

INTRODUCTION

How to Use This Manual

This supplement contains information specifically applicable to the 1987 ACCORD. Refer to the Base Shop Manual (No.62SE300) as the general source for service procedures applicable to this model. The first page of each section is marked with a black tab that lines up with one of the thumb index tabs 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.

Special Information

 **WARNING** Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard* workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause **PERSONAL INJURY**, or could damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by Honda motor, might be done, or of the possible hazardous consequences of each conceivable way, nor could Honda motor investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda motor, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice. No part of this publication may be reproduced, stored in retrieval system, or transmitted, in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. This includes text, figures and tables.

* For these chapters, this supplement contains no new information; refer to the Base Shop Manual.

First Edition 9/86
Second Print 2/90 300 pages
All Rights Reserved

HONDA MOTOR CO., LTD.
Service Publication Office

General Info



Special Tools



Specifications

specs

Maintenance



Engine



Cooling



Fuel and
Emission Controls



Transaxle



Steering*



Suspension



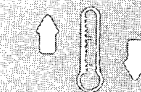
Brakes



Body



Heating and
Air Conditioning*



Electrical



Outline of Model Changes

ITEM		MODELS						DESCRIPTION	REF. SECTION
		KE	KF	KG	KQ	KW	KX		
Carbureted Engine Model (equipped with A20A1 Engine)							○	New Release (KG and KX models were released in 1986)	—
Fuel-Injected Engine Model	A20A3 Engine			○		○	○	New Release	—
	A20A4 Engine				○			New Release (Other models were released in 1986)	—
	B20A2 Engine	○	○	○				New Release	—
Engine		○ (EXSI type)	○ (EXSI type)	○ (EXSI type)				New Type (B20A2)	§5 thru. §10
Fuel and Emission Control System	A20A1 Engine			○		○	○	<u>Idle Control System does not apply</u>	—
	A20A3 Engine			○		○	○	New System	—
	A20A4 Engine				○			Evaporative Emission Control System added	§12
	B20A2 Engine	○	○	○				New System	§12
Clutch								New Type	§13
Manual Transmission								New Type (B2)	§14
Driveshafts		○ (EXSI type)	○ (EXSI type)	○ (EXSI type)				Intermediate Shaft added	§17
Front Brakes								Uses large Front Caliper and Disc	§20
Distributor		○	○	○		○	○	Uses New Type (for A20A1 and B20A2 Engines)	§24
Headlights		○						Equipped with Dim-Dip Lighting System	§25

ITEM	MODELS	DESCRIPTION	REF. SECTION
Front Brakes	Models equipped with 4W—ALB (except KS model)	Uses large Front Caliper and Disc	§20
Frame Specification	ALL	Frame Specifications near Rear Suspension are changed	§21
Combination Meter	ALL	For Coolant Temperature and Fuel Gauges, Design and Mechanism are changed	§25



General Information

Chassis and Engine Numbers	1-2
Identification Number Locations	1-3
Label Locations	1-4
Lift and Support Points	1-5
Towing	1-8
Preparation of Work	1-9

Chassis and Engine Numbers

Vehicle Identification Number

JHMCA53400C100001

Model Name

CA4: Accord 1600
CA5: Accord 2000

Transmission Group

3: 5-speed (3D)
4: Automatic (3D)
5: 5-speed (4D)
6: Automatic (4D)

Vehicle Version

2: STD, GL
3: EX
4: EXi
5: EXSi
6: EXR, LXC
7: EXC
8: EXCi

Model Year

0: 1987

Plant

C: Sayama Plant

Serial Number

Engine Serial Number

A20A4 -- 2000001

Engine Type

✓ A20A1: 2000 with Carburetor (With catalyst)
A20A2: 2000 with Carburetor (Without catalyst)
A20A3: 2000 with Fuel-Injection (EXCi)
A20A4: 2000 with Fuel-Injection (EXi)
A16A1: 1600 with Carburetor
B20A2: 2000 DOHC with Fuel-Injection

Model Year

1: 1987 2000 with Fuel-Injection (EXCi and EXSi)
2: 1987 Other types

Transmission Group

0: 5-speed
3: 5-speed (KQ)
5: Automatic Transmission
✓ 7: 5-speed (KG, KX, KW with catalyst)
8: Automatic (KX, KQ, KG, KW with catalyst)

Serial Number

Transmission Number

(Manual Transmission)

A2K5 -- 2000001

Transmission Type

A2K5: for A20A Engine
A1M5: for A16A Engine
B2K5: for B20A2 Engine

Serial Number

Transmission Number

(Automatic Transmission)

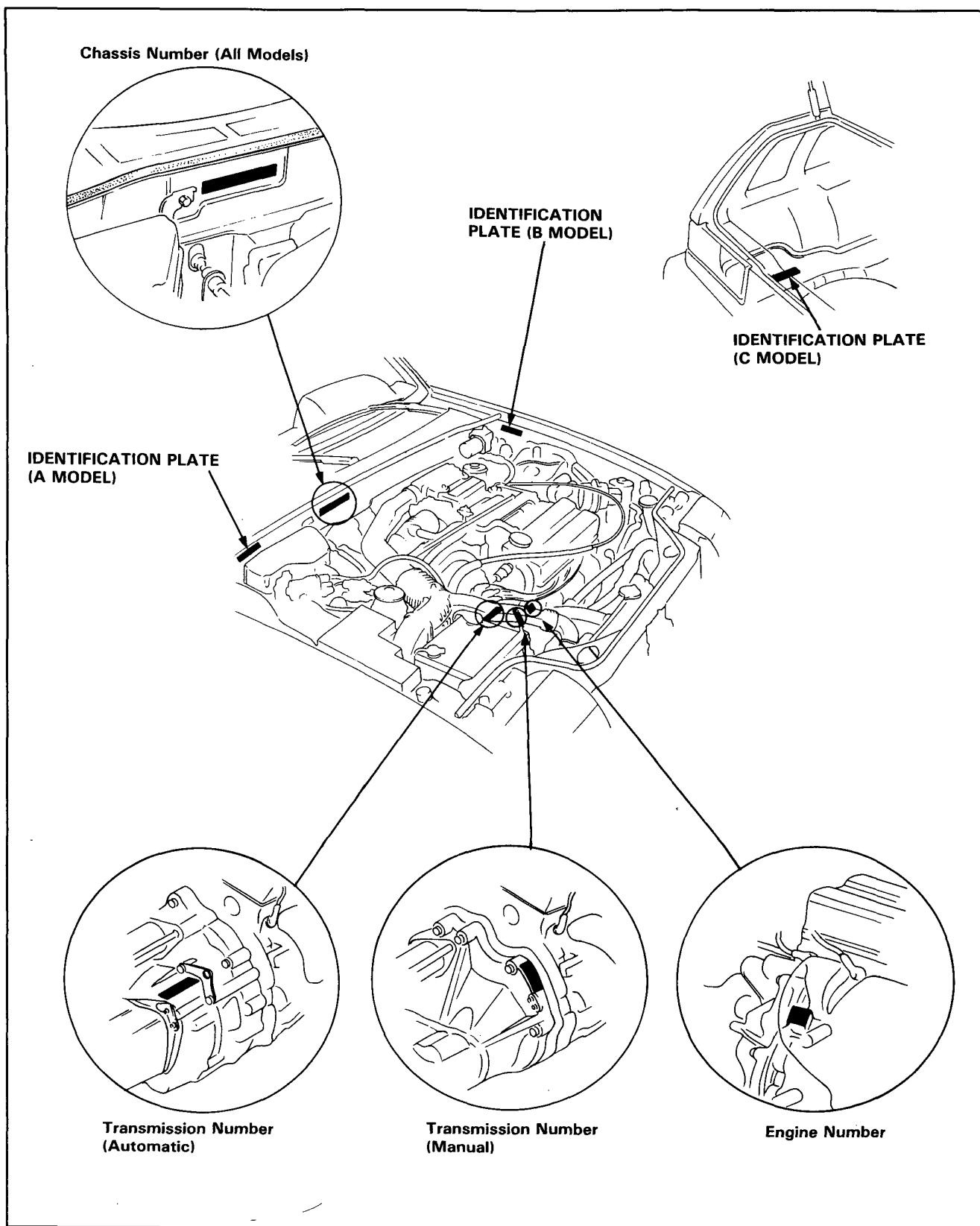
F4 -- 6000001

Transmission Type

F4: for A20A and B20A Engine
C9: for A16A Engine

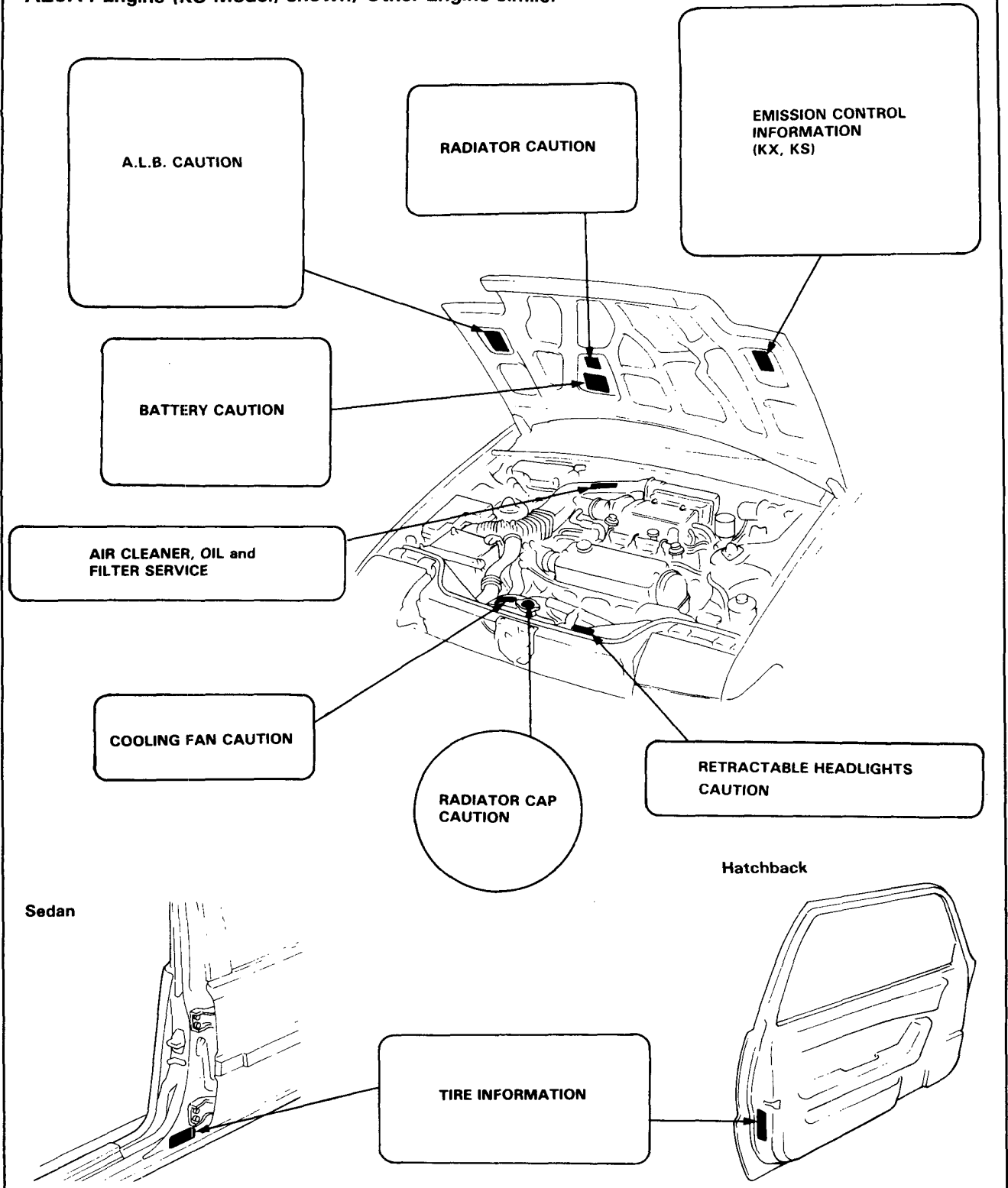
Serial Number

Identification Number Locations



Label Locations

A20A4 Engine (KS Model) shown; Other Engine similar



Lift and Support Points

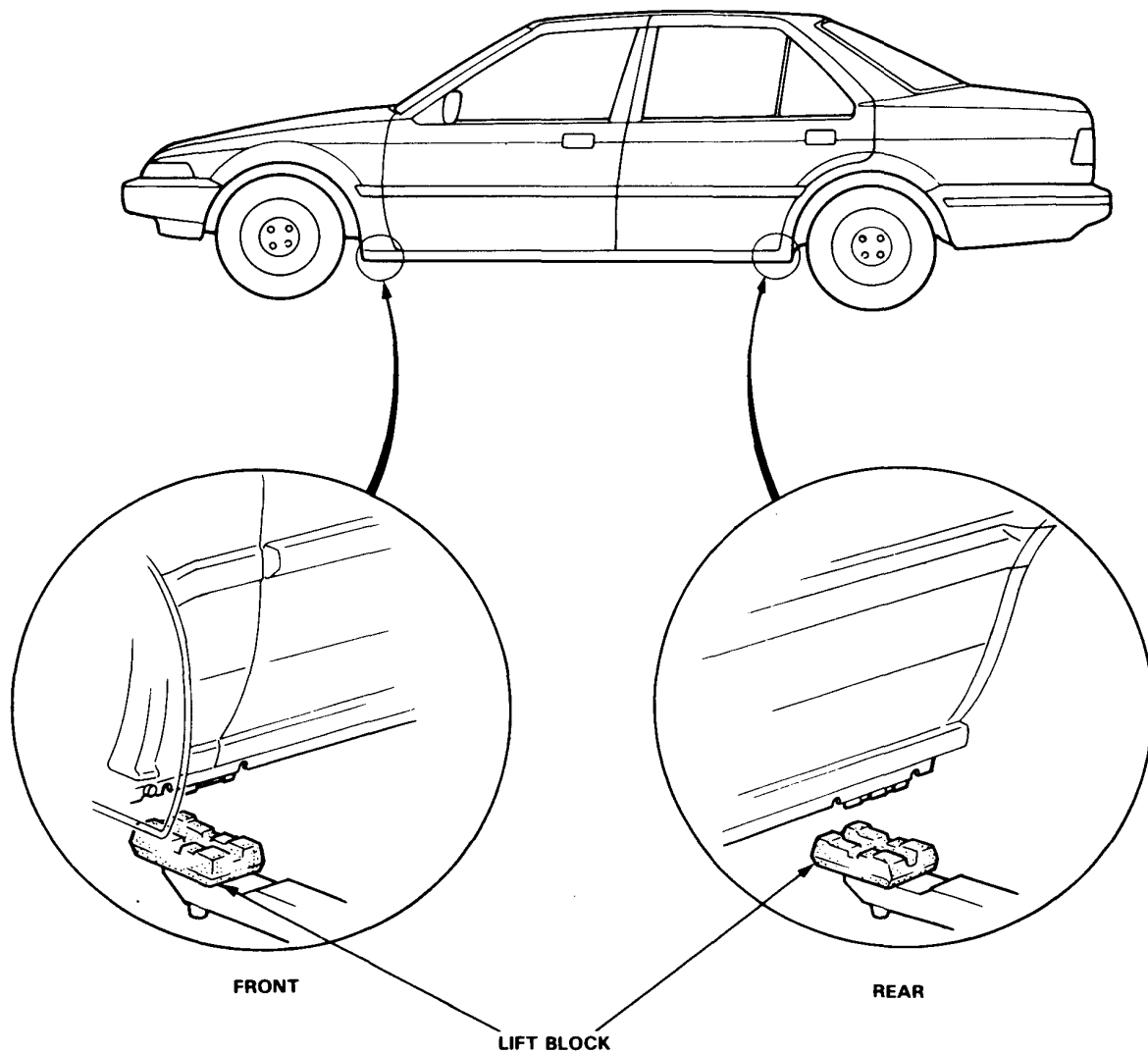


Hoist

1. Place the lift blocks as shown.
2. Raise the hoist a few inches and rock the car to be sure it is firmly supported.
3. Raise the hoist to full height and inspect lift points for solid support.

WARNING When heavy rear components such as suspension, fuel tank, spare tire and trunk lid/hatch are to be removed, place additional weight in the trunk before hoisting. When substantial weight is removed from the rear of the car, the center of gravity may change and can cause the car to tip forward on the hoist.

NOTE: Since each tire/wheel assembly weights approximately 14 kg (30 lbs), placing the front wheels in the trunk can assist with the weight transfer.



(cont'd)

Lift and Support Points (cont'd)

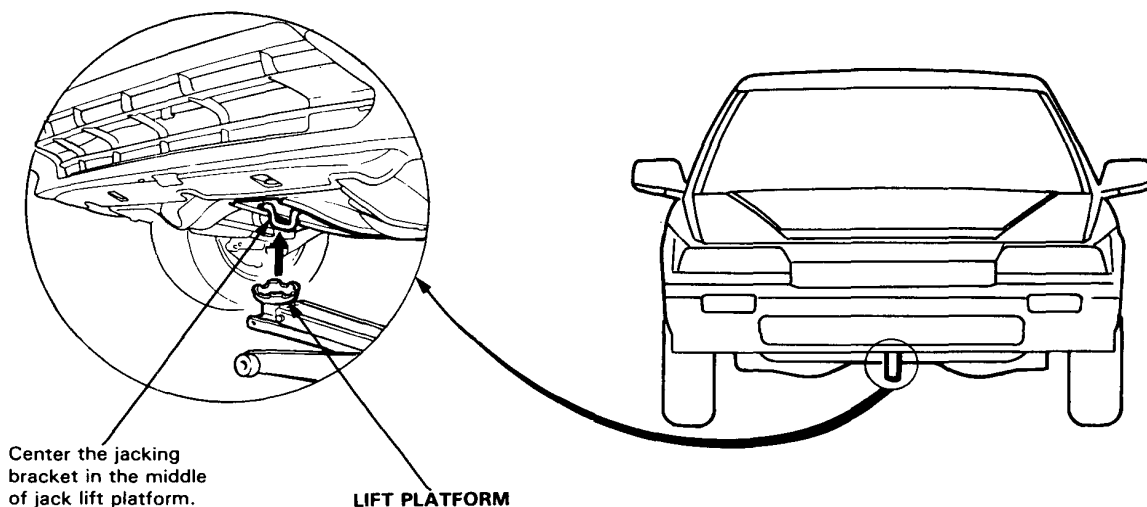
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of the car, put the gearshift lever in reverse (Automatic in PARK).
3. Raise the car high enough to insert the safety stands.
4. Adjust and place the safety stands as shown on page 1-7 so the car will be approximately level, then lower the car onto them.

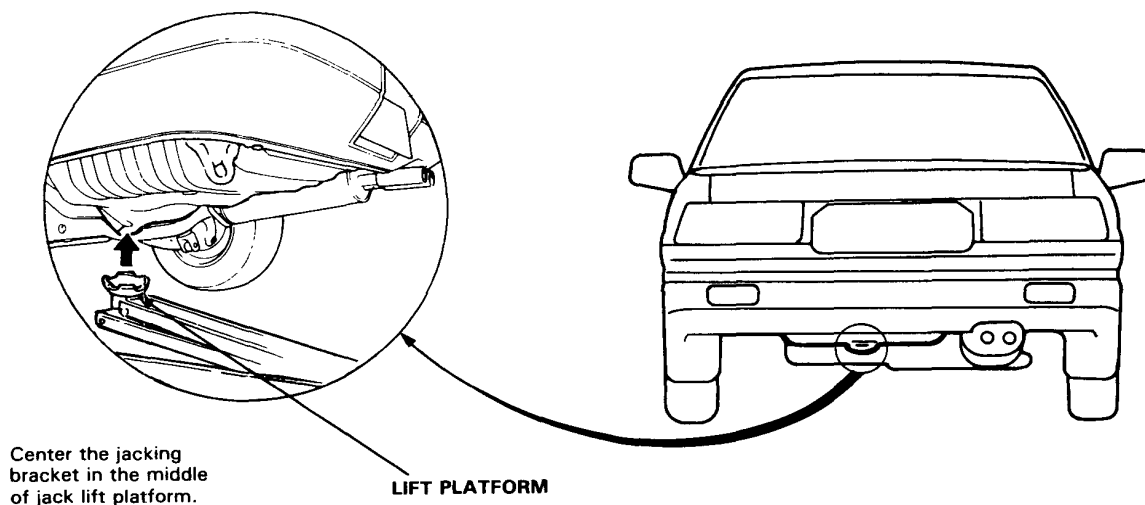
WARNING

- Always use safety stands when working on or under any vehicle that is supported by only a jack.
- Never attempt to use a bumper jack for lifting or supporting the car.

