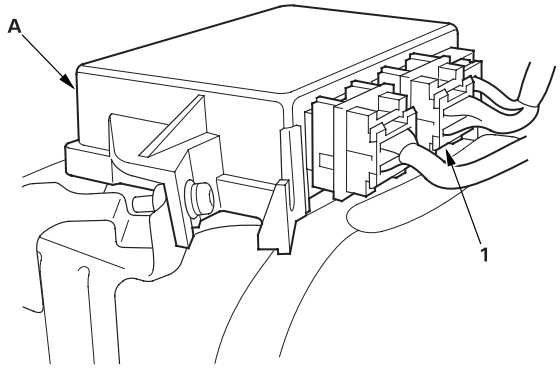
   Is DTC 22-1 or DTC 22-2 indicated?

   Yes Go to step 9.

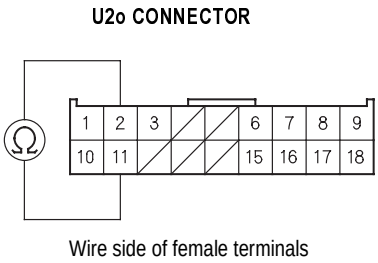
   No Open or increased resistance in the right side seat belt buckle tensioner; replace the right side seat belt buckle.■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SDo and SPo connectors (1) and the TBLo connector (2).



11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Check resistance between the No. 2 and No. 11 terminals of the U2o connector. There should be 2.0 - 3.0 Ω.



Is the resistance as specified?

Yes Faulty SRS unit or poor contact at U2o connector and at the SRS unit. Check the connection between connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in the floor wire harness; replace the floor wire harness.■

DTC 22-3: Short to Another Wire or Decreased Resistance in Right Side Seat Belt Buckle Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

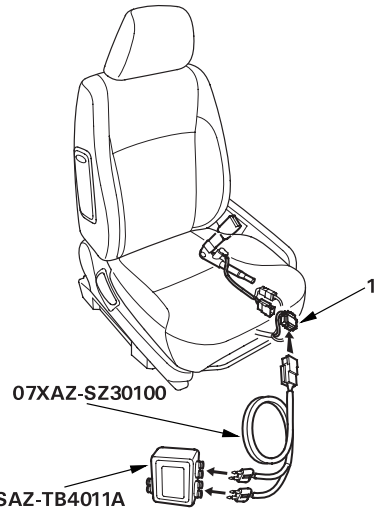
Does the SRS indicator stay on?

Yes Go to step 3.

No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the TBRo connector from the TBRi connector (1).



5. Connect the special tool (2 Ω connectors) to the TBRi connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

8. Read the DTC.

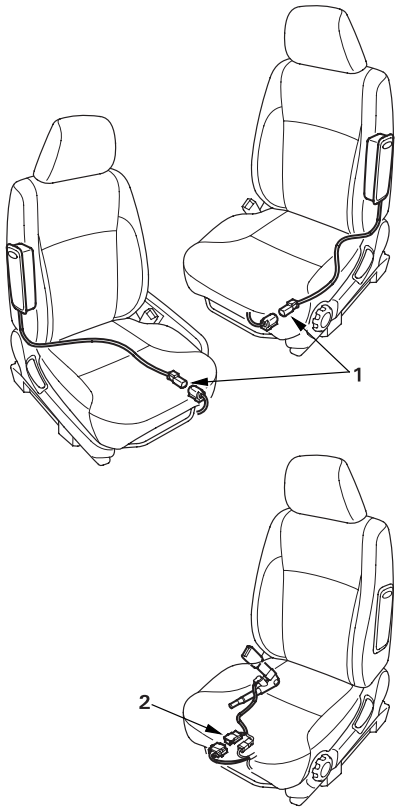
Is DTC 22-3 indicated?

Yes Go to step 9.

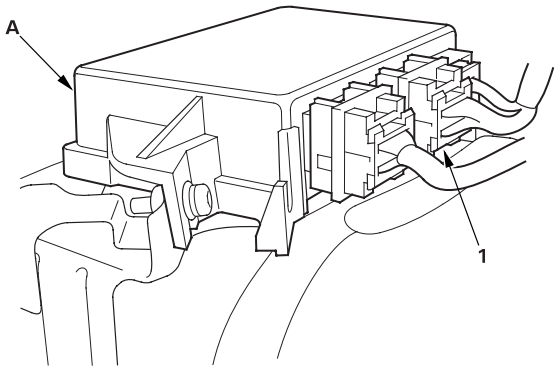
No Short in the light side seat belt buckle tensioner; replace the light side seat belt buckle.■

9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SDo and SPo connectors (1) and the TBLo connector (2).



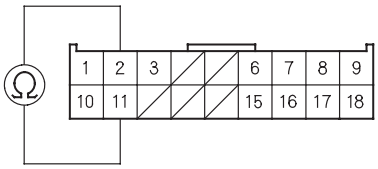
11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Disconnect the special tool (2 Ω connectors) from the TBRi connector.

13. Check resistance between the No. 2 and No. 11 terminals of the U2o connector. There should be 1 M Ω or more.

U2o CONNECTOR



Wire side of female terminal

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short in the floor wire harness; replace the floor wire harness.■

DTC 22-4: Short to Power in Right Side Seat Belt Buckle Tensioner

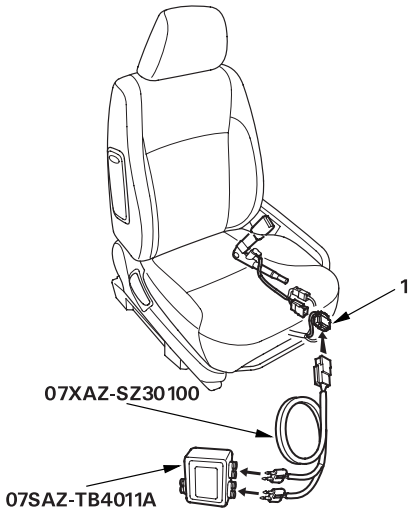
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the TBRo connector from the TBRi connector (1).

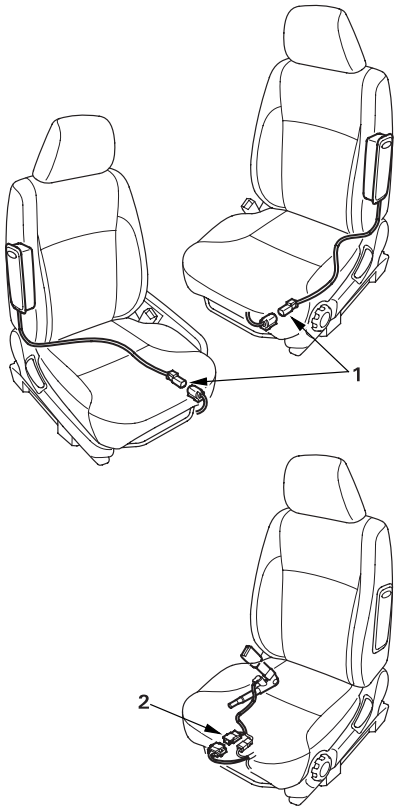


5. Connect the special tool (2 Ω connectors) to the TBRi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 22-4 indicated?

   Yes Go to step 9.

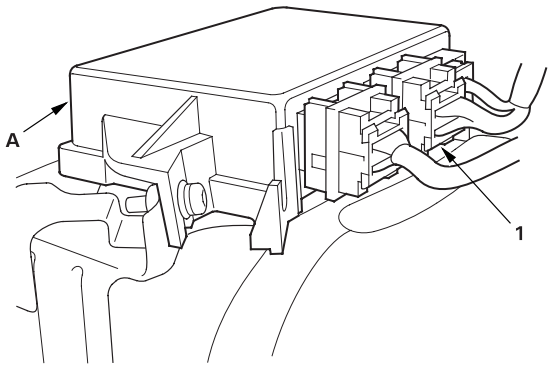
   No Short to power in the right side seat belt buckle tensioner; replace the right side seat belt buckle.■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SDo and SPo connectors (1) and the TBLo connector (2).



(cont'd)

DTC TROUBLESHOOTING (cont'd)

11. Disconnect the U2o connector (1) from the SRS unit (A).

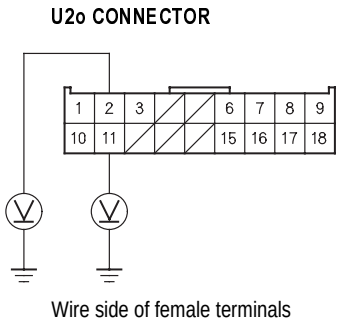


12. Disconnect the special tool (2 Ω connectors) from the TBRi connector.

13. Reconnect the battery negative cable.

14. Turn the ignition switch ON (II).

15. Check for voltage between the No. 2 terminal of the U2o connector and body ground. and between the No. 11 terminal and body ground. There should be 0.5 V or less.



Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to power in the floor wire harness; replace the floor wire harness.■

DTC 22-5: Short to Ground in Right Side Seat Belt Buckle Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-29).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

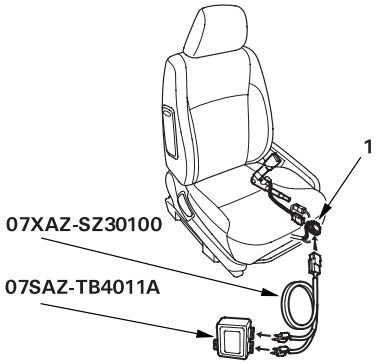
Does the SRS indicator light stay on?

Yes Go to step 3.

No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the TBRo connector from the TBRi connector (1).



5. Connect the special tool (2 Ω connectors) to the TBRi connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

8. Read the DTC.

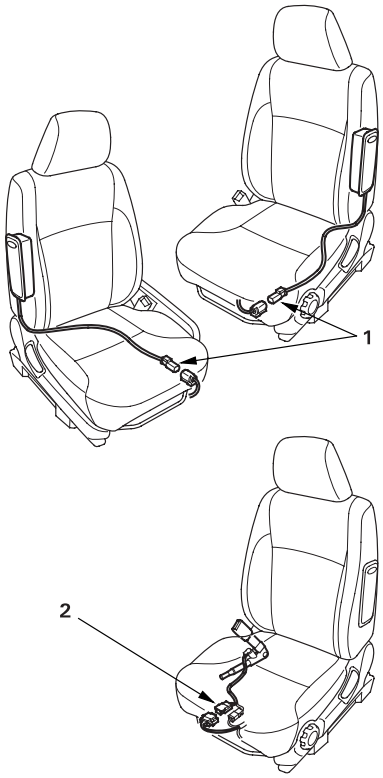
Is DTC 22-5 indicated?

Yes Go to step 9.

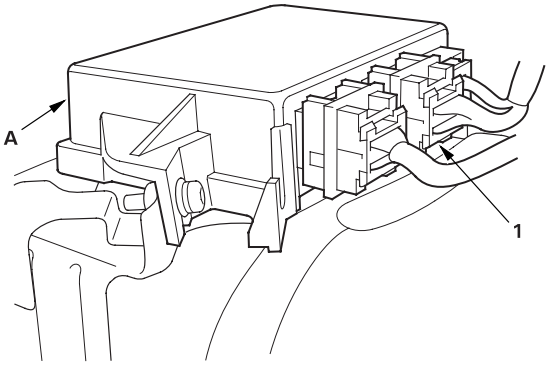
No Short to ground in the right side seat belt buckle tensioner; replace the right side seat belt buckle.■

9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SDo and SPo connectors (1) and the TBLo connector (2).



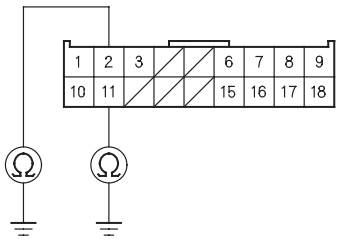
11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Disconnect the special tool (2 Ω connectors) from the floor wire harness 2P connector.

13. Check resistance between the No. 2 terminal of the U2o connector and body ground. and between the No. 11 terminal and body ground. There should be 1 M Ω or more.

U2o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to ground in the floor wire harness; replace the floor wire harness.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 5-1, 5-2, 5-4, 5-8, 6-3, 6-4, 6-7, 6-8, 7-1, 7-2, 7-3, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 9-1, 9-2: Internal Failure of the SRS Unit

NOTE: Before troubleshooting any of these DTCs, check the battery/system voltage. If the voltage is low, repair the charging system before troubleshooting the SRS. If the battery/system voltage is now OK, ask the customer if the battery ever went dead.

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Replace the SRS unit (see page 23-144).■

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

DTC 10-1, 10-2, 10-3, 10-4, 10-5, 10-6, 10-7:Airbags, Side Airbags and/or Seat Belt Tensioners Deployed

The SRS unit must be replaced after any airbags have deployed (see page 23-144).■

DTC 13-1, 13-2: Internal Failure of the Driver's Side Impact Sensor

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Replace the driver's side impact sensor (see page 23-145).■

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

DTC 14-1, 14-2: Internal Failure of the Front Passenger's Side Impact Sensor

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Replace the front passenger's side impact sensor (see page 23-145).■

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

(cont'd)

DTC Troubleshooting (cont'd)

DTC 9-6: Faulty Left Front Sensor

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3A0100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

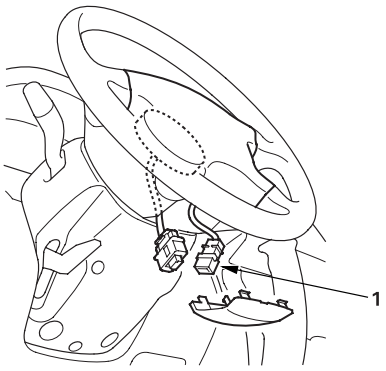
   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Check the connections between U1o connector and the SRS unit, and between the engine compartment wire harness 2P connector and the left front sensor (see page 23-147).

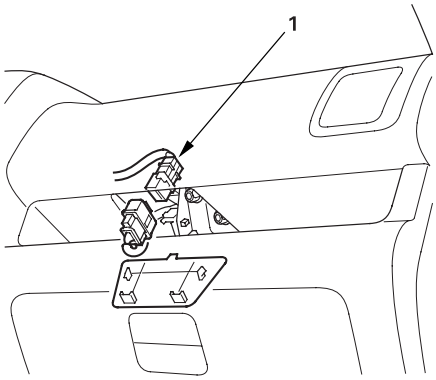
   Are the connections OK?

   Yes Go to step 4.

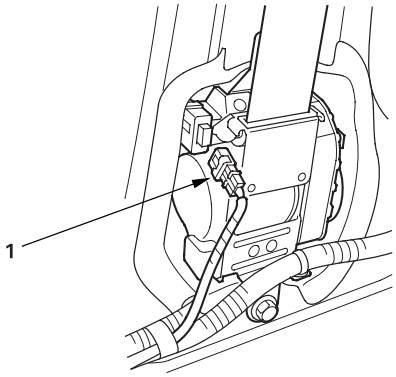
   No Repair the poor connections and retest. If DTC 9-6 still present, replace the left front sensor and retest. If the DTC is still preset, replace the SRS unit.■
4. Disconnect the battery negative cable, and wait for 3 minutes.
5. Disconnect the D1o connector from the D1i connector (1).



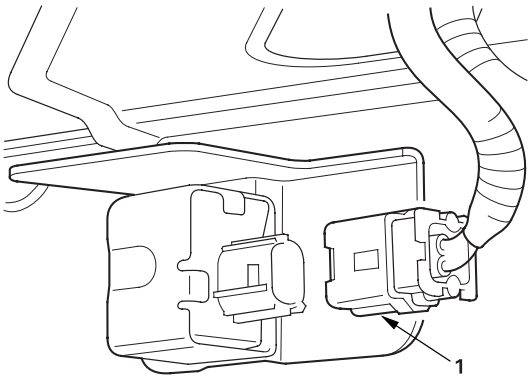
6. Disconnect the P1o connector from the P1i connector (1).



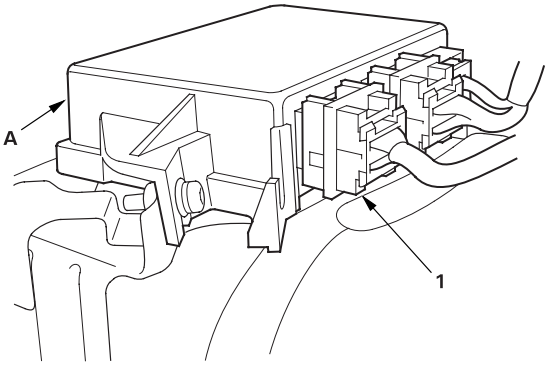
7. Disconnect the TL1o and TR1o connectors from the TL1i and TR1i connectors (1).



8. Disconnect the FSL1i connector (1) from the left front sensor.

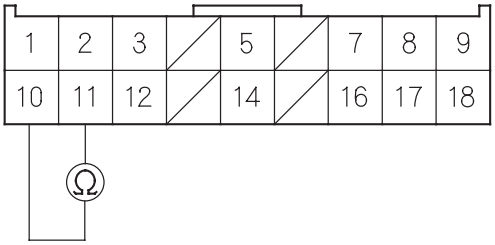


9. Disconnect the U1o connector (1) from the SRS unit (A).



10. Check resistance between the No. 10 and No. 11 terminals of U1o connector. There should be 1 M Ω or more.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Go to step 11.

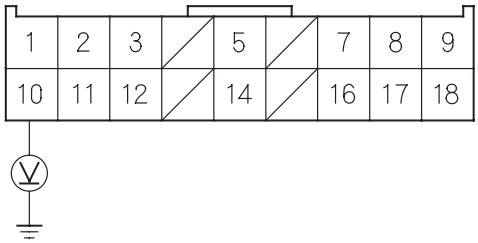
No Short in the engine compartment wire harness or dashboard wire harness B; replace the faulty harness.■

11. Reconnect the battery negative cable.

12. Turn the ignition switch ON (II).

13. Check the voltage between the No. 10 terminal of U1o connector and the body ground. There should be 1 V or less.

U1o CONNECTOR



Wire side of female terminals

Is the voltage as specified?

Yes Go to step 14.

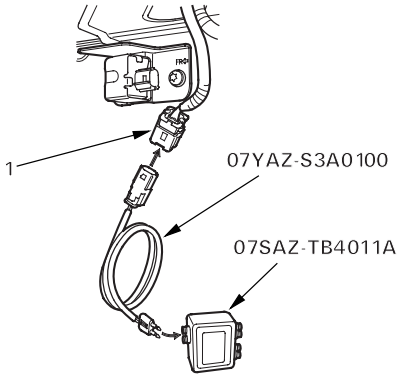
No Short to power in the engine compartment wire harness or dashboard wire harness B; replace the faulty harness.■

(cont'd)

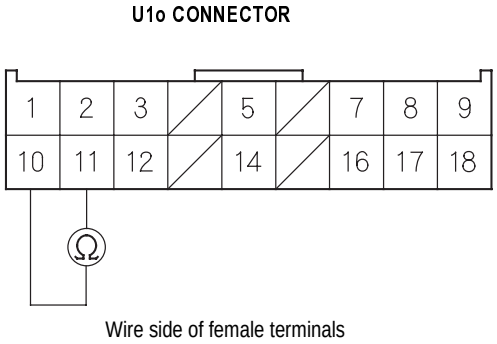
DTC Troubleshooting (cont'd)

14. Turn the ignition switch OFF.

15. Connect the special tool (jumper connector) to the FSL1i connector (1).



16. Check resistance between the No. 10 and No. 11 terminals of U1o connector. There should be 1 Ω or less.



Is the resistance as specified?

Yes Faulty left front sensor or SRS unit. Replace the left front sensor; if the problem is still present, replace the SRS unit (see page 23-144).■

No Faulty engine compartment wire harness or dashboard wire harness B; replace the faulty harness.■

DTC 9-7: Faulty Right Front Sensor

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3A0100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

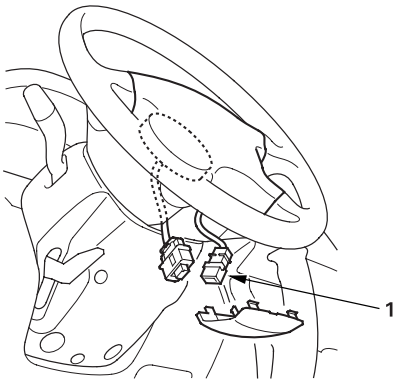
   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Check the connections between the U1o connector and the SRS unit, and between the front sensor wire harness 2P connector and the right front sensor (see page 23-147).

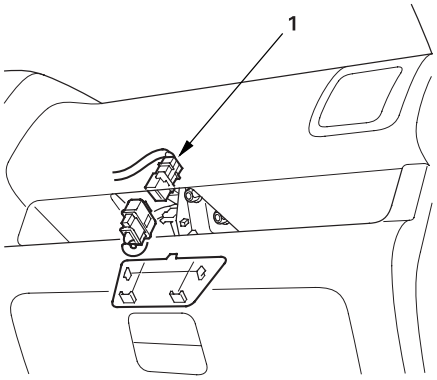
   Are the connections OK?

   Yes Go to step 4.

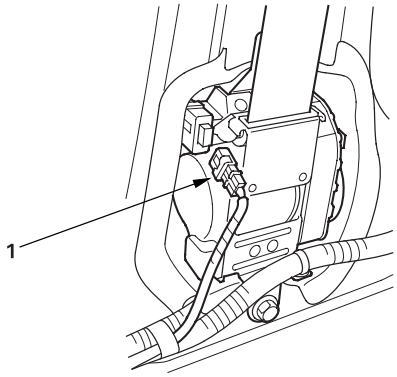
   No Repair the poor connections and retest. If DTC 9-7 still present, replace the right front sensor and retest. If the DTC is still present, replace the SRS unit.■
4. Disconnect the battery negative cable, and wait for 3 minutes.
5. Disconnect the D1o connector from the D1i connector (1).



6. Disconnect the P1o connector from the P1i connector (1).



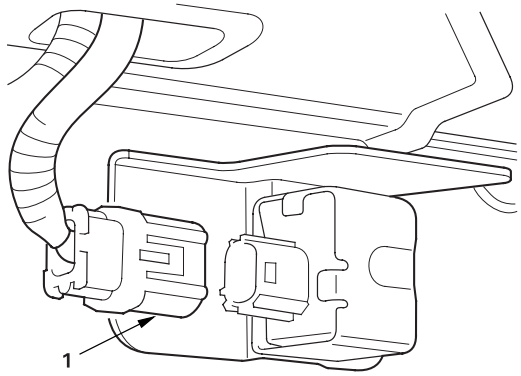
7. Disconnect the TL1o and TR1o connectors from the TL1i and TR1i connectors (1).



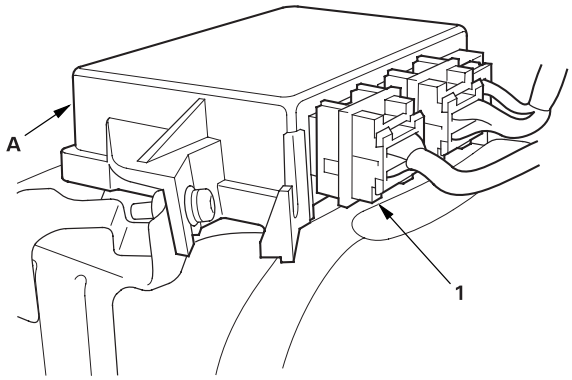
(cont'd)

DTC Troubleshooting (cont'd)

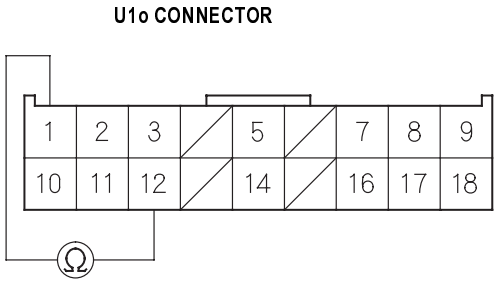
8. Disconnect the FSR1i connector (1) from the right front sensor.



9. Disconnect the U1o connector (1) from the SRS unit (A).



10. Check resistance between the No. 1 and No. 12 terminals of U1o connector. There should be 1 M Ω or more.



Is the resistance as specified?

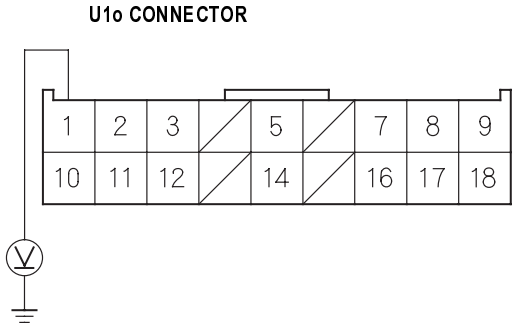
Yes Go to step 11.

No Short in the engine compartment wire harness or dashboard wire harness B; replace the faulty harness.■

11. Reconnect the battery negative cable.

12. Turn the ignition switch ON (II).

13. Check the voltage between the No. 1 terminal of U1o connector and body ground. There should be 1 V or less.



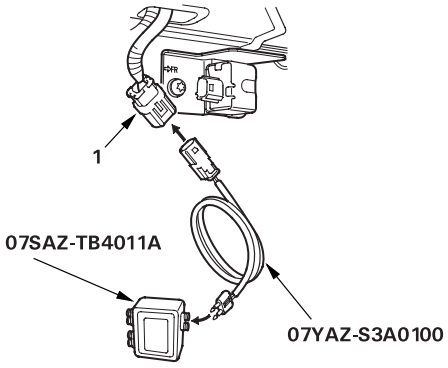
Is the voltage as specified?

Yes Go to step 14.

No Short to power in the engine compartment wire harness or the dashboard wire harness B; replace the faulty harness.■

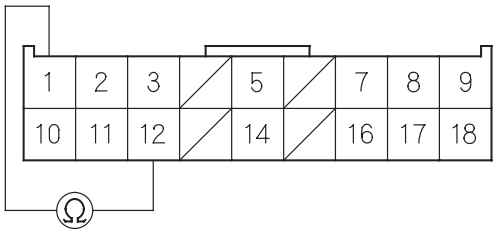
14. Turn the ignition switch OFF.

15. Connect the special tool (jumper connector) to the FSR1i connector (1).



16. Check resistance between the No. 1 and No. 12 terminals of U1o connector. There should be 1 Ω or less.

U1o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty right front sensor or SRS unit. Replace the right front sensor; if the problem is still present, replace the SRS unit (see page 23-144).■

No Faulty engine compartment wire harness or dashboard wire harness B; replace the faulty harness.■

DTC Troubleshooting (cont'd)

DTC 11-1: Open or Increased Resistance in Driver's Side Airbag Inflator ((With OPDS unit model)
DTC 12-1: Open or Increased Resistance in Right Side Airbag Inflator (Without OPDS unit model)

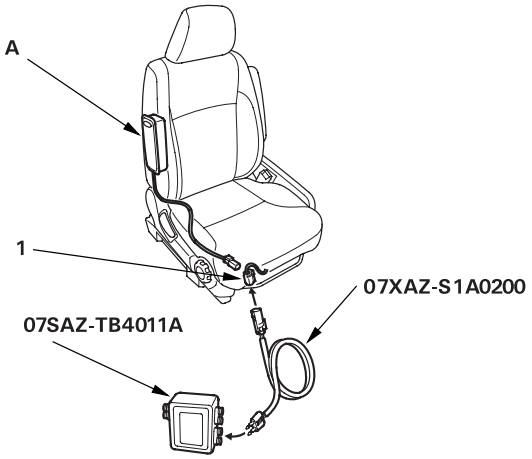
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SDi connector (1) from the driver's (right) side airbag (A).

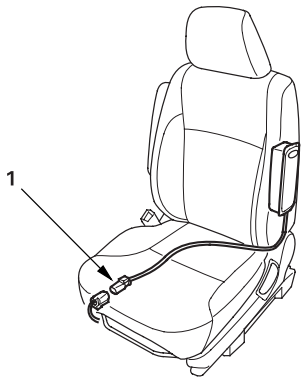


5. Connect the special tool (2 Ω connector) to the SDi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

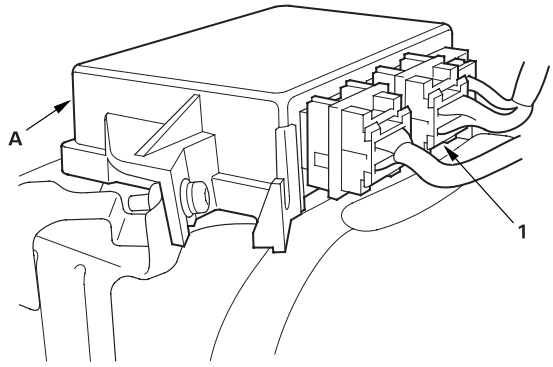
   Is DTC 11-1 or DTC 12-1 indicated?

   Yes Go to step 9.

   No Open or increased resistance in the driver's (right) side airbag inflator; replace the driver's (right) side airbag (see page 23-137).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SPo connector (1).

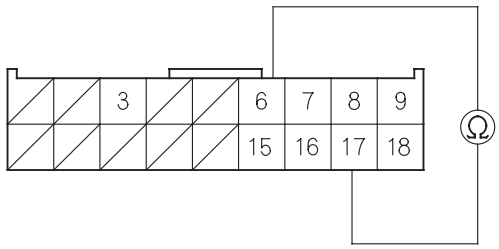


11. Disconnect the U2o connector (1) from the SRS unit (A). Do not disconnect the special tool from the SDi connector.



12. Check resistance between the No. 6 and No. 17 terminals of U2o connector. There should be 2.0 - 3.0 Ω.

U2o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit or poor contact at U2o connector and the SRS unit; check the connection at the connector and SRS unit. If the connector is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in the floor wire harness; replace the floor wire harness.■

DTC 11-3: Short to Another Wire or Decreased Resistance in Driver's Side Airbag Inflator (With OPDS unit model)

DTC 12-3: Short to Another Wire or Decreased Resistance in Right Side Airbag Inflator (Without OPDS unit model)

Special Tools Required

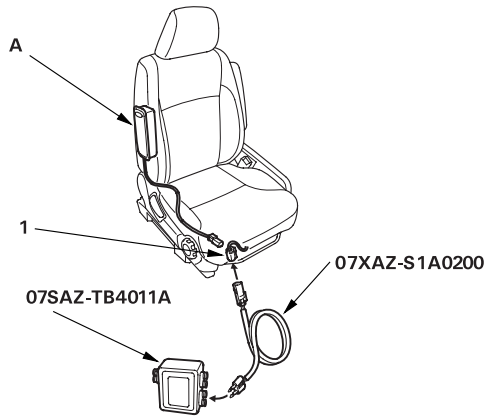
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SDi connector (1) from the driver's (right) side airbag (A).



5. Connect the special tool (2 Ω connector) to the SDi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

8. Read the DTC.

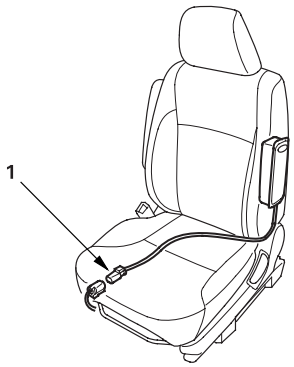
Is DTC 11-3 or DTC 12-3 indicated?

Yes Go to step 9.

No Short to another wire in the driver's (right) side airbag inflator; replace the driver's (right) side airbag.■

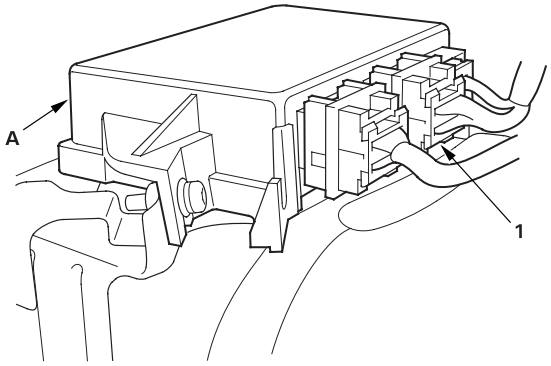
9. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the SPo connector (1).

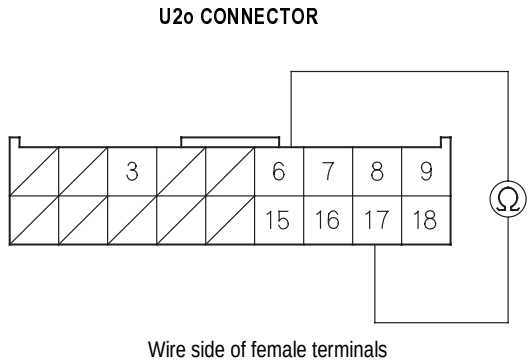


11. Disconnect the special tool from the SDi connector.

12. Disconnect the U2o connector (1) from the SRS unit (A).



13. Check resistance between the No. 6 and No. 17 terminals of U2o connector. There should be 1 M Ω or more.



Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to another wire in the floor wire harness; replace the floor wire harness.■

DTC 11-4: Short to Power in Driver's Side Airbag Inflator (With OPDS unit model)

DTC 12-4: Short to Power in Right Side Airbag Inflator (Without OPDS unit model)

Special Tools Required

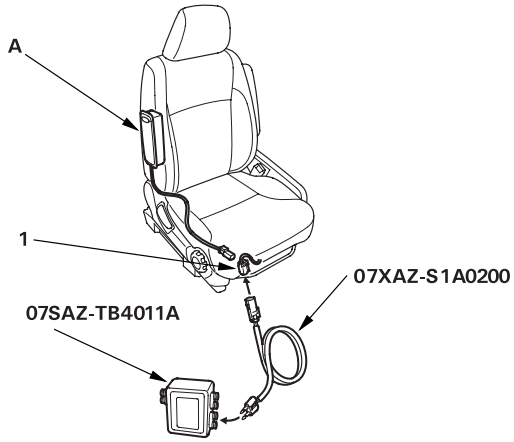
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SDi connector (1) from the driver's right side airbag (A).

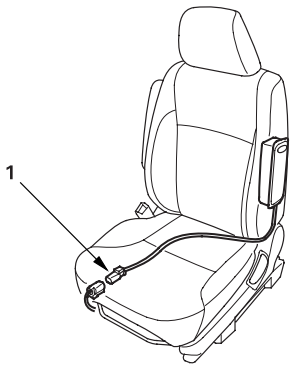


5. Connect the special tool (2 Ω connector) to the SDi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 11-4 or DTC 12-4 indicated?

   Yes Go to step 9.

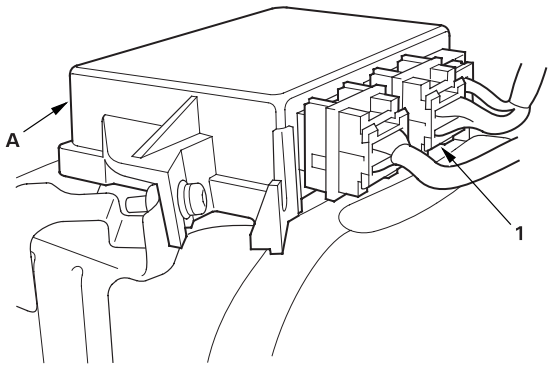
   No Short to power in the driver's (right) side airbag inflator; replace the driver's (right) side airbag (see page 23-137).■
9. Disconnect the battery negative cable, and wait for 3 minutes.■
10. Disconnect the SPo connector (1).



(cont'd)

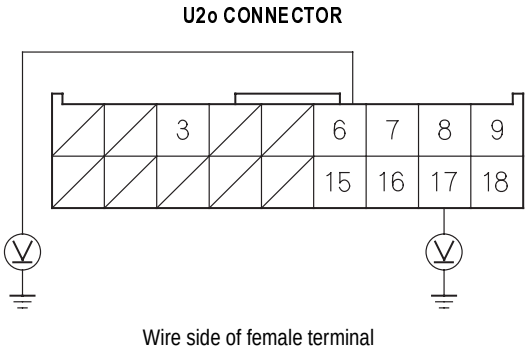
DTC Troubleshooting (cont'd)

11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Turn the ignition switch ON (II).

13. Check for voltage between the No. 6 terminal of U2o connector and body ground, and between the No. 17 terminal and body ground. There should be 0.5 V or less.



Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to power in the floor wire harness; replace the floor wire harness.■

DTC 11-5: Short to Ground in Driver's Side Airbag Inflator (With OPDS unit model)

DTC 12-5: Short to Ground in Right Side Airbag Inflator (Without OPDS unit model)

Special Tools Required

- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-29).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

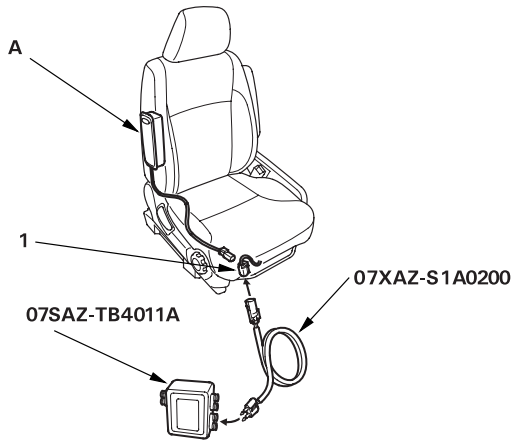
Does the SRS indicator stay on?

Yes Go to step 3.

No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the SDi connector (1) from the driver's (right) side airbag (A).



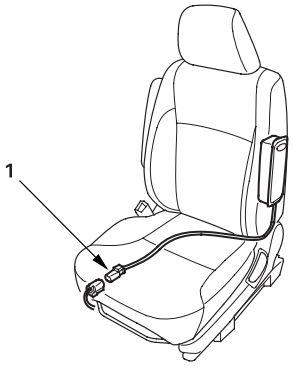
5. Connect the special tool (2 Ω connector) to the SDi connector.

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

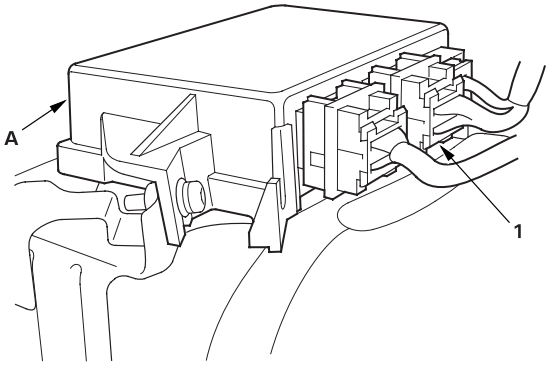
   Is DTC 11-5 or DTC 12-5 indicated?

   Yes Go to step 9.

   No Short to ground in the driver's side airbag inflator; replace the driver's side airbag (see page 23-137).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SPo connector (1).

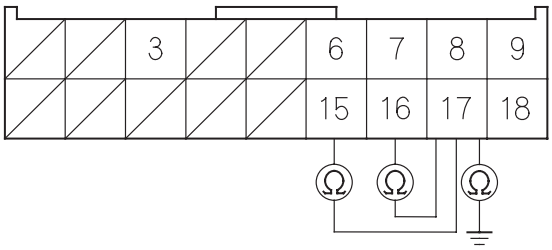


11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Check resistance between the No. 17 and No. 15 terminals of U2o connector, and between the No. 17 and No. 16 terminals. Then check resistance between the No. 17 terminal and body ground. There should be 1 M Ω or more.

U2o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to ground in the floor wire harness; replace the floor wire harness.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 12-1: Open or Increased Resistance in Front Passenger's Side Airbag Inflator(With OPDS unit model)
DTC 11-1: Open or Increased Resistance in Left Side Airbag Inflator(Without OPDS unit model)

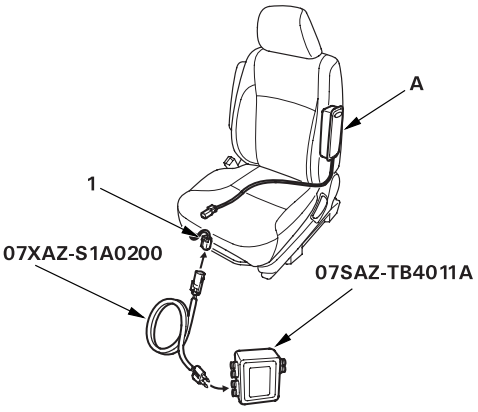
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SPi connector (1) from the front passenger's (left) side airbag (A).

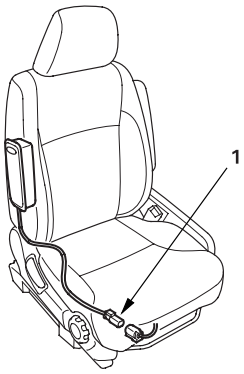


5. Connect the special tool (2 Ω connector) to the SPi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

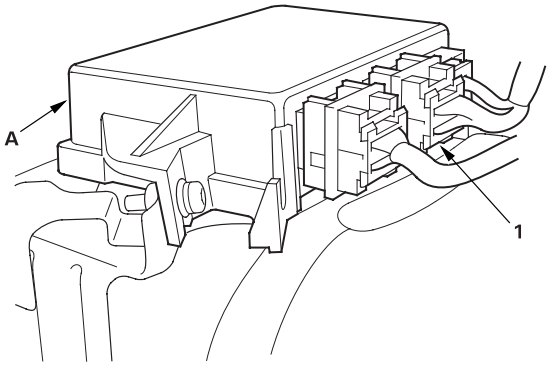
   Is DTC 12-1 or DTC 11-1 indicated?

   Yes Go to step 9.

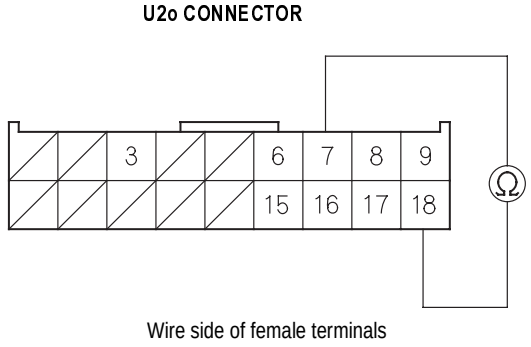
   No Open or increased resistance in the front passenger's (left) side airbag inflator, replace the front passenger's (left) side airbag (see page 23-137).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SDo connector (1).



11. Disconnect the U2o connector (1) from the SRS unit (A). Do not disconnect the special tool from the SPi connector.



12. Check resistance between the No. 7 and No. 18 terminals of U2o connector. There should be 2.0 - 3.0 Ω.



Is the resistance as specified?

Yes Faulty SRS unit or poor contact at U2o connector and the SRS unit; check the connection at the connector and SRS unit. If the connector is OK, replace the SRS unit (see page 23-144).■

No Open or increased resistance in the floor wire harness; replace the floor wire harness.■

DTC 12-3: Short to Another Wire or Decreased Resistance in Front Passenger's Side Airbag Inflator (With OPDS unit model)

DTC 11-3: Short to Another Wire or Decreased Resistance in Left Side Airbag Inflator (Without OPDS unit model)

Special Tools Required

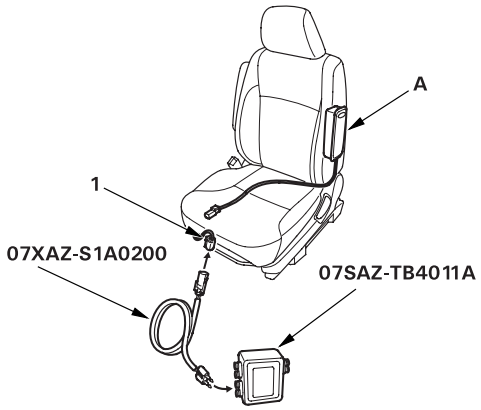
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SPi connector (1) from the front passenger's (left) side airbag (A).



5. Connect the special tool (2 Ω connector) to the SPi connector.

(cont'd)

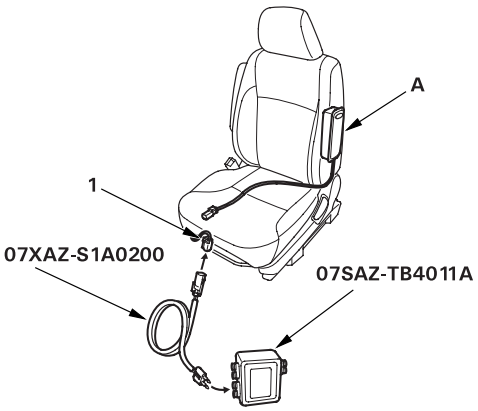
DTC Troubleshooting (cont'd)

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

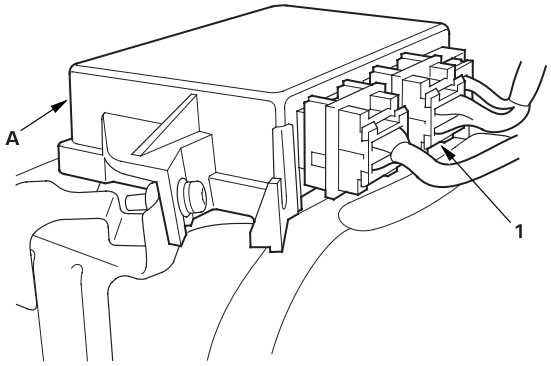
   Is DTC 12-3 or DTC 11-3 indicated?

   Yes Go to step 9

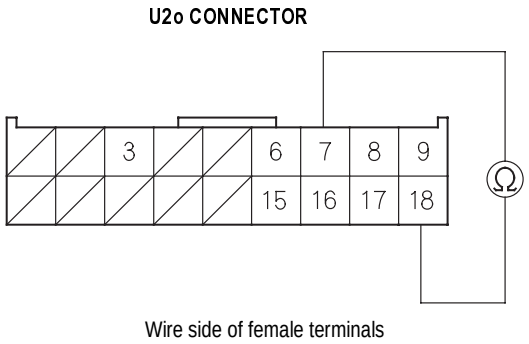
   No Short to another wire in the front passenger's (left) side airbag inflator; replace the front passenger's (left) side airbag.■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SDo connector (1).



11. Disconnect the special tool from the SPi connector.
12. Disconnect the U2o connector (1) from the SRS unit (A).



13. Check resistance between the No. 7 and No. 18 terminals of U2o connector. There should be 1 M Ω or more.



Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to another wire in the floor wire harness; replace the floor wire harness.■

DTC 12-4: Short to Power in Front Passenger's Side Airbag Inflator (With OPDS unit model)
DTC 11-4: Short to Power in Left Side Airbag Inflator (Without OPDS unit model)

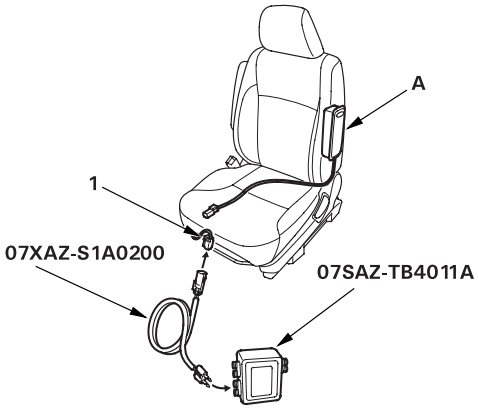
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SPi connector (1) from the front passenger's (left) side airbag (A).

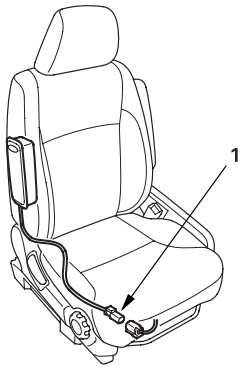


5. Connect the special tool (2 Ω connector) to the SPi connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 12-4 or DTC 11-4 indicated?

   Yes Go to step 9.

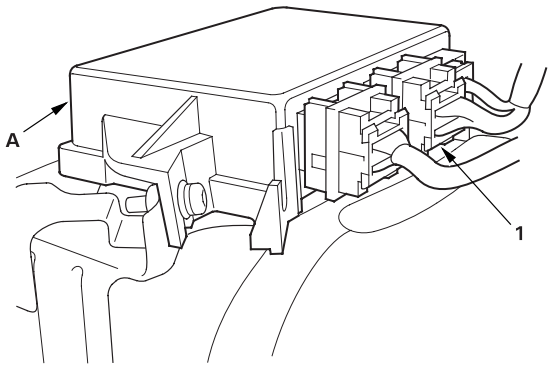
   No Short to power in the front passenger's (left) side airbag inflator; replace the front passenger's (left) side airbag (see page 23-137).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SDo connector (1).



(cont'd)

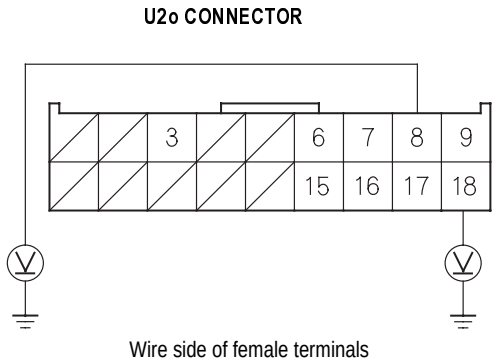
DTC Troubleshooting (cont'd)

11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Turn the ignition switch ON (II).

13. Check for voltage between the No. 8 terminal of U2o connector and body ground, and between the No. 18 terminal and body ground. There should be 0.5 V or less.



Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to power in the floor wire harness; replace the floor wire harness.■

DTC 12-5: Short to Ground in Front Passenger's Side Airbag Inflator (With OPDS unit model)
DTC 11-5: Short to Ground in Left Side Airbag Inflator (Without OPDS unit model)

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-29).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

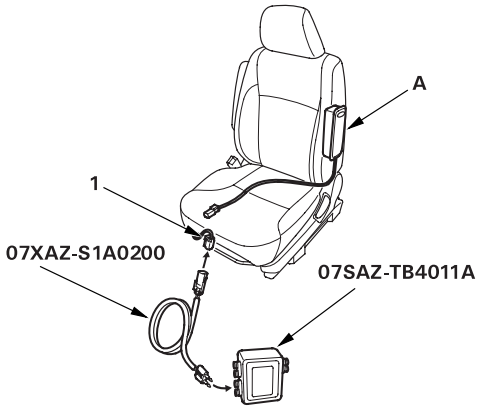
Does the SRS indicator stay on?

Yes Go to step 3.

No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the SPi connector (1) from the front passenger's (left) side airbag (A).



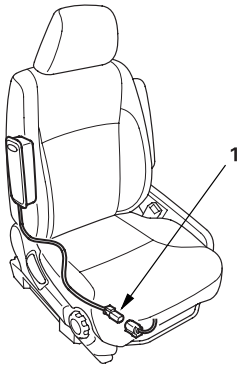
5. Connect the special tool (2 Ω connector) to the SPi connector.

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

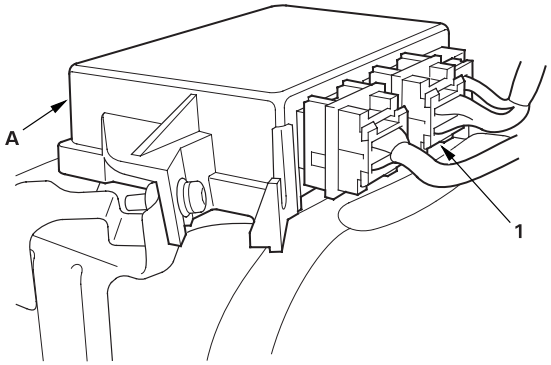
   Is DTC 12-5 or DTC 11-5 indicated?

   Yes Go to step 9.

   No Short to ground in the front passenger's (left) side airbag inflator; replace the front passenger's (left) side airbag (see page 23-137).■
9. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the SDo connector (1).

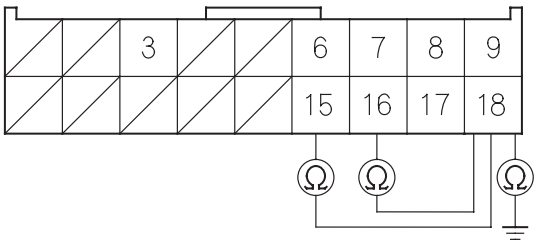


11. Disconnect the U2o connector (1) from the SRS unit (A).



12. Check resistance between the No. 15 and No. 18 terminals of U2o connector and between the No. 16 and No. 18 terminals. Then check resistance between the No. 18 terminal and body ground. There should be 1 M Ω or more.

U2o CONNECTOR



Wire side of female terminal

Is the resistance as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to ground in the floor wire harness; replace the floor wire harness.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 13-3: No Signal from the Driver's Side Impact Sensor (With OPDS unit model)
DTC 14-3: No Signal from the Right Side Impact Sensor (Without OPDS unit model)

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3A0100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

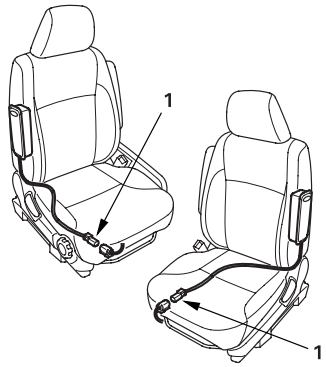
   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Check the connection between the IDi connector and the driver's (right) side impact sensor.

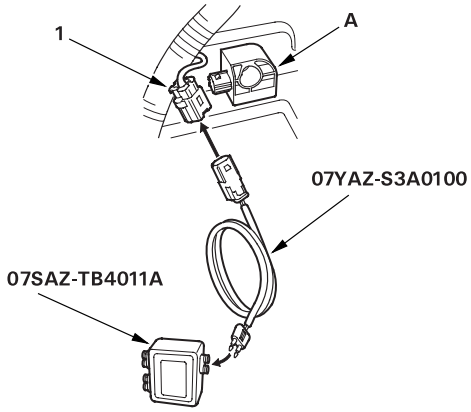
   Is the connection OK?

   Yes Go to step 5.

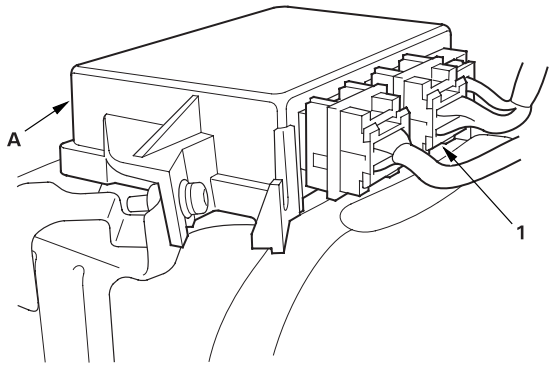
   No Replace the driver's (right) side impact sensor (see page 23-145).■
5. Disconnect the SDo and SPo connectors (1).



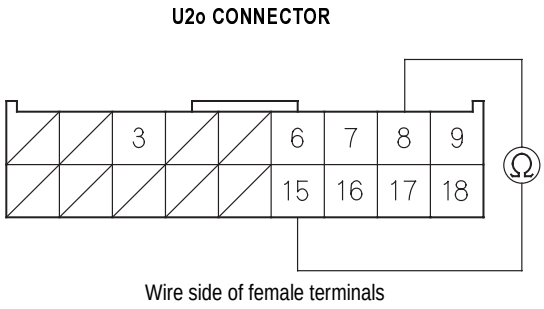
6. Disconnect the IDi connector (1) from the driver's (right) side impact sensor (A).



7. Connect the special tool (jumper connector) to the IDi connector.
8. Disconnect U2o connector (1) from the SRS unit (A).



9. Check resistance between the No. 8 and No. 15 terminals of U2o connector. There should be 0 - 1.0 Ω.



Is the resistance as specified?

Yes Faulty driver's (right) side impact sensor or SRS unit; replace the driver's (right) side impact sensor (see page 23-147). If the problem is still present, replace the SRS unit (see page 23-144).■

No Open in the floor wire harness; replace the floor wire harness.■

DTC 13-4: Faulty Power Supply to the Driver's Side Impact Sensor (With OPDS unit model)

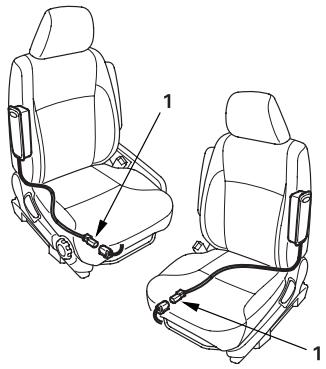
DTC 14-4: Faulty Power Supply to the Right Side Impact Sensor (Without OPDS unit model)

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Go to step 3.

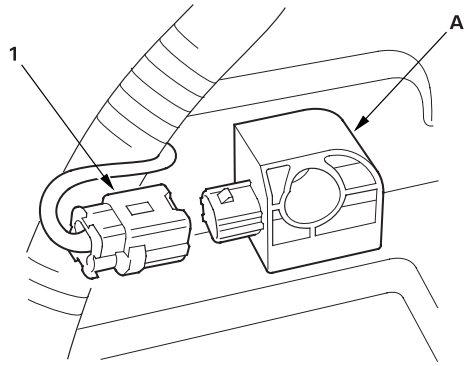
   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SDo and SPo connectors (1).



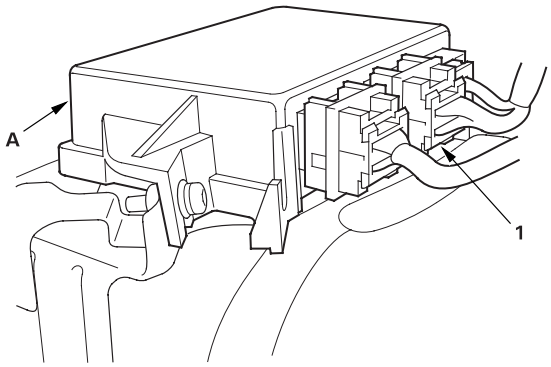
(cont'd)

DTC Troubleshooting (cont'd)

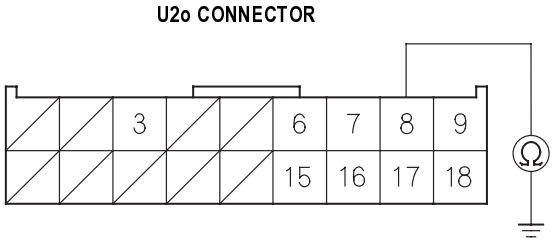
5. Disconnect the IDi connector (1) from the driver's side impact sensor (A).



6. Disconnect the U2o connector (1) from the SRS unit (A).



7. Check resistance between the No. 8 terminal of U2o connector and body ground. There should be 1 M Ω or more.



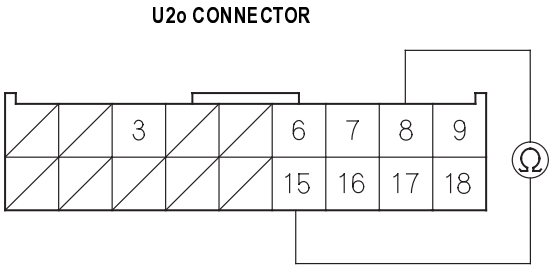
Wire side of female terminals

Is the resistance as specified?

Yes Go to step 8.

No Short to ground in the floor wire harness; replace the floor wire harness.■

8. Check resistance between the No. 8 and No. 15 terminals of U2o connector. There should be 1 M Ω or more.



Wire side of female terminals

Is the resistance as specified?

Yes Faulty driver's (right) side impact sensor or SRS unit; replace the driver's (right) side impact sensor (see page 23-147). If the problem is still present, replace the SRS unit (see page 23-144).■

No Short in the floor wire harness; replace the floor wire harness.■

DTC 14-3: No Signal from the Front Passenger's Side Impact Sensor (With OPDS unit model)

DTC 13-3: No Signal from the Left Side Impact Sensor (Without OPDS unit model)

Special Tools Required

- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3A0100

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

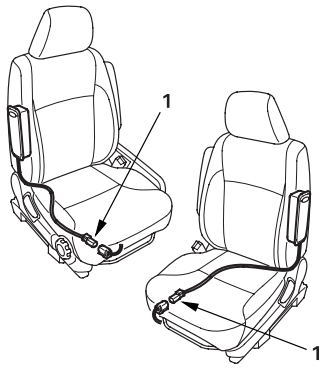
   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Check the connection between the IPi connector and the front passenger's (left) side impact sensor.

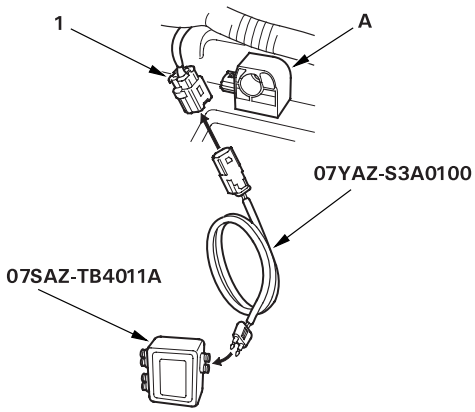
   Is the connection OK?

   Yes Go to step 5.

   No Poor contact between the floor wire harness 2P connector and the front passenger's (left) side impact sensor; replace the front passenger's (left) side impact sensor (see page 23-145).■
5. Disconnect the SDo and SPo connectors (1).



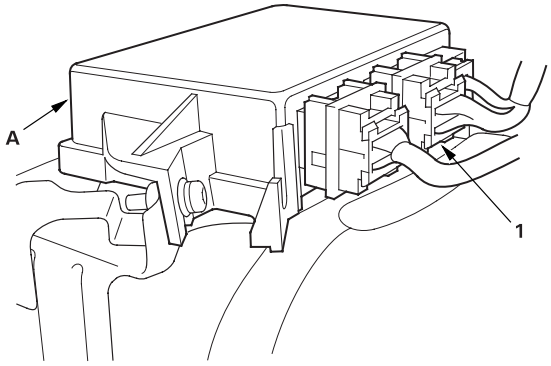
6. Disconnect the IPi connector (1) from the front passenger's (left) side impact sensor (A).



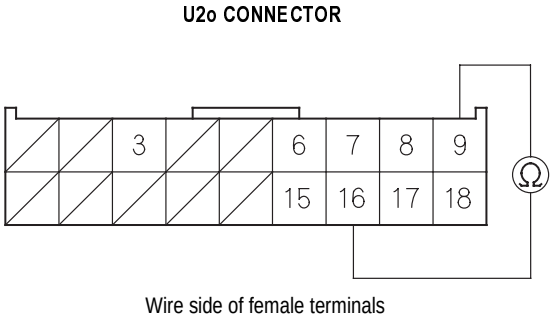
(cont'd)

DTC Troubleshooting (cont'd)

7. Connect the special tool (jumper connector) to the IPi connector.
8. Disconnect the U2o connector (1) from the SRS unit (A).



9. Check resistance between the No. 9 and No. 16 terminals of U2o connector. There should be 0 - 1.0 Ω.



Is the resistance as specified?

Yes Faulty front passenger's (left) side impact sensor or SRS unit; replace the front passenger's (left) side impact sensor (see page 23-147). If the problem is still present, replace the SRS unit (see page 23-144).■

No Open in the floor wire harness; replace the floor wire harness.■

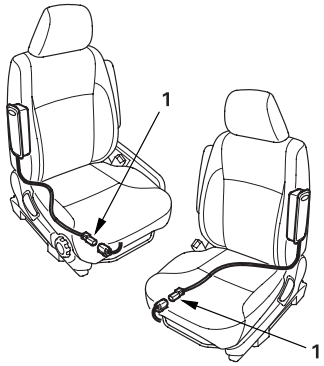
DTC 14-4: Faulty Power Supply to the Front Passenger's Side Impact Sensor (With OPDS unit model)
DTC 13-4: Faulty Power Supply to the Left Side Impact Sensor (Without OPDS unit model)

1. Erase the DTC memory (see page 23-29).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

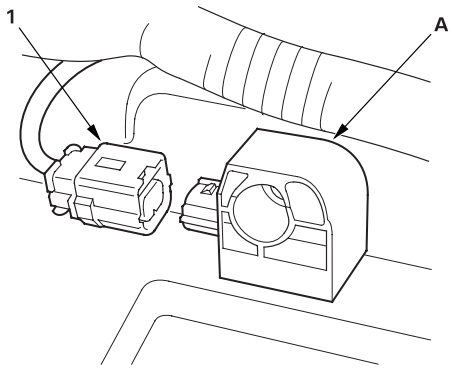
   Does the SRS indicator stay on?

   Yes Go to step 3.

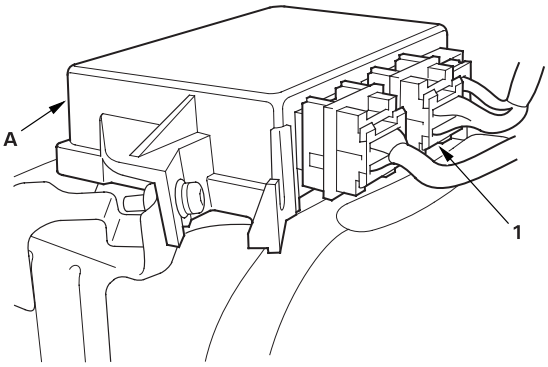
   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the SDo and SPo connectors (1).



5. Disconnect the IPi connector (1) from the front passenger's (left) side impact sensor (A).

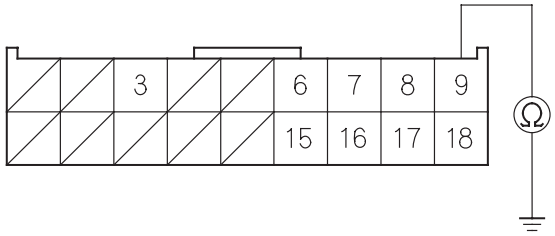


6. Disconnect the U2o connector (1) from the SRS unit (A).



7. Check resistance between the No. 9 terminal of U2o connector and body ground. There should be 1 M Ω or more.

U2o CONNECTOR



Wire side of female terminals

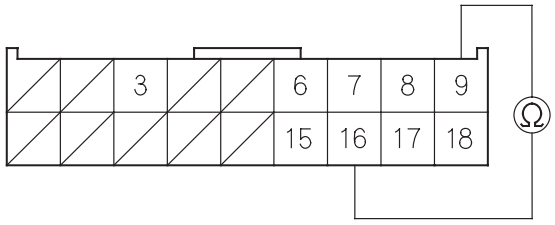
Is the resistance as specified?

Yes Go to step 8.

No Short to ground in the floor wire harness; replace the floor wire harness.■

8. Check resistance between the No. 9 and No. 16 terminals of U2o connector. There should be 1 M Ω or more.

U2o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty front passenger's (left) side impact sensor or SRS unit; replace the front passenger's (left) side impact sensor (see page 23-145). If the problem is still present, replace the SRS unit (see page 23-144).■

No Short in the floor wire harness; replace the floor wire harness.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 15-1: Faulty OPDS Unit

1. Make sure nothing is on the front passenger's seat.
2. Initialize the OPDS unit (see page 23-30).
3. Erase the DTC memory (see page 23-29).
4. Read the DTC.

   Is DTC 15-1 indicated?

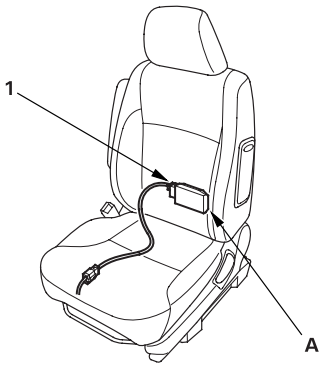
   Yes Go to step 5.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
5. Check the No. 9 (7.5A) fuse in the under-dash fuse/relay box.

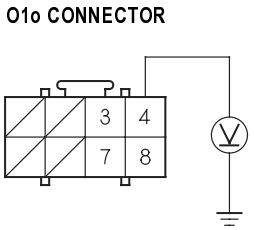
   Is the fuse OK?

   Yes Go to step 6.

   No Go to step 9.
6. Disconnect the O1o connector (1) from the OPDS unit (A) (see page 23-146).



7. Turn the ignition switch ON (II).
8. Check for voltage between the No. 4 terminal of the O1o connector and body ground. There should be battery voltage.



Wire side of female terminals

   Is there battery voltage?

   Yes Go to step 16.

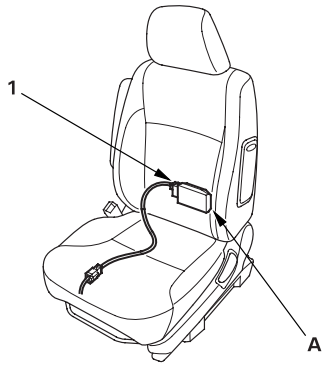
   No Open in the floor wire harness or in the OPDS unit harness; replace the faulty harness.■
9. Replace the No. 9 (7.5A) fuse in the under-dash fuse/relay box.
10. Turn the ignition switch ON (II) for 30 seconds, then turn it OFF.
11. Check the No. 9 (7.5A) fuse in under-dash fuse/relay box.

    Is the fuse OK?

    Yes Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).

    No Go to step 12.
12. Replace the No. 9 (7.5A) fuse in the under-dash fuse/relay box.

13. Disconnect the O1o connector (1) from the OPDS unit (A).



14. Turn the ignition switch ON (II) for 30 seconds, then turn it off.

15. Check the No. 9 (7.5 A) fuse in the under-dash fuse/relay box.

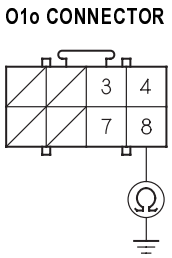
Is the fuse OK?

Yes Short to ground in the OPDS unit; replace the OPDS unit (see page 23-146).■

No Short to ground in the No. 9 (7.5 A) circuit.■

16. Turn the ignition switch OFF.

17. Check resistance between the No. 8 terminal of the O1o connector and body ground. There should be 0 - 1.0 Ω.



Wire side of female terminals

Is the resistance as specified?

Yes Go to step 18.

No Open in floor wire harness or OPDS unit harness, or poor ground (G551). If the G551 is OK, replace the faulty harness.■

18. Disconnect the battery negative cable, and wait for 3 minutes.

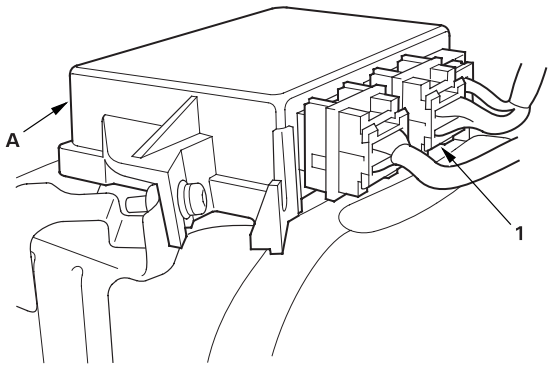
19. Disconnect the SDo and SPo connectors (1).



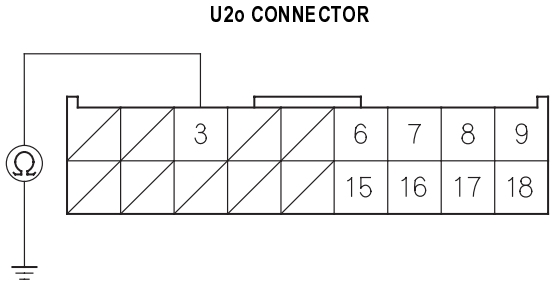
(cont'd)

DTC Troubleshooting (cont'd)

20. Disconnect the U2o connector (1) from the SRS unit (A).



21. Check resistance between the No. 3 terminal of U2o connector and body ground. There should be 1 M Ω or more.

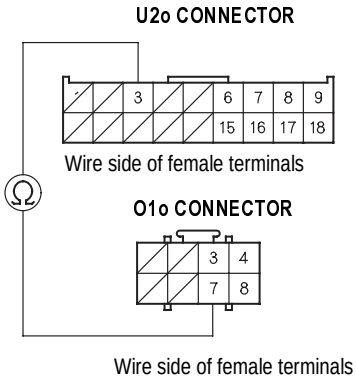


Is the resistance as specified?

Yes Go to step 22.

No Short to ground in the floor wire harness or OPDS unit harness; replace the faulty harness.■

22. Check resistance between the No. 3 terminal of U2o connector and the No. 7 terminal of the O1o connector. There should be 0 - 1.0 Ω.

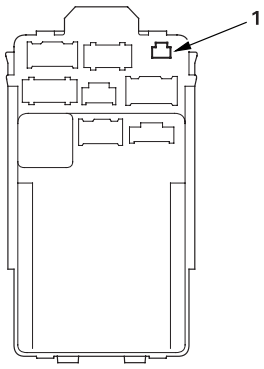


Is the resistance as specified?

Yes Go to step 23.

No Open in the floor wire harness or in the OPDS unit harness; replace the faulty harness.■

23. Disconnect the F1o connector (1) from the under-dash fuse/relay box.

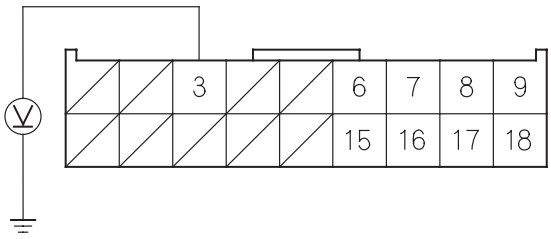


24. Reconnect the negative battery cable.

25. Turn the ignition switch ON (II).

26. Check for voltage between the No. 3 terminal of U2o connector and body ground. There should be 0.5 V or less.

U2o CONNECTOR



Wire side of female terminal

Is the voltage as specified?

Yes Go to step 27.

No Short to power in the floor wire harness or in the OPDS unit harness; replace the faulty harness.■

27. Replace the OPDS unit (see page 23-146), then intialize the system (see page 23-29).

28. Erase the DTC memory, then check for DTC 15-1.

Is DTC 15-1 indicated?

Yes Replace the SRS unit (see page 23-144).■

No The system is OK.■

(cont'd)

DTC Troubleshooting (cont'd)

DTC 15-2: Faulty Side Airbag Cutoff Indicator Circuit

1. Make sure nothing is on the front passenger's seat.
2. Erase the DTC memory (see page 23-29).
3. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   Yes Turn the ignition switch OFF, go to step 4.

   No Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-29).
4. Turn the ignition switch ON (II), and check that the side airbag cutoff indicator comes on.

   Does the side airbag cutoff indicator come on?

   Yes Go to step 5.

   No Go to step 6.
5. Make sure the side airbag cutoff indicator comes on for 5 seconds and then goes off.

   Does the side airbag cutoff indicator go off?

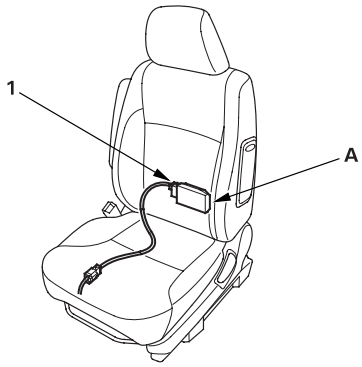
   Yes Faulty OPDS unit or SRS unit; replace the OPDS unit (see page 23-146). If the problem is still present, replace the SRS unit (see page 23-144).■

   No Go to step 35.
6. Turn the ignition switch OFF.
7. Check the No. 10 (7.5A) fuse in the under-dash fuse/relay box.

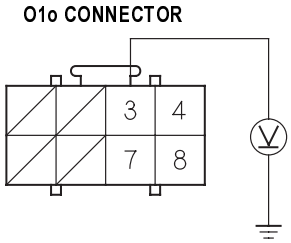
   Is the fuse OK?

   Yes Go to step 8.

   No Repair the short to ground in the No. 10 (7.5A) fuse circuit.■
8. Disconnect the O1o connector (1) from the OPDS unit (A) (see page 23-146).



9. Turn the ignition switch ON (II).
10. Check for voltage between the No. 3 terminal of the O1o connector and body ground. There should be battery voltage.



Wire side of female terminals

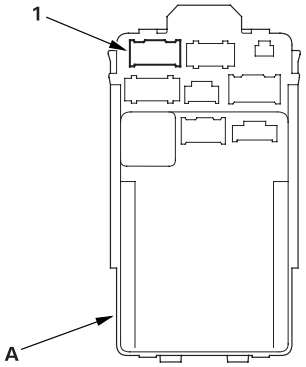
Is there battery voltage?

Yes Go to step 11.

No Go to step 23.

11. Turn the ignition switch OFF.

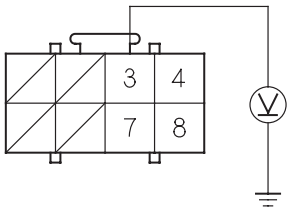
12. Disconnect the F3o connector (1) from the under-dash fuse/relay box (A).



13. Turn the ignition switch ON (II).

14. Check for voltage between the No. 3 terminal of the O1o connector and body ground. There should be 0.5 V or less.

O1o CONNECTOR



Wire side of female terminals

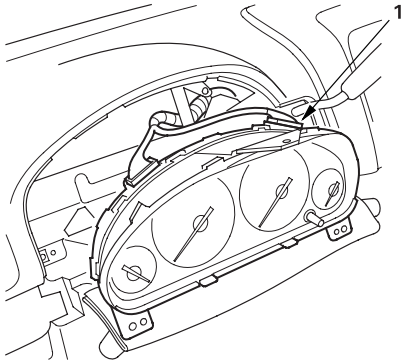
Is the voltage as specified?

Yes Faulty OPDS unit; replace the OPDS unit (see page 23-146).■

No Go to step 15.

15. Turn the ignition switch OFF.

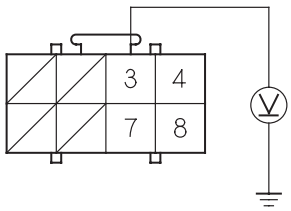
16. Disconnect C2 connector (1) from the gauge assembly (see page 22A-74).



17. Turn the ignition switch ON (II).

18. Check for voltage between the No. 3 terminal of the O1o connector and body ground. There should be 0.5 V or less.

O1o CONNECTOR



Wire side of female terminals

Is the voltage as specified?

Yes Short to power in the gauge assembly; replace the gauge assembly.■

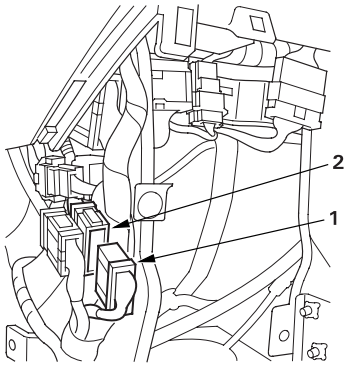
No Go to step 19.

(cont'd)

DTC Troubleshooting (cont'd)

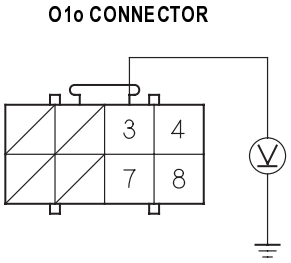
19. Turn the ignition switch OFF.

20. Disconnect the C4 connector (1) from the C3 connector (2).



21. Turn the ignition switch ON (II).

22. Check for voltage between the No. 3 terminal of the O1o connector and body ground. There should be 0.5 V or less.



Wire side of female terminals

Is the voltage as specified?

Yes Short to power in the dashboard wire harness A; replace the dashboard wire harness A.■

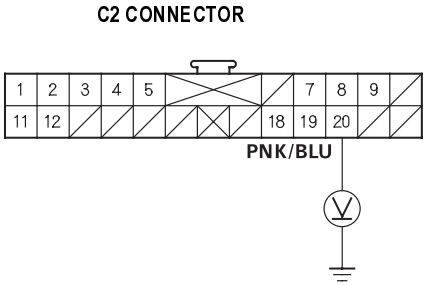
No Short to power in the floor wire harness or in the OPDS unit harness; if the OPDS unit harness is OK, replace the floor wire harness.■

23. Turn the ignition switch OFF.

24. Backprobe the No. 8 terminal of C2 connector. Do not disconnect C2 connector from the gauge assembly (see page 22A-74).

25. Turn the ignition switch ON (II).

26. Check for voltage between the No. 20 terminal of C2 connector B and body ground. There should be battery voltage.



Wire side of female terminals

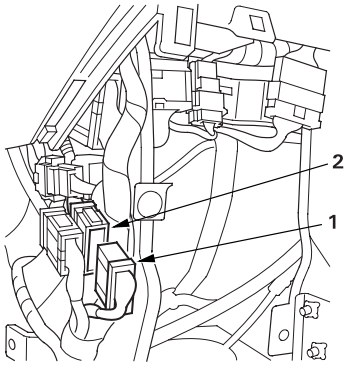
Is there battery voltage?

Yes Go to step 27.

No Go to step 31.

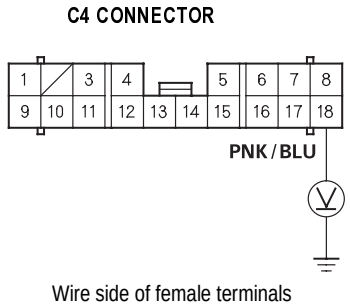
27. Turn the ignition switch OFF.

28. Disconnect the C4 connector (1) from the C3 connector (2).



29. Turn the ignition switch ON (II).

30. Check for voltage between the No. 18 terminal of the C4 connector and body ground. There should be battery voltage.



Wire side of female terminals

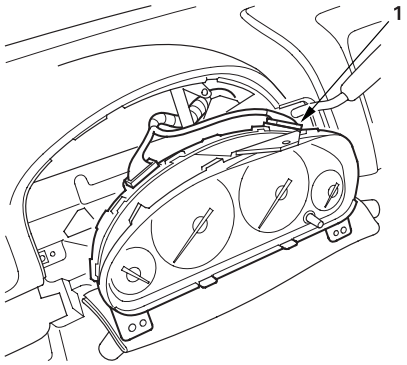
Is there battery voltage?

Yes Poor contact at the C4 and C3 connectors or an open in floor wire harness or in the OPDS unit harness. Check the connection between the C4 and C3 connectors; if the connection is OK, replace the faulty harness.■

No Poor contact at gauge assembly connector B (18P) or an open in dashboard wire harness A. Check C2 connector; if the connections are OK, replace dashboard wire harness A.■

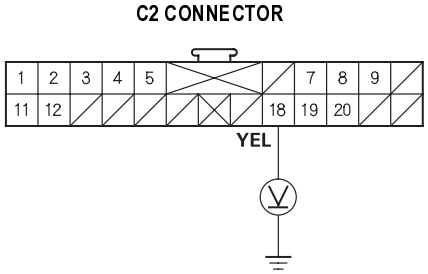
31. Turn the ignition switch OFF.

32. Disconnect C2 connector (1) from the gauge assembly.



33. Turn the ignition switch ON (II).

34. Check for voltage between the No. 18 terminal of C2 connector and body ground. There should be battery voltage.



Wire side of female terminals

Is there battery voltage?

Yes Faulty side airbag cutoff indicator circuit; replace the gauge assembly.■

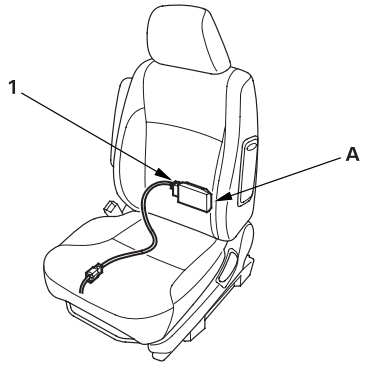
No Open in the dashboard wire harness; replace the dashboard wire harness.■

(cont'd)

DTC Troubleshooting (cont'd)

35. Turn the ignition switch OFF.

36. Disconnect the O1o connector (1) from the OPDS unit (A) (see page 23-146).



37. Turn the ignition switch ON (II).

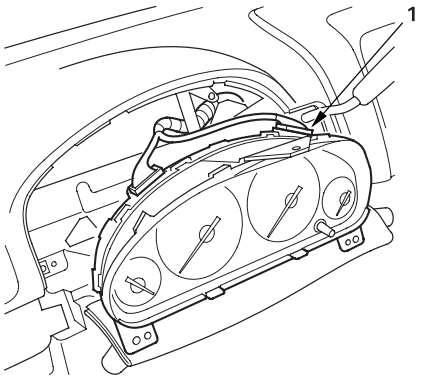
Does the side airbag cutoff indicator come on?

Yes Go to step 38.

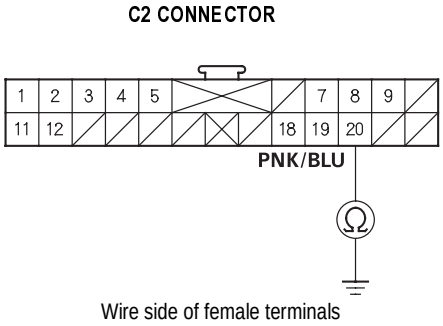
No Faulty OPDS unit; replace the OPDS unit.■

38. Turn the ignition switch OFF.

39. Disconnect C2 connector (1) from the gauge assembly (see page 22A-74).



40. Check resistance between the No. 20 terminal of C2 connector and body ground. There should 1 M Ω or more.



Is the resistance as specified?

Yes Short to ground in the side airbag cutoff indicator circuit; replace the gauge assembly.■

No Short to ground in the dashboard wire harness A, floor wire harness or OPDS unit harness; replace the faulty harness.■

DTC 15-3: Faulty OPDS Sensor

1. Erase the DTC memory (see page 23-29).

   NOTE:Aftermarket devices (fluorescent map lights, laptop computers, etc.) Used near the front passenger's seat-back can interfere with the seat-back sensors and cause a false DTC 15-3. If one of these devices was used, erase the DTC, operate the device near the seat-back, and recheck for DTCs. If DTC 15-3 is reset, erase it, and do not use the device near the seat-back.

2. Check the connection at the OPDS sensor harness connector and the OPDS unit connector.

   Are the connections OK?

   Yes Go to step 4.

   No Reconnect the OPDS sensor harness connector, and clear the DTC.■

3. Replace the OPDS sensor/seat back foam (see page 20-103), and reinitialize the OPDS system (see page 23-30).

4. Erase the DTC memory, then check for DTC 15-3.

   Is DTC 15-3 indicated?

   Yes Replace the OPDS unit (see page 23-146).■

   No System is OK.■

SRS Indicator Circuit Troubleshooting

The SRS Indicator Doesn't Come On

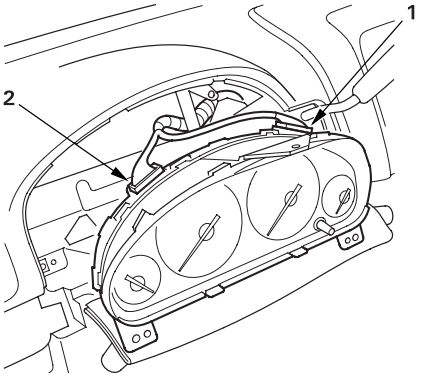
1. Turn the ignition switch ON (II), and check to see if the other indicators come on (brake system, etc).

Do the other indicators come on?

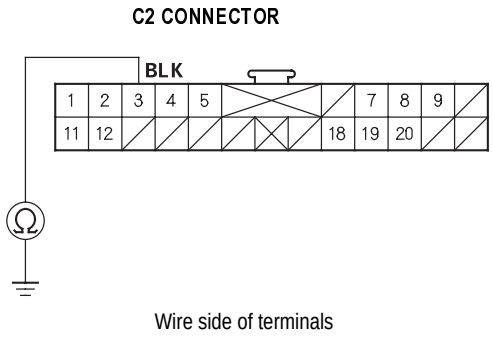
Yes Go to step 2.

No Go to step 8.

2. Turn the ignition switch OFF, then disconnect C1 connector (2), and C2 connector (1) from the gauge assembly (see page 22A-74).



3. Check resistance between the No. 3 terminal of C2 connector and body ground. There should be 0 - 1.0 Ω.



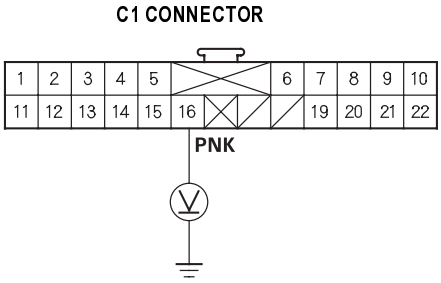
Wire side of terminals

Is the resistance as specified?

Yes Go to step 4.

No Open in the BLK wire of dashboard wire harness A or faulty body ground terminal (G502). If the body ground terminal is OK, replace dashboard wire harness A.■

4. Check for voltage between the No. 16 terminal of C1 connector and body ground within the first 6 seconds after turning the ignition switch ON (II). There should be 8.5 V or less.



Wire side of female terminals

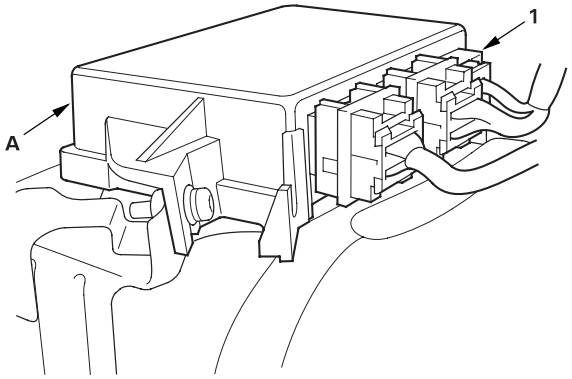
Is the voltage as specified?

Yes Faulty SRS indicator circuit in the gauge assembly; replace the gauge assembly.■

No Go to step 5.

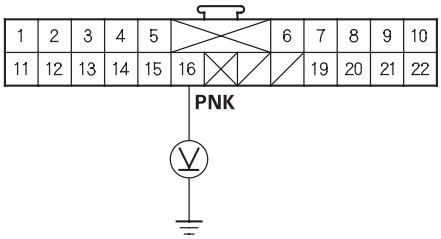
5. Turn the ignition switch OFF.

6. Disconnect the U3o connector (1) from the SRS unit (A).



7. Connect a voltmeter between the No. 16 terminal of C1 connector and body ground. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.

C1 CONNECTOR



Wire side of female terminals

Is the voltage as specified?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Short to power in the PNK wire of dashboard wire harness A or in the floor wire harness; replace the faulty harness.■

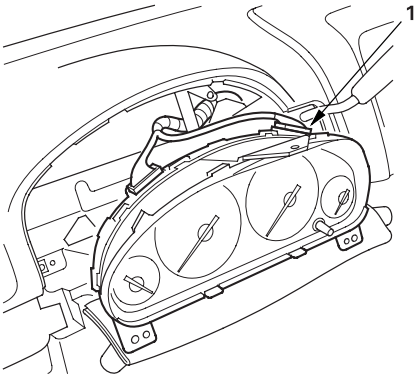
8. Turn the ignition switch OFF. Check the No. 10 (7.5A) fuse in the under-dash fuse/relay box.

Is the fuse blown?

Yes Go to step 11.

No Go to step 9.

9. Disconnect C2 connector (1) from the gauge assembly (see page 22A-74).

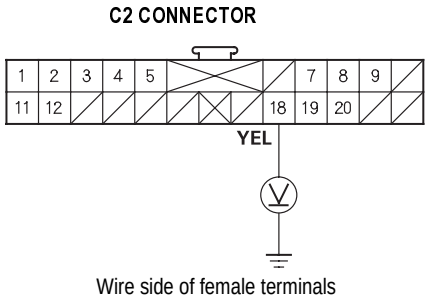


(cont'd)

SRS Indicator Circuit Troubleshooting (cont'd)

The SRS Indicator Doesn't Come On (cont'd)

10. Connect a voltmeter between the No. 18 terminal of C2 connector and body ground. Turn the ignition switch ON (II), and measure the voltage. There should be battery voltage.



Wire side of female terminals

Is there battery voltage?

Yes Faulty SRS indicator circuit in the gauge assembly or poor contact at gauge assembly C2 connector and gauge assembly; if the connection is OK, replace the gauge assembly.■

No Open in the under-dash fuse/relay box No. 10 (7.5A) fuse line, or open in the YEL wire of dashboard wire harness A. If the under-dash fuse/relay box is OK, replace the faulty harness.■

11. Replace the No. 10 (7.5A) fuse, then check to see if the SRS indicator comes on.

Does the SRS indicator come on?

Yes The system is OK at this time.■

No Repair the short to ground in the under-dash fuse/relay box No. 10 (7.5A) fuse line.■

The SRS Indicator Stays On When In "SCS" Menu Method

NOTE:
- If you cannot retrieve DTCs with the PGM Tester using the SRS menu method, Retrieve the flash codes with the tester in SCS mode (see page 23-26).
- A new SRS unit must sense the entire system is OK before completing its initial self-test. The most common cause of an incomplete self-test is the failure to replace all deployed parts after a collision, in particular, seat belt tensioners and seat belt buckle tensioners.
- An incomplete self-test prevents the PGM Tester from retrieving DTCs, although flash codes are available in the Tester's SCS mode.

1. Erase the DTC memory with the "SRS Indicator Method" (see page 23-29).

   Does the SRS indicator go off when the DTC memory is being erased?

   Yes Go to step 42.

   No Go to step 2.

2. Check the No. 13 (10A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   Yes Go to step 19.

   No Go to step 3.

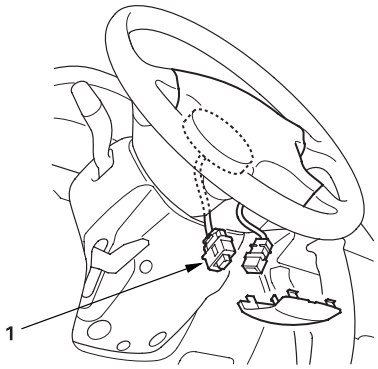
3. Replace the No. 13 (10A) fuse in the under-dash fuse/relay box.
4. Turn the ignition switch ON (II), and wait for 30 seconds. Then turn the ignition switch OFF.
5. Check the No. 13 (10A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

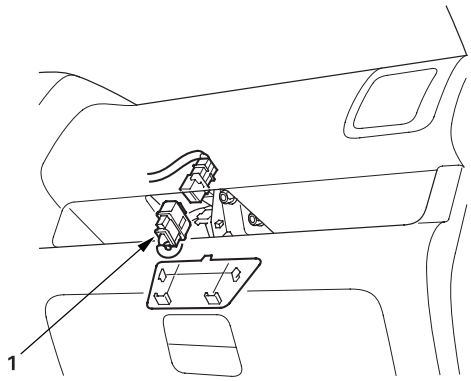
   Yes The system is OK at this time.■

   No Go to step 6.

6. Replace the No. 13 (10A) fuse in the under-dash fuse/relay box.
7. Disconnect the battery negative cable, and wait for 3 minutes.
8. Disconnect the D1o connector (1).



9. Disconnect the P1o connector (1).

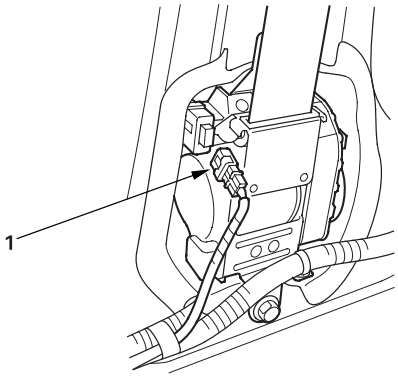


(cont'd)

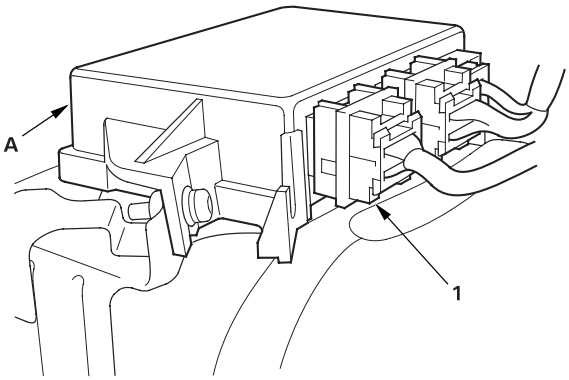
SRS Indicator Circuit Troubleshooting (cont'd)

The SRS Indicator Stays On When In "SCS" Menu Method (cont'd)

10. Disconnect the TL1o and TR1o connectors (1).



11. Disconnect U1o connector (1) from the SRS unit (A).



12. Reconnect the battery negative cable.

13. Turn the ignition switch ON (II), and wait for 30 seconds. Then turn the ignition switch OFF.

14. Check the No. 13 (10A) fuse in the under-dash fuse/relay box.

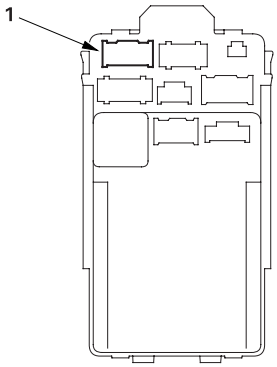
Is the fuse OK?

Yes Short to ground in the SRS unit; replace the SRS unit (see page 23-144).■

No Go to step 15.

15. Replace the No. 13 (10A) fuse in the under-dash fuse/relay box.

16. Disconnect the F3o connector (1) from the under-dash fuse/relay box.



17. Turn the ignition switch ON (II), and wait for 30 seconds. Then turn the ignition switch OFF.

18. Check the No. 13 (10A) fuse in the under-dash fuse/relay box.

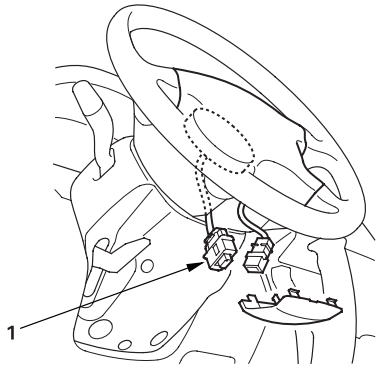
Is the fuse OK?

Yes Short to ground in dashboard wire harness A; replace dashboard wire harness A.■

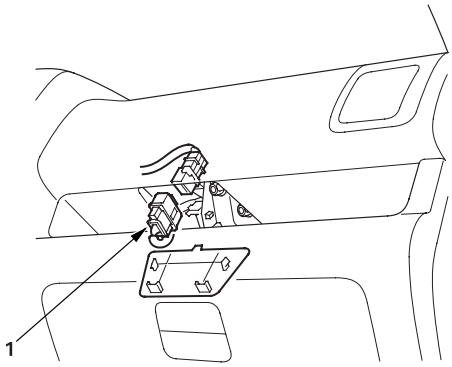
No Repair the short to ground in the under-dash fuse/relay box No. 13 (10A) fuse line; it the problem is still present, replace the under-dash fuse/relay box.■

19. Disconnect the battery negative cable, and wait for 3 minutes.

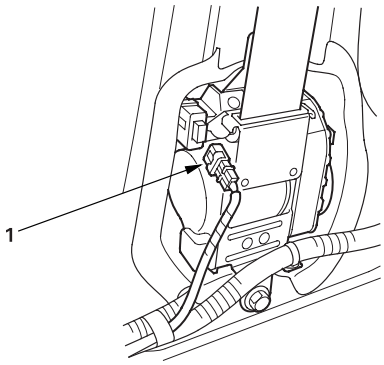
20. Disconnect the D1o connector (1).



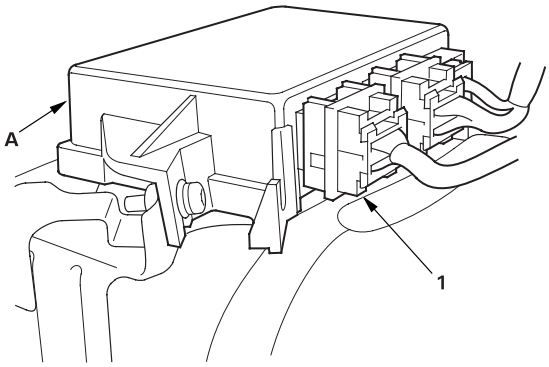
21. Disconnect the P1o connector (1).



22. Disconnect the TL1i and TR1i connectors (1).



23. Disconnect U1o connector (1) from the SRS unit (A).



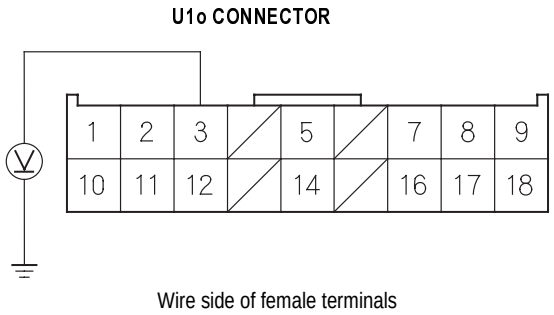
(cont'd)

SRS Indicator Circuit Troubleshooting (cont'd)

The SRS Indicator Stays On When In "SCS" Menu Method (cont'd)

24. Reconnect the battery negative cable.

25. Connect a voltmeter between the No. 3 terminal of U1o connector and body ground. Turn the ignition switch ON (II), and measure the voltage. There should be battery voltage.



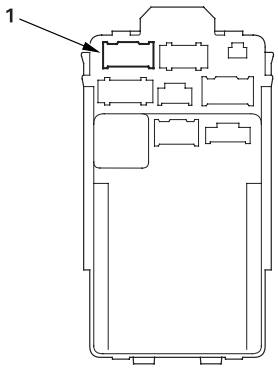
Is there battery voltage?

Yes Go to step 29.

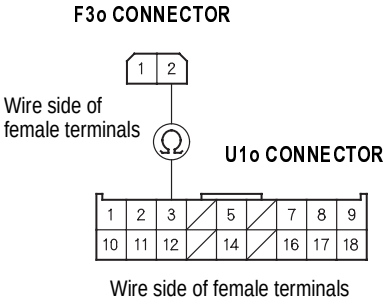
No Go to step 26.

26. Turn the ignition switch OFF.

27. Disconnect the F3o connector (1) from the under-dash fuse/relay box.



28. Check resistance between the No. 3 terminal of U1o connector and the No. 2 terminal of the F3o connector. There should be 0 - 1.0 Ω.



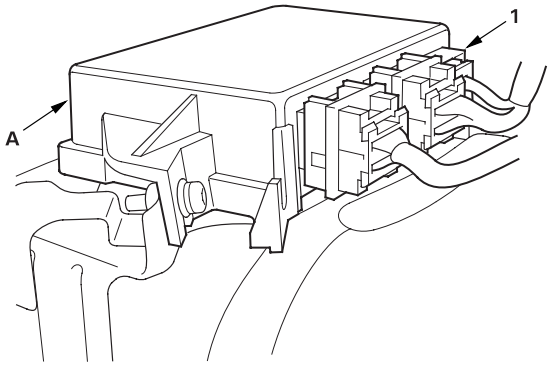
Is the resistance as specified?

Yes Open in the under-dash fuse/relay box or poor contact at the F3o connector; check the connection. If the connection is OK, replace the under-dash fuse/relay box.■

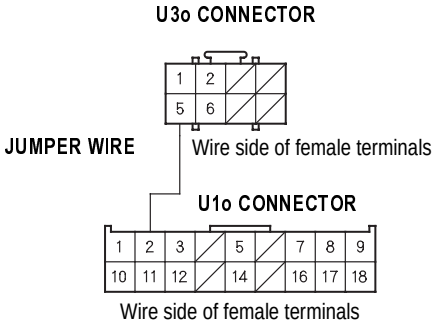
No Open in dashboard wire harness A; replace dashboard wire harness.■

29. Turn the ignition switch OFF.

30. Disconnect U3o unit connector (1) from the SRS unit (A).



31. Connect the No. 2 terminal of U3o connector and the No. 5 terminal of the U3o connector with a jumper wire.



32. Turn the ignition switch ON (II).

33. Check the SRS indicator.

Did the SRS indicator go off?

Yes Faulty SRS unit; replace the SRS unit (see page 23-144).■

No Go to step 34.

34. Turn the ignition switch OFF.

35. Disconnect the jumper wire between the No. 2 terminal of U1o connector and the No. 5 terminal of the U3o connector.

36. Check the No. 13 (10A) fuse in the under-dash fuse/relay box.

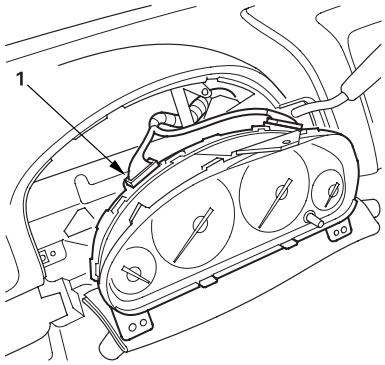
Is the fuse OK?

Yes Go to step 40.

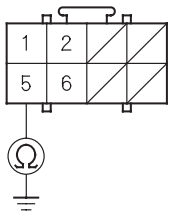
No Go to step 37.

37. Replace the No. 13 (10A) fuse in the under-dash fuse/relay box.

38. Disconnect C1 connector (1) from the gauge assembly (see page 22A-74).



39. Check resistance between the No. 5 terminal of U3o connector and body ground. There should be 1 M Ω or more.



Is the resistance as specified?

Yes Faulty SRS indicator circuit in the gauge assembly; replace the gauge assembly.■

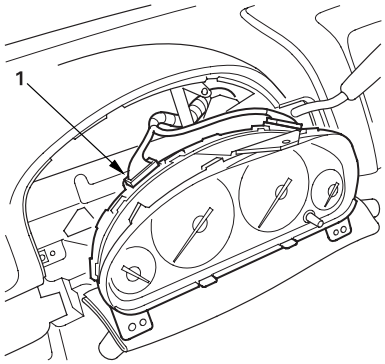
No Short to ground in the floor wire harness or in dashboard wire harness A; replace the faulty harness.■

(cont'd)

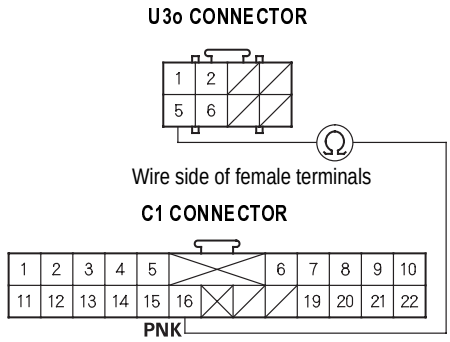
SRS Indicator Circuit Troubleshooting (cont'd)

The SRS Indicator Stays On When In "SCS" Menu Method (cont'd)

40. Disconnect C1 connector (1) from the gauge assembly (see page 22A-74).



41. Check resistance between the No. 16 terminal of C1 connector and the No. 5 terminal of U3o connector. There should be 1 Ω or less.

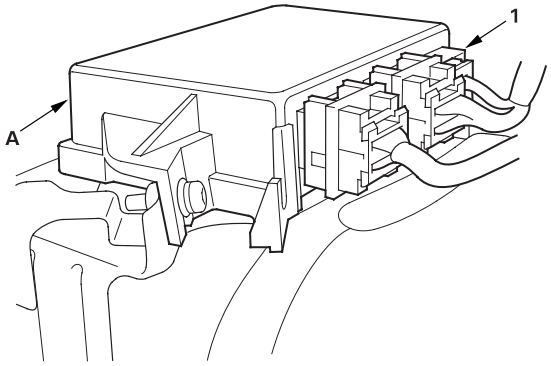


Is the resistance as specified?

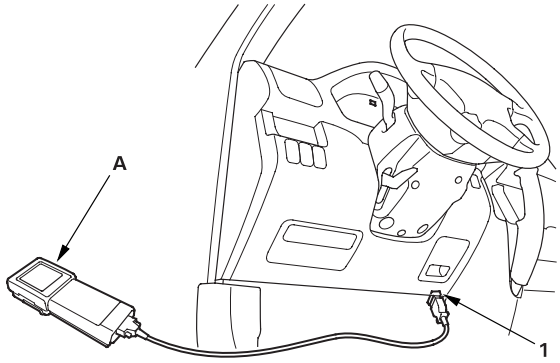
Yes Faulty SRS indicator circuit in the gauge assembly or poor contact at the C1 connector; check the connection. If the connection is OK, replace the gauge assembly.■

No Open in the floor wire harness or in dashboard wire harness A; replace the faulty harness.■

42. Disconnect U3o connector (1) from the SRS unit (A).

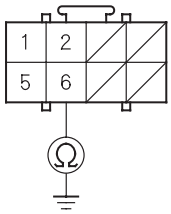


43. Connect the Honda PGM Tester (A) to the Data Link Connector (16P) (1), and follow the Tester's prompts in the "SCS" menu.



44. Check resistance between the No. 6 terminal of U3o connector and body ground. There should be 0 - 1.0 Ω.

U3o CONNECTOR



Wire side of female terminals

Is the resistance as specified?

Yes Faulty SRS unit or poor contact at the floor wire harness 8P connector; check the connection at U3o connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-144).■

No Open in the SCS line between the No. 6 terminal of U3o connector and the No. 9 terminal (BRN wire) of the Data Link Connector (DLC) (16P) or open between the No. 4 terminal of the Data Link Connector (DLC) (16P) and body ground. Repair the open wire(s).■

Component Replacement/Inspection After Deployment

NOTE: Before doing any SRS repairs, use the PGM Tester SRS menu method to check for DTCs; refer to the DTC Troubleshooting Index for the less obvious deployed parts (seat belt tensioners, OPDS sensor, side airbag sensors, etc.)

After a collision where the frontal airbag(s) deployed, replace these items:
- SRS unit
- Deployed airbag(s)
- Seat belt tensioners
- Front sensors

After a collision where the side airbag(s) deployed, replace these items:
- SRS unit
- Deployed side airbag(s)
- Side impact sensor(s) for side(s) deployed

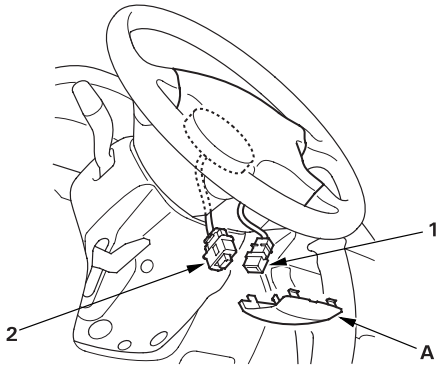
During the repair process, inspect these areas:
- Inspect all the SRS wire harnesses. Replace, don't repair, any damaged harnesses.
- Inspect the cable reel for heat damage. If there is any damage, replace the cable reel.

After the vehicle is completely repaired, turn the ignition switch on. If the SRS indicator comes on for about 6 seconds and then goes off, the SRS airbag system is OK. If the indicator does not function properly, use the PGM Tester SRS Menu Method to read the DTC(s). If this doesn't retrieve any codes, use the Tester's SCS menu method. If the SCS method doesn't work, you may need to install a known-good SRS unit to read the DTC(s). If you still cannot retrieve a code, go to SRS Indicator Circuit Troubleshooting.

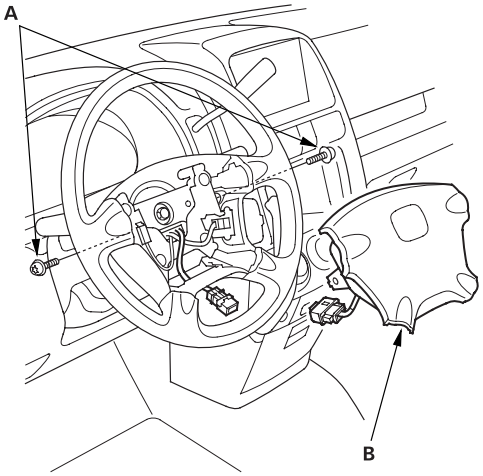
Driver's Airbag Replacement

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the access panel (A) from the steering wheel, then disconnect the connector between the cable reel 2P connector (1) and driver's airbag 2P connector (2).

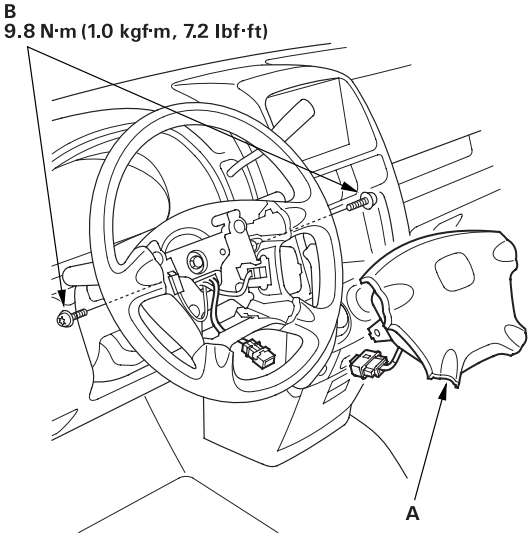


3. Remove the two Torx bolts (A) using a Torx T30 bit. Then remove the driver's airbag (B).

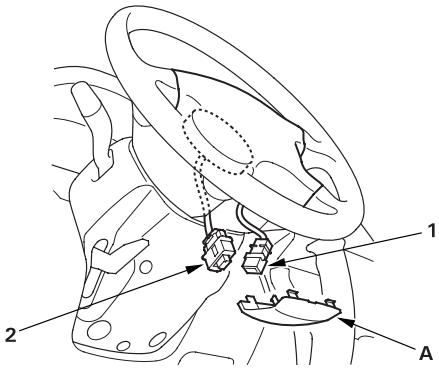


Installation

1. Place the new driver's airbag (A) in the steering wheel, and secure it with new Torx bolts (B).



2. Connect the cable reel 2P connector (1) to the driver's airbag 2P connector (2), then install the access panel (A) on the steering wheel.

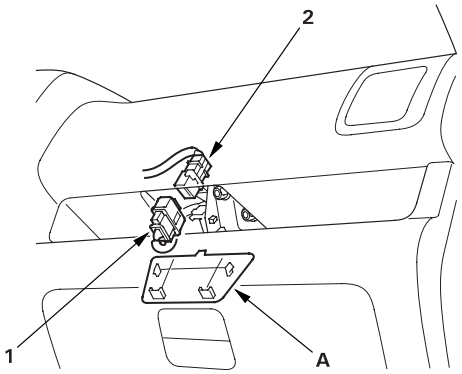


3. Connect the battery negative cable.
4. After installing the airbag, confirm proper system operation:
   - Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
   - Make sure the horn button works.

Front Passenger's Airbag Replacement

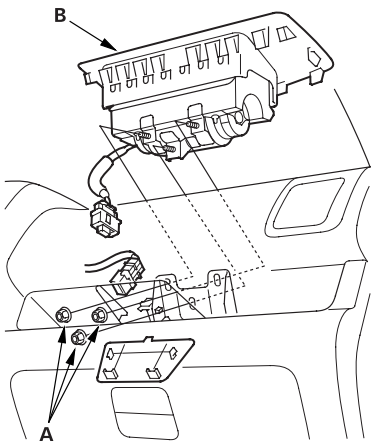
Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the access panel (A) from the dushboard panel.
3. Disconnect the connector between the front passenger's airbag 2P connector (1) and the dashboard wire harness B 2P connector (2).



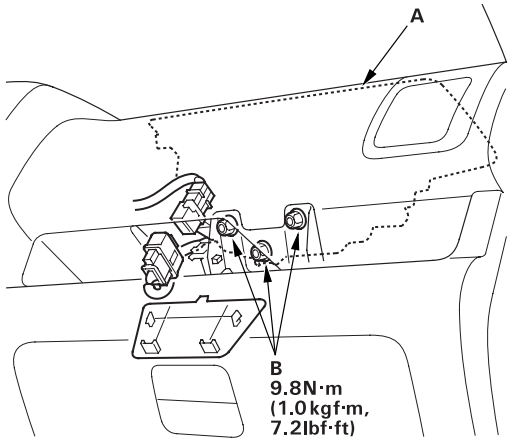
4. Remove the three mounting nuts (A) from the bracket. Cover the lid and dashboard with a cloth, and pry carefully with a screwdriver to lift the front passenger's airbag (B) out of the dashboard.

   NOTE: The airbag lid has pawls on its side which attach it to the dashboard.

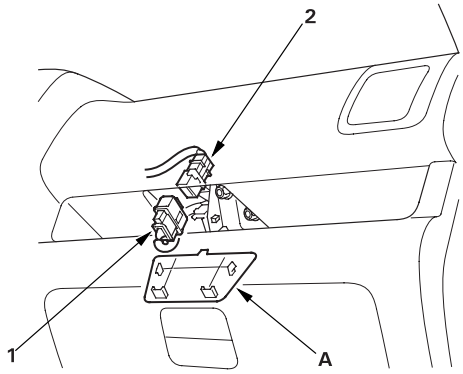


Installation

1. Place the new front passenger's airbag (A) into the dashboard. Tighten the front passenger's airbag mounting nuts (B).



2. Connect the front passenger's airbag 2P connector (1) to the dashboard wire harness B 2P connector (2), then reinstall the access panel (A).



3. Reconnect the battery negative cable.
4. After installing the airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Side Airbag Replacement

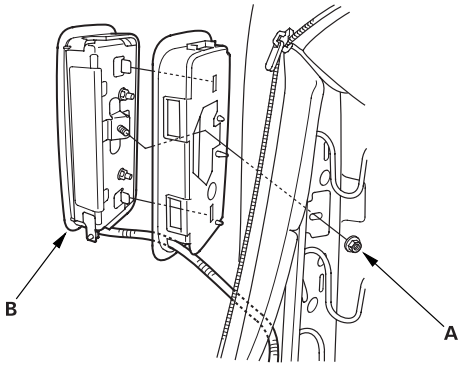
NOTE: Review the seats replacement procedure in the body section before performing repair or service.

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the side airbag harness 2P connector (1).



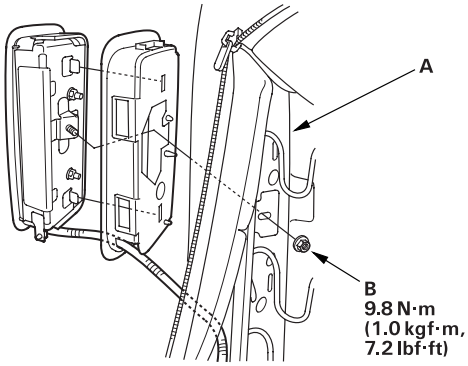
3. Remove the seat assembly (see page 20-103) and seat-back cover (see page 20-110).
4. Remove the mounting nut (A) and the side airbag (B).



Installation

NOTE:
- If the side airbag lid is secured by a tape, remove the tape.
- Do not open the lid of the side airbag cover.
- Use new mounting nuts tightened to the specified torque when you replace a side airbag.
- Make sure that the seat-back cover is installed properly. Improper installation may prevent proper deployment.
- Be sure to install the harness wires so that they are not pinched or interfering with other parts.

1. Place the new side airbag on the seat back-frame (A). Tighten the side airbag mounting nuts (B).



2. Install the seat-back cover (see page 20-110).
3. Install the seat assembly (see page 20-103), then connect the side airbag harness 2P connector.
4. Move the front seat and the seat-back through their full ranges of movement, making sure the harness wires are not pinched or interfering with other parts.
5. Reconnect the battery negative cable.
6. After installing the side airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Airbag Disposal

Special Tool Required
Deployment tool 07HAZ-SG00500

Before scrapping any airbags, side airbags, or seat belt tensioners or seat belt buckle tensioners (including those in a whole vehicle to be scrapped), the airbags, side airbags, seat belt tensioners and seat belt buckle tensioners must be deployed. If the vehicle is still within the warranty period, the Honda Service Manager must give approval and/or special instruction before deploying the airbags, side airbags, or seat belt tensioners. Only after the airbags, side airbags, or seat belt tensioners have been deployed (as the result of vehicle collision, for example), can they be scrapped.
If the airbags, side airbags, seat belt tensioners and seat belt buckle tensioners appear intact (not deployed), treat them with extreme caution. Follow this procedure.

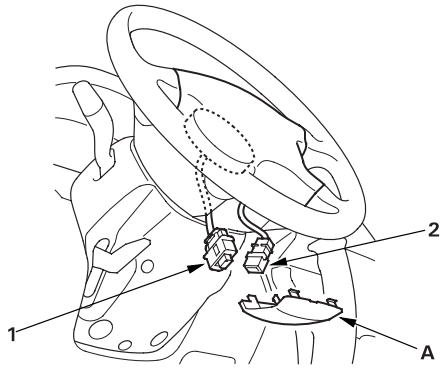
Deploying Airbags in the Vehicle

If an SRS equipped vehicle is to be entirely scrapped, its airbags, side airbags, and seat belt tensioners should be deployed while still in the vehicle. The airbags, side airbags, seat belt tensioners and seat belt buckle tensioners should not be considered as salvageable parts and should never be installed in another vehicle.

1. Turn the ignition switch OFF, then disconnect the battery negative cable, and wait at least 3 minutes.
2. Confirm that each airbag, side airbag, or seat belt tensioner is securely mounted.
3. Confirm that the special tool is functioning properly by following the check procedure on the tool label.

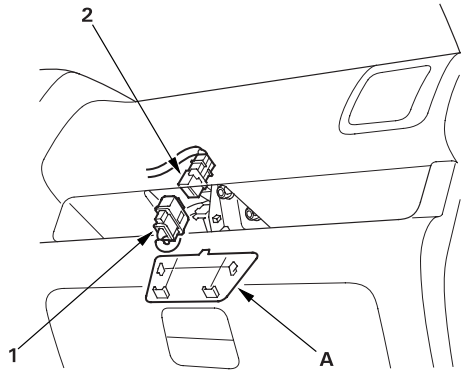
Driver's Airbag:

4. Remove the access panel (A), then disconnect the 2P connector between the driver's airbag (1) and the cable reel (2).



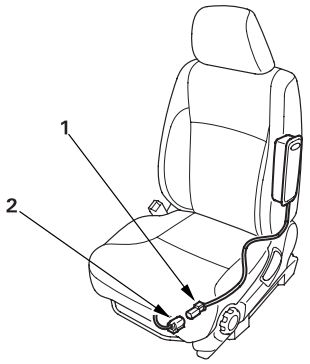
Front Passenger's Airbag:

5. Remove the access panel (A), then disconnect the 2P connector between the front passenger's airbag (1) and dashboard wire harness (2).



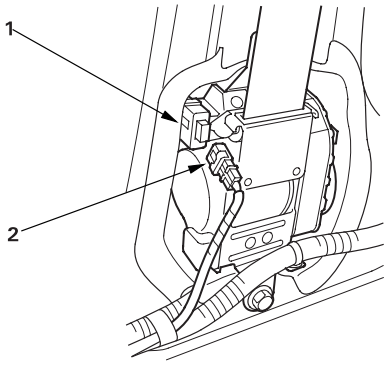
Side Airbag:

6. Disconnect the 2P connector between the side airbag (1) and the floor wire harness (2).



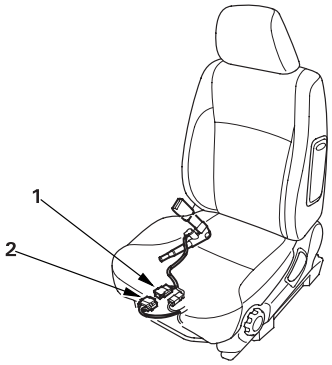
Seat belt tensioner:

7. Disconnect the 2P connector between the seat belt tensioner (1) and floor wire harness (2).



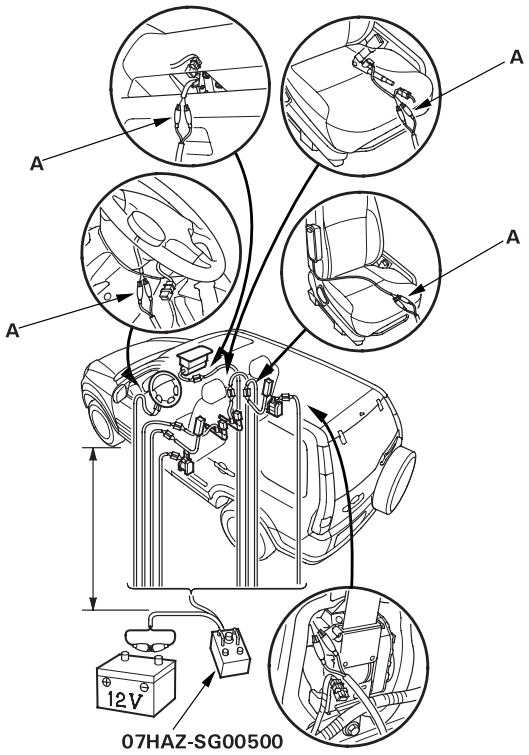
Seat belt buckle tensioner:

8. Disconnect the 4P connector between the seat belt buckle tensioner (1) and floor wire harness (2).



9. Pull the seat belt out all the way and cut it.

10. Cut off each connector, strip the ends of the wires, and connect the deployment tool alligator clips (A) to the wires. Place the deployment tool at least 30 feet (10 meters) away from the vehicle.



(cont'd)

Airbag Disposal (cont'd)

Deploying Airbags in the Vehicle (cont'd)

11. Connect a 12 volt battery to the tool.
- If the green light on the tool comes on, the igniter circuit is defective and cannot deploy the component. Go to Disposal of Damaged Components.
- If the red light on the tool comes on, the component is ready to be deployed.

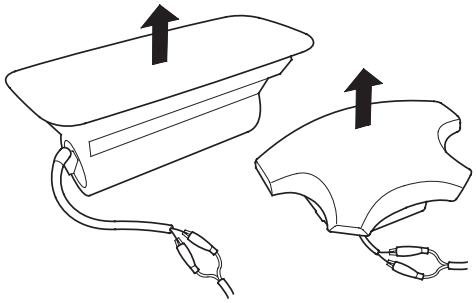
12. Push the tool's deployment switch. The airbags and tensioners should deploy (deployment is both highly audible and visible: a loud noise and rapid inflation of the bag, followed by slow deflation).
- If the components deploy and the green light on the tool comes on, continue with this procedure.
- If a component doesn't deploy, yet the green light comes ON, its igniter is defective. Go to Disposal of Damaged components.
- During deployment the airbag can become hot enough to burn you. Wait 30 minutes after deployment before touching the airbag.

13. Dispose of the complete airbag. No part of it can be reused. Place it in a sturdy plastic bag (A), and seal it securely.



Deploying Components Out of the Vehicle

If an intact airbag or tensioner has been removed from a scrapped vehicle, or has been found defective or damaged during transit, storage, or service, it should be deployed as follows:



1. Confirm that the special tool is functioning properly by following the check procedure on this page or on the tool label.

2. Position the airbag face up, outdoors, on flat ground, at least 30 feet (10 meters) from any obstacles or people.

3. Follow steps 9 through 11 of the in-vehicle deployment procedure.

Disposal of Damaged Components

1. If installed in a vehicle, follow the removal procedure for the driver's airbag (see page 23-135), front passenger's airbag (see page 23-136), side airbag (see page 23-137), seat belt tensioner (see page 23-4).

2. In all cases, make a short circuit by twisting together the two inflator wires.

3. Package the component in exactly the same packaging that the new replacement part came in.

4. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED", "DAMAGED SIDE AIRBAG NOT DEPLOYED", "DAMAGED SEAT BELT TENSIONER NOT DEPLOYED" so it does not get confused with your parts stock.

5. Contact your Honda Service Manager for how and where to return it for disposal.

Deployment Tool Check

1. Connect the yellow clips to both switch protector handles on the tool; connect the tool to a battery.

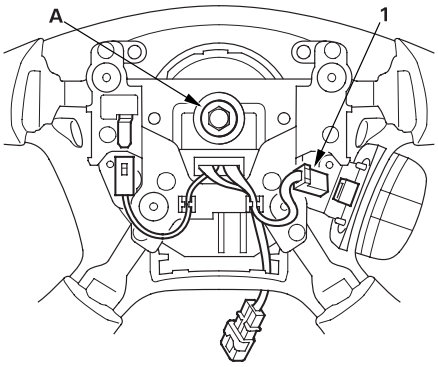
2. Push the operation switch: green means the tool is OK; red means the tool is faulty.

3. Disconnect the battery and the yellow clips.

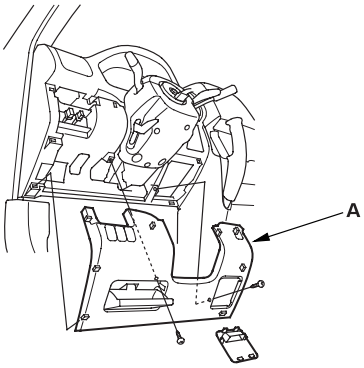
Cable Reel Replacement

Removal

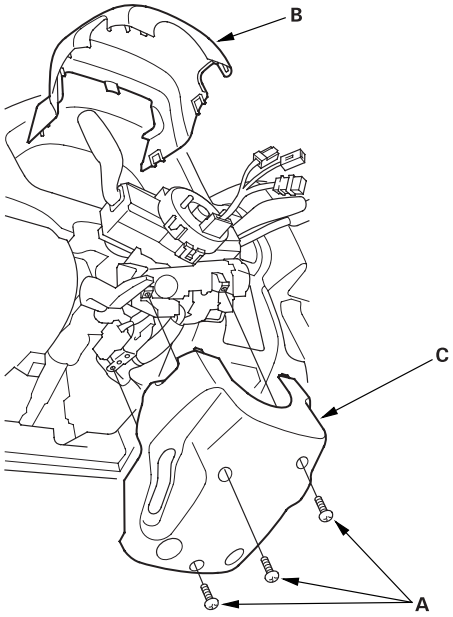
1. Make sure the front wheels are aligned straight ahead.
2. Disconnect the battery negative cable, and wait at least 3 minutes.
3. Remove the driver's airbag (see page 23-135).
4. Disconnect the connector (1) from the cruis control set/resume switch, then remove the steering wheel bolt (A).



5. Remove the steering wheel with a steering wheel puller (see step 3 on page 17-21).
   Do not tap on the steering wheel or steering column shaft when removing the steering wheel.
6. Remove the dashboard lower cover (A).



7. Remove the column cover screws (A), then remove the column covers (B, C).

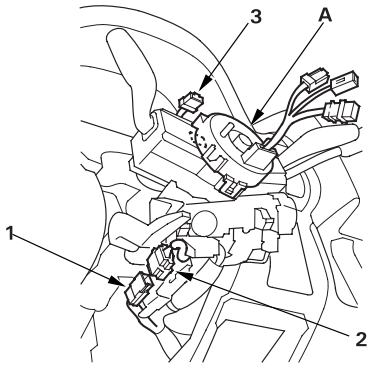


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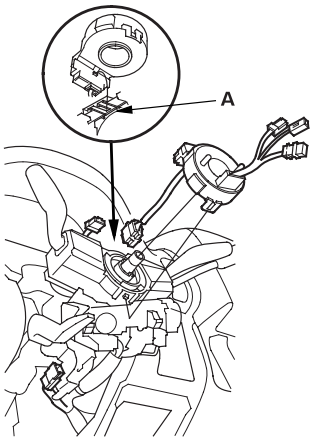
Cable Reel Replacement (cont'd)

Removal (cont'd)

8. Disconnect the dashboard wire harness B 4P connector (1) from the cable reel 4P connector (2), then disconnect the dashboard wire harness B 5P connector (3) from the cable reel (A).



9. Release the tab (A), then remove the cable reel from the column.

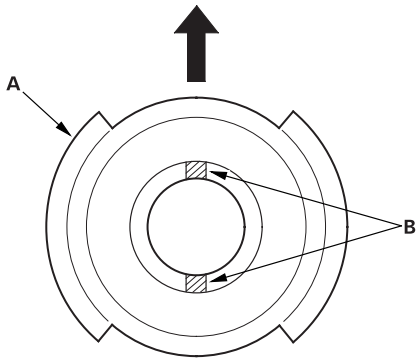


Installation

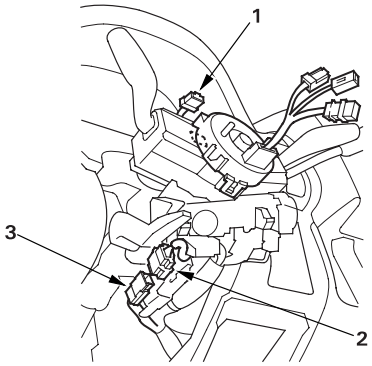
1. Before installing the steering wheel, align the front wheels straight ahead.

2. If not already done, disconnect the battery negative cable, and wait at least 3 minutes.

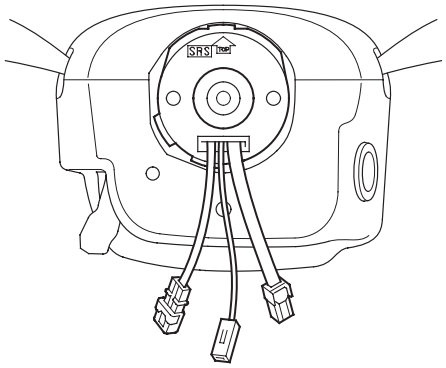
3. Set the cancel sleeve (A) so that the projections (B) are aligned vertically.



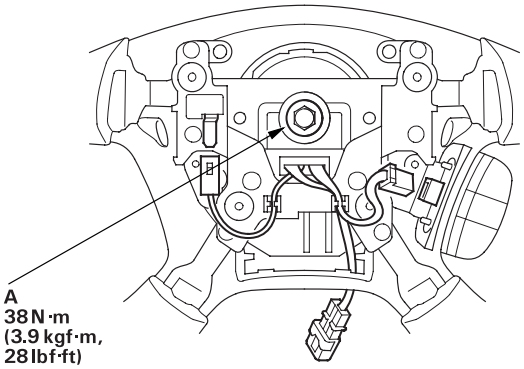
4. Carefully install the cable reel (A) on the steering column shaft. Then connect the 5P connector (1) to the cable reel, and connect the 4P connector (2) to the dashboard wire harness B 4P connector (3).



5. Install the steering column covers.
6. If necessary, center the cable reel. (New replacement cable reels come centered.) Do this by first rotating the cable reel clockwise until it stops.
   Then rotate it counterclockwise (about 2 1/2 turns) until the arrow mark on the cable reel label points straight up.



7. Align the projections on the cable reel with the holes on the steering wheel, and install the steering wheel with a new steering wheel bolt (A).

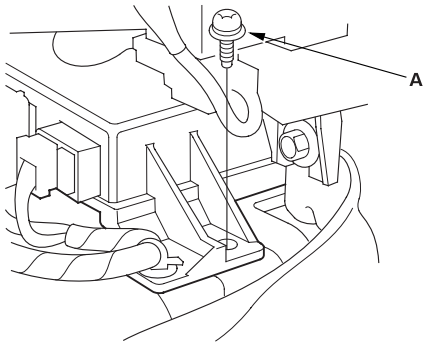


8. Install the driver's airbag (see page 23-135).
9. Reconnect the battery negative cable.
10. After installing the cable reel, confirm proper system operation:
    - Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
    - After the SRS indicator has turned off, turn the steering wheel fully left and right to confirm the SRS indicator does not come on.
    - Make sure the horn button works.

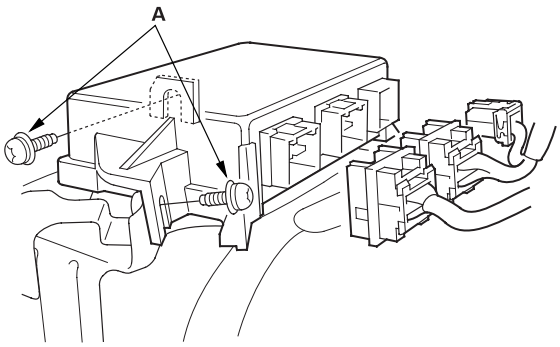
SRS Unit Replacement

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the driver's and front passenger's airbag connectors (see page 23-23).
3. Disconnect the side airbag connectors (see page 23-23).
4. Disconnect both seat belt tensioner connectors (see page 23-24).
5. Remove the dashboard center lower cover (see page 20-91).
6. Pull down the carpet, then remove the Torx bolt (A) from the SRS unit.



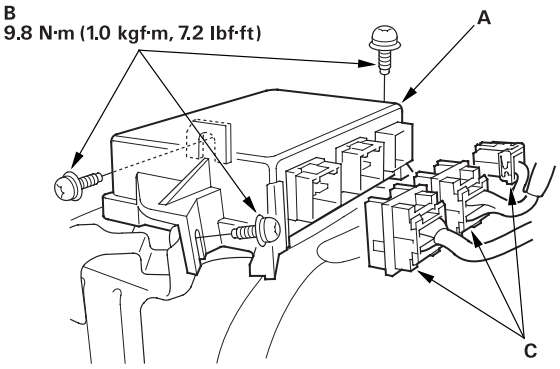
7. Disconnect the connectors and remove the two Torx bolts (A), then pull out the SRS unit from the right side.



Installation

1. Install the new SRS unit (A) with Torx bolts (B), then connect the connectors (C) to the SRS unit; push it into position until it clicks.

   NOTE: When tightening the Torx bolts to the specified torque after replacement, be careful to turn them in so that their heads rest squarely on the brackets.



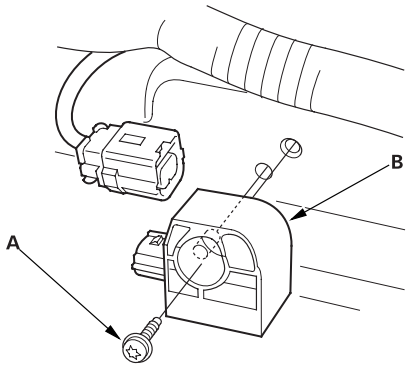
2. Reinstall the dashboard center lower cover (see page 20-91).
3. Reconnect the driver's and front passenger's airbag connectors (see page 23-23).
4. Reconnect the side airbag connectors (see page 23-23).
5. Reconnect both seat belt tensioner connectors (see page 23-24).
6. Reconnect the battery negative cable.
7. Initialize the OPDS unit (see page 23-30).
8. After installing the SRS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Side Impact Sensor Replacement

Removal

NOTE:
- Removal of the side impact sensor must be performed according to the precautions/procedures described before.
- Before disconnecting the side impact sensor 2P connector(s), disconnect the side airbag 2P connector(s).
- Do not turn the ignition switch ON (II), and do not connect the battery cable while replacing the side impact sensor.

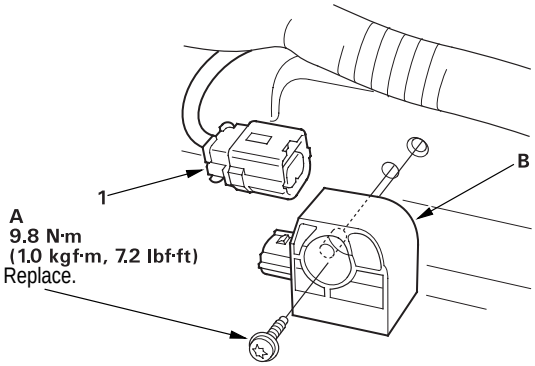
1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the seat assembly (see page 20-103).
3. Remove the rear side trim panel (see page 20-77).
4. Disconnect the floor wire harness 2P connector from the side impact sensor.
5. Remove the Torx bolt (A) using a Torx T30 bit, then remove the side impact sensor (B).



Installation

NOTE:
- Be sure to install the harness wires so that they are not pinched or interfering with other parts.
- Do not turn the ignition switch ON (II), and do not connect the battery cable while replacing the side impact sensor.

1. Install the new side impact sensor with a new Torx bolt (A) then connect the floor wire harness 2P connector (1) to the side impact sensor (B).



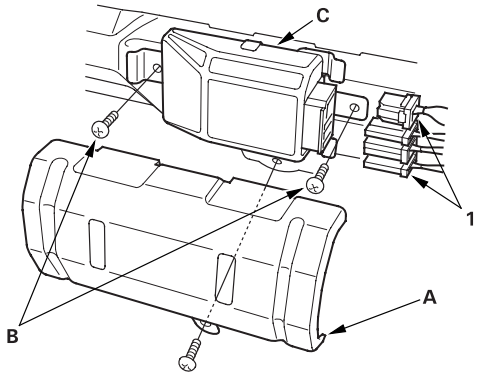
2. Reconnect the negative battery cable.
3. After installing the side impact sensor, confirm proper system operation: Turn the ignition switch ON (II): the SRS indicator should come on for about 6 seconds and then go off.

OPDS Unit Replacement

NOTE: Review the seats replacement procedures in the body section before performing repairs or service.

Removal

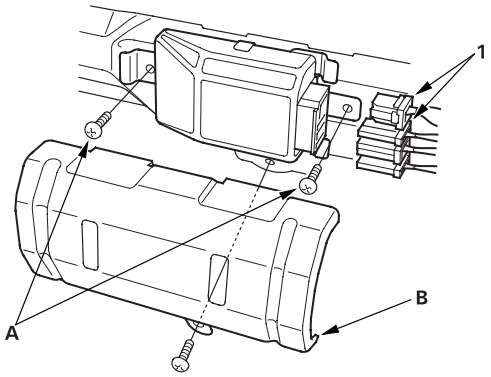
1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the side airbag harness 2P connector (see step 4 on page 23-23).
3. Remove the seat assembly (see page 20-103) and seat-back cover (see page 20-110).
4. Remove the cover (A), then disconnect the OPDS unit harness 8P and sensor connectors (1) from the OPDS unit.



5. Remove the two screws (B) and OPDS unit (C).

Installation

1. Place the new OPDS unit on the seat-back frame. Tighten the two screws (A), and connect the OPDS unit harness 8P and sensor connector (1) to the OPDS unit. Reinstall the cover (B).



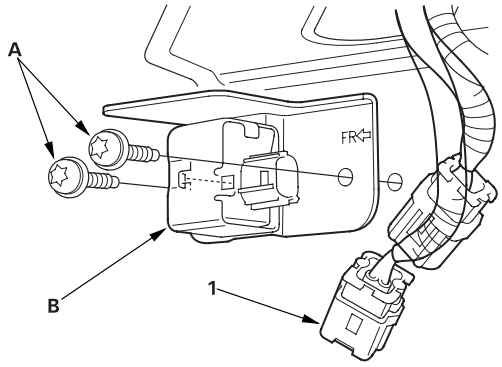
2. Install the seat-back cover (see page 20-110).
3. Install the seat assembly (see page 20-103), then connect the side airbag harness 2P connector.
4. Reconnect the battery negative cable.
5. Set the seat-back in the normal position, and make sure there is nothing on the front passenger's seat.
6. Initialize the OPDS unit (see page 23-30).
7. After installing the OPDS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Front Sensor Replacement

Removal

NOTE:
- Removal of the front sensor must be performed according to the precautions/procedures described before.
- Before disconnecting the front sensor 2P connector(s), disconnect the driver's and front passenger's airbag 4P, both seat belt tensioner 2P connector(s).
- Do not turn the ignition switch ON (II), and do not connect the battery cable while replacing the front sensor.

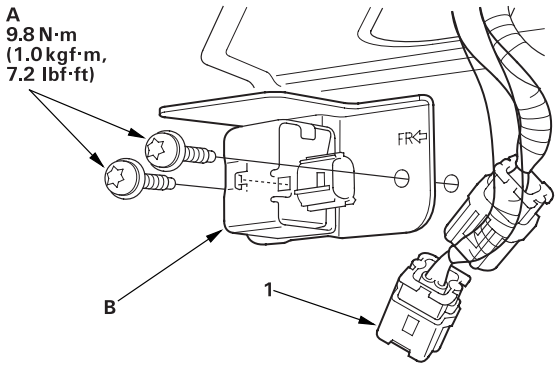
1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the front inner fender (see page 20-155).
3. Disconnect the engine compartment wire harness 2P connector (1), and remove the two Torx bolts (A) using a Torx T30 bit, then remove the front sensor (B).



Installation

NOTE:
- Be sure to install the harness wires so that they are not pinched or interfering with other parts.
- Do not turn the ignition switch ON (II), and do not connect the battery cable while replacing the front sensor.

1. Install the new front sensor with new Torx bolts (A), then connect the engine compartment wire harness 2P connector (1) to the front sensor (B).



2. Reconnect the battery negative cable.
3. After installing the front sensor, confirm proper system operation: Turn the ignition switch ON (II): the SRS indicator should come on for about 6 seconds and then go off.

77

Supplement

Fuel and Emissions Systems **77-2**
- Special Tools 77-2
- General Troubleshooting Information 77-3
- DTC Troubleshooting Index 77-5
- DTC Troubleshooting 77-6
- MIL Circuit Troubleshooting 77-33
- Throttle Body Test 77-45

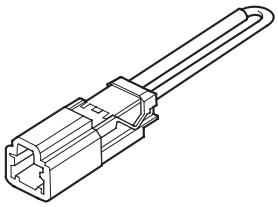
Automatic Transmission **77-46**
- DTC with [D] Indicator Light Troubleshooting Procedures 77-46
- DTC Troubleshooting Index 77-47

NOTE : This section contains procedures without using scantool or Honda PGM tester.

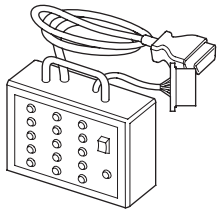
Fuel and Emissions Systems

Special Tools

Ref. No.	Tool Number	Description	Qty
1	07PAZ-0010100	SCS Short Connector	1
2	07WAJ-0010100	DLC Pin Box	1



1



2

General Troubleshooting Information

Intermittent Failures

The term ”intermittent failure” means a system may have had a failure, but it checks OK now. If the Malfunction Indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting.

Opens and Shorts

”Open” and ”Short” are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something won’t work at all. In complex electronics (like ECM’s/PCM’s) this can sometimes mean something works, but not the way it’s supposed to.

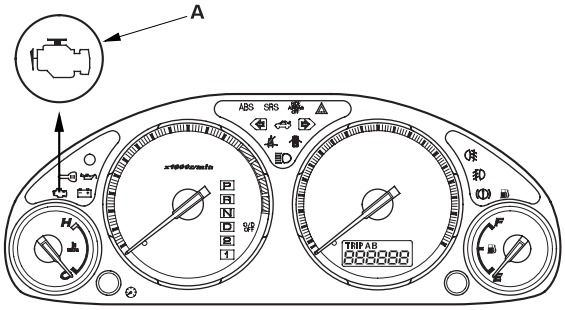
How to Troubleshooting

Special Tool Required

- DLC pin box 07WAJ-0010100
- SCS short connector 07PAZ-0010100

If the MIL (Malfunction Indicator Lamp) has come on

1. Start the engine and check the MIL (A).

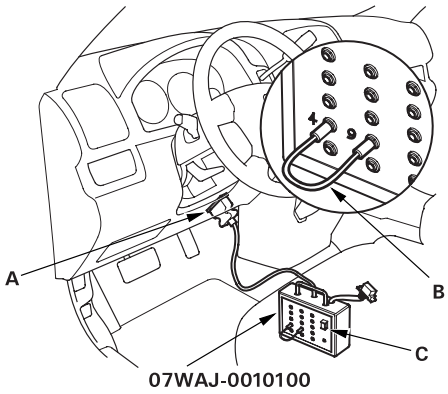


2. Except KG, KS, KE, KR, KU (Hong Kong) models:

If the MIL stays on, jump the SCS line

1 Connect the DLC pin box to the 16P Data Link Connector (DLC) (A) located under the driver’s side of the dashboard.

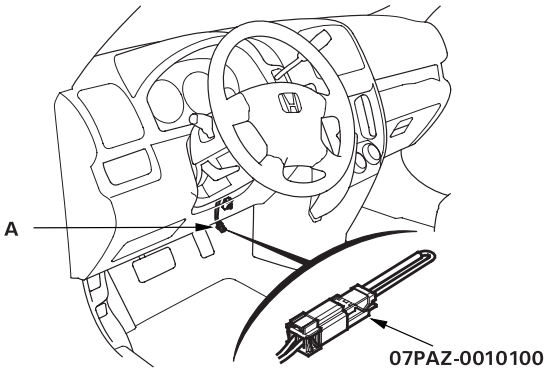
2 Connect the DLC pin box terminals No. 4 and No. 9 with a jumper wire (B), then push the switch (C).



3. KG, KS, KE, KR, KU (Hong Kong) models:

If the MIL stays on, jump the SCS line

1 With the ignition switch OFF, connect the SCS short connector to the service check connector (2P) (A) located under the dash on the driver’s side of the dashboard.



*: The illustration shows LHD model.

(cont’d)

General Troubleshooting Information (cont'd)

How to Troubleshooting (cont'd)

1 Check the Diagnostic Trouble Code (DTC) and note it. Refer to the DTC Troubleshooting Index and begin the appropriate troubleshooting procedure.

If the MIL did not come on

If the MIL did not come on but there is a driveability problem, refer to the Symptom Troubleshooting index in this section.

If you can't duplicate the DTC

Some of the troubleshooting in this section requires you to reset the Engine Control Module (ECM)/Powertrain Control Module (PCM) and try to duplicate the DTC. If the problem is intermittent and you can't duplicate the code, do not continue through the procedure. To do so will only result in confusion and, possibly, a needlessly replaced ECM/PCM.

DTC Troubleshooting Index

DTC (MIL indication)	Detection Item	MIL	Page
0	MIL does not comes on or does not go off, no DTC stored	O	(see page 77-33)
1*4	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1)	O	(see page 77-6)
3	Manifold Absolute Pressure (MAP) Sensor	O	(see page 77-7)
4	Crankshaft Position (CKP) Sensor	O	(see page 11-88)
6	Engine Coolant Temperature (ECT) Sensor	O	(see page 77-9)
7	Throttle Position (TP) Sensor	O	(see page 77-11)
8	Top Dead Center Position (TDC) Sensor	O	(see page 11-100)
10	Intake Air Temperature (IAT) Sensor	O	(see page 77-13)
11*8	Idle Mixture Adjuster (IMA)	X	(see page 77-15)
13	Barometric Pressure (BARO) Sensor	O	(see page 11-93)
14	Idle Air Control (IAC) Valve	O	(see page 11-140)
17*2	Vehicle Speed Sensor	O	(see page 11-90)
20*6	Electrical Load Detector (ELD)	X	(see page 77-17)
21*7	VTEC System	O	(see page 11-130)
22*3	VTEC System	O	(see page 11-133)
23	Knock Sensor	O	(see page 11-87)
34	Engine Control Module (ECM)/Powertrain Control Module (PCM) Power Source Circuit Unexpected Voltage	O	(see page 11-91)
39	Serial Communication Link Malfunction	X	Refer to the Multiplex Control System Troubleshooting (see page 22A-231)
41*4	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Heater	O	(see page 11-74)
45*3	Fuel Supply System	O	(see page 77-19)
56	VTC Oil Control Solenoid Valve	O	(see page 77-21)
57	Camshaft Position (CMP) Sensor	O	(see page 77-24)
61*3	Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1)	O	(see page 11-73)
63*5	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2)	O	(see page 77-27)
65*5	Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Heater	O	(see page 11-78)
67*3	Catalyst System	O	(see page 11-188)
70*1	Automatic Transaxle	X	Refer to the Automatic Transmission DTC Troubleshooting Index (see page 14-7)
71*3	No.1 Cylinder Misfire	O	(see page 77-28)
72*3	No.2 Cylinder Misfire	O	(see page 77-28)
73*3	No.3 Cylinder Misfire	O	(see page 77-28)
74*3	No.4 Cylinder Misfire	O	(see page 77-28)
71*3 72 73 74	Any combination of the No.1, No.2, No.3, No.4 Cylinder Misfire	O	(see page 11-81)
92*3	Evaporative Emission (EVAP) Canister Purge Valve	O	(see page 11-193)

*1: A/T
*2: M/T
*3: KG, KS, KE, KR, KU (Hong Kong) models
*4: with TWC model
*5: KG, KS, KE, KR, KU, KZ, FO, FQ models
*6: KG, KS, KE, KR, KU, KZ, FO, KQ, KK, KM models
*7: except KG, KS, KE, KR, KU (Hong Kong) models
*8: without TWC model

DTC Troubleshooting

DTC 1: Primaly HO2S (Sensor 1) Circuit Malfunction

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle for at least one minute before test-driving.
3. Test-drive under following conditions.
   - M/T in 4th gear, A/T in 2nd position
   - accelerate using wide open throttle for at least 5 seconds, then decelerate for at least 5 seconds with the throttle completely closed.

   Is the MIL on and does it indicate DTC 1?

   Yes Go to step 4.

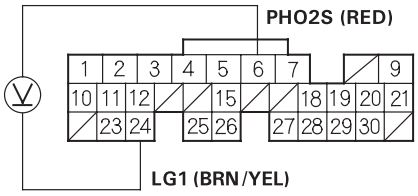
   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the primary HO2S (Sensor 1) and at the ECM/PCM.■
4. Inspect fuel pressure (see page 11-154).

   Is it normal?

   Yes Go to step 5.

   No Check for fuel supply system.■
5. Let it idle for at least 1 minute before test-driving.
6. Open the throttle wide open, then quickly release it.
7. Measure voltage between ECM/PCM connector terminals A6 and A24.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

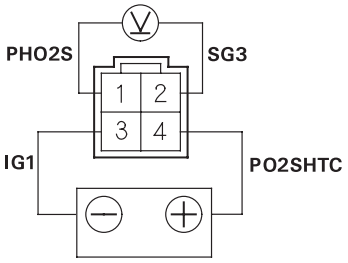
Is the voltage above 0.6 V at wide open throttle to 4,500 rpm (min^{-1}) and below 0.4 V when the throttle is quickly released from 4,500 rpm (min^{-1})?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Go to step 8.

8. Turn the ignition switch OFF.
9. Disconnect the primary HO2S (Sensor 1) 4P connector.
10. At the primary HO2S (Sensor 1) harness side, connect the battery positive terminal to terminal No. 3 and battery negative terminal to terminal No. 4.
11. Start the engine.
12. After 2 minutes, measure voltage between primary HO2S (Sensor 1) 4P connector terminals No. 1 and No. 2.

PRIMARY HO2S (SENSOR 1) 4P CONNECTOR



Terminal side of male terminals

Is the voltage above 0.6 V at wide open throttle to 4,500 rpm (min^{-1}) and below 0.4 V when the throttle is quickly released from 4,500 rpm (min^{-1})?

Yes Repair open or short in the wire between the ECM/PCM (A6) and the primary HO2S(Sensor 1).■

No Replace the primary HO2S (Sensor 1) (see page 11-119).■

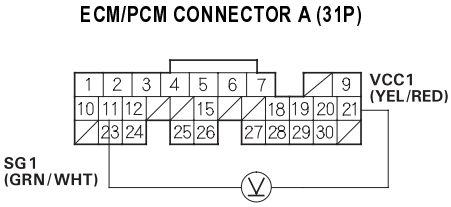
DTC 3: MAP Sensor Circuit Malfunction

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine and let it idle.

   Is the MIL on and does it indicate DTC 3?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the MAP sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II).
5. Measure voltage between ECM/PCM connector terminals A11 and A21.

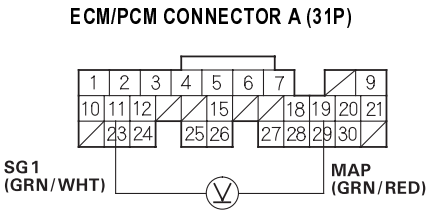


Wire side of female terminals

   Is there about 5 V?

   Yes Go to step 6.

   No Substitute a known-good ECM/PCM and recheck (see page 11-4) If the symptom/ indication goes away, replace the original ECM/PCM.■
6. Measure voltage between ECM/PCM connector terminals A11 and A19.

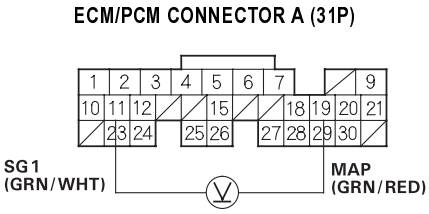


Wire side of female terminals

   Is there about 3 V?

   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away, replace the original ECM/PCM.■

   No Go to step 7.
7. Measure voltage between ECM/PCM connector terminals A11 and A19.

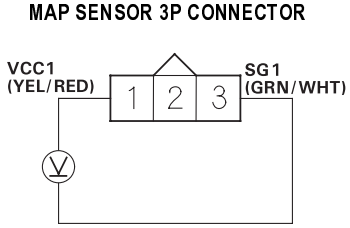


Wire side of female terminals

   Is there about 5 V?

   Yes Go to step 8.

   No Go to step 13.
8. Turn the ignition switch OFF.
9. Disconnect the MAP sensor 3P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 3.



Wire side of female terminals

   Is there about 5 V?

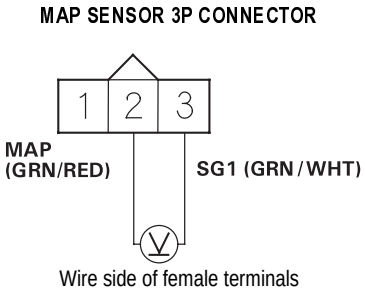
   Yes Go to step 12.

   No Repair open in the wire between the ECM/ PCM (A11) and the MAP sensor.■

(cont'd)

DTC Troubleshooting (cont'd)

12. Measure voltage between MAP sensor 3P connector terminals No. 2 and No. 3.



Is there about 5 V?

Yes Replace the MAP sensor.■

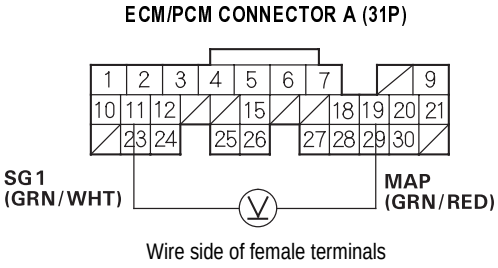
No Repair open in the wire between the ECM/PCM (A19) and the MAP sensor.■

13. Turn the ignition switch OFF.

14. Disconnect the MAP sensor 3P connector.

15. Turn the ignition switch ON (II).

16. Measure voltage between ECM/PCM connector terminals A11 and A19.

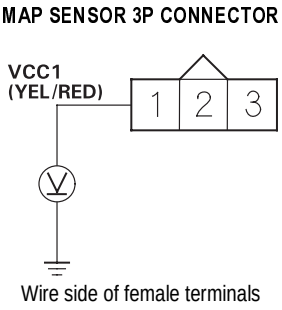


Is there about 5 V?

Yes Replace the MAP sensor.■

No Go to step 17.

17. Measure voltage between MAP sensor 3P connector terminals No. 1 and body ground.



Is there about 5 V?

Yes Go to step 18.

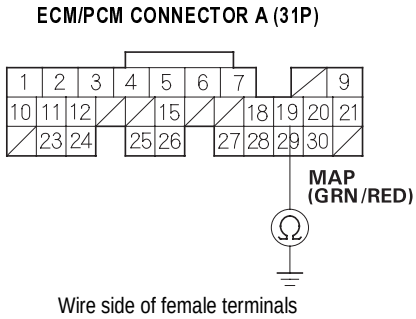
No Repair open in the wire between the ECM/PCM (A21) and the MAP sensor.■

18. Turn the ignition switch OFF.

19. Disconnect the negative cable from the battery.

20. Disconnect ECM/PCM connector A (31P).

21. Check for continuity between ECM/PCM connector terminal A19 and body ground.



Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A19) and the MAP sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

DTC 6: ECT Sensor Circuit Malfunction

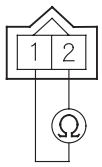
1. Reset the ECM/PCM (see page 11-4).
2. Turn the ignition switch ON (II).