Front

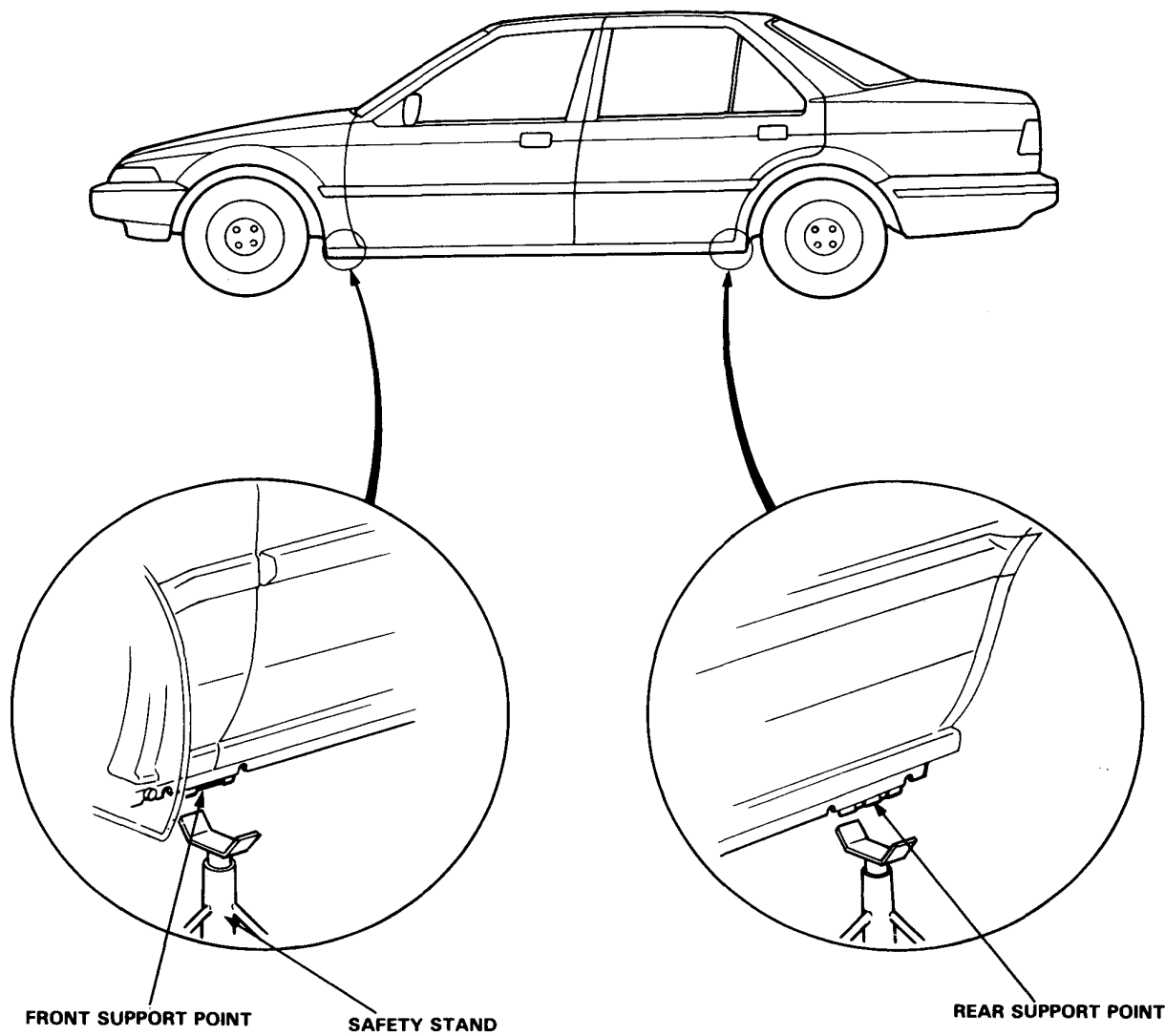


Rear





Safety Stands



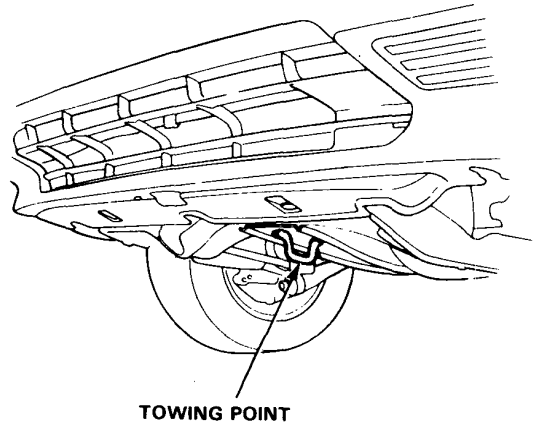
Towing

Towing

If possible, always tow the car with the front wheels off the ground. Do not use the bumpers to lift the car or to support the car's weight while towing. Check local regulations for towing with a chain or frame-mounted tow bar. A chain may be attached to the hook shown in the illustration. Do not attach a tow bar to either bumper.

If the car is to be towed with four wheels on the ground, observe the following precautions:

1. Wheels and axle must not be touching the body or frame.
2. Turn the ignition key to the "I" position and make sure the steering wheel turns freely.
3. Place the transmission in NEUTRAL.
4. Release the parking brake.
5. DO NOT exceed 55KPH (35 MPH) for distances of more than 80 km (50 miles).

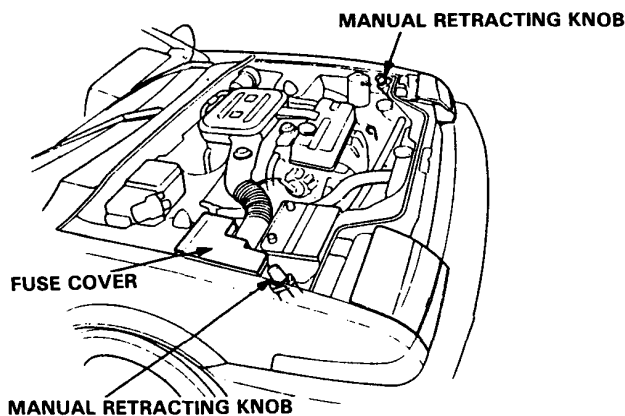


Preparation of Work

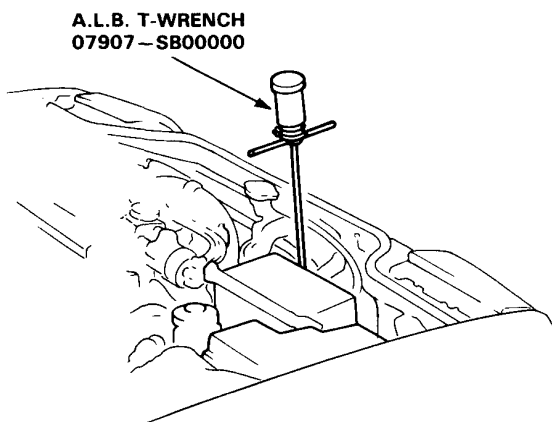


Special Caution Items For This Car

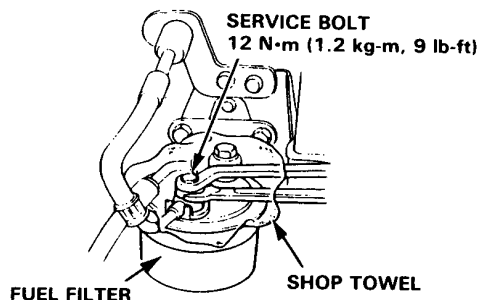
1. Retractable headlights are installed. For manual raising and lowering, the fuse must be pulled. When raising and lowering is executed without pulling the fuse, danger may be caused by rapid turning of the manual retracting knob.



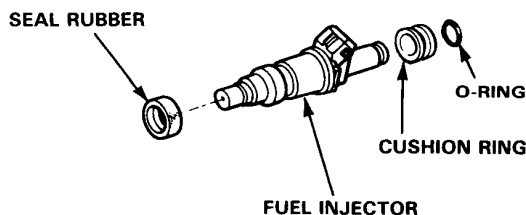
2. For cars equipped with A.L.B., the high-pressure brake fluid must be drained before disassembly of the A.L.B. piping system. When this is not done, danger may be caused by brake fluid squirting out under high pressure. For draining of the high-pressure brake fluid, refer to Section 20.



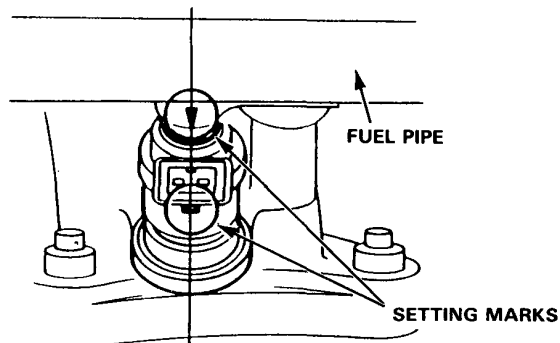
3. Fuel Line Servicing (Fuel-Injected Engine)
 - Relieve fuel pressure by loosening the service bolt provided on the top of the fuel filter before disconnecting a fuel hose or a fuel pipe.



- Be sure to replace washers, O-rings, and seal rubbers with new ones when servicing fuel line parts.
- Always apply oil to the surfaces of O-rings and seal rings before installation. Never use brake fluid, radiator fluid, vegetable oils or alcohol-based oils.



- When assembling the flare joint of the high-pressure fuel line, clean the joint and coat with new engine oil.
- When installing an injector, check the angle of the coupler. The center line of the coupler should align with the setting mark on the injector holder.



(cont'd)

Preparation of Work

Special Caution Items For This Car (cont'd)

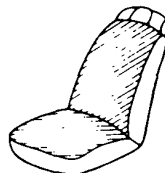
4. Inspection for fuel leakage
 - After assembling fuel line parts, turn ON the ignition switch (do not operate the starter) so that the fuel pump is operated for approximately two seconds and the fuel is pressurized. Repeat this operation two or three times and check whether any fuel leakage has occurred in any of the various points in the fuel line.
5. Installation of an amateur radio for cars equipped with PGM-FI and A.L.B.

Care has been taken for the PGM-FI and A.L.B. control units (computer) and its wiring to prevent erroneous operation from external interference, but erroneous operation of the computer may be caused by entry of extremely strong radio waves. Attention must be paid to the following items to prevent erroneous operation of the computer.

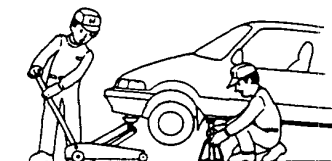
 - The antenna and the body of the radio must be at least 200 mm (7.9 in.) away from the computer. (The computer installation position is under the right side seat.)
 - Do not lead the antenna feeder and the coaxial cable over a long distance parallel to the wiring, and when crossing with the wiring is required, execute crossing at a right angle.
 - Do not install a radio with a large output (max. 10 W).
6. Apply liquid gasket to the transmission, oil pump cover, right side cover and water outlet. Use HONDA PARTS NO 08740-99986 as a liquid gasket.
 - Check that the mating surfaces are clean and dry before applying liquid gasket. Degrease the mating surfaces if necessary.
 - Apply liquid gasket evenly, being careful to cover all the mating surface.
 - To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
 - Do not allow liquid gasket to stand for more than 20 minutes before assembly.
 - Fill the case with clean engine oil or coolant 30 minutes after assembly.

CAUTION: Observe all safety precautions and notes while working.

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



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



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

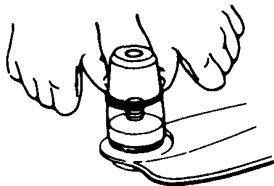


Mark or place all removed parts in order in a parts rack so they can be placed back to their original places or parts from which they were removed or with which they were mated.



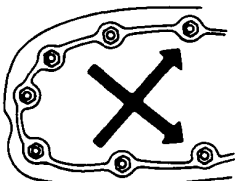


4. Use special tool when use of such a tool is specified.

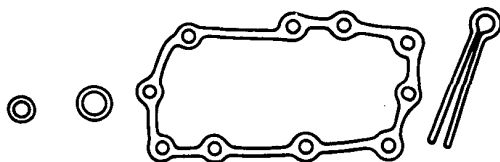


5. Parts must be assembled with the proper looseness or tightness according to the maintenance standards established.

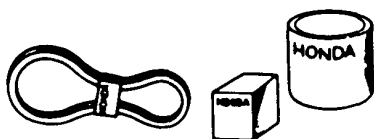
6. When tightening bolts or nuts, begin on center or large diameter bolts and tighten them in crisscross pattern in two or more steps if necessary.



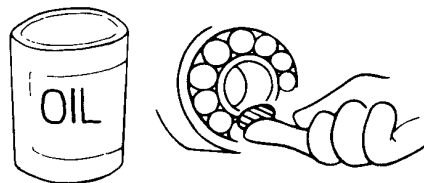
7. Use new packings, gaskets, O-rings and cotter pins whenever reassembling.



8. 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 in good usable condition.



9. Coat or fill parts with specified grease where specified grease where specified (page 4-2). Clean all removed parts in or with solvent upon disassembly.



10. Brake fluid and hydraulic components

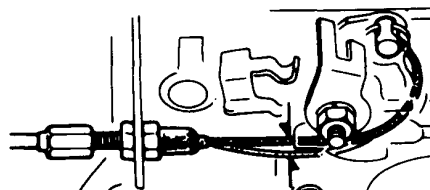
- When replenishing the system, use extreme care not to allow dust and dirt from entering the inside.
- Do not mix different brands of fluid as they may not be compatible.
- Do not reuse drained brake fluid.
- Brake fluid can cause damage to the painted surfaces. Wipe up spilled fluid at once.
- After disconnecting brake hoses or pipes from the joint, be sure plug the opening 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.

11. Avoid oil or grease getting on rubber parts and tubes.

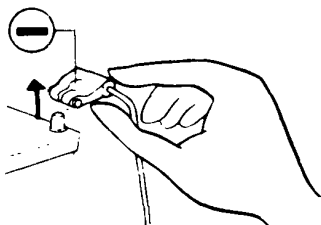
12. Upon assembling, check every possible part for proper installation and movement or operation.



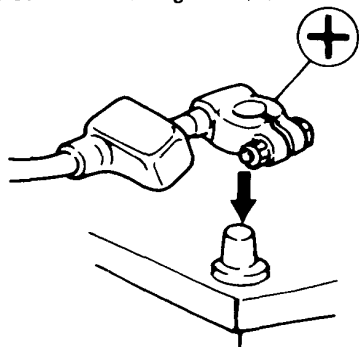
Preparation of Work

Electrical

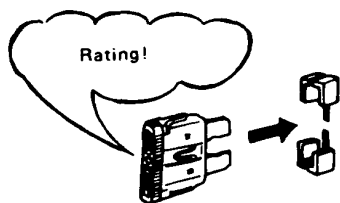
- Before making any repairs on electric wires or parts, disconnect the battery cables from the battery starting with the negative (-) terminal.



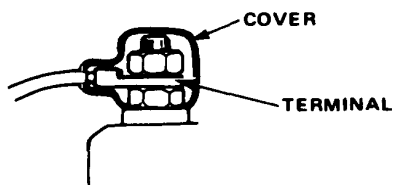
- After making repairs, check each wire or part for proper routing and installation. Also check to see that they are connected properly.
- Always connect the battery positive (+) cable first, then connect the negative (-) cable.



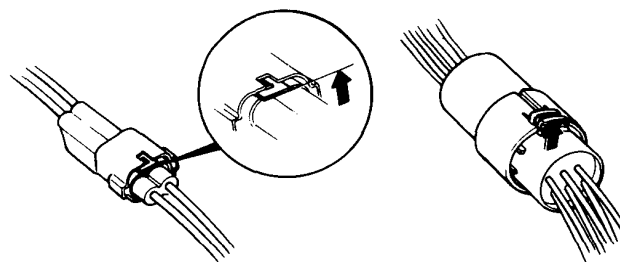
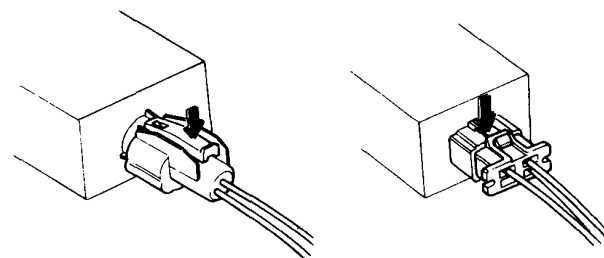
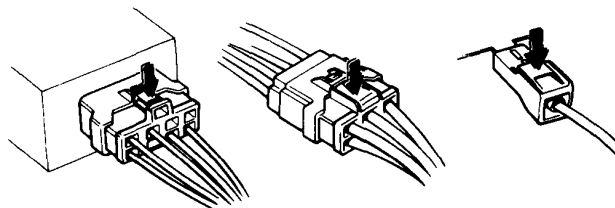
- Coat the terminals with clean grease after connecting the battery cables.
- Don't forget to install the terminal cover over the positive battery terminal after connecting.
- Before installing a new fuse, isolate the cause and take corrective measures, particularly when frequent fuse failure occurs.



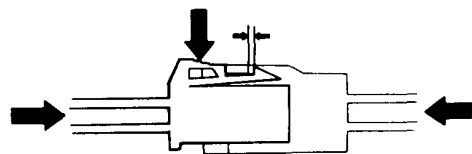
- Be sure to install the terminal cover over the connections after a wire or wire harness has been connected.



- When removing locking couplers, be sure to disconnect the lock before performing work.
- Couplers may be of two types, those in which the lock is pressed to remove, and those in which the lock is pulled up to remove. Be sure to ascertain the type of locking device before beginning work. The following is a depiction of the means of disconnecting various typical couplers.



- When disconnecting locks, first press in the Coupler Tightly (to provide clearance to the locking device), then operate the tab fully and remove the coupler in the designated manner.

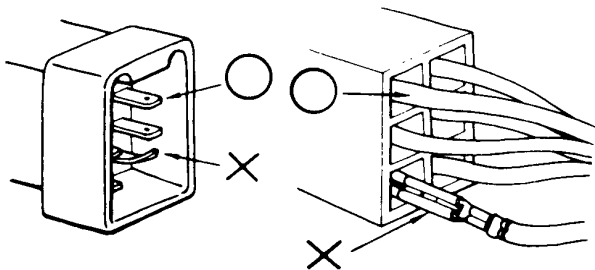




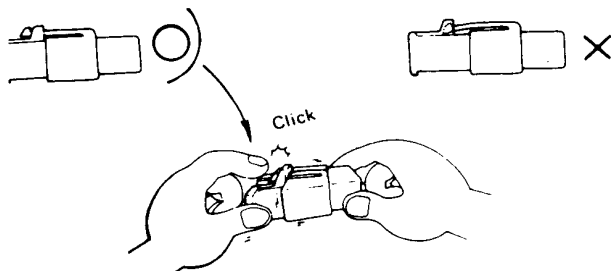
- When disconnecting a coupler, pull it off from the mating coupler by holding on both couplers.
- Never try to disconnect couplers by pulling on their wires.



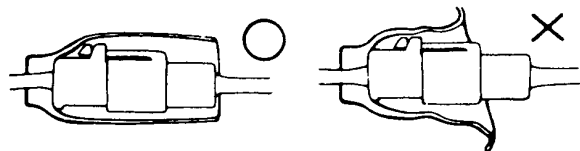
- Before connecting couplers, check to see that the terminals are in place and are not bent or distorted.



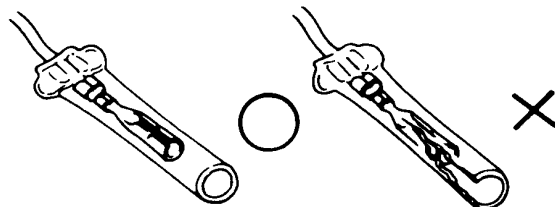
- Insert couplers fully until they will no longer go.
- Some couplers have locking tabs that must be aligned and engaged securely.
- Don't use wire harnesses with a loose wire or coupler.



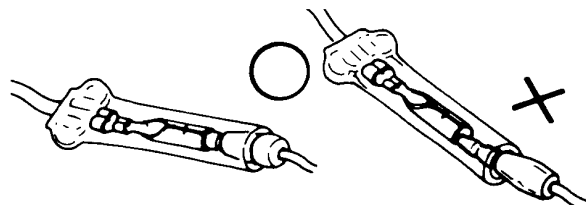
- Place the plastic cover over the mating coupler after reconnecting. Also check that the end is not inverted.



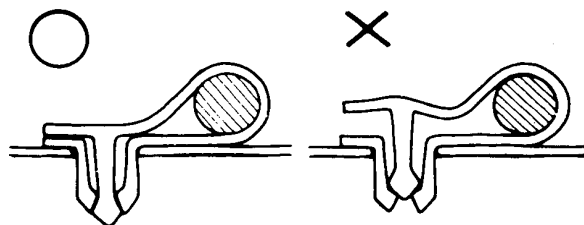
- Before connecting, check each connector cover for breakage. Also make sure that the female connector is tight and not pried open from the previous use.



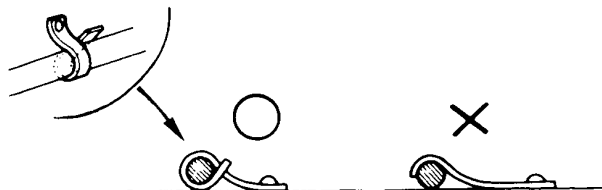
- Insert male connectors into the female connectors fully until they will no longer go.
- Be sure that plastic cover is placed over the connection.
- Don't place the opening of each plastic cover facing up.



- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.



- A loose wire harness or cable can be a hazard to safety. After clamping, check each wire for security in its clamp.



- Do not squeeze wires against the weld or nugget of its clamp when a weld-on clamp is used.

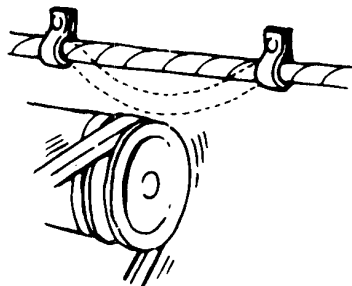


(cont'd)

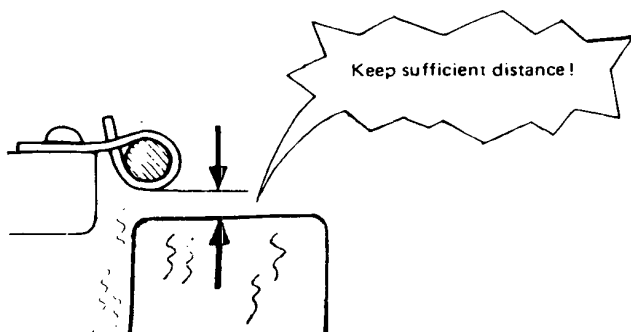
Preparation of Work

Electrical (cont'd)

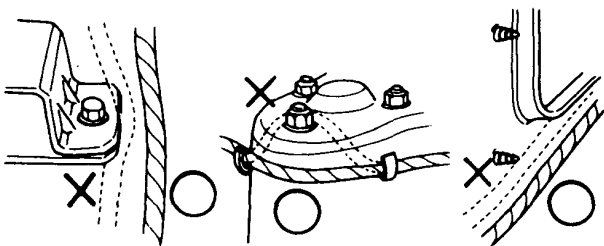
- After clamping, check each harness to be certain that it is not interfering with any moving or sliding parts of the vehicle.
- Keep wire harnesses away from the exhaust pipes and other hot parts.



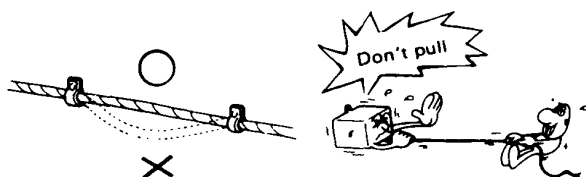
- Always keep a safe distance between wire harnesses and any heated parts.



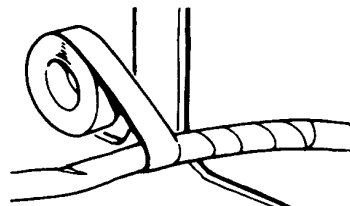
- Do not bring wire harnesses in direct contact with sharp edges or corners.
- Also avoid contact with the projected ends of bolts, screws and other fasteners.



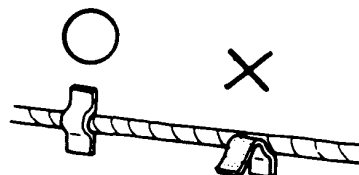
- Route harnesses so they are not pulled taut or slackened excessively.



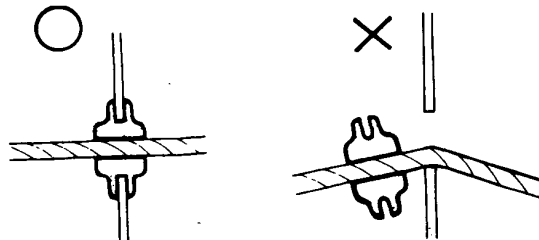
- Protect wires and harnesses with a tape or tube if they are in contact with a sharp edge or corner.



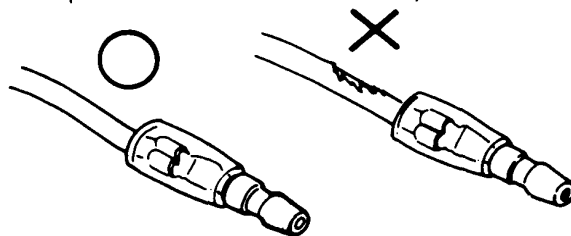
- Clean the attaching surface thoroughly if a plaster is used. Use a spirit wipe if necessary.



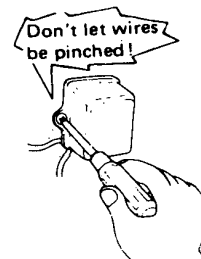
- Seat grommets in their grooves properly.



- Do not damage the insulator when connecting a wire.
- Do not use wires or harnesses with a broken insulator. Repair by wrapping with a protective tape or replace with new ones if necessary.

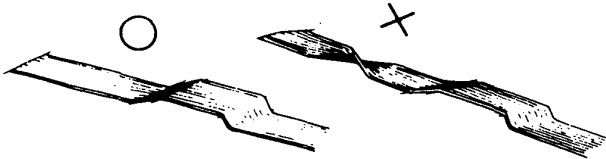


- After installing parts, make sure that wire harnesses are not pinched.

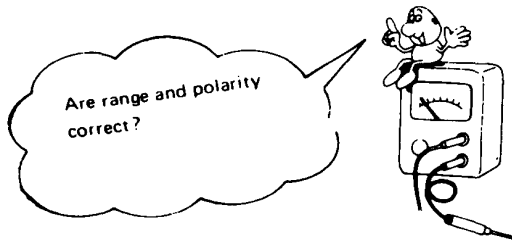




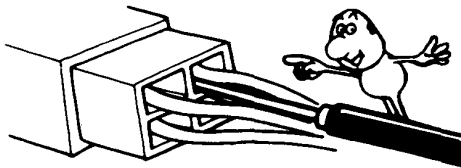
- After routing, check that the wire harnesses are not twisted or kinked.



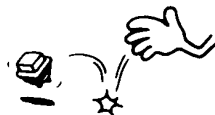
- Wire harnesses should be routed so that they are not pulled taut, slackened excessively, pinched, or interfered with adjacent or surrounding parts in all steering positions.



- When using the Service Tester, follow the manufacturer's instructions and those described in the Shop Manual.



- Do not throw or let parts fall.



- Rust is the enemy of all finished surfaces. Before connecting connectors and couplers, check the terminals and remove, if any, rust using a fine sand paper or emery cloth.



Symbol Marks

The following symbols stand for:



:Apply engine oil.



:Apply brake fluid.



:Apply grease.



:Apply Automatic Transmission Fluid.



:Apply Power Steering Fluid.



Special Tools

Special Tools (Common with Other Models)	2-2
Optional Tools	2-6

Special Tools

Special Tools (Common with Other Models)

5. Engine Removal/Installation

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07941—6920002	Ball Joint Remover	1	
②	07966—6340011	Engine Block Hanger	1	

6. Cylinder head/Valve Train

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07743—0020000	Adj. Valve Guide Driver	1	
②	07757—PJ10100	Valve Spring Compressor Attachment	1	Use changed to 07757-0010000 attachment <B20 A Engine>
③	07757—0010000	Valve Spring Compressor	1	
④	07942—SA50000	Valve Guide Driver, 7.0 mm	1	07942—8230000 may also be used.
⑤	07942—6570100	Valve Guide Driver, 6.6 mm	1	07942—6110000 may also be used.
⑥	07947—SB00100	Camshaft Seal Driver	1	
⑦	07984—SA50000	Valve Guide Reamer, 7.0 mm	1	07984—6890100 may also be used.
⑧	07984—6570100	Valve Guide Reamer, 6.6 mm	1	07984—6110000 may also be used.

7. Engine Block

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07749—0010000	Driver	1	07949—6110000 may also be used.
②	07924—PD20002	Ring Gear Holder	1	
③	07947—SB00200	Oil Seal Driver	1	Crankshaft Seal <Carbureted Engine>
④	07948—SB00101	Driver Attachment	1	Crankshaft Seal (Clutch Side)
⑤	07973—SB00100	Piston Base Head	1	
⑥	07973—SB00200	Pilot Collar	1	Not included in base set. Use each with the base set.
⑦	07973—SB00400	Piston Pin Base Insert	1	
⑧	07973—PE00302	Adj. Piston Pin Driver	1	
⑨	07973—6570002	Piston Pin Insert Base Set	1	

8. Engine Lubrication

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07406—0030000	Oil Pressure Gauge Adaptor	1	
②	07746—0010100	Attachment, 32 x 35 mm	1	<A20A and A16A Engines>
③	07746—0010400	Attachment, 52 x 55 mm	1	<B20A Engine>
④	07749—0010000	Driver	1	07949—6110000 may also be used.
⑤	07912—6110001	Oil Filter Socket Wrench	1	

11, 12. Fuel and Emission Controls

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAC—SE00200	Fuel Sender Wrench	1	
②	07GAZ—SE00300	R.P.M. Connecting Adaptor	1	
③	07406—0040001	Fuel Pressure Gauge Set	1	<Fuel-Injected Engine>
③-1	07406—0040100	Pressure Gauge	(1)	Component Tool
③-2	07406—0040201	Hose Assembly	(1)	Component Tool
④	07411—0020000	Digital Circuit Tester	1	<Fuel-Injected Engine>
⑤	07614—0050100	Fuel Line Clamp	1	<Carbureted Engine>
⑥	07999—PD6000A	System Checker Harness	1	<Fuel-Injected Engine>

13. Clutch

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAG—PF50100	Clutch Disc Alignment Tool	1	<B20A Engine>
②	07708—0010102	10 mm T-Wrench	1	
③	07924—PD20002	Ring Gear Holder	1	
④	07974—6890101	Clutch Disc Alignment Tool	1	<A20A and A16A Engines>



14. Manual Transmission <B2>

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07933-6890101	Bearing Remover Attachment	1	
②	07744-0010200	Pin Punch, 3.0 mm	1	
③	07744-0010400	Pin Punch, 5.0 mm	1	07944-6110100 may also be used.
④	07746-0010200	Attachment, 37 x 40 mm	1	
⑤	07746-0010400	Attachment, 52 x 55 mm	1	07949-6340200 may also be used.
⑥	07746-0010500	Attachment, 62 x 68 mm	1	
⑦	07749-0010000	Driver	1	07949-6110000 may also be used.
⑧	07936-6340000	Bearing Remover Set	1	

14. Manual Transmission <A2>

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAC-PG40100	Transmission Housing Puller	1	07GAC-PF40100 may also be used.
②	07936-6890101	Bearing Remover Attachment	1	
③	07744-0010200	Pin Punch, 3.0 mm	1	
④	07744-0010400	Pin Punch, 5.0 mm	1	07944-6110100 may also be used.
⑤	07746-0010400	Attachment, 52 x 55 mm	1	
⑥	07749-0010000	Driver	1	07949-6110000 may also be used.
⑦	07907-PD10000	Socket Wrench, 30 mm	1	
⑧	07923-6890101	Mainshaft Holder	1	
⑨	07936-6340000	Bearing Remover Set	1	
⑩	07947-6110500	Driver Attachment, E	1	Differential Oil seal
⑪	07947-6340000	Oil Seal Driver	1	
⑫	07947-6340500	Driver Attachment, E	1	

15. Automatic Transmission

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAB-PF50100	Mainshaft Holder, Automatic	1	<F4 Transmission>
②	07GAC-PG40100	Transmission Housing Puller	1	07GAC-PF40100 may also be used.
③	07GAE-PG40000	Clutch Spring Compressor Set	1	
③-1	07GAE-PG40100	Compressor Attachment	(1)	} 07960-689000 may also be used.
③-2	07GAE-PG40200	Compressor Bolt Assembly	(1)	
③-3	07960-6120100	Compressor Attachment	(1)	
④	07406-0020003	Oil Pressure Gauge Set	1	
④-1	07406-0020201	Oil Pressure Hose	(3)	Component Tool
⑤	07406-0070000	Low Pressure Gauge	1	
⑥	07936-6890101	Bearing Remover Attachment	1	
⑦	07746-0010500	Attachment, 62 x 68 mm	1	
⑧	07749-0010000	Driver	1	07949-6110000 may also be used.
⑨	07907-PD10000	Socket Wrench, 30 mm	1	07907-6890100 may also be used.
⑩	07923-6890202	Mainshaft Holder	1	<C9 Transmission>
⑪	07936-6340000	Bearing Remover Set	1	
⑫	07947-6110500	Oil Seal Driver Attachment	1	
⑬	07947-6340201	Oil Seal Driver	1	
⑭	07947-6340500	Driver Attachment, E	1	
⑮	07974-6890300	Throttle Cable Adjustment Gauge	1	<Carbureted Engine>
⑯	07998-SA50000	Accelerator Pedal Weight Set	1	
⑯-1	07988-SA50100	Main Pedal Weight (1.0 kg)	(1)	Component Tool
⑯-2	07988-SA50200	Sub Pedal Weight (0.5 kg)	(1)	Component Tool

(cont'd)

Special Tools

Special Tools (Common with Other Models)

16. Differential

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07746-0030100	Driver	1	07949-6110000 may also be used.
②	07749-0010000	Driver	1	
③	07944-SA00000	Pin Punch, 4.0 mm	1	
④	07947-6110500	Seal Driver Attachment	1	
⑤	07947-6340500	Driver Attachment, E	1	

17. Driveshaft

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAD-SE00100	Oil Seal Driver Attachment	1	
②	07746-0010400	Attachment, 52 x 55 mm	1	
③	07746-0010500	Attachment, 62 x 68 mm	1	
④	07746-0040900	Pilot, 40 mm	1	
⑤	07749-0010000	Driver	1	
⑥	07947-SD90200	Oil Seal Driver Attachment	1	
⑦	07965-SD90100	Support Base	1	
⑧	07965-SD90200	Support Collar	1	

18. Steering

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07746-0010300	Attachment, 42 x 47 mm	1	07916-6920000 may also be used.
②	07916-SA50001	Steering Gearbox Locknut Wrench, 40 mm	1	
③	07941-6920002	Ball Joint Remover	1	
④	07965-6340301	Hub Dis/Assembly Tool, Base A	1	
⑤	07974-SA50800	Ball Joint Boot Clip	1	
⑥	07974-6790000	Installation Guide, B Tie-Rod Boots Driver	1	

19. Power Steering

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAK-SE00100	P/S Joint Adaptor Set	1	Component tools
①-1	07GAK-SE00110	P/S Pump Joint Adaptor	(1)	
①-2	07GAK-SE00120	P/S Hose Joint Adaptor	(1)	
②	07406-0010001	P/S Pressure Gauge Set	1	Component tools
②-1	07406-0010101	Bypass Tube Joint	(1)	
②-2	07406-0010300	Oil Pressure Valve	(1)	
②-3	07406-0010400	Pressure Gauge	(1)	07725-0010101 may also be used.
③	07725-0030000	Universal Holder	1	
④	07746-0010300	Attachment, 42 X 47 mm	1	
⑤	07749-0010000	Driver	1	07949-6110000 may also be used.
⑥	07900-SA50000	P/S Seal Replacement Tool Set	1	
⑥-1	07974-SA50100	Piston Seal Ring Guide	(1)	
⑥-2	07974-SA50200	Piston Seal Ring Sizing Tool	(1)	Component Tools
⑥-3	07974-SA50300	Cylinder End Packing Slider	(1)	
⑥-4	07974-SA50400	End Seal Guide	(1)	
⑥-5	07974-SA50600	Dust Seal Guide	(1)	
⑥-6	07974-SA50900	P/S Tool Set Case	(1)	
⑦	07916-SA50001	Steering Gearbox Locknut Wrench, 40 mm	1	
⑧	07941-6920002	Ball Joint Remover	1	
⑨	07947-6340300	Driver Attachment	1	
⑩	07953-7190000	Collar Driver	1	



20. Suspension

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAE—SE00100	Shock Absorber Spring Compressor	1	07949—6110000 may also be used. Component tools
②	07GAF—SE00100	Hub Assembly Pin	1	
③	07GAF—SE00200	Hub Assembly Driver Attachment	1	
④	07GAF—SE00401	Front Hub Driver Base	1	
⑤	07410—0010200	Wheel Alignment Gauge ATT., B	1	
⑥	07746—0010100	Attachment, 32 x 35 mm	1	
⑦	07746—0010400	Attachment, 52 x 55 mm	1	
⑧	07746—0010600	Attachment, 72 x 75 mm	1	
⑨	07749—0010000	Driver	1	
⑩	07941—6920002	Ball Joint Remover	1	
⑪	07965—SB000000	Ball Joint Dis/Assebbly Tool Set	1	
⑪-1	07965—SB00100	Ball Joint Remover/Installer	(1)	
⑪-2	07965—SB00200	Ball Joint Remover Base	(1)	
⑪-3	07965—SB00300	Ball Joint Installer Base	(1)	
⑫	07965—6340301	Front Wheel Bearing Dis/Assembly Tool Base, A	2	
⑬	07965—6920201	Front Hub Dis/Assembly Tool, B	1	
⑭	07974—SA50700	Ball Joint Boot Clip Installation Guide, A	1	

21. Brake

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAF—SE00300	Pulser Driver Attachment	1	Short parts of the Brake Booster Set 07504—6340100 07494—611000 may also be used. With 8" Master Cylinder With 9" Master Cylinder
②	07GAG—SE00100	Brake Booster Adjustment Gauge	1	
③	07GAZ—SE00100	A.L.B. Hand Pump Assembly	1	
④	07GAZ—SE00200	A.L.B. Checker Harness Adaptor	1	
⑤	07504—6340100	Brake Booster Tool Set	1	
⑤-1	07404—5790300	Vacuum Gauge	(1)	
⑤-2	07406—5790200	Oil Pressuer Gauge	(2)	
⑤-3	07410—5790100	Pressure Gauge Attachment, C	(1)	
⑤-4	07410—5790500	Tube Joint Att, I	(2)	
⑤-5	07510—6340100	Pressuer Gauge Joint Pipe	(2)	
⑤-6	07510—6340300	Vacuum Joint Tube, A	(1)	
⑥	07508—SB000000	A.L.B. Checker	1	
⑦	07749—0010000	Driver	1	
⑧	07907—SB000000	A.L.B. T-Wrench	1	
⑨	07914—SA500000	Snap-ring Pliers	1	
⑩	07921—0010000	Flare Nut Wrench	1	
⑪	07929—SB000000	Modulator Holder	1	
⑫	07947—6890300	Driver Attachment, C	1	
⑬	07960—SA50002	Brake Spring Compressor	1	
⑭	07965—5790300	Cup Guide	1	
⑮	07965—5790400	Cup Guide	1	
⑯	07965—6340301	Front Wheel Bearing Dis/Assembly Tool Base, A	2	
⑰	07967—SB000000	Pulser Driver	1	
⑱	07973—SA500000	Rear Caliper Guide	1	

(cont'd)

Special Tools

Special Tools (Common with Other Models)

22. Body

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAZ—SE30100	Torsion Rod Assembly Tool	1	

24. Air Conditioner

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAB—PJ60100	A/C Clutch Holder	1	07923—PB80001 may also be used.
②	07703—0010200	Torx Bit Driver, T-30	1	
③	07749—0010000	Driver	1	07949—6110000 may also be used.
④	07934—PB80001	A/C Clutch Puller	1	
⑤	07934—SB20000	Shaft Seal Remover	1	
⑥	07947—6340300	Driver Attachment, A	1	

Optional Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07780—0012300	Valve Seat Cutter 30°	1	EX
②	07780—0012900	Valve Seat Cutter 30°	1	IN
③	07780—0014000	Valve Seat Cutter 60°	1	IN
④	07780—0014100	Valve Seat Cutter 60°	1	EX
⑤	07780—0010400	Valve Seat Cutter 45°	1	EX
⑥	07780—0010800	Valve Seat Cutter 45°	1	IN
⑦	07781—0010201	Valve Seat Cutter Holder, 6.6 mm	1	
⑧	07781—0010301	Valve Seat Cutter Holder, 7.0 mm	1	

Specifications

Standards and Service Limits	3-2
Design Specifications	3-13
Body Specifications	3-21