   Is the MIL on and does it indicate DTC 6?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ECT sensor, climate control unit (with climate control), and the ECM/PCM.■
3. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Turn the ignition switch OFF.
5. Disconnect the ECT sensor 2P connector.
6. Measure resistance between ECT sensor 2P connector terminals No. 1 and No. 2.

ECT SENSOR 2P CONNECTOR



Terminal side of male terminals

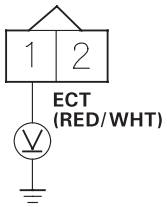
Is there 200 - 400 Ω ?

Yes Go to step 7.

No Replace the ECT sensor.■

7. Turn the ignition switch ON (II).
8. At the engine wire harness side, measure voltage between ECT sensor 2P connector terminal No. 1 and body ground.

ECT SENSOR 2P CONNECTOR



Wire side of female terminals

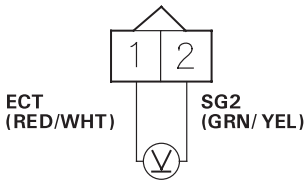
Is there about 5 V?

Yes Go to step 9.

No Go to step 10.

9. Measure voltage between ECT sensor 2P connector terminals No. 1 and No. 2.

ECT SENSOR 2P CONNECTOR



Wire side of female terminals

Is there about 5 V?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between the ECM/PCM (A10) and the ECT sensor.■

(cont'd)

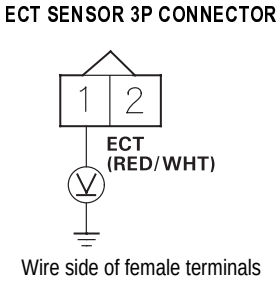
DTC Troubleshooting (cont'd)

10. Turn the ignition switch OFF.

11. Disconnect the climate control unit 30P connector.

12. Turn the ignition switch ON(II).

13. At the engine harness side, measure voltage between ECT sensor 2P connector terminal No. 2 and body ground.

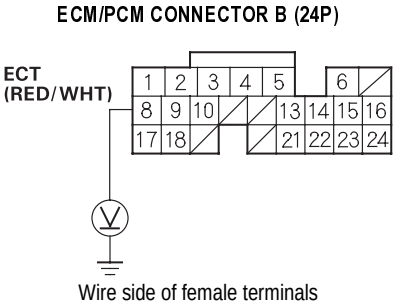


Is there about 5 V?

Yes Replace the climate control unit.■

No Go to step 14.

14. Measure voltage between ECM/PCM connector terminals B8 and body ground.



Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (B8) and the ECT sensor.■

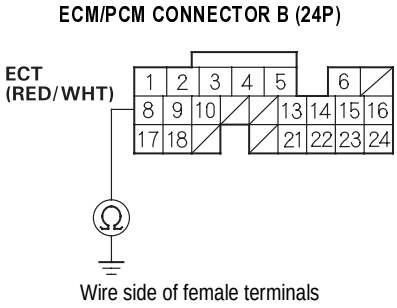
No Go to step 15.

15. Turn the ignition switch OFF.

16. Disconnecl the negative cable from the battery.

17. Disconnect ECM/PCM connector B (24P).

18. Check for continuity between ECM/PCM connector terminal B8 and body ground.



Is there continuity?

Yes Repair short in the wire between the ECM/PCM (B8) and the ECT sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

DTC 7: TP Sensor Circuit Malfunction

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine.

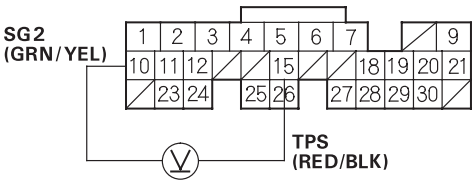
   Is the MIL on and does it indicate DTC 7?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the TP sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II).
5. Measure voltage between ECM/PCM connector terminals A10 and A15.

   NOTE: There should be a smooth transition as the throttle is pressed.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

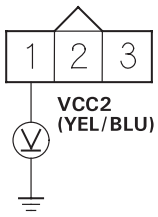
Is the voltage about 0.5 V at full close throttle, and about 4.5 V at full open throttle?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Go to step 6.

6. Turn the ignition switch OFF.
7. Disconnect the TP sensor 3P connector.
8. Turn the ignition switch ON (II).
9. At the engine wire harness side, measure voltage between TP sensor 3P connector terminal No. 1 and body ground.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

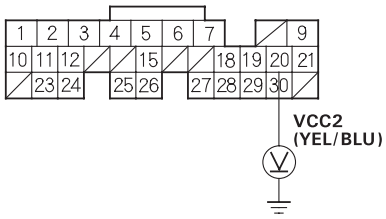
Is there about 5 V?

Yes Go to step 11.

No Go to step 10.

10. Measure voltage between ECM/PCM connector terminals A20 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

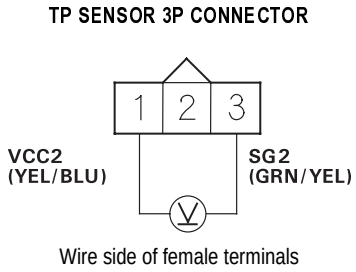
Yes Repair open in the wire between the ECM/PCM (A20) and the TP sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

11. At the engine wire harness side, measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.



Is there about 5 V?

Yes Go to step 12.

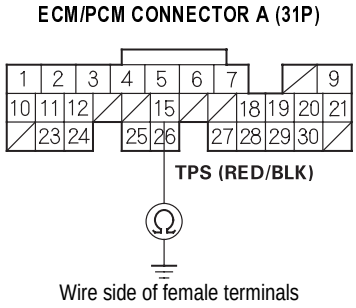
No Repair open in the wire between the ECM/PCM (A20) and the TP sensor.■

12. Turn the ignition switch OFF.

13. Disconnect the negative cable from the battery.

14. Disconnect ECM/PCM connector A (31P).

15. Check for continuity between ECM/PCM connector terminal A15 and body ground.

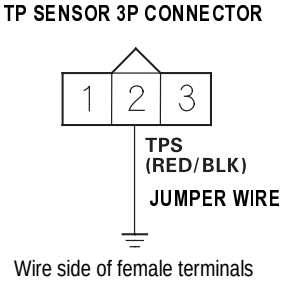


Is there continuity?

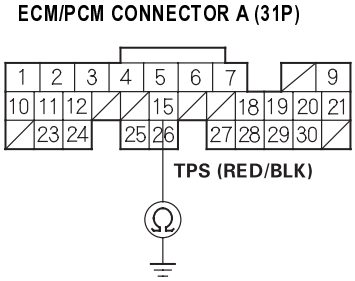
Yes Repair short in the wire between the ECM/PCM (A15) and the TP sensor.■

No Go to step 16.

16. Connect TP sensor 3P connector terminal No. 2 and body ground with a jumper wire.



17. Check for continuity between ECM/PCM connector terminal A15 and body ground.



Is there continuity?

Yes Replace the TP sensor.■

No Repair open in the wire between the ECM/PCM (A15) and the TP sensor.■

DTC 10: IAT Sensor Circuit Malfunction

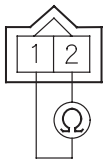
1. Reset the ECM/PCM (see page 11-4).
2. Turn the ignition switch ON (II).

   Is the MIL on and does it indicate DTC 10?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IAT sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the IAT sensor 2P connector.
5. Measure resistance between IAT sensor 2P connector terminals No. 1 and No. 2.

IAT SENSOR 2P CONNECTOR



Terminal side of male terminals

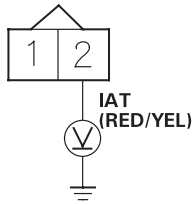
Is there 0.4 - 4.0 kΩ?

Yes Go to step 6.

No Replace the IAT sensor.■

6. Turn the ignition switch ON (II).
7. At the engine wire harness side, measure voltage between IAT sensor 2P connector terminal No. 2 and body ground.

IAT SENSOR 2P CONNECTOR



Wire side of female terminals

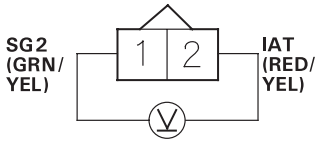
Is there about 5 V?

Yes Go to step 8.

No Go to step 9.

8. Measure voltage between IAT sensor 2P connector terminals No. 1 and No. 2.

IAT SENSOR 2P CONNECTOR



Wire side of female terminals

Is there about 5 V?

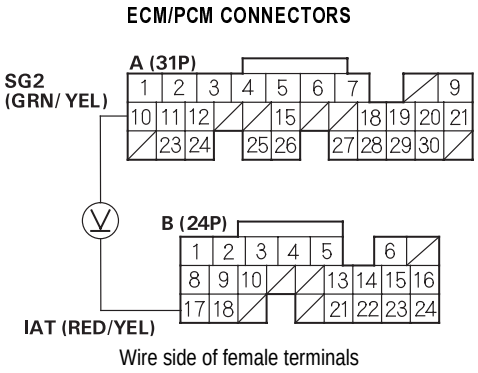
Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between the ECM/PCM (A10) and the IAT sensor.■

(cont'd)

DTC Troubleshooting (cont'd)

9. Measure voltage between ECM/PCM connector terminals A10 and B17.



Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (B17) and the IAT sensor.■

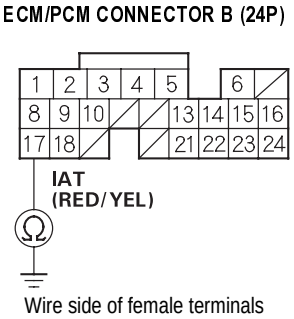
No Go to step 10.

10. Turn the ignition switch OFF.

11. Disconnect the negative cable from the battery.

12. Disconnect ECM/PCM connector B (24P).

13. Check for continuity between ECM/PCM connector terminal B17 and body ground.



Is there continuity?

Yes Repair short in the wire between the ECM/PCM (B17) and the IAT sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

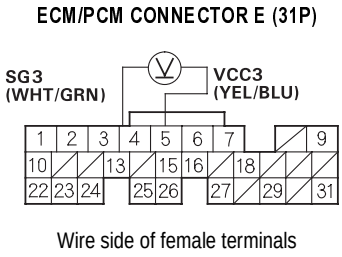
DTC 11: IMA Circuit Malfunction

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine, then let it idle for more than 5 seconds.

   Is the MIL on and does it indicate DTC 11?

   Yes Go to step 3.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the IMA sensor and at the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II).
5. Measure voltage between ECM/PCM connector terminals E4 and E5.

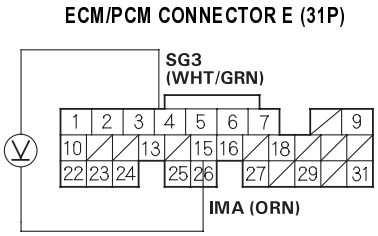


Wire side of female terminals

   Is there about 5 V?

   Yes Go to step 6.

   No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■
6. Measure voltage between ECM/PCM connector terminals E4 and E15.

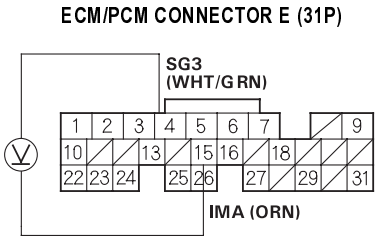


Wire side of female terminals

   Is there about 0.5 - 4.5 V?

   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

   No Go to step 7.
7. Measure voltage between ECM/PCM connector terminals E4 and E15.

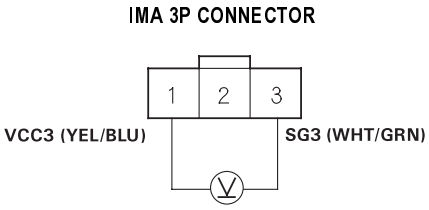


Wire side of female terminals

   Is there about 5 V?

   Yes Go to step 8.

   No Go to step 13.
8. Turn the ignition switch OFF.
9. Disconnect the IMA 3P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between IMA 3P connector terminals No. 1 and No. 3.



Wire side of female terminals

   Is there about 5 V?

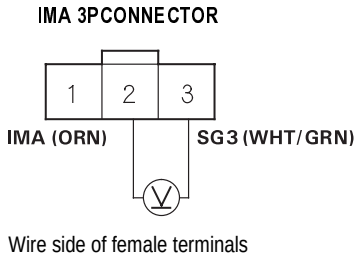
   Yes Go to step 12.

   No Repair open in the wire between the ECM/ PCM (E4) and the IMA.■

(cont'd)

DTC Troubleshooting (cont'd)

12. Measure voltage between IMA 3P connector terminals No. 2 and No. 3.



Wire side of female terminals

Is there about 5 V?

Yes Replace the IMA.■

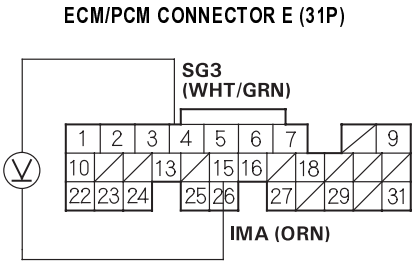
No Repair open in the wire between the ECM/PCM (E15) and the IMA.■

13. Turn the ignition switch OFF.

14. Disconnect the IMA 3P connector.

15. Turn the ignition switch ON (II).

16. Measure voltage between ECM/PCM connector terminals E4 and E15.



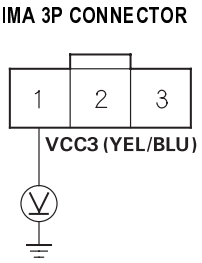
Wire side of female terminals

Is there about 5 V?

Yes Replace the IMA.■

No Go to step 17.

17. Measure voltage between IMA connector terminal No. 1 and body ground.



Wire side of female terminals

Is there about 5 V?

Yes Go to step 18.

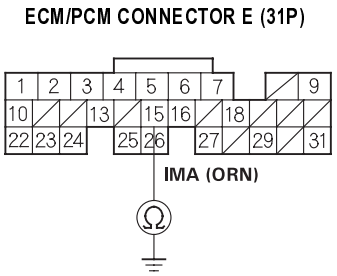
No Repair open in the wire between the ECM/PCM (E5) and the IMA.■

18. Turn the ignition switch OFF.

19. Disconnect the negative cable from the battery.

20. Disconnect ECM/PCM connector E (31P).

21. Check for continuity between ECM/PCM connector terminal E15 and body ground.



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (E15) and the IMA.

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

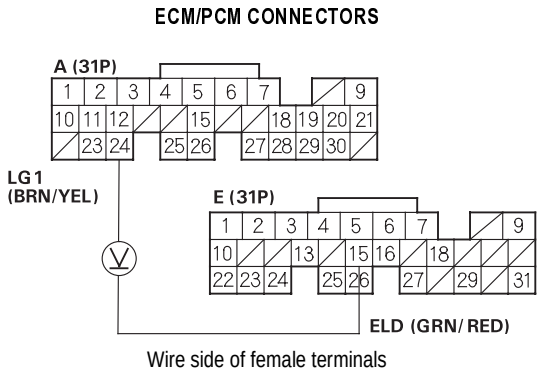
DTC 20: ELD Circuit Malfunction

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine and keep engine speed at idle.
3. Turn the headlights on.

   Does the MIL indicate DTC 20?

   Yes Go to step 4.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the ELD and at the ECM/PCM.■
4. Turn the ignition switch OFF.
5. Start the engine and let it idle.
6. Measure voltage between ECM/PCM connector terminals A24 and E15.
7. While measuring voltage between ECM/PCM connector terminals A24 and E15, turn the headlights on (low).

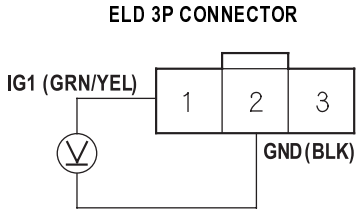


Wire side of female terminals

   Does the voltage drop when the headlights are turned on?

   Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

   No Go to step 8.
8. Turn the ignition switch and headlights OFF.
9. Disconnect the ELD 3P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between ELD 3P connector terminals No. 1 and No. 2.

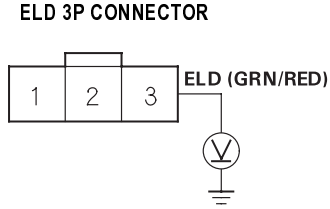


Wire side of female terminals

   Is there battery voltage?

   Yes Go to step 12.

   No Go to step 19.
12. Measure voltage between ELD 3P connector terminal No. 3 and body ground.



Wire side of female terminals

   Is there about 5 V?

   Yes Replace the under-hood fuse/relay box.■

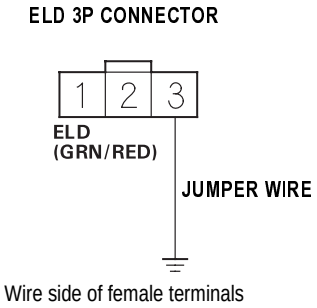
   No Go to step 13.

(cont'd)

DTC Troubleshooting (cont'd)

13. Turn the ignition switch OFF

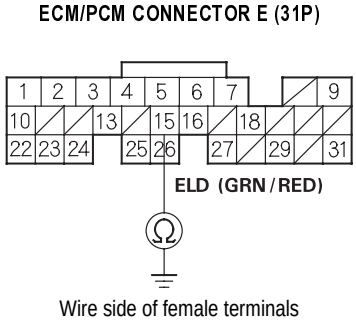
14. Connect ELD 3P connector terminal No. 3 and body ground with a jumper wire.



15. Disconnect ECM/PCM connector E (31P).

16. Disconnect the negative cable from the battery.

17. Check for continuity between body ground and ECM/PCM connector terminal E15.

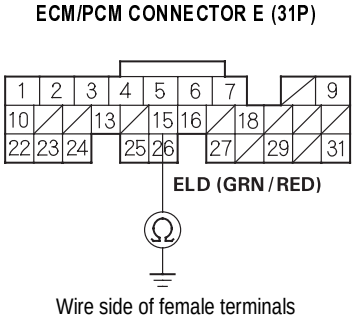


Is there continuity?

Yes Go to step 18.

No Repair open in the wire between the ECM/PCM (E15) and the ELD.

18. Check for continuity between body ground and ECM/PCM connector terminal E15.

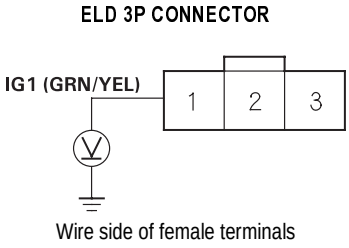


Is there continuity?

Yes Repair short in the wire between the ECM/PCM (E15) and the ELD.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

19. Measure voltage between ELD 3P connector terminal No. 1 and body ground.



Is there battery voltage?

Yes Repair open in the wire between the ELD and G201.■

No Check the No. 4 ACG (10A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between No. 4 ACG (10A) fuse and the ELD.■

DTC 45: Fuel System Malfunction

NOTE: If some of the DTCs listed below are stored at the same time as DTC 45, troubleshoot those DTCs first, then recheck for DTC 45.

DTC 3: MAP Sensor
DTC 41: Primary HO2S (Sensor 1) Heater
DTC 63: Secondary (Sensor 2) HO2S
DTC 65: Secondary HO2S (Sensor 2) Heater
DTC 22: VTEC System
DTC 56: VTC Oil Control Solenoid Valve
DTC 57: CMP Sensor

1. Recheck the fuel pressure (see page 11-154).

   Is fuel pressure OK?

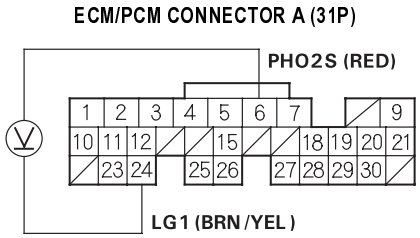
   Yes Go to step 2.

   No Check these items:■

   - If the pressure is too high. Check the fuel pressure regulator.
   - If the pressure is too low. Check the fuel pump, the fuel feed pipe, the fuel filter, and the fuel pressure regulator.

2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.

3. Measure voltage between ECM/PCM connector terminals A6 and A24.



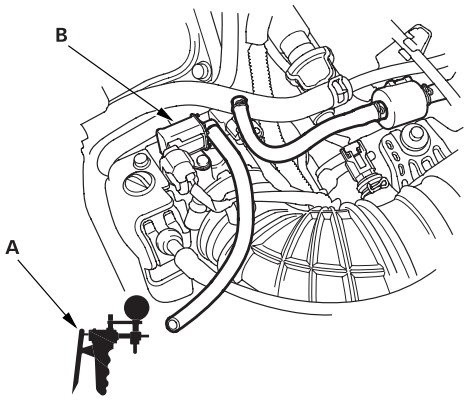
Wire side of female terminals

Does it stay at less than 0.3 V or more than 0.6 V?

Yes Replace the primary HO2S (Sensor 1).■

No Go to step 4.

4. With a vacuum pump, apply vacuum to the EVAP canister purge valve from the intake manifold side.

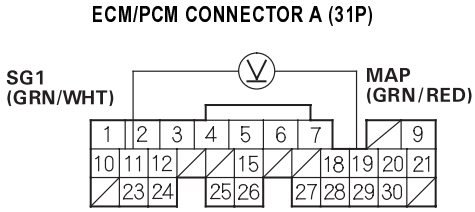


Does it hold vacuum?

Yes Go to step 5.

No Replace the EVAP canister purge valve.■

5. Measure voltage between ECM/PCM connector terminals A11 and A19.



Wire side of female terminals

Is there about 3 V?

Yes Go to step 6.

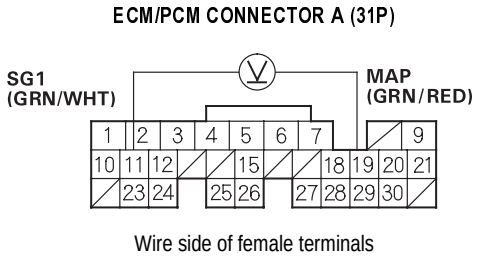
No Replace the MAP sensor.■

(cont'd)

DTC Troubleshooting (cont'd)

6. Start the engine.

7. Measure voltage between ECM/PCM connector terminals A11 and A19.



Is there 1.5 V or less within 1 second after starting the engine?

Yes Check the valve clearance and adjust if necessary. If the valve clearances are OK, replace the injector.■

No Replace the MAP sensor.■

DTC 56: VTC Oil Control Solenoid Valve Malfunction

NOTE: Information marked with asterisk (*) applies to VTC- line

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle.

   Is DTC 56 indicated?

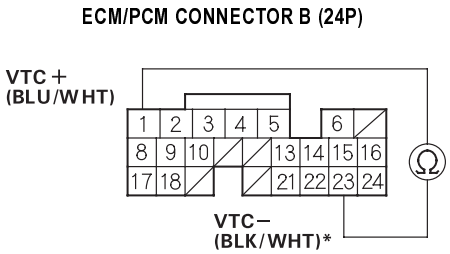
   Yes Go to step 6.

   No Go to step 3.
3. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on.
4. Test-drive at a steady speed between 30 - 60 km/h (20 - 40 mph) for 10 minutes.
5. Jump the SCS line (see step 2 on page 77-3).

   Is DTC 56 indicated?

   Yes Go to step 16.

   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the VTC oil control solenoid valve and at the ECM/PCM.■
6. Turn the ignition switch OFF.
7. Disconnect ECM/PCM connector B (24P).
8. Disconnect the negative cable from the battery.
9. Measure resistance between ECM/PCM connector terminal B1 and B23*.



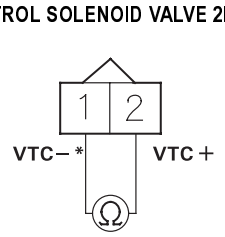
Wire side of female terminals

Is there 6.75 - 8.25 Ω?

Yes Go to step 14.

No Go to step 10.

10. Disconnect the VTC oil control solenoid valve 2P connector.
11. Measure resistance between VTC oil control solenoid valve 2P connector terminal No. 1* and No. 2.



Wire side of female terminals

Is there 6.75 - 8.25 Ω?

Yes Go to step 12.

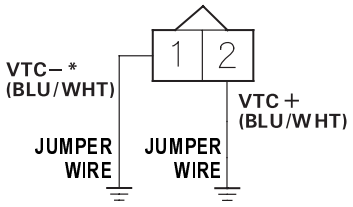
No Replace the VTC oil control solenoid valve.■

(cont'd)

DTC Troubleshooting (cont'd)

12. Connect VTC oil control solenoid valve 2P connector terminals No. 1, No. 2 and body ground with a jumper wire individually.

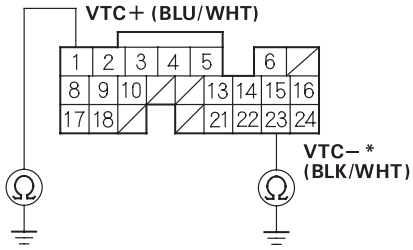
VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

13. Check for continuity between ECM/PCM connector terminal B1, B23 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

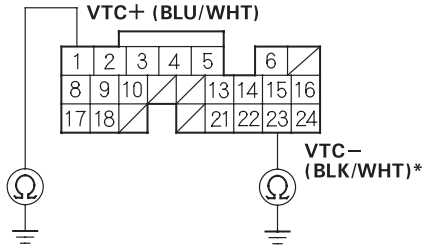
Is there continuity?

Yes Go to step 14.

No Repair open in the wire between the ECM/PCM (B1, B23*) and the VTC oil control solenoid valve.■

14. Check for continuity between ECM/PCM connector terminal B1, B23* and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

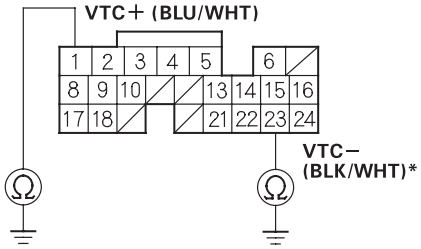
Yes Go to step 15.

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

15. Disconnect the VTC oil control solenoid valve 2P connector.

16. Check for continuity between ECM/PCM connector terminal B1, B23* and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (B1, B23*) and the VTC oil control solenoid valve.■

No Replace the VTC oil control solenoid valve.■

17. Reconnect the negative cable to the battery.

18. Watch the low oil pressure light.

Is the low oil pressure light on?

Yes Check the oil pressure (see page 08-4).■

No Go to step 19.

19. Check the VTC oil control solenoid valve (see page 11-137).

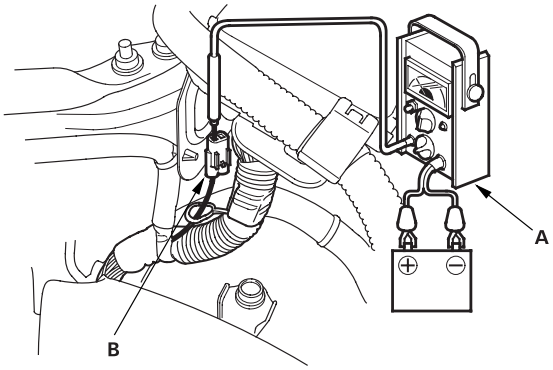
Is the VTC oil control solenoid valve OK?

Yes Go to step 20.

No Clean the ports of the VTC oil control solenoid valve, or replace the VTC oil control solenoid valve.■

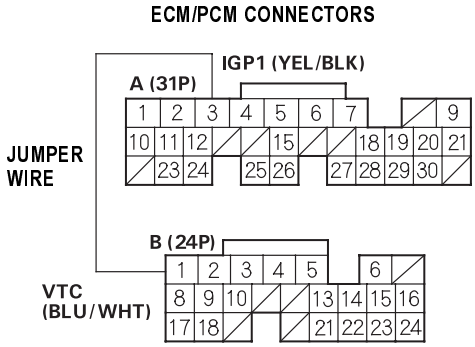
20. Install the VTC oil control solenoid valve.

21. Connect a tachometer (A) to the test tachometer connector (B).



22. Start the engine. Hold the engine at 700 - 1,000 rpm (min^{-1}).

23. Connect the ECM/PCM connector terminal A3 and B1 with a jumper wire.



Wire side of female terminals

Did the engine stall or run rough?

Yes Test-drive at a steady speed between 30 - 60 km/h (20 - 40 mph) for 10 minutes. If temporary DTC P0011 is indicated, substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

No Go to step 24.

(cont'd)

DTC Troubleshooting (cont'd)

24. Check the VTC actuator (see page 06-8).

Is the VTC actuator OK?

Yes Remove the auto-tensioner (see page 04-31) and replace the VTC oil filter. Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

No Replace the VTC actuator.■

DTC 57: CMP Sensor Circuit Malfunction

1. Reset the ECM/PCM (see page 11-4).

2. Start the engine.

Is the MIL on and does it indicated DTC 57?

Yes Go to step 3.

No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the CMP sensor and at the ECM/PCM.■

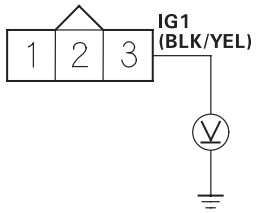
3. Turn the ignition switch OFF.

4. Disconnect the CMP sensor 3P connector.

5. Turn the ignition switch ON (II).

6. Measure voltage between CMP sensor 3P connector terminal No. 3 and body ground.

CMP SENSER 3P CONNECTOR



Wire side of female terminals

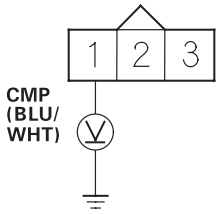
Is there battery voltage?

Yes Go to step 7.

No Check the No. 4 ACG (10A) fuse in the under-dash fuse/relay box. If the fuse OK, repair open in the wire between the CMP sensor and No. 4 ACG (10A) fuse.■

7. Measure voltage between CMP sensor 3P connector terminal No. 1 and body ground.

CMP SENSOR 3P CONNECTOR



Wire side of female terminals

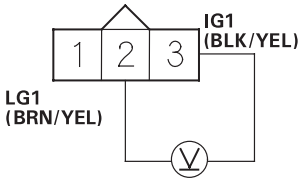
Is there about 5 V?

Yes Go to step 8.

No Go to step 10.

8. Measure voltage between CMP sensor 3P connector terminals No. 2 and No. 3.

CMP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

Yes Go to step 9.

No Repair open in the wire between the CMP sensor and G101.■

9. Substitute a known-good CMP sensor and recheck.

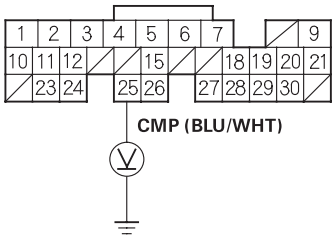
Is the MIL on and does it indicated DTC 57?

Yes Go to step 14.

No Replace the original CMP sensor.■

10. Measure voltage between ECM/PCM connector terminal A25 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

Yes Repair open in the wire between the ECM/PCM (A25) and CMP sensor.■

No Go to step 11.

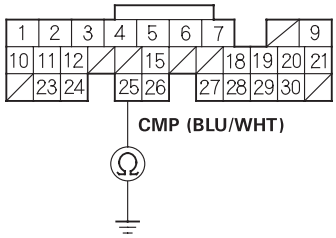
11. Turn the ignition switch OFF.

12. Disconnect the negative cable from the battery.

13. Disconnect ECM/PCM connector A (31P).

14. Check for continuity between ECM/PCM connector terminal A25 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A25) and the CMP sensor.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

15. Check the VTC oil control solenoid valve (see page 11-137).

Is the VTC oil control solenoid valve OK?

Yes Go to step 16.

No Clean the VTC oil control solenoid valve, or replace the VTC oil control solenoid valve.■

16. Remove the head cover and check the timing chain (see page 06-15).

Is the timing chain OK?

Yes Go to step 17.

No Replace the timing chain.■

17. Check the slack in the cam chain (see page 06-22).

Is the cam chain OK?

Yes Go to step 18.

No Replace the cam chain.■

18. Check the VTC actuator (see page 06-8).

Is the VTC actuator OK?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away with a known-good ECM/PCM, replace the original ECM/PCM.■

No Replace the VTC actuator.■

DTC 63: Secondary HO2S (Sensor 2) Circuit Malfunction

1. Reset the ECM/PCM (see page 11-4).
2. Jump the SCS line (see page 77-3).
3. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle for at least 1 minute before test-driving.

   Is the MIL on and does it indicate DTC 63?

   Yes Go to step 4.

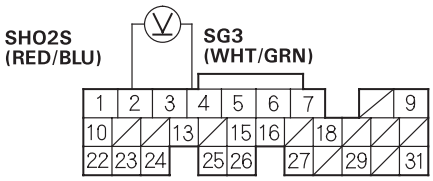
   No Intermittent failure, system is OK at this time. Check for poor connections or loose wires at the secondary HO2S (Sensor 2) and at the ECM/PCM.■
4. Inspect fuel pressure (see page 11-154).

   Is it normal?

   Yes Go to step 5.

   No Check for fuel supply system.■
5. Let it idle for at least 1 minute before test-driving.
6. Open the throttle wide open, then quickly release it.
7. Measure voltage between ECM/PCM connector terminals E2 and E4.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

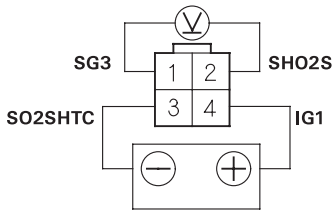
Is the voltage above 0.6 V at wide open throttle to 4,500 rpm (min^{-1}) and below 0.4 V when the throttle is quickly released from 4,500 rpm (min^{-1})?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

No Go to step 7.

8. Turn the ignition switch OFF.
9. Disconnect the secondary HO2S (Sensor 2) 4P connector.
10. At the secondary HO2S (Sensor 2) harness side, connect the battery positive terminal to terminal No. 4 and battery negative terminal to terminal No. 3.
11. Start the engine.
12. After 2 minute, measure voltage between secondary HO2S (Sensor 2) 4P connector terminals No. 1 and No. 2.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Wire side of female terminals

Is the voltage above 0.6 V at wide open throttle to 4,500 rpm (min^{-1}) and below 0.4 V when the throttle is quickly released from 4,500 rpm (min^{-1})?

Yes Repair open or short in the wire between the ECM/PCM (E2, E4) and the secondary HO2S (Sensor 2).■

No Replace the secondary HO2S (sensor 2).■

DTC Troubleshooting (cont'd)

DTC 71: No. 1 Cylinder Misfire

DTC 72: No. 2 Cylinder Misfire

DTC 73: No. 3 Cylinder Misfire

DTC 74: No. 4 Cylinder Misfire

NOTE: If some of the DTCs listed below are stored at the same time as a misfire DTC, troubleshoot those DTCs first, then recheck for the misfire DTC.

1. Reset the ECM/PCM (see page 11-4).
2. Start the engine, and listen for a clicking sound at the injector at the problem cylinder.

   Does it click?

   Yes Go to step 3.

   No Go to step 30.
3. Turn the ignition switch OFF.
4. Exchange the ignition coil from the problem cylinder with one from another cylinder.
5. Start the engine. Hold the engine at 3,000 rpm (min^{-1}) with no load (in Park or neutral) until the radiator fan comes on, then let it idle with the headlights, rear defogger, blower fan and air conditioner turned off.
6. Jump the SCS line (see page 77-3).
7. Test-drive the vehicle several times under vavious conditions.

   Is DTC 71, 72, 73 or 74 indicated?

   Yes Go to step 8.

   No Intermittent misfire due to poor contact at the ignition coil connector (no misfire at this time).■
8. Determine which cylinder(s) had the misfire.

   Does the misfire occur in the other cylinder whose ignition coil was exchanged?

   Yes Replace the faulty ignition coil (see page 04-21).■

   No Go to step 9.
9. Turn the ignition switch OFF.
10. Exchange the spark plug from the problem cylinder with one from another cylinder.
11. Test-drive the vehicle several times under vavious conditions.

    Is DTC 71, 72, 73 or 74 indicated?

    Yes Go to step 12.

    No Intermittent misfire due to spark plug fouling, etc. (on misfire at that time).■
12. Determine which cylinder(s) had the misfire.

    Does the misfire occur in the other cylinder whose spark plug was exchanged?

    Yes Replace the faulty spark plug.■

    No Go to step 13.

13. Turn the ignition switch OFF.

14. Exchange the injector from the problem cylinder with one from the another cylinder.

15. Let the engine idle for 2 minutes.

16. Test-drive the vehicle several times under various conditions.

Is DTC 71, 72, 73 or 74 indicated?

Yes Go to step 17.

No Intermittent misfire due to bad contact in the injector connector (no misfire at this time).■

17. Determine which cylinder(s) had the misfire.

Does the misfire occur in the other cylinder whose injector was exchanged?

Yes Replace the faulty injector.■

No Go to step 18.

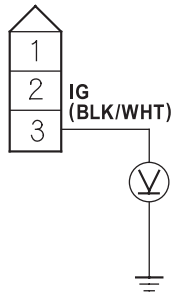
18. Turn the ignition switch OFF.

19. Disconnect the ignition coil 3P connector from the problem cylinder.

20. Turn the ignition switch ON (II).

21. Measure voltage between ignition coil 3P connector terminal No. 3 and body ground.

IGNITION COIL 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

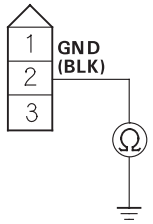
Yes Go to step 22.

No Repair open or short in the wire between the No. 1 IGN COIL (15A) fuse and the ignition coil.■

22. Turn the ignition switch OFF.

23. Check for continuity between ignition coil 3P connector terminal No. 2 and body ground.

IGNITION COIL 3P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Go to step 24.

No Repair open in the wire between the ignition coil and G101.■

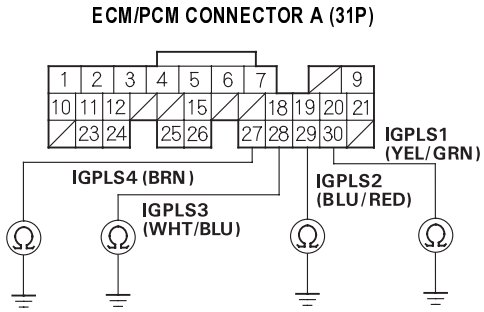
24. Disconnect the negative cable from the battery.

25. Disconnect ECM/PCM connector A (31P).

(cont'd)

DTC Troubleshooting (cont'd)

26. Check for continuity between body ground and the ECM/PCM connector terminal (see table).



Wire side of female terminals

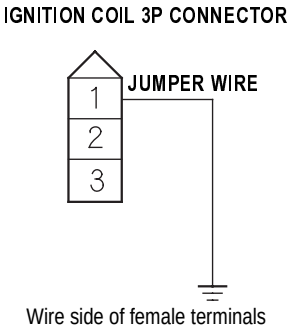
PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	DTC 71	A30	YEL/GRN
No. 2	DTC 72	A29	BLU/RED
No. 3	DTC 73	A28	WHT/BLU
No. 4	DTC 74	A27	BRN

Is there continuity?

Yes Repair short in the wire between the ECM/PCM and the ignition coil.■

No Go to step 27.

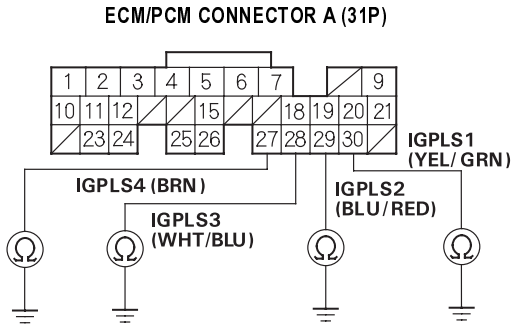
27. Connect the ignition coil 3P connector terminal No. 1 and body ground with a jumper wire (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	DTC 71	YEL/GRN
No. 2	DTC 72	BLU/RED
No. 3	DTC 73	WHT/BLU
No. 4	DTC 74	BRN

28. Check for continuity between body ground and the ECM/PCM connector terminal (see table).



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	DTC 71	A30	YEL/GRN
No. 2	DTC 72	A29	BLU/RED
No. 3	DTC 73	A28	WHT/BLU
No. 4	DTC 74	A27	BRN

Is there continuity?

Yes Go to step 29.

No Repair open in the wire between the ECM/PCM and the ignition coil.■

29. Check the engine compression.

Is the engine compression OK?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/indication goes away, replace the original ECM/PCM.■

No Repair the engine.■

30. Disconnect the negative cable from the battery.

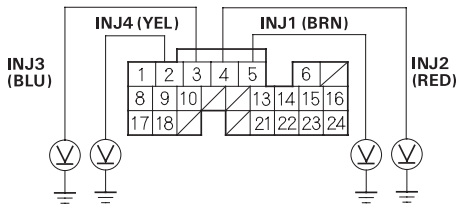
31. Disconnect ECM/PCM connector B (24P).

32. Reconnect the negative cable to the battery.

33. Turn the ignition switch ON (II).

34. Measure voltage between body ground and the ECM/PCM connector terminal (see table).

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	DTC 71	B5	BRN
No. 2	DTC 72	B4	RED
No. 3	DTC 73	B3	BLU
No. 4	DTC 74	B2	YEL

Is there battery voltage?

Yes Go to step 35.

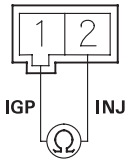
No Go to step 43.

35. Turn the ignition switch OFF, and remove the engine cover.

36. Disconnect the injector 2P connector on the problem cylinder.

37. Measure the resistance between the injector 2P connector terminals No. 1 and No. 2.

INJECTOR 2P CONNECTOR



Terminal side of male terminals

Is there 10Ω - 13 Ω?

Yes Go to step 38.

No Replace the injector (see page 11-117).■

38. Exchange the injector from the problem cylinder with one from another cylinder.

39. Jump the SCS line (see page 77-3).

40. Let the engine idle for 2 minutes.

41. Test-drive the vehicle several times under various conditions.

Is DTC 71, 72, 73 or 74 indicated?

Yes Go to step 42.

No Intermittent misfire due to bad contact in the injector connector (no misfire at this time).■

42. Determine which cylinder(s) had the misfire.

Does the misfire occur in the other cylinder whose injector was exchanged?

Yes Replace the faulty injector.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If symptom/ indication goes away, replace the original ECM/PCM.■

43. Turn the ignition switch OFF.

44. Remove the engine cover.

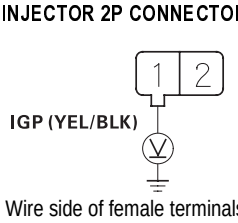
45. Disconnect the injector 2P connector on the problem cylinder.

46. Turn the ignition switch ON (II).

(cont'd)

DTC Troubleshooting (cont'd)

47. Measure voltage between the injector 2P connector terminals No. 1 and body ground.



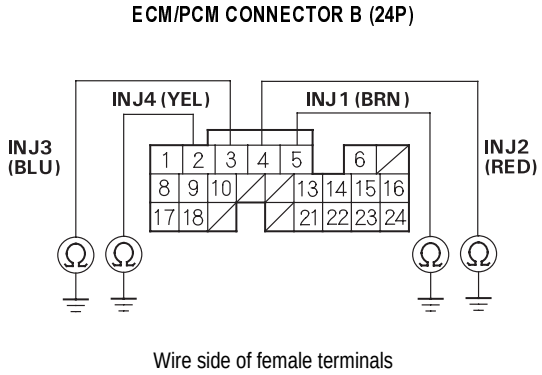
Is there battery voltage?

Yes Go to step 48.

No Repair open in the wire between the injector and the PGM-FI main relay.■

48. Turn the ignition switch OFF.

49. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).



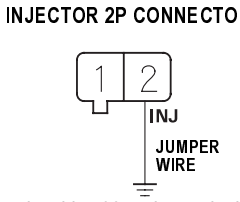
PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	DTC 71	B5	BRN
No. 2	DTC 72	B4	RED
No. 3	DTC 73	B3	BLU
No. 4	DTC 74	B2	YEL

Is there continuity?

Yes Repair short in the wire between the ECM/PCM and the injector.■

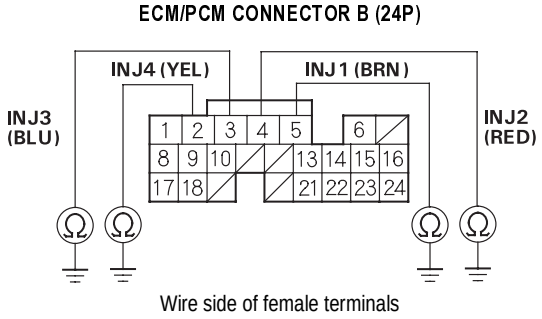
No Go to step 50.

50. Connect the appropriate injector 2P connector terminal No. 2 to body ground with a jumper wire (see table).



PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	DTC 71	BRN
No. 2	DTC 72	RED
No. 3	DTC 73	BLU
No. 4	DTC 74	YEL

51. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).



PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	DTC 71	B5	BRN
No. 2	DTC 72	B4	RED
No. 3	DTC 73	B3	BLU
No. 4	DTC 74	B2	YEL

Is there continuity?

Yes Replace the injector, then recheck.■

No Repair open in the wire between the ECM/PCM and the injector.■

MIL Circuit Troubleshooting

1. Turn the ignition switch ON (II) and watch the Malfunction Indicator Lamp (MIL).

Does the MIL come on and stay on?

Yes If the MIL always come on and stays on, go to step 74. But if the MIL sometimes works normally, first check for these problems:

- An intermittent short in the wire between the ECM/PCM (E29) and the Data Link Connector (DLC).
- An intermittent short in the wire between the ECM/PCM (E31) and the gauge assembly.

No If the MIL is always off, go to step 2. But if the MIL sometimes works normally, first check for these problems:

- A loose No. 10 METER (7.5A) fuse in the under-dash fuse/relay box.
- A loose No. 20 IG (50A) fuse in the under-hood fuse/relay box.
- A loose No. 6 ECU (ECM/PCM) (15A) fuse in the under-hood fuse/relay box.
- A loose No. 17 FUEL PUMP (15A) fuse in the under-dash fuse/relay box.
- A poor connection at ECM/PCM terminal E31.
- An intermittent open in the GRN/WHT wire between the ECM/PCM (E31) and the gauge assembly.
- An intermittent short in the wire between the ECM/PCM (A21) and the manifold absolute pressure (MAP) sensor, countershaft speed sensor (A/T).
- An intermittent short in the wire between the ECM/PCM (A20) and the throttle position (TP) sensor, mainshaft speed sensor (A/T).

2. KG, KS, KE, KR models:

Turn the ignition switch OFF and press the inertia switch button.

3. KG, KS, KE, KR models:

Turn the ignition switch ON(II).

Does the MIL come on for 2 seconds after the ignition switch is turned ON (II)?

Yes Intermittent failure system is OK at this time.■

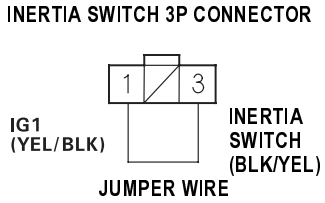
No Go to step 4.

4. KG, KS, KE, KR models:

Turn the ignition switch OFF and disconnect the inertia switch 3P connector

5. KG, KS, KE, KR models:

Connect inertia switch 3P connector terminals No. 1 and No. 3 with a jumper wire.



Wire side of female terminals

6. KG, KS, KE, KR models:

Turn the ignition switch ON (II).

Does the MIL come on for 2 seconds after the ignition switch is turned ON (II)?

Yes Replace the inertia switch.■

No Go to step 7.

7. Turn the ignition switch OFF.

8. Turn the ignition switch ON(II).

Is the low oil pressure light on?

Yes Go to step 11.

No Go to step 9.

9. Inspect the No. 10 METER (7.5A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

Yes Go to step 10.

No Repair short in the wire between No. 10 METER (7.5A) fuse and the gauge assembly. Also replace the No. 10 METER (7.5A) fuse.■

(cont'd)

MIL Circuit Troubleshooting (cont'd)

10. Inspect the No. 20 IG1 (50A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

Yes Repair open in the wire between the No. 20 IG (50A) fuse and the gauge assembly. If the wires are OK, test the ignition switch (see page 22A-63).■

No Repair short in the wire between the No. 20 IG (50A) fuse and the under-dash fuse/relay box. Also replace the No. 20 IG (50A) fuse.■

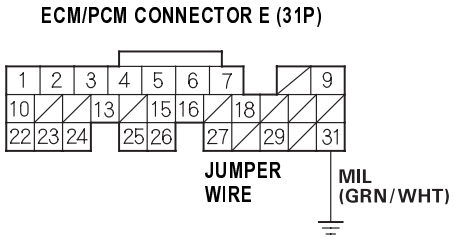
11. Try to start the engine.

Does the engine start?

Yes Go to step 12.

No Go to step 14.

12. Turn the ignition switch OFF. Connect ECM/PCM connector terminal E31 and body ground with a jumper wire.



Wire side of female terminals

13. Turn the ignition switch ON (II).

Is the MIL on?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Check for an open in the wires between the ECM/PCM (E31) and the gauge assembly. Also check for a blown MIL bulb. If the wires and the bulb are OK, replace the gauge assembly.■

14. Turn the ignition switch OFF.

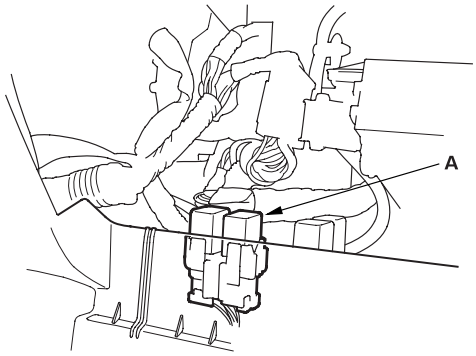
15. Remove and inspect the No. 6 ECU (ECM/PCM) (15A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

Yes Go to step 21.

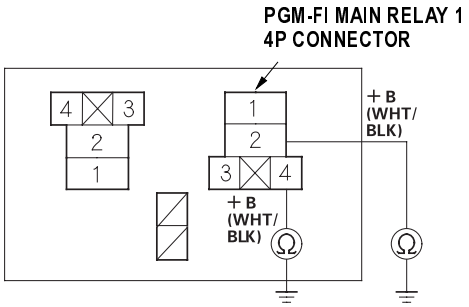
No Go to step 16.

16. Remove the glove box (see page 20-95), PGM-FI main relay 1 (A).



*:The illustration shows LHD model.

17. Check for continuity between body ground and PGM-FI main relay 1 4P connector terminals No. 2 and No. 4 individually.



Wire side of female terminals

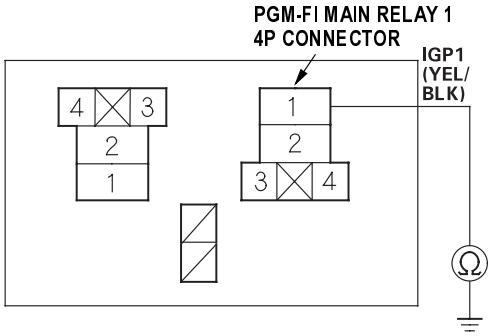
Is there continuity?

Yes Repair short in the wire between the No. 6 ECU (ECM/PCM) (15A) fuse and the PGM-FI main relay 1. Also replace the No. 6 ECU (ECM/PCM) (15A) fuse.■

No Go to step 18.

18. Disconnect each of the component or the connector sensors below, one at a time, and check for continuity between the PGM-FI main relay 1 4P connector terminal No. 1 and body ground.

- PGM-FI main relay 2
- ECM/PCM connector A (31P)
- Each injector 2P connector
- Idle air control (IAC) valve 3P connector
- Top dead center (TDC) sensor 2P connector
- Crankshaft position (CKP) sensor 3P connector



Wire side of female terminals

Is there continuity?

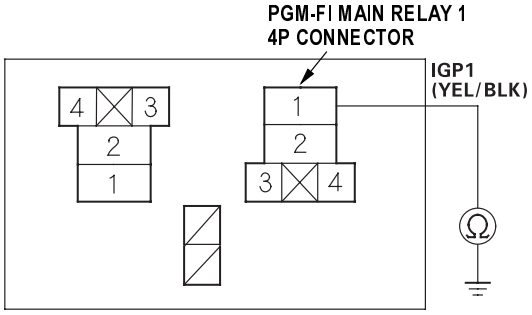
Yes Go to step 19.

No Replace the item that made continuity to body ground go away when disconnected. If the item is the ECM/PCM, substitute a known-good ECM/PCM and recheck (see page 11-5).
If the symptom/indication goes away, replace the original ECM/PCM.
Also replace the No. 6 ECU (ECM/PCM) (15A) fuse.■

19. Disconnected the connectors of all following items.

- PGM-FI main relay 2
- ECM/PCM connector A (31P)
- Injectors
- Idle air control (IAC) valve
- Top dead center (TDC) sensor
- Crankshaft position (CKP) sensor

20. Check for continuity between PGM-FI main relay 1 4P connector terminals No. 1 and body ground.



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between PGM-FI main relay 1 and each item. Also replace the No. 6 ECU (ECM/PCM) (15A) fuse.■

No Replace the PGM-FI main relay 1. Also replace the No. 6 ECU (ECM/PCM) (15A) fuse.■

21. Remove and inspect the No. 17 FUEL PUMP (15A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

Yes Go to step 32.

No Go to step 22.

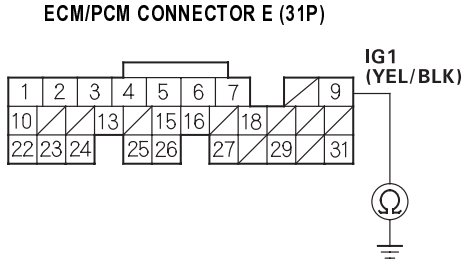
22. Disconnect the negative cable from the battery.

23. Disconnect ECM/PCM connector E (31P).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

24. Check for continuity between ECM/PCM connector terminal E9 and body ground.



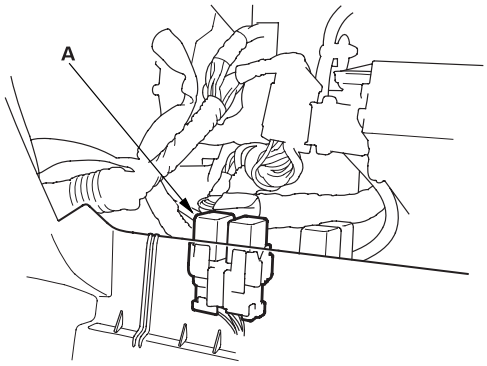
Wire side of female terminals

Is there continuity?

Yes Go to step 25.

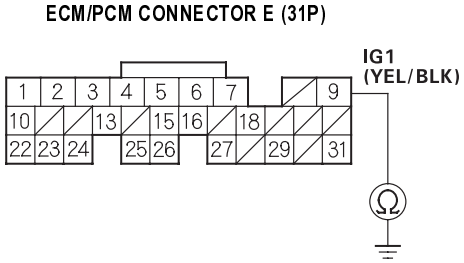
No Replace the No. 17 FUEL PUMP (15A) fuse, and substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away, replace the original ECM/PCM.■

25. Remove the glove box (see page 20-95), PGM-FI main relay 2 (A).



*: The illustration shows LHD model.

26. Check for continuity between ECM/PCM connector terminal E9 and body ground.



Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the No. 17 FUEL PUMP (15A) fuse and the ECM/PCM (E9), or the No. 17 FUEL PUMP (15A) fuse and the PGM-FI main relay 2. Also replace the No. 17 FUEL PUMP (15A) fuse.■

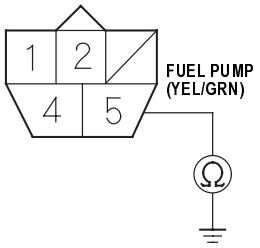
No Go to step 27.

27. Fold the rear seats forward, and pull back the carpet to expose the access panel.

28. Remove the access panel from the floor. Disconnect the fuel pump 5P connector.

29. Check for continuity between fuel pump 5P connector terminal No. 5 and body ground.

FUEL PUMP 5P CONNECTOR



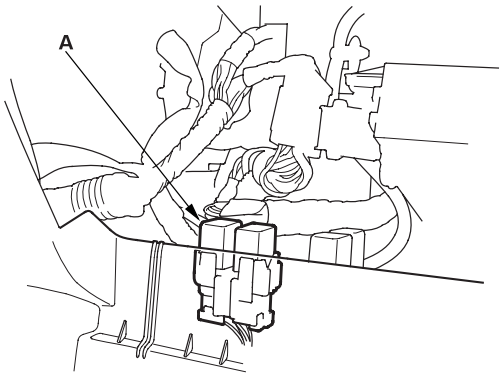
Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between the fuel pump and the PGM-FI main relay 2. Also replace the No. 17 FUEL PUMP (15A) fuse.■

No Go to step 30.

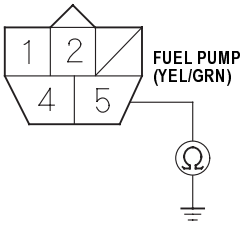
30. Reinstall PGM-FI main relay 2 (A).



*: The illustration shows LHD model.

31. Check for continuity between fuel pump 5P connector terminal No. 5 and body ground.

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

Is there continuity?

Yes Replace PGM-FI main relay 2. Also replace the No. 17 FUEL PUMP (15A) fuse.■

No Check the fuel pump, and replace it as necessary. Also replace the No. 17 FUEL PUMP (15A) fuse.■

32. Disconnect the negative cable from the battery.

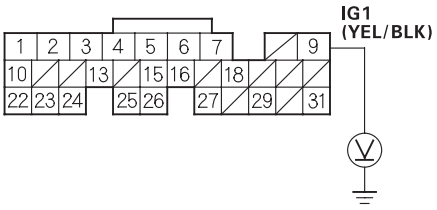
33. Disconnect ECM/PCM connector E (31P).

34. Reconnect the negative cable to the battery.

35. Turn the ignition switch ON (II).

36. Measure voltage between ECM/PCM connector terminals E9 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there battery voltage?

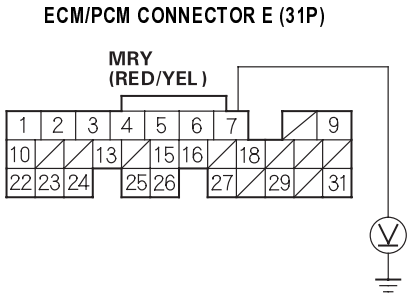
Yes Go to step 37.

No Repair open in the wire between the No. 17 FUEL PUMP (15A) fuse and the ECM/PCM (E9).■

(cont'd)

MIL Circuit Troubleshooting (cont'd)

37. Measure voltage between ECM/PCM connector terminal E7 and body ground.



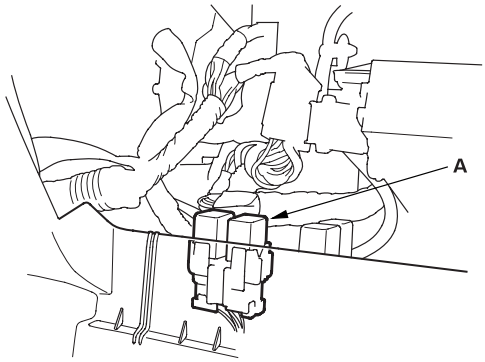
Wire side of female terminals

Is there battery voltage?

Yes Go to step 41.

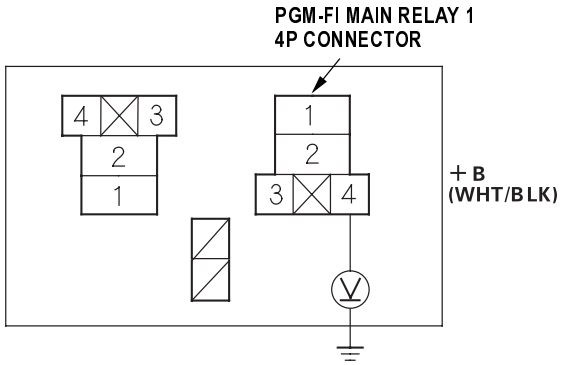
No Go to step 38.

38. Turn the ignition switch OFF and remove PGM-FI main relay 1 (A).



*: The illustration shows LHD model.

39. Measure voltage between PGM-FI main relay 1 4P connector terminal No. 4 and body ground.



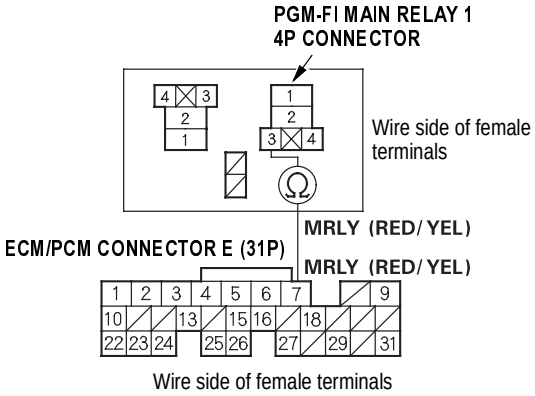
Wire side of female terminals

Is there battery voltage?

Yes Go to step 40.

No Repair open in the wire between the No. 6 ECU (ECM/PCM) (15A) fuse and PGM-FI main relay 1.■

40. Check for continuity between PGM-FI main relay 1 4P connector terminal No. 3 and ECM/PCM connector terminal E7.



Wire side of female terminals

Is there continuity?

Yes Test PGM-FI main relay 1 (see page 22A-60). If the relay is OK, substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

No Repair open in the wire between PGM-FI main relay 1 and the ECM/PCM (E7).■

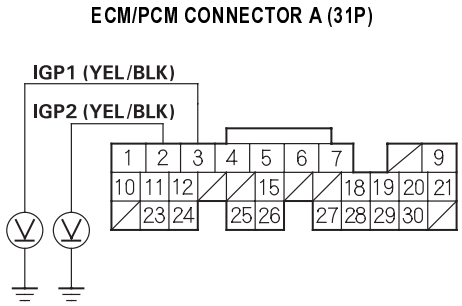
41. Disconnect the negative cable from the battery.

42. Reconnect ECM/PCM connector E (31P).

43. Reconnect the negative cable to the battery.

44. Turn the ignition switch ON (II).

45. Measure voltage between body ground and ECM/PCM connector terminals A2 and A3 individually.

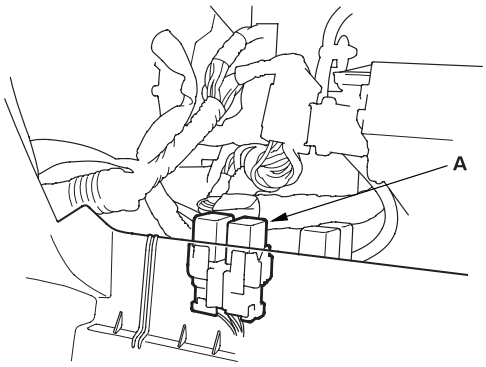


Is there battery voltage?

Yes Go to step 51.

No Go to step 46.

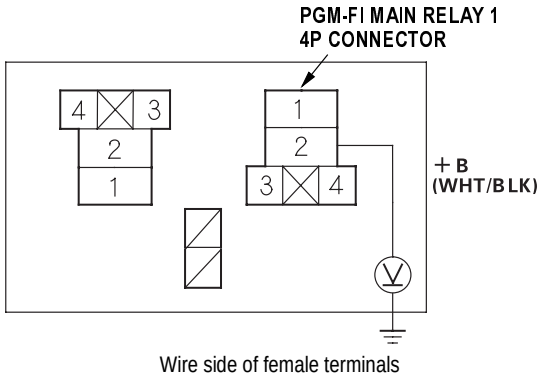
46. Turn the ignition switch OFF and remove PGM-FI main relay 1 (A).



*: The illustration shows LHD model.

47. Turn the ignition switch ON (II).

48. Measure voltage between PGM-FI main relay 1 4P connector terminal No. 2 and body ground.



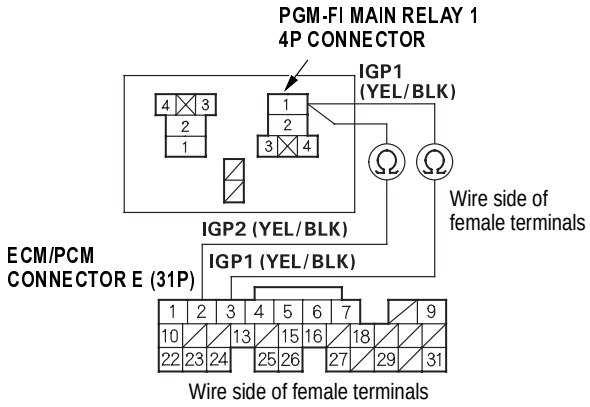
Is there battery voltage?

Yes Go to step 49.

No Repair open in the wire between the No. 6 ECU (ECM/PCM) (15A) fuse and PGM-FI main relay 1.■

49. Turn the ignition switch OFF.

50. Check for continuity between PGM-FI main relay 1 4P connector terminal No. 1 and ECM/PCM connector terminals A2 and A3 individually.



Is there continuity?

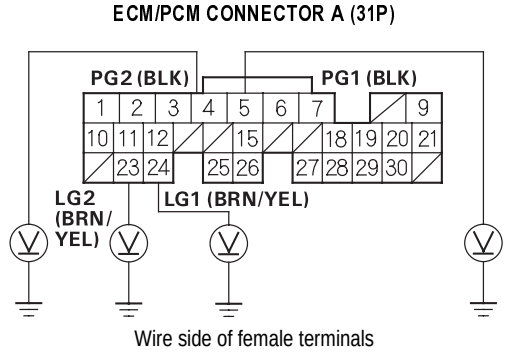
Yes Replace the PGM-FI main relay 1.■

No Repair open in the wire between PGM-FI main relay 1 and the ECM/PCM (A2, A3).■

(cont'd)

MIL Circuit Troubleshooting (cont'd)

51. Measure voltage between body ground and ECM/PCM connector terminals A4, A5, A23 and A24 individually.



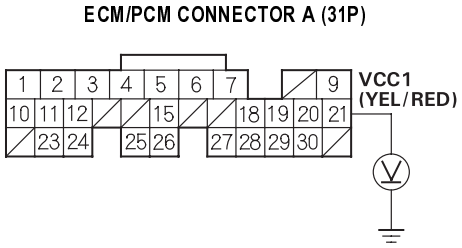
Wire side of female terminals

Is there less than 1.0 V?

Yes Repair open in the wire(s) that had more than 1.0 V between G101 and ECM/PCM (A4, A5, A23, A24).■

No Go to step 52.

52. Measure voltage between body ground and ECM/PCM connector terminals A21.



Wire side of female terminals

Is there about 5 V?

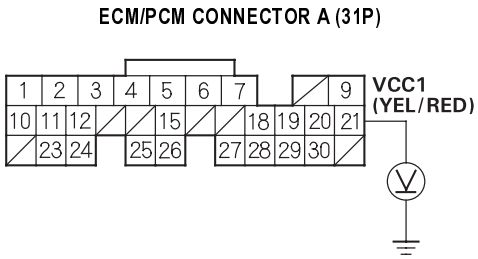
Yes Go to step 59.

No Go to step 53.

53. Turn the ignition switch OFF.

54. Disconnect the 3P connector from each of these sensors, one at a time, and measure voltage between body ground and ECM/PCM connector terminal A21 with the ignition switch ON (II).

- Manifold absolute pressure (MAP) sensor
- Countershaft speed sensor (A/T)



Wire side of female terminals

Is there about 5 V?

Yes Replace the sensor that restored 5 V when disconnected.■

No Go to step 55.

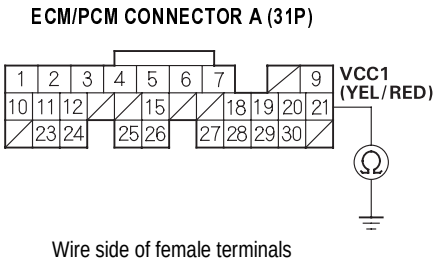
55. Turn the ignition switch OFF and disconnect the negative cable from the battery.

56. Disconnect the 3P connector from the following sensors.

- Manifold absolute pressure (MAP) sensor
- Countershaft speed sensor (A/T)

57. Disconnect ECM/PCM connector A (31P).

58. Check for continuity between ECM/PCM connector terminal A21 and body ground.



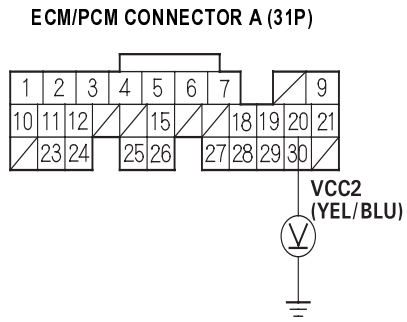
Wire side of female terminals

Is there continuity?

Yes Repair short in the wire between ECM/PCM (A21) and the MAP sensor, countershaft speed sensor (A/T).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

59. Measure voltage between body ground and ECM/PCM connector terminals A20.



Wire side of female terminals

Is there about 5 V?

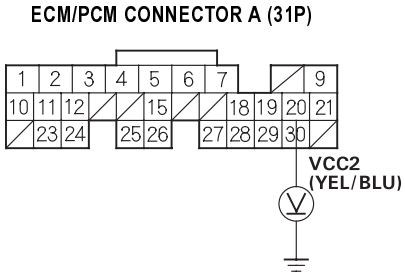
Yes Go to step 66.

No Go to step 60.

60. Turn the ignition switch OFF.

61. Disconnect the 3P connector from each of these sensors, one at a time, and measure voltage between body ground and ECM/PCM connector terminal A20 with the ignition switch ON (II).

- Throttle position (TP) sensor
- Mainshaft speed sensor (A/T)



Wire side of female terminals

Is there about 5 V?

Yes Replace the sensor that restored about 5 V when disconnected.■

No Go to step 62.

62. Turn the ignition switch OFF and disconnect the negative cable from the battery.

63. Disconnect the 3P connector from the following sensors.

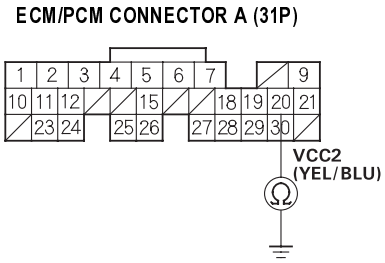
- Throttle position (TP) sensor
- Mainshaft speed sensor (A/T)

64. Disconnect ECM/PCM connector A (31P).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

65. Check for continuity between ECM/PCM connector terminal A20 and body ground.

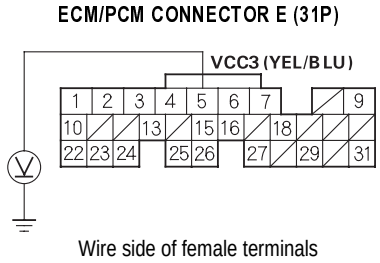


Is there continuity?

Yes Repair short in the wire between the ECM/PCM (A20) and the TP sensor, mainshaft speed sensor (A/T).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

66. Measure voltage between body ground and ECM/PCM connector terminals E5.



Is there about 5 V?

Yes Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

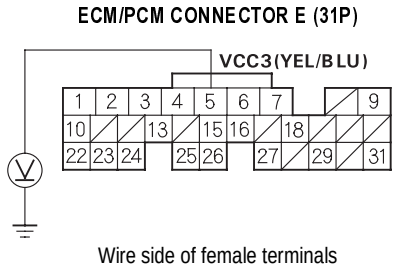
No Go to step 67.

67. Turn the ignition switch OFF.

68. Disconnect the idle mixture adjuster (IMA) sensor 3P connector.

69. Turn the ignition switch ON (II).

70. Measure voltage between body ground and ECM/PCM connector terminal E5.



Is there about 5 V?

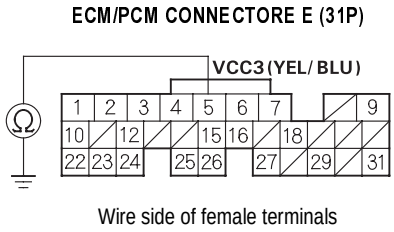
Yes Replace the IMA.■

No Go to step 71.

71. Turn the ignition switch OFF and disconnect the negative cable from the battery.

72. Disconnect ECM/PCM connector E (31P).

73. Check for continuity between ECM/PCM connector terminal E5 and body ground.



Is there continuity?

Yes Repair short in the wire between ECM/PCM (E5) and the IMA.■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/indication goes away, replace the original ECM/PCM.■

74. Turn the ignition switch OFF.

75. Jump the SCS line (see step 2 on page 77-3).

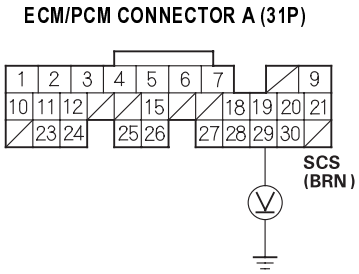
76. Turn the ignition switch ON (II), and read the MIL.

Does the OBD II scan tool/Honda PGM Tester communicate with the ECM/PCM?

Yes Go to the DTC Troubleshooting index.■

No Go to step 77.

77. Measure voltage between ECM/PCM connector terminal E29 and body ground.



Wire side of female terminals

Is there about 5 V (or battery voltage)?

Yes Repair open in the wire between the DLC and the ECM/PCM (E3, E29). After repairing it, check the DTC and go to the DTC Troubleshooting Index.■

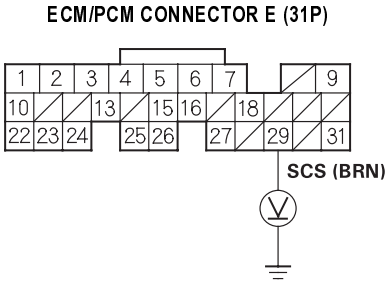
No Go to step 79.

78. Turn the ignition switch OFF.

79. Disconnect the DLC Terminal Box or SCS short connector.

80. Turn the ignition switch ON (II).

81. Measure voltage between ECM/PCM connector terminal E29 and body ground.



Wire side of female terminals

Is there about 5 V (or battery voltage)?

Yes Go to step 85.

No Go to step 82.

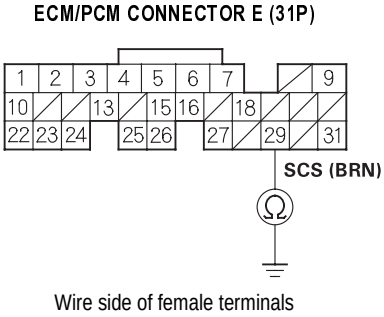
82. Turn the ignition switch OFF and disconnect the negative cable from the battery.

83. Disconnect the ECM/PCM connector E (31P).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

84. Check for continuity between ECM/PCM connector terminal E29 and body ground.



Is there continuity?

Yes Repair short in the wire between the DLC and the ECM/PCM (E29).■

No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away, replace the original ECM/PCM.■

85. Turn the ignition switch OFF and disconnect the negative cable from the battery.

86. Disconnect ECM/PCM connector E (31P).

87. Reconnect the negative cable to the battery.

88. Turn the ignition switch ON (II).

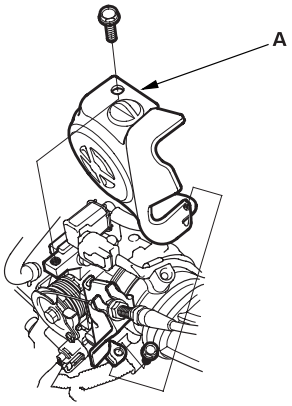
Is the MIL on?

Yes Repair short in the wire between the gauge assembly and the ECM/PCM (E31). If the wires are OK, replace the gauge assembly.■

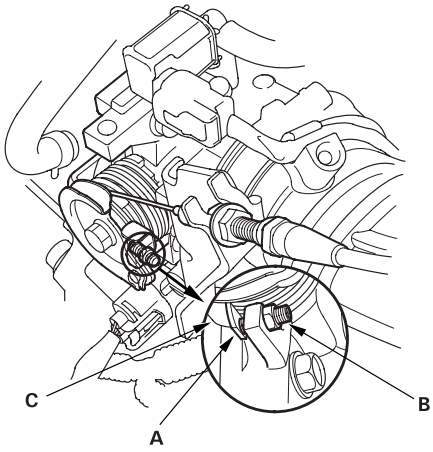
No Substitute a known-good ECM/PCM and recheck (see page 11-5). If the symptom/ indication goes away, replace the original ECM/PCM.■

Throttle Body Test

1. Remove the throttle linkage cover (A).



2. Check the throttle cable operation. The cable should operate without binding or sticking.
   - If the cable is OK, go to step 3.
   - If the cable binds or sticks, check the throttle cable and its routing. If it's faulty, reroute it or replace it and adjust it (see page 11-183), then go to step 3.
3. Operate the throttle lever by hand to see if the throttle valve and/or shaft are too loose or too tight.
   - If there is excessive play in the throttle valve shaft or the throttle valve binds at the fully closed position, replace the throttle body.
   - If the throttle valve and shaft are OK, go to step 4.
4. Check for clearance (A) between the throttle stop screw (B) and the throttle lever (C) at the fully closed position. If there is any clearance, replace the throttle body (see page 11-185). Do not adjust the throttle stop screw.



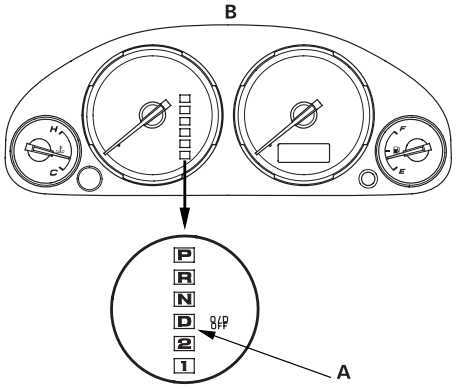
Automatic Transmission

DTC with [D] Indicator Light Troubleshooting Procedures

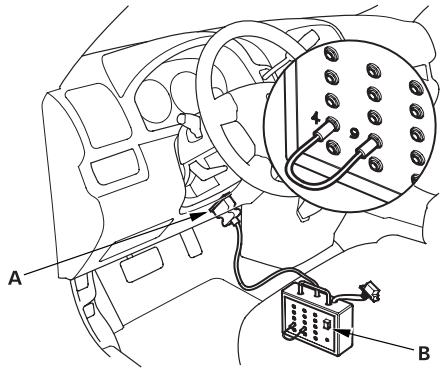
How to Check for DTCs

Special Tool Required
DLC pin box 07WAJ-0010100

When the PCM senses an abnormality in the input or output systems, the [D] indicator (A) in the gauge assembly (B) will usually blink and/or the Malfunction Indicator Lamp (MIL) may come on. When the Data Link Connector (located under the dash behind the center console) is connected with the special tool (DLC Pin Box), and the SCS signal terminal is connected to ground with the jumper wire at the special tool. The [D] indicator will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON (II).

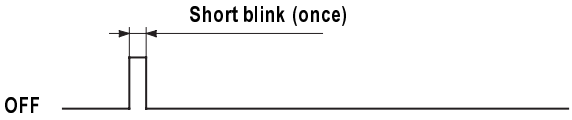


When the [D] indicator has been reported on, connect the DLC (A) with the special tool (DLC Pin Box), then connect the jumper wire between the terminals 4 and 9 at the special tool, and turn the switch (B) on. Turn the ignition switch ON (II), then observe the [D] indicator.

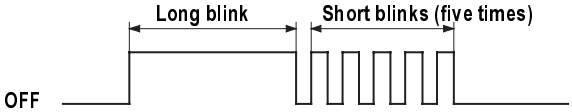


Codes 1 through 9 are indicated by individual short blinks. Code 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code. After determining the code, refer to the DTC Troubleshooting Index.