Standards and Service Limits

Cylinder Head/Valve Train <Expect B20A2 Engine> — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	300 rpm and wide-open throttle		Nominal A20A3, A20A4 Engines (Expect KS) Other Engines Minimum A20A3, A20A4 Engines (Expect KS) Other Engines Maximum variation	1,226 kPa (12.5 kg/cm ² , 178 psi) 1,176 kPa (12.0 kg/cm ² , 171 psi) 1,030 kPa (10.5 kg/cm ² , 149 psi) 980 kPa (10.0 kg/cm ² , 142 psi) 196 kPa (2 kg/cm ² , 28 psi)
Cylinder head	Warpage		—	0.05 (0.002)
	Height		90 (3.54)	89.8 (3.54)
Camshaft	End play		0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance	No. 1,3 and 5 Journals No. 2 and 4 Journals	0.050–0.089 (0.002–0.004) 0.130–0.169 (0.005–0.007)	0.15 (0.006) 0.23 (0.009)
	Runout		0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height	A20A3 Engine		
		IN A	38.858 (1.5102)	—
		IN B	38.604 (1.5198)	—
		EX	38.796 (1.5274)	—
		A20A4 Engine	38.858 (1.5102)	—
		EX	38.607 (1.5200)	—
		A20A1 Engine MT	38.477 (1.5148)	—
		EX	38.653 (1.5218)	—
		A16A1 Engine	38.175 (1.5029)	—
		EX	37.776 (1.4872)	—
		Other Engines	38.541 (1.5174)	—
		EX	38.607 (1.5200)	—
Valve	Valve clearance	IN	0.12–0.17 (0.005–0.007)	—
		EX	0.25–0.30 (0.010–0.012)	—
	Valve stem O.D.	IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
		EX	6.94–6.95 (0.2732–0.2736)	6.91 (0.272)
	Stem-to-guide clearance	IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
		EX	0.06–0.09 (0.002–0.004)	0.12 (0.005)
	Stem installed height	IN	48.59 (1.913)	49.34 (1.943)
		EX	47.66 (1.876)	48.41 (1.906)
Valve seat	Width	IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length	IN	49.2 (1.94)	48.2 (1.90)
		EX Inner	39.8 (1.57)	38.8 (1.53)
		Outer	49.8 (1.96)	48.8 (1.92)
	Squareness Inner and Outer		—	1.75 (0.068)
Valve guide	I.D.	IN	6.61–6.63 (0.260–0.261)	6.65 (0.262)
		EX	7.01–7.03 (0.276–0.277)	7.05 (0.278)
Rocker arm	Arm-to-shaft clearance		0.008–0.054 (0.0003–0.0021)	0.08 (0.003)

Cylinder Head/Valve Train <B20A2 Engine> — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	300 min ⁻¹ (rpm) and wide-open throttle		Nominal Minimum Maximum variation	1,226 kPa (12.5 kg/cm ² , 178 psi) 1,030 kPa (10.5 kg/cm ² , 149 psi) 196 kPa (2 kg/cm ² , 28 psi)
Cylinder head	Warpage		—	0.05 (0.002)
	Height		132 (5.20)	131.8 (5.19)
Camshaft	End play		0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance		0.050–0.089 (0.002–0.004)	0.15 (0.006)
	Runout		0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height	IN	33.676 (1.3258)	—
		EX	33.737 (1.3282)	—
Valve	Valve clearance	IN	0.08–0.12 (0.003–0.005)	—
		EX	0.16–0.20 (0.006–0.008)	—
	Valve stem O.D.	IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
		EX	6.55–6.56 (0.2579–0.2583)	6.52 (0.257)
	Stem-to-guide clearance	IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
		EX	0.05–0.08 (0.002–0.003)	0.11 (0.04)
	Stem installed height	IN and EX	42.75 (1.683)	43.54 (1.714)
Valve seat	Width	IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length	Inner	41.25 (1.622)	40.2 (1.583)
		Outer	44.74 (1.761)	43.74 (1.722)
	Squareness	Inner and Outer	—	1.6 (0.063)
Valve guide	I.D.	IN and EX	6.61–6.63 (0.260–0.261)	6.65 (0.262)

Engine Block <Expect B20A2 Engine> — Section 7
***A16A1 Engine only**

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.08 (0.003) max.	0.10 (0.004)
	Bore diameter	A	82.70—82.71 (3.2559—3.2563)	82.74 (3.2575)
		B	82.69—82.70 (3.2555—3.2559)	82.73 (3.2571)
		A	*80.01—80.02 (3.1500—3.1504)	80.05 (3.1516)
Piston	Bore taper	B	*80.00—80.01 (3.1496—3.1500)	80.04 (3.1512)
	Reboring limit		0.007—0.012 (0.0003—0.0005)	0.05 (0.002)
			—	0.5 (0.02)
	Skirt O.D. (At 21 mm (0.83 in) from bottom of skirt)	A	82.67—82.68 (3.2574—3.2551)	82.66 (3.254)
Piston ring		B	82.66—82.67 (3.2543—3.2574)	82.65 (3.253)
		A	*79.98—79.99 (3.1488—3.1492)	79.97 (3.148)
		B	*79.97—79.98 (3.1484—3.1500)	79.96 (3.148)
	Clearance in cylinder		0.02—0.04 (0.0008—0.0016)	0.08 (0.003)
Piston ring	Piston-to-ring clearance	Top	0.030—0.060 (0.0012—0.0024)	0.13 (0.005)
		2nd	0.030—0.055 (0.0012—0.0022)	0.13 (0.005)
		* Top and 2nd	*0.02—0.05 (0.0008—0.0020)	0.13 (0.005)
	Ring end gap	Top	0.20—0.37 (0.008—0.015)	0.6 (0.02)
Piston ring		A16A1 Engine	0.20—0.35 (0.008—0.014)	0.6 (0.02)
		Others	0.20—0.37 (0.008—0.015)	0.6 (0.02)
		2nd	0.20—0.37 (0.008—0.015)	0.6 (0.02)
		A16A1 Engine	0.30—0.42 (0.012—0.017)	0.6 (0.02)
Piston ring		Others	0.30—0.90 (0.012—0.035)	1.0 (0.04)
		Oil	0.20—0.70 (0.008—0.028)	0.8 (0.03)
		RIKEN		
		TEIKOKU		
Connecting rod	Pin-to-rod interference		0.013—0.032 (0.0005—0.0013)	0.013 (0.0005)
	Large end bore diameter		Nominal 48 (1.89) *45 (1.77)	—
	End play installed on crankshaft		0.15—0.30 (0.006—0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		49.970—49.994 (1.9673—1.9683)	—
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter		44.976—45.000 (1.7707—1.7717)	—
			*41.976—42.000 (1.6530—1.6535)	—
Crankshaft	Taper/out-of-round, rod journal	Other Engine	0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10—0.35 (0.004—0.014)	0.45 (0.018)
	Runout		0.024 (0.0009) max.	0.04 (0.0016)
Bearings	Main bearing-to-journal	No. 1, 2, 4, and 5	0.026—0.055 (0.0010—0.0022)	0.07 (0.003)
	Oil clearance	Journals	0.032—0.061 (0.0013—0.0024)	0.07 (0.003)
		No. 3 Journal	0.020—0.038 (0.0008—0.0015)	0.07 (0.003)
	Rod bearing-to-journal oil clearance			

Engine Block <B20A2 Engine> — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	A	81.01—81.02 (3.1894—3.1898)	81.05 (3.1909)
		B	81.00—81.01 (3.1890—3.1894)	81.04 (3.1905)
	Bore taper		0.007—0.012 (0.0003—0.0005)	0.05 (0.002)
Piston	Reboring limit		—	0.05 (0.002)
	Skirt O.D. (At 21 mm (0.83 in) from bottom of skirt)	A	80.98—80.99 (3.1882—3.1886)	80.97 (3.188)
		B	80.97—80.98 (3.1878—3.1882)	80.96 (3.187)
	Clearance in cylinder		0.02—0.04 (0.0008—0.0016)	0.08 (0.003)
Piston ring	Piston-to-ring clearance	Top	0.035—0.060 (0.0014—0.0024)	0.13 (0.005)
		2nd	0.030—0.055 (0.0012—0.0022)	0.13 (0.005)
	Ring end gap	Top	0.25—0.35 (0.010—0.014)	0.6 (0.02)
		2nd	0.35—0.45 (0.014—0.018)	0.7 (0.03)
Piston ring		Oil	0.20—0.70 (0.008—0.028)	0.8 (0.03)
Connecting rod	Pin-to-rod interference		0.013—0.032 (0.0005—0.0013)	0.013 (0.0005)
	Large end bore diameter		Nominal 51 (2.01)	—
	End play installed on crankshaft		0.15—0.30 (0.006—0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		54.976—55.000 (2.1644—2.1654)	—
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter		47.976—48.000 (1.8888—1.8900)	—
	Taper/out-of-round, rod journal		0.005 (0.0002) max.	0.010 (0.0004)
Crankshaft	End play		0.10—0.35 (0.004—0.014)	0.45 (0.018)
	Runout		0.02 (0.0003) max.	0.030 (0.0012)
Bearings	Main bearing-to-journal	No. 1, 2, 4, and 5	0.024—0.042 (0.0010—0.0017)	0.05 (0.002)
	Oil clearance	Journals	0.030—0.048 (0.0012—0.0019)	0.05 (0.002)
		No. 3 Journal	0.026—0.044 (0.0010—0.0017)	0.05 (0.002)
	Rod bearing-to-journal oil clearance			

(cont'd)

Standards and Service Limits (cont'd)

Engine Lubrication <Expect B20A2 Engine> — Section 8

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)	4.0 (4.2, 3.5) After engine disassembly 3.5 (3.7, 3.1) After oil change, including oil filter 3.0 (3.2, 2.6) After oil change, without oil filter	
Oil pump	Displacement	40.3 ℓ (10.6 US. gal., 8.9 Imp. gal.)	5,500 min ⁻¹ (rpm)
	Inner-to-outer rotor radial clearance	0.15 (0.006) max.	0.2 (0.008)
	Pump body-to-rotor radial clearance	0.10—0.18 (0.004—0.007)	0.2 (0.008)
	Pump body-to-rotor side clearance	0.30—0.108 (0.001—0.004)	0.15 (0.006)
Relief valve	Pressure setting 80°C (176°F)	Idle	98 kPa (1.0 kg/cm ² , 14 psi) min.
		3,000 min ⁻¹ (rpm)	373—451 kPa (3.8—4.6 kg/cm ² , 54—65 psi)

Engine Lubrication <B20A2 Engine> — Section 8

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)	5.0 (5.3, 4.4) After engine disassembly 4.0 (4.2, 3.5) After oil change, including oil filter 3.5 (3.7, 3.1) After oil change, without oil filter	
Oil pump	Displacement	54 ℓ (10.6 US. gal., 8.9 Imp. gal.)	5,000 min ⁻¹ (rpm)
	Inner-to-outer rotor radial clearance	0.04—0.16 (0.002—0.006)	0.2 (0.008)
	Pump body-to-rotor radial clearance	0.10—0.19 (0.004—0.007)	0.21 (0.008)
	Pump body-to-rotor side clearance	0.02—0.071 (0.001—0.003)	0.12 (0.005)
Relief valve	Pressure setting 80°C (176°F)	Idle	137 kPa (1.4 kg/cm ² , 20 psi) min.
		3,000 min ⁻¹ (rpm)	470—559 kPa (4.8—5.7 kg/cm ² , 67—80 psi)

Cooling — Section 10

	MEASUREMENT	STANDARD (NEW)
Cooling fan belt	Deflection midway between pulleys/load	6—9 (0.24—0.35) /98N (10 kg, 22 lb) for used belt 5 (0.20) /98N (10 kg, 22 lb) after replacement of belt
Radiator	Capacity (incl. heater) ℓ (US. Gal., Imp. Gal.) (Includes reservoir tank 0.8 (0.21, 0.18))	A20A3, A20A4 Engines Manual 6.4 (1.7, 1.4) Automatic 7.0 (1.8, 1.5)
		A20A1, A20A2 Engines Manual 6.3 (1.7, 1.4) Automatic 6.9 (1.8, 1.5)
		B20A2 Engine Manual 7.1 (1.9, 1.6)
		A16A1 Engine Manual 6.3 (1.7, 1.4) Automatic 6.2 (1.6, 1.4)
Thermostat	Pressure cap opening pressure	74—103 kPa (0.75—1.05 kg/cm ² , 11—15 psi)
	Starts to open	Primary: 82°C ±2 (180°F ±3) Secondary: 85°C ±2 (185°F ±3)
	Full open Valve lift at full open	95°C (203°F) 8 (0.31) max. 100°C (212°F) OPTIONAL 8 (0.31) max.
Water pump	Gear ratio (crankshaft)	1.34
	Capacity: ℓ per min/at min ⁻¹ (rpm)	124/5,000 (32.7 US. gal/5,000 min ⁻¹ (rpm))
Cooling fan	Fan-to-core clearance	26.0 (1.02)
	Thermoswitch "ON" temperature	87°—93°C (188°—199°F)
	Thermoswitch "OFF" temperature	83°C (181°F) or more (hysteresis 2°C (35°F) or more)

Fuel and Emissions — Section 11

	MEASUREMENT	STANDARD (NEW)
Fuel pump (Fuel-injected engine)	Delivery pressure	230—270 kPa (2.35—2.75 kg/cm ² , 33—39 psi)
	Displacement	230 cc/min in 10 seconds
	Relief valve opening pressure	441—588 kPa (4.5—6.0 kg/cm ² , 64—85 psi)
Pressure regulator (Fuel-injected engine)	Pressure	230—270 kPa (2.35—2.75 kg/cm ² , 33—39 psi)
Fuel pump (Carbureted engine)	Delivery pressure	17.6—22.5 kPa (0.18—0.23 kg/cm ² , 2.6—3.3 psi)
	Displacement	760 cc at 12V (46 cu. in./12V)
Fuel Tank	Capacity	60ℓ (15.9 US. Gal., 13.2 Imp. Gal.)
Fuel injected engine	Fast idle	1,000—1,800 min ⁻¹ (rpm)
	Idle Speed with headlights and cooling fan off	Manual A20A3 750 ± 50 min ⁻¹ (rpm)
		A20A4, B20A2 800 ± 50 min ⁻¹ (rpm)
		Automatic A20A3 750 ± 50 min ⁻¹ (rpm)
		(in "N" or "P") A20A4 800 ± 50 min ⁻¹ (rpm) KQ: 750 ± 50 min ⁻¹ (rpm)
Carbureted engine	idle CO	A20A3 and A20A4 KQ: 0.1 %
	Choke fast idle	A20A1 and A20A2: 2,000—3,000 min ⁻¹ (rpm) A16A1: 1,500—2,500 min ⁻¹ (rpm)
	Idle Speed with headlights and cooling fan off	Manual A16A1, A20A2 750 ± 50 min ⁻¹ (rpm)
		A20A1 800 ± 50 min ⁻¹ (rpm)
		Automatic A16A1, A20A2 700 ± 50 min ⁻¹ (rpm) (in gear) KS: 750 ± 50 min ⁻¹ (rpm) A20A1 730 ± 50 min ⁻¹ (rpm)
Carbureted engine	Idle CO	A20A1 and A20A2 KQ: 0.1 %

Clutch — Section 13

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal height	205 (8.1) to floor	—
	Stroke	178 (7.0) to carpet	—
	Pedal play	138–143 (5.4–5.6)	—
	Disengagement height	15–25 (0.6–1.0)	—
Clutch arm	Release arm adjustment	73 (2.9) min. to floor	—
		49 (1.9) min. to carpet	—
Flywheel	Clutch surface runout	5.2–6.4 (0.20–0.25)	—
Clutch plate	Rivet head depth	0.05 (0.002) max.	0.15 (0.006)
	Surface runout	1.3 (0.05) min.	0.2 (0.008)
	Radial play in splines	0.8 (0.03) max.	1.0 (0.04)
	Thickness	0.7–2.1 (0.028–0.083)	4.0 (0.16)
Clutch release bearing holder	I.D.	8.1–8.8 (0.32–0.35)	5.7 (0.22)
	Holder-to-guide sleeve clearance	31.00–31.059 (1.220–1.223)	31.09 (1.224)
Clutch cover		0.05–0.15 (0.002–0.006)	0.22 (0.009)
	Unevenness of diaphragm spring	0.8 (0.03) max.	1.0 (0.04)

Manual Transmission (A1/A2) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	2.4 (2.5, 2.1) at assembly 2.3 (2.4, 2.0) at oil change	
Mainshaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	28.002–28.015 (1.1024–1.1030)	27.95 (1.100)
	Diameter of third gear contact area	31.984–32.000 (1.2592–1.2598)	31.93 (1.2571)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
Mainshaft third and fourth gears	Runout	0.04 (0.0016) max.	0.10 (0.004)
	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.18 (0.0012–0.0071)	0.3 (0.012)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Mainshaft fifth gear	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.13 (0.0012–0.0051)	0.3 (0.012)
	Thickness	29.92–29.97 (1.1780–1.1799)	29.8 (1.173)
Countershaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Diameter of low gear contact area	33.984–34.000 (1.3380–1.3386)	33.93 (1.336)
Countershaft low gear	Runout	0.04 (0.0016)	0.10 (0.004)
	I.D.	39.008–39.025 (1.5357–1.5364)	39.07 (1.538)
	End play	0.03–0.08 (0.0012–0.0031)	0.18 (0.007)
Countershaft second gear	I.D.	43.008–43.025 (1.6932–1.6939)	43.07 (1.696)
	End play	0.03–0.10 (0.0012–0.0039)	0.18 (0.007)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Spacer collar (Countershaft second gear)	I.D.	30.98–30.99 (1.2197–1.2201)	31.4 (1.236)
	O.D.	37.989–38.000 (1.4956–1.4961)	37.93 (1.493)
	Length	30.53–30.55 (1.2020–1.2028)	30.51 (1.201)
Spacer collar (Mainshaft fourth and fifth gears)	I.D.	25.002–25.012 (0.9843–0.9847)	25.06 (0.987)
	O.D.	31.989–32.000 (1.2594–1.2598)	31.93 (1.257)
	Length	27.03–27.08 (1.0642–1.0661)	27.01 (1.063)
Reverse idler gear	I.D.	17.016–17.043 (0.6699–0.6710)	17.09 (0.673)
	Gear-to-reverse gear shaft clearance	0.032–0.077 (0.0013–0.0030)	0.15 (0.006)
	Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.73–1.18 (0.031–0.046)
			0.4 (0.016)
Shift fork	Synchronizer sleeve gear	6.75–6.85 (0.266–0.270)	6.0 (0.24)
	Fork-to-synchronizer sleeve clearance	0.35–0.65 (0.014–0.026)	1.0 (0.04)
	End gap	11.8–12.1 (0.46–0.48)	—
	Fork-to-reverse idler gear clearance	0.2–1.0 (0.008–0.039)	1.7 (0.07)
Reverse shift fork	Groove width	7.05–7.25 (0.278–0.285)	—
	Fork-to-fifth/reverse shift shaft clearance	0.05–0.35 (0.002–0.014)	0.5 (0.02)
Shift arm	Width of groove in shift rod guide	11.8–12.0 (0.46–0.47)	—
	Shift arm-to-shift rod guide clearance	0.05–0.35 (0.002–0.014)	0.8 (0.03)
	Width in shift guide	7.9–8.0 (0.311–0.315)	—
	Shift arm-to-shift guide clearance	0.1–0.3 (0.004–0.012)	0.6 (0.02)
Shift rod guide	I.D.	14.000–14.068 (0.5512–0.5539)	—
	Guide-to-shaft clearance	0.011–0.092 (0.0004–0.0036)	0.15 (0.006)
	O.D.	11.9–12.0 (0.469–0.472)	—
	Guide-to-fifth/reverse shift shaft clearance	0.2–0.5 (0.008–0.020)	0.8 (0.03)
Selector arm	Width	11.9–12.0 (0.469–0.472)	—
	Arm-to-shift rod guide clearance	0.05–0.25 (0.002–0.010)	0.5 (0.02)
	End gap	10.05–10.15 (0.396–0.400)	—
	Arm-to-interlock clearance	0.05–0.25 (0.002–0.010)	0.7 (0.03)
	Arm-to-holder clearance	0.01–0.20 (0.0004–0.0079)	Selection with 5 types of shims

(cont'd)

Standards and Service Limits (cont'd)

Manual Transmission<B2>- Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	1.9 (2.0, 1.7) at assembly 2.0 (2.1, 1.8) at oil change	
Mainshaft	End play Diameter of needle bearing contact area Diameter of third gear contact area Diameter of ball bearing contact area Runout	0.14–0.21 (0.006–0.008) 27.987–28.000 (1.1018–1.1024) 37.984–38.000 (1.4954–1.4961) 27.987–28.000 (1.1018–1.1024) 0.04 (0.0016) max.	Adjust with a shim. 27.94 (1.100) 37.93 (1.493) 27.94 (1.100) 0.10 (0.004)
Mainshaft third and fourth gears	I.D. End play Thickness 3rd 4th	43.009–43.025 (1.6933–1.6939) 0.06–0.21 (0.0024–0.0083) 32.42–32.47 (1.2764–1.2783) 30.92–30.97 (1.2173–1.2193)	43.08 (1.696) 0.3 (0.012) 32.3 (1.272) 30.8 (1.213)
Mainshaft fifth gear	I.D. End play Thickness	43.009–43.025 (1.6933–1.6939) 0.06–0.21 (0.0024–0.0083) 30.42–30.47 (1.1976–1.1996)	43.08 (1.696) 0.3 (0.0012) 30.3 (1.193)
Countershaft	End play Diameter of needle bearing contact area Diameter of ball bearing contact area Diameter of low gear contact area Runout	0.10–0.35 (0.004–0.014) 33.000–33.015 (1.2992–1.2998) 24.987–25.000 (0.9837–0.9843) 33.984–40.000 (1.3380–1.5748) 0.04 (0.0016)	0.5 (0.02) 32.95 (1.297) 24.94 (0.982) 33.93 (1.336) 0.10 (0.004)
Countershaft low gear	I.D. End play	46.009–46.025 (1.8114–1.8120) 0.03–0.08 (0.0012–0.0031)	46.08 (1.814) Adjust with a shim
Countershaft Second gear	I.D. End play Thickness	50.009–50.025 (1.9689–1.9695) 0.03–0.08 (0.0012–0.0031) 32.92–32.97 (1.2961–1.2980)	50.08 (1.972) Adjust with a collar. 32.8 (1.291)
Spacer collar (Countershaft second gear)	I.D. O.D. Length A B	36.48–36.49 (1.4362–1.4366) 43.989–44.000 (1.7318–1.7323) 28.98–29.00 (1.1409–1.1417) 29.03–29.05 (1.1429–1.1437)	36.5 (1.437) 43.94 (1.730) — —
Spacer collar (Mainshaft fourth and fifth gears)	I.D. O.D. Length A B	28.002–28.012 (1.1024–1.1028) 34.989–35.000 (1.3775–1.3780) 55.95–56.05 (2.2028–2.2067) 26.03–26.08 (1.0248–1.0268)	28.06 (1.105) 34.94 (1.376) — —
Reverse Idler gear	I.D. Gear-to-reverse gear shaft clearance	20.016–20.043 (0.7880–0.7891) 0.036–0.084 (0.0014–0.0033)	20.09 (0.791) 0.16 (0.006)
Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.85–1.10 (0.033–0.043)	0.4 (0.016)
Shift fork	Synchronizer sleeve gear Fork-to-synchronizer sleeve 1, 2, 3 and 4th 5th 1, 2, 3 and 4th 5th	7.95–8.05 (0.313–0.317) 5.75–5.85 (0.226–0.230) 0.45–0.65 (0.018–0.026) 0.25–0.45 (0.010–0.018)	— — 1.0 (0.04) 0.8 (0.03)
Reverse shift fork	End gap Fork-to-reverse idler gear clearance Groove width Fork-to-fifth/reverse shift shaft clearance	13.0–13.3 (0.51–0.52) 0.5–1.1 (0.020–0.043) 7.05–7.25 (0.278–0.285) 0.05–0.35 (0.002–0.014)	— 1.8 (0.07) — 0.5 (0.02)
Shift arm	Width of groove in shift rod guide Shift arm-to-shift rod guide clearance Width in shift guide Shift arm-to-shift guide clearance	12.8–13.0 (0.50–0.51) 0.05–0.35 (0.002–0.014) 7.9–8.0 (0.311–0.315) 0.1–0.3 (0.004–0.012)	— 0.8 (0.03) — 0.6 (0.02)
Shift rod guide	I.D. Guide-to-shaft clearance O.D. Guide-to-fifth/reverse shift shaft clearance	14.000–14.068 (0.5512–0.5539) 0.011–0.092 (0.0004–0.0036) 11.9–12.0 (0.469–0.472) 0.2–0.5 (0.008–0.020)	— 0.15 (0.006) — 0.8 (0.03)
Selector arm	Width Arm-to-shift rod guide clearance End gap Arm-to-interlock clearance	11.9–12.0 (0.469–0.472) 0.05–0.25 (0.002–0.010) 9.9–10.0 (0.390–0.394) 0.05–0.20 (0.002–0.008)	— 0.5 (0.02) — 0.45 (0.018)

Automatic Transmission (F4) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt)	2.4 (2.5, 2.1) at oil change 5.4 (5.7, 4.8) at assembly	
Hydraulic pressure	Line pressure at 2,000 min ⁻¹ (rpm)	834—883 kPa (8.5—9.0 kg/cm ² , 121—128 psi)	785 kPa (8.0 kg/cm ² , 114 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min ⁻¹ (rpm)	441—834 kPa (4.5—8.5 kg/cm ² , 64—121 psi)	392 kPa (4.0 kg/cm ² , 57 psi) with lever released 785 kPa (8.0 kg/cm ² , 114 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min ⁻¹ (rpm)	834—883 kPa (8.5—9.0 kg/cm ² , 121—128 psi)	785 kPa (8.0 kg/cm ² , 114 psi)
	Governor pressure at 60 km/h	181—191 kPa 1.85—1.95 kg/cm ² , 26—28	177 kPa (1.80 kg/cm ² , 25.6 psi)
	Throttle pressure A	485—500 kPa (4.95—5.1 kg/cm ² , 70—73 psi)	481 kPa (4.9 kg/cm ² , 69.7 psi)
	Throttle pressure B	834—883 kPa (8.5—9.0 kg/cm ² , 121—123 psi)	785 kPa (8.0 kg/cm ² , 114 psi)
Stall speed	Check with car on level ground	* 2,500—2,800 min ⁻¹ (rpm) 2,600—2,900 min ⁻¹ (rpm)	— —
Clutch	Clutch initial clearance	1st 0.65—0.85 (0.026—0.033) 2nd 0.50—0.70 (0.020—0.028) 3rd, 4th 0.40—0.60 (0.016—0.024) 31.0 (1.22)	— — — —
	Clutch return spring free length	1.88—2.0 (0.074—0.079)	29.0 (1.14)
	Clutch disc thickness	1.95—2.05 (0.077—0.079)	Until grooves worn out
	Clutch plate thickness	2.05—2.10 (0.081—0.083)	Discoloration
	Clutch end plate thickness	2.15—2.20 (0.085—0.087)	
	Mark 1	2.25—2.30 (0.089—0.091)	
	Mark 2	2.35—2.40 (0.093—0.094)	
	Mark 3	2.45—2.55 (0.096—0.098)	
	Mark 4	2.55—2.60 (0.100—0.102)	
	Mark 5	2.65—2.70 (0.104—0.106)	
Transmission	Mark 6	2.75—2.80 (0.108—0.110)	
	Mark 7	2.85—2.90 (0.112—0.114)	
	Mark 8	2.95—3.00 (0.116—0.118)	Discoloration
	Mark 9		
	Mark 10		
	Diameter of needle bearing contact area on main and stator shaft	22.980—22.993 (0.9047—0.9052)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear	35.975—35.991 (1.4163—1.4169)	
	Diameter of needle bearing contact area on mainshaft 4th gear collar	31.975—31.991 (1.2588—1.2594)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar	30.975—30.991 (1.2195—1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)	38.505—38.515 (1.5159—1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear	27.980—27.993 (1.1016—1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft L gear collar	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on reverse idle gear	13.990—14.000 (0.5508—0.5512)	
	Reverse idler shaft holder diameter	14.416—14.434 (0.5676—0.5683)	
	Mainshaft 2nd gear I.D.	41.000—41.016 (1.6141—1.6148)	
	Mainshaft 1st gear I.D.	36.000—36.016 (1.4173—1.4179)	
	Countershaft 4th gear I.D.	33.000—33.016 (1.2992—1.2998)	
	Countershaft 3rd gear I.D.	38.000—38.016 (1.4961—1.4966)	
	Countershaft 2nd gear I.D.	31.000—31.016 (1.2204—1.2210)	
	Countershaft 1st gear I.D.	38.000—38.016 (1.4961—1.4966)	
	Countershaft reverse gear I.D.	38.000—38.016 (1.4961—1.4966)	
	Reverse idle gear I.D.	18.006—18.017 (0.7089—0.7093)	
	Mainshaft 4th gear end play	0.10—0.22 (0.004—0.009)	Wear or damage
	Mainshaft 2nd gear end play	0.07—0.15 (0.003—0.006)	
	Mainshaft 1st gear end play	0.08—0.24 (0.003—0.009)	
	Countershaft 3rd gear end play	0.07—0.15 (0.003—0.006)	
	Countershaft 2nd gear end play	0.08—0.40 (0.003—0.016)	
	Reverse idler gear end play	0.05—0.18 (0.002—0.007)	
	Countershaft reverse gear end play	0.10—0.25 (0.004—0.016)	
	Reverse gear hub O.D.	51.87—51.90 (2.0421—2.0433)	Wear or damage

*Fuel Injected Engine

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (F4) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness		
	Mainshaft 2nd gear		
	A	3.97—4.00 (0.156—0.157)	—
	B	4.02—4.05 (0.158—0.159)	—
	C	4.07—4.10 (0.160—0.161)	—
	D	4.12—4.15 (0.162—0.163)	—
	E	4.17—4.20 (0.164—0.165)	—
	F	4.22—4.25 (0.166—0.167)	—
	G	4.27—4.30 (0.168—0.169)	—
	H	4.32—4.35 (0.170—0.171)	—
	I	4.37—4.40 (0.172—0.173)	—
	Mainshaft bearing contact area (R side)	2.95—3.05 (0.116—0.120)	Wear or damage
	Mainshaft 1st gear	2.43—2.50 (0.096—0.098)	Wear or damage
	Countershaft 3rd gear		
	A	2.97—3.00 (0.1169—0.1181)	—
	B	3.02—3.05 (0.1189—0.1201)	—
	C	3.07—3.10 (0.1209—0.1220)	—
	D	3.12—3.15 (0.1228—0.1240)	—
	E	3.17—3.20 (0.1248—0.1260)	—
	F	3.22—3.25 (0.1268—0.1280)	—
	G	3.27—3.30 (0.1287—0.1299)	—
	H	3.32—3.35 (0.1307—0.1319)	—
	I	3.37—3.40 (0.1327—0.1339)	—
	Countershaft 4th gear collar thickness		
	A	38.97—39.00 (1.5342—1.5354)	—
	B	39.02—39.05 (1.5362—1.5374)	—
	C	39.07—39.10 (1.5382—1.5394)	—
	D	39.12—39.15 (1.5402—1.5413)	—
	E	39.17—39.20 (1.5421—1.5433)	—
	F	39.22—39.25 (1.5441—1.5453)	—
	G	39.27—39.30 (1.5461—1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)	1.45—1.50 (0.057—0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length	24.50—24.55 (0.4646—0.9665)	—
	Mainshaft 1st gear collar flange thickness	2.5—2.6 (0.098—0.102)	Wear or damage
	Countershaft reverse gear collar length	12.0—12.05 (0.472—0.474)	—
	Countershaft reverse gear collar flange thickness	2.4—2.6 (0.094—0.102)	Wear or damage
	Countershaft 1st gear collar length	12.0—12.1 (0.472—0.476)	—
	Countershaft 1st gear collar flange thickness	2.4—2.6 (0.095—0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area	83.339—83.365 (3.2811—3.2821)	Wear or damage
	Diameter of parking gear one-way clutch contact area	66.635—66.695 (2.6234—2.6258)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)	6.97—6.98 (0.2744—0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)	7.97—7.98 (0.3138—0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness	1.980—1.995 (0.0780—0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.	6.018—6.030 (0.2369—0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.	9.000—9.015 (0.3543—0.3549)	9.03 (0.356)
	Countershaft bushing I.D.	8.000—8.015 (0.3150—0.3156)	8.03 (0.316)
	Mainshaft sealing ring groove width	2.025—2.060 (0.0797—0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter	35.000—35.025 (1.3780—1.3789)	35.05 (1.38)
Shifting device and parking brake control	Reverse shift fork thickness	5.9—6.0 (0.232—0.236)	5.4 (0.21)
	Parking brake ratchet pawl	—	Wear or other defect
	Parking gear Throttle cam stopper	18.5—18.6 (0.728—0.732)	Wear or other defect
Servo body	Shift fork shaft bore I.D.		
	A	14.000—14.005 (0.5512—0.5514)	—
	B	14.006—14.010 (0.5514—0.5516)	—
	C	14.011—14.015 (0.5516—0.5518)	—
	Shift fork shaft valve bore I.D.	37.000—37.039 (1.4567—1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance	0.03—0.05 (0.0012—0.0020)	0.07 (0.003)
	Oil pump gear-to-body clearance	0.240—0.265 (0.009—0.010)	—
	Drive:	0.125—0.175 (0.005—0.007)	—
	Driven:	27.000—27.021 (1.0630—1.0638)	Wear or damage
	Stator camshaft needle bearing bore I.D.	29.000—30.013 (1.1417—1.1816)	Wear or damage
	Stator camshaft needle bearing contact and O.D.	14.016—14.034 (0.5518—0.5525)	Wear or damage
	Oil pump driven gear I.D.	13.980—13.990 (0.5504—0.5508)	Wear or damage
	Oil pump shaft O.D.		

Automatic Transmission (C9) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt.)		2.2 (2.3, 1.9) at oil change 5.2 (5.5, 4.6) at assembly	
Hydraulic pressure	Line pressure at 2,000 min ⁻¹ (rpm)		785—834 kPa (8.0—8.5 kg/cm ² , 114—121 psi)	736 kPa (7.5 kg/cm ² , 107 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min ⁻¹ (rpm)		441—834 kPa (4.5—8.5 kg/cm ² , 64—121 psi)	392 kPa (4.0 kg/cm ² , 57 psi) with lever released 736 kPa (7.5 kg/cm ² , 107 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min ⁻¹ (rpm)		736—834 kPa (7.5—8.5 kg/cm ² , 107—121 psi)	736 kPa (7.5 kg/cm ² , 107 psi)
	Governor pressure at 60 km/h		198—208 kPa (2.02—2.12 kg/cm ² , 29—30 psi)	193 kPa (1.97 kg/cm ² , 28 psi)
	Throttle pressure A		495—510 kPa (5.05—5.20 kg/cm ² , 72—74 psi)	490 kPa (5.0 kg/cm ² , 71 psi)
	Throttle pressure B		735—834 kPa (8.0—8.5 kg/cm ² , 114—121 pai)	736 kPa (7.5 kg/cm ² , 107 psi)
Stall speed	Check with car on lever ground		2,600—2,900 min ⁻¹ (rpm)	—
Clutch	Clutch initial clearance	1st	0.65—0.85 (0.026—0.033)	—
		2nd	0.60—0.80 (0.024—0.031)	—
		3rd, 4th	0.4—0.6 (0.016—0.024)	—
	Clutch return spring free length	1st	31.0 (1.22)	28.5 (1.12)
		2nd—4th	30.5 (1.20)	28.5 (1.12)
	Clutch disc thickness		1.88—2.0 (0.074—0.079)	Until grooves worn out
	Clutch plate thickness		1.95—2.05 (0.077—0.079)	Discoloration
	Clutch end plate thickness	Mark 1	2.3—2.4 (0.091—0.094)	↑ ↓
		Mark 2	2.4—2.5 (0.094—0.098)	
		Mark 3	2.5—2.6 (0.098—0.102)	
		Mark 4	2.6—2.7 (0.102—0.106)	
		Mark 5	2.7—2.8 (0.106—0.110)	
		Mark 6	2.8—2.9 (0.110—0.114)	
		Mark 7	2.9—3.0 (0.114—0.118)	
		Mark 8	3.0—3.1 (0.118—0.122)	
		Mark 9	3.1—3.2 (0.122—0.126)	
		Mark 10	3.2—3.3 (0.126—0.130)	
			Discoloration	
Transmission	Diameter of needle bearing contact area on main and stator shaft		19.980—19.983 (0.7866—0.7867)	Wear or damage ↑
	Diameter of needle bearing contact area on mainshaft 2nd gear		35.975—35.991 (1.4163—1.4169)	
	Diameter of needle bearing contact area on mainshaft 4th gear collar		31.975—31.991 (1.2588—1.2594)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar		30.975—30.991 (1.2195—1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)		38.505—38.515 (1.5159—1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear		31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear		27.980—27.993 (1.1016—1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar		29.980—29.993 (1.1803—1.1808)	
	Diameter of needle bearing contact area on countershaft L gear collar		29.980—29.993 (1.1803—1.1808)	
	Diameter of needle bearing contact area on reverse idle gear		13.994—14.000 (0.5509—0.5512)	
	Reverse idler shaft holder diameter		14.416—14.434 (0.5676—0.5683)	
	Mainshaft 2nd gear I.D.		41.000—41.016 (1.6141—1.6148)	
	Mainshaft 1st gear I.D.		36.000—36.016 (1.4173—1.4179)	
	Countershaft 4th gear I.D.		33.000—33.016 (1.2992—1.2998)	
	Countershaft 3rd gear I.D.		38.000—38.016 (1.4961—1.4966)	
	Countershaft 2nd gear I.D.		31.000—31.016 (1.2204—1.2210)	
	Countershaft 1st gear I.D.		35.000—35.016 (1.3779—1.3785)	
	Countershaft reverse gear I.D.		36.000—36.016 (1.4173—1.4179)	
	Reverse idle gear I.D.		18.007—18.020 (0.7086—0.7094)	Wear or damage ↓
	Mainshaft 4th gear end play		0.10—0.22 (0.004—0.009)	
	Mainshaft 2nd gear end play		0.07—0.15 (0.003—0.006)	
	Mainshaft 1st gear end play		0.08—0.24 (0.003—0.009)	
	Countershaft 3rd gear end play		0.07—0.15 (0.003—0.006)	
	Countershaft 2nd gear end play		0.08—0.40 (0.003—0.016)	
	Reverse idler gear end play		0.05—0.18 (0.002—0.007)	
	Countershaft reverse gear end play		0.10—0.20 (0.004—0.008)	
	Reverse gear hub O.D.		51.87—51.90 (2.0421—2.0433)	
				Wear or damage

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (C9) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness		
	Mainshaft 2nd gear A	3.47—3.50 (0.137—0.138)	—
	B	3.52—3.55 (0.139—0.140)	—
	C	3.57—3.60 (0.141—0.142)	—
	D	3.62—3.65 (0.143—0.144)	—
	E	3.67—3.70 (0.144—0.146)	—
	F	3.72—3.75 (0.146—0.148)	—
	G	3.77—3.80 (0.148—0.150)	—
	H	3.82—3.85 (0.150—0.152)	—
	I	3.87—3.90 (0.152—0.154)	—
	Mainshaft bearing contact area (R side)	2.95—3.05 (0.116—0.120)	Wear or damage
	Mainshaft 1st gear	2.43—2.50 (0.096—0.098)	Wear or damage
	Countershaft 3rd gear A	2.97—3.00 (0.1169—0.1181)	—
	B	3.02—3.05 (0.1189—0.1201)	—
	C	3.07—3.10 (0.1209—0.1220)	—
	D	3.12—3.15 (0.1228—0.1240)	—
	E	3.17—3.20 (0.1248—0.1260)	—
	F	3.22—3.25 (0.1268—0.1280)	—
	G	3.27—3.30 (0.1287—0.1299)	—
	H	3.32—3.35 (0.1307—0.1319)	—
	I	3.37—3.40 (0.1327—0.1339)	—
	Countershaft 4th gear collar thickness A	38.97—39.00 (1.5342—1.5354)	—
	B	39.02—39.05 (1.5362—1.5374)	—
	C	39.07—39.10 (1.5382—1.5394)	—
	D	39.12—39.15 (1.5402—1.5413)	—
	E	39.17—39.20 (1.5421—1.5433)	—
	F	39.22—39.25 (1.5441—1.5453)	—
	G	39.27—39.30 (1.5461—1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)	1.45—1.50 (0.057—0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length	22.50—22.55 (0.886—0.888)	—
	Mainshaft 1st gear collar flange thickness	2.5—2.6 (0.098—0.102)	Wear or damage
	Countershaft reverse gear collar length	12.00—12.05 (0.472—0.474)	—
	Countershaft reverse gear collar flange thickness	2.45—2.55 (0.096—0.100)	Wear or damage
	Countershaft 1st gear collar length	11.0—11.1 (0.433—0.437)	—
	Countershaft 1st gear collar flange thickness	2.4—2.6 (0.095—0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area	74.414—74.444 (2.9297—2.9309)	Wear or damage
	Diameter of parking gear one-way clutch contact area	57.755—57.768 (2.2738—2.2743)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)	6.97—6.98 (0.2744—0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)	7.97—7.98 (0.3138—0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness	1.980—1.995 (0.0780—0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.	6.018—6.030 (0.2369—0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.	9.000—9.015 (0.3543—0.3549)	9.03 (0.356)
	Countershaft bushing I.D.	8.000—8.015 (0.3150—0.3156)	8.03 (0.316)
	Mainshaft sealing ring groove width	2.025—2.060 (0.0797—0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter	32.000—32.025 (1.2598—1.2608)	32.05 (1.262)
Shifting device and parking brake control	Reverse shift fork thickness	5.90—6.00 (0.232—0.236)	5.4 (0.21)
	Parking brake ratchet pawl	—	Wear or other defect
	Parking gear Throttle cam stopper	18.5—18.6 (0.728—0.732)	Wear or other defect
Servo body	Shift fork shaft bore I.D. A	14.000—14.005 (0.5512—0.5514)	—
	B	14.006—14.010 (0.5514—0.5516)	—
	C	14.011—14.015 (0.5516—0.5518)	—
	Shift fork shaft valve bore I.D.	37.000—37.039 (1.4567—1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance	0.03—0.05 (0.0012—0.0020)	0.07 (0.003)
	Oil pump gear-to-body clearance Drive:	0.240—0.265 (0.009—0.010)	—
	Driven:	0.125—0.175 (0.005—0.007)	—
	Stator camshaft needle bearing bore I.D.	24.000—24.021 (0.9449—0.9457)	Wear or damage
	Stator camshaft needle bearing contact and O.D.	26.000—26.013 (1.0236—1.0241)	Wear or damage
	Oil pump driven gear I.D.	14.016—14.034 (0.5518—0.5525)	Wear or damage
	Oil pump shaft O.D.	13.980—13.990 (0.5504—0.5508)	Wear or damage