Example: DTC 1



Example: DTC 15



If the [D] indicator and the MIL come on at the same time, or if a driveability problem is suspected, follow this procedure:

1. Record all fuel and emission DTCs, A/T DTCs.
2. If there is fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except for DTC 70 on fuel and emission system, DTC 70 means there is one or more A/T DTCs, and no problems were detected in the fuel and emissions circuit of the PCM).
3. Write down the radio station presets.
4. Reset the memory by removing the No. 6 ECU fuse in the under-hood fuse/relay box for more than 10 seconds.
5. Drive the vehicle for several minutes at speeds over 30 mph (50 km/h), and then recheck for DTC. If the A/T DTC returns, go to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight, and then go to step 6.
6. Reset the radio preset stations, and set the clock.

DTC Troubleshooting Index by Number of [D] Indicator Blinking

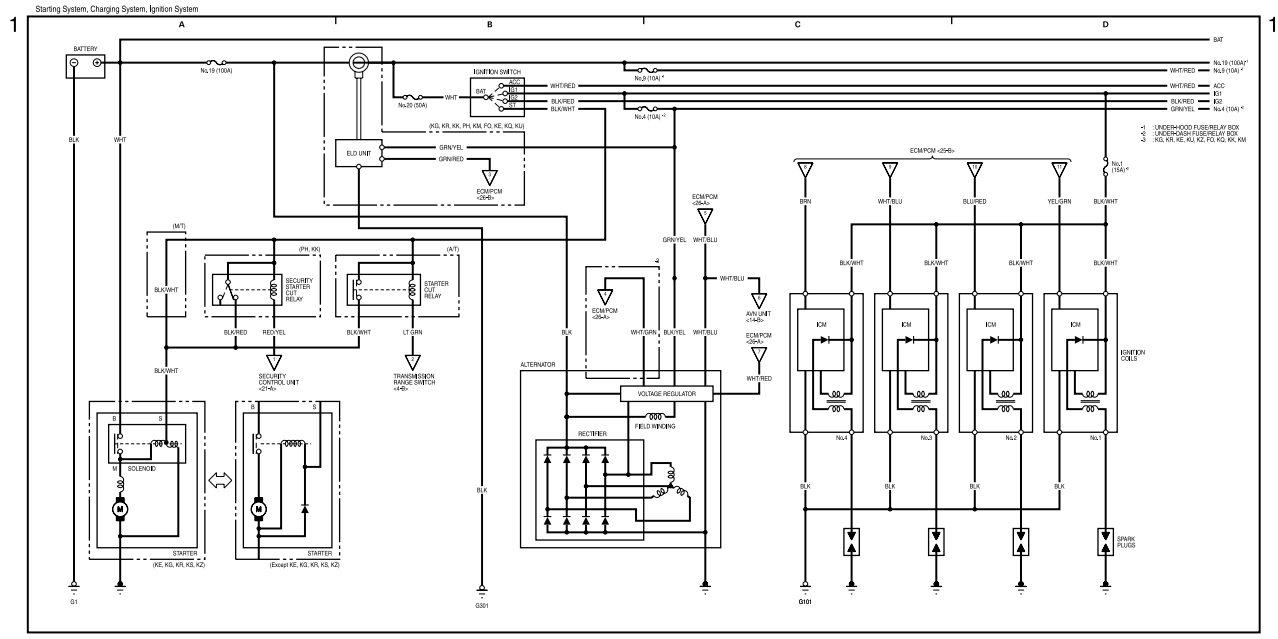
DTC Number of [D] Indicator Blink	Detection Item	[D] Indicator	MIL	Page
5	Transmission range switch (short to ground)	Blinks	ON	(see page 14-98)
6	Transmission range switch (open)	OFF	ON	(see page 14-102)
7	Shift solenoid valve A	Blinks	ON	(see page 14-79)
8	Shift solenoid valve B	Blinks	ON	(see page 14-81))
9	Countershaft speed sensor	Blinks	ON	(see page 14-71)
15	Mainshaft speed sensor	Blinks	ON	(see page 14-68))
16	A/T clutch pressure control solenoid valve A	Blinks	ON	(see page 14-76)
22	Shift solenoid valve C	Blinks	ON	(see page 14-83)
23	A/T clutch pressure control solenoid valve B	Blinks	ON	(see page 14-88)
25	2nd clutch pressure switch	Blinks	OFF	(see page 14-94)
26	3rd clutch pressure switch	Blinks	OFF	(see page 14-96)
28	ATF temperature sensor	Blinks	OFF	(see page 14-66)
29	A/T clutch pressure control solenoid valve C	Blinks	ON	(see page 14-92)
45	Mechanical problem in hydraulic control system	Blinks	ON	(see page 14-90)
61	Shift solenoid valve E	Blinks	ON	(see page 14-85)
62	Transmission range switch ([**R**] position circuit)	Blinks	OFF	(see page 14-104)
70	Hydraulic control system of shift solenoid valve A circuit	Blinks	ON	(see page 14-78)
76	Hydraulic control system of A/T clutch pressure control solenoid valve A circuit	Blinks	ON	(see page 14-75)
77	Hydraulic control system of A/T clutch pressure control solenoid valve B circuit	Blinks	ON	(see page 14-87)
78	Hydraulic control system of A/T clutch pressure control solenoid valve C circuit	Blinks	ON	(see page 14-91)

78

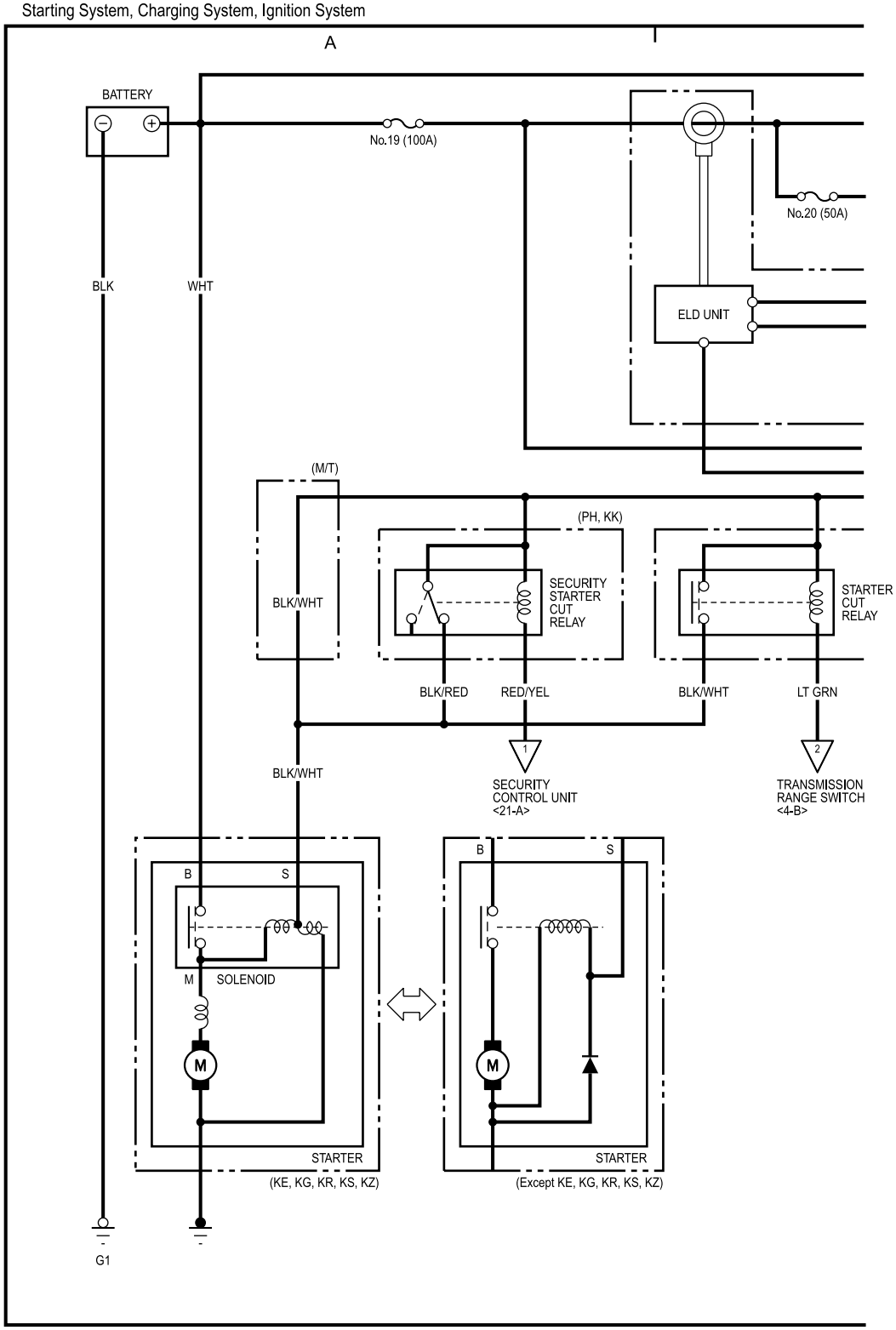
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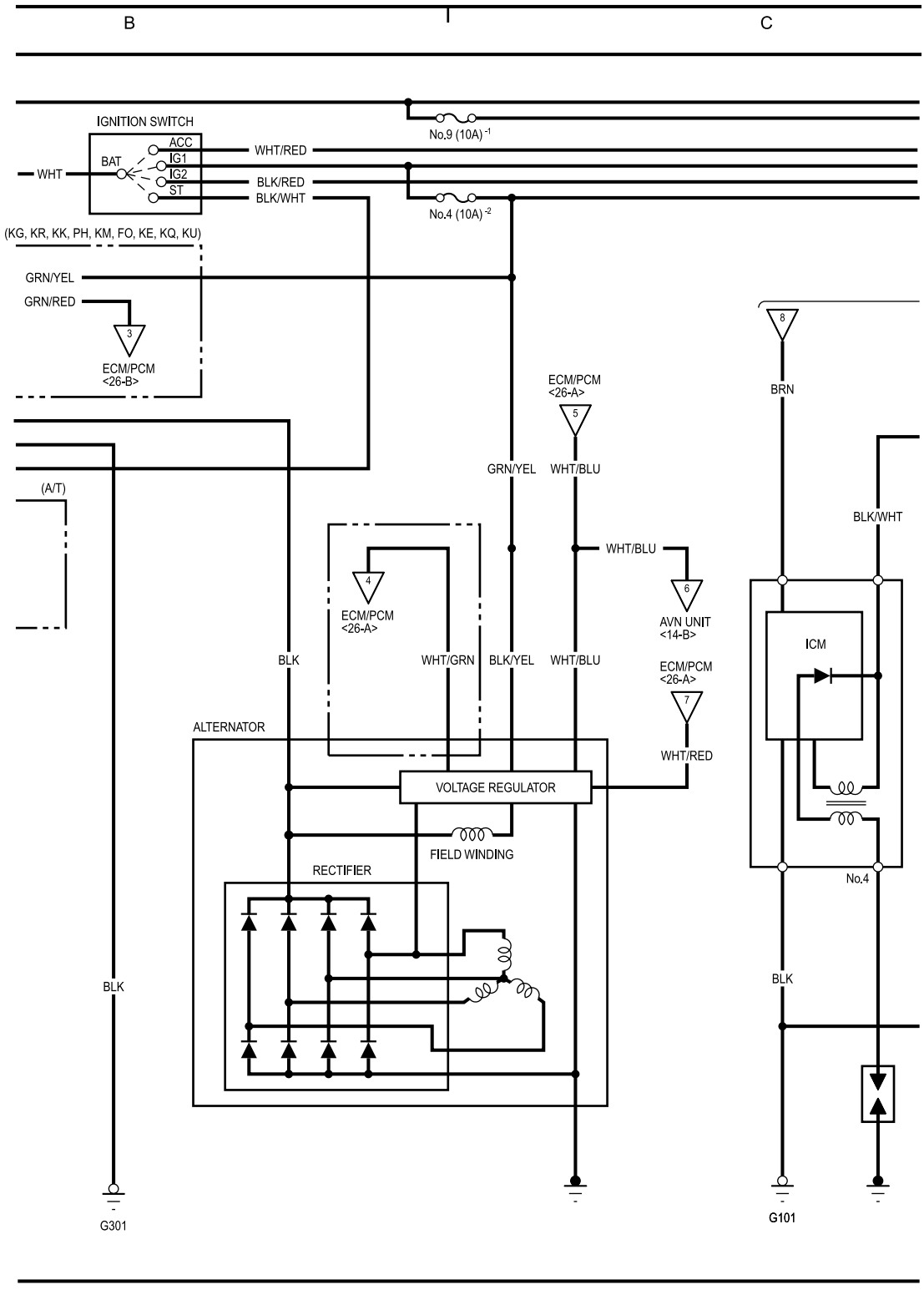
Starting System, Charging System, Ignition System



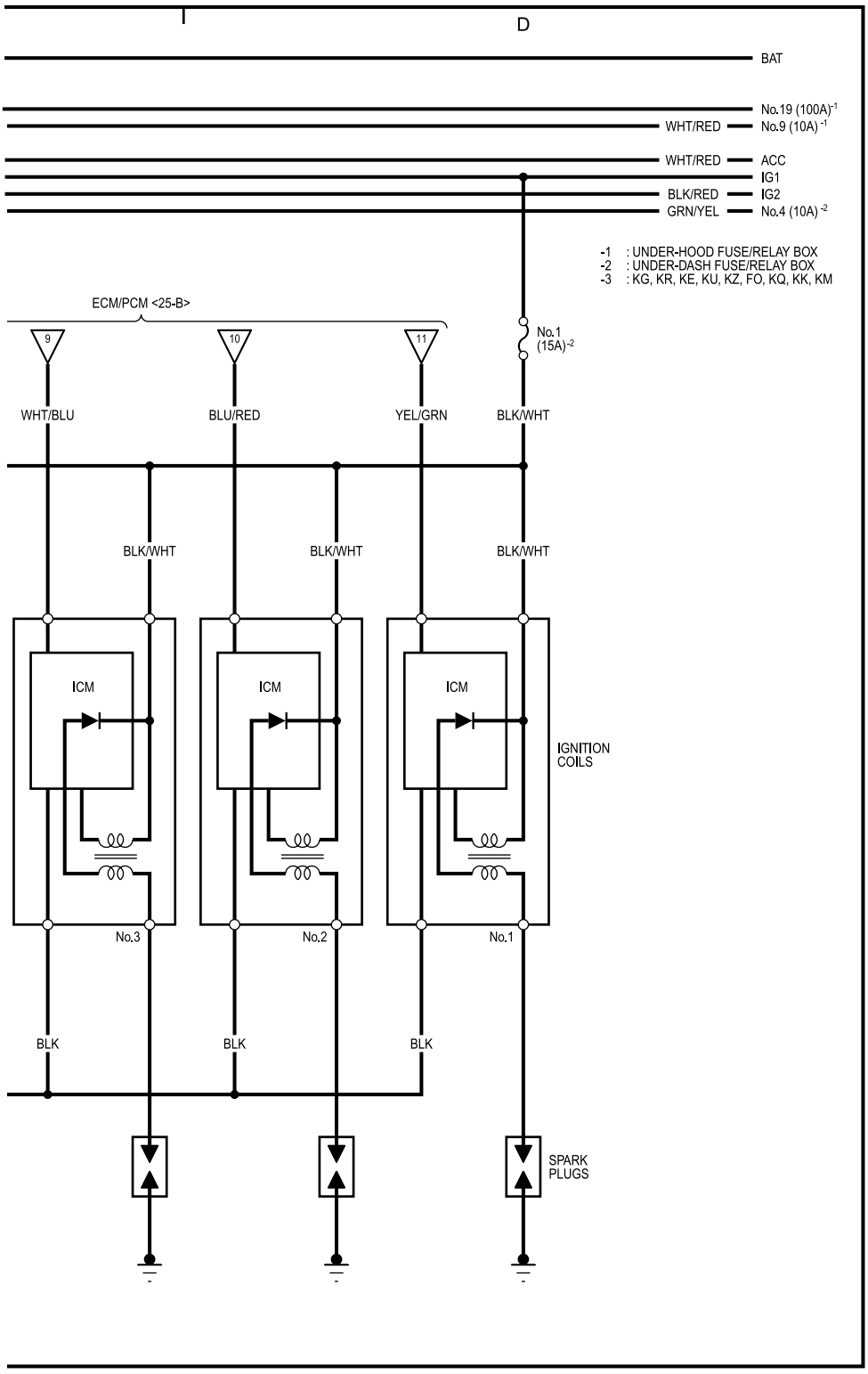
1 Starting System, Charging System, Ignition System



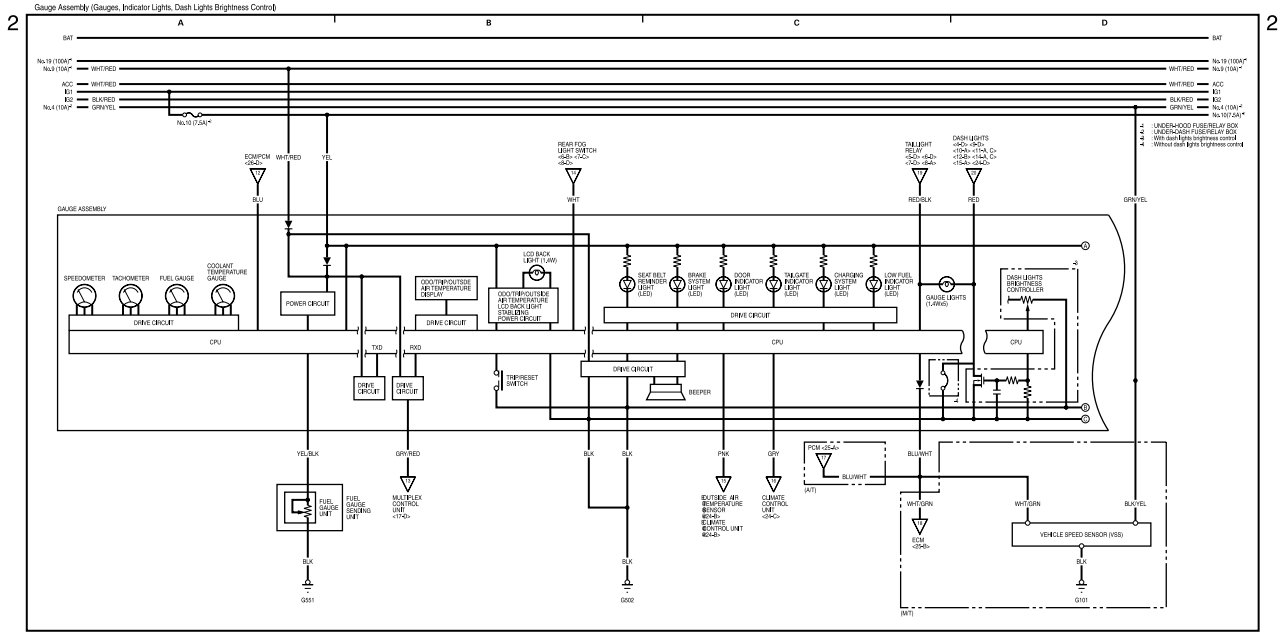
Starting System, Charging System, Ignition System (cont'd)



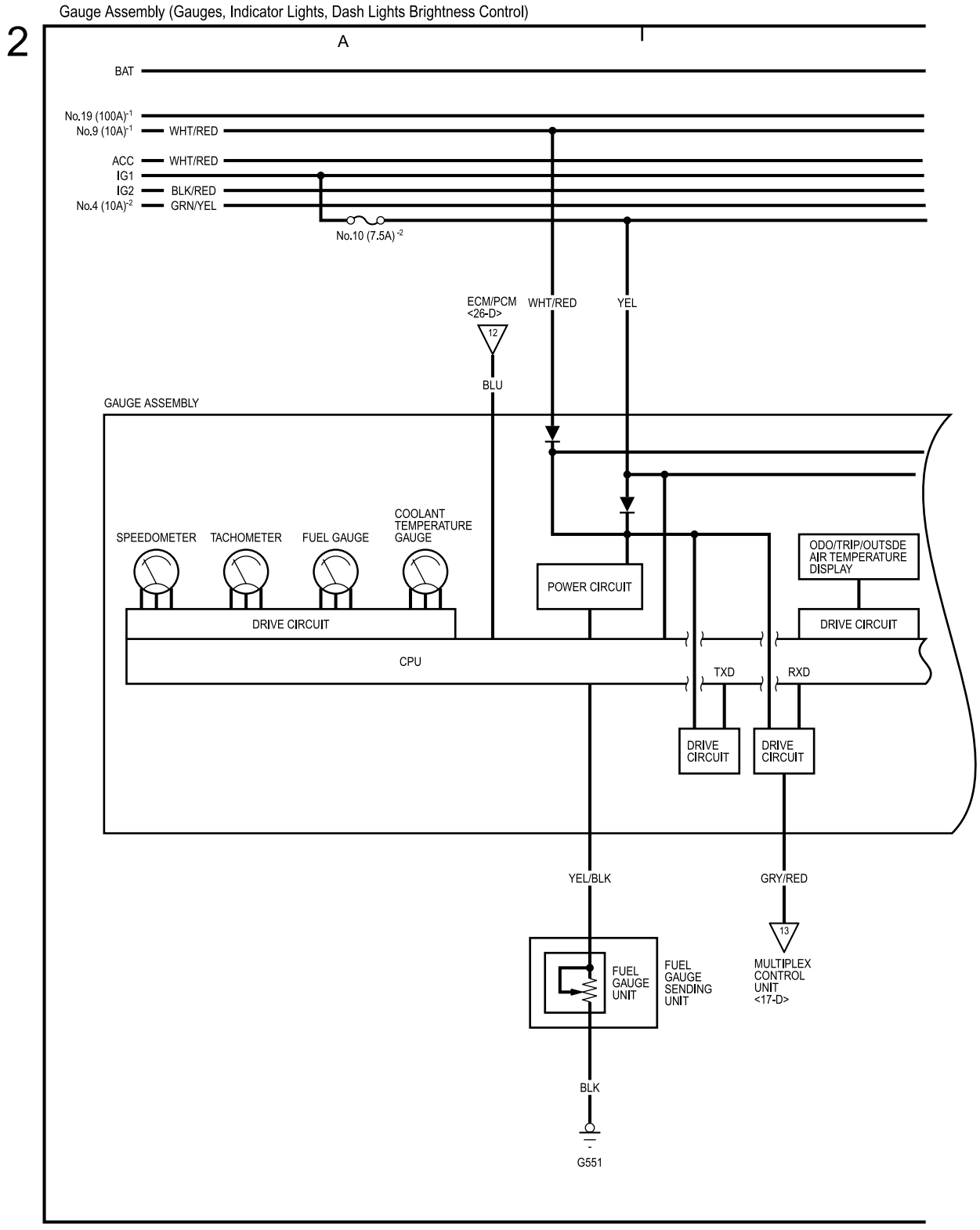
Starting System, Charging System, Ignition System (cont'd)



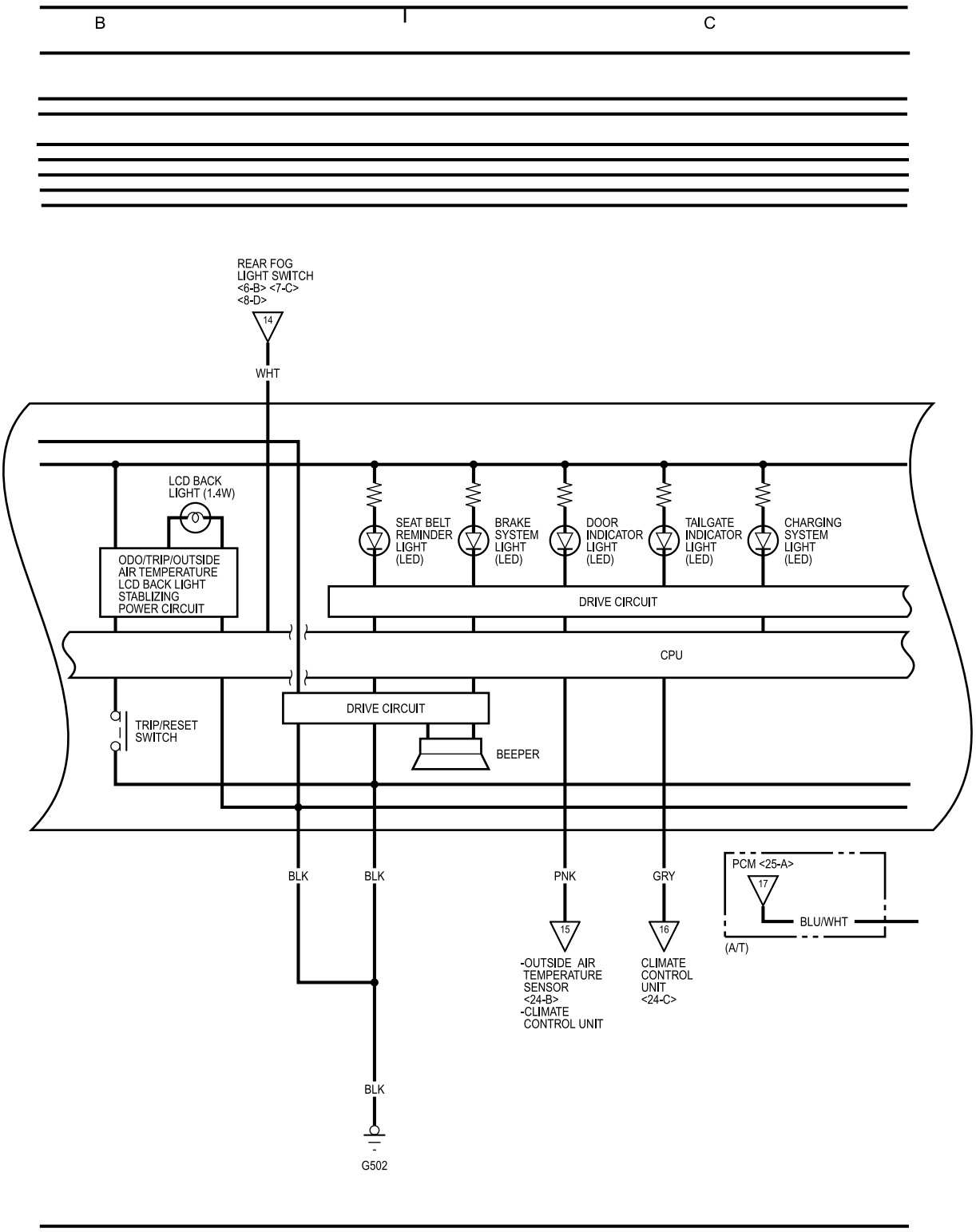
Gauge Assembly (Gauges, Indicator Lights, Dash Lights Brightness Control



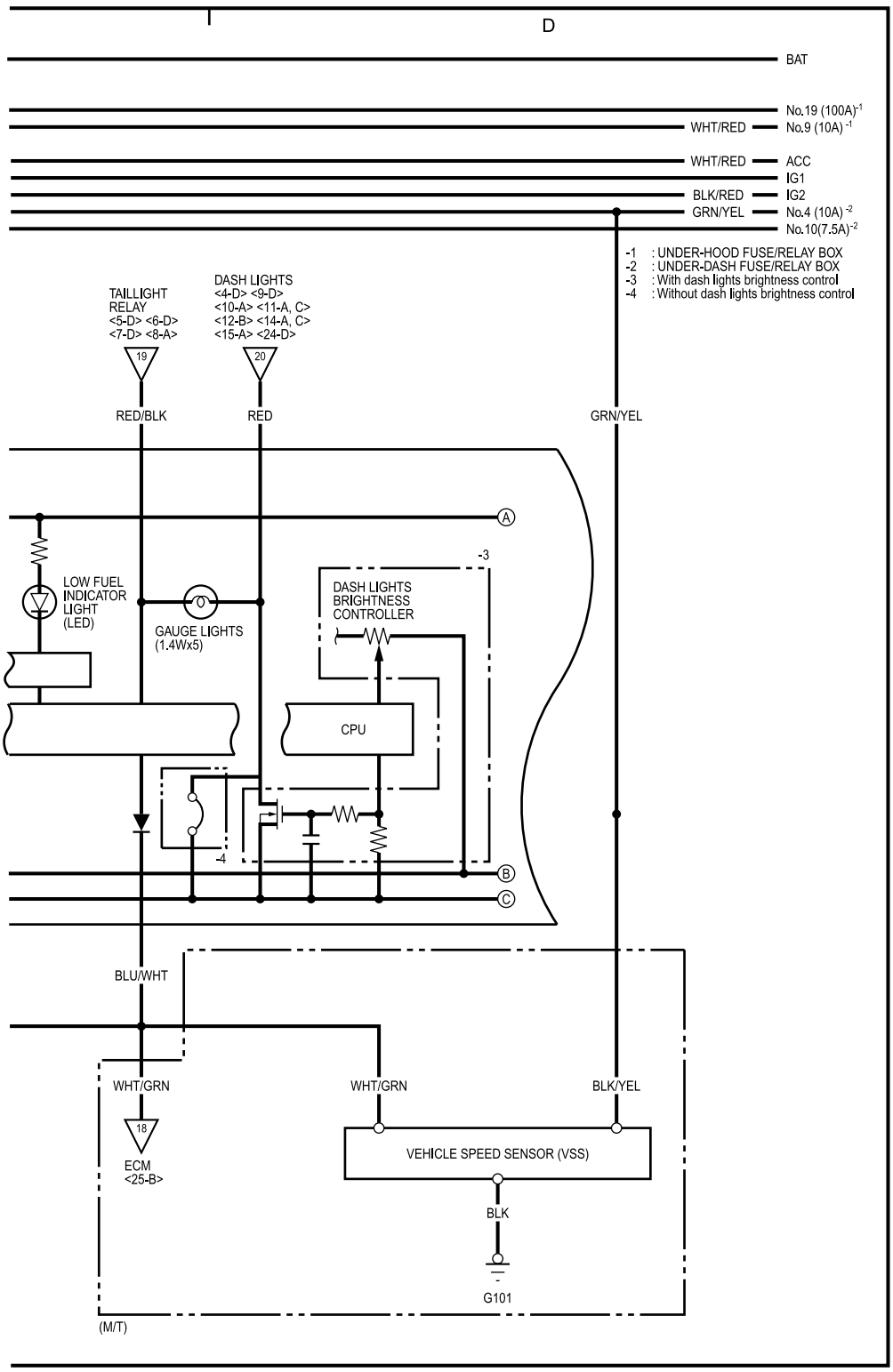
Gauge Assembly (Gauges, Indicator Lights, Dash Lights Brightness Control) (cont'd)



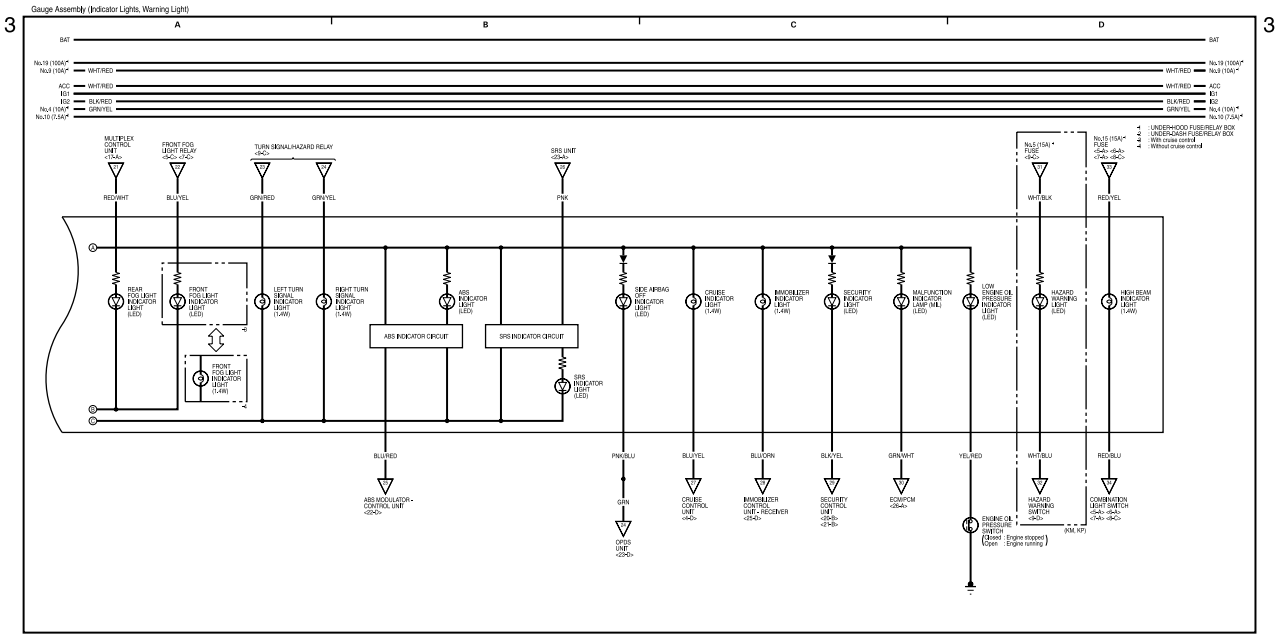
Gauge Assembly (Gauges, Indicator Lights, Dash Lights Brightness Control) (cont'd)



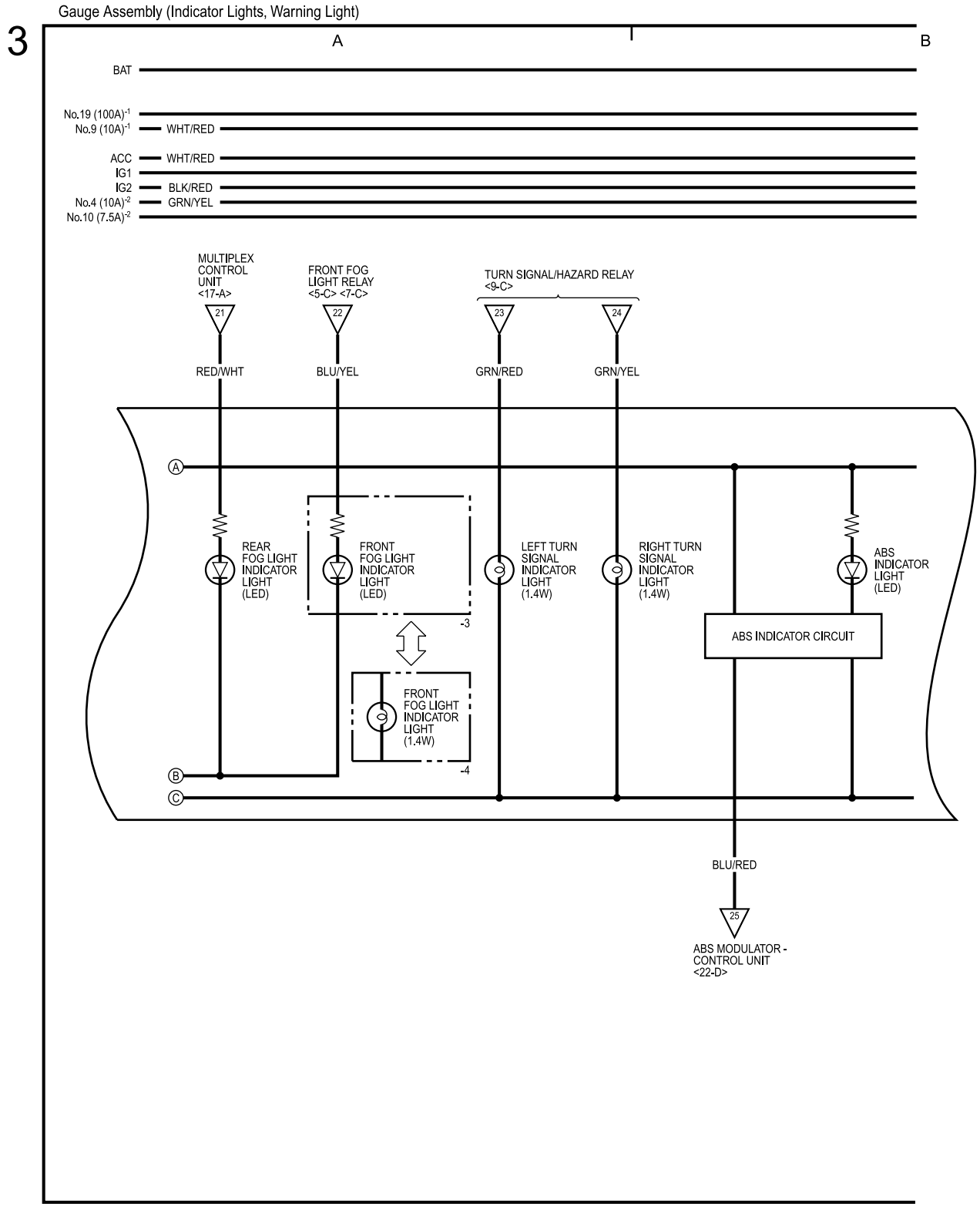
Gauge Assembly (Gauges, Indicator Lights, Dash Lights Brightness Control) (cont'd)



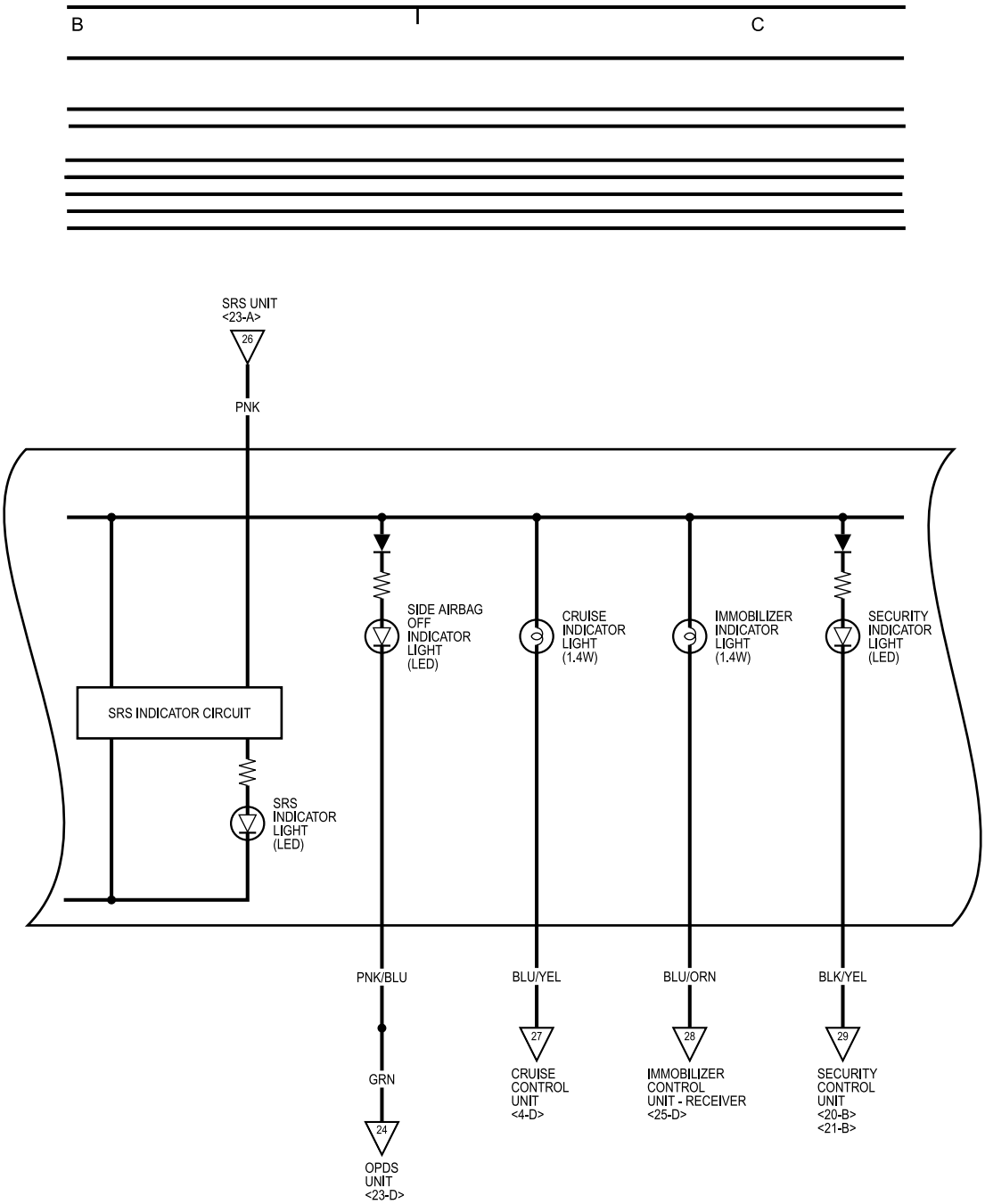
Gauge Assembly (Indicator Lights, Warning Lights)



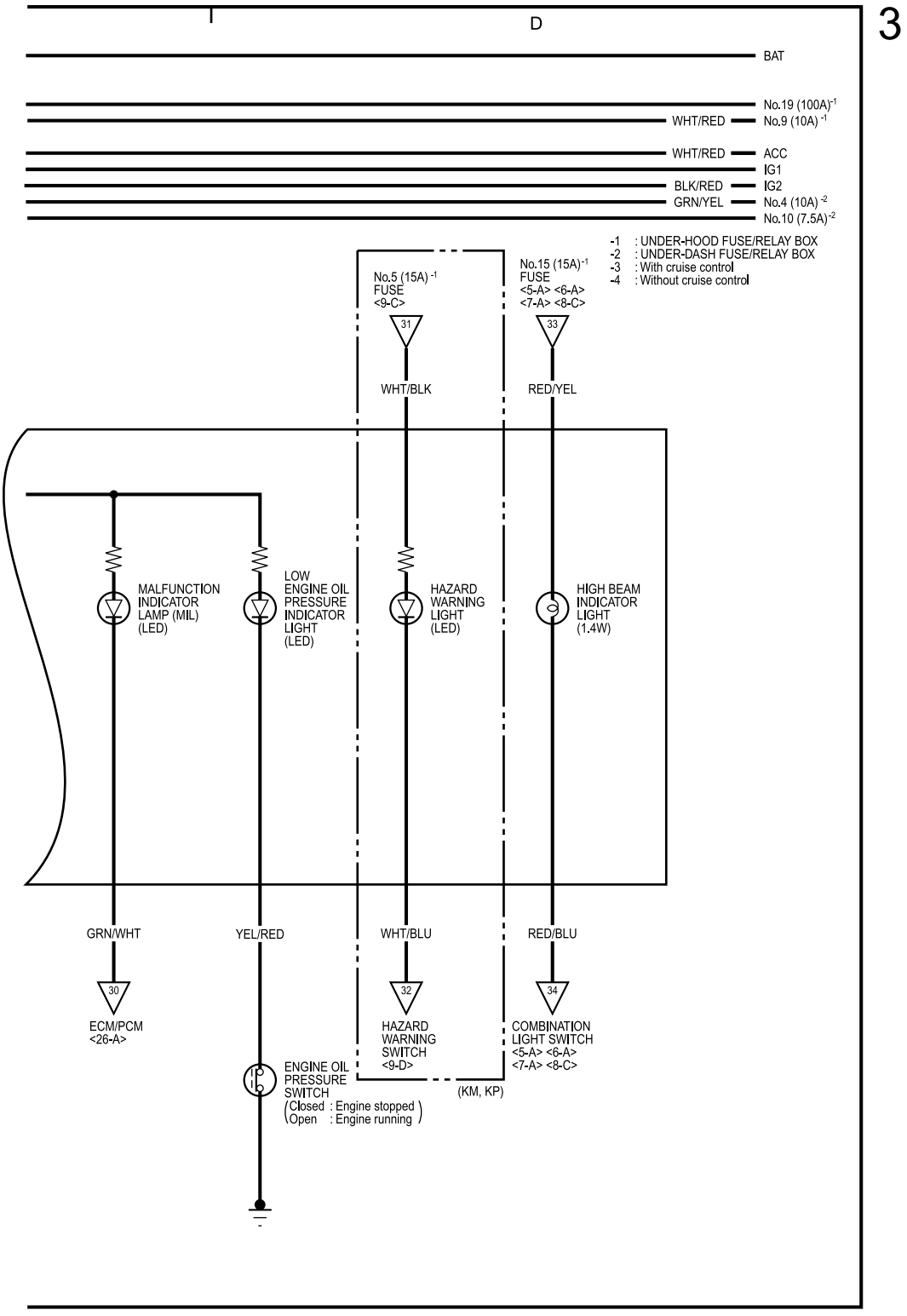
Gauge Assembly (Indicator Lights, Warning Lights) (cont'd)



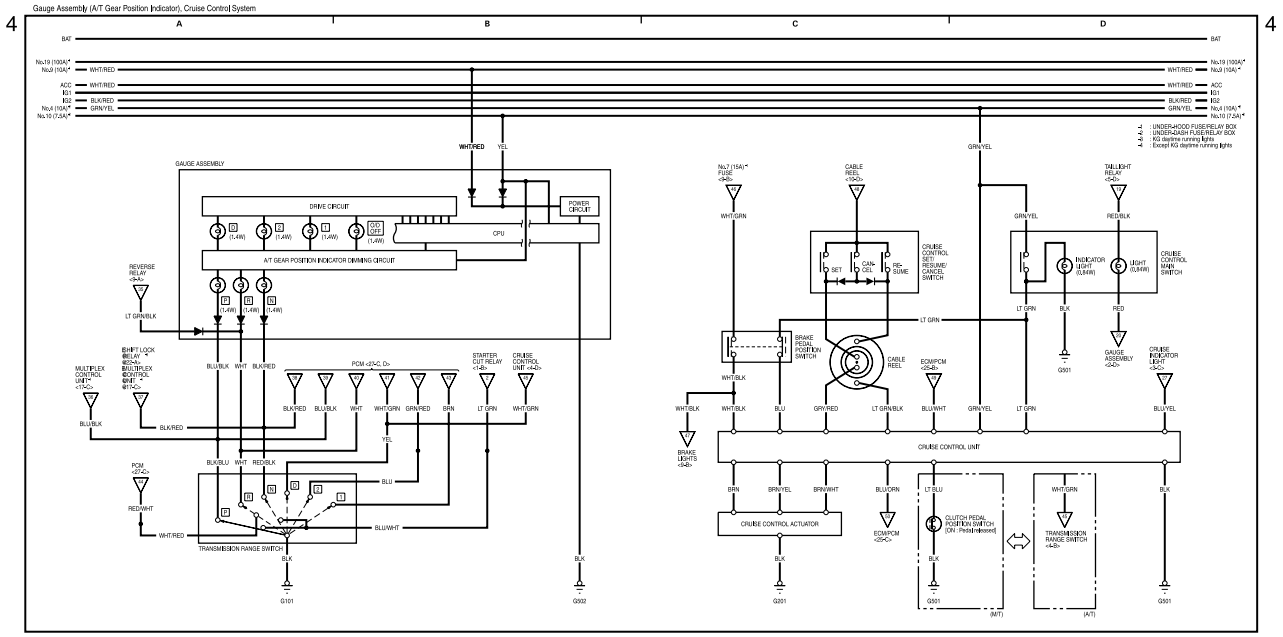
Gauge Assembly (Indicator Lights, Warning Lights) (cont'd)



Gauge Assembly (Indicator Lights, Warning Lights) (cont'd)

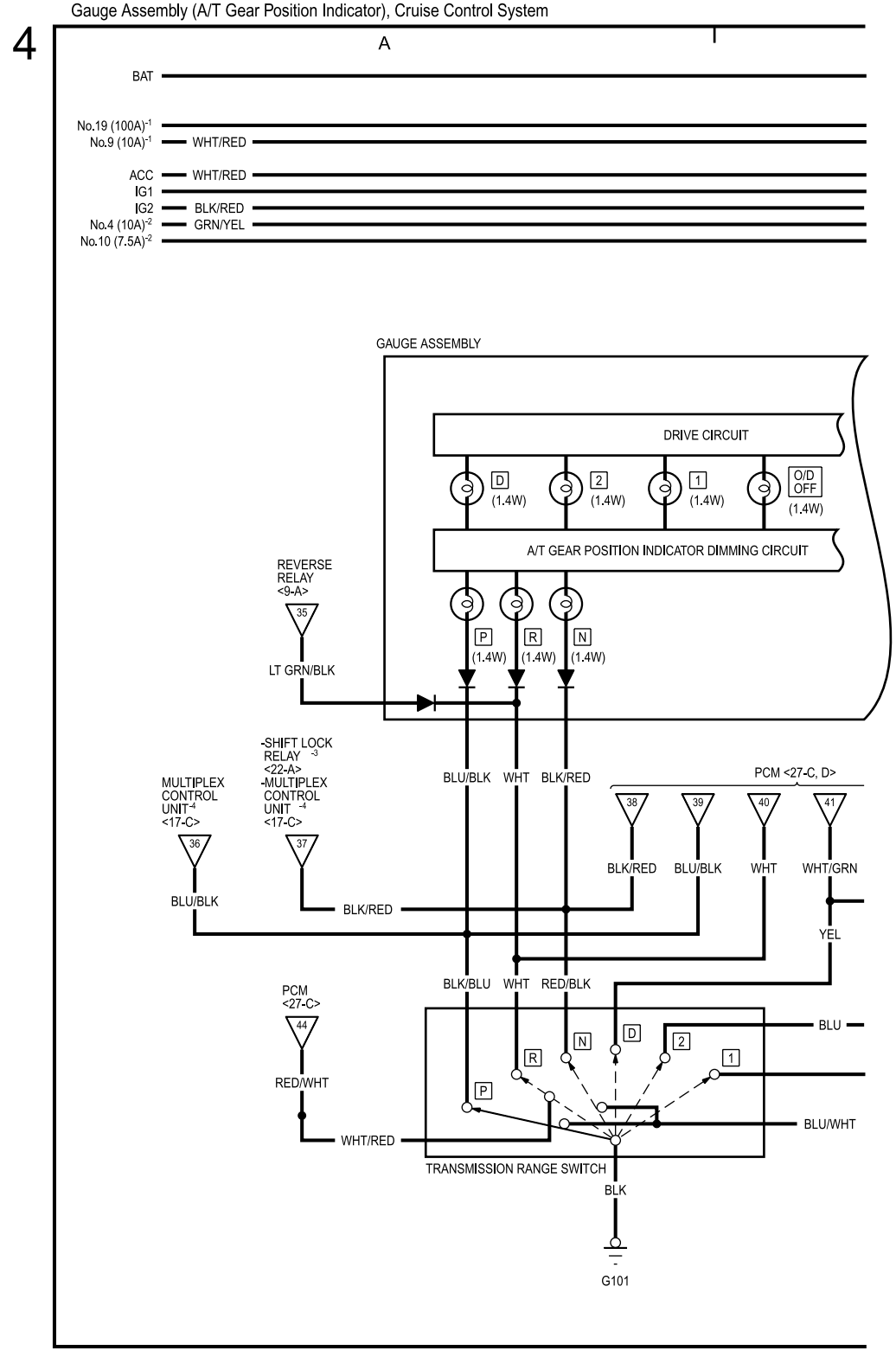


Gauge Assembly (A/T Gear Position Indicator), Cruise Control System

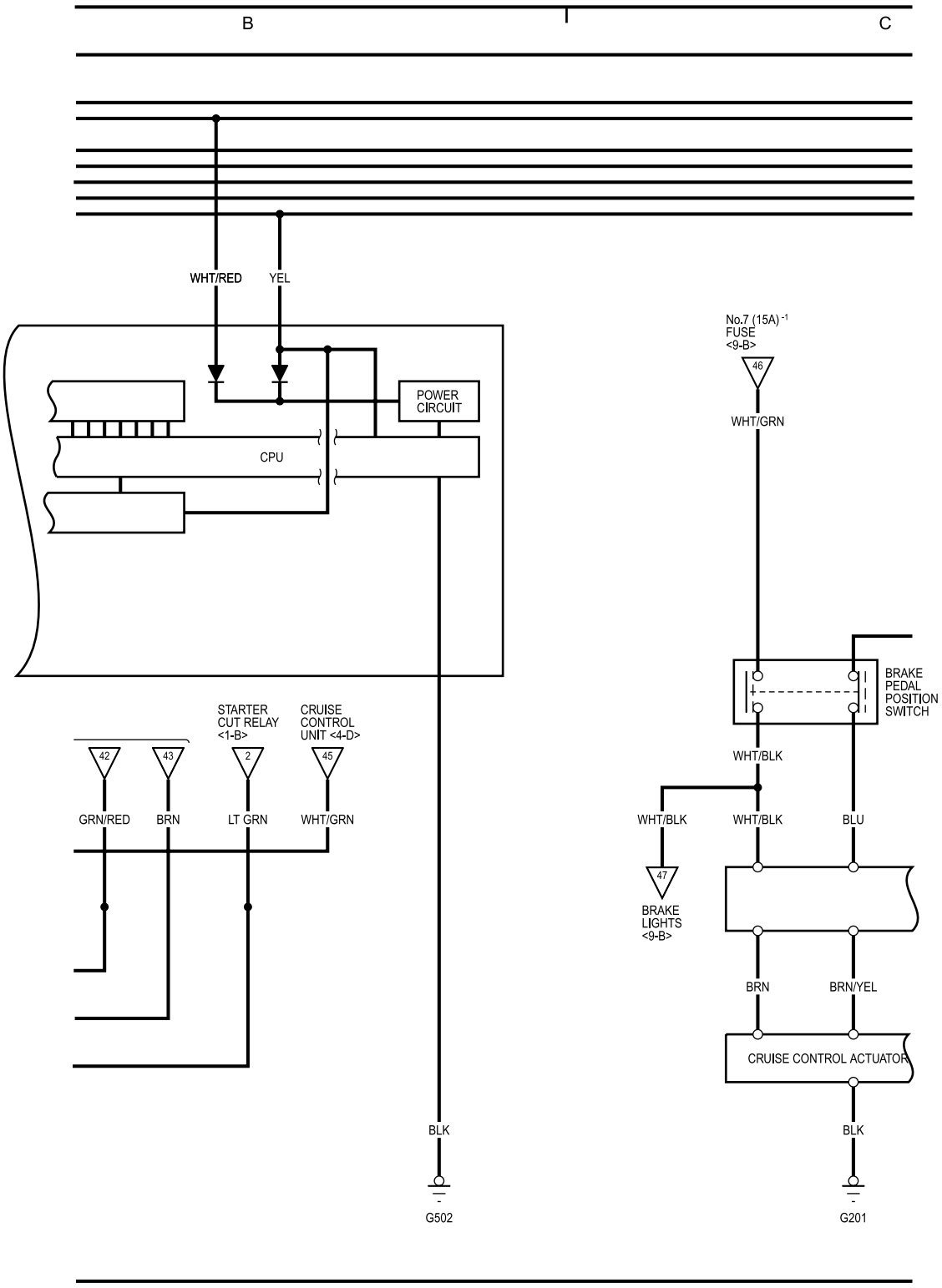


Gauge Assembly (A/T Gear Position Indicator), Cruise Control System (cont'd)

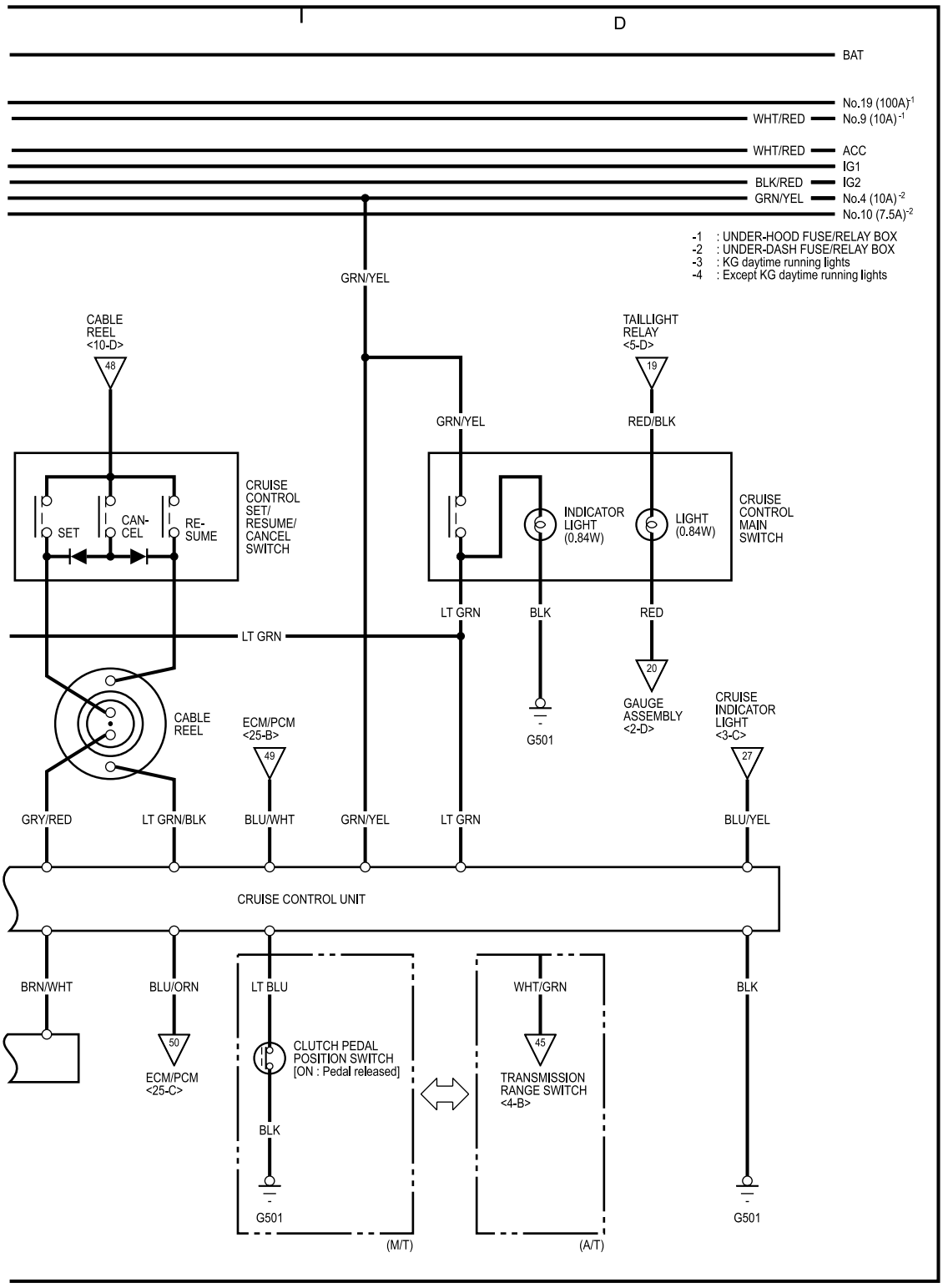
Gauge Assembly (A/T Gear Position Indicator), Cruise Control System



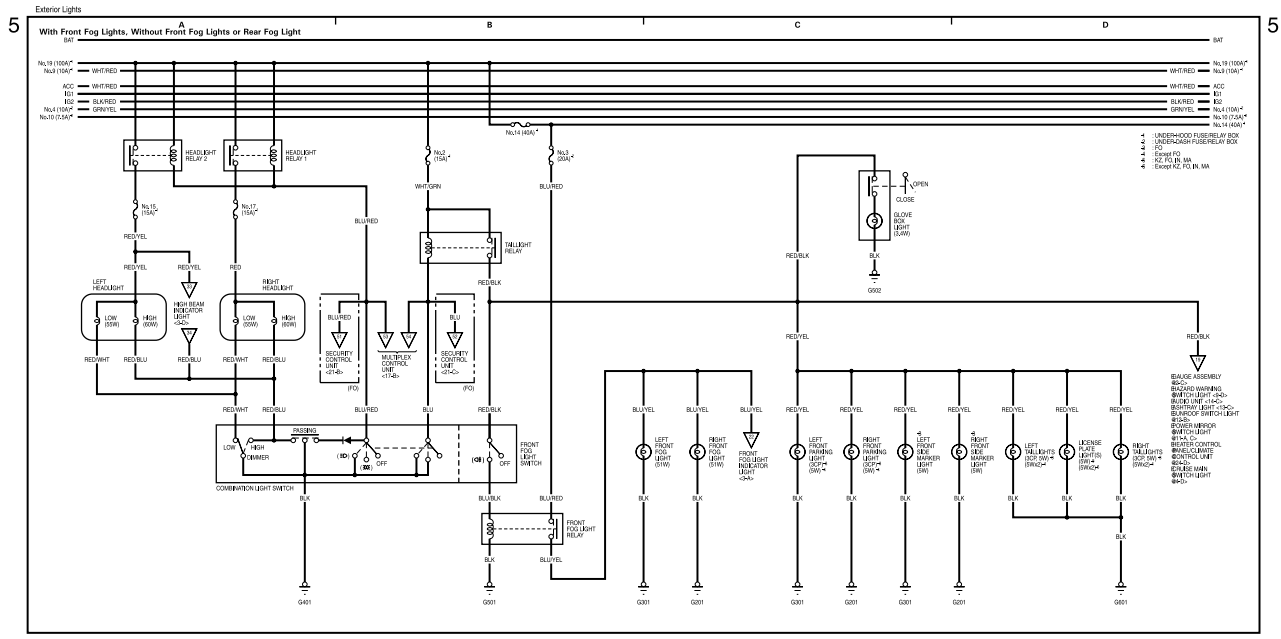
Gauge Assembly (A/T Gear Position Indicator), Cruise Control System (cont'd)



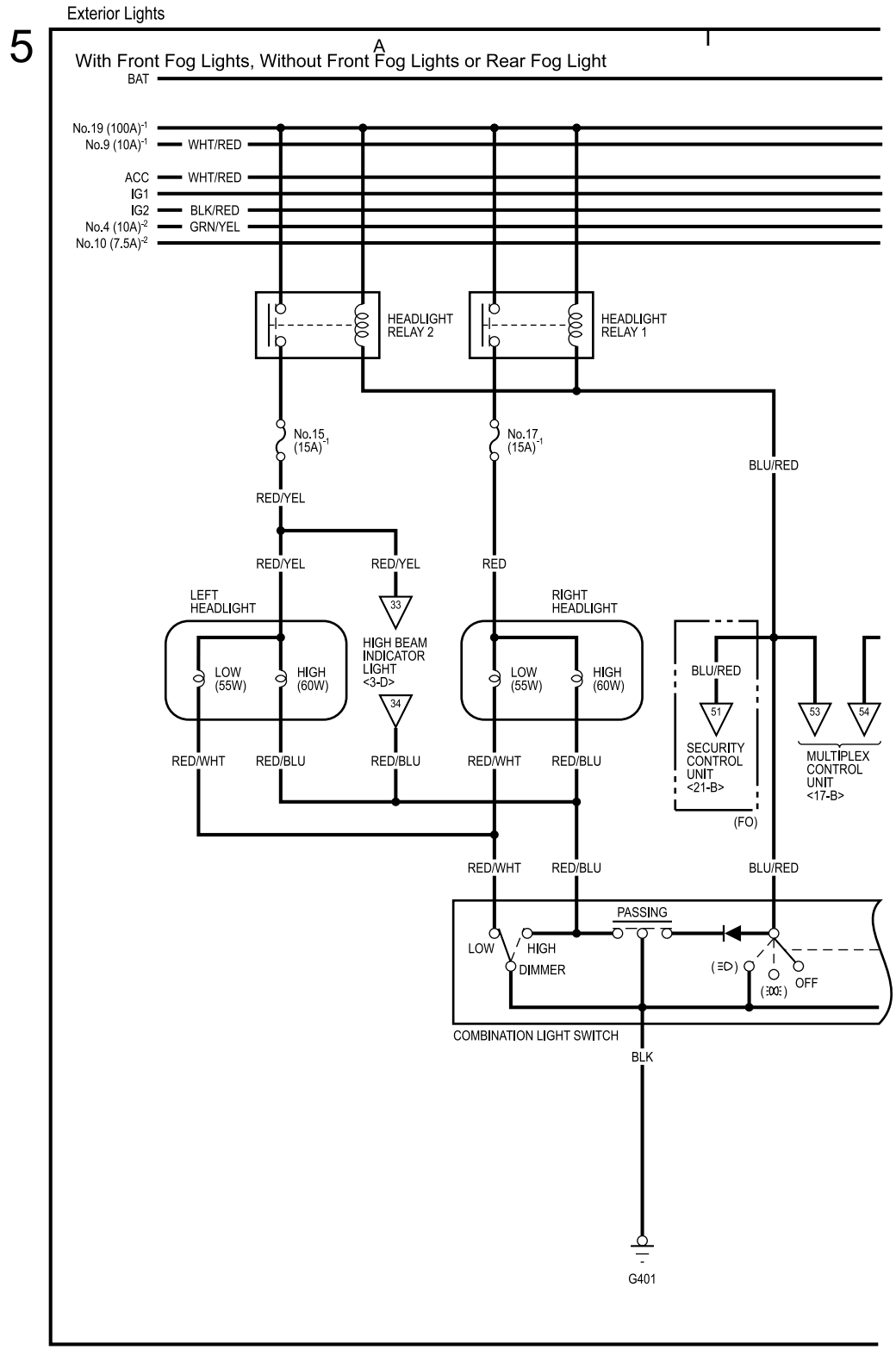
Gauge Assembly (A/T Gear Position Indicator), Cruise Control System (cont'd)



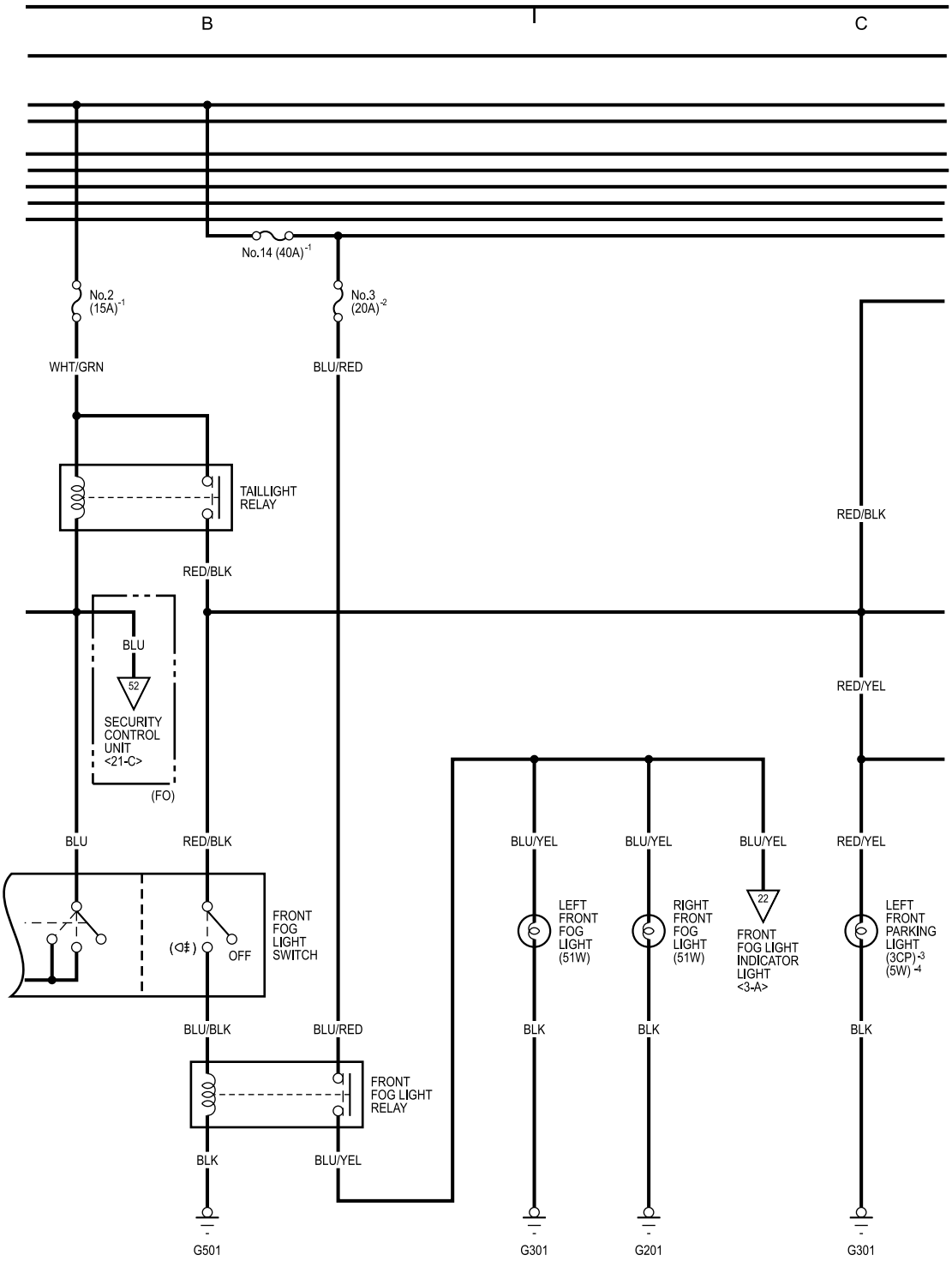
Exterior Lights (With Front Fog Lights, Without Front Fog Lights or Rear Fog Lights



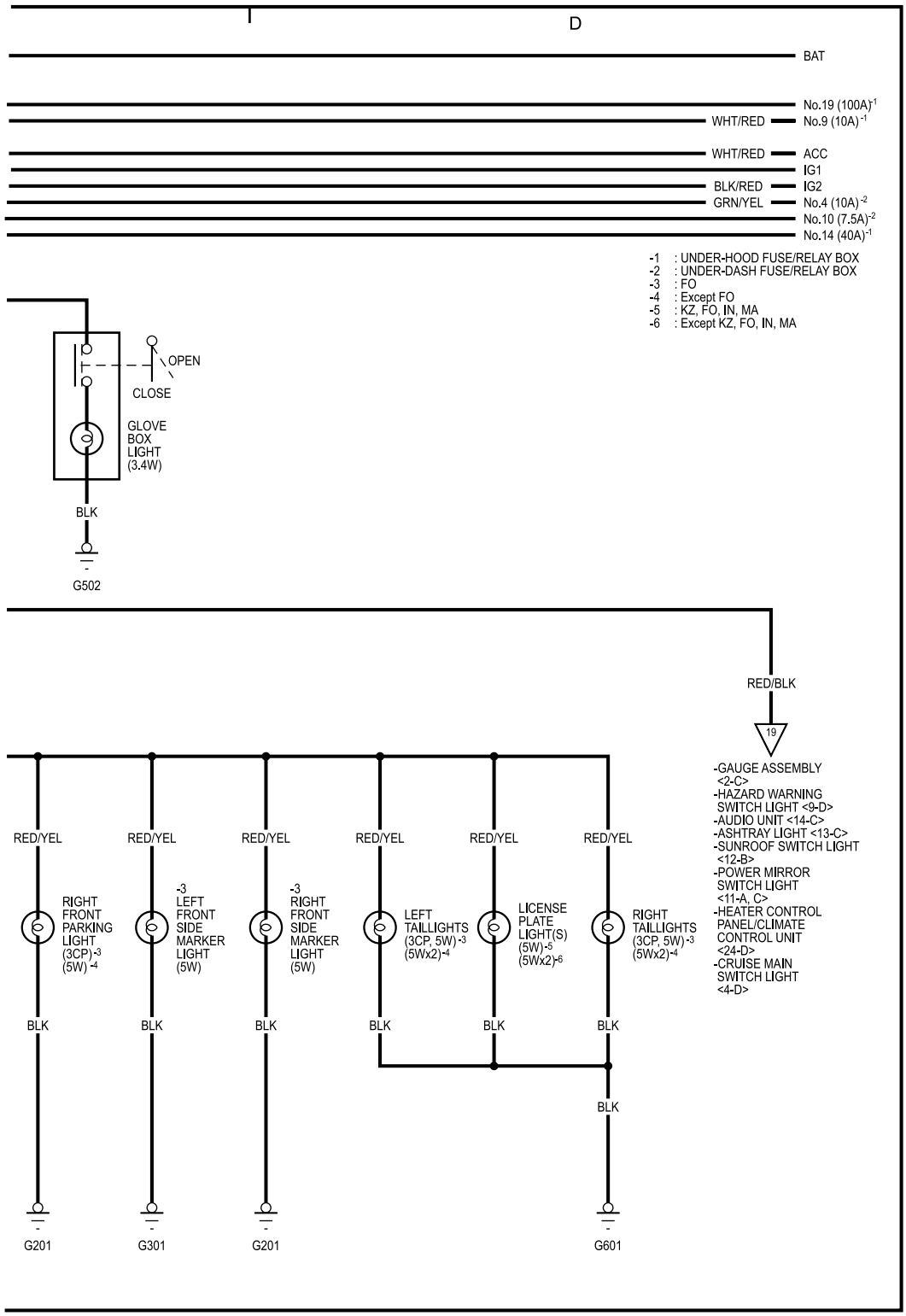
Exterior Lights (With Front Fog Lights, Without Front Fog Lights or Rear Fog Light) (cont'd)



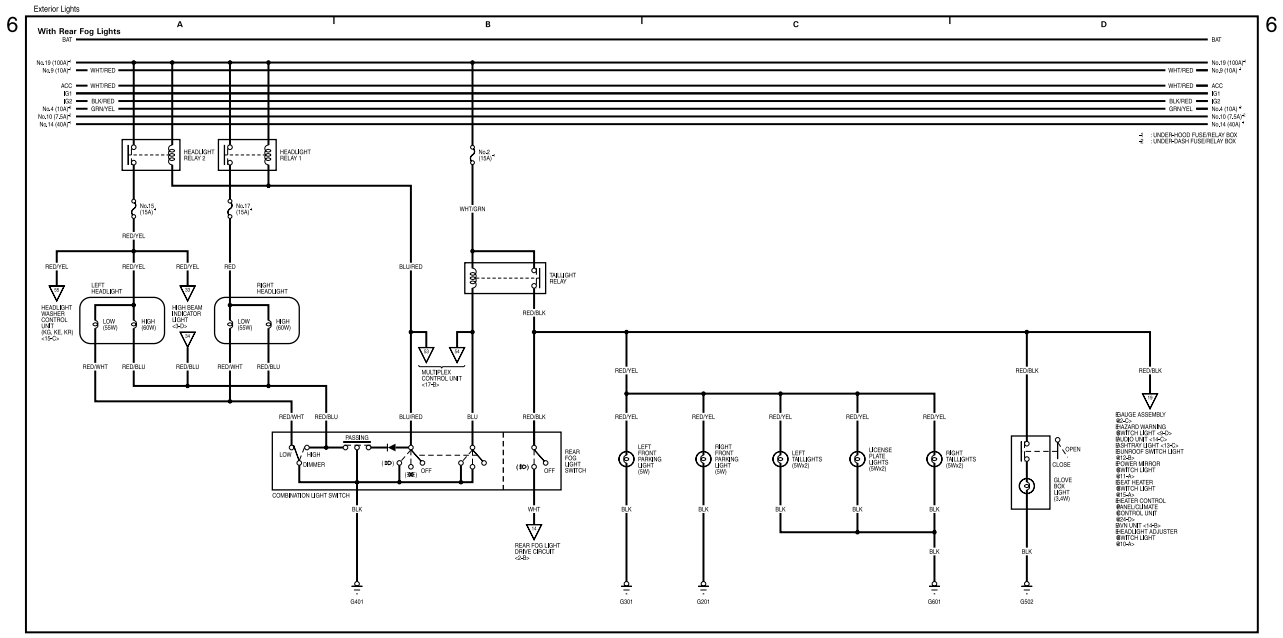
Exterior Lights (With Front Fog Lights, Without Front Fog Lights or Rear Fog Light) (cont'd)



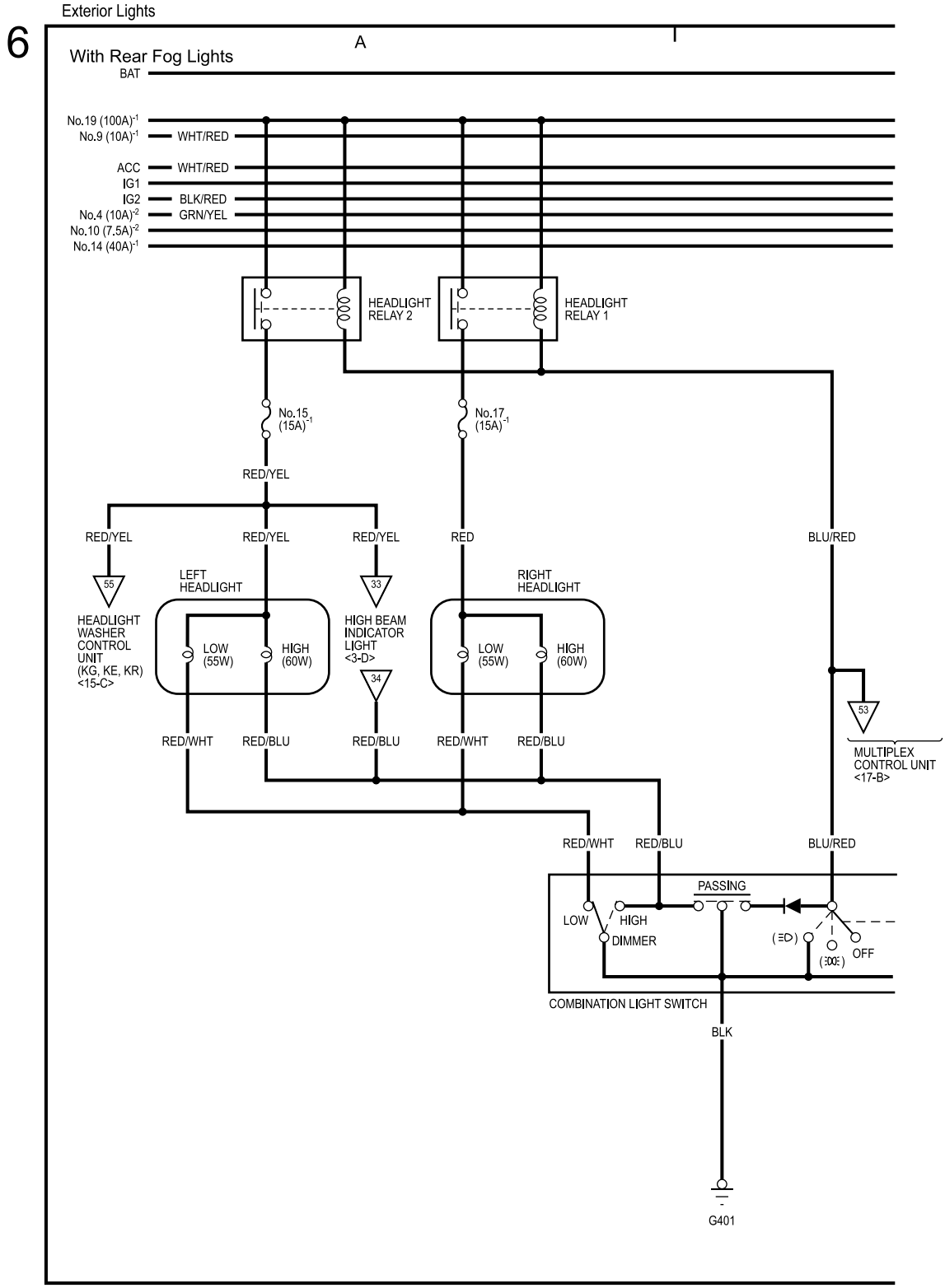
Exterior Lights (With Front Fog Lights, Without Front Fog Lights or Rear Fog Light) (cont'd)



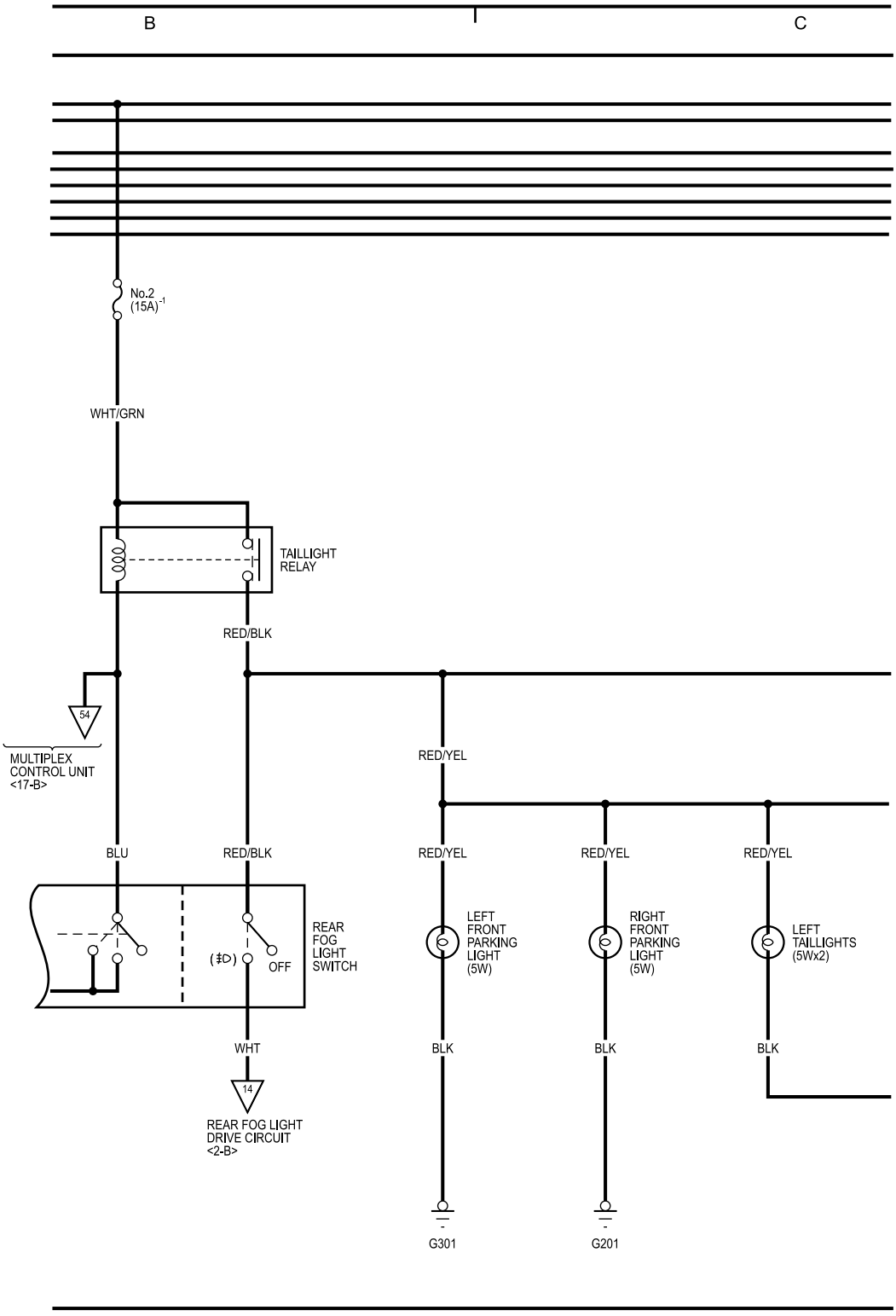
Exterior Lights (With Rear Fog Lights)



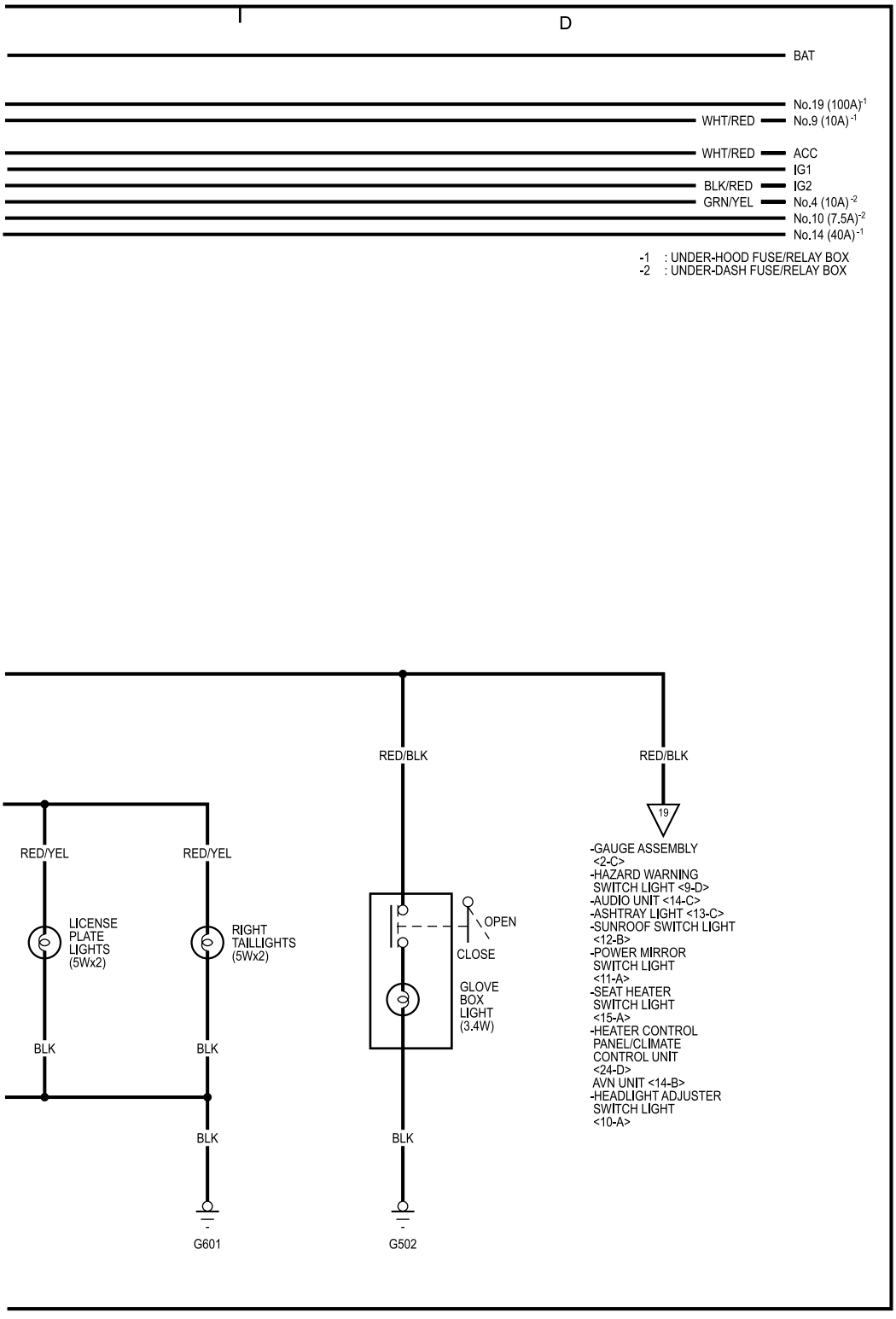
Exterior Lights (With Rear Fog Lights) (cont'd)



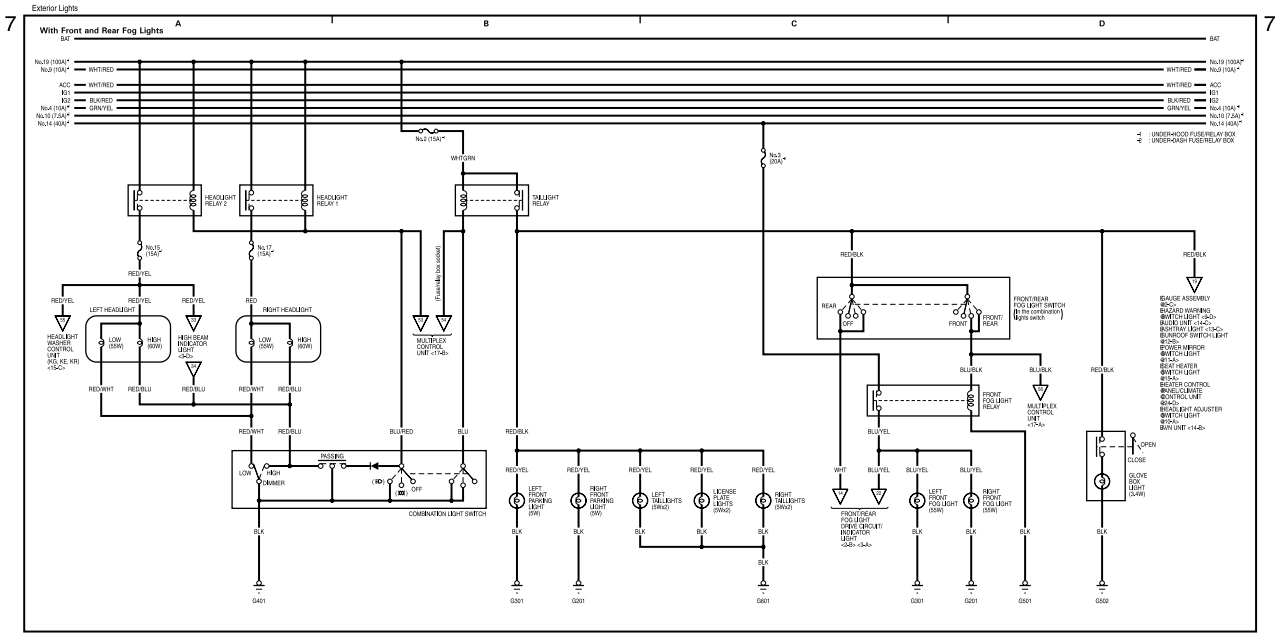
Exterior Lights (With Rear Fog Lights) (cont'd)



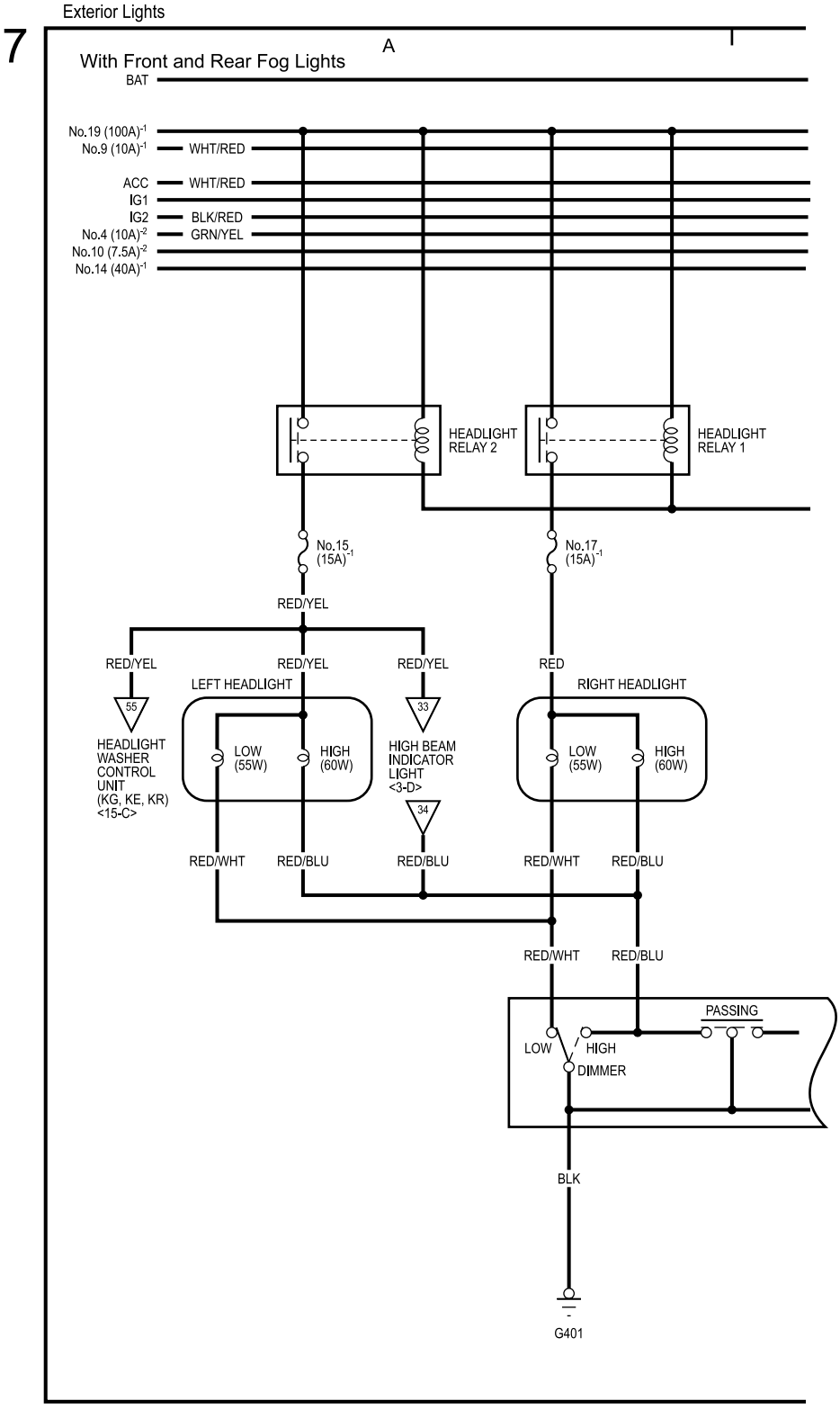
Exterior Lights (With Rear Fog Lights) (cont'd)



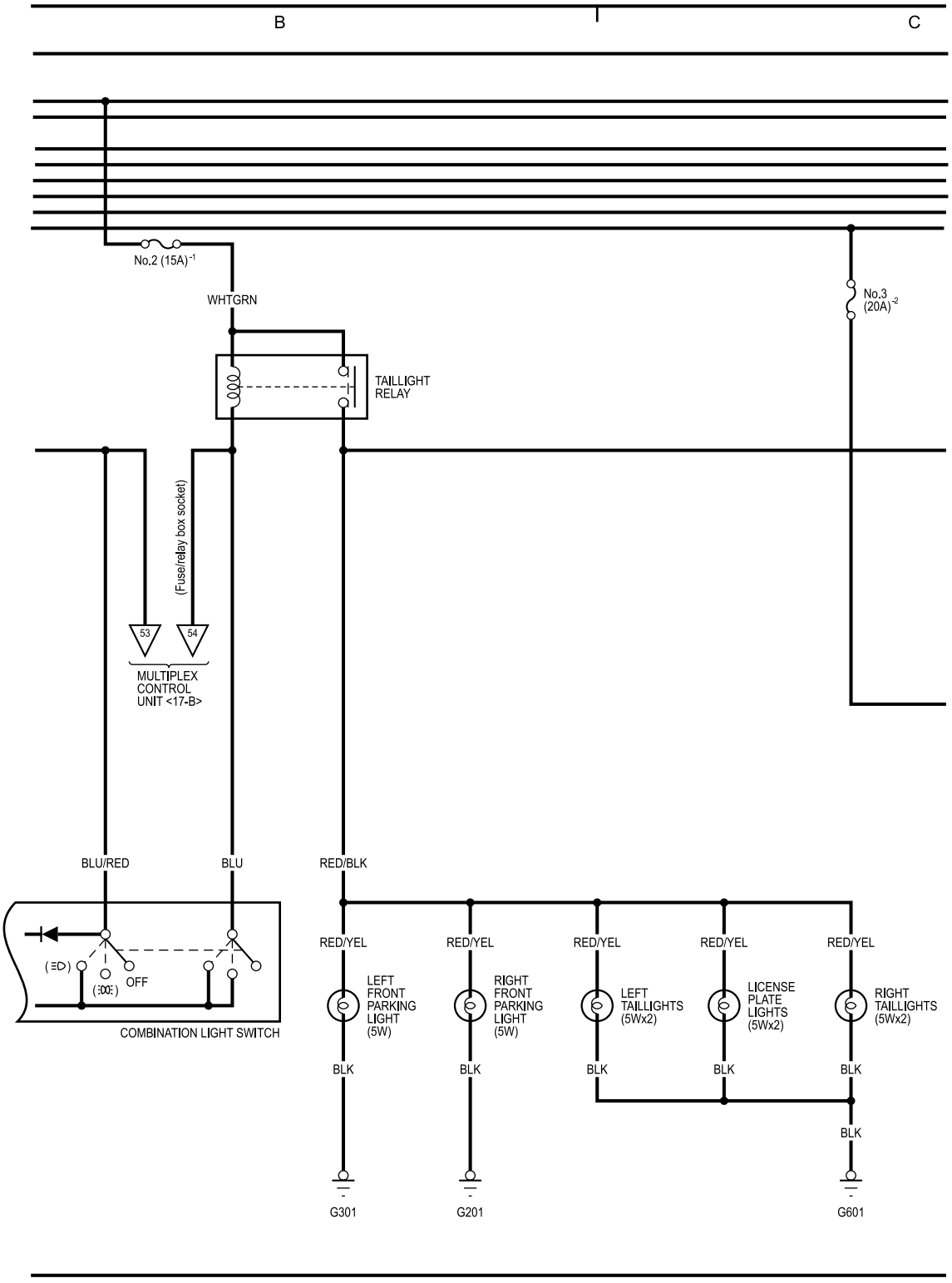
Exterior Lights (With Front and Rear Fog Lights)



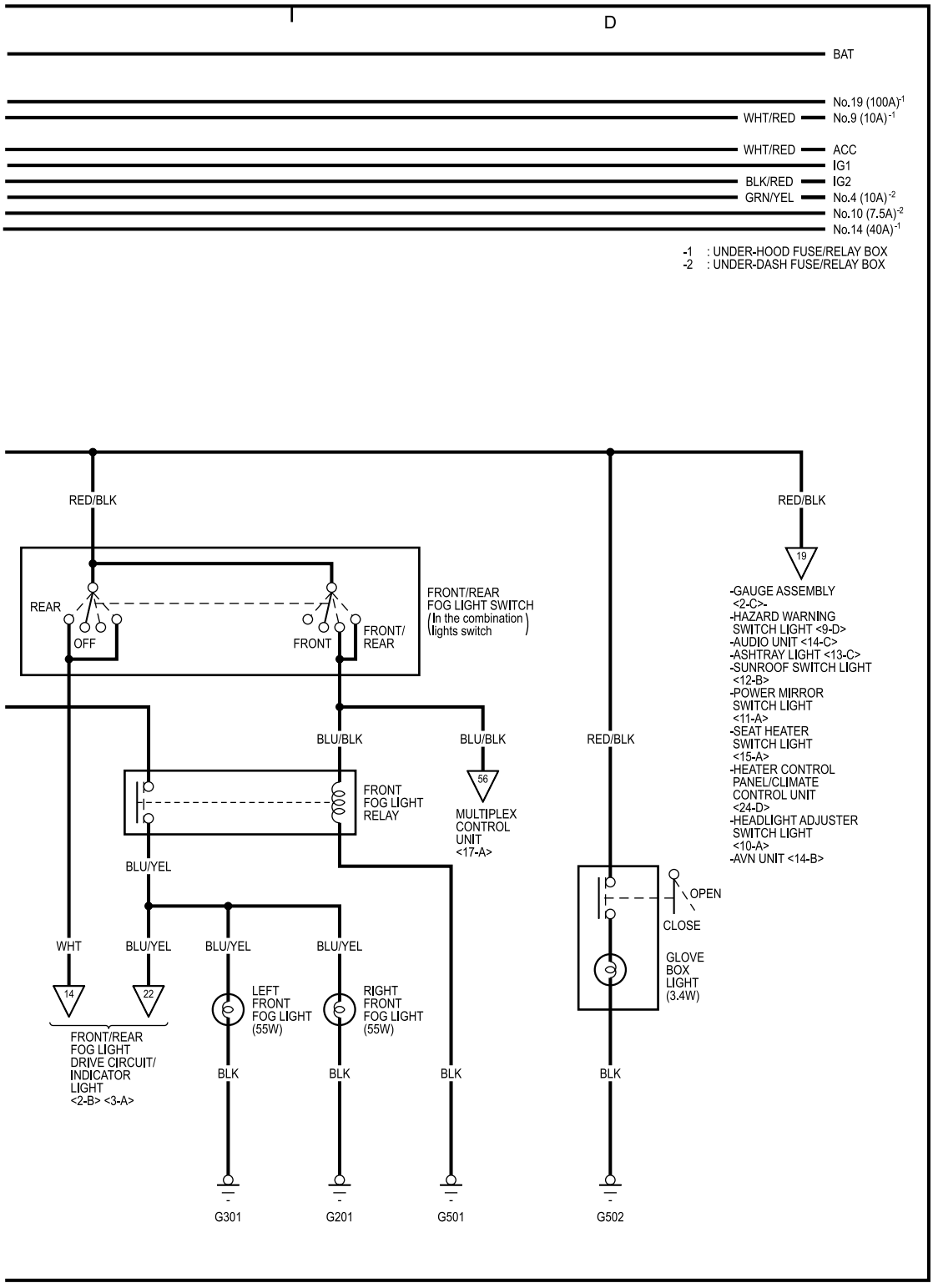
Exterior Lights (With Front and Rear Fog Lights) (cont'd)



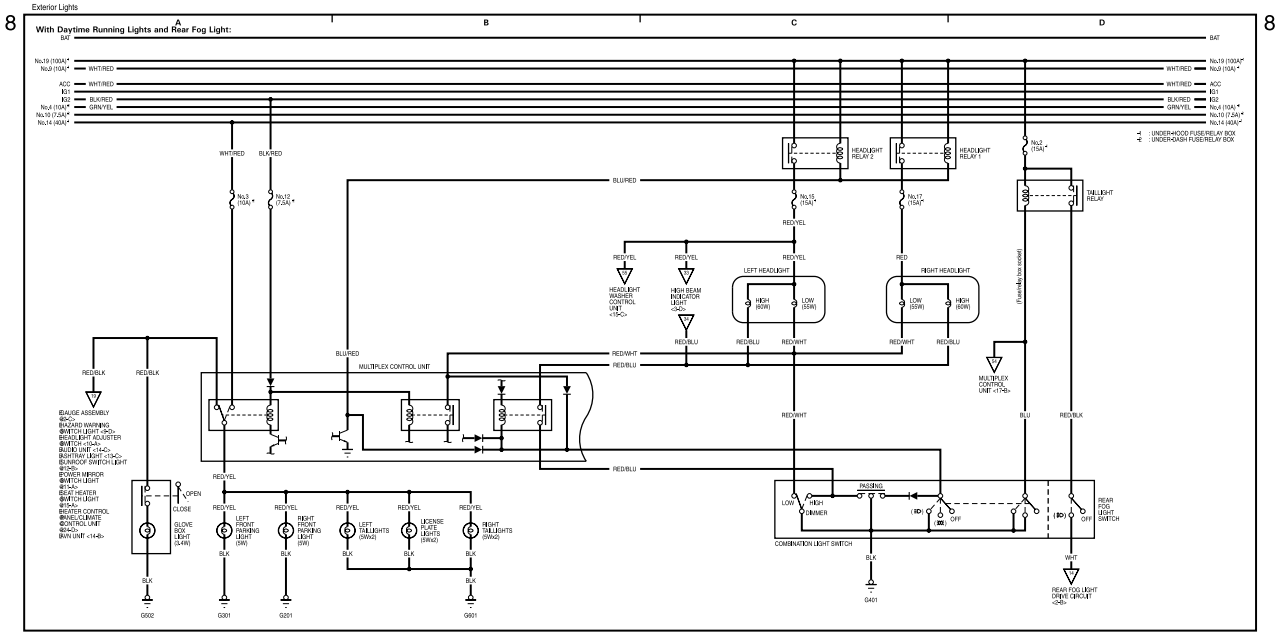
Exterior Lights (With Front and Rear Fog Lights) (cont'd)



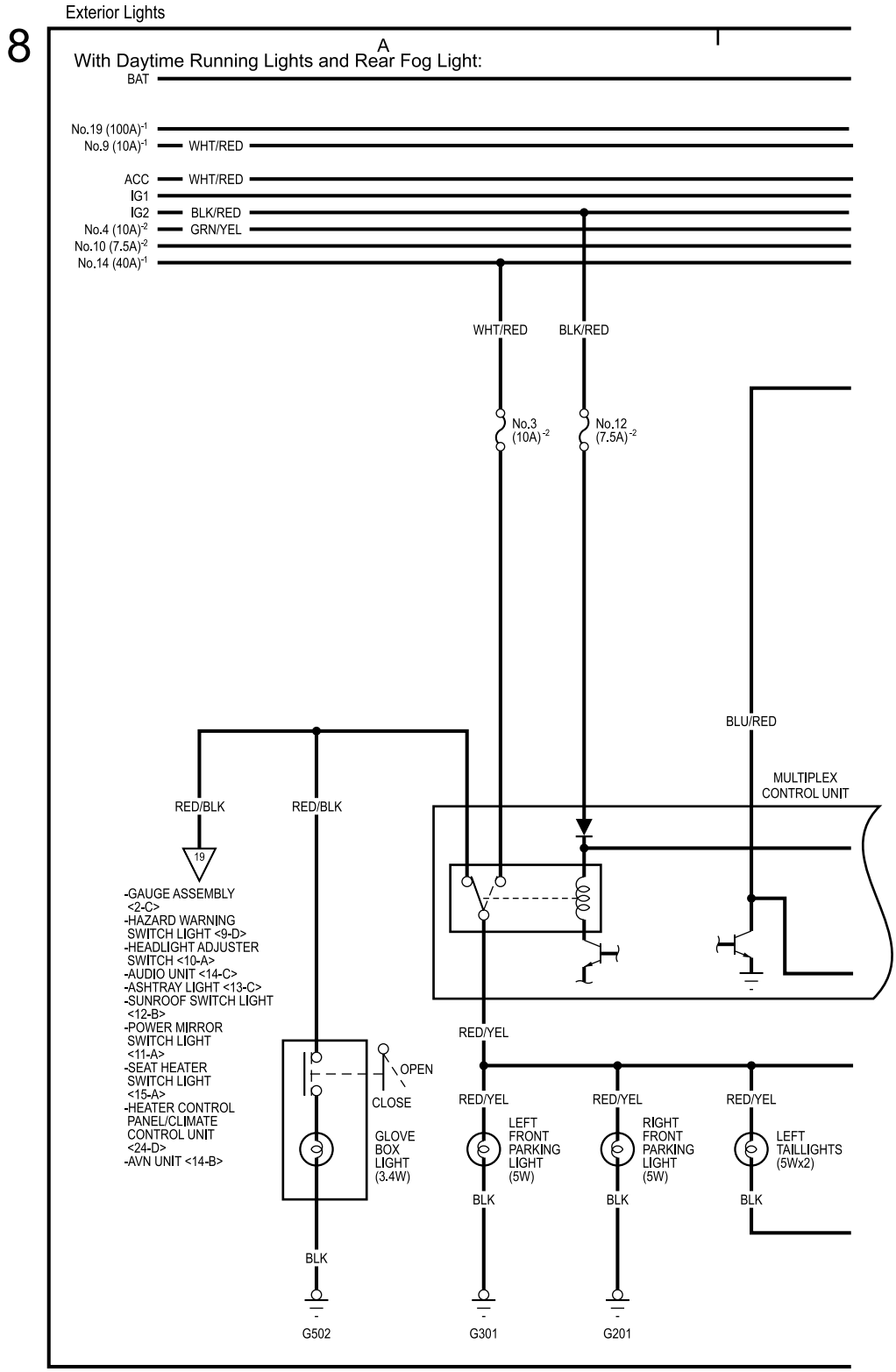
Exterior Lights (With Front and Rear Fog Lights) (cont'd)



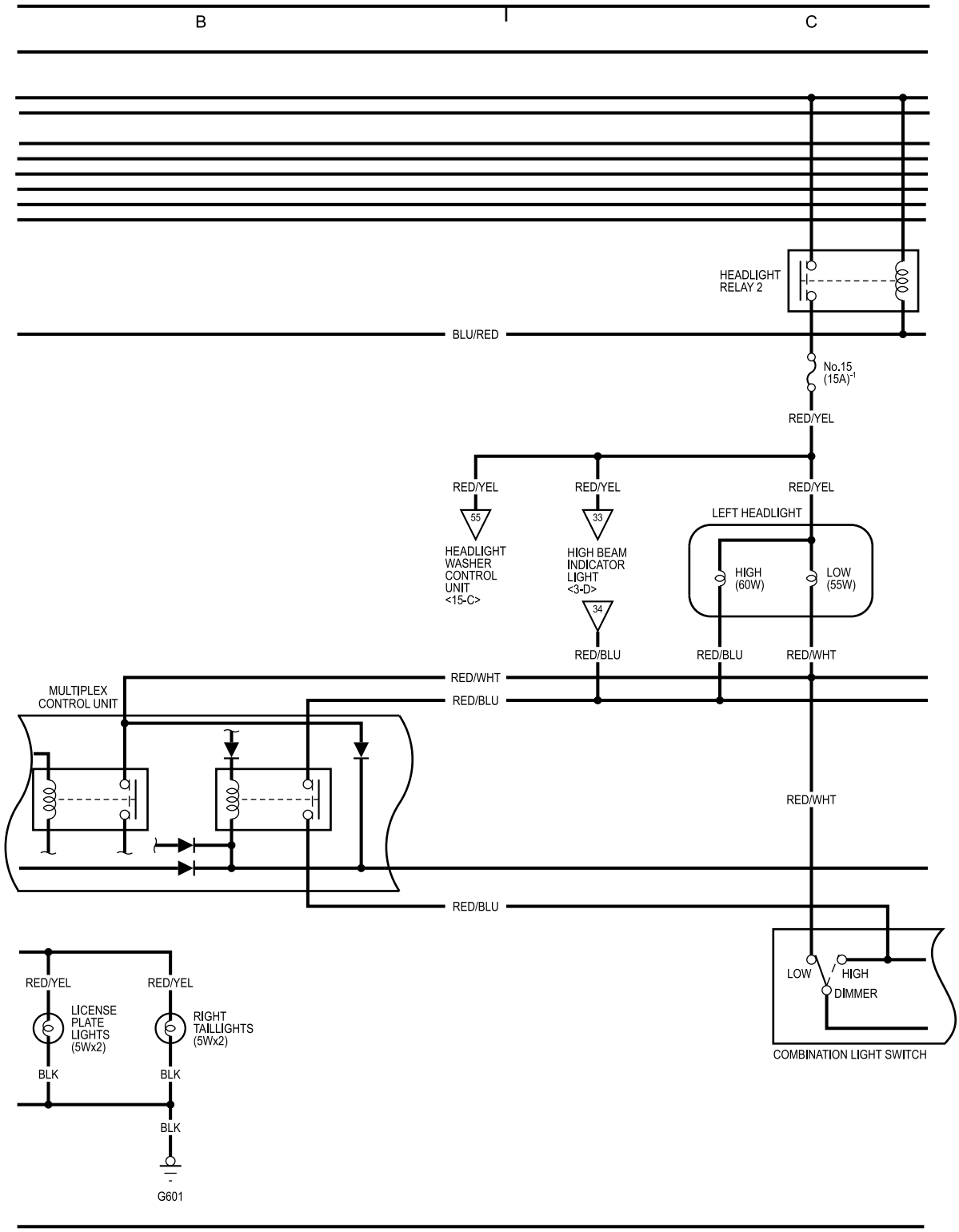
Exterior Lights (With Daytime Running Lights and Rear Fog Light)



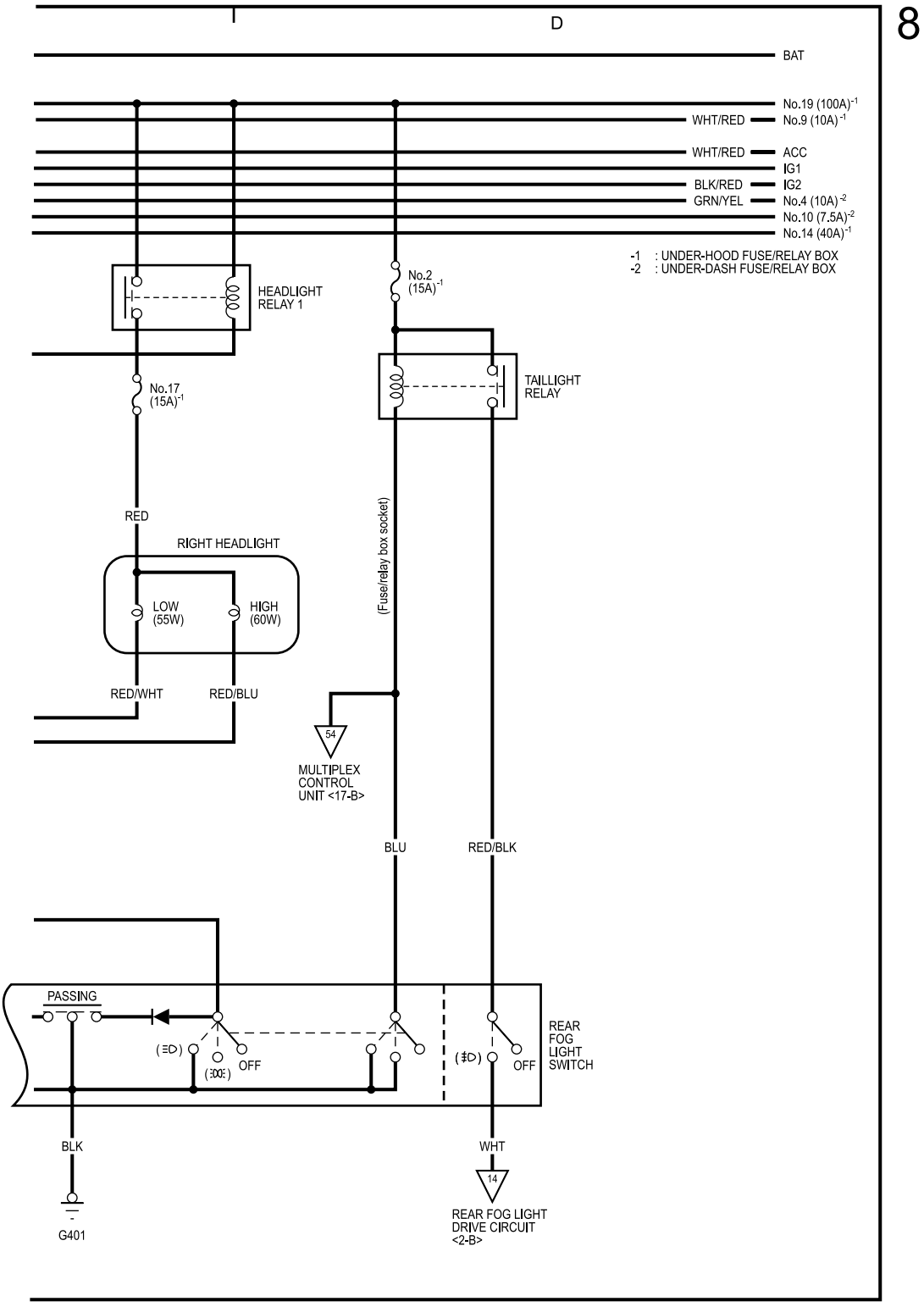
Exterior Lights (With Daytime Running Lights and Rear Fog Light) (cont'd)



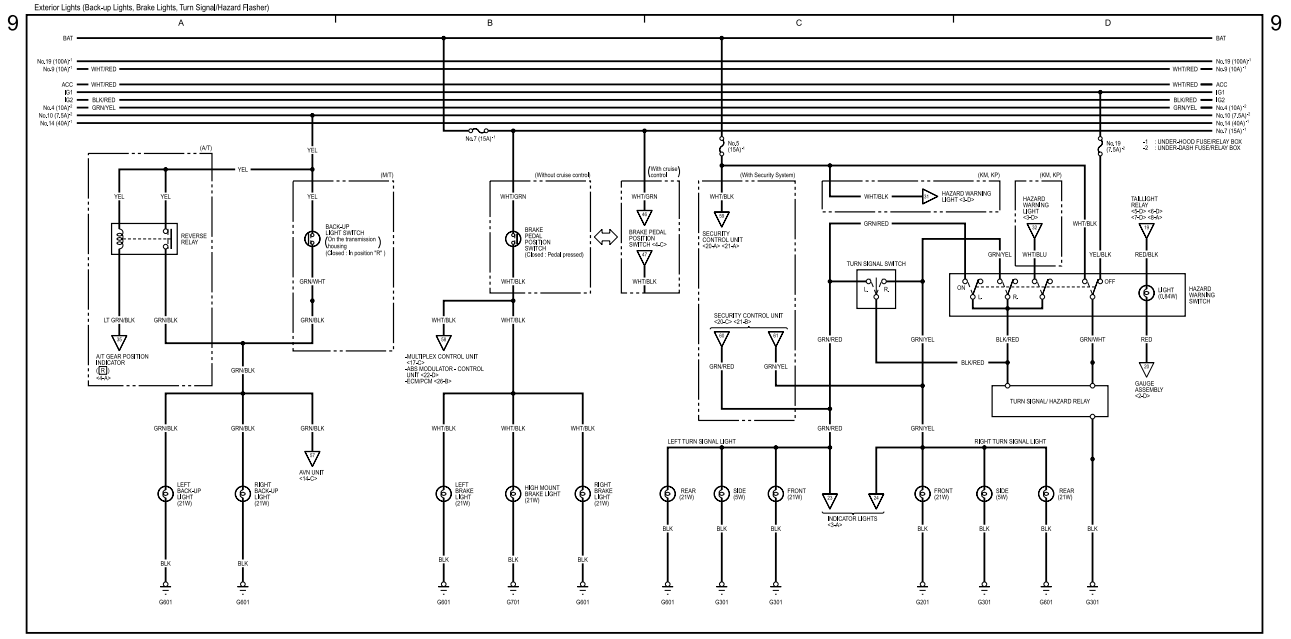
Exterior Lights (With Daytime Running Lights and Rear Fog Light) (cont'd)



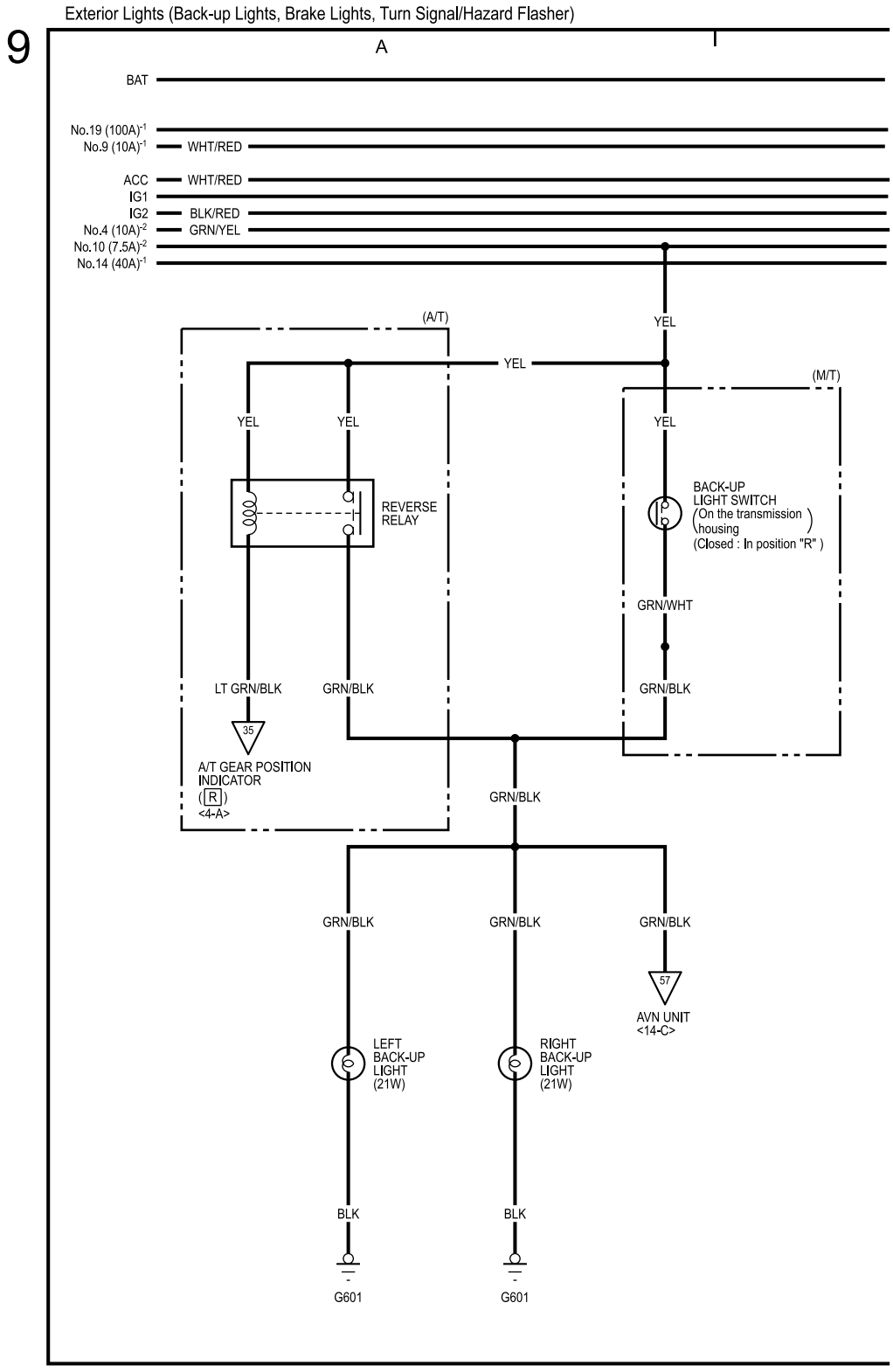
Exterior Lights (With Daytime Running Lights and Rear Fog Light) (cont'd)



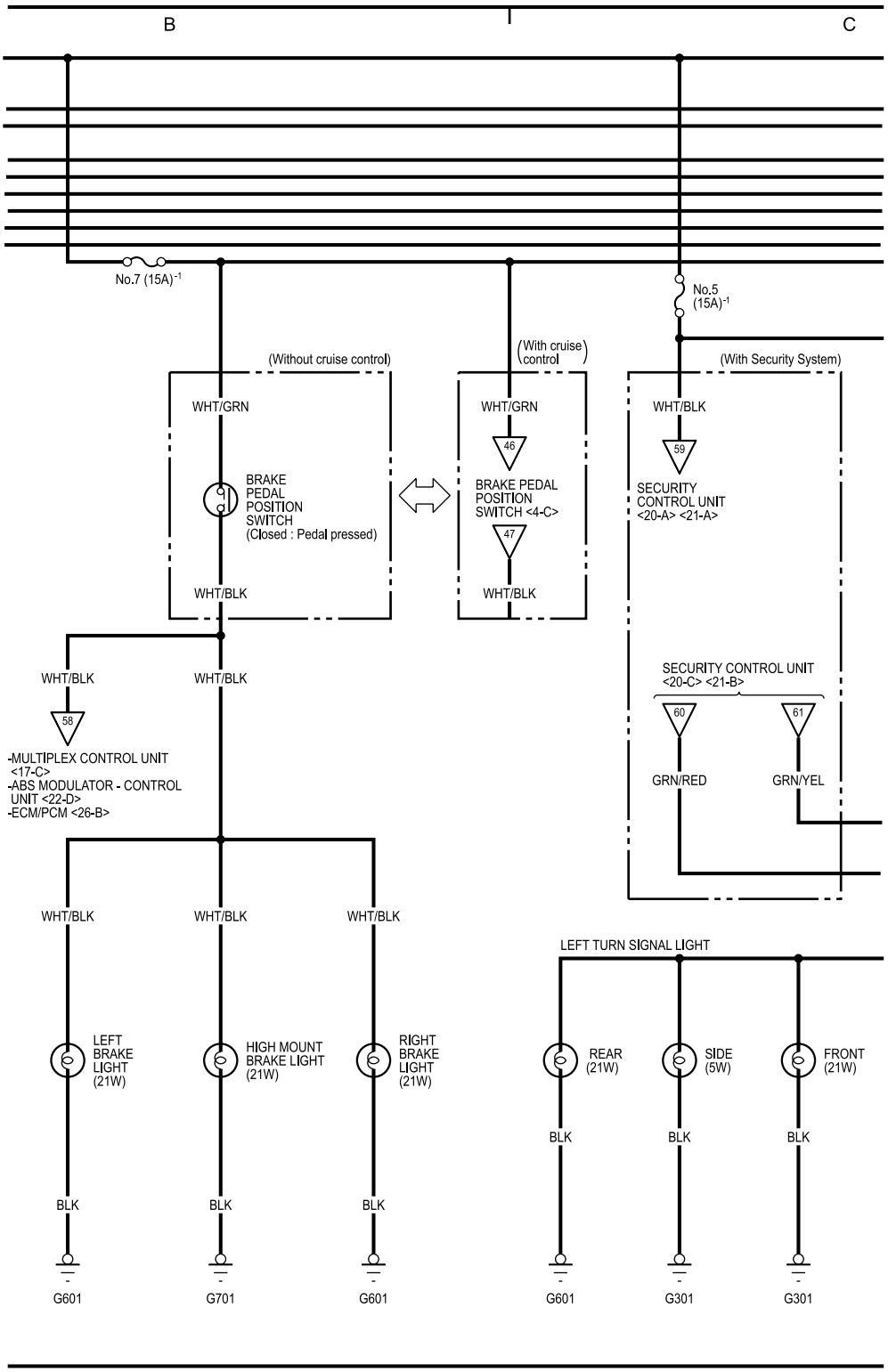
Exterior Lights (Back-up Lights, Brake Lights, Turn Signal/Hazard Flasher)



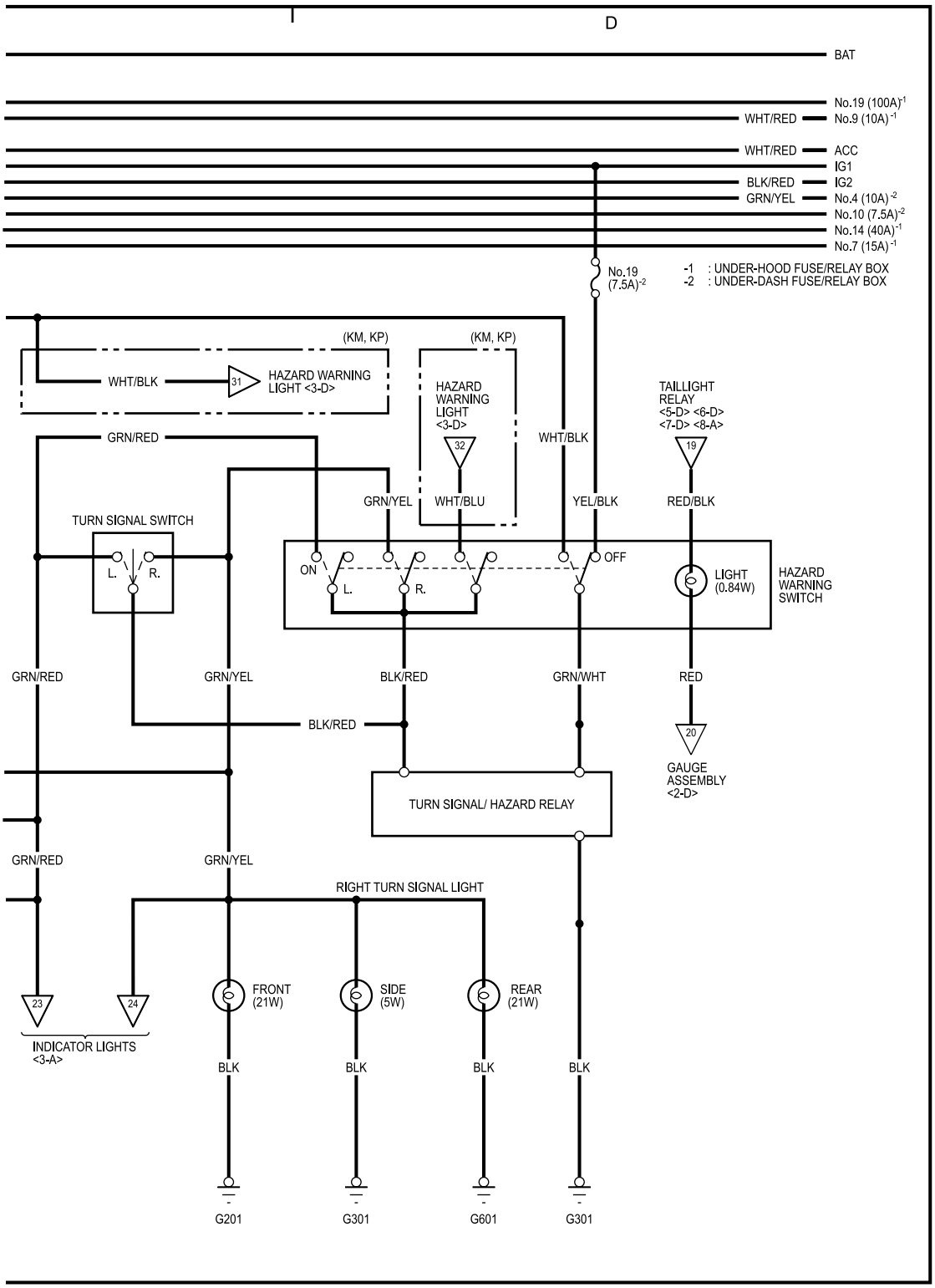
Exterior Lights (Back-up Lights, Brake Lights, Turn Signal/Hazard Flasher) (cont'd)



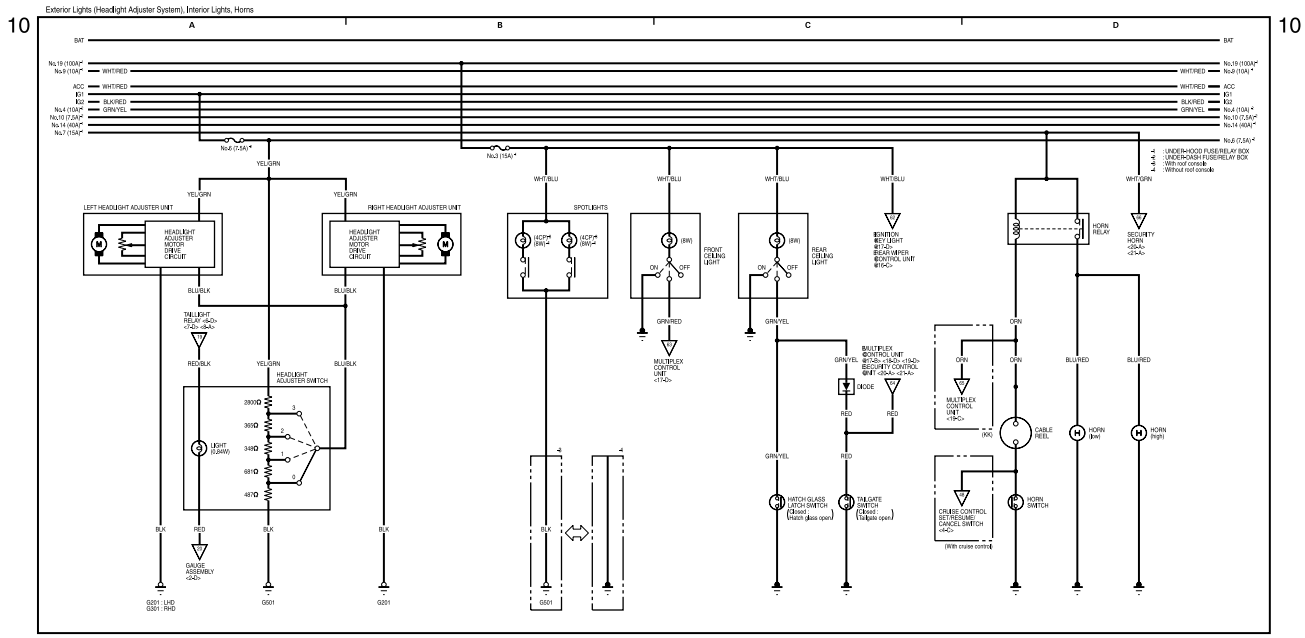
Exterior Lights (Back-up Lights, Brake Lights, Turn Signal/Hazard Flasher) (cont'd)



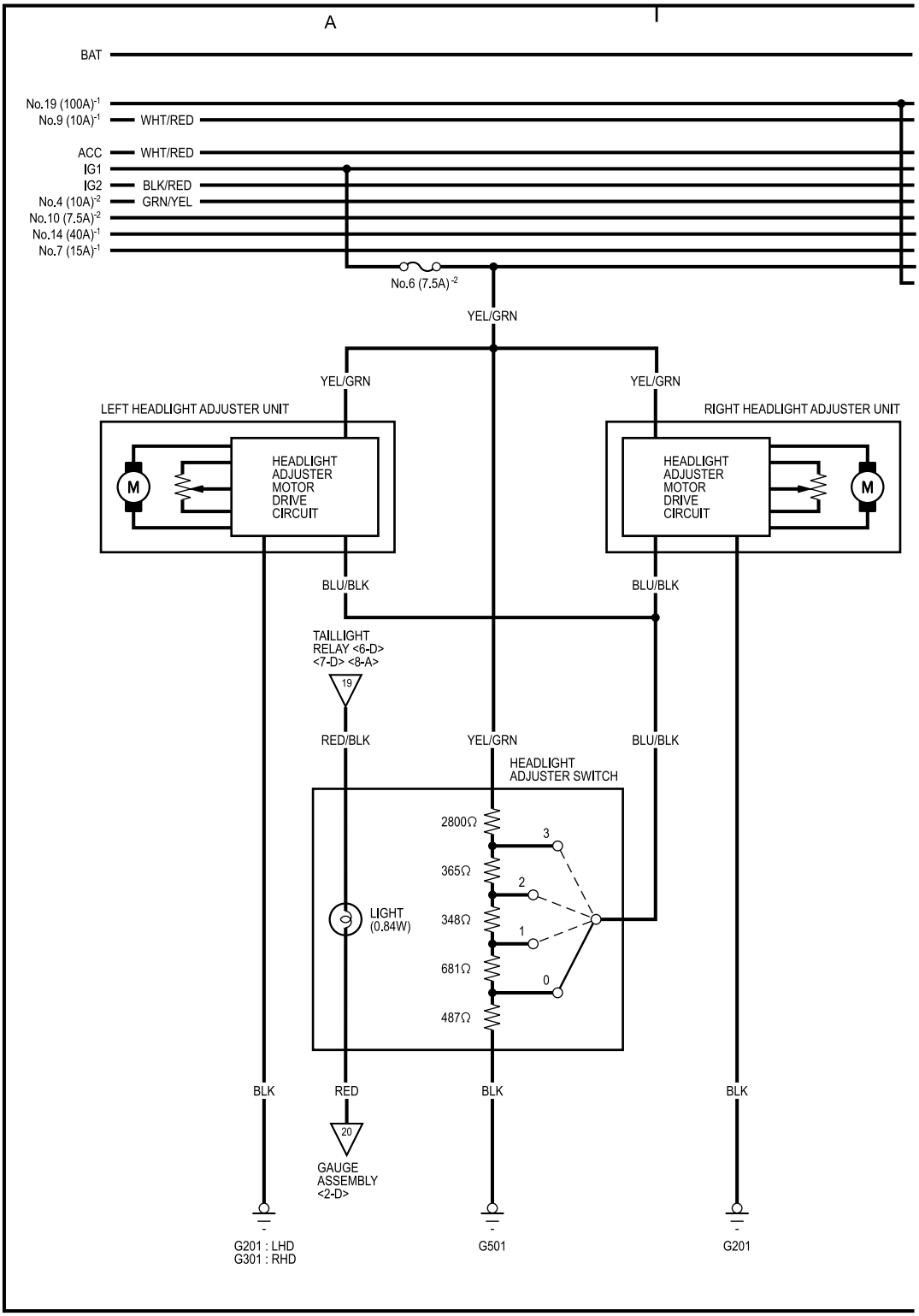
Exterior Lights (Back-up Lights, Brake Lights, Turn Signal/Hazard Flasher) (cont'd)



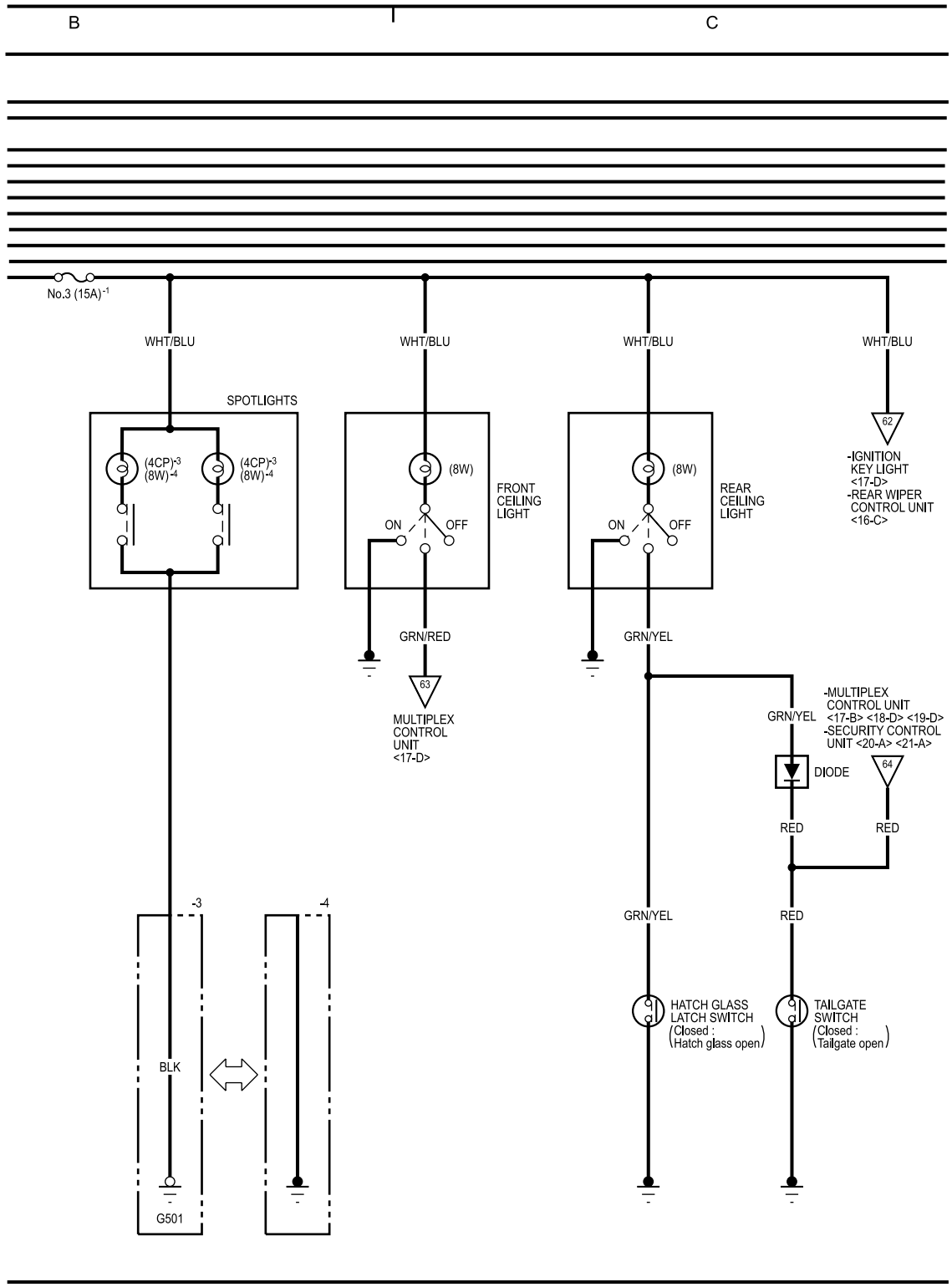
Exterior Lights (Headlight Adjuster System), Interior Lights, Horns

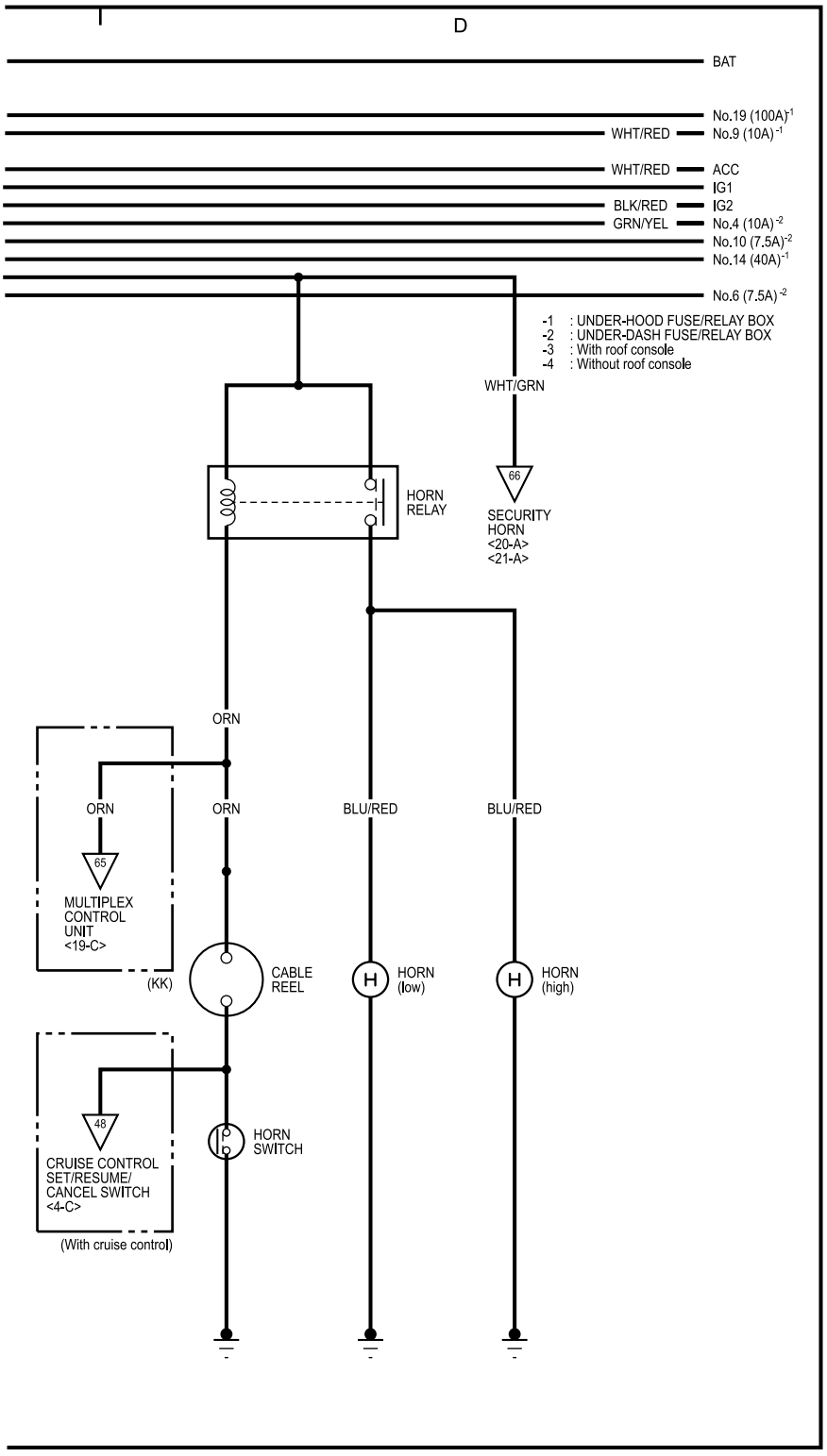


10 Exterior Lights (Headlight Adjuster System), Interior Lights, Horns

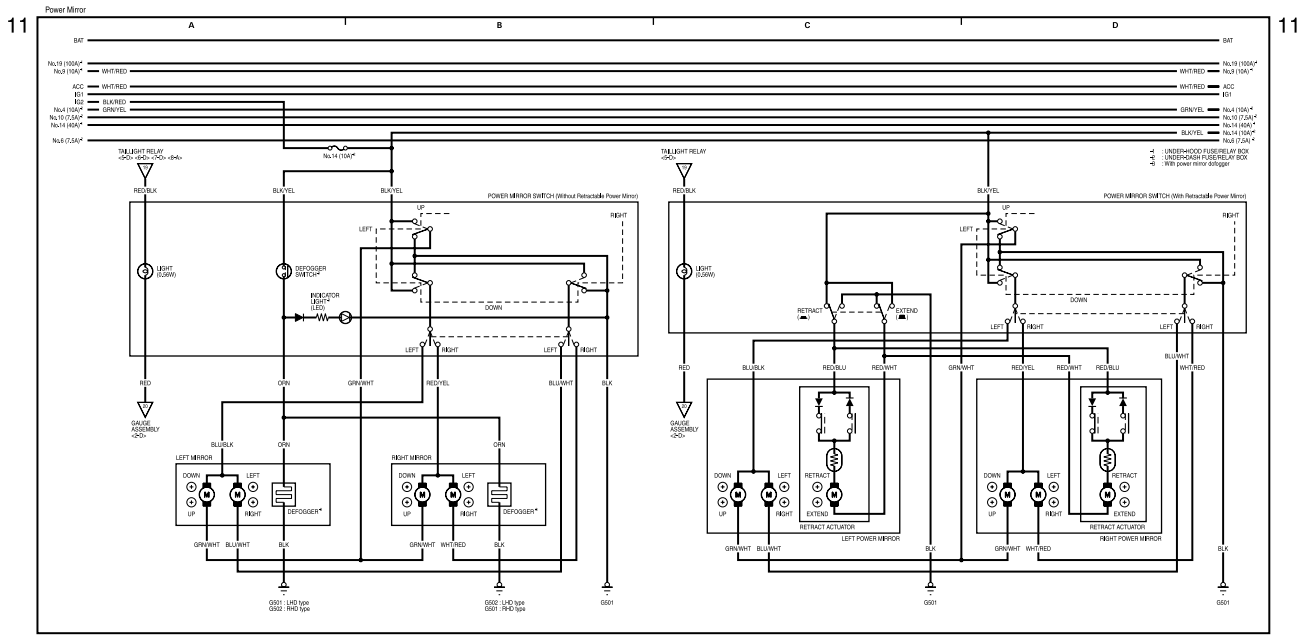


Exterior Lights (Headlight Adjuster System), Interior Lights, Horns (cont'd)

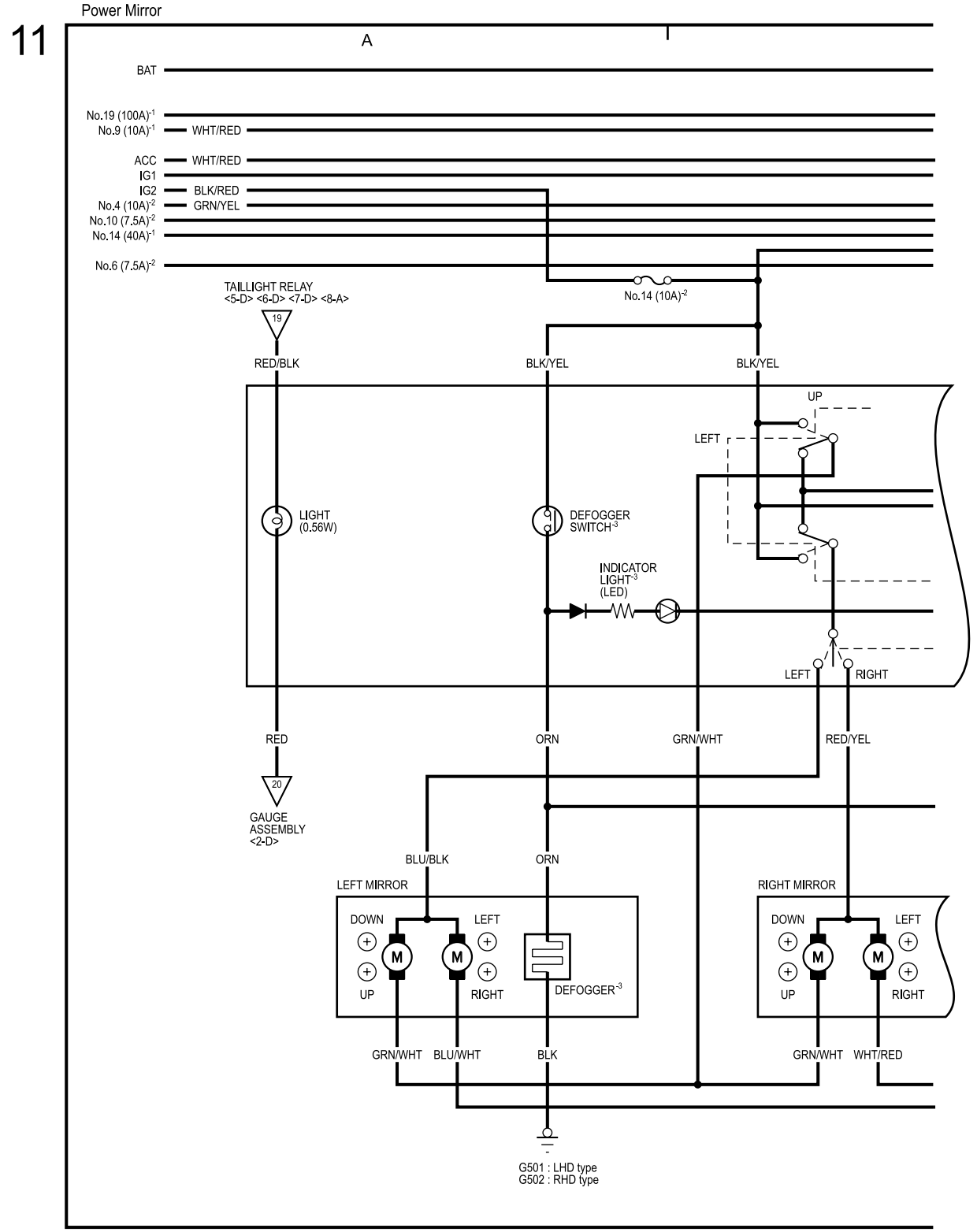



10
D
BAT
No.19 (100A)-1
WHT/RED
No.9 (10A)-1
WHT/RED
ACC
IG1
BLK/RED
IG2
GRN/YEL
No.4 (10A)-2
No.10 (7.5A)-2
No.14 (40A)-1
No.6 (7.5A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
-3 : With roof console
-4 : Without roof console
WHT/GRN
66
SECURITY HORN
<20-A>
<21-A>
HORN RELAY
ORN
ORN
ORN
BLU/RED
BLU/RED
65
MULTIPLEX CONTROL UNIT
<19-C>
(KK)
CABLE REEL
H
HORN (low)
H
HORN (high)
48
CRUISE CONTROL SET/RESUME/ CANCEL SWITCH
<4-C>
(With cruise control)
HORN SWITCH

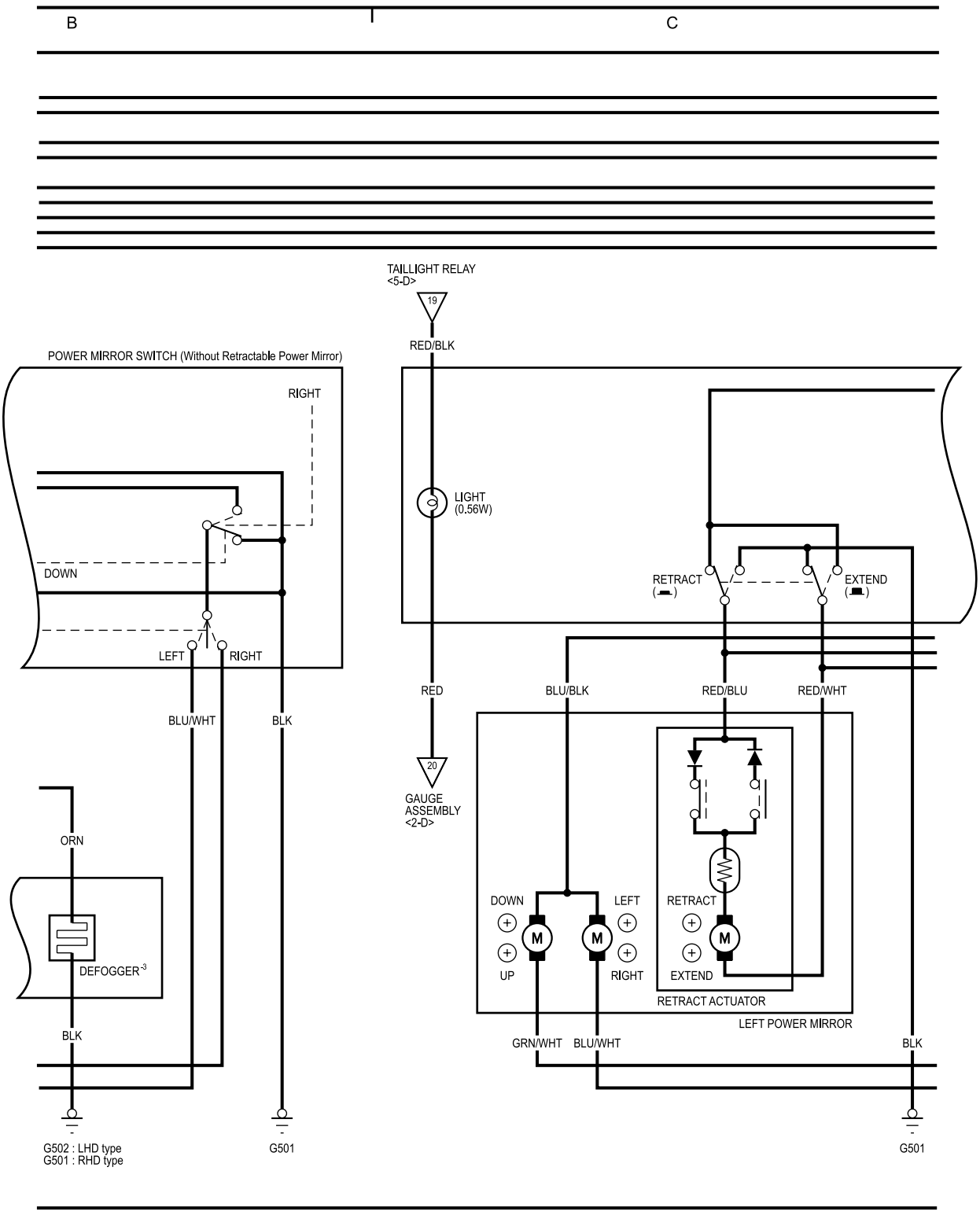
Power Mirror



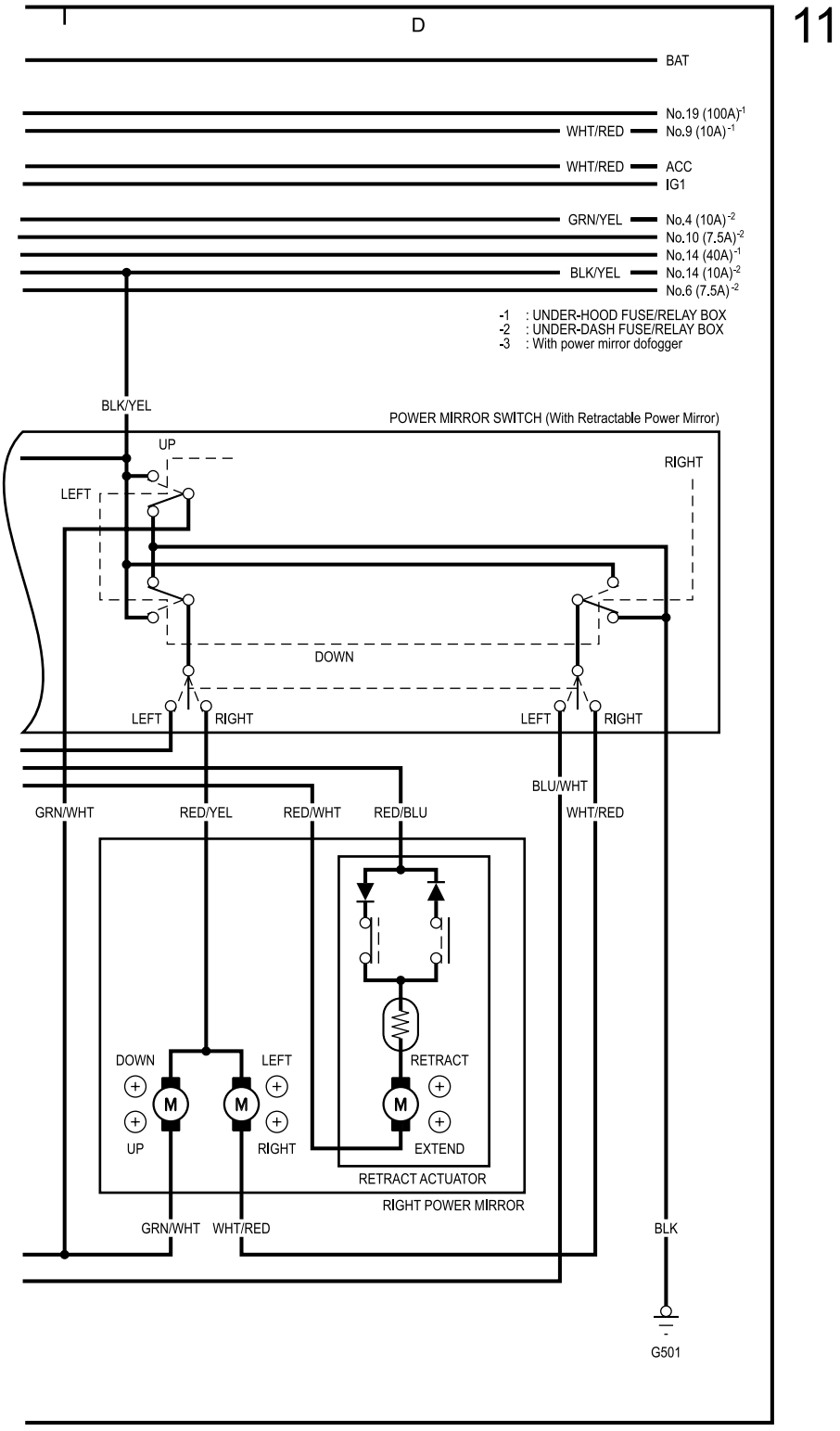
Power Mirror (cont'd)