Differential — Section 16

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Ring gear	Backlash	0.085–0.149 (0.0033–0.0059)	0.2 (0.0079)
Differential carrier	Pinion shaft bore diameter	18.000–18.018 (0.7087–0.7094)	18.1 (0.71)
	Carrier-to-pinion shaft clearance	0.016–0.052 (0.0006–0.0020)	0.1 (0.004)
	Driveshaft bore diameter	28.000–28.021 (1.1024–1.1032)	—
		*1 26.000–26.021 (1.0236–1.0244)	—
Differential pinion gear	Carrier-to-driveshaft clearance	0.025–0.066 (0.0010–0.0026)	0.12 (0.005)
	Side clearance	0.10–0.20 (0.004–0.008)	0.15 (0.006)
	Backlash	0.05–0.15 (0.002–0.006)	Selection with 8 types of washers
	Pinion gear bore diameter	18.041–18.061 (0.7103–0.7111)	—
	Pinion gear-to-pinion shaft clearance	0.057–0.093 (0.0022–0.0037)	0.15 (0.006)

*1 A1 Transmission only

Driveshaft — Section 17

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Driveshaft	Right boot As installed	506.0–510.5 (19.9–20.1)	—
	Left boot As installed MT	805.0–809.5 (31.7–31.9)	—
	AT	812.0–816.5 (32.0–32.1)	—

Steering — Section 18

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Steering wheel	Play	10 (0.39) Max.	—
	Steering assist N (kg, lb) P/S	15 (1.5, 3.31) Max 18 (1.8, 3.97) Max	—
Power steering	Pump pressure with valve closed (Oil temp./ speed: 40°C (104°F) min/idle. Do not run for more than 5 seconds) kPa (kg/cm², psi)	7845–8826 (80–90, 1138–1280)	—
	Fluid capacity Reservoir At change	0.5ℓ (0.53 US. qt., 0.44 Imp. qt.) approx 1.7ℓ (1.8 US. qt., 1.5 Imp. qt.)	—

Suspension — Section 19

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Wheel alignment	Camber	Front 0° 00' ± 1°	—
	Caster	Rear 0° 00' ± 1°	
	Toe-in	0° 31' ± 1°	
	Kingpin inclination	0 ± 3 (0 ± 0.118) 0 ± 2 (0 ± 0.079)	
	Steering angle R/L	6° 50'	—
	Inside Outside	39° 30' 30° 30'	
Wheel	Rim runout Steel	Axial 0–1.0 (0–0.039)	—
	Aluminum	Radial 0–1.0 (0–0.039)	—
		Axial 0–0.7 (0–0.028)	—
		Radial 0–0.07 (0–0.003)	—
Wheel bearing	Front wheel bearing axial play	0–0.05 (0–0.002)	—
	Rear wheel bearing axial play	0–0.05 (0–0.002)	—

(cont'd)

Standards and Service Limits (cont'd)

Unit: mm (in.)

Brake — Section 20

	MEASUREMENT		STANDARD (NEW)		SERVICE LIMIT
Parking brake lever	Play in stroke 200N (20 kg, 44 lbs)		To be locked when pulled 7—11 notches		
Foot brake pedal	Pedal height		205 (8.1) from floor		
	Free play		1—5 (0.04—0.20)		5 (0.20)
Master cylinder	Piston-to-push rod clearance		0—0.4 (0.016)		
		with ALB	0—0.6 (0—0.024)		
Brake drum	I.D.		200.0 (7.87)		201.0 (7.91)
Lining	Thickness		4.5 (0.18)		2.0 (0.08)
Disc brake	Disc thickness	Front	19.0 (0.75) *21 (0.83)		17.0 (0.67) *19 (0.75)
		Rear	10.0 (0.39)		8 (0.31)
	Disc runout				0.15 (0.006) *0.1 (0.004)
	Disc parallelism				0.015 (0.0006)
	Pad thickness	Front	11.0 (0.43) *11.5 (0.45)		3.0 (0.12)
		Rear	8.0 (0.31)		1.6 (0.06)
Brake booster	Characteristics	Vacuum (mm Hg)	Pedal Pressure kg (lbs)	Line Pressure kPa (kg/cm ² , psi)	
				8" Booster	9" Booster
		0	20 (44)	1.304 (13.3, 189.1) min	1.177 (12.0, 170.6) min
		300	20 (44)	4.501 (45.9, 652.7) min	4.766 (48.6, 691.1) min
		500	20 (44)	6.629 (67.6, 961.3) min	7.149 (72.9, 1,036.6) min

*EXSi model and cars equipped with ALB (Except KS type)

Engine Electrical — Section 24

Engine Electrical — Section 24									
	MEASUREMENT				STANDARD (NEW)				
Ignition coil	Rated voltage			12 Volts					
	Insulation resistance			10,000 ohms min.					
	Performance: Make sure strong sparks jump across electrodes (3-point tester)								
	Voltage		Camshaft	Secondary Voltage		3-point gap		Condition	
	6 V		75 rpm	30±4 kV		15—21 mm (0.59—0.83)		At 80°C (176°F)	
	12 V		3,000 rpm	22±4 kV		13—19 mm (0.51—0.75)			
Ignition wire	Resistance			25,000 ohms max.					
Spark plug	Type	Standard		B20A2	BCPR6E-11 (NGK), Q20PR-U11 (ND)				
				Others	BPR5EY-11 (NGK), W16EXR-U11 (ND)				
	Gap			1.0—1.1 (0.039—0.043)					
Ignition timing	At idling	Carbureted Engine	Manual Automatic (in gear)		20±2° BTDC *24±2° BTDC 15±2° BTDC				
	At idling	Fuel-injected Engine	Manual Automatic (in gear)		15±2° BTDC 15±2° BTDC				
Battery	Lighting capacity (20-hour ratio)			47 Ampere Hours					
	Starting capacity (5-second ratio)			8.4 V minimum at 300 Ampere draw					
Alternator	Output at no-load			14 V at 1,000 rpm max.					
	Output			14 V/65 A at 5,500 rpm max.					
	Coil resistance (rotor)			2.8—3.0 ohms				±0.1 ohms	
	Slip ring O.D.			32.5 (1.28)				32.1 (1.26)	
	Brush length			10.5 (0.41)				5.5 (0.22)	
	Brush spring tension			300—500 g (10.6—18.6 oz)					
Starting motor	MEASUREMENT	ND 0.8 kW		HITACH 0.8 kW		ND 1.0 kW, 1.4 kW		MITSUBA 1.0 kW, 1.4 kW	
		STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT
	Mica depth	0.5—0.8 (0.020—0.031)	0.2 (0.008)	0.5—0.8 (0.020—0.031)	0.2 (0.008)	0.5—0.8 (0.020—0.031)	0.2 (0.008)	0.4—0.5 (0.016—0.020)	0.15 (0.006)
	Commutator runout	0—0.5 (0.020)	0.3 (0.012)	0—0.1 (0.004)	0.4 (0.016)	0—0.02 (0.0008)	0.05 (0.020)	0—0.02 (0.008)	0.05 (0.020)
	Commutator O.D.	28.0 (1.10)	27.0 (1.06)	—	39.0 (1.54)	30.0 (1.18)	29.0 (1.14)	28.0 (1.10)	27.5 (1.08)
	Brush length	15.5—16.5 (0.61—0.65)	10.0 (0.39)	14.5—15.5 (0.57—0.61)	11.0 (0.43)	12.5—13.5 (0.49—0.53)	8.5 (0.33)	14.3—14.7 (0.56—0.58)	9.3 (0.37)
	Spring pressure (new)	1.2 kg (2.6 lb)	—	1.6 kg (3.5 lb)	—	1.75 kg (3.8 lb)	—	2.1 kg (4.6 lb)	—

Design Specificaitons

European Model

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION	Overall length	3D		4,335 mm	170.6 in.	KW: 4,365 mm KW: 4,565 mm
		4D		4,535 mm	178.5 in.	
	Overall width			1,695 mm	66.7 in.	
	Overall height	3D		1,335 mm	52.6 in.	
		4D		1,335 mm	52.6 in.	
	Wheel base			2,600 mm	102.4 in.	
	Tread	Front		1,480 mm	58.3in.	
		Rear		1,475 mm	58.1 in.	
	Ground clearance			160 mm	6.3 in.	
	Seating Capacity	(F/R)		5 (2/3)		
WEIGHT On cars equipped with sunroof (S/R), ALB or air conditioner (A/C), add S/R: 18 kg (40 lb) ALB: KE 19 kg (42 lb) except KE 14 kg (31 lb) A/C: 22 kg (49 lb)	Curb weight (5-MT)	3D	EX (A20A2)	1,065 kg*	2,348 lb.*	KF, KG, KB, KW
				1,070 kg*	2,359 lb.*	SF
				1,077 kg	2,374 lb.	KF, KG, KB, KW
				1,082 kg	2,385 lb.	SF
				1,095 kg	2,414 lb.	KS
				1,075 kg	2,370 lb.	KE
			EXi (A20A4)	1,100 kg	2,425 lb.	KF, KG, KB, KW
				1,110 kg	2,447 lb.	SF
				1,120 kg	2,469 lb.	KS
				1,105 kg	2,436 lb.	KE
			EXC (A20A1)	1,085 kg*	2,392 lb.*	KG, KB
				1,095 kg	2,414 lb.	KG, KB
				1,100 kg	2,425 lb.	KX
			EXCi (A20A3)	1,115 kg	2,458 lb.	KG, KB, KX
		4D	STD (A16A1)	1,050 kg	2,315 lb.	KG, KB, KW, SF
			STD (A20A2)	1,060 kg	2,337 lb.	KG, KB, KW, SF
				1,075 kg	2,370 lb.	KS
			EX (A16A1)	1,062 kg	2,341 lb.	KW, SF
				1,085 kg	2,392 lb.	KF
			EX (A20A2)	1,085 kg	2,392 lb.	KF, KG, KB, KE
				1,095 kg	2,414 lb.	KW
				1,100 kg	2,425 lb.	KS, SF
			EXi (A20A4)	1,105 kg	2,436 lb.	KF, KG, KB
				1,115 kg	2,458 lb.	KW, KE
				1,120 kg	2,469 lb.	KS, SF
			LXC (A20A1)	1,080 kg	2,381 lb.	KW
			EXC (A20A1)	1,105 kg	2,436 lb.	KG, KB
				1,115 kg	2,458 lb.	KW, KX
			EXCi (A20A3)	1,120 kg	2,469 lb.	KG, KB
				1,135 kg	2,502 lb.	KX
				1,130 kg	2,491 lb.	KW
			EXSi (B20A2)	1,170 kg	2,579 lb.	KF
				1,155 kg	2,546 lb.	KG, KB
				1,185 kg	2,612 lb.	KE

*: Cars equipped with manual steering
 SF: Finland and Norway

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

European Model (cont'd)					
	ITEMS		METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	(4-AT)	3D EX (A20A2)	1,085 kg*	2,392 lb.*	KF, KG, KB, KW
On cars equipped with sunroof (S/R), ALB or air condi- tioner (A/C), add			1,090 kg*	2,403 lb.*	SF
S/R: 18 kg (40 lb)			1,097 kg	2,418 lb.	KF, KG, KB, KW
ALB: KE			1,102 kg	2,429 lb.	SF
19 kg (42 lb)			1,115 kg	2,458 lb.	KS
except KE			1,095 kg	2,414 lb.	KE
14 kg (31 lb)		3D EXi (A20A4)	1,120 kg	2,469 lb.	KF, KG, KB, KW
A/C: 22 kg (49 lb)			1,130 kg	2,491 lb.	SF
			1,140 kg	2,513 lb.	KS
			1,125 kg	2,480 lb.	KE
		EXC (A20A1)	1,105 kg*	2,436 lb.*	KG, KB
			1,115 kg	2,458 lb.	KG, KB
		EXi (A20A3)	1,135 kg	2,502 lb.	KG, KB, KX
		STD (A16A1)	1,060 kg	2,337 lb.	KG, KB, KW, SF
		STD (A20A2)	1,080 kg	2,381 lb.	KG, KB, KW, SF
			1,095 kg	2,414 lb.	KS
		EX (A16A1)	1,072 kg	2,363 lb.	KW, SF
			1,100 kg	2,425 lb.	KF
		EX (A20A2)	1,105 kg	2,436 lb.	KF, KG, KB KE
			1,115 kg	2,458 lb.	KW
			1,120 kg	2,469 lb.	KS, SF
		EXi (A20A4)	1,125 kg	2,480 lb.	KF, KG, KB
			1,135 kg	2,502 lb.	KW, KE
			1,140 kg	2,513 lb.	SF
		LXC (A20A1)	1,100 kg	2,425 lb.	KW
		EXC (A20A1)	1,125 kg	2,480 lb.	KG, KB
			1,135 kg	2,502 lb.	KX, KW
		EXCi (A20A3)	1,140 kg	2,513 lb.	KG, KB
			1,155 kg	2,546 lb.	KX
			1,150 kg	2,535 lb.	KW
On cars equipped with sunroof (S/R), ALB or air condi- tioner (A/C), add	Weight Distribution (Fr/Rr)				
S/R: 9/9 kg	(5-MT)	3D EX (A20A2)	645/420 kg*	1,422/926 lb.*	KF, KG, KB, KW
(20/20 lb)			650/420 kg*	1,433/926 lb.*	SF
ALB: KE			657/420 kg	1,448/926 lb.	KF, KG, KB, KW
12/7 kg			662/420 kg	1,459/926 lb.	SF
(26/15 lb)			670/425 kg	1,477/937 lb.	KS
except KE			655/420 kg	1,444/926 lb.	KE
12/2 kg		EXi (A20A4)	665/435 kg	1,466/959 lb.	KF, KG, KB, KW
(26/4 lb)			675/435 kg	1,488/959 lb.	SF
A/C: 24/-2 kg			680/440 kg	1,499/970 lb.	KS
(53/-4 lb)			670/435 kg	1,477/959 lb.	KE
		EXC (A20A1)	665/420 kg*	1,466/926 lb.*	KG, KB
			675/420 kg	1,488/926 lb.	KG, KB
			680/420 kg	1,499/926 lb.	KX
		EXCi (A20A3)	680/435 kg	1,499/959 lb.	KG, KB, KX
		STD (A16A1)	625/425 kg	1,378/937 lb.	KG, KB, KW, SF
		STD (A20A2)	635/425 kg	1,400/937 lb.	KG, KB, KW, SF
			640/435 kg	1,411/959 lb.	KS

*: Cars equipped with manual steering SF: Finland and Norway

	ITEMS		METRIC	ENGLISH	NOTE
WEIGHT		EX (A16A1)	637/425	1,404/937 lb.	KW, SF
			645/440 kg	1,422/970 lb.	KF
		EX (A20A2)	650/435 kg	1,433/959 lb.	KF, KG, KB, KE
			655/440 kg	1,444/970 lb.	KW
			660/440 kg	1,455/970 lb.	KS, SF
		EXi (A20A4)	660/445 kg	1,455/981 lb.	KF, KG, KB
			665/450 kg	1,466/992 lb.	KW, KE
			670/450 kg	1,477/992 lb.	KS, SF
		LXC (A20A1)	655/425 kg	1,444/937 lb.	KW
		EXC (A20A1)	670/435 kg	1,477/959 lb.	KG, KB
			675/440 kg	1,488/970 lb.	KW, KX
		EXCi (A20A3)	675/445 kg	1,488/981 lb.	KG, KB
			685/450 kg	1,510/992 lb.	KX
			680/450 kg	1,499/992 lb.	KW
		EXSi (B20A2)	710/460 kg	1,565/1,014 lb.	KF
			695/460 kg	1,532/1,014 lb.	KG, KB
			715/470 kg	1,576/1,036 lb.	KE
	(4-AT)	3D EX (A20A2)	665/420 kg*	1,466/926 lb.*	KF, KG, KB, KW
			670/420 kg*	1,477/926 lb.*	SF
			677/420 kg	1,493/926 lb.	KF, KG, KB, KW
			682/420 kg	1,504/926 lb.	SF
			690/425 kg	1,521/937 lb.	KS
			675/420 kg	1,488/926 lb.	KE
			685/435 kg	1,510/959 lb.	KF, KG, KB, KW
			695/435 kg	1,532/959 lb.	SF
			700/440 kg	1,543/970 lb.	KS
			690/435 kg	1,521/959 lb.	KE
		EXC (A20A1)	685/420 kg*	1,510/926 lb.*	KG, KB
			695/420 kg	1,532/926 lb.	KG, KB
		EXCi (A20A3)	700/435 kg	1,543/959 lb.	KG, KB, KX
		4D STD (A16A1)	635/425 kg	1,400/937 lb.	KG, KB, KW, SF
			655/425 kg	1,444/937 lb.	KG, KB, KW, SF
		STD (A20A2)	660/435 kg	1,455/959 lb.	KS
		EX (A16A1)	647/425 kg	1,426/937 lb.	KW, SF
			660/440 kg	1,455/970 lb.	KF
		EX (A20A2)	670/435 kg	1,477/959 lb.	KF, KG, KB, KE
			675/440 kg	1,488/970 lb.	KW
			680/440 kg	1,499/970 lb.	KS, SF
		EXi (A20A4)	680/445 kg	1,499/981 lb.	KF, KG, KB
			685/450 kg	1,510/992 lb.	KW, KE
		EXi (A20A4)	690/450 kg	1,521/992 lb.	SF
		LXC (A20A1)	675/425 kg	1,488/937 lb.	KW
		EXC (A20A1)	690/435 kg	1,521/959 lb.	KG, KB
			695/440 kg	1,532/970 lb.	KX, KW
		EXCi (A20A3)	695/445 kg	1,532/981 lb.	KG, KB
			705/450 kg	1,554/992 lb.	KX
			700/450 kg	1,543/992 lb.	KW

*: Cars equipped with manual steering, SF: Finland and Norway

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

	ITEMS		METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	Max. Loaded Vehicle Weight (ADR)	5—MT	1,590 kg	3,505 lb.	
		4—AT	1,610 kg	3,549 lb.	
	Max. Permissible Weight (EC)	2000	1,660 kg	3,660 lb.	
		1600	1,580 kg	3,484 lb.	
ENGINE (Expect B20A2)	Type		Water cooled, gasoline fueled, 4-cycle OHC		
	Cylinder arrangement		4-cylinder in-line transverse		
	Bore and Stroke	1600	80.0 x 79.5 mm	3.15 x 3.13 in.	
		2000	82.7 x 91.0 mm	3.25 x 3.58 in.	
	Displacement	1600	1,598 cm ³	97.8 cuin	
		2000	1,955 cm ³	119 cuin	
	Compression Ratio		A16A1:9.0		
			A20A1:9.1, A20A2:9.2		
			A20A3:8.8, A20A4:9.4, 8.9 (KS)		
	Valve Train		Trochoid Pump		
	Fuel Required		Regular gasoline with 91 RON (Research Octane Number) or higher Super/Premium gasoline with 97 RON (Research Octane Number) or higher.		
ENGINE (B20A2)	Type		Water cooled, 4-cycle D.O.H.C		
	Cylinder Arrangement		4-cylinder in line, transverse		
	Bore and Stroke		81.0 x 95 mm	3.18 x 3.74 in.	
	Displacement		1,958 cm ³	120 cu.in.	
	Compression Ratio		9.5:1		
	Valve Train		Timing belt driven, double overhead camshaft		
	Lubrication System		Trochoid pump		
	Fuel Required		Leaded gasoline with 97 research octane number or higher.		
TRANS- MISSION	Clutch	4—AT	Three element, one strage, two phase		
		5—MT			
	Transmission	4—AT			
		5—MT	Single dry plate, diaphragm spring		
			Torque converter with lock up clutch		
			Synchronesh 5 forward speeds, 1 reverse		
			A16A1	A20A2 A20A4	A20A1 A20A2 KS A20A3
	Primary Reduction		1.000	1.000	1.000
	Gear Ratio	I	3.181	<2.421>	<2.529>
	< >:4—AT	II	1.842	<1.560>	<1.481> * ²
		III	1.250 * ¹	<0.969>	<1.030> * ³
		IV	0.937	<0.729>	<0.700> * ⁴
		V	0.771		
		Reverse	3.000	<1.954>	<1.904>
		Final	4.066	<3.933>	<4.066>
	Clutch Facing Area	1600	160 cm ²		24.8 sq. in.
		2000	176 cm ²		27.3 sq. in.
					A20A1 KX
					* ¹ :1.208
					A20A3 KX
					* ² :1.428
					* ³ :1.060
					* ⁴ :0.743