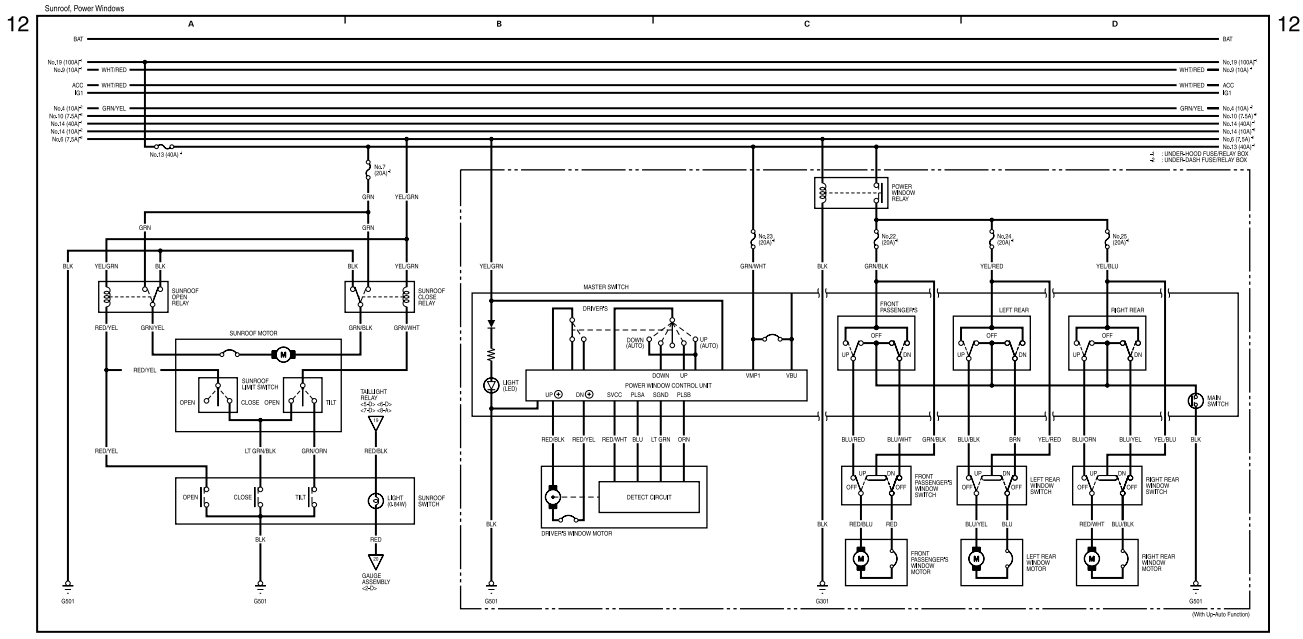
Power Mirror (cont'd)



Power Mirror (cont'd)

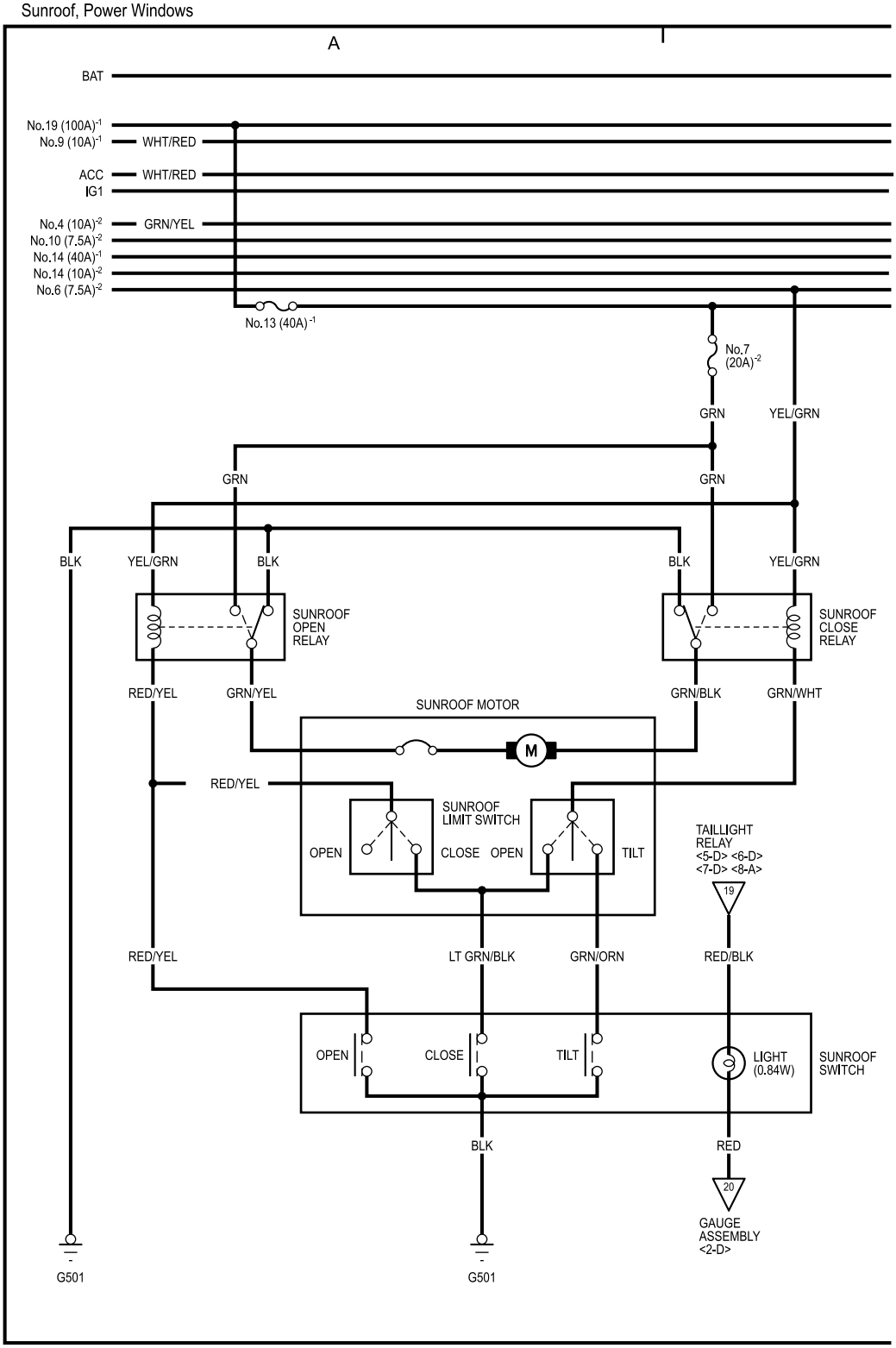


Sunroof, Power Windows

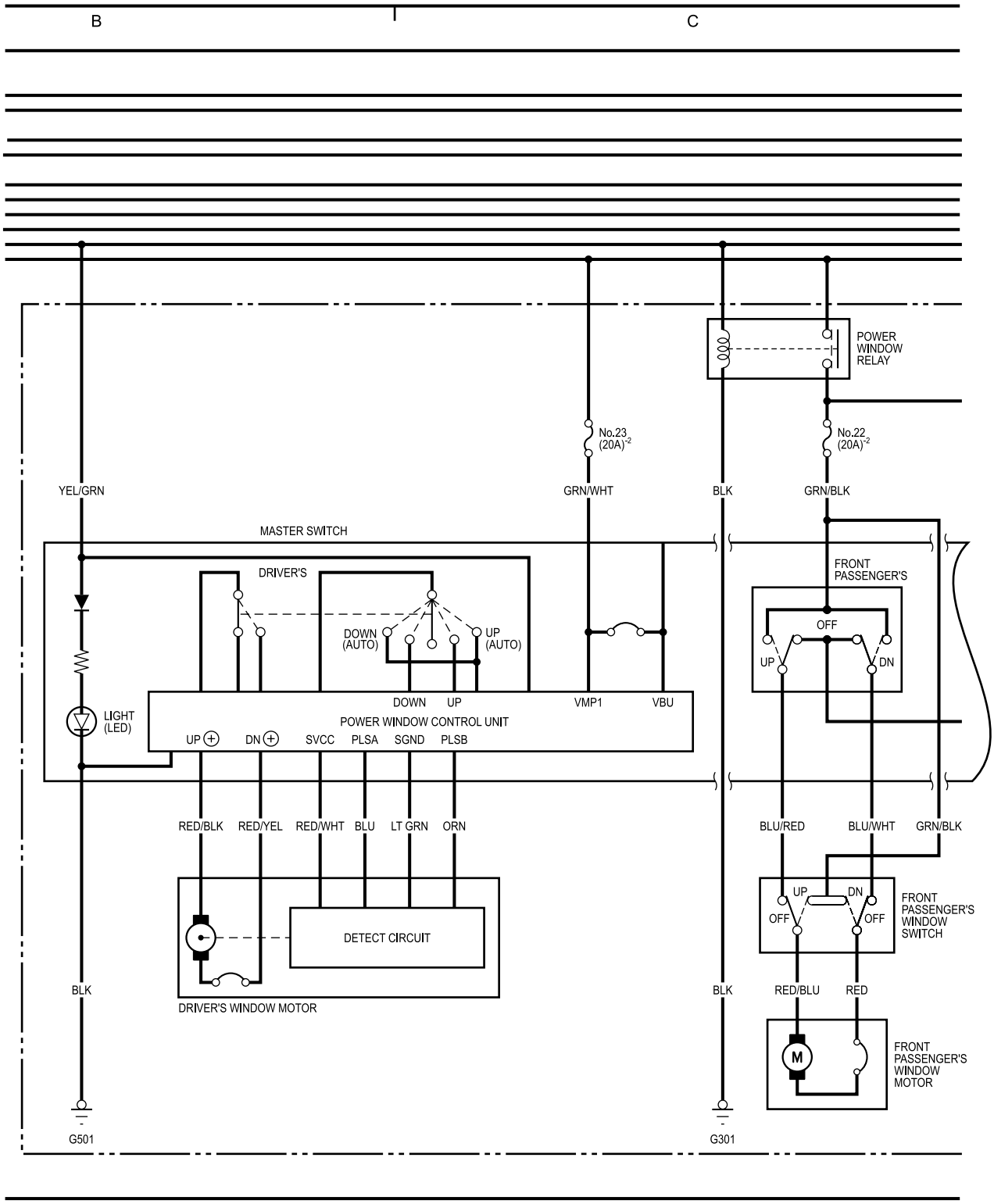


Sunroof, Power Windows (cont'd)

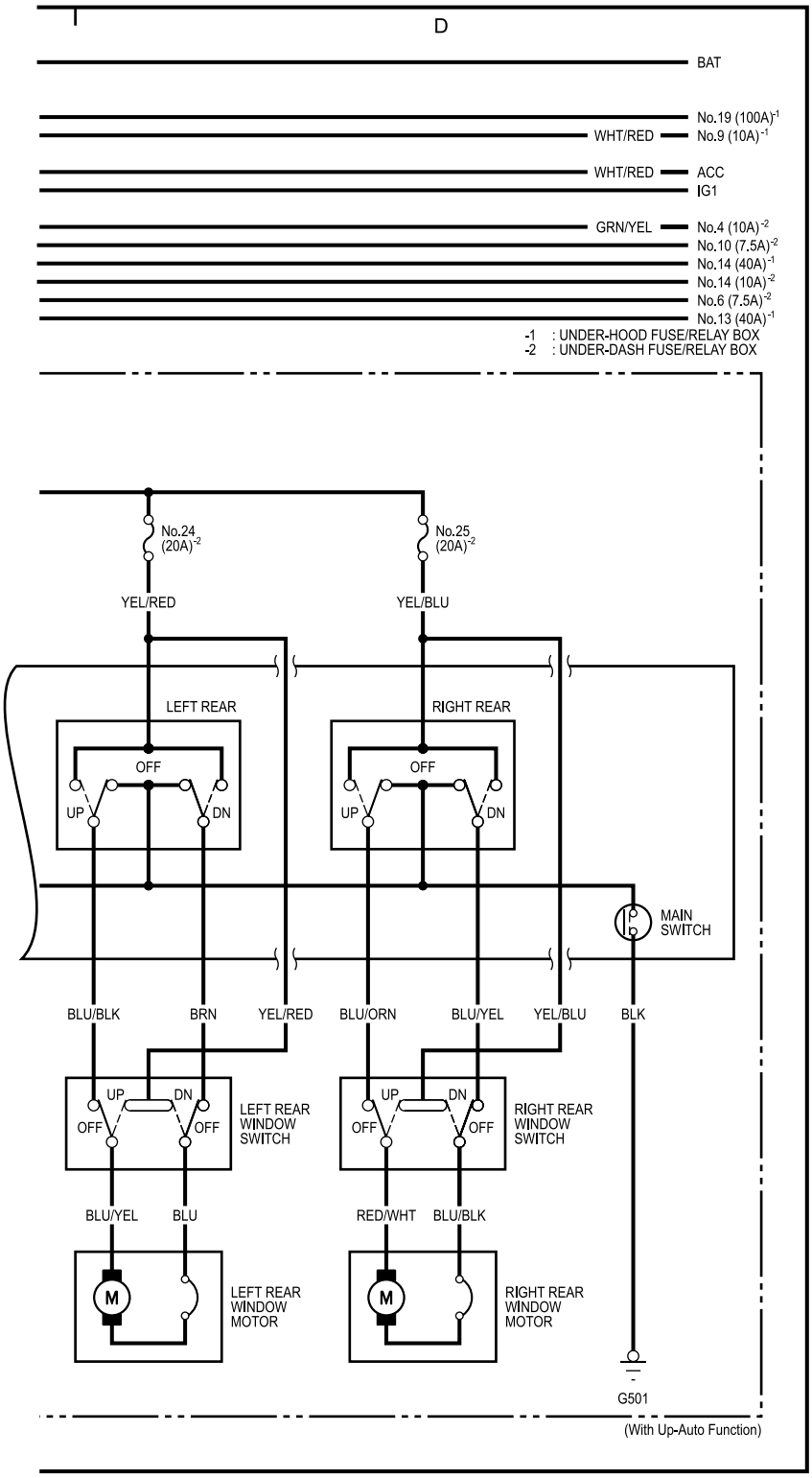
12 Sunroof, Power Windows



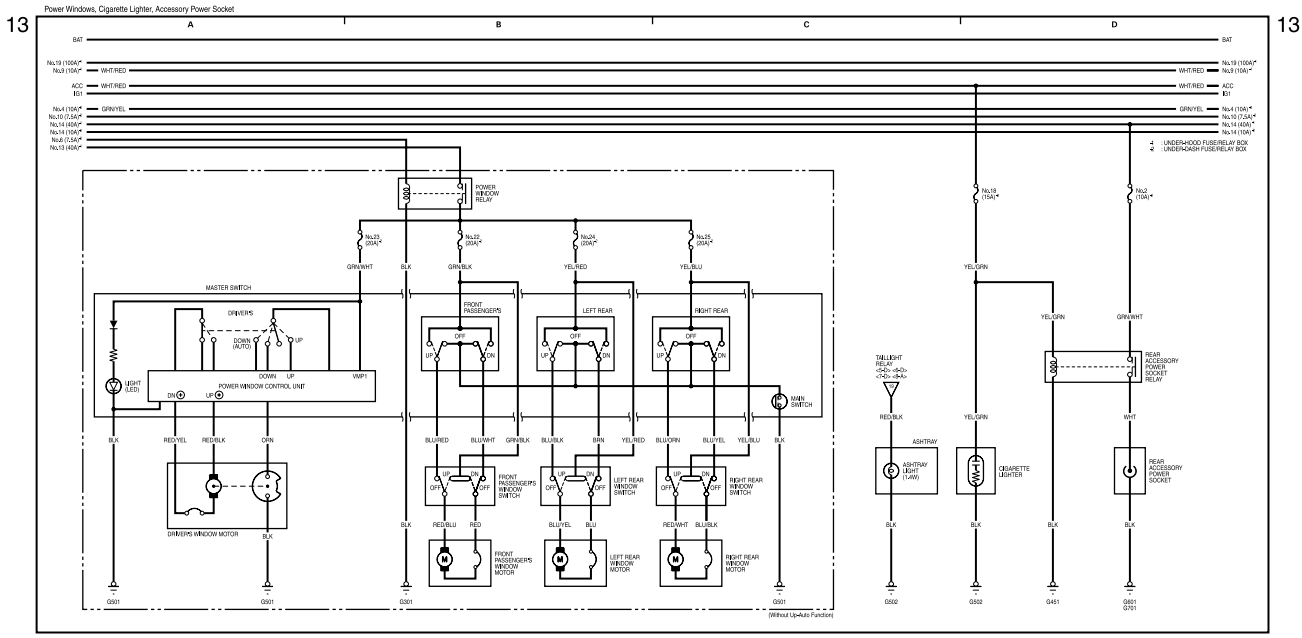
Sunroof, Power Windows (cont'd)



Sunroof, Power Windows (cont'd)

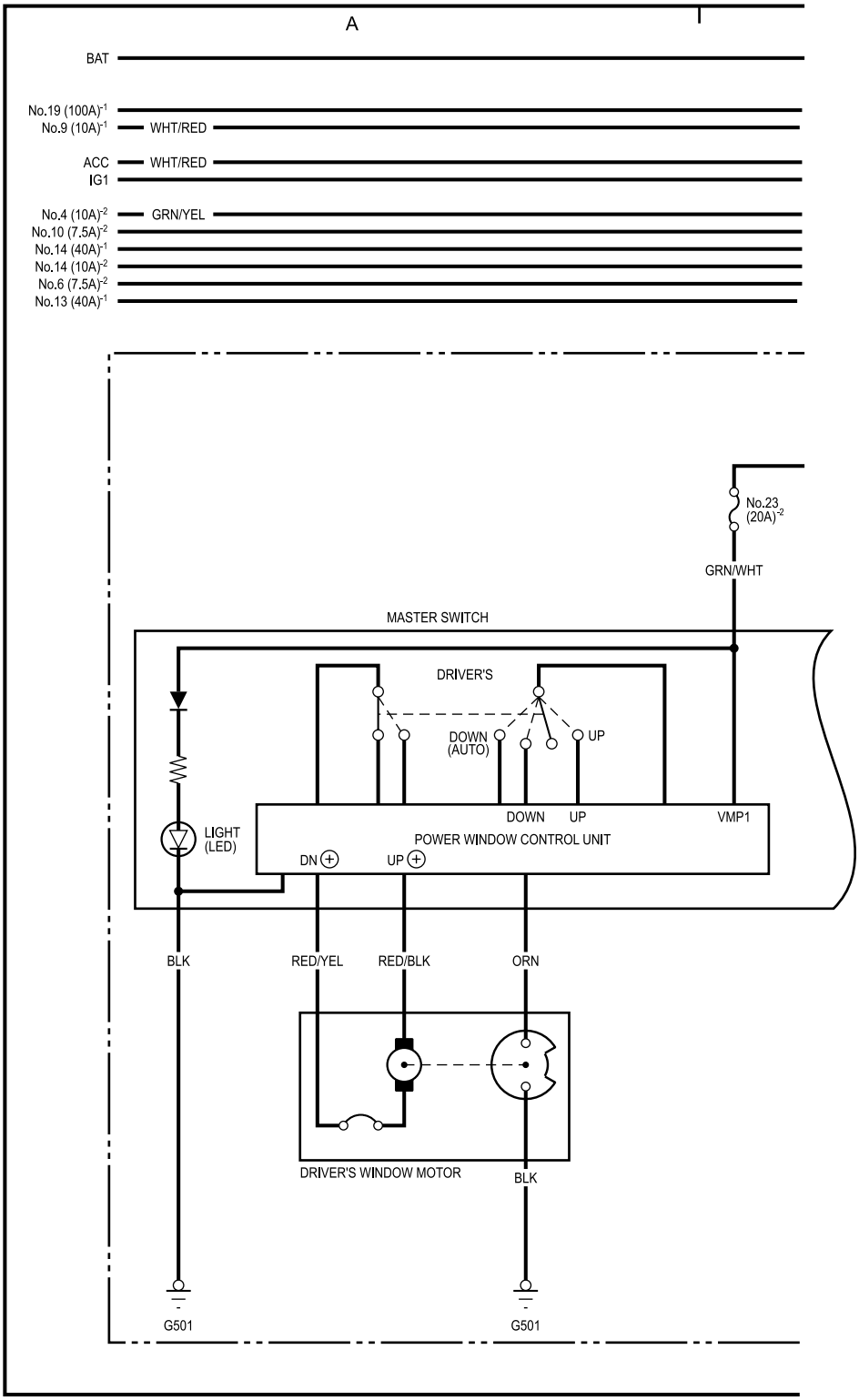


Power Window, Cigarette Lighter, Accessory Power Socket

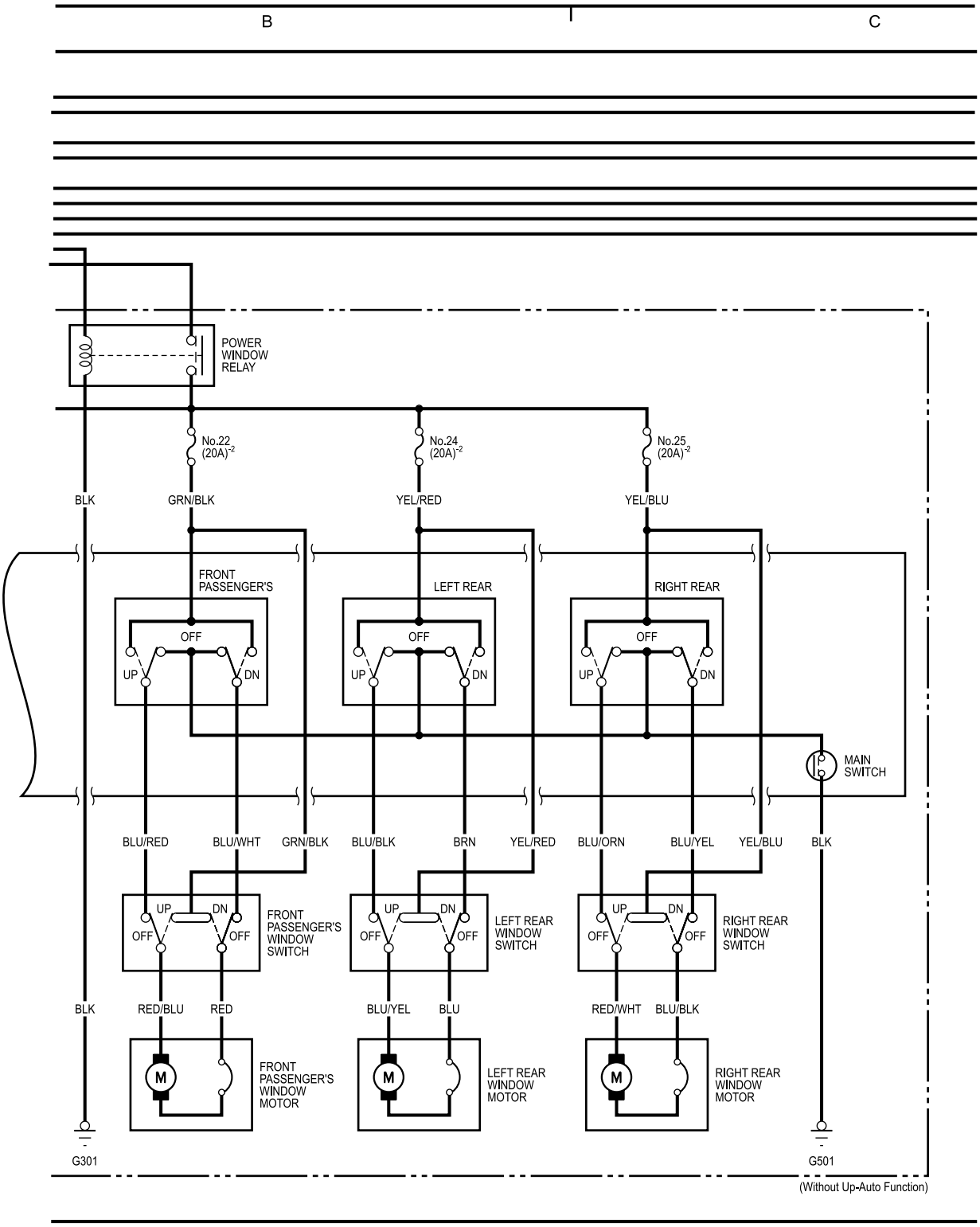


Power Window, Cigarette Lighter, Accessory Power Socket (cont'd)

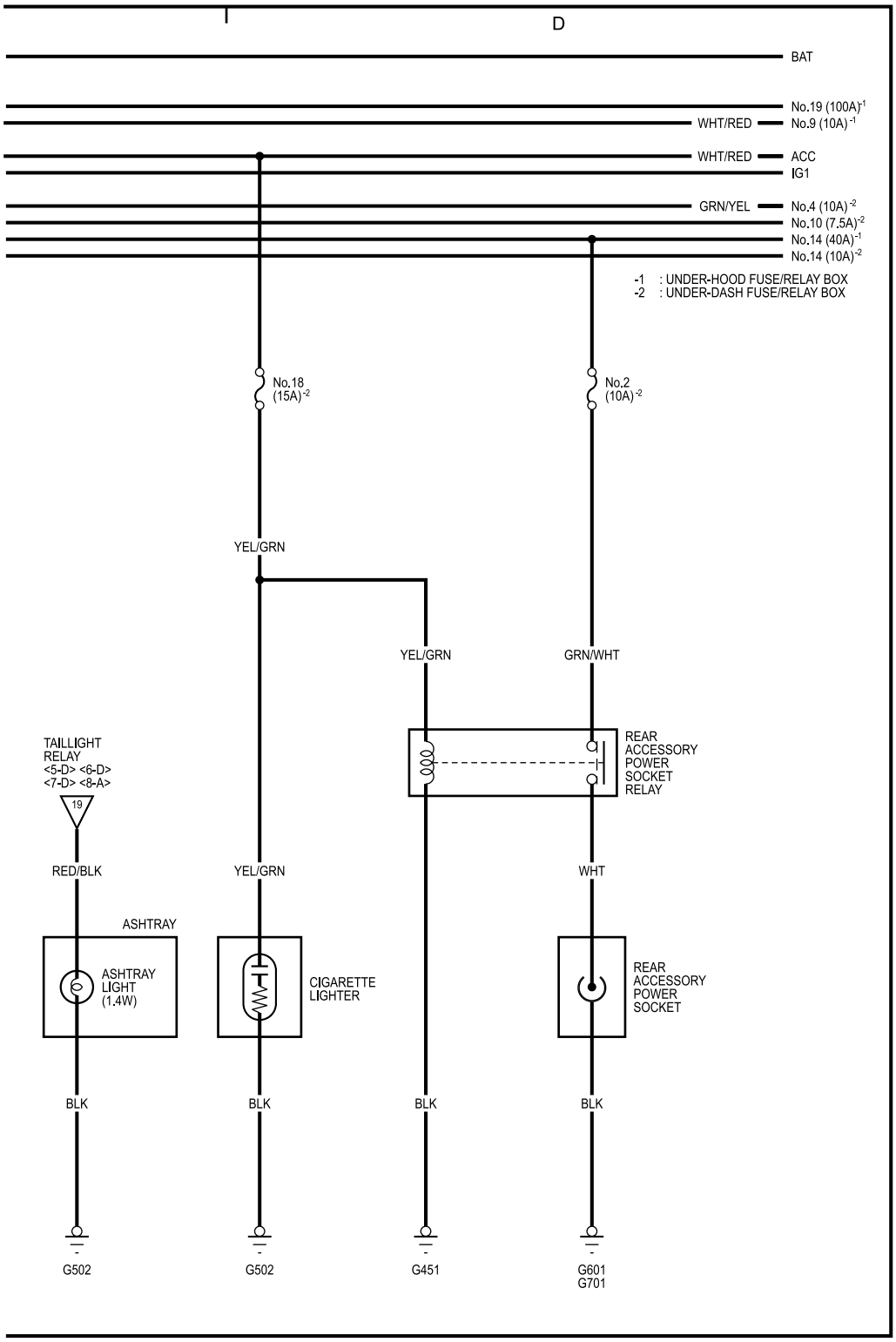
13 Power Windows, Cigarette Lighter, Accessory Power Socket



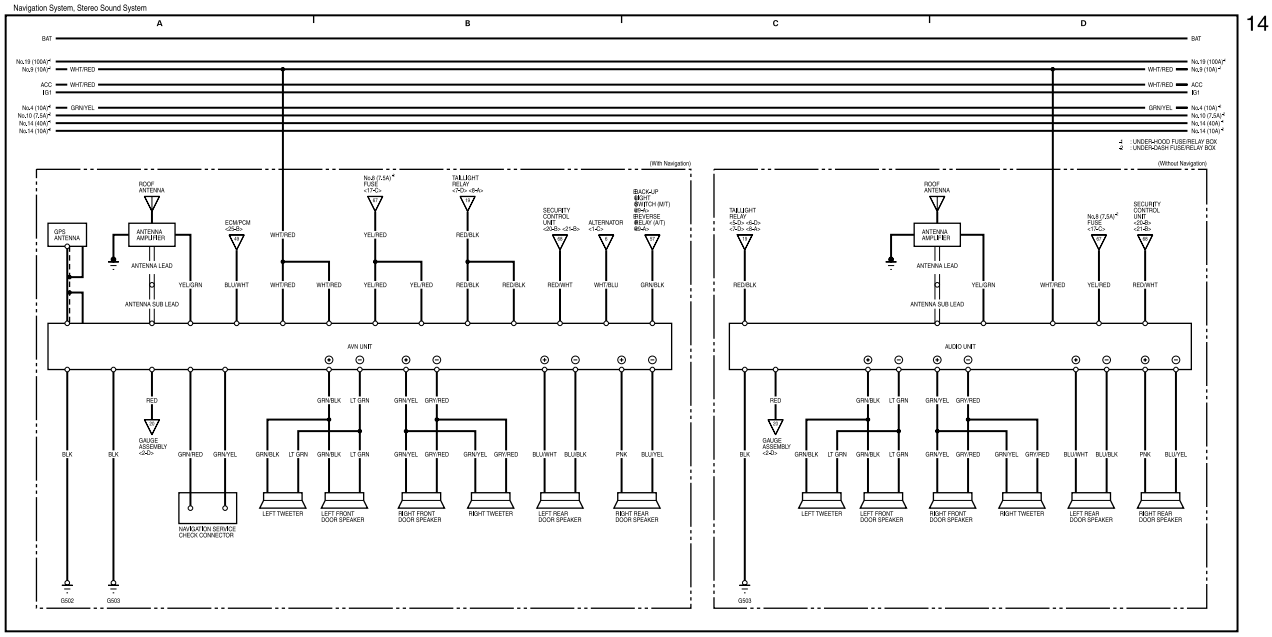
Power Window, Cigarette Lighter, Accessory Power Socket (cont'd)



13

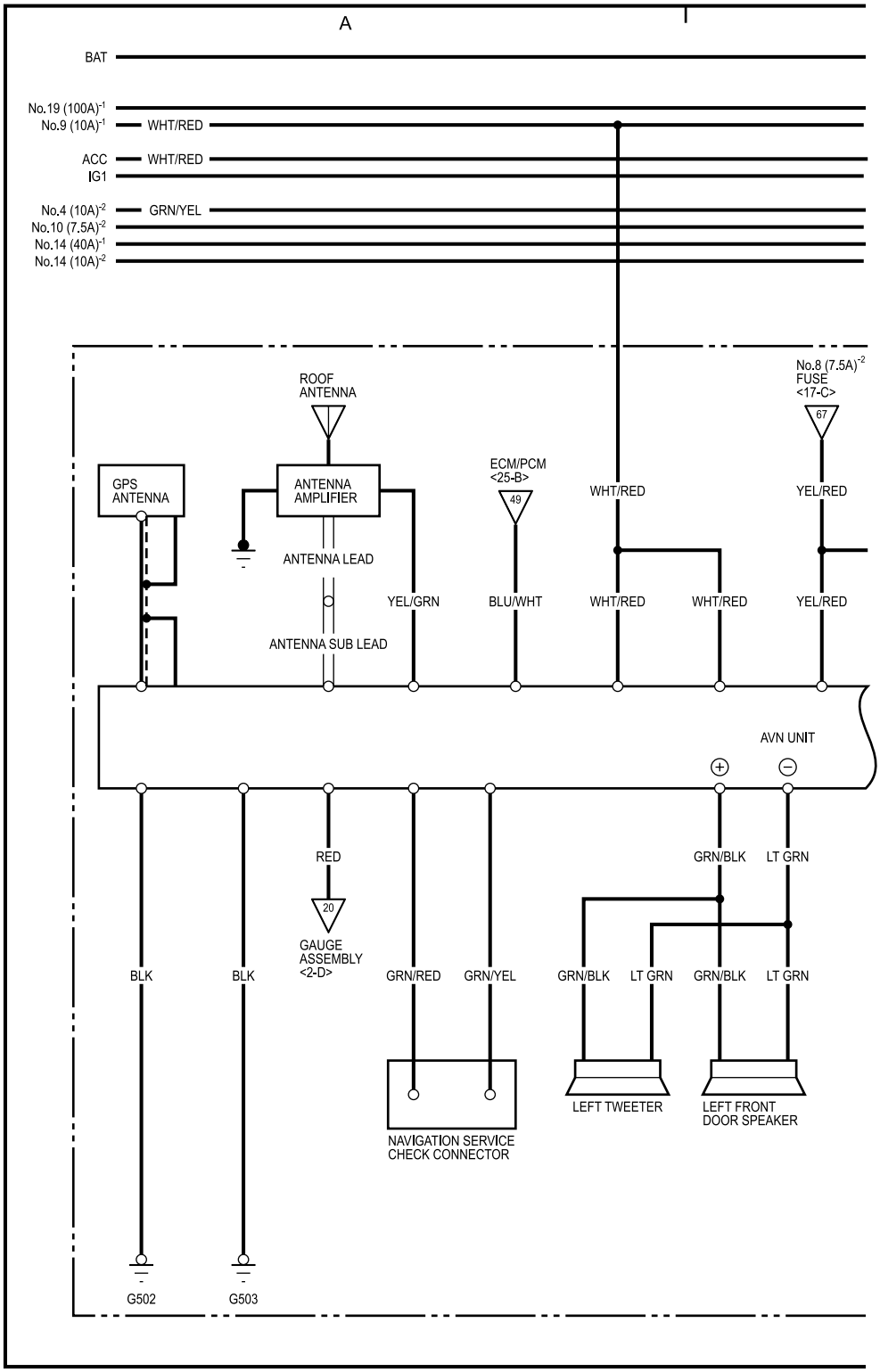

I
D
BAT
No.19 (100A)-1
WHT/RED
No.9 (10A)-1
WHT/RED
ACC
IG1
GRN/YEL
No.4 (10A)-2
No.10 (7.5A)-2
No.14 (40A)-1
No.14 (10A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
No.18 (15A)-2
No.2 (10A)-2
YEL/GRN
YEL/GRN
GRN/WHT
REAR ACCESSORY POWER SOCKET RELAY
TAILLIGHT RELAY <5-D> <6-D> <7-D> <8-A>
19
RED/BLK
YEL/GRN
WHT
ASHTRAY
ASHTRAY LIGHT (1.4W)
CIGARETTE LIGHTER
REAR ACCESSORY POWER SOCKET
BLK
BLK
BLK
BLK
G502
G502
G451
G601
G701

Navigation System, Stereo Sound System

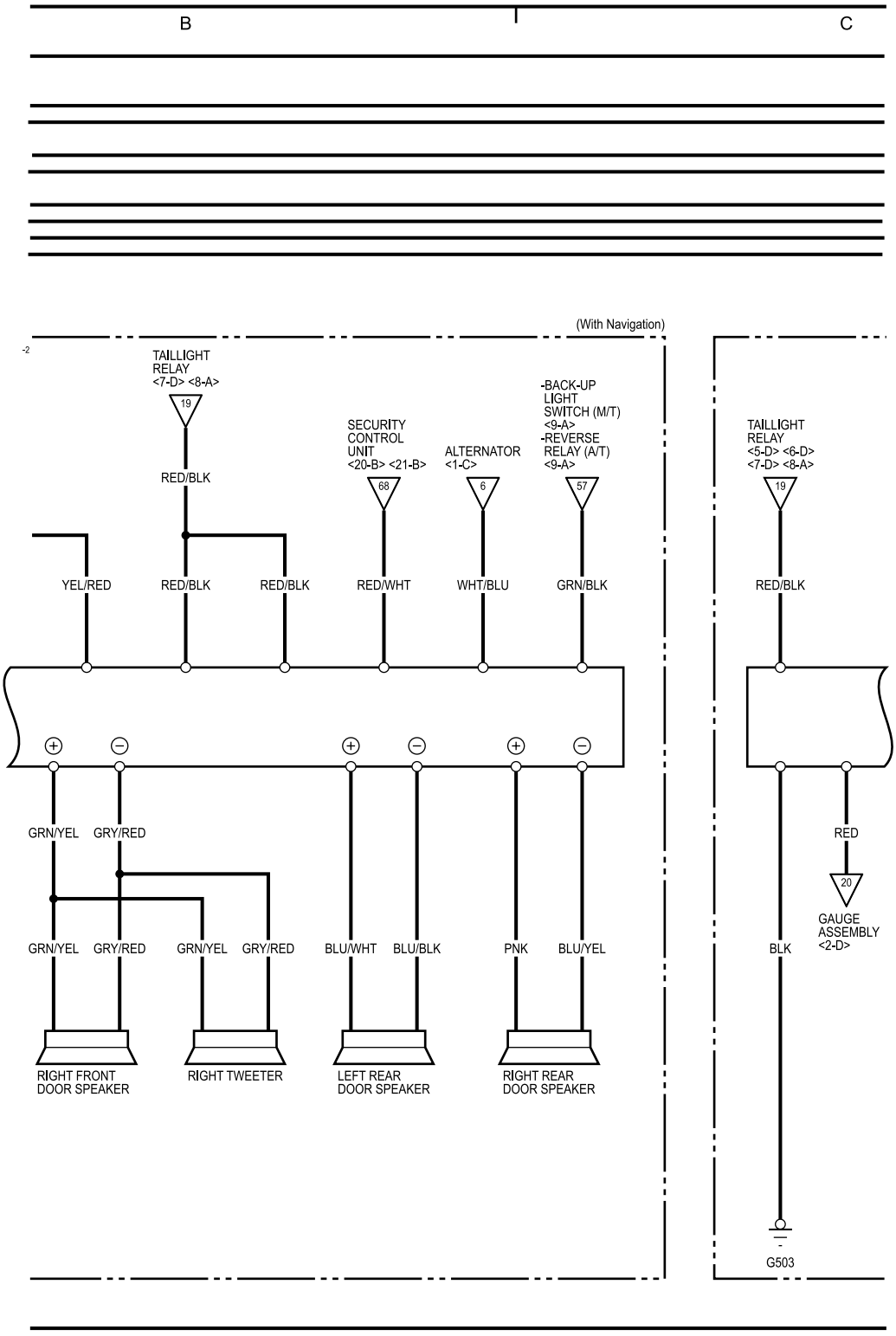


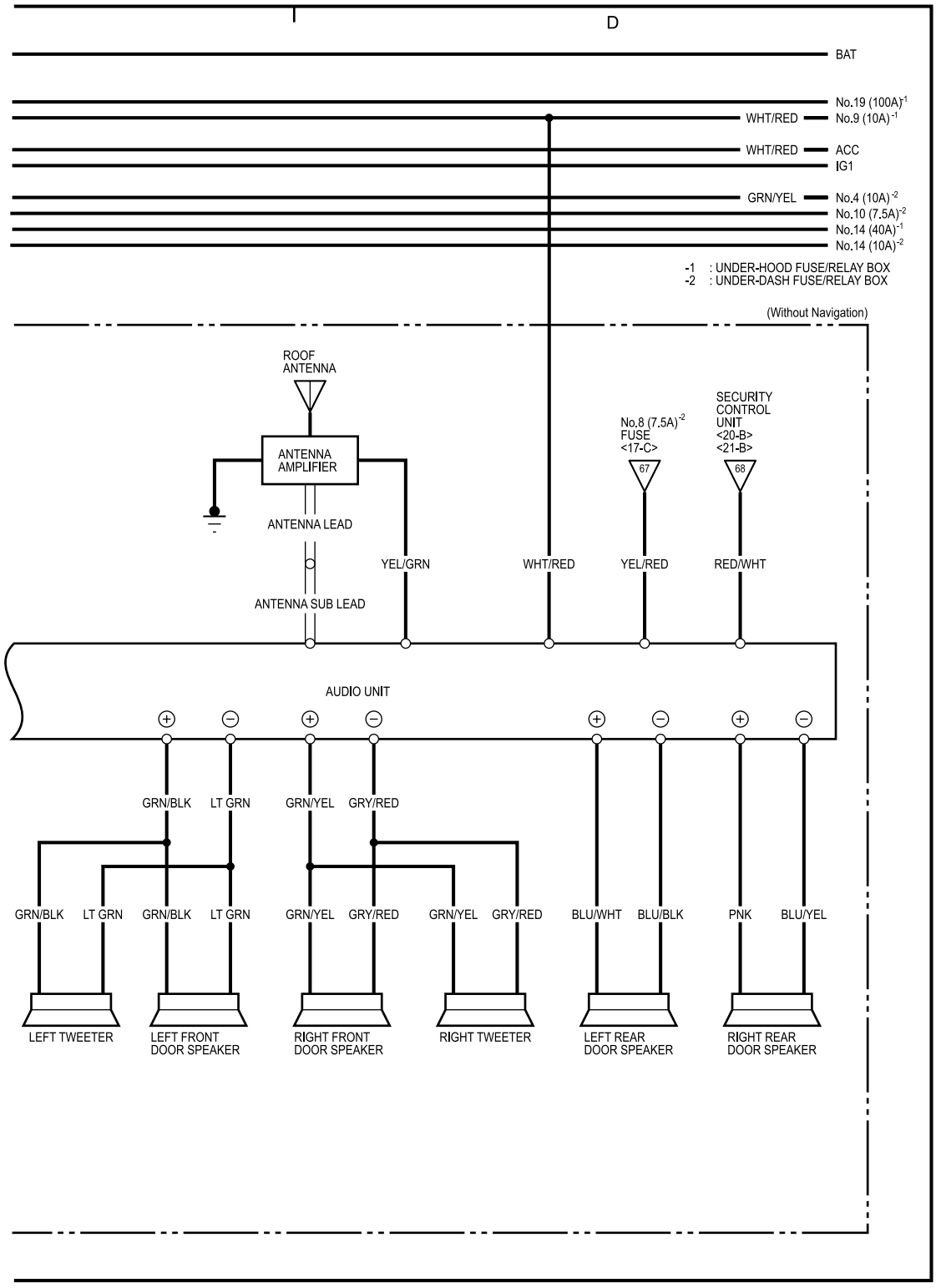
Navigation System, Stereo Sound System (cont'd)

14 Navigation System, Stereo Sound System

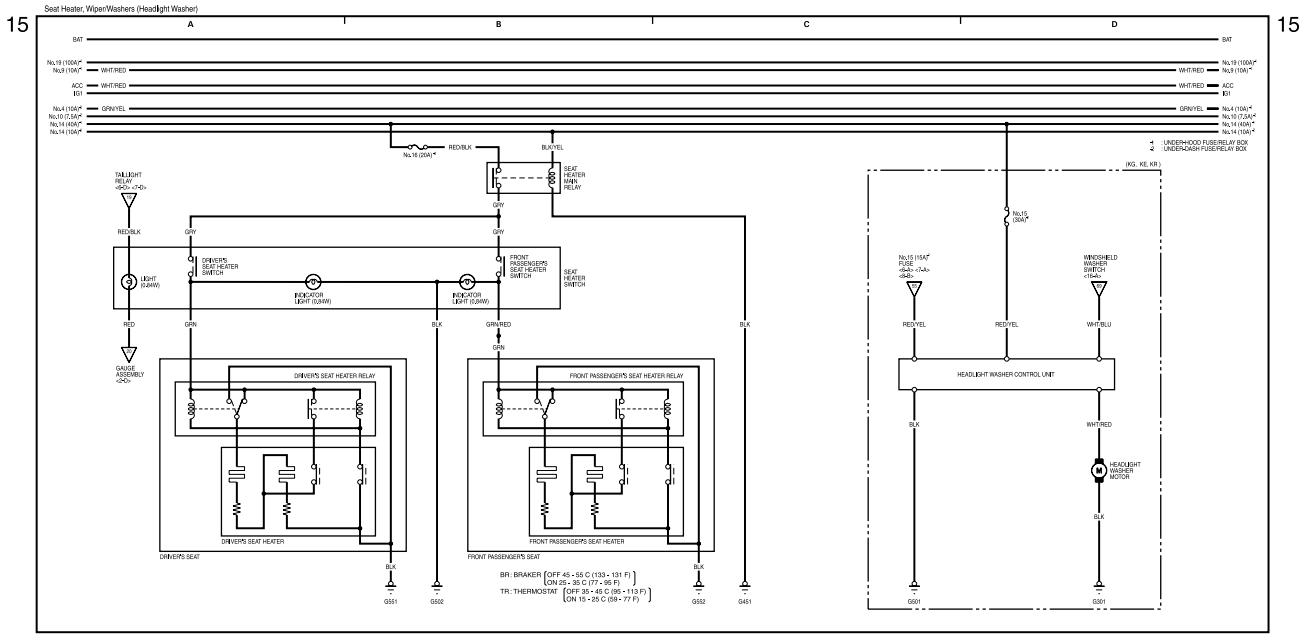


Navigation System, Stereo Sound System (cont'd)



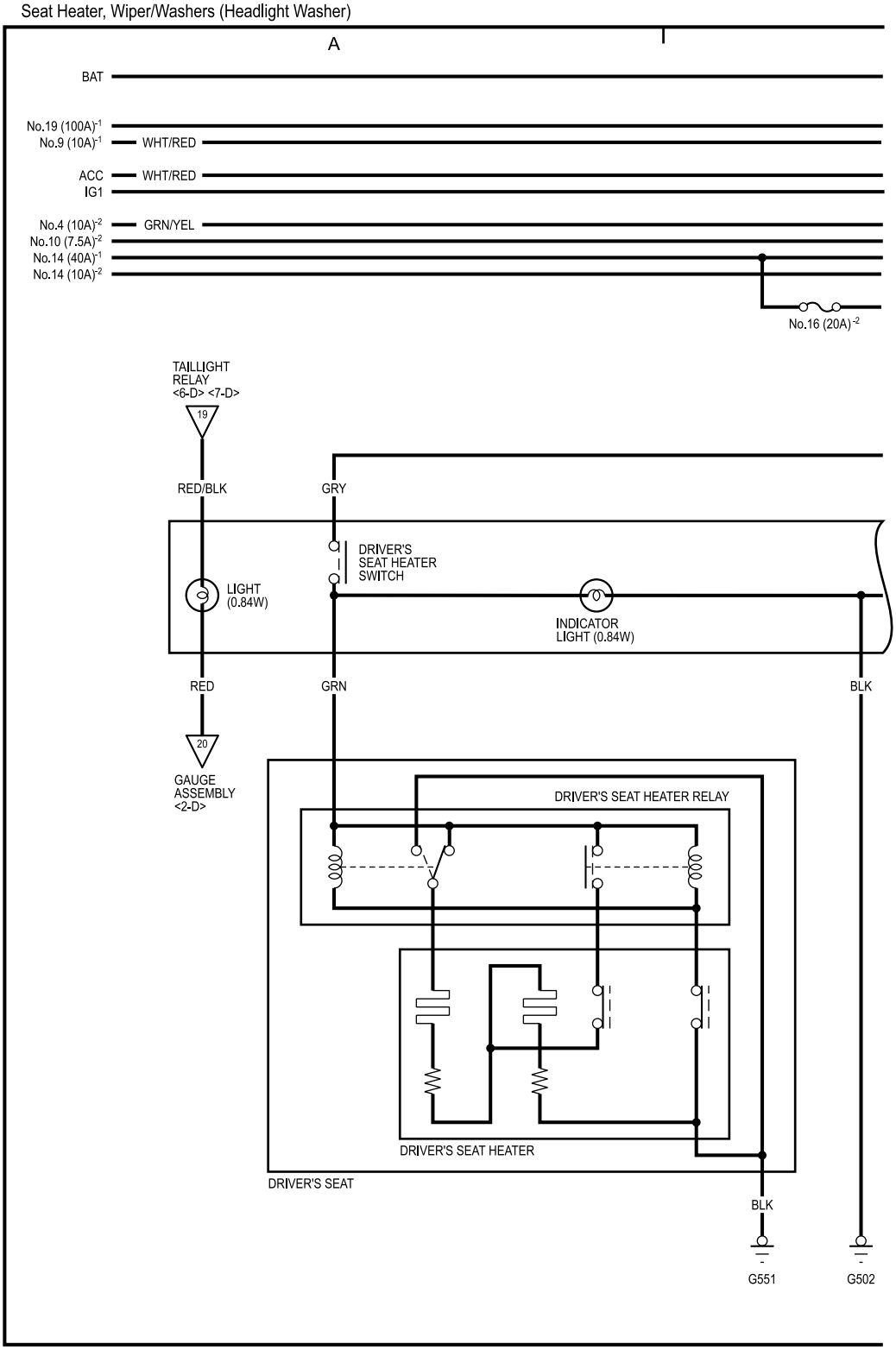

14
D
BAT
No.19 (100A)-1
WHT/RED
No.9 (10A)-1
WHT/RED
ACC
IG1
GRN/YEL
No.4 (10A)-2
No.10 (7.5A)-2
No.14 (40A)-1
No.14 (10A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
(Without Navigation)
ROOF ANTENNA
ANTENNA AMPLIFIER
ANTENNA LEAD
ANTENNA SUB LEAD
No.8 (7.5A)-2 FUSE <17-C>
SECURITY CONTROL UNIT <20-B> <21-B>
67
68
YEL/GRN
WHT/RED
YEL/RED
RED/WHT
AUDIO UNIT
GRN/BLK
LT GRN
GRN/YEL
GRY/RED
BLU/WHT
BLU/BLK
PNK
BLU/YEL
LEFT TWEETER
LEFT FRONT DOOR SPEAKER
RIGHT FRONT DOOR SPEAKER
RIGHT TWEETER
LEFT REAR DOOR SPEAKER
RIGHT REAR DOOR SPEAKER

Seat Heater, Wipers/Washers (Headlight Washer)

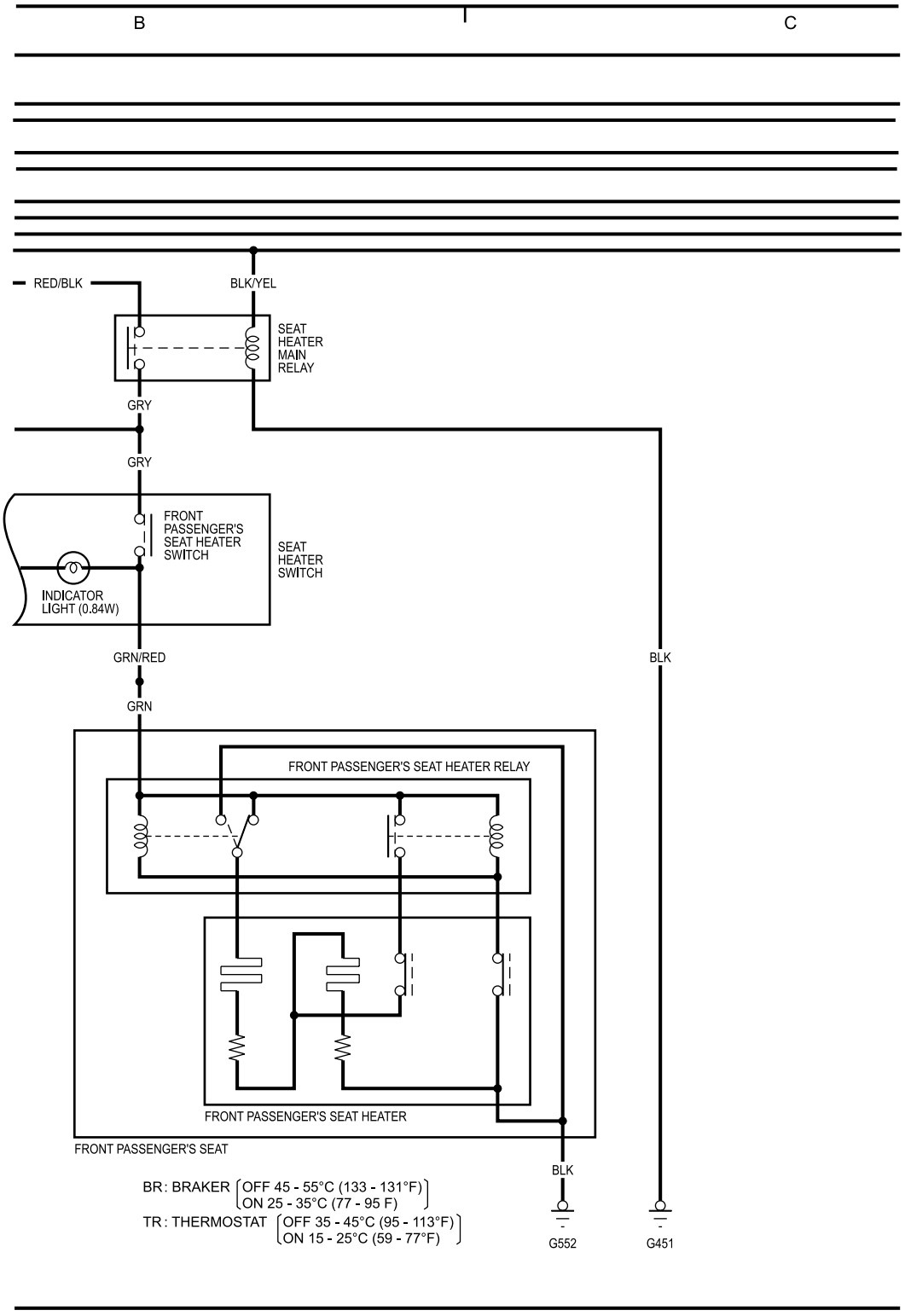


Seat Heater, Wipers/Washers (Headlight Washer) (cont'd)

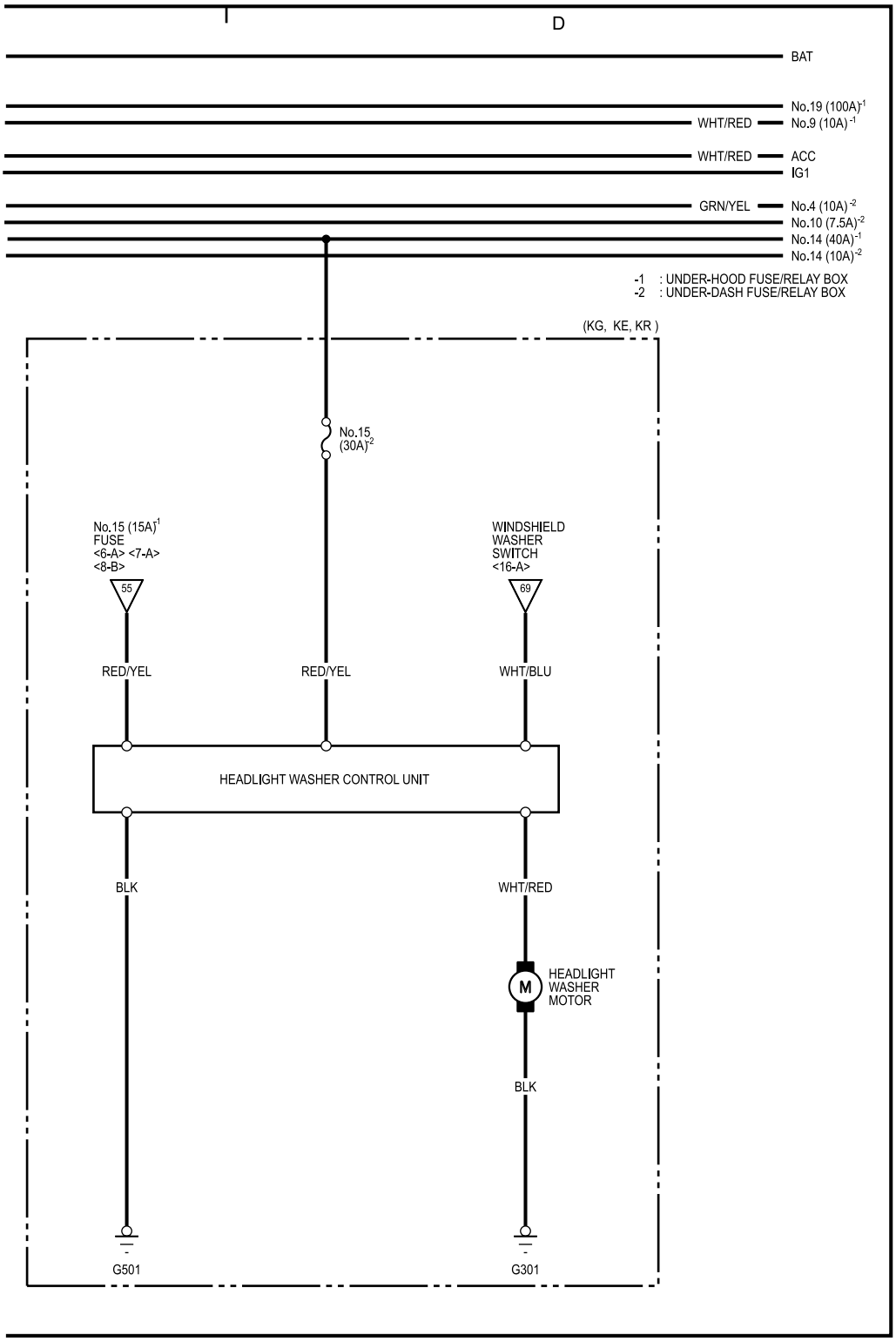
15



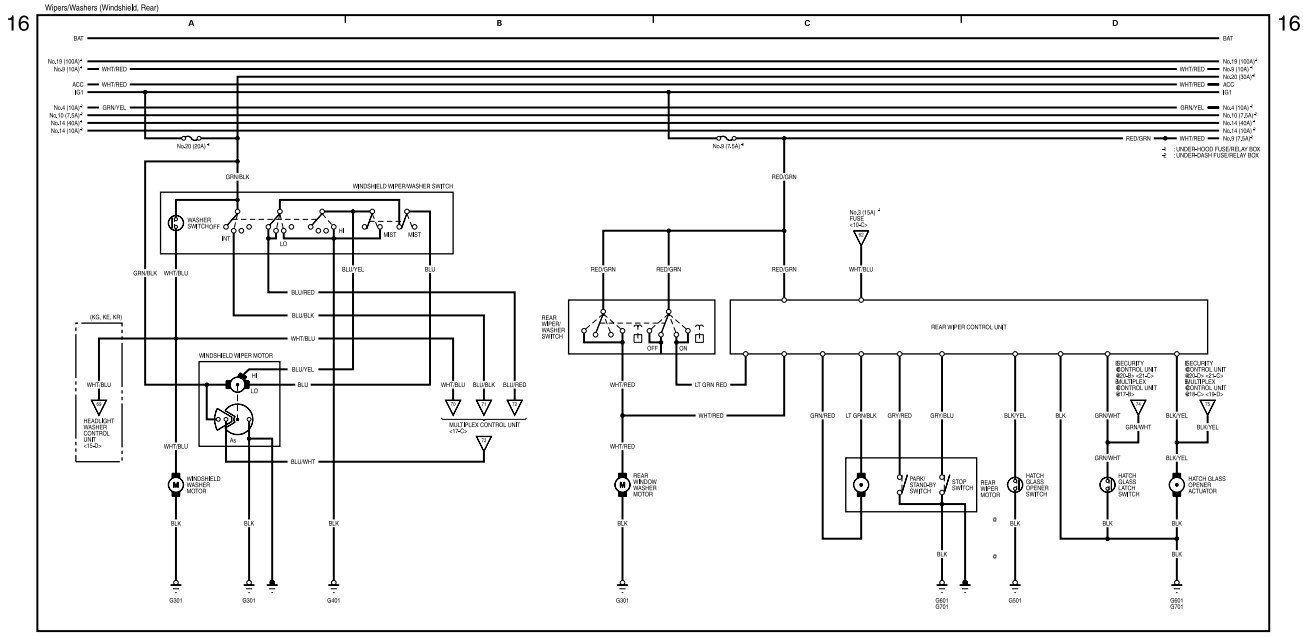
Seat Heater, Wipers/Washers (Headlight Washer) (cont'd)



Seat Heater, Wipers/Washers (Headlight Washer) (cont'd)

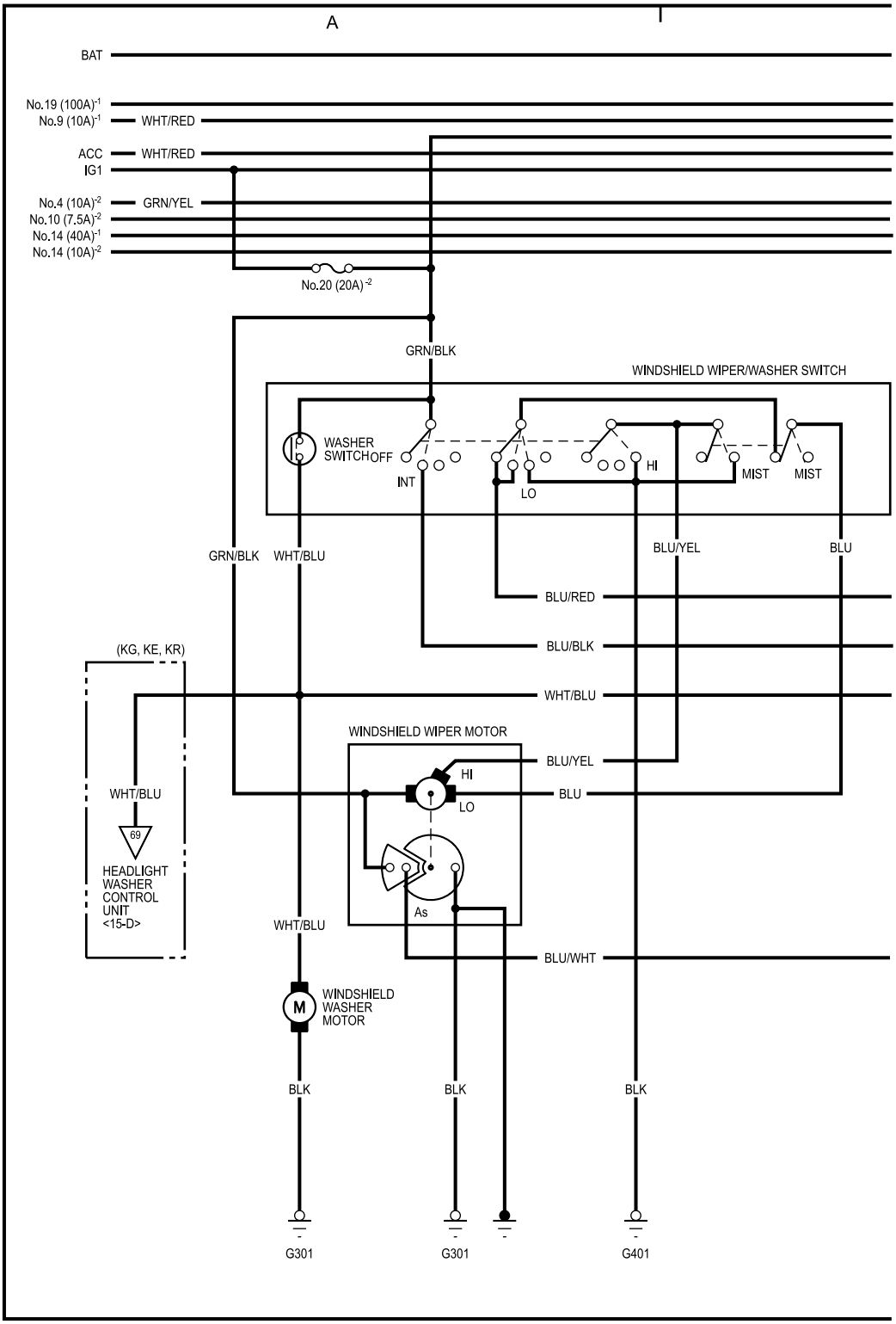


Wipers/Washers (Windshield Rear)

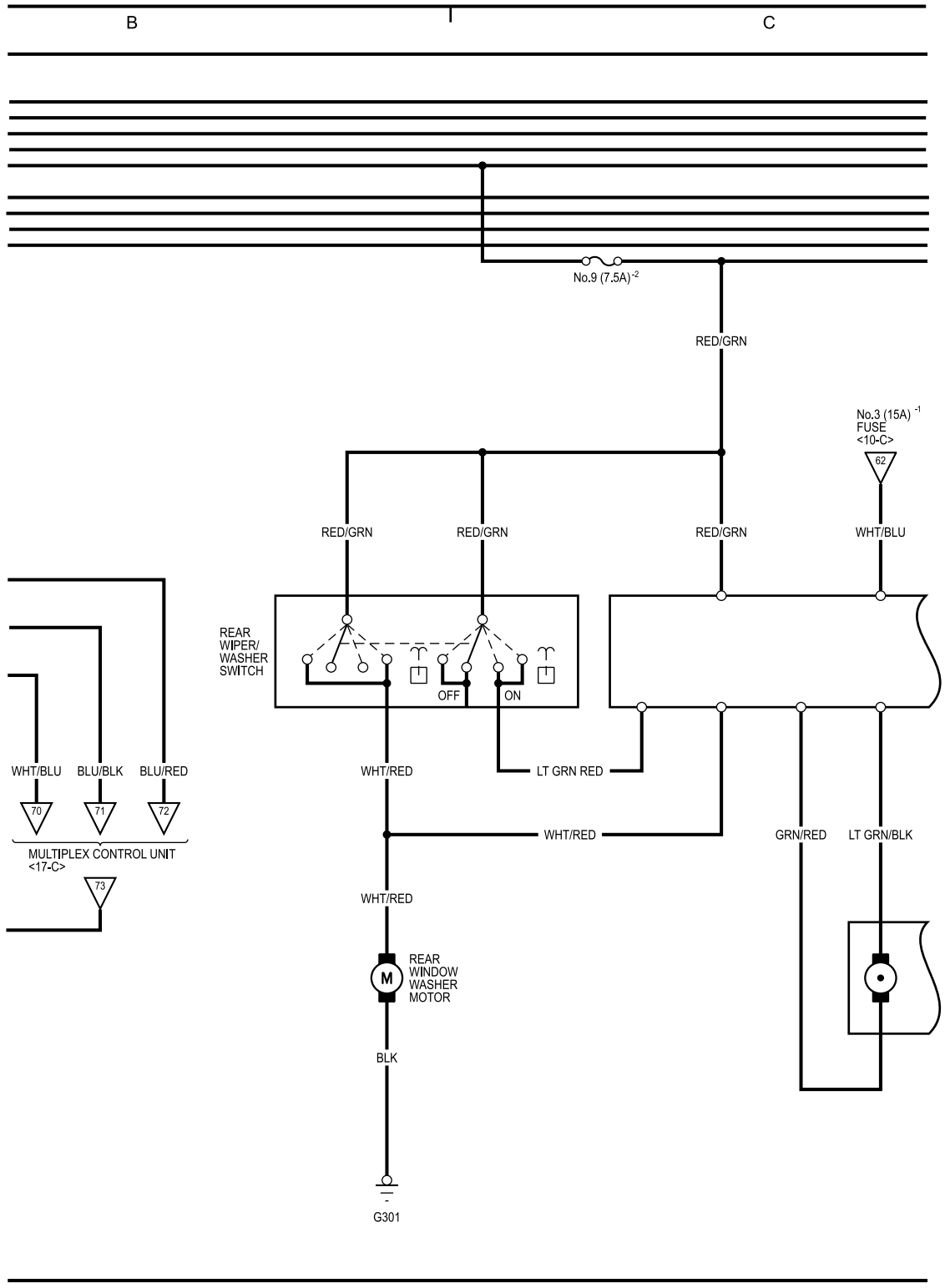


Wipers/Washers (Windshield Rear) (cont'd)

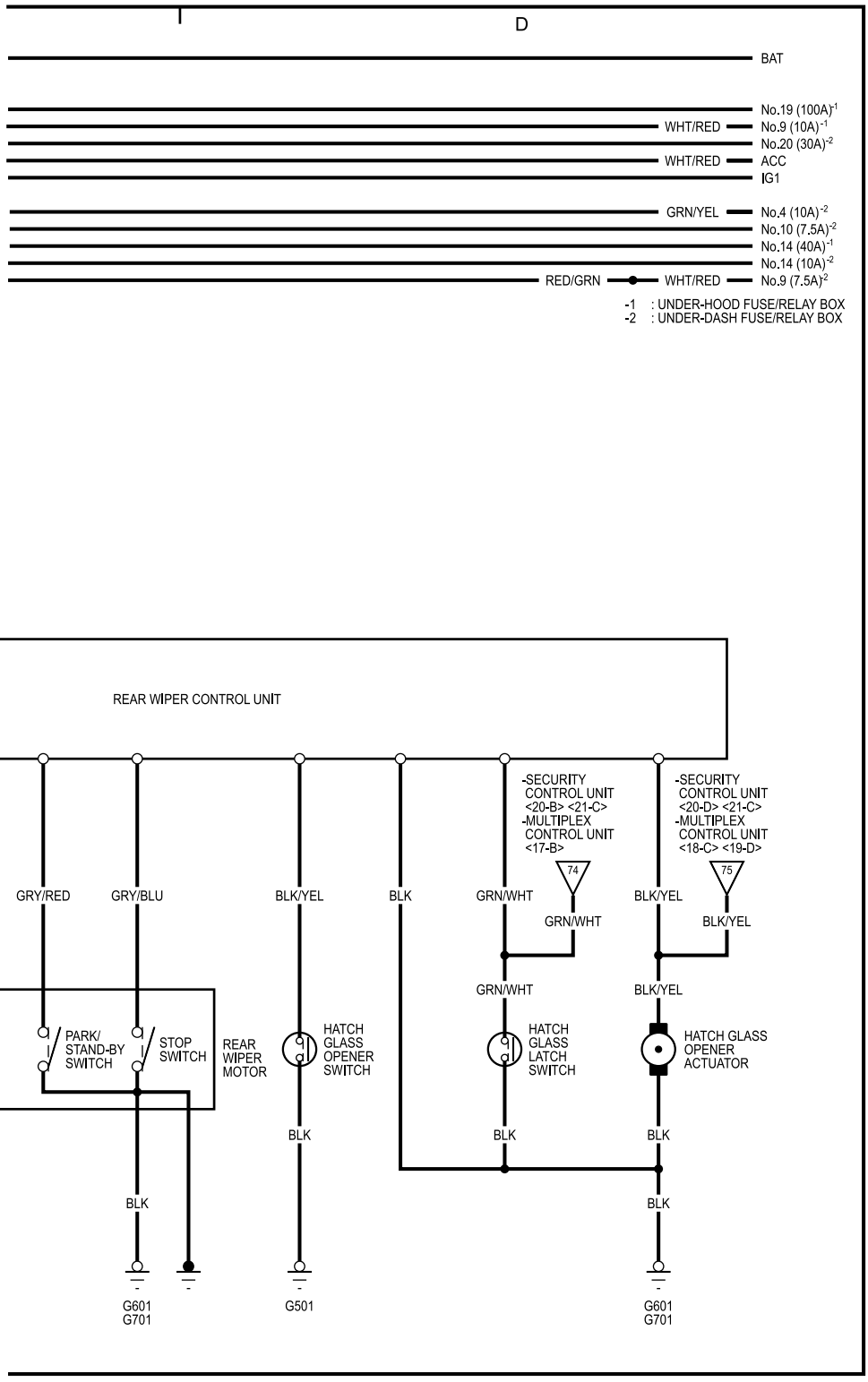
16 Wipers/Washers (Windshield, Rear)



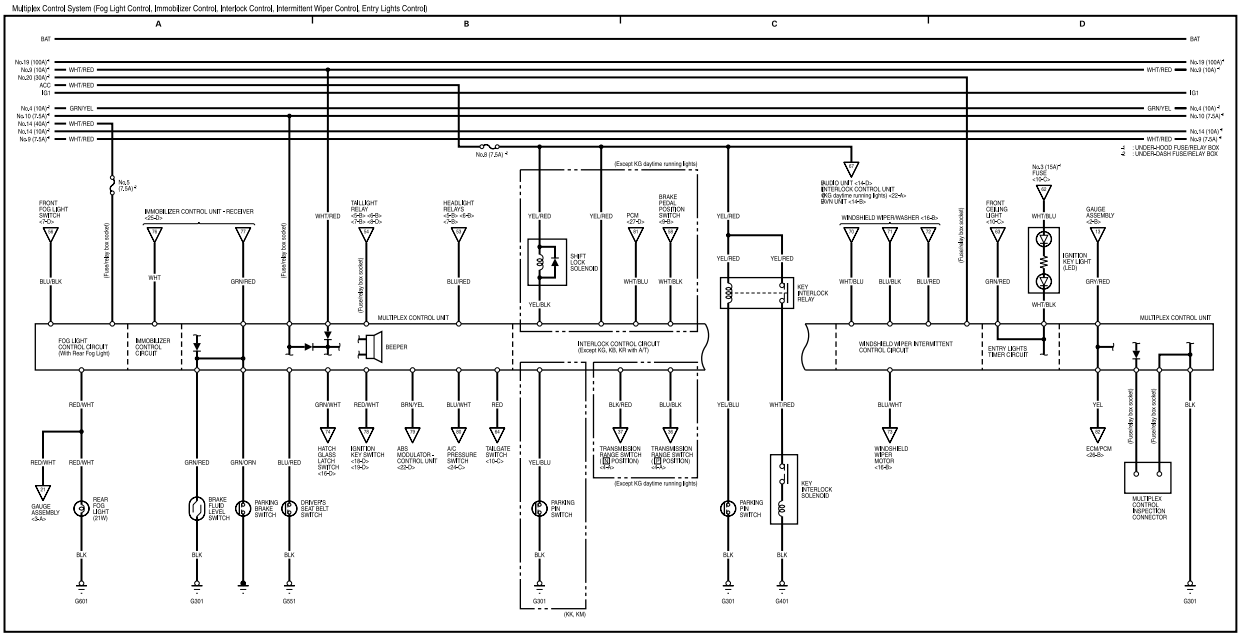
Wipers/Washers (Windshield Rear) (cont'd)



16

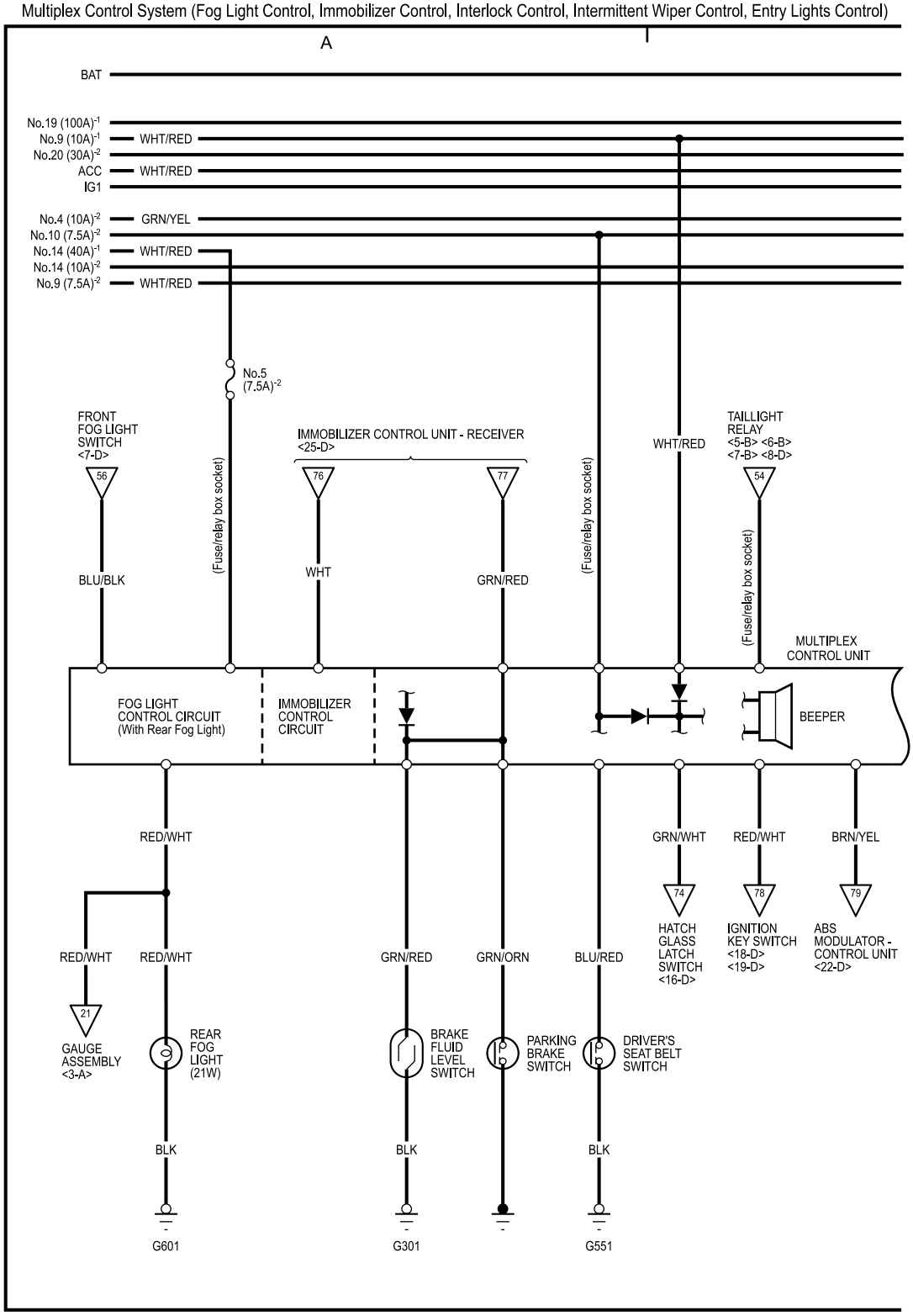

I
D
BAT
No.19 (100A)-1
WHT/RED
No.9 (10A)-1
No.20 (30A)-2
WHT/RED
ACC
IG1
GRN/YEL
No.4 (10A)-2
No.10 (7.5A)-2
No.14 (40A)-1
No.14 (10A)-2
RED/GRN
WHT/RED
No.9 (7.5A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
REAR WIPER CONTROL UNIT
-SECURITY CONTROL UNIT <20-B> <21-C>
-MULTIPLEX CONTROL UNIT <17-B>
-SECURITY CONTROL UNIT <20-D> <21-C>
-MULTIPLEX CONTROL UNIT <18-C> <19-D>
74
75
GRY/RED
GRY/BLU
BLK/YEL
BLK
GRN/WHT
BLK/YEL
GRN/WHT
BLK/YEL
GRN/WHT
BLK/YEL
PARK/ STAND-BY SWITCH
STOP SWITCH
REAR WIPER MOTOR
HATCH GLASS OPENER SWITCH
HATCH GLASS LATCH SWITCH
HATCH GLASS OPENER ACTUATOR
BLK
BLK
BLK
BLK
BLK
G601
G701
G501
G601
G701

Multiplex Control System (Fog Light Control, Immobilizer Control, Interlock Control, Intermittent Wiper Control, Entry Lights Control)

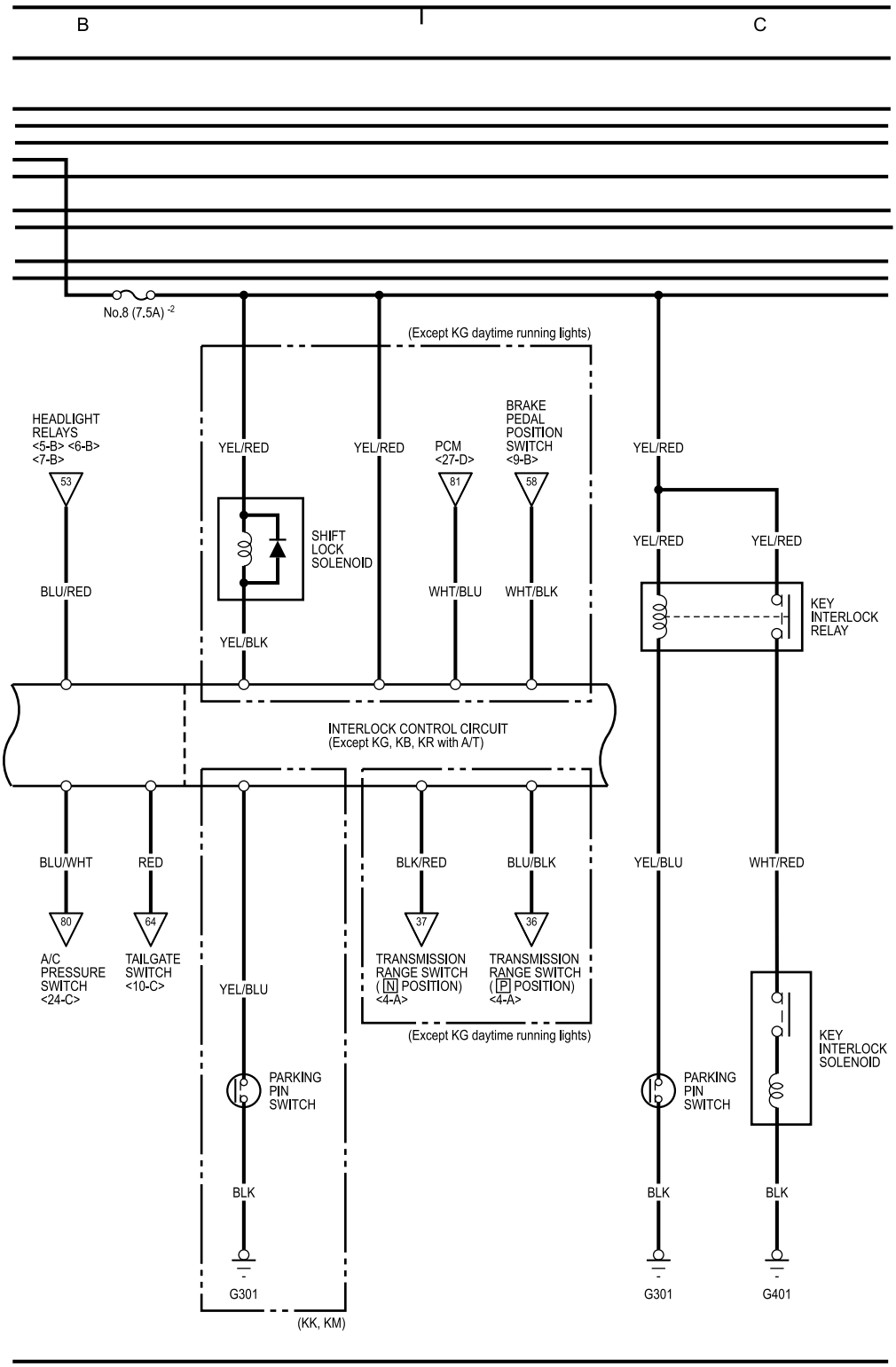


Multiplex Control system (Fog Light Control, Immobilizer Control, Interlock Control, Intermittent Wiper Control, Entry Lights Control) (cont'd)

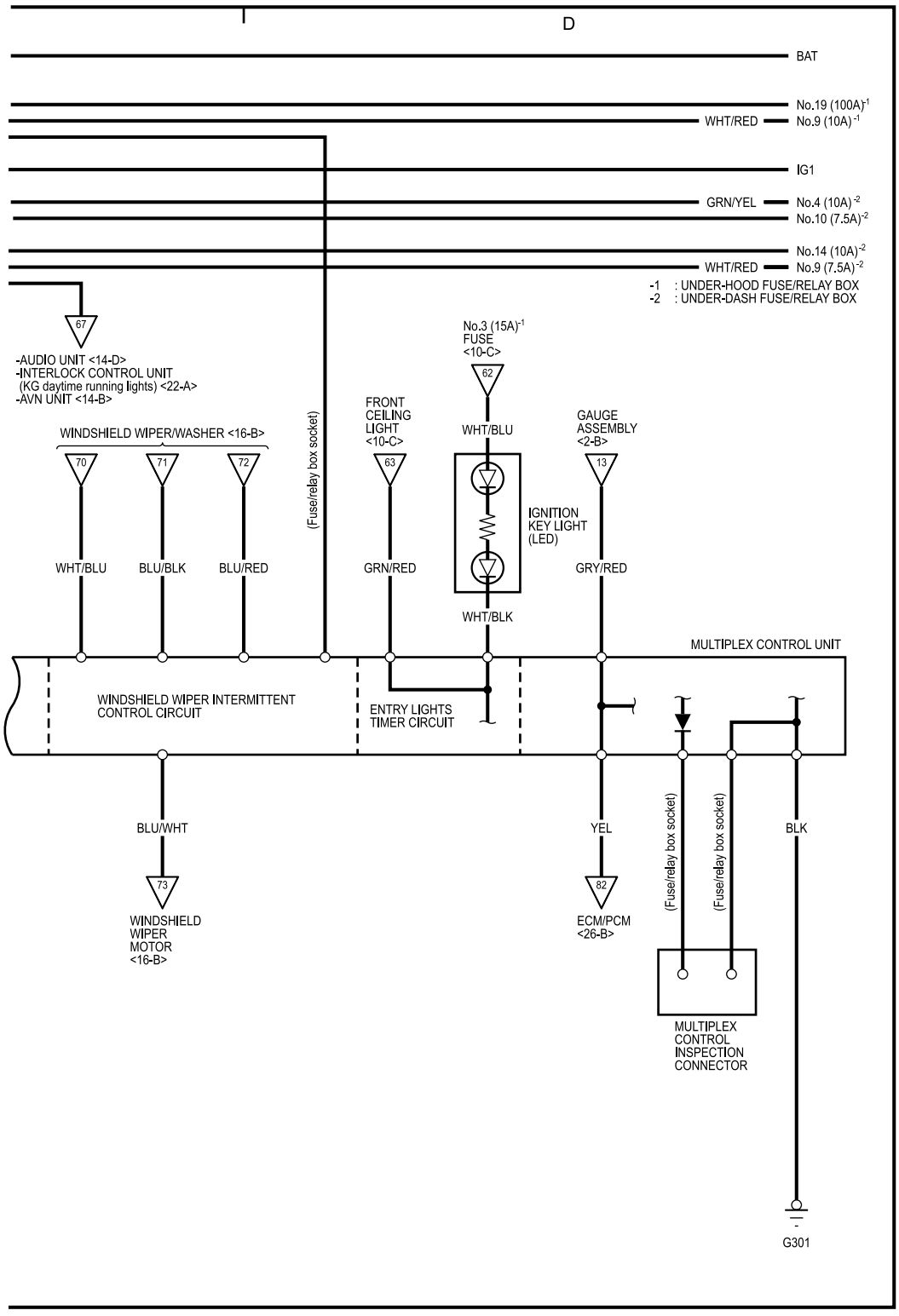
17 Multiplex Control System (Fog Light Control, Immobilizer Control, Interlock Control, Intermittent Wiper Control, Entry Lights Control)



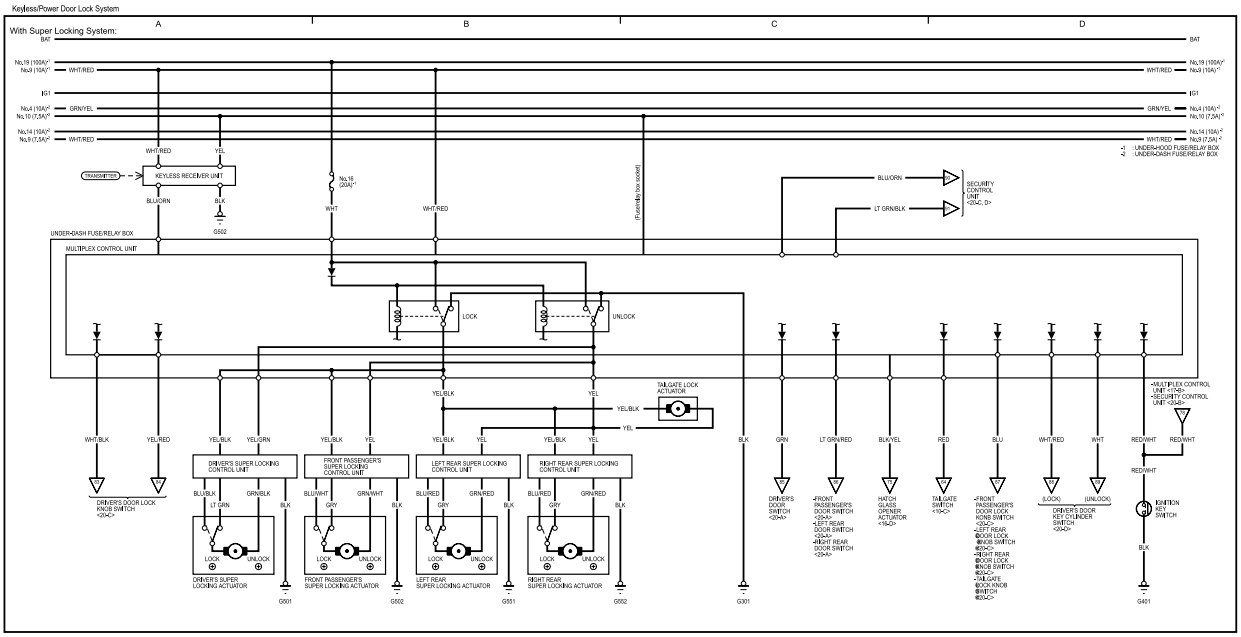
Multiplex Control system (Fog Light Control, Immobilizer Control, Interlock Control, Intermittent Wiper Control, Entry Lights Control) (cont'd)



Multiplex Control system (Fog Light Control, Immobilizer Control, Interlock Control, Intermittent Wiper Control, Entry Lights Control) (cont'd)

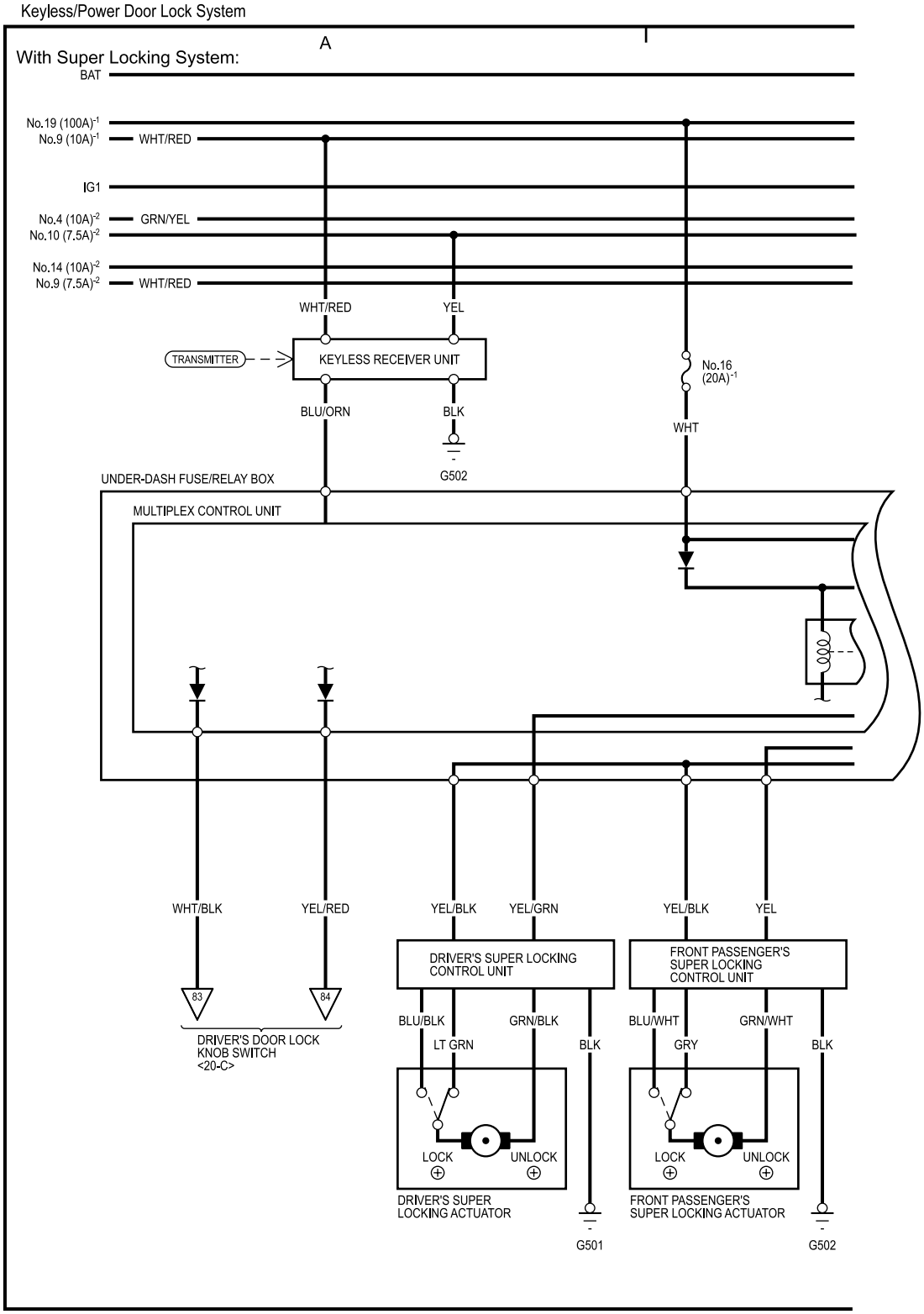


Keyless/Power Door Lock System (With Super locking System)

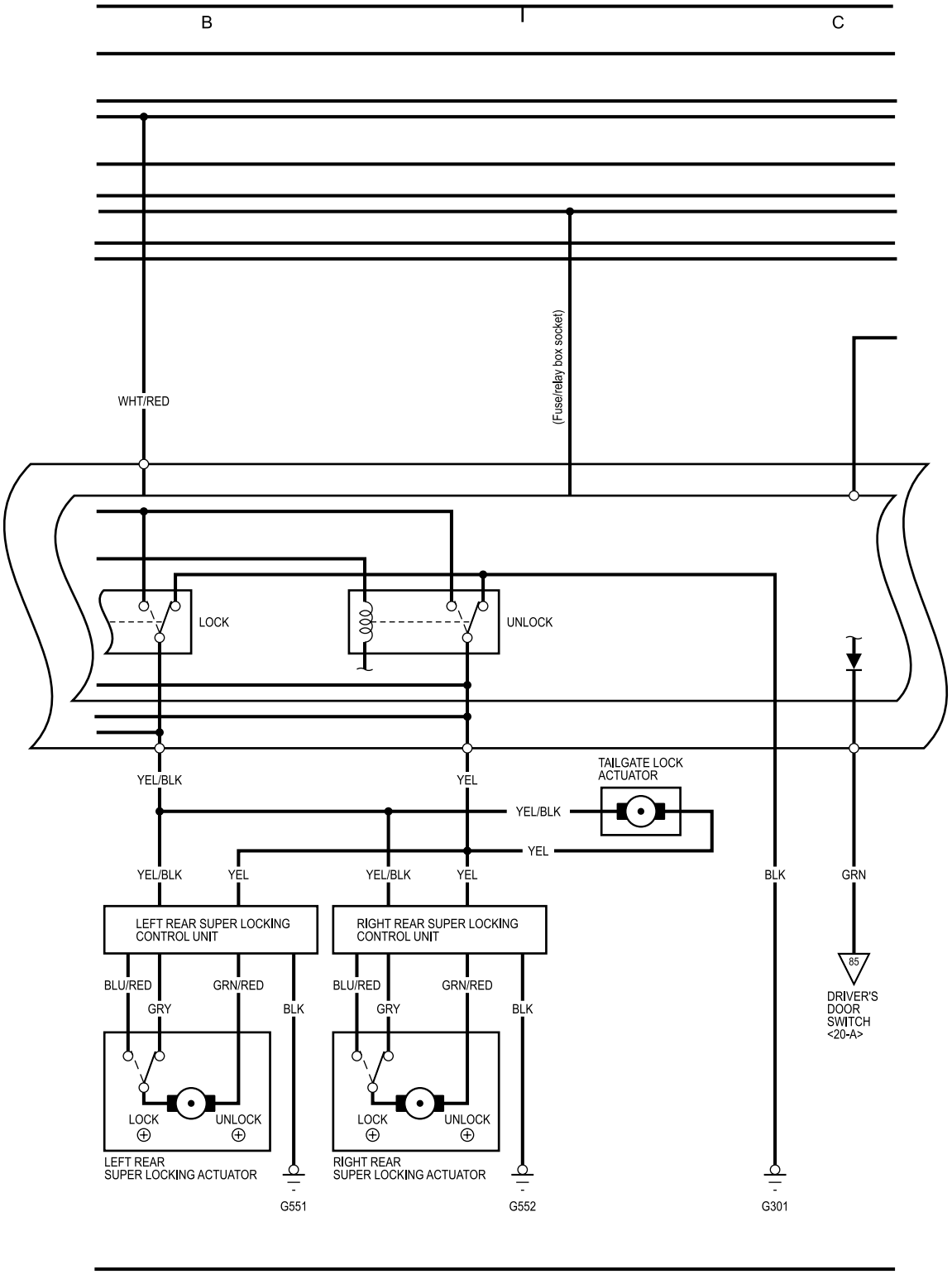


Keyless/Power Door Lock System (With Super locking System) (cont'd)

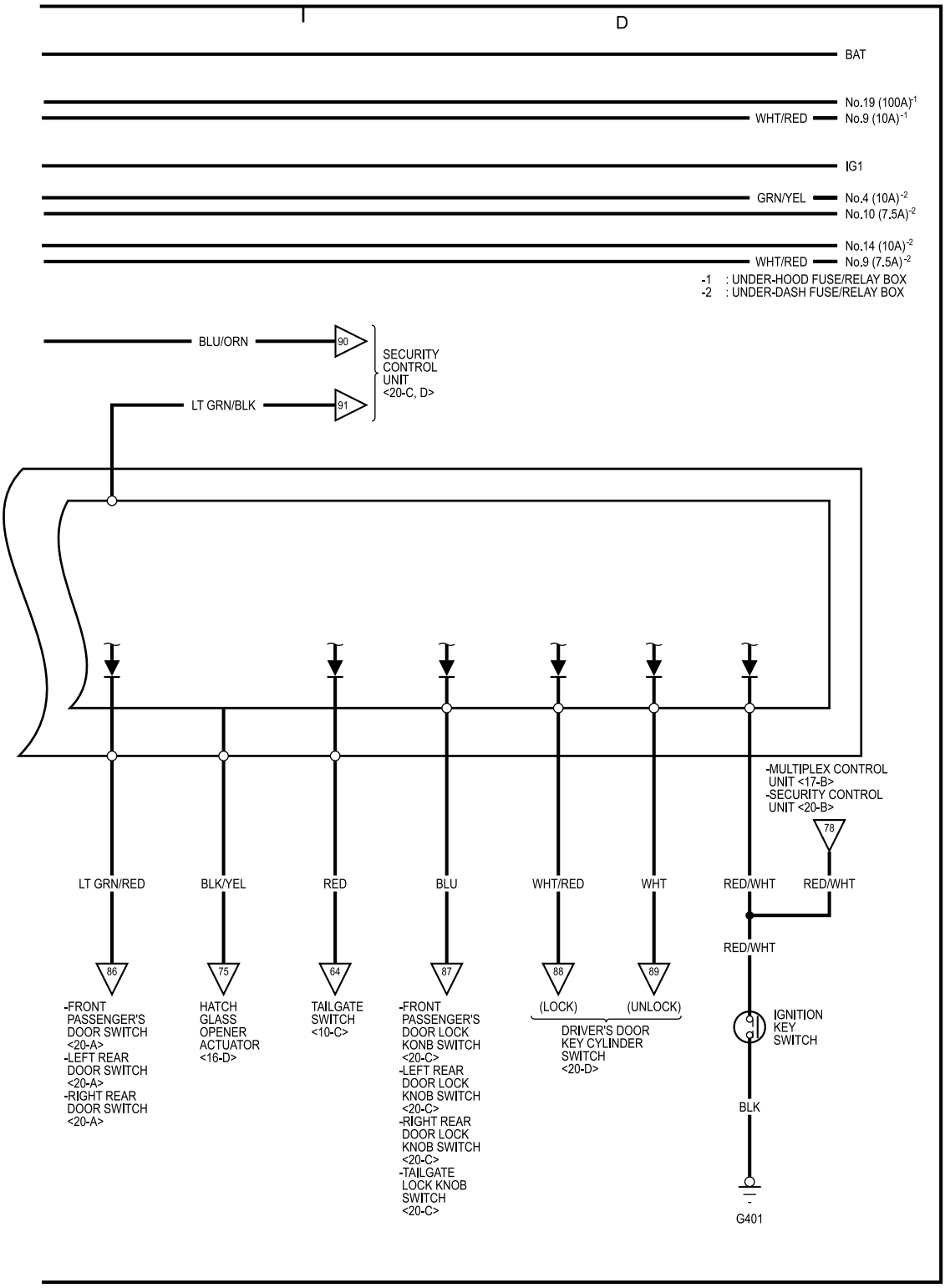
18



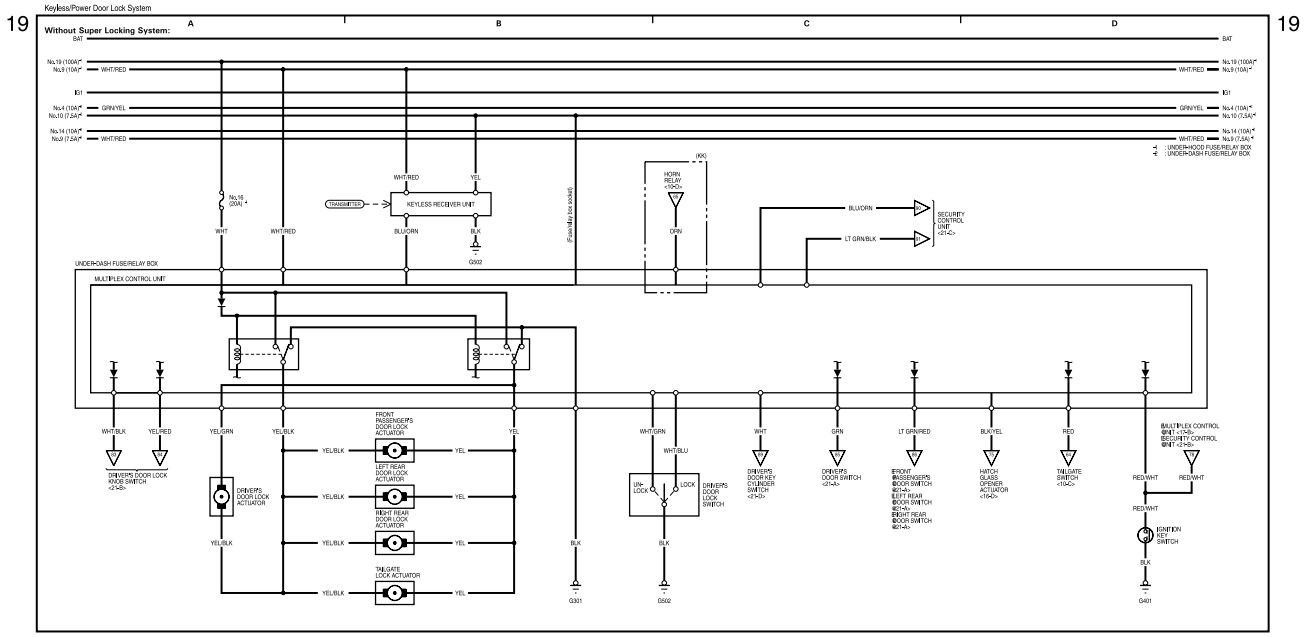
Keyless/Power Door Lock System (With Super locking System) (cont'd)



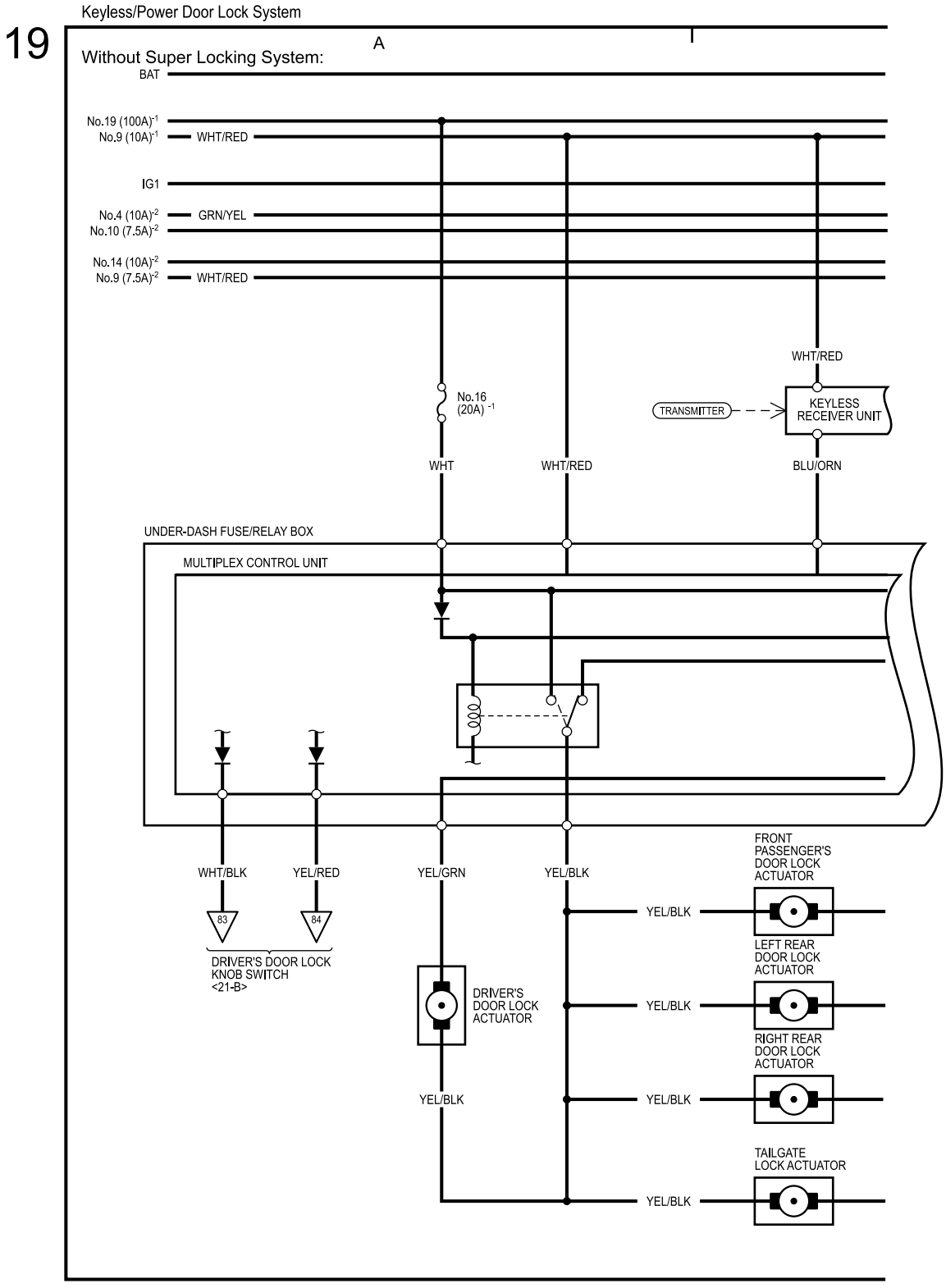
Keyless/Power Door Lock System (With Super locking System) (cont'd)



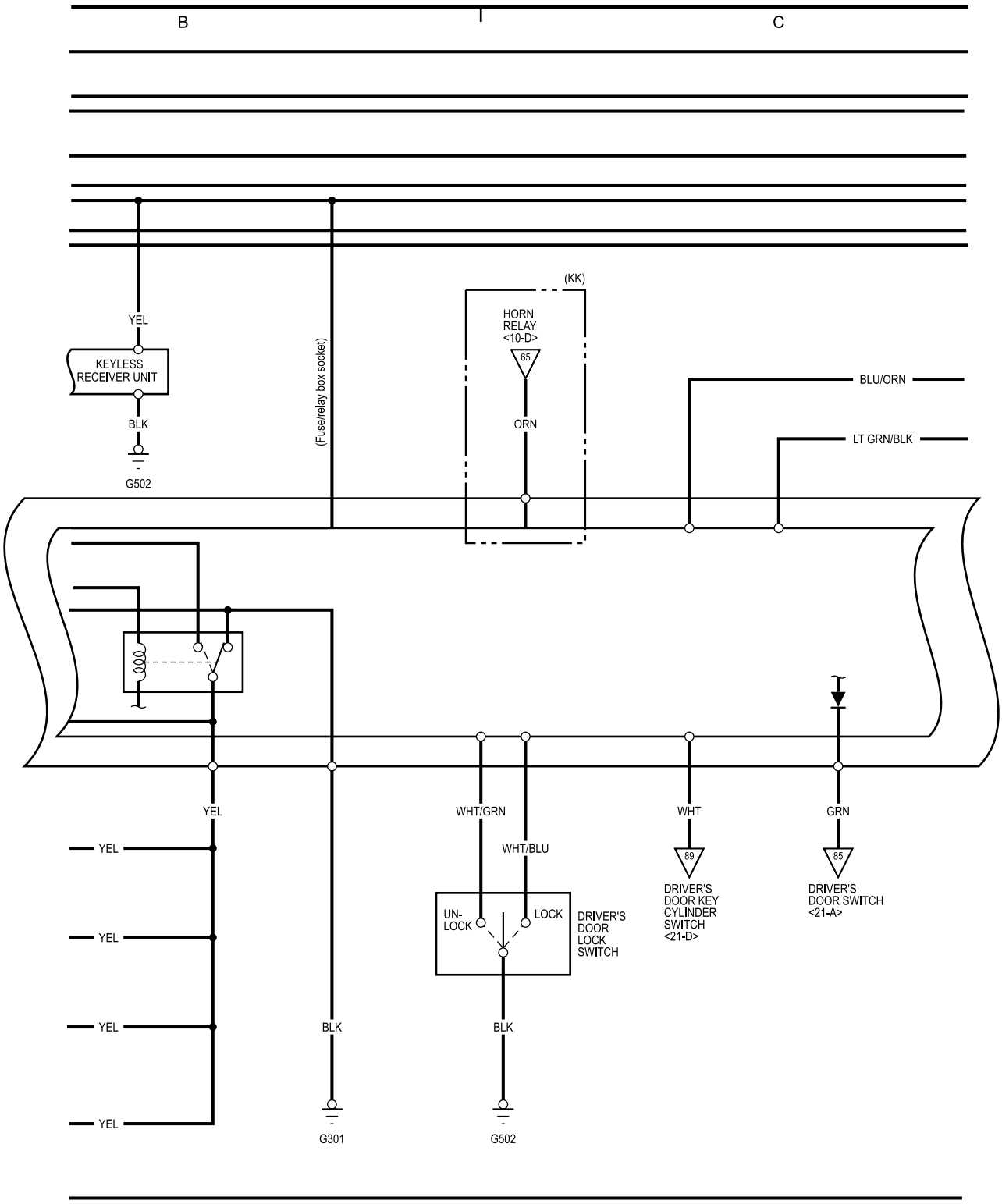
Keyless/Power Door Lock System (Without Super locking System)



Keyless/Power Door Lock System (Without Super locking System) (cont'd)

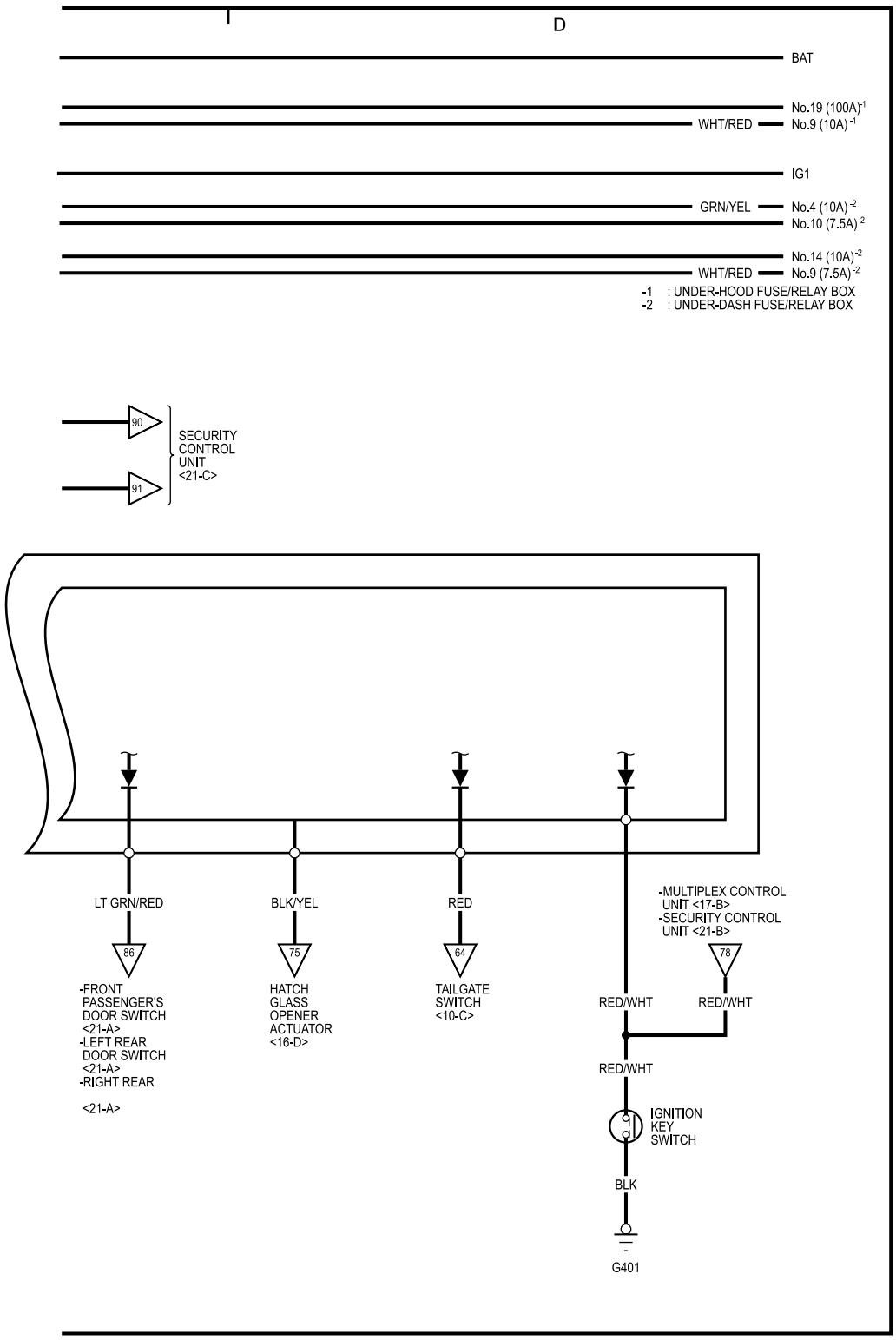


Keyless/Power Door Lock System (Without Super locking System) (cont'd)

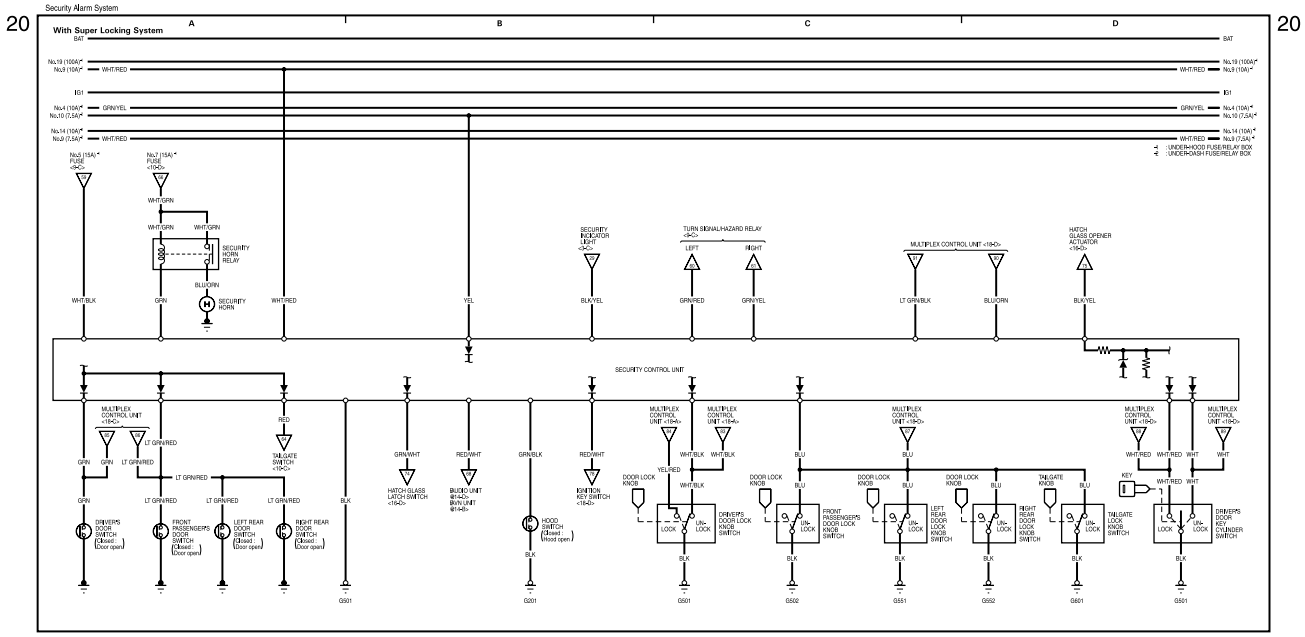


Keyless/Power Door Lock System (Without Super locking System) (cont'd)

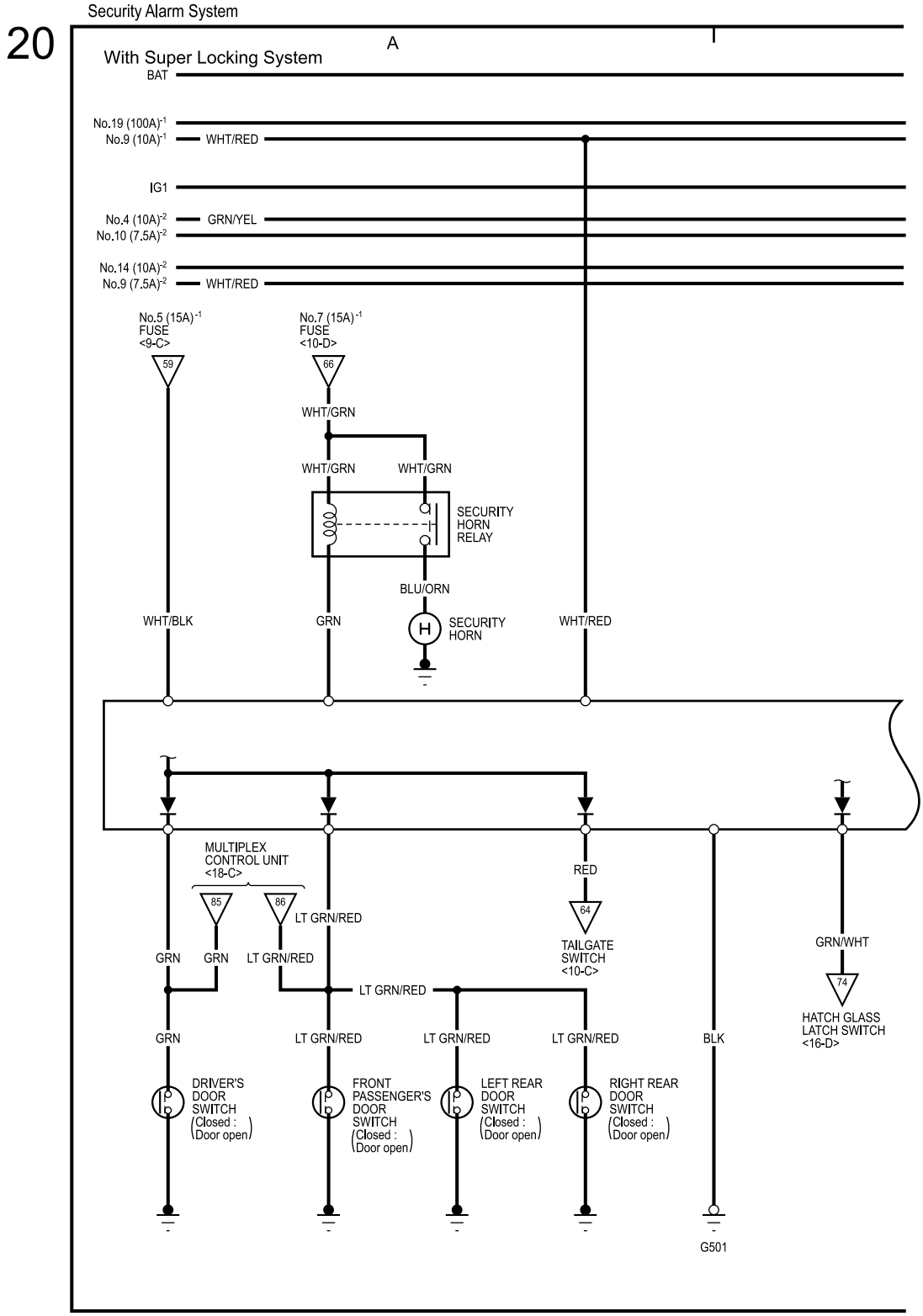
19



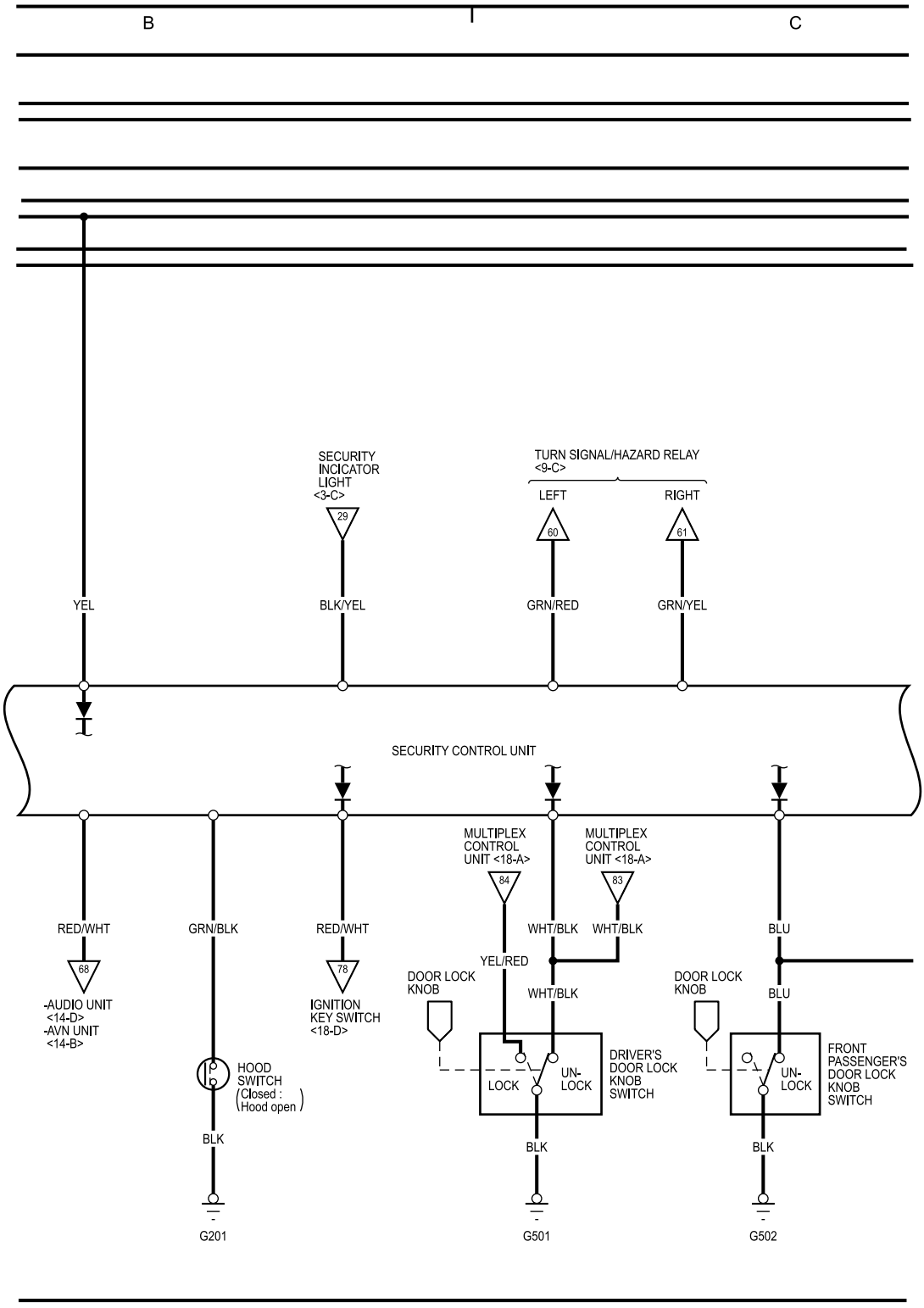
Security Alarm System (With Super Locking System)



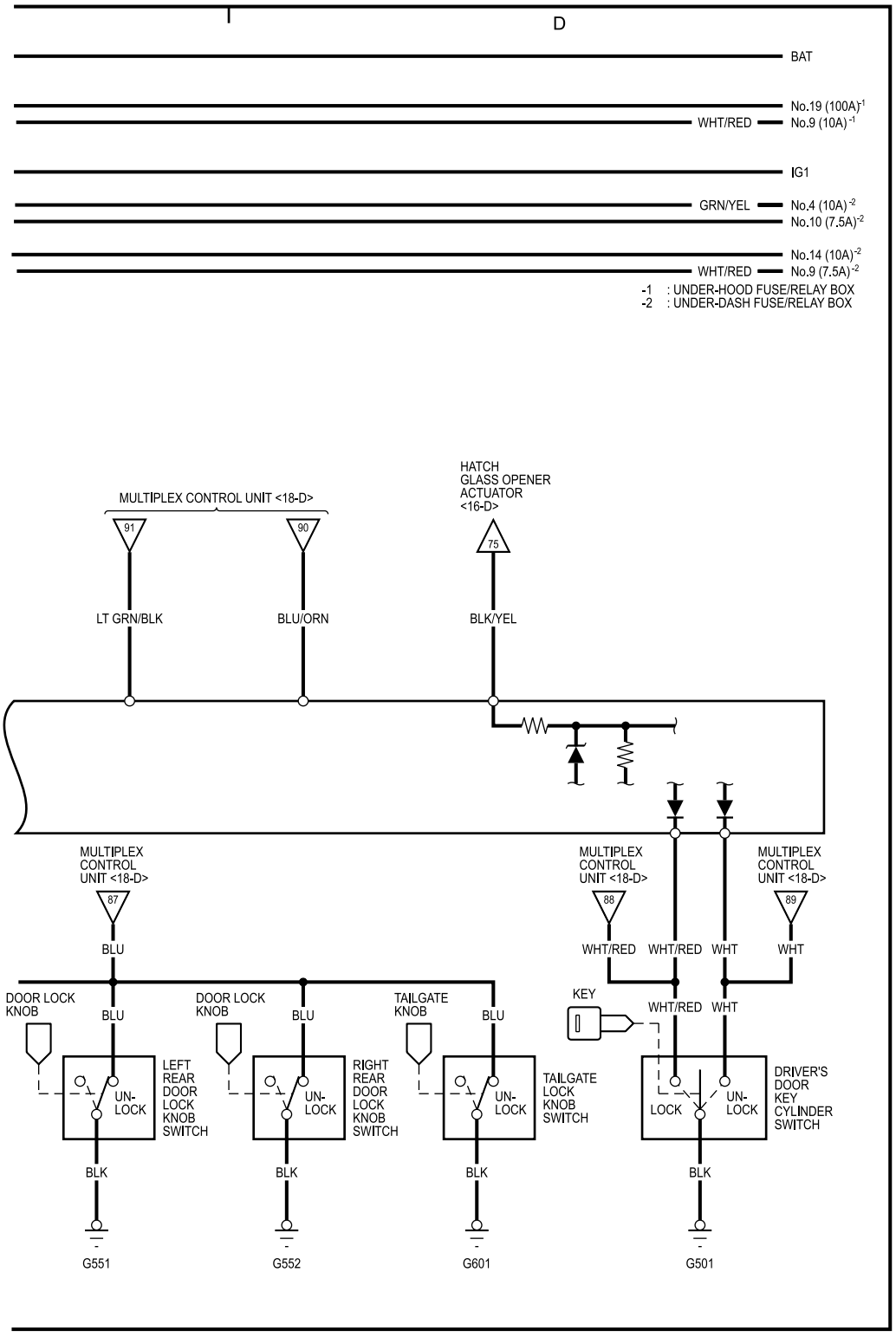
Security Alarm System (With Super Locking System) (cont'd)



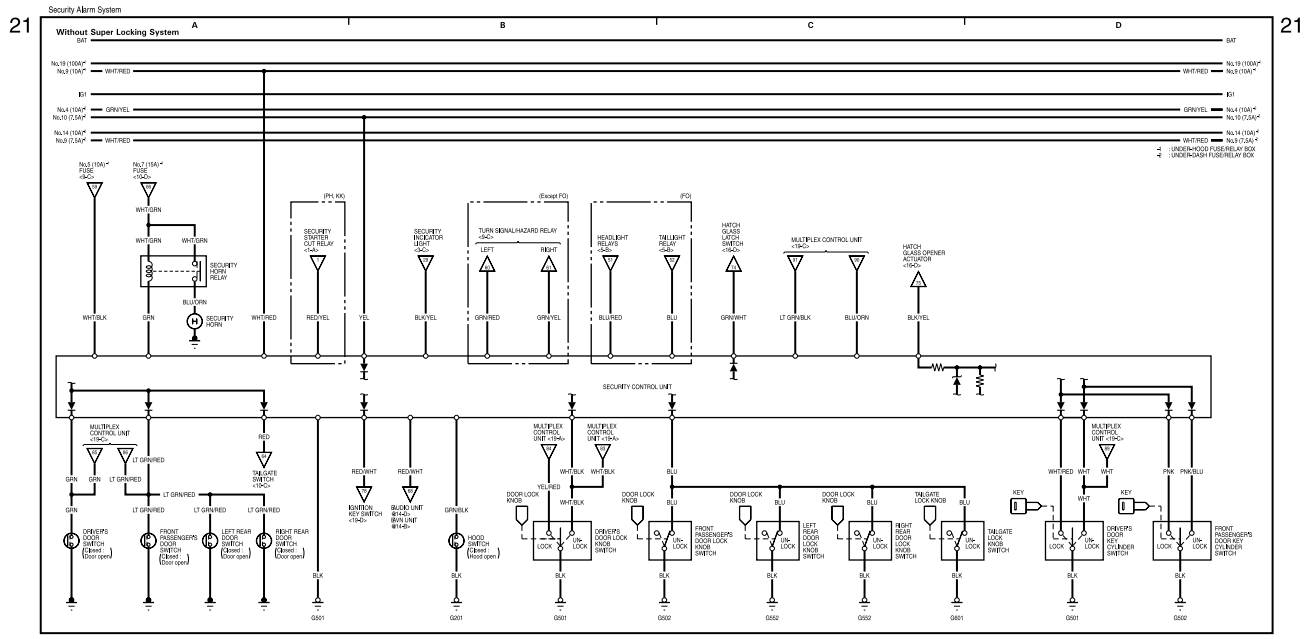
Security Alarm System (With Super Locking System) (cont'd)



20

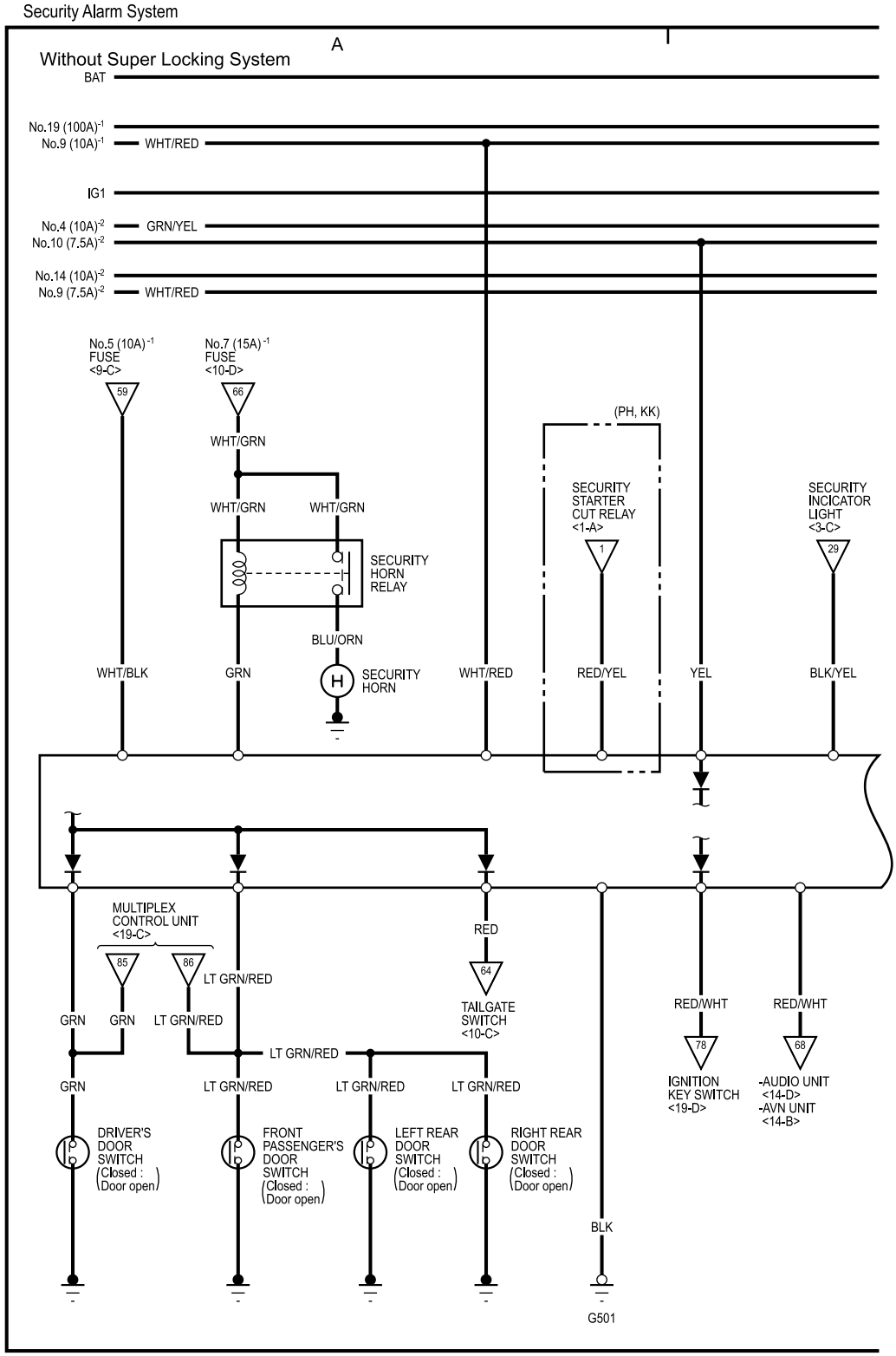

I
D
BAT
No.19 (100A)-1
WHT/RED
No.9 (10A)-1
IG1
GRN/YEL
No.4 (10A)-2
No.10 (7.5A)-2
No.14 (10A)-2
WHT/RED
No.9 (7.5A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
MULTIPLEX CONTROL UNIT <18-D>
HATCH GLASS OPENER ACTUATOR <16-D>
91
90
75
LT GRN/BLK
BLU/ORN
BLK/YEL
MULTIPLEX CONTROL UNIT <18-D>
87
BLU
MULTIPLEX CONTROL UNIT <18-D>
88
WHT/RED
MULTIPLEX CONTROL UNIT <18-D>
89
WHT/RED
WHT
WHT
DOOR LOCK KNOB
BLU
UN-LOCK
LEFT REAR DOOR LOCK KNOB SWITCH
BLK
G551
DOOR LOCK KNOB
BLU
UN-LOCK
RIGHT REAR DOOR LOCK KNOB SWITCH
BLK
G552
TAILGATE KNOB
BLU
UN-LOCK
TAILGATE LOCK KNOB SWITCH
BLK
G601
KEY
WHT/RED
WHT
LOCK
UN-LOCK
DRIVER'S DOOR KEY CYLINDER SWITCH
BLK
G501

Security Alarm System (Without Super Locking System)

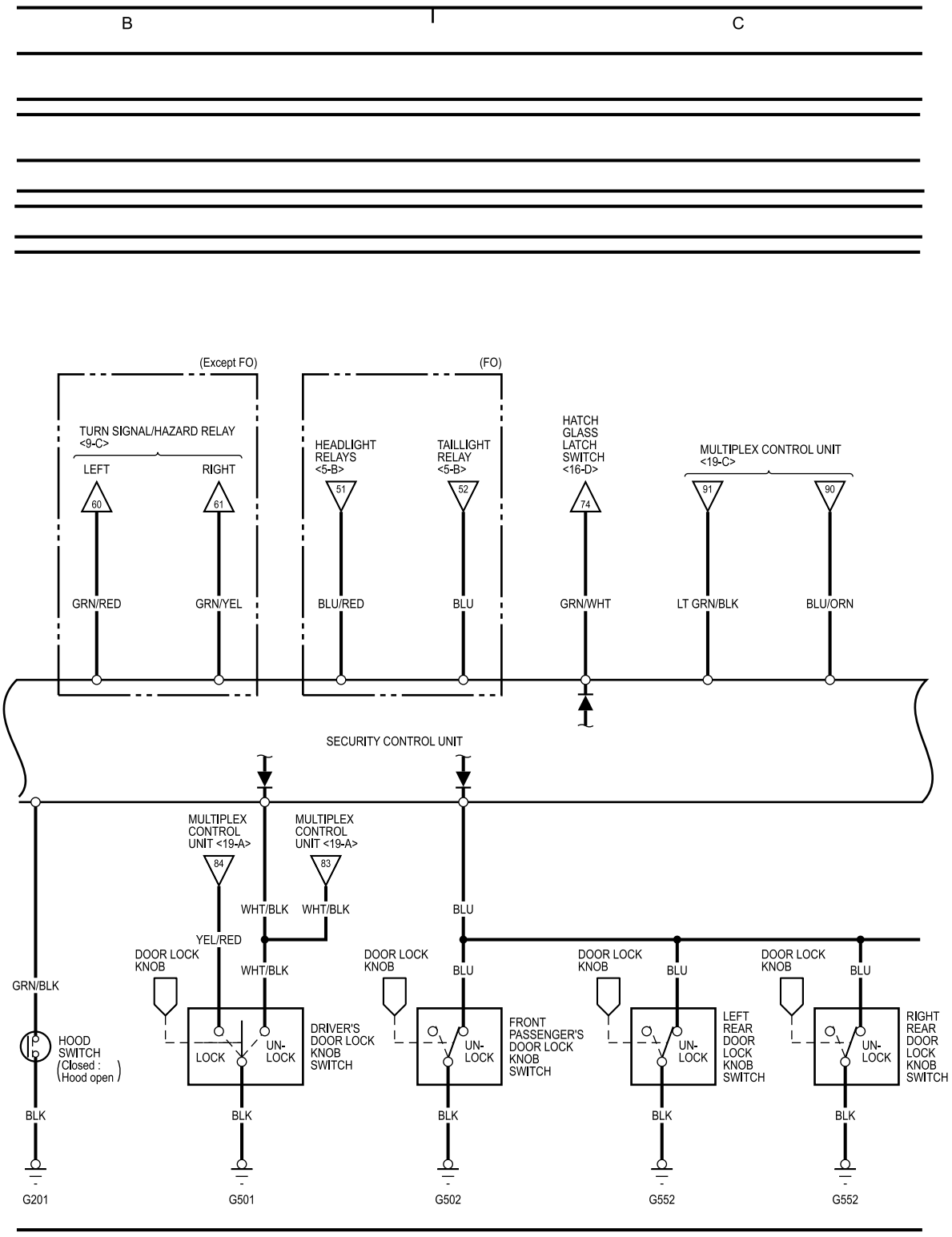


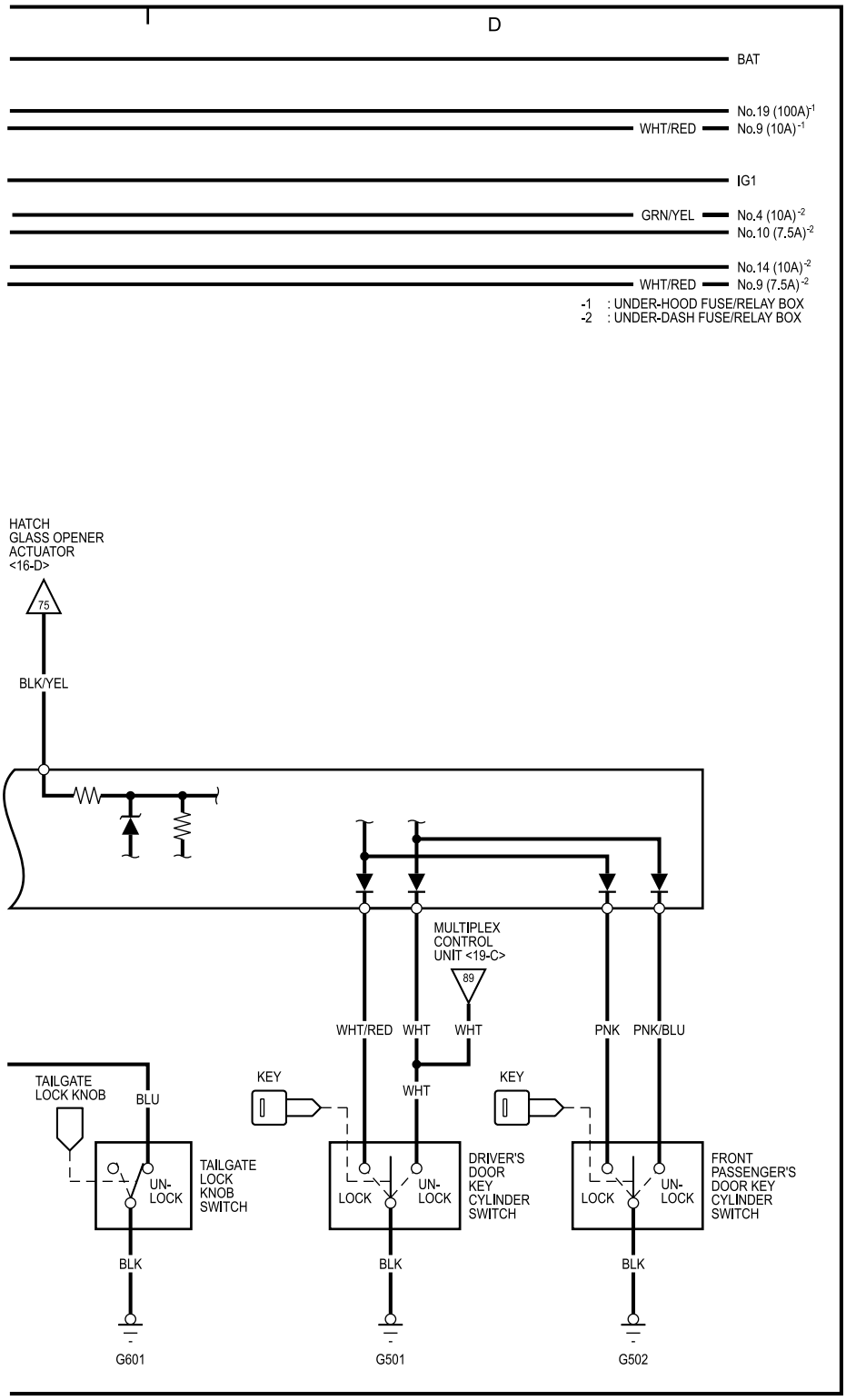
Security Alarm System (Without Super Locking System) (cont'd)

21

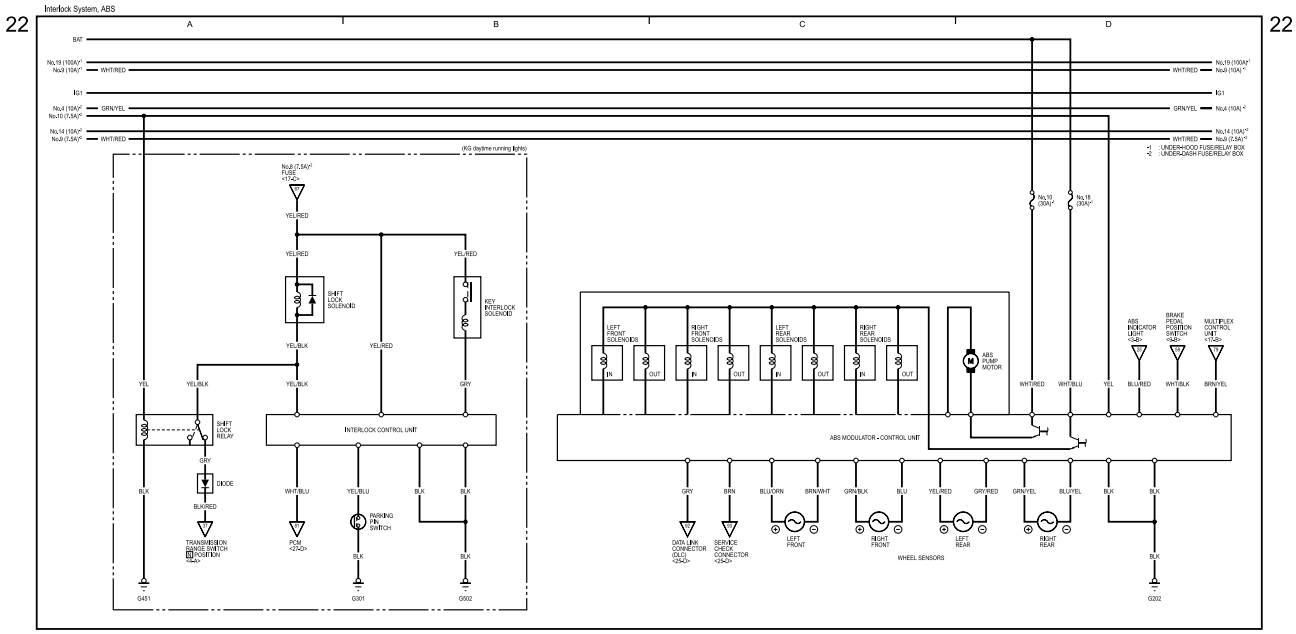


Security Alarm System (Without Super Locking System) (cont'd)

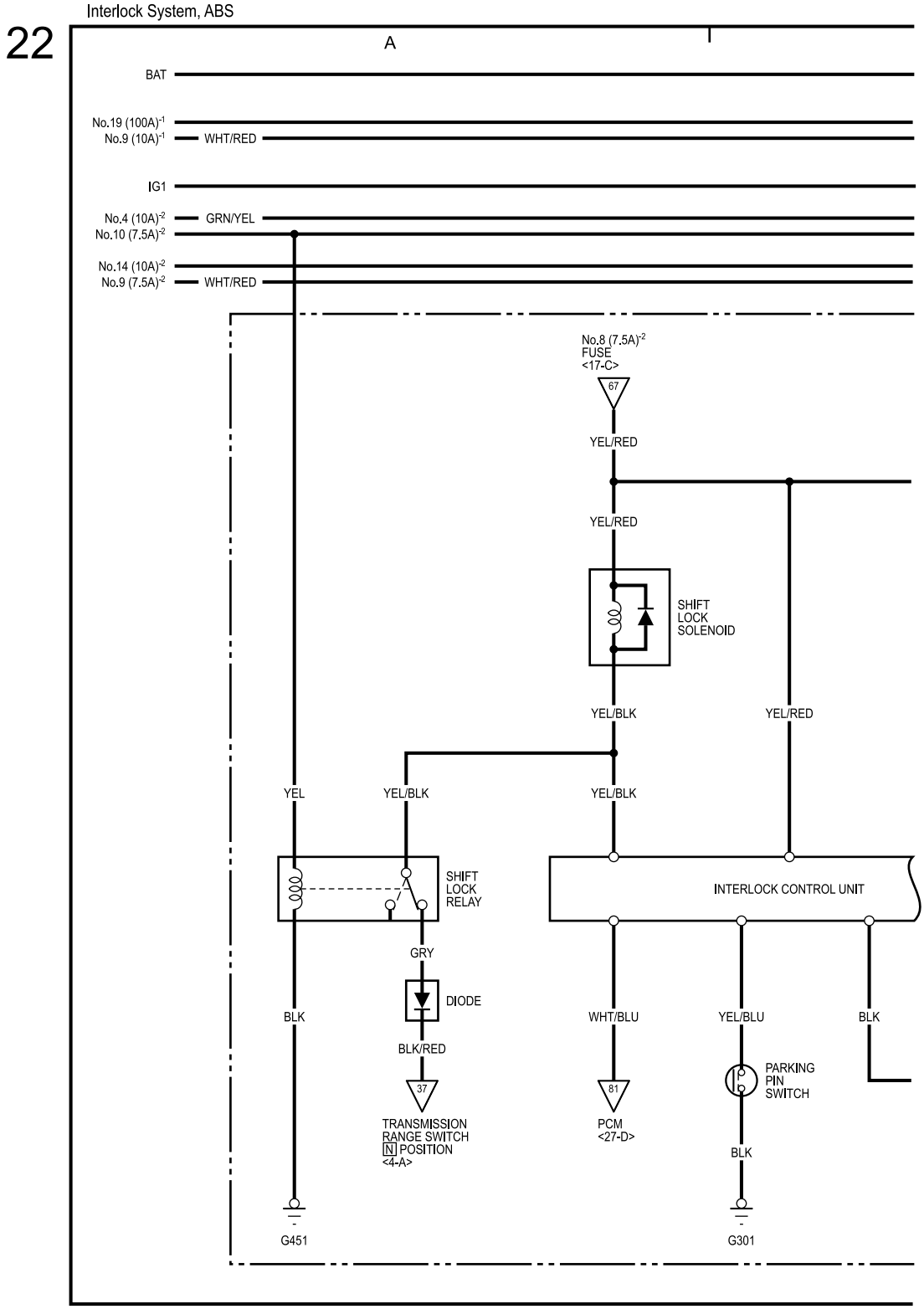



I
D
21
BAT
No.19 (100A)-1
WHT/RED
No.9 (10A)-1
IG1
GRN/YEL
No.4 (10A)-2
No.10 (7.5A)-2
No.14 (10A)-2
WHT/RED
No.9 (7.5A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
HATCH GLASS OPENER ACTUATOR <16-D>
75
BLK/YEL
MULTIPLEX CONTROL UNIT <19-C>
89
WHT/RED
WHT
WHT
PNK
PNK/BLU
WHT
TAILGATE LOCK KNOB
BLU
KEY
KEY
UN-LOCK
TAILGATE LOCK KNOB SWITCH
LOCK
UN-LOCK
DRIVER'S DOOR KEY CYLINDER SWITCH
LOCK
UN-LOCK
FRONT PASSENGER'S DOOR KEY CYLINDER SWITCH
BLK
BLK
BLK
G601
G501
G502

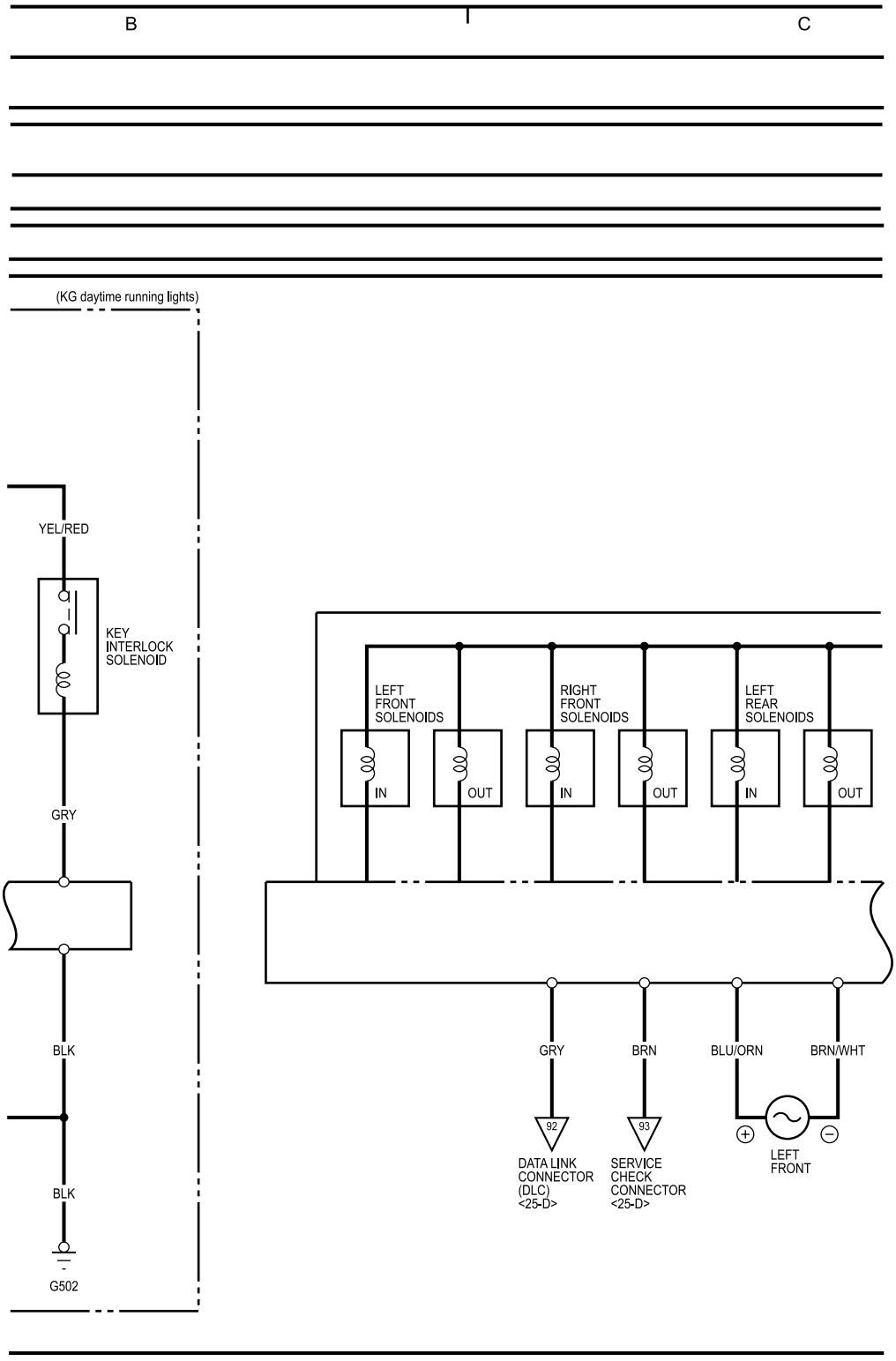
Interlock System, ABS



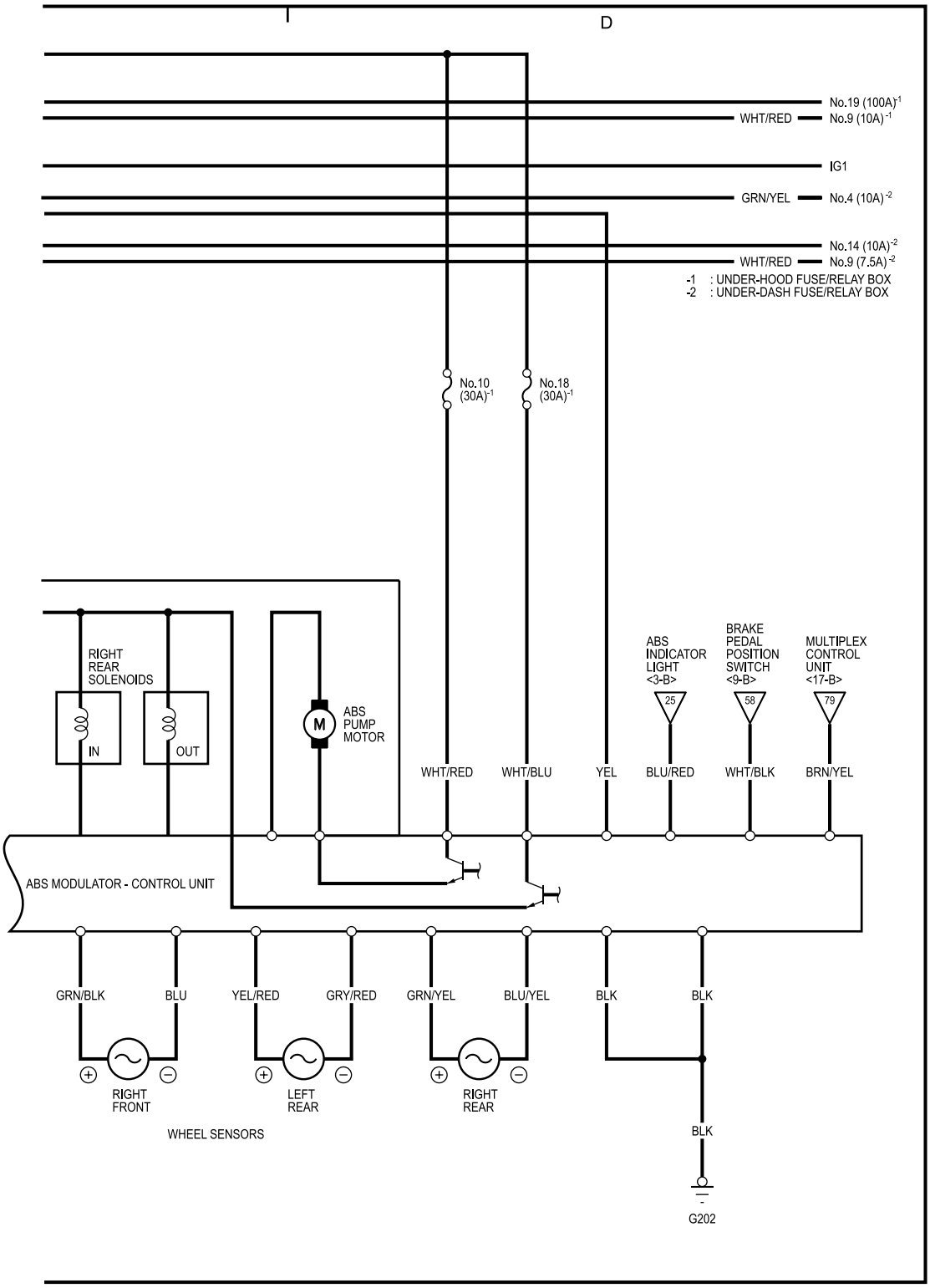
Interlock System, ABS (cont'd)