	ITEMS		METRIC	ENGLISH	NOTE
STEERING SYSTEM	Type	Manual Steering	Rack and Pinion		
		Power Steering	Power assisted Rack and Pinion integral		
	Overall Ratio	Manual Steering	19.4		
		Power Steering	18.0		
	Turns, lock-to-lock	Manual Steering	3.78		
		Power Steering	3.50		
	Steering Wheel Dia.		375 mm	14.76	
	Power Steering Oil Tank Capacity		1.4 ℓ	1.2 Imp. pt., 1.5 US pt.	
	Power Steering Oil		Honda Genuine power steering fluid		
SUSPENSION SYSTEM	Type, F		Double Wishbone		
	Type, R		Double Wishbone		
	Shock Absorber F/R		Telescopic hydraulic		
WHEEL ALIGNMENT	Wheel Alignment				
	Camber	Front	0°		
		Rear	0°		
	Caster	Front	0°30'		
	Toe	Front	0 mm	0.0 in.	
		Rear	0 mm	0.0 in.	
BRAKE SYSTEM	Type, F		Self-adjusting power assisted disc brake type		*1 Disc for EX 2.0 ℓ and cans equipped with Anti-Lock Brake.
	Type, R		Drum *1		
	Lining Surface Area F/R		43.3/21 (disc) 67.2 (drum) cm²		
	Effective Disc Dia.		208 mm		
	Effective Brake Drum I.D.		200 mm	7.9 in	
	Parking Brake Type		Mechanical expanding, Rear two wheel brakes *2		*2 Mechanical to rear disc for equipped with Disc Brake.
TIRES	F/R		165SR13, 185/70 R13 86T, 185/70 HR13 195/60 HR 14, 195/60 VR 14 T105/80D13, T105/80R13, T105/70D14 T135/70D15*		* For cars equipped with ALB <Except for KE>
		Spare			
ELECTRICAL SYSTEM	Battery		12V—50AH (Cold cranking current —17.7°C [0°F] 410A)		
	Starting Motor		12V—1.0/1.4KW		
	Generator		12—65AH		
	Fuses		7.5A, 10A, 15A, 20A, 30A		
	Main Fuse		70A, 40A		
	Headlights		12V—60/55W		
	Turn signal lights	Front	12V—21W		
		Rear	12V—21W		
		Side	12V—5W		
	License Plate Lights		12V—5W		
	Back-up Lights		12V—21W		
	Stop Lights		12V—21W		
	Tail Lights		12V—5W		
	Rear Fog Light		12V—21W		

(cont'd)

Design Specification (cont'd)

KQ Model

NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS		METRIC	ENGLISH	NOTE
DIMENSION On cars equipped with air conditioner, add 22 kg (49 lb).	Curb weight (5-MT)	3D EX (A20A2)	1,120 kg	2,469 lb.	
		EXi (A20A4)	1,128 kg	2,487 lb.	
		4D EX (A20A2)	1,130 kg	2,491 lb.	
			1,148 kg	2,531 lb.	
		EXi (A20A4)	1,142 kg	2,518 lb.	
			1,160 kg	2,557 lb.	
	(4-AT)	3D EX (A20A2)	1,140 kg	2,513 lb.	S/R
		EXi (A20A4)	1,148 kg	2,531 lb.	
		4D EX (A20A2)	1,150 kg	2,535 lb.	
			1,168 kg	2,575 lb.	S/R
		EXi (A20A4)	1,162 kg	2,562 lb.	
			1,180 kg	2,601 lb.	S/R
	Weight Distribution (F/R) (5-MT)	3D EX (A20A2)	670/450 kg	1,477/992 lb.	
		EXi (A20A4)	677/451 kg	1,493/994 lb.	
		4D EX (A20A2)	673/457 kg	1,484/1,007 lb.	
			682/466 kg	1,504/1,027 lb.	S/R
		EXi (A20A4)	681/461 kg	1,502/1,016 lb.	
			690/470 kg	1,521/1,036 lb.	S/R
		(4-AT)	690/450 kg	1,521/992 lb.	
			697/451 kg	1,537/994 lb.	
		4D EX (A20A2)	693/457 kg	1,528/1,007 lb.	
			702/466 kg	1,548/1,027 lb.	S/R
			701/461 kg	1,546/1,016 lb.	
		EXi (A20A4)	710/470 kg	1,565/1,036 lb.	S/R
ENGINE	Compression ratio		A20A2 9.1 A20A4 8.8		
TRANSMISSION	Gear Ratio < >: 4AT	I	3.181	<2.529>	
		II	1.842	<1.481>	
		III	1.250	<1.060>	
		IV	0.937	<0.743>	
		V	0.771	—	
		Reverse	3.000	<1.904>	
		Final	4.066	<4.066>	
TIRES	Tire size F/R	EX	185/70 R13 86T		
		2.0 si	185/70 HR 13		
ELECTRICAL SYSTEM	Starting Motor		12 V—1.0 KW		
	Battery		12 V—40 AH		

S/R: Cars equipped with sunroof

General Export Model

NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION On cars equipped with air conditioner, add 22 kg (49 lb).	Ground Clearance			170 mm	6.7 in.	KY
	Curb weight (5-MT)					
	3D (A20A2)	STD		1,060 kg	2,337 lb.	KP, KT, KU
		EX		1,080 kg	2,381 lb.	KP, KT, KU
	4D (A16A1)	EXR		1,130 kg	2,491 lb.	KY (A/C)
		STD		1,140 kg	2,513 lb.	KY (A/C)
	4D (A20A2)	STD		1,055 kg	2,315 lb.	KT
		EX		1,060 kg	2,337 lb.	Singapore
	4D (A20A2)	STD		1,085 kg	2,392 lb.	KT, Singapore
		EX		1,103 kg	2,432 lb.	KT, Singapore (S/R)
	4D (A20A2)	STD		1,060 kg	2,337 lb.	KP, KU
		EX		1,085 kg	2,392 lb.	KP, KT, KU
	4D (A20A2)	STD		1,103 kg	2,432 lb.	KP, KT, KU (S/R)
		EX		1,130 kg	2,491 lb.	KY (A/C)
	4D (A20A2)	STD		1,140 kg	2,513 lb.	KY (A/C)
		EX		1,160 kg	2,557 lb.	KY (S/R, A/C)
	4D (A20A2)	STD		1,170 kg	2,579 lb.	KY (S/R, A/C)
		EX		1,075 kg	2,370 lb.	KP, KT, KU
	4D (A20A2)	STD		1,095 kg	2,414 lb.	KP, KT, KU
		EX		1,150 kg	2,535 lb.	KY (A/C)
	4D (A20A2)	STD		1,160 kg	2,557 lb.	KY (A/C)
		EX		1,070 kg	2,359 lb.	KT
	4D (A20A2)	STD		1,075 kg	2,370 lb.	Singapore
		EX		1,100 kg	2,425 lb.	KT, Singapore
	4D (A20A2)	STD		1,118 kg	2,465 lb.	KT, Singapore (S/R)
		EX		1,080 kg	2,381 lb.	KP, KU
	4D (A20A2)	STD		1,105 kg	2,436 lb.	KP, KT, KU
		EX		1,123 kg	2,476 lb.	KP, KT, KU (S/R)
	4D (A20A2)	STD		1,150 kg	2,535 lb.	KY (A/C)
		EX		1,160 kg	2,557 lb.	KY (A/C)
	4D (A20A2)	STD		1,180 kg	2,601 lb.	KY (S/R, A/C)
		EX		1,190 kg	2,623 lb.	KY (S/R, A/C)
On cars equipped with air conditioner, add 24/-2 kg (53/-4 lb).	Weight Distribution (Fr/Rr)					
	(5-MT)					
	3D (A20A2)	STD		645/415 kg	1,422/915 lb.	KP, KT, KU
		EX		660/420 kg	1,455/926 lb.	KP, KT, KU
	4D (A16A1)	EXR		690/440 kg	1,521/970 lb.	KY (A/C)
		STD		695/445 kg	1,532/981 lb.	KY (A/C)
	4D (A16A1)	STD		625/430 kg	1,378/978 lb.	KT
		EX		630/430 kg	1,389/948 lb.	Singapore
	4D (A16A1)	STD		645/440 kg	1,422/970 lb.	KT, Singapore
		EX		654/449 kg	1,441/990 lb.	KT, Singapore (S/R)

S/R: Cars equipped with sunroof A/C: Cars equipped with air conditioner

(cont'd)

Design Specifications (cont'd)

General Export Model (cont'd)

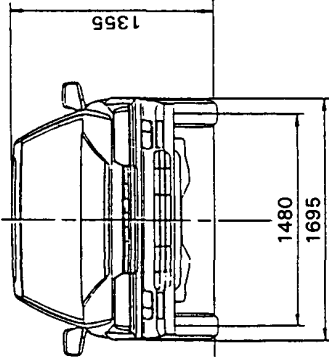
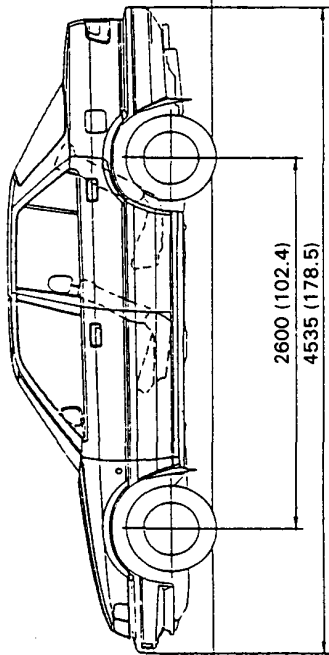
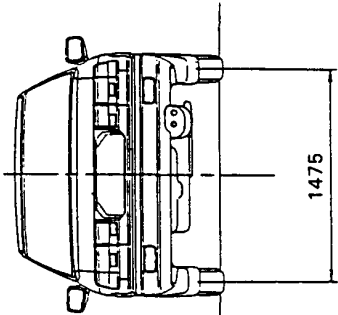
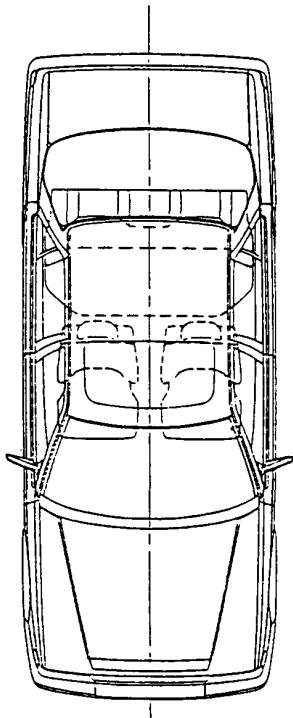
General Export Model (cont'd)						
	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION (cont'd)	Weight Distribution					
	(4-AT)	4D (A20A4)	STD	635/425 kg	1,400/937 lb.	KP, KU
			EX	650/435 kg	1,433/959 lb.	KP, KT, KU
		GL		659/444 kg	1,453/979 lb.	KP, KT, KU (S/R)
			EX	690/440 kg	1,521/970 lb.	KY (A/C)
		EXR		695/445 kg	1,532/981 lb.	KY
				705/455 kg	1,554/1,003 lb.	KY (S/R, A/C)
		3D (A20A2)	STD	710/460 kg	1,565/1,014 lb.	KY (S/R, A/C)
			EX	660/415 kg	1,445/915 lb.	KP, KT, KU
		EXR		675/420 kg	1,488/926 lb.	KP, KT, KU
				710/440 kg	1,565/970 lb.	KY (A/C)
		4D (A16A1)	STD	715/445 kg	1,576/981 lb.	KY (A/C)
			EX	640/430 kg	1,411/948 lb.	KT
		EXR		645/430 kg	1,422/948 lb.	Singapore
				660/440 kg	1,455/970 lb.	KT, Singapore
		4D (A20A2)	STD	669/449 kg	1,475/990 lb.	KT, Singapore (S/R)
			EX	655/425 kg	1,444/937 lb.	KP, KU
		GL		670/435 kg	1,477/959 lb.	KP, KT, KU
			EX	679/444 kg	1,497/979 lb.	KP, KT, KU (S/R)
		EXR		710/440 kg	1,565/970 lb.	KY (A/C)
				715/445 kg	1,576/981 lb.	KY (A/C)
		EXR		725/455 kg	1,598/1,003 lb.	KY (S/R, A/C)
				730/460 kg	1,609/1,014 lb.	KY (S/R, A/C)
ENGINE		Compression Ratio			A16A1 9.0 A20A2 9.2	
TRANSMISSION	Gear Ratio		I	3.181	<2.529> (2.421)	
	< >: 4AT with 2000		II	1.842	<1.481> (1.560)	
	(): 4AT with 1600		III	1.250	<1.060> (0.969)	
			IV	0.937	<0.743> (0.729)	
			V	0.771	_____	
			Reverse	3.000	<1.904> (1.954)	
			Final	4.066	<4.066> (3.933)	
TIRES	Tire Size F/R Sedan		STD, GL	165SR13		
			EX	185/70SR13		
ELECTRIAL SYSTEM	Battery			12 V—40 AH		
	Starting Motor			12 V—1.0 W		

S/R: Cars equipped with sunroof A/C: Cars equipped with air conditioner

Body Specifications

4 D Sedan

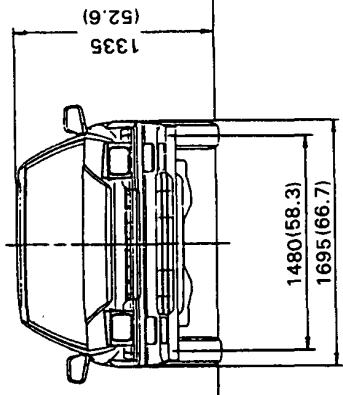
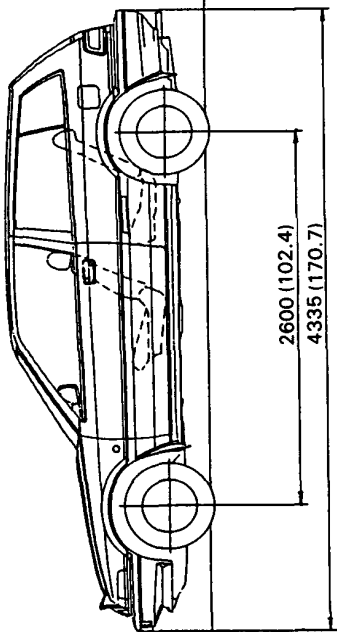
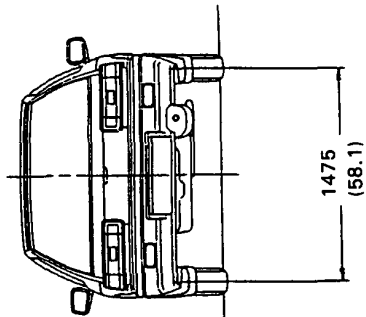
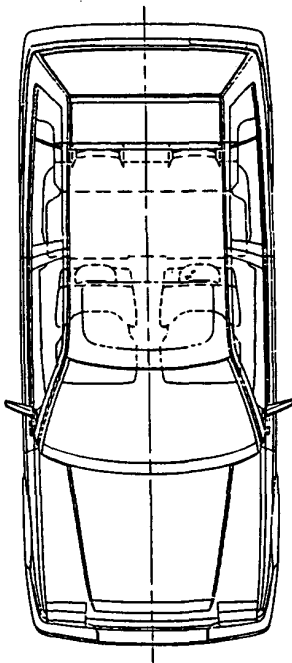
Unit: mm



Body Specifications

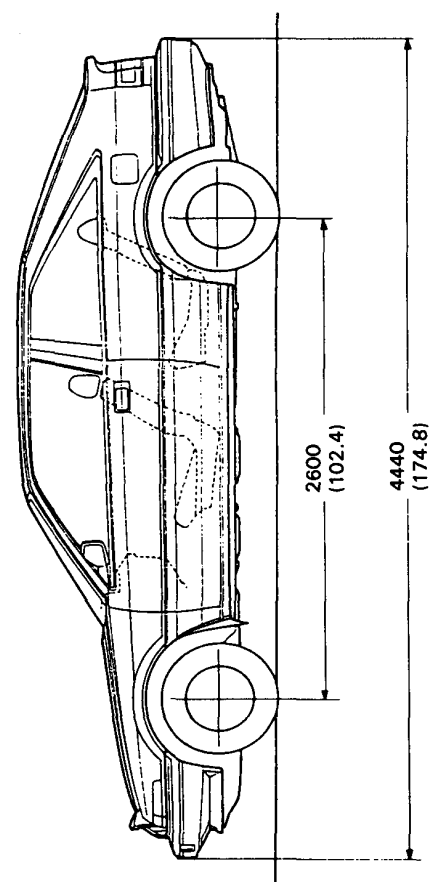
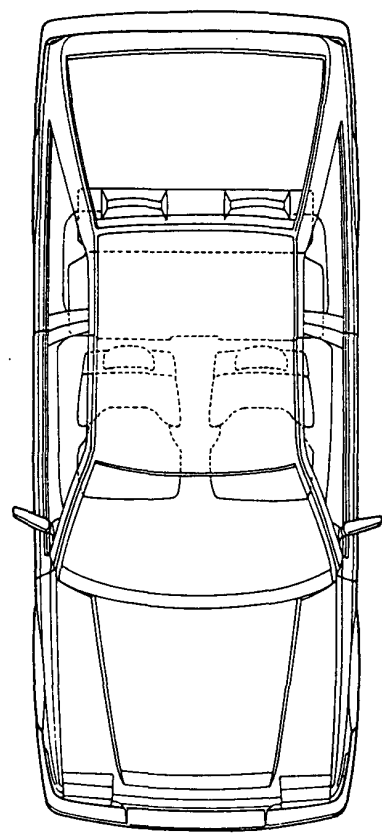
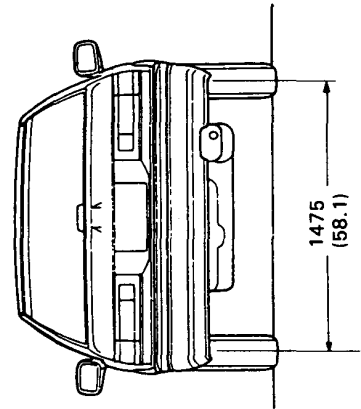
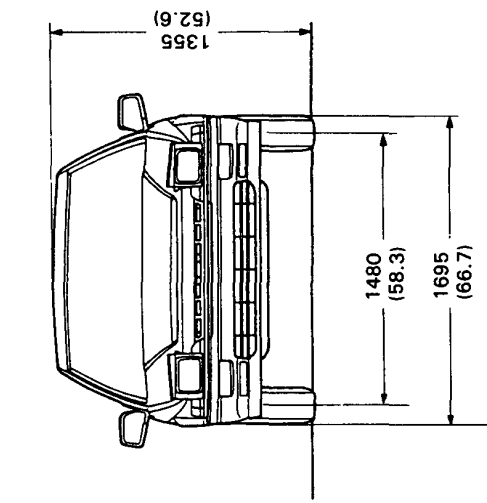
Aerodeck

Unit: mm (in.)



Glass Back

Unit: mm (in.)