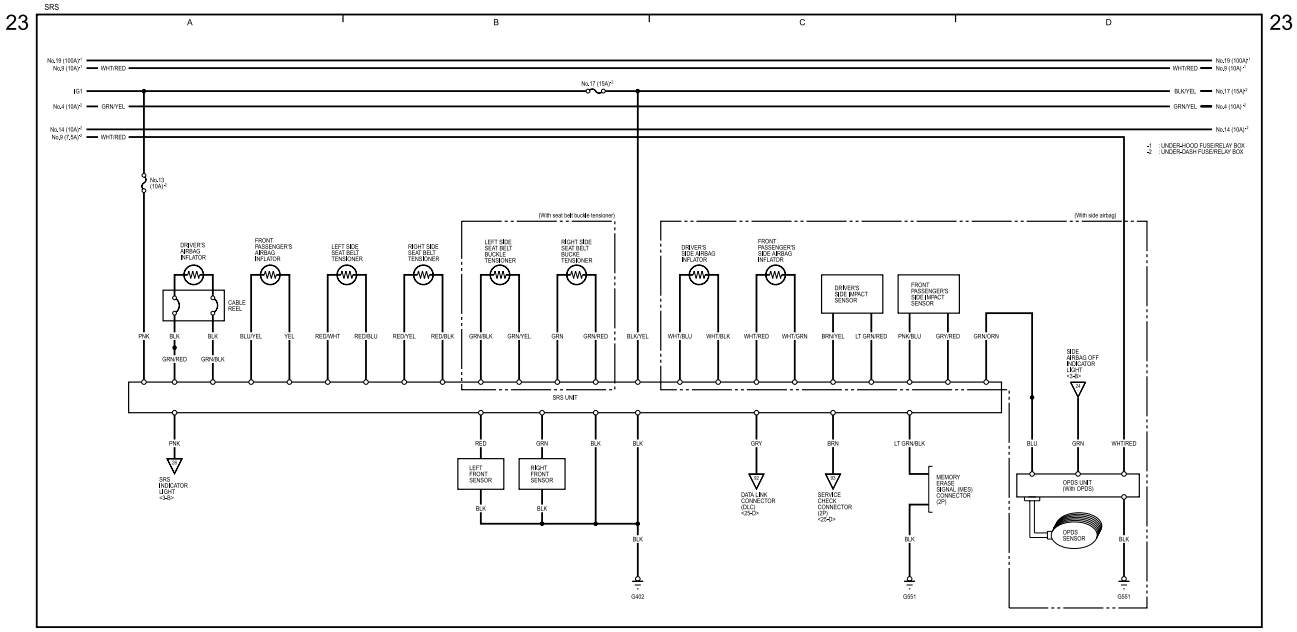
Interlock System, ABS (cont'd)



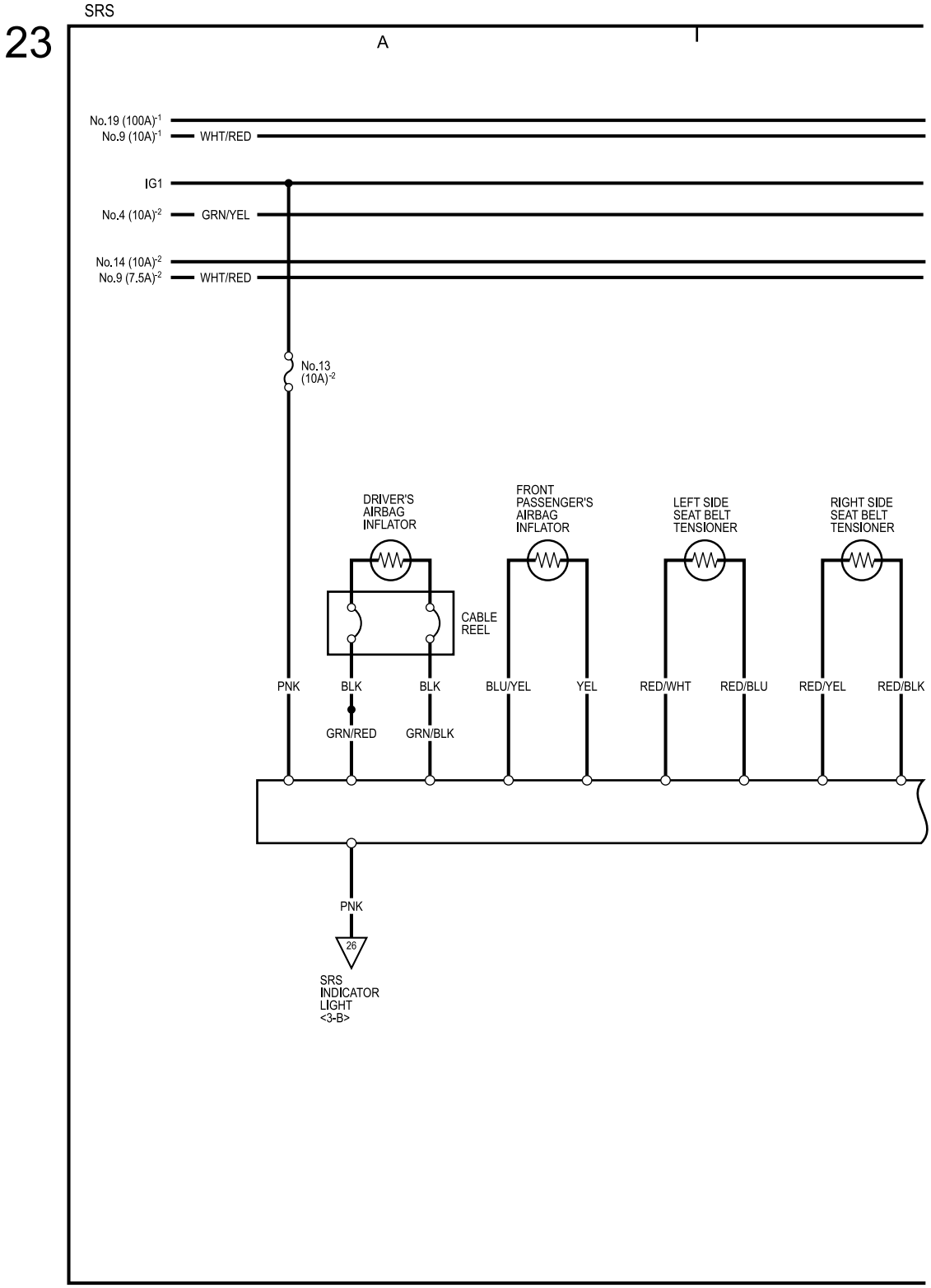
Interlock System, ABS (cont'd)



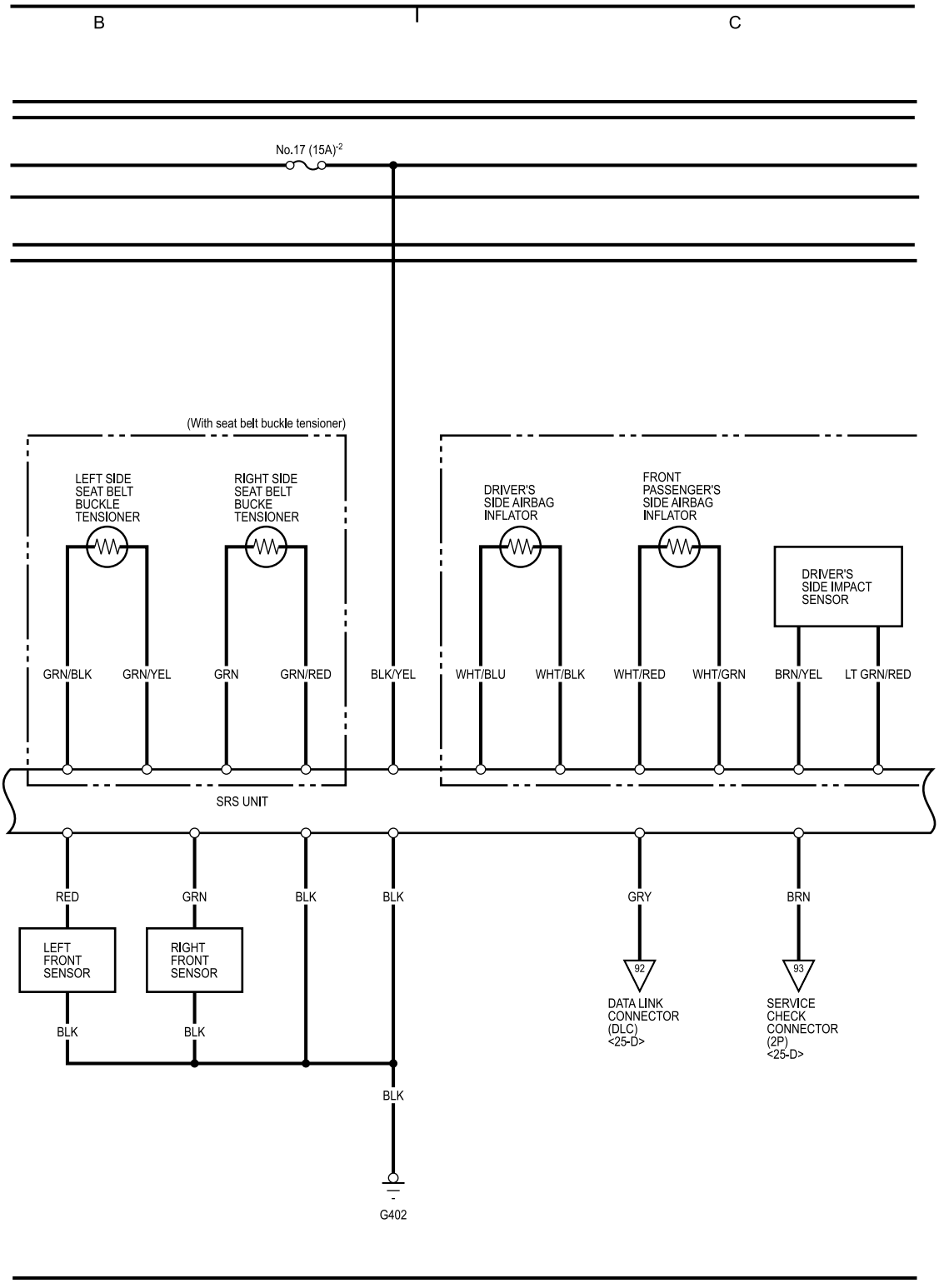
SRS

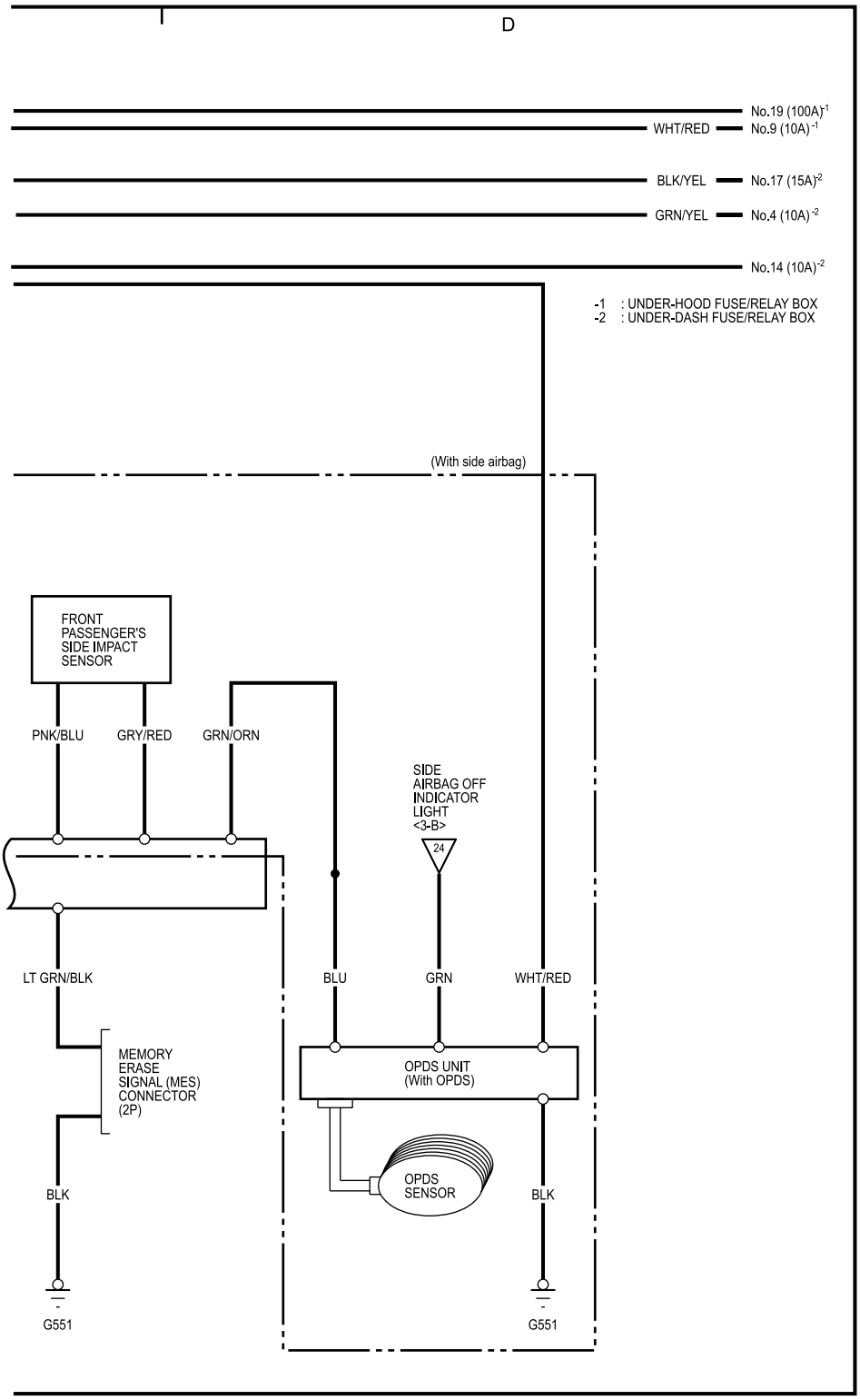

SRS
23
A
B
C
D
23
No.19 (100A)*2
No.9 (10A)*2
WHT/RED
IG1
No.4 (10A)*2
GRN/YEL
No.14 (10A)*2
No.9 (7.5A)*2
No.17 (15A)*2
BLK/YEL
No.13 (10A)*2
*1 : UNDER-HOOD FUSE/RELAY BOX
*2 : UNDER-DASH FUSE/RELAY BOX
(With seat belt buckle tensioner)
(With side airbag)
DRIVER'S AIRBAG INFLATOR
FRONT PASSENGER'S AIRBAG INFLATOR
LEFT SIDE SEAT BELT TENSIONER
RIGHT SIDE SEAT BELT TENSIONER
LEFT SIDE SEAT BELT BUCKLE TENSIONER
RIGHT SIDE SEAT BELT BUCKLE TENSIONER
DRIVER'S SIDE AIRBAG INFLATOR
FRONT PASSENGER'S SIDE AIRBAG INFLATOR
DRIVER'S SIDE IMPACT SENSOR
FRONT PASSENGER'S SIDE IMPACT SENSOR
CABLE REEL
PNK
BLK
GRN/RED
GRN/BLK
BLU/YEL
YEL
RED/WHT
RED/BLU
RED/YEL
RED/BLK
GRN/BLK
GRN/YEL
GRN
GRN/RED
BLK/YEL
WHT/BLU
WHT/BLK
WHT/RED
WHT/GRN
BRN/YEL
LT GRN/RED
PNK/BLU
GRY/RED
GRN/ORN
SIDE AIRBAG OFF INDICATOR LIGHT <3A>
SRS UNIT
SRS INDICATOR LIGHT <3B>
RED
GRN
LEFT FRONT SENSOR
RIGHT FRONT SENSOR
DATA LINK CONNECTOR (DLC) <2H>
GRY
SERVICE CHECK CONNECTOR (2P) <2H>
BRN
LT GRN/BLK
MEMORY ERASE SIGNAL (MES) CONNECTOR (2P)
BLU
GRN
WHT/RED
OPDS UNIT (With OPDS)
OPDS SENSOR
G402
G551
G551

SRS (cont'd)

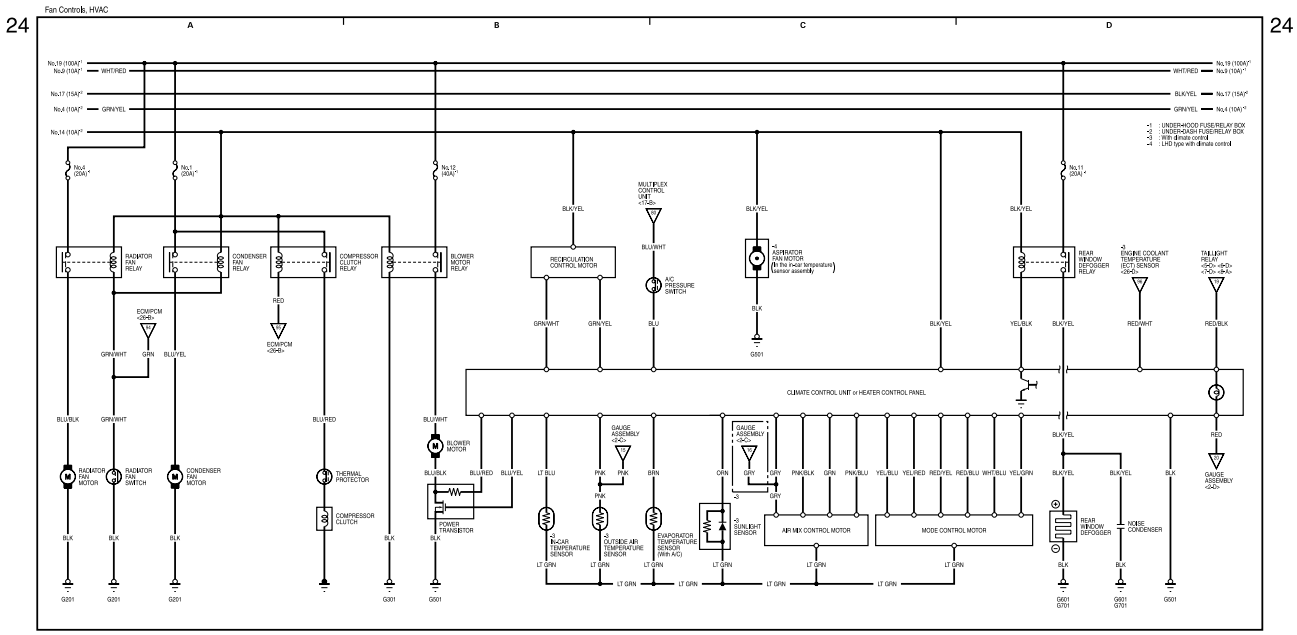

SRS
23
A
No.19 (100A)-1
No.9 (10A)-1
WHT/RED
IG1
No.4 (10A)-2
GRN/YEL
No.14 (10A)-2
No.9 (7.5A)-2
WHT/RED
No.13
(10A)-2
DRIVER'S AIRBAG INFLATOR
FRONT PASSENGER'S AIRBAG INFLATOR
LEFT SIDE SEAT BELT TENSIONER
RIGHT SIDE SEAT BELT TENSIONER
CABLE REEL
PNK
BLK
BLK
BLU/YEL
YEL
RED/WHT
RED/BLU
RED/YEL
RED/BLK
GRN/RED
GRN/BLK
PNK
26
SRS INDICATOR LIGHT
<3-B>

SRS (cont'd)

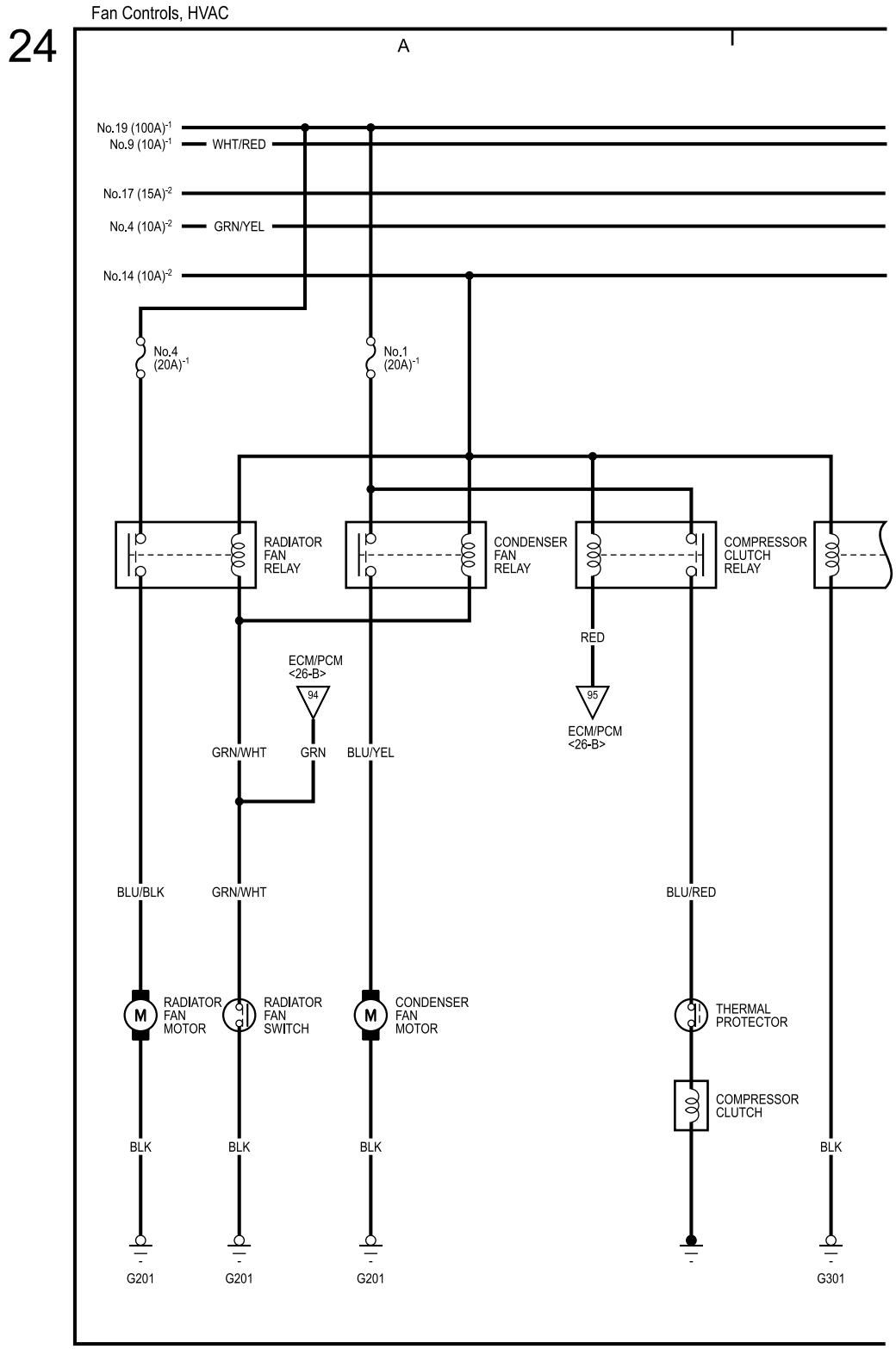

B
I
C
No.17 (15A)-2
(With seat belt buckle tensioner)
LEFT SIDE SEAT BELT BUCKLE TENSIONER
RIGHT SIDE SEAT BELT BUCKE TENSIONER
DRIVER'S SIDE AIRBAG INFLATOR
FRONT PASSENGER'S SIDE AIRBAG INFLATOR
DRIVER'S SIDE IMPACT SENSOR
GRN/BLK
GRN/YEL
GRN
GRN/RED
BLK/YEL
WHT/BLU
WHT/BLK
WHT/RED
WHT/GRN
BRN/YEL
LT GRN/RED
SRS UNIT
RED
GRN
BLK
BLK
GRY
BRN
LEFT FRONT SENSOR
RIGHT FRONT SENSOR
92
93
DATA LINK CONNECTOR (DLC) <25-D>
SERVICE CHECK CONNECTOR (2P) <25-D>
BLK
BLK
BLK
G402


I
D
23
No.19 (100A)-1
WHT/RED
No.9 (10A)-1
BLK/YEL
No.17 (15A)-2
GRN/YEL
No.4 (10A)-2
No.14 (10A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
(With side airbag)
FRONT PASSENGER'S SIDE IMPACT SENSOR
PNK/BLU
GRY/RED
GRN/ORN
SIDE AIRBAG OFF INDICATOR LIGHT <3-B>
24
LT GRN/BLK
BLU
GRN
WHT/RED
MEMORY ERASE SIGNAL (MES) CONNECTOR (2P)
OPDS UNIT (With OPDS)
OPDS SENSOR
BLK
BLK
G551
G551

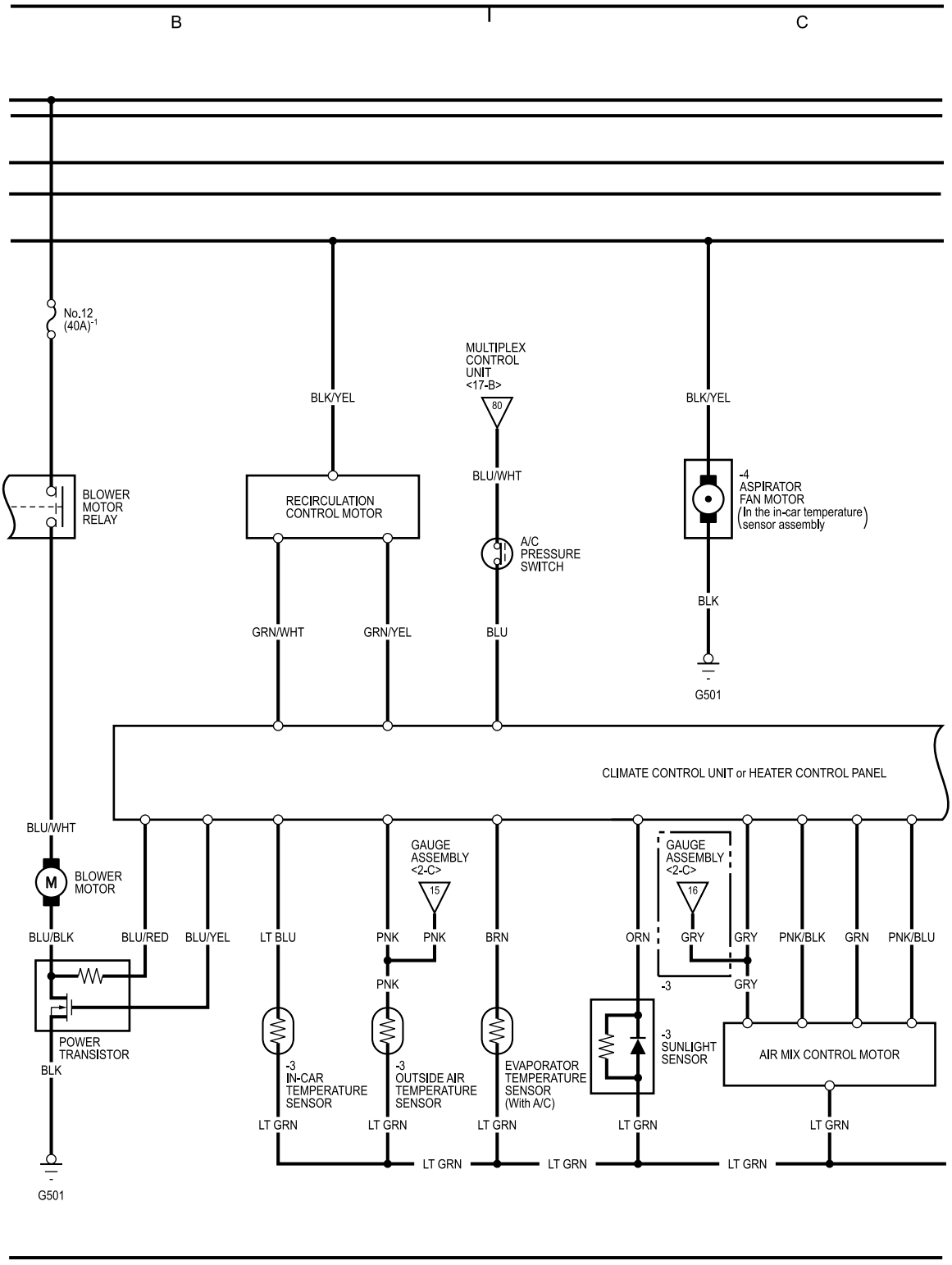
Fan Controls, HVAC

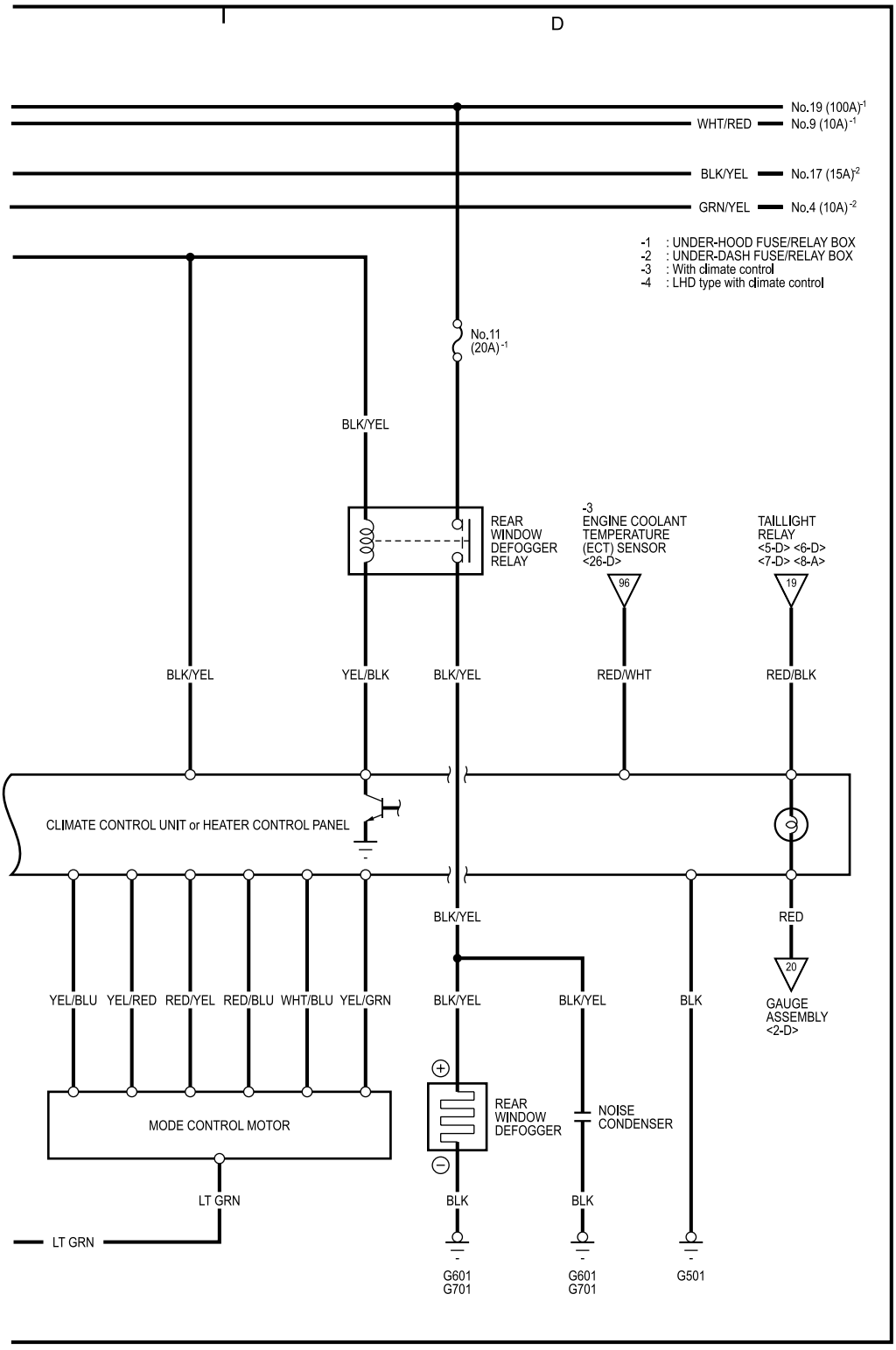


Fan Controls, HVAC (cont'd)

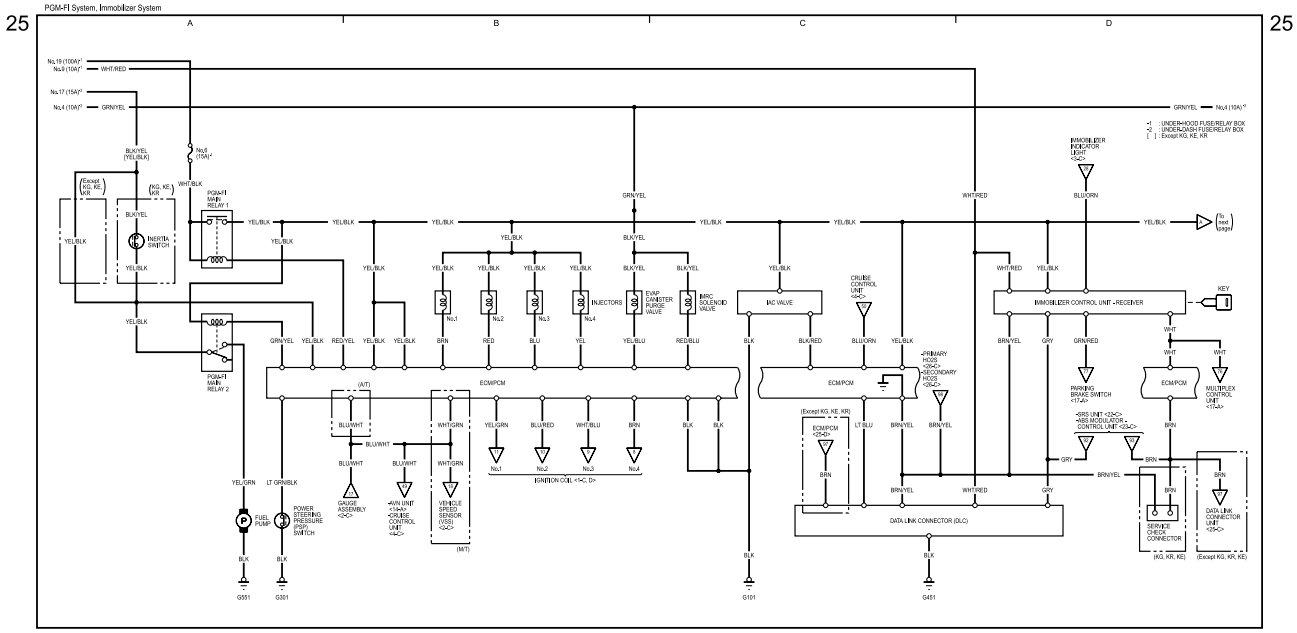


Fan Controls, HVAC (cont'd)



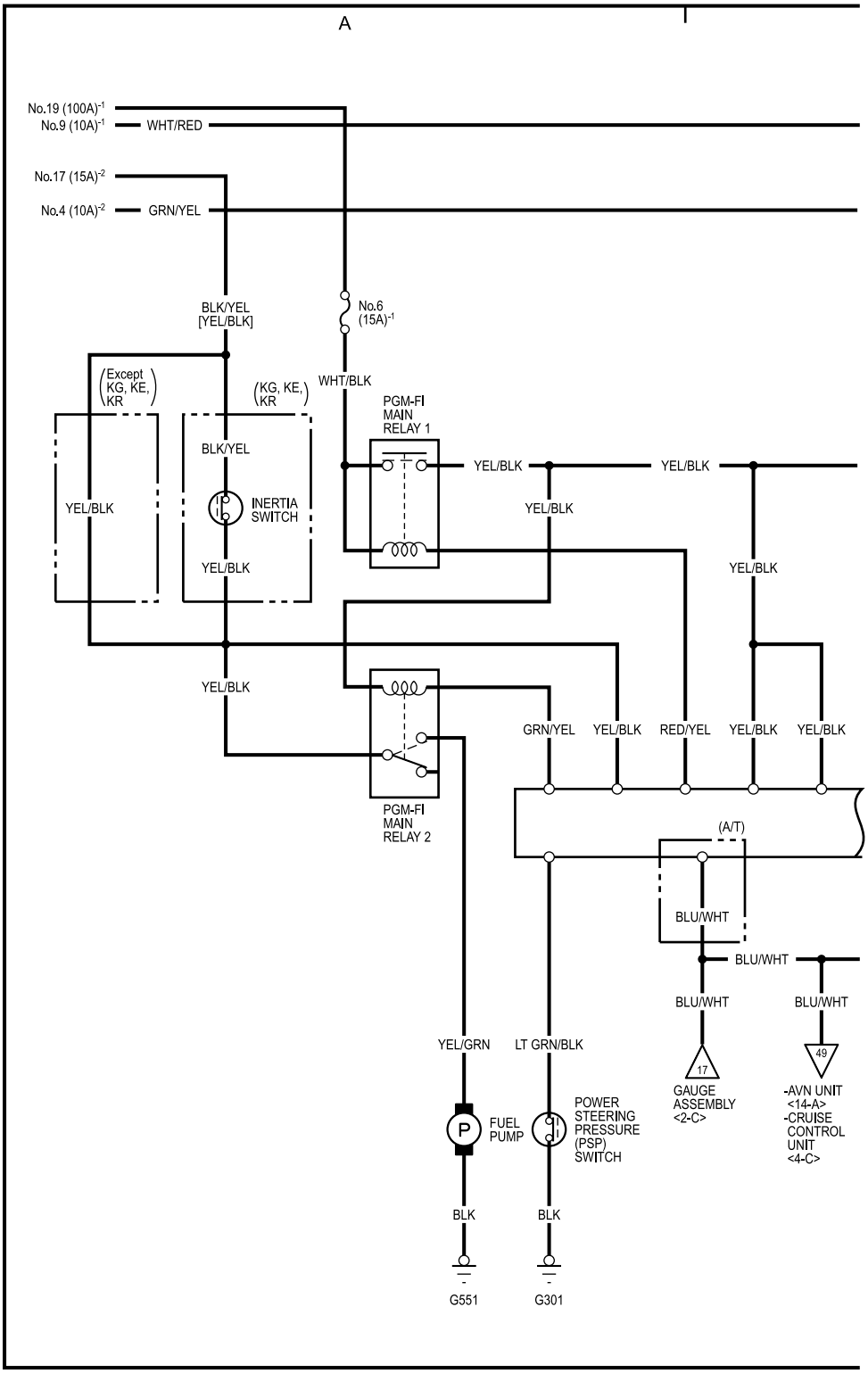

24
I
D
No.19 (100A)-1
WHT/RED
No.9 (10A)-1
BLK/YEL
No.17 (15A)-2
GRN/YEL
No.4 (10A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
-3 : With climate control
-4 : LHD type with climate control
No.11 (20A)-1
BLK/YEL
REAR WINDOW DEFOGGER RELAY
-3 ENGINE COOLANT TEMPERATURE (ECT) SENSOR <26-D>
96
TAILLIGHT RELAY <5-D> <6-D> <7-D> <8-A>
19
BLK/YEL
YEL/BLK
BLK/YEL
RED/WHT
RED/BLK
CLIMATE CONTROL UNIT or HEATER CONTROL PANEL
BLK/YEL
RED
20
GAUGE ASSEMBLY <2-D>
YEL/BLU
YEL/RED
RED/YEL
RED/BLU
WHT/BLU
YEL/GRN
BLK/YEL
BLK/YEL
BLK
MODE CONTROL MOTOR
REAR WINDOW DEFOGGER
NOISE CONDENSER
LT GRN
BLK
BLK
LT GRN
G601
G701
G601
G701
G501

PGM-FI System, Immobilizer System

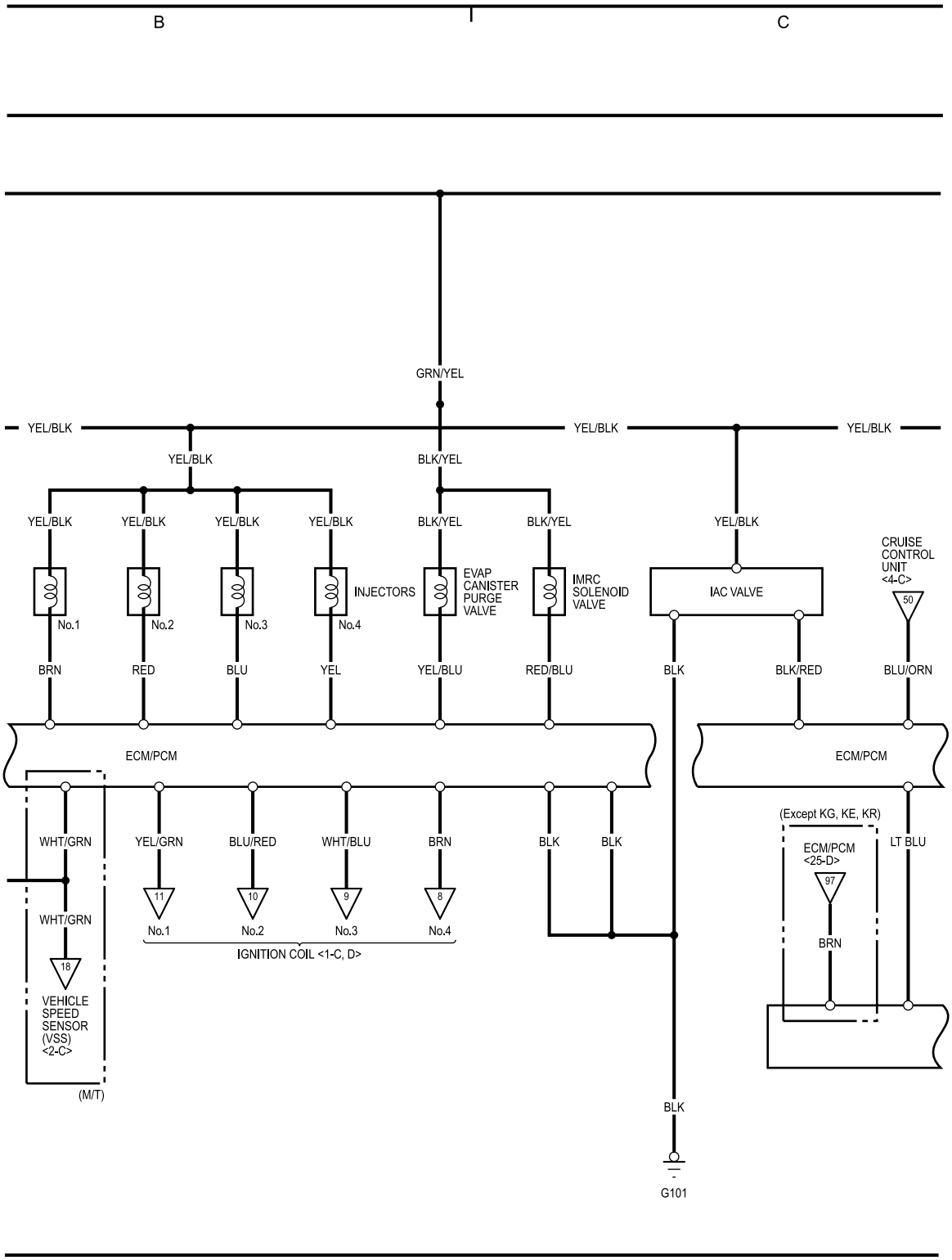

PGM-FI System, Immobilizer System
25
A
B
C
D
25
No.19 (100A)*
No.9 (10A)*
WHT/RED
No.17 (15A)*
No.4 (10A)*
GRN/YEL
No.4 (10A)*1
*1 : UNDER-HOOD FUSE/RELAY BOX
*2 : UNDER-DASH FUSE/RELAY BOX
( ) : Except KG, KE, KR
IMMOBILIZER INDICATOR LIGHT <1A2>
BLK/YEL (YEL/BLK)
No.8 (15A)*
(Except KG, KE) (KR)
(KG, KE) (KR)
WHT/BLK
PGM-FI MAIN RELAY 1
BLK/YEL
INERTIA SWITCH
YEL/BLK
GRN/YEL
BLK/YEL
WHT/RED
BLU/ORN
YEL/BLK
(To rear lamp)
YEL/BLK
YEL/BLK
YEL/BLK

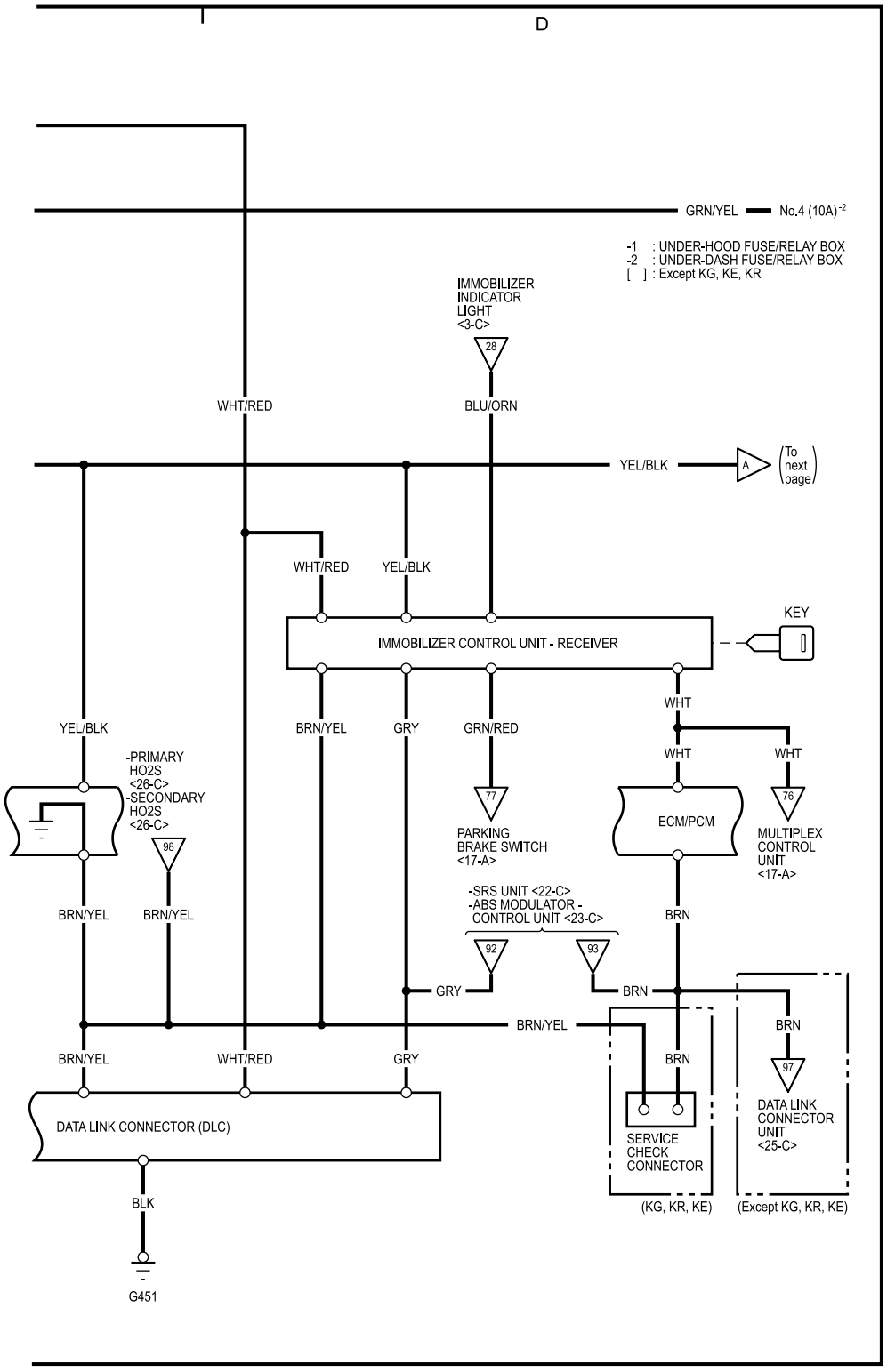
25

PGM-FI System, Immobilizer System

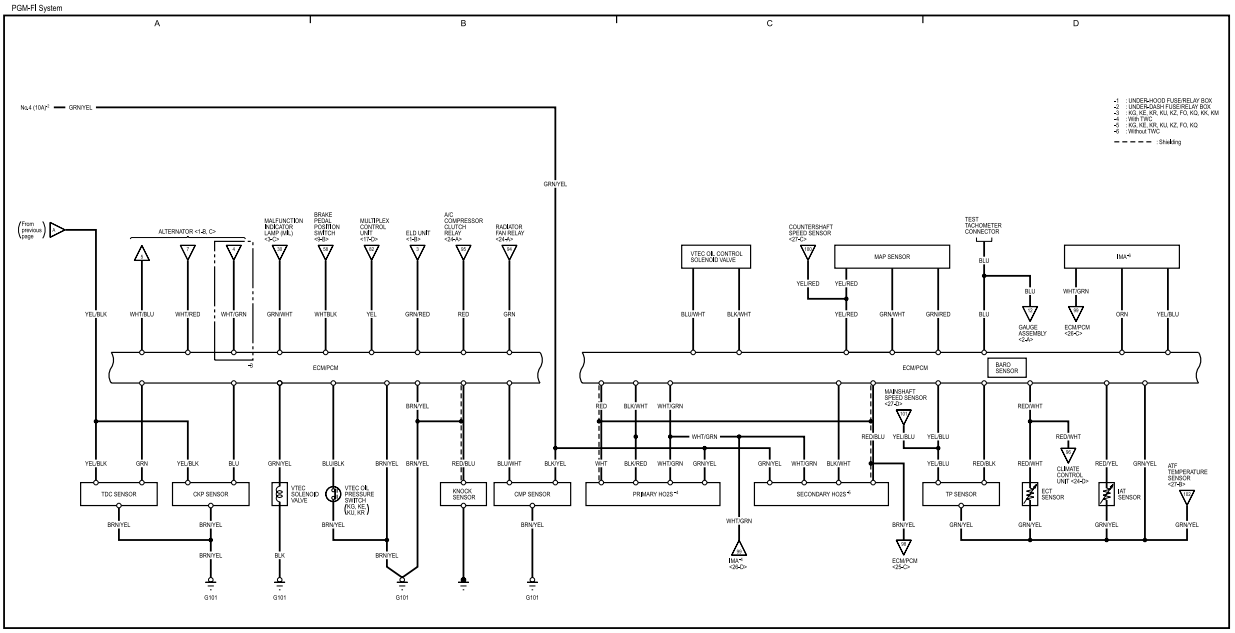


PGM-FI System, Immobilizer System (cont'd)

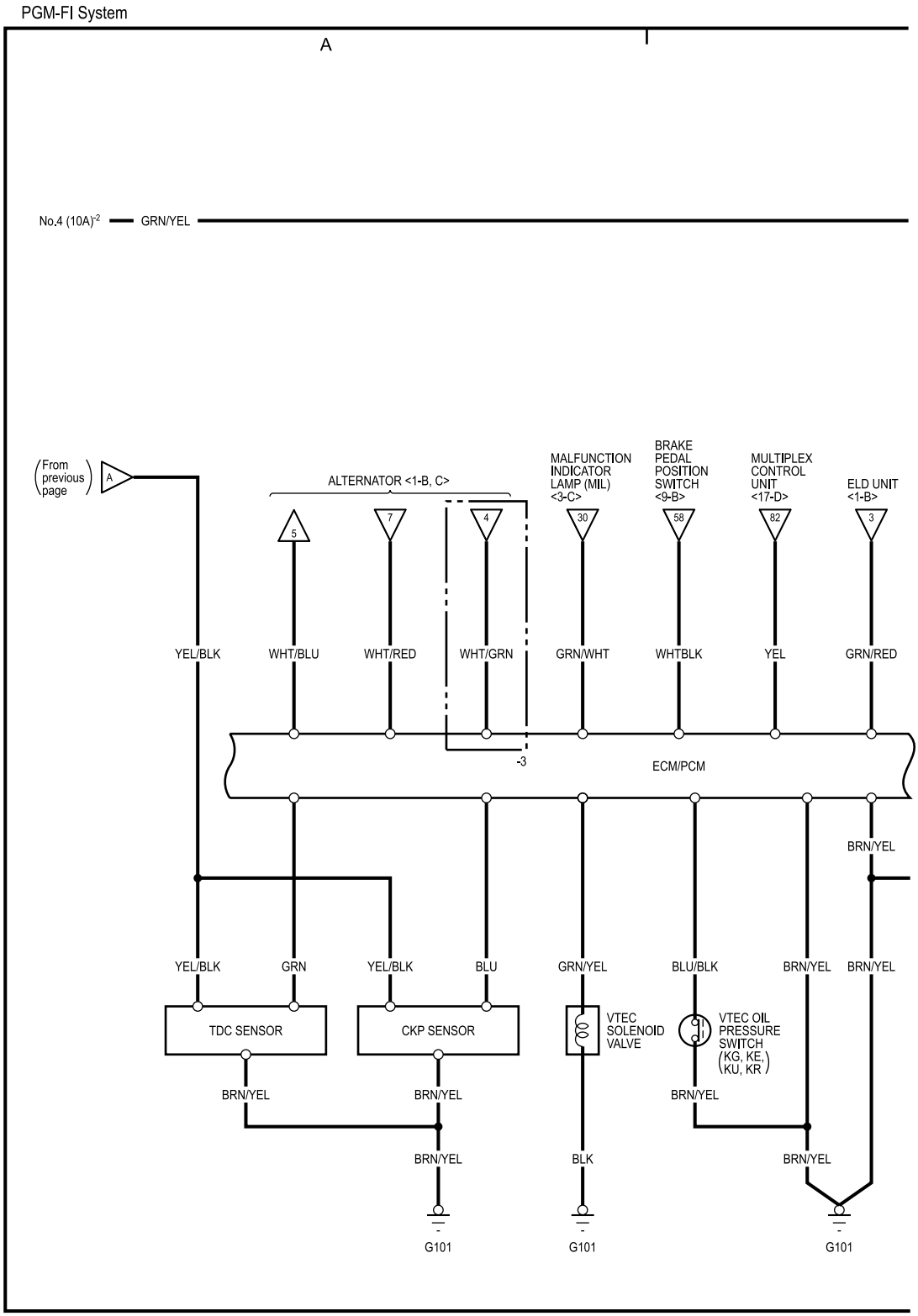



25
I
D
GRN/YEL
No.4 (10A)-2
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
[ ] : Except KG, KE, KR
IMMOBILIZER INDICATOR LIGHT <3-C>
28
WHT/RED
BLU/ORN
YEL/BLK
A
To next page
WHT/RED
YEL/BLK
KEY
IMMOBILIZER CONTROL UNIT - RECEIVER
WHT
YEL/BLK
BRN/YEL
GRY
GRN/RED
WHT
WHT
WHT
-PRIMARY HO2S <26-C>
-SECONDARY HO2S <26-C>
98
77
PARKING BRAKE SWITCH <17-A>
ECM/PCM
76
MULTIPLEX CONTROL UNIT <17-A>
-SRS UNIT <22-C>
-ABS MODULATOR - CONTROL UNIT <23-C>
92
93
BRN
BRN/YEL
BRN/YEL
GRY
BRN
BRN/YEL
BRN/YEL
WHT/RED
GRY
BRN
BRN
97
DATA LINK CONNECTOR (DLC)
SERVICE CHECK CONNECTOR
DATA LINK CONNECTOR UNIT <25-C>
(KG, KR, KE)
(Except KG, KR, KE)
BLK
G451

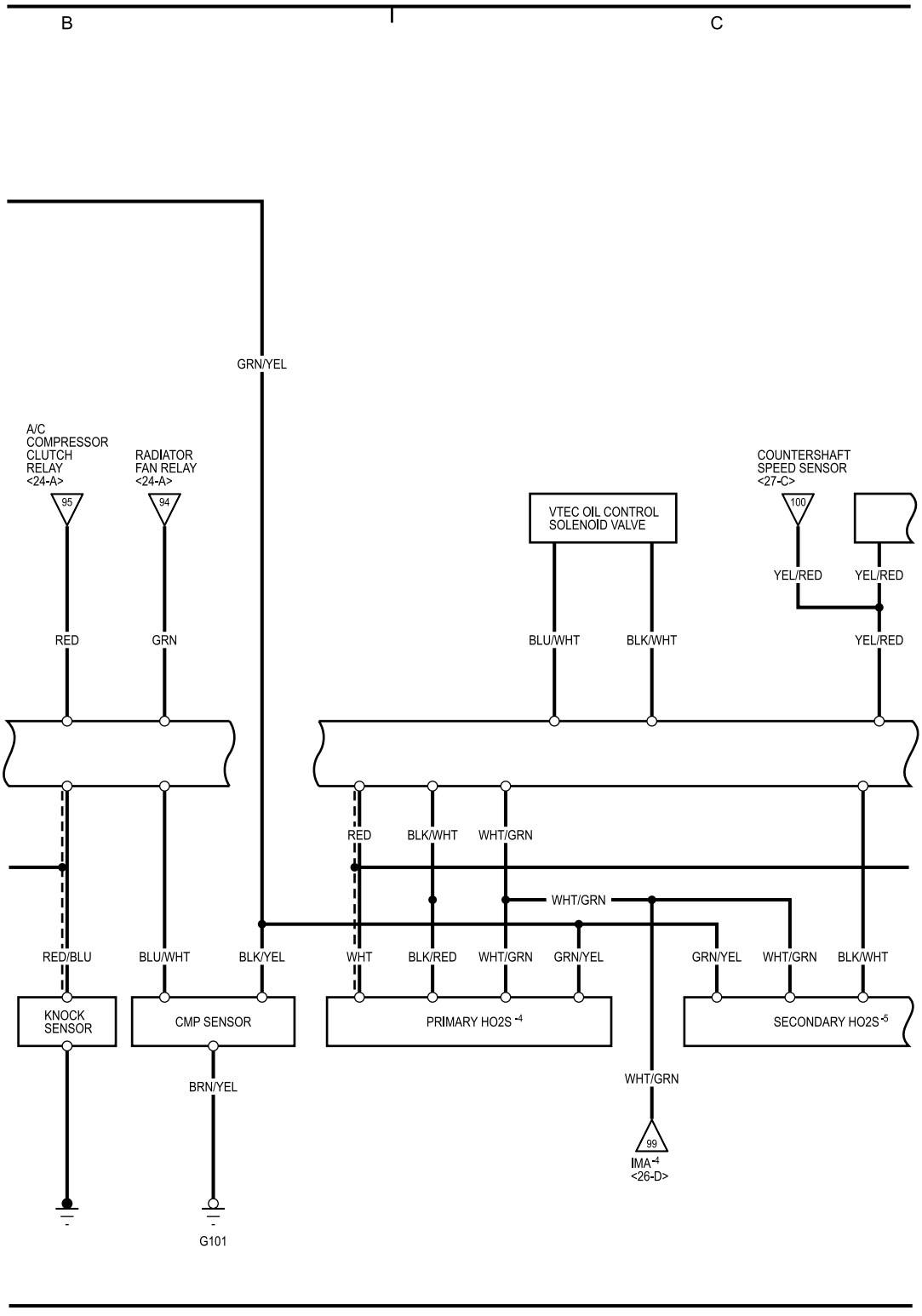
PGM-FI System

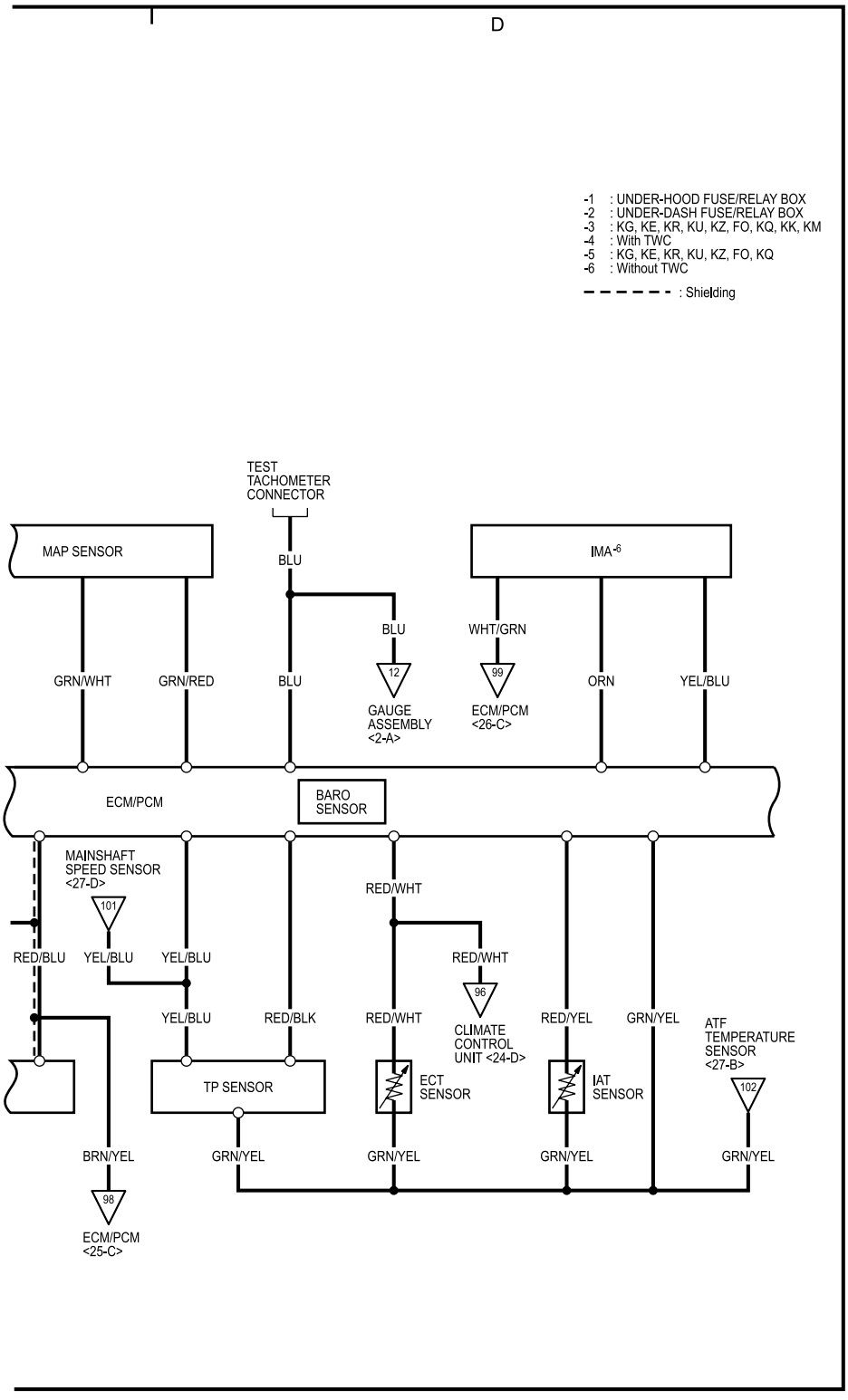


26

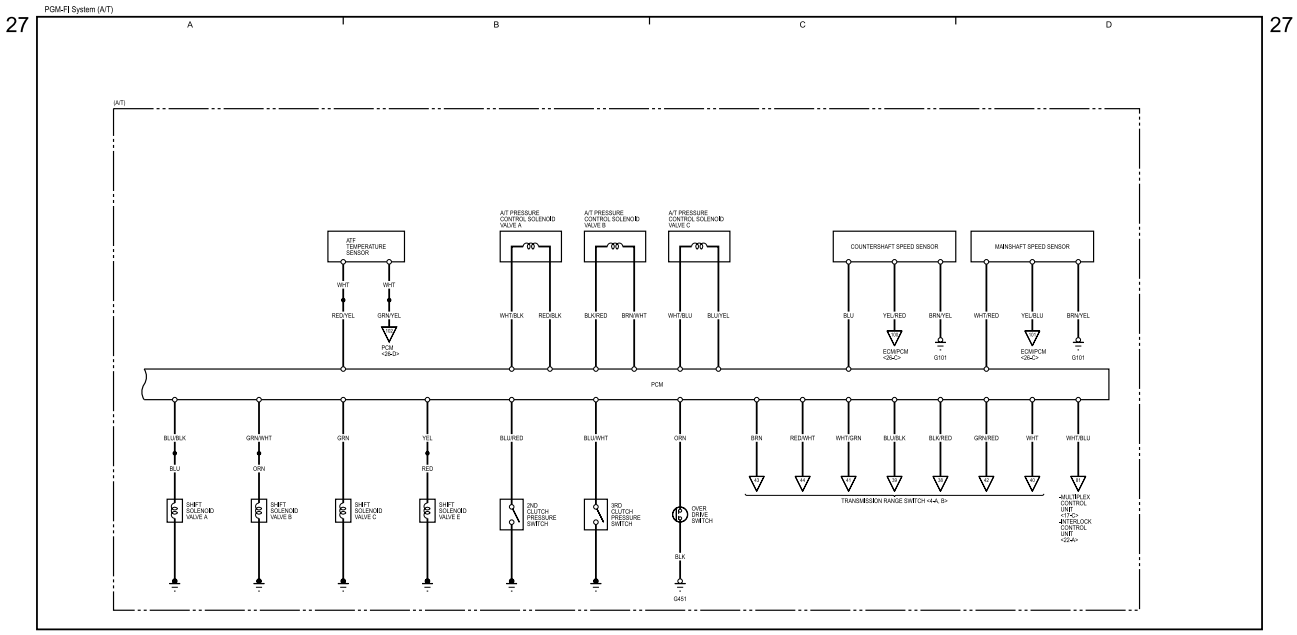

PGM-FI System
A
No.4 (10A)-2
GRN/YEL
From previous page
A
ALTERNATOR <1-B, C>
MALFUNCTION INDICATOR LAMP (MIL) <3-C>
BRAKE PEDAL POSITION SWITCH <9-B>
MULTIPLEX CONTROL UNIT <17-D>
ELD UNIT <1-B>
5
7
4
30
58
82
3
YEL/BLK
WHT/BLU
WHT/RED
WHT/GRN
GRN/WHT
WHTBLK
YEL
GRN/RED
-3
ECM/PCM
BRN/YEL
YEL/BLK
GRN
YEL/BLK
BLU
GRN/YEL
BLU/BLK
BRN/YEL
BRN/YEL
TDC SENSOR
CKP SENSOR
VTEC SOLENOID VALVE
VTEC OIL PRESSURE SWITCH (KG, KE, KU, KR)
BRN/YEL
BRN/YEL
BRN/YEL
BLK
BRN/YEL
G101
G101
G101

PGM-FI System (cont'd)

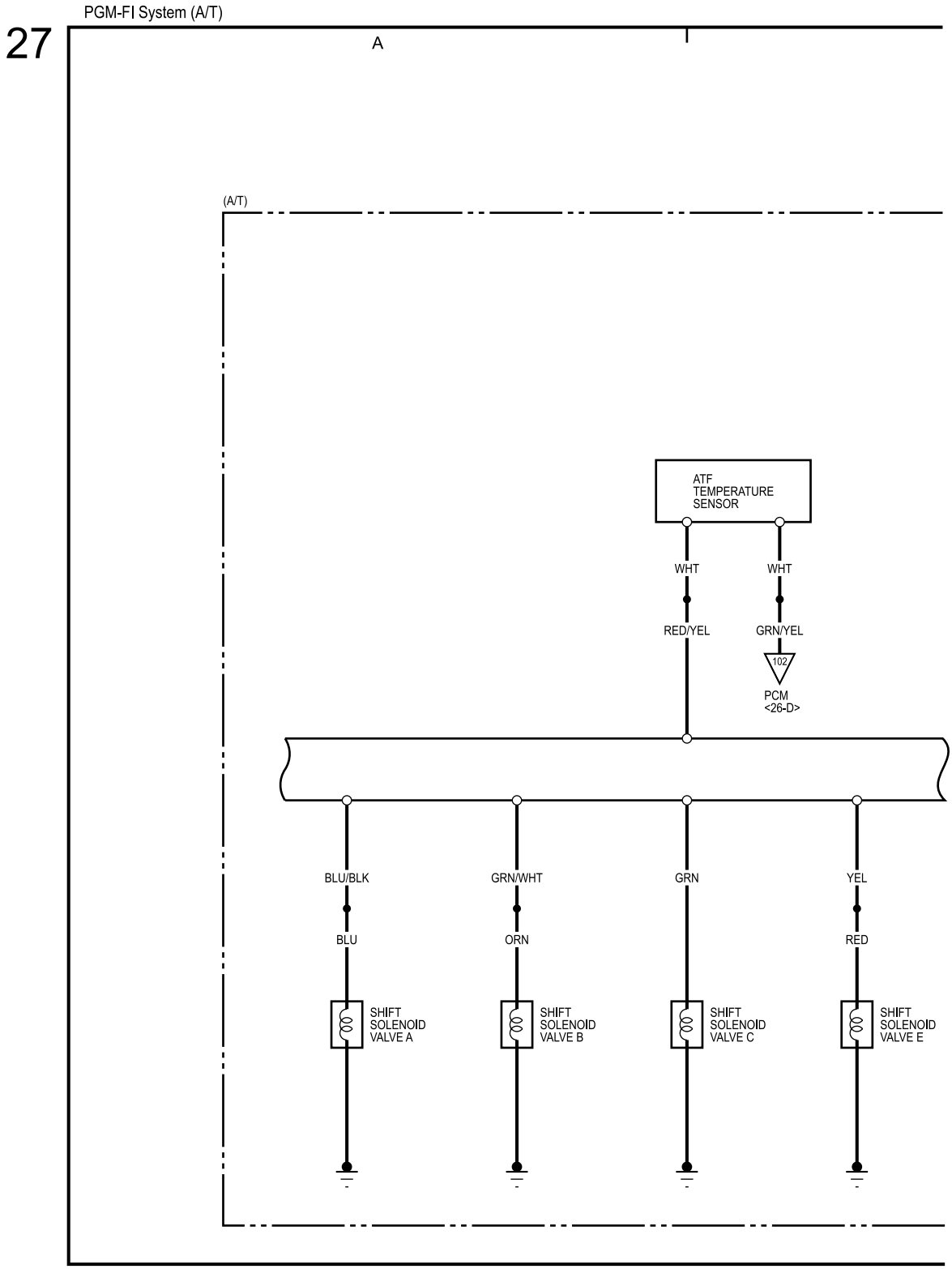



D
26
-1 : UNDER-HOOD FUSE/RELAY BOX
-2 : UNDER-DASH FUSE/RELAY BOX
-3 : KG, KE, KR, KU, KZ, FO, KQ, KK, KM
-4 : With TWC
-5 : KG, KE, KR, KU, KZ, FO, KQ
-6 : Without TWC
: Shielding
TEST TACHOMETER CONNECTOR
MAP SENSOR
BLU
IMA-6
BLU
WHT/GRN
GRN/WHT
GRN/RED
BLU
12
99
ORN
YEL/BLU
GAUGE ASSEMBLY <2-A>
ECM/PCM <26-C>
ECM/PCM
BARO SENSOR
MAINSHAFT SPEED SENSOR <27-D>
101
RED/WHT
RED/BLU
YEL/BLU
YEL/BLU
RED/WHT
96
YEL/BLU
RED/BLK
RED/WHT
RED/YEL
GRN/YEL
ATF TEMPERATURE SENSOR <27-B>
CLIMATE CONTROL UNIT <24-D>
TP SENSOR
ECT SENSOR
IAT SENSOR
102
BRN/YEL
GRN/YEL
GRN/YEL
GRN/YEL
GRN/YEL
98
ECM/PCM <25-C>

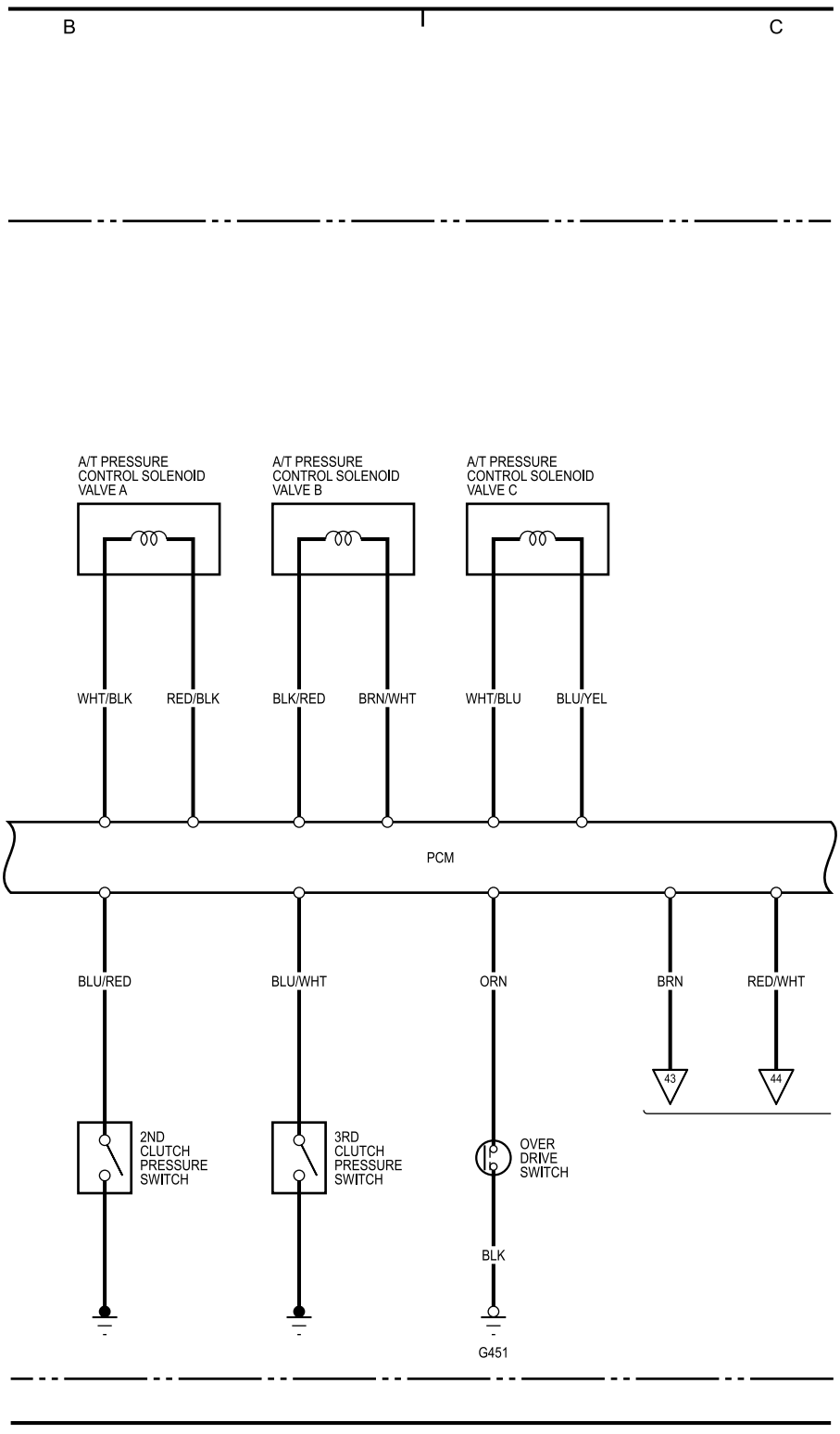
PGM-FI System (A/T)

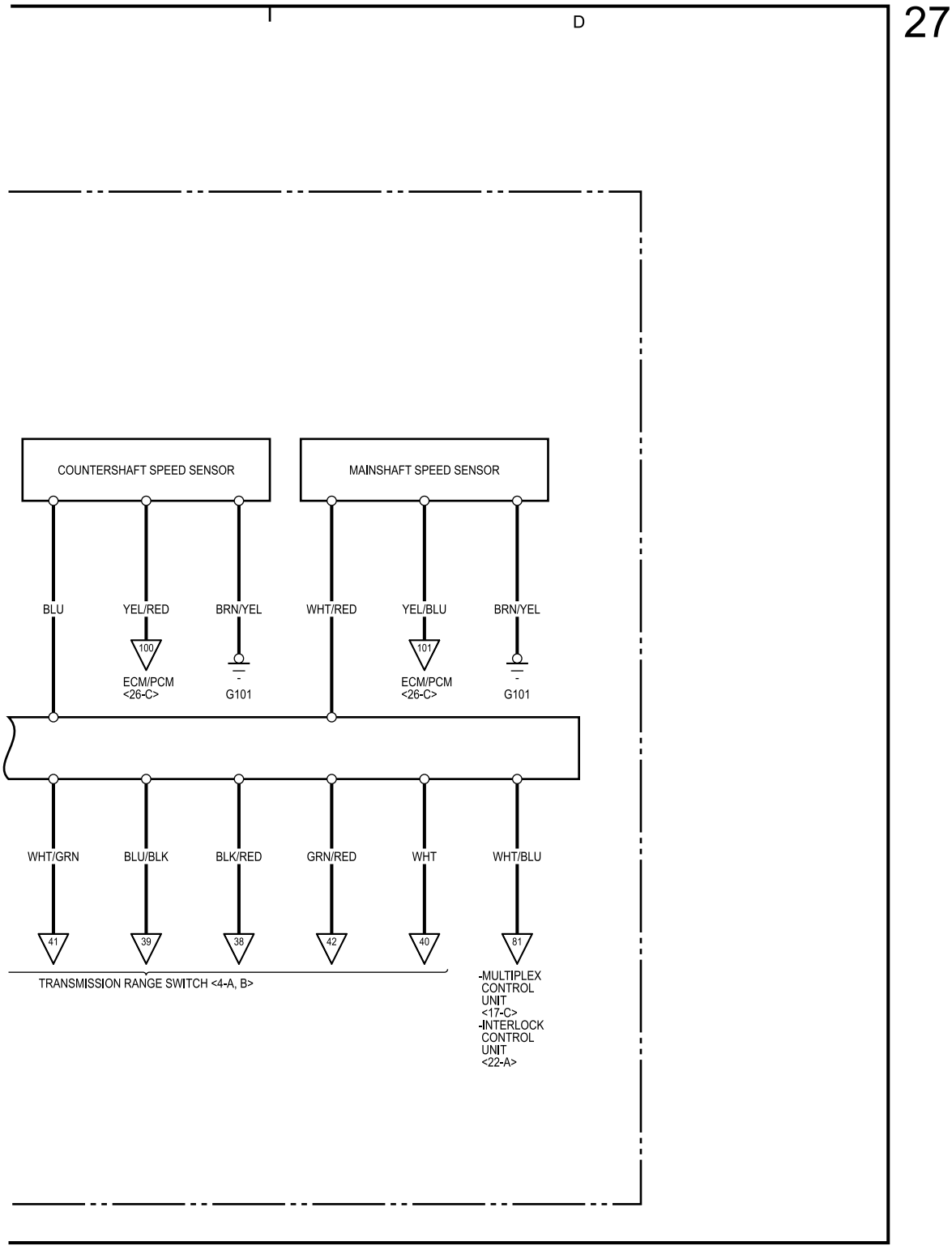


PGM-FI System (A/T) (cont'd)



PGM-FI System (A/T) (cont'd)




I
D
27
COUNTERSHAFT SPEED SENSOR
MAINSHAFT SPEED SENSOR
BLU
YEL/RED
BRN/YEL
WHT/RED
YEL/BLU
BRN/YEL
100
101
ECM/PCM
<26-C>
G101
ECM/PCM
<26-C>
G101
WHT/GRN
BLU/BLK
BLK/RED
GRN/RED
WHT
WHT/BLU
41
39
38
42
40
81
TRANSMISSION RANGE SWITCH <4-A, B>
-MULTIPLEX CONTROL UNIT <17-C>
-INTERLOCK CONTROL UNIT <22-A>