Maintenance



Lubrication Points 4-2

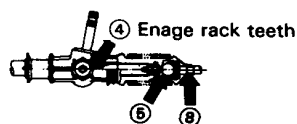
Maintenance Schedule 4-4

Lubrication Points

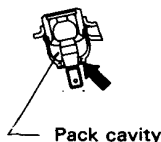
No	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: SE or SF SAE Viscosity: See chart below
2	Transmission	Manual Automatic	API Service Grade: SE or SF SAE30, 10W-30, 10W-40 or 20W-40 grade oil DEXRON® Automatic transmission fluid
3	Brake reservoir		Brake fluid DOT 3 or DOT 4
4	Steering gearbox (Power)		Honda steering grease P/N 08704-99969
4	Steering gearbox (Manual)		Multipurpose Grease
5	Steering ball joint		
6	Suspension ball joints		
7	Front upper arm		
8	Steering Boot		
9	Shift lever pivot (Manual)		
10	Steering column bushings		
11	Horn contact		
12	Shift rod clevis bushings		
13	Select lever (Automatic)		
14	Pedal linkage		
15	Throttle cable end		
16	Brake master cylinder push rod		
17	Rear caliper		
18	Tailgate hinges (Hatchback)		
19	Trunk hinges (Sedan)		
20	Door hinges upper and lower		
21	Door opening detents		
22	Fuel filler lid		
23	Engine hood hinges		
24	Engine hood latch		
25	Tilt lever		
26	Select lever		
27	Rear brake shoe linkage		
28	Intermediate shaft (B20A Engine)		
29	Caliper	Piston seal	Silicone Grease
30		Dust seal	
30		Caliper pin Piston	
31	Power steering reservoir		Honda power steering fluid P/N 08208-99961

Recommended Engine Oil
(SE or SF Grade only)

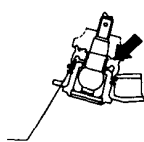
Engine oil viscosity for
ambient temperature ranges.



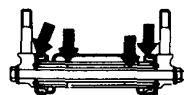
④ Engage rack teeth
⑤ STEERING GEARBOX
⑥ STEERING BALL JOINT
⑧ STEERING BOOT



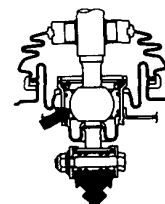
⑥ FRONT SUSPENSION BALL JOINTS



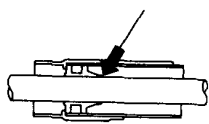
⑥ REAR SUSPENSION BALL JOINTS



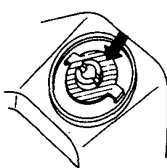
⑦ FRONT UPPER ARM



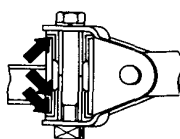
⑨ SHIFT LEVER PIVOT



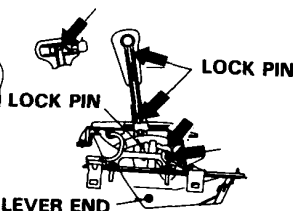
⑩ STEERING COLUMN BUSHING



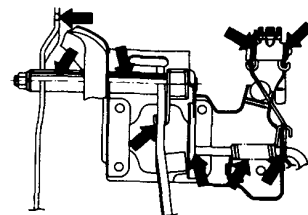
⑪ HORN CONTACT



⑫ SHIFT ROD CLEVIS BUSHINGS



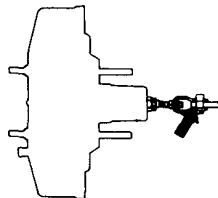
⑬ SELECT LEVER



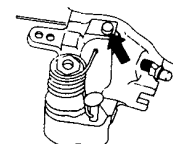
⑭ PEDAL LINKAGE



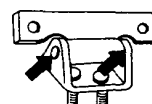
⑮ THROTTLE CABLE END



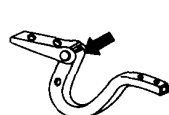
⑯ BRAKE MASTER CYLINDER PUSH ROD



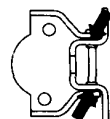
⑰ REAR CALIPER



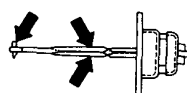
⑱ TAILGATE HINGES



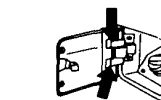
⑲ TRUNK HINGES



⑳ DOOR HINGES



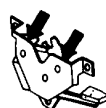
㉑ DOOR OPENING DETENTS



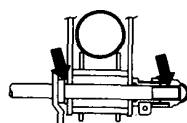
㉒ FUEL FILLER LID



㉓ ENGINE HOOD HINGES



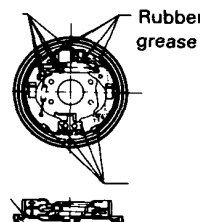
㉔ ENGINE HOOD LATCH



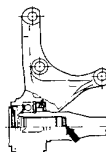
㉕ TILT LEVER



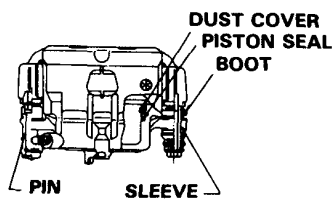
㉖ SELECT LEVER



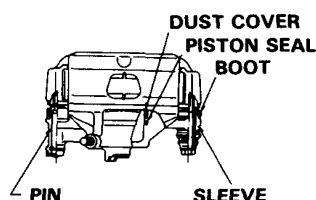
㉗ REAR BRAKE



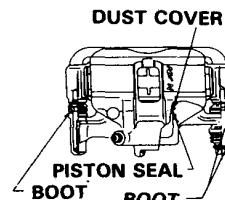
㉘ INTERMEDIATE SHAFT



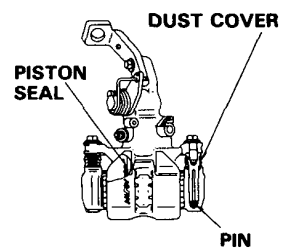
㉙ FRONT CALIPER



㉙ FRONT CALIPER



㉙ FRONT CALIPER



㉚ REAR CALIPER

Maintenance Schedule

SERVICE AT THE INTERVAL OF LISTED KM (MILES) OR MONTHS, WHICHEVER OCCURS FIRST.						
ITEMS	x 1,000 km	20	40	60	80	100
	x 1,000 miles	12	24	36	48	60
	months	12	24	36	48	60
IDLE SPEED AND IDLE CO		I	I	I	I	I
VALVE CLEARANCE		I	I	I	I	I
ALTERNATOR DRIVE BELT			I		I	
ENGINE OIL AND OIL FILTER	Replace every 10,000 km (6,000 miles) or 6 months					
TRANSMISSION OIL			R		R	
RADIATOR COOLANT					R*1	
COOLING SYSTEM, HOSES AND CONNECTIONS			I		I	
E.G.R. SYSTEM (For cars using unleaded gasoline)*7						I
SECONDARY AIR SUPPLY SYSTEM (For carburetor type)*2						I
AIR CLEANER ELEMENT*5	R	R	R	R	R	R
AIR CLEANER ELEMENT*6			R		R	
FUEL FILTER (including aux. filter for carburetor type)			R		R	
INTAKE AIR TEMP. CONTROL SYSTEM (For carburetor type)						I
TANK, FUEL LINE AND CONNECTIONS			I		I	
THROTTLE CONTROL SYSTEM (For carburetor type)			I		I	
CHOKE MECHANISM (For carburetor type)			I		I	
CHOKE OPENER OPERATION (For carburetor type)*3						I
EVAPORATIVE EMISSION CONTROL SYSTEM*4						I
IGNITION TIMING AND CONTROL SYSTEM			I		I	
SPARK PLUGS (For cars using leaded gasoline)	R	R	R	R	R	R
SPARK PLUGS (For cars using unleaded gasoline)			R		R	
DISTRIBUTOR CAP AND ROTOR			I		I	
IGNITION WIRING			I		I	
CRANKCASE EMISSION CONTROL SYSTEM			I		I	
BRAKE HOSES, LINES (Includes ALB hoses and pipes for ALB models)	I	I	I	I	I	I
BRAKE FLUID (Includes ALB fluid for ALB models)			R		R	
FRONT BRAKE DISCS AND CALIPERS	I	I	I	I	I	I
FRONT BRAKE PADS	Inspect every 10,000 km (6,000 miles) or 6 months					
REAR BRAKES			I		I	
PARKING BRAKE			I		I	
CLUTCH RELEASE ARM TRAVEL	I	I	I	I	I	I
ENGINE EXHAUST SILENCER, SUSPENSION MOUNTING BOLTS	I	I	I	I	I	I
FRONT WHEEL ALIGNMENT	I	I	I	I	I	I
STEERING OPERATION, TIE ROD ENDS, STEERING GEAR BOX AND BOOTS	I	I				
ALB HIGH PRESSURE HOSES					R	
ALB OPERATION	I	I			I	
POWER STEERING SYSTEM	I	I	I	I	I	I
POWER STEERING PUMP BELT			I		I	
CATALYTIC CONVERTER HEAT SHIELD (Cars equipped with Catalytic Converter)						I

R—Replace I—Inspect. After inspection, clean, adjust, repair or replace if necessary

REMARK: These service intervals assume routine checking and replenishment has been done, as needed, by the customer.

*1 Thereafter, replace every 2 years or 48,000 km (30,000 miles), whichever comes first.

*2 Only for cars using unleaded gasoline (KG, KW, KX, KQ)

*3 Only for 2.0 l model

*4 Only for KQ, KY, KX types and for KG, KW types using unleaded gasoline

*5 Except KQ type and for European types

*6 Only for KQ type and for European types

*7 Only for KG, KW, KX, KQ types using carbureted Engine and KG, KW, KX using Fuel-Injected Engine

CAUTION: The following items must be serviced more frequently on cars normally used under severe driving conditions. Refer to the chart below for the appropriate maintenance intervals.

Severe driving conditions include:

- A: Repeated short distance driving
- B: Driving in dusty conditions
- C: Driving in severe, cold weather
- D: Driving in areas using road salt or other corrosive materials
- E: Driving on rough and/or muddy roads
- F: Towing a trailer

R—Replace

I—Inspect. After inspection, clean, adjust, repair or replace if necessary.

Condition	Maintenance item	Maintenance operation	Interval
A, B, F	Engine oil and oil filter	R	Every 5,000 km (3,000 miles) or 3 months
F	Transmission oil	R	Every 20,000 km (12,000 miles) or 12 months
A, B, D, E, F	Front brake discs and calipers	I	Every 10,000 km (6,000 miles) or 6 months
A, B, D, E, F	Rear brakes (Only for disc type brakes)	I	Every 20,000 km (12,000 miles) or 12 months
A, B, C, E, F	Clutch release arm travel	I	Every 10,000 km (6,000 miles) or 6 months
B, C, E	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

Engine

Description	5-2
Engine Removal/Installation	5-11
Cylinder Head/Valve Train	6-1
Engine Block	7-1
Engine Lubrication	8-1
Intake Manifold/Exhaust System	9-1



Outline of Model Change

B20A2 engine is newly added.

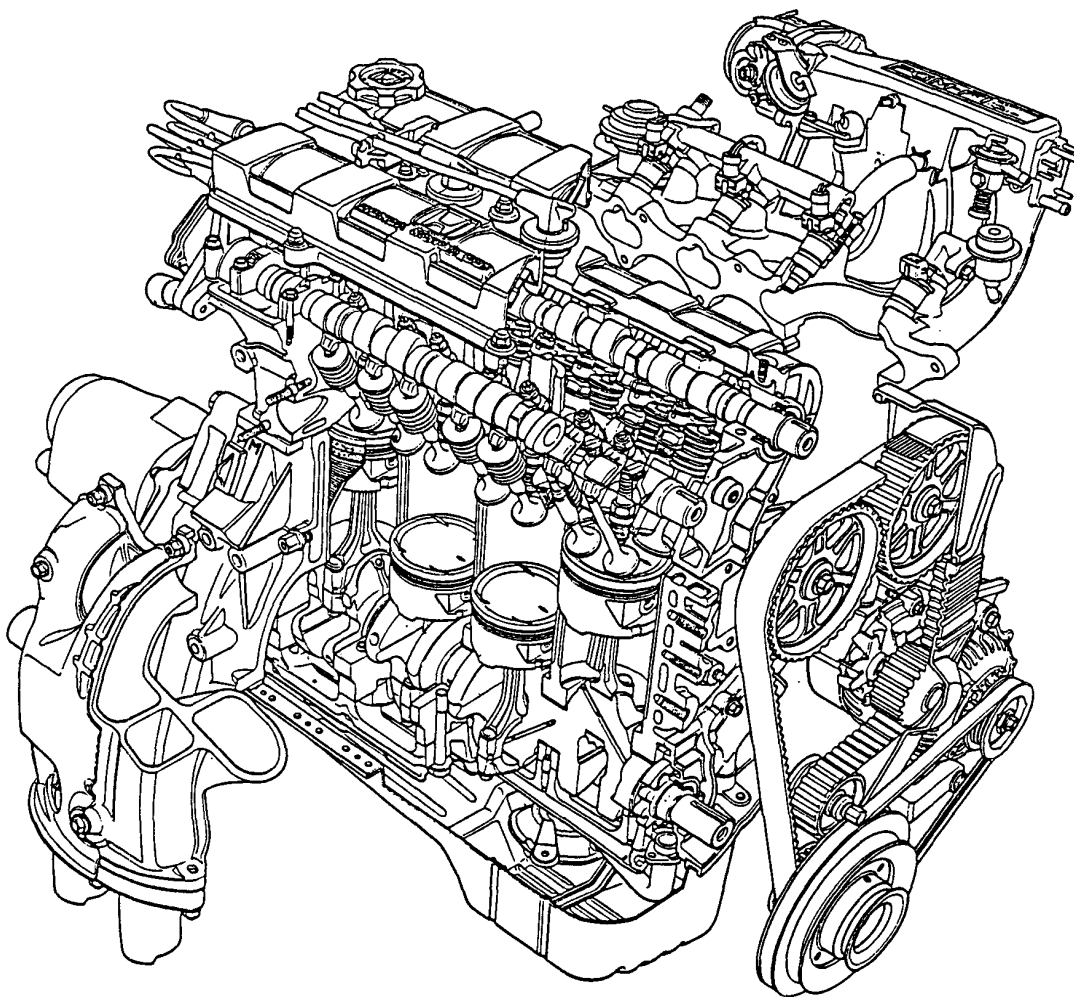
Description

Outline

A 2.0 liter DOHC PGM-FI engine version is newly added to the Accord series.

It features the following new points;

- A lightweight, compact 4-row-siamese closed deck aluminum cylinder block.
- A compact, high valve lift, inside pivot rocker arm type cylinder head.
- Lightweight, hollow camshafts.
- Power-saving crankshaft baffle plate.
- Internal recirculation direct-driven oil pump.



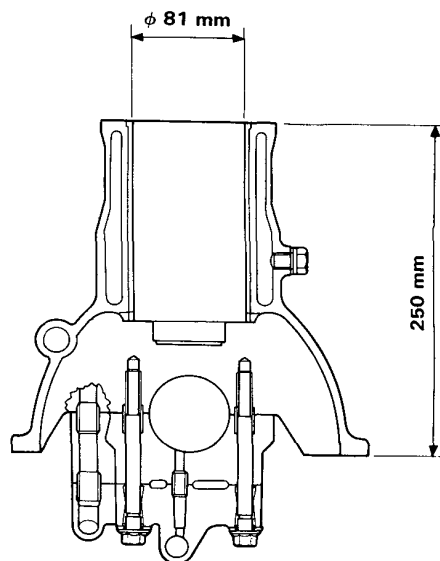
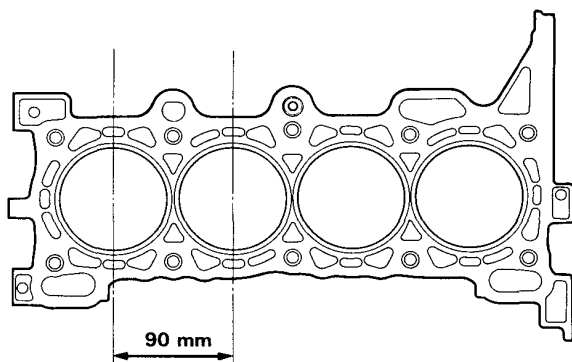


Cylinder Block

The cylinder block is a 4-row-siamese closed deck design which features compact and high rigidity. A Honda original NDC (New Diecast) method is used in the manufacture. The aluminum cylinder block is approx. 50% lighter than a cast iron cylinder block having the same rigidity.

Specifications

Bore x Stroke	81 x 95.0 mm
Bore Pitch	90 mm
Block Height	250 mm
Displacement	1.955 cm ³



Crankshaft

The crankshaft is of high-strength microalloyed steel with an ideal combination of forging material treatment and nitriding process to provide the strength and quality needed for the increased output of this engine.

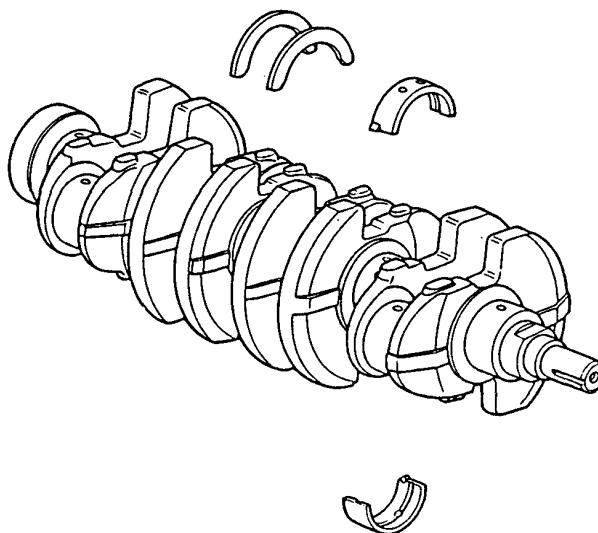
Specifications

Overall Length	471 mm
Journal Diameter	55 mm
Crankpin Diameter	48 mm

NOTE:

The bearing selection mark indicated for the #3 journal is one rank smaller than for other journals as the housing expansion in the #3 journal is greater.

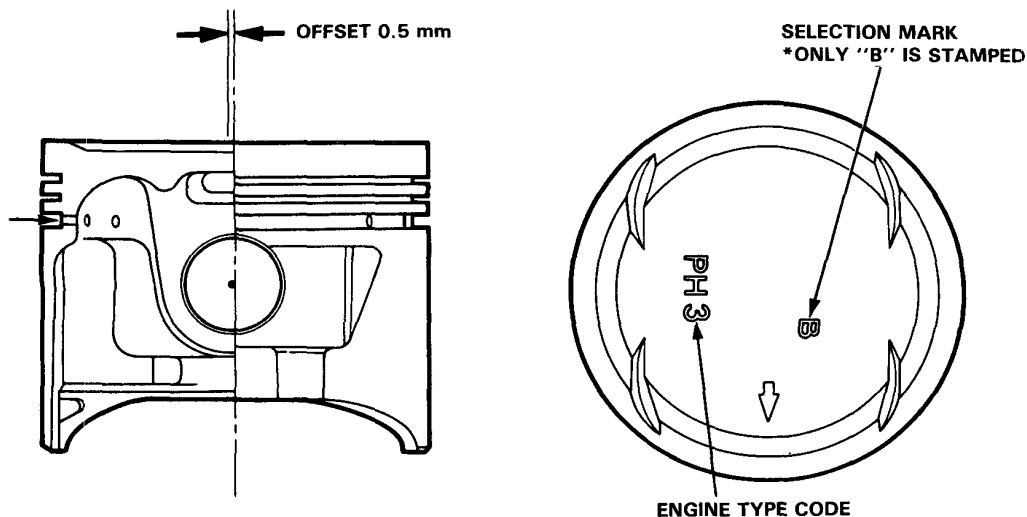
#3 JOURNAL		OTHER JOURNALS	
MARK	RANGE (μ)	MARK	RANGE (μ)
1	-6~-12	1	0~-6
2	-12~-18	2	-6~-12
3	-18~-24	3	-12~-18
4	-24~-30	4	-18~-24



Description

Piston

The design and material are identical to the pistons for A20A4 engine. "PH 3" is marked on the piston head. Two over-size piston sizes (0.25 and 0.50) are available.



Connecting Rod

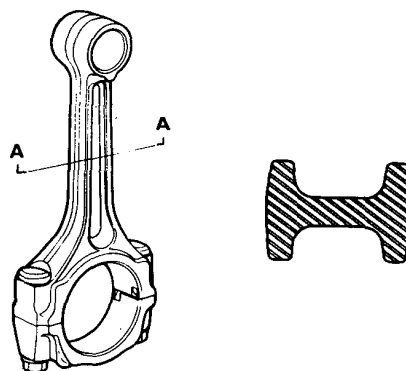
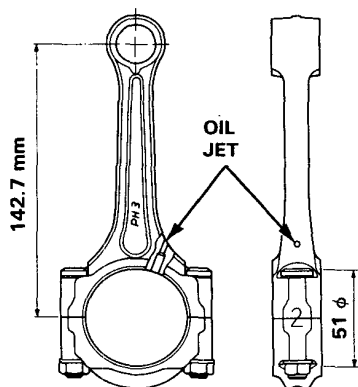
Connecting rods are of high-strength microalloyed steel providing sufficient rigidity for the increased power with a 5% reduction in weight. The weight reduction contributes to reduced inertial mass, hence reduced engine vibration. The weight balance for each cylinder is also controlled within 5 grams to help prevent engine vibration.

Specifications

Big End Bore Diameter	51 mm
Small End Bore Diameter	20 mm
Bore Center Distance	142.7 mm

NOTE:

When assembling the piston and connecting rod, the arrow mark should be on the left side when facing the oil jet.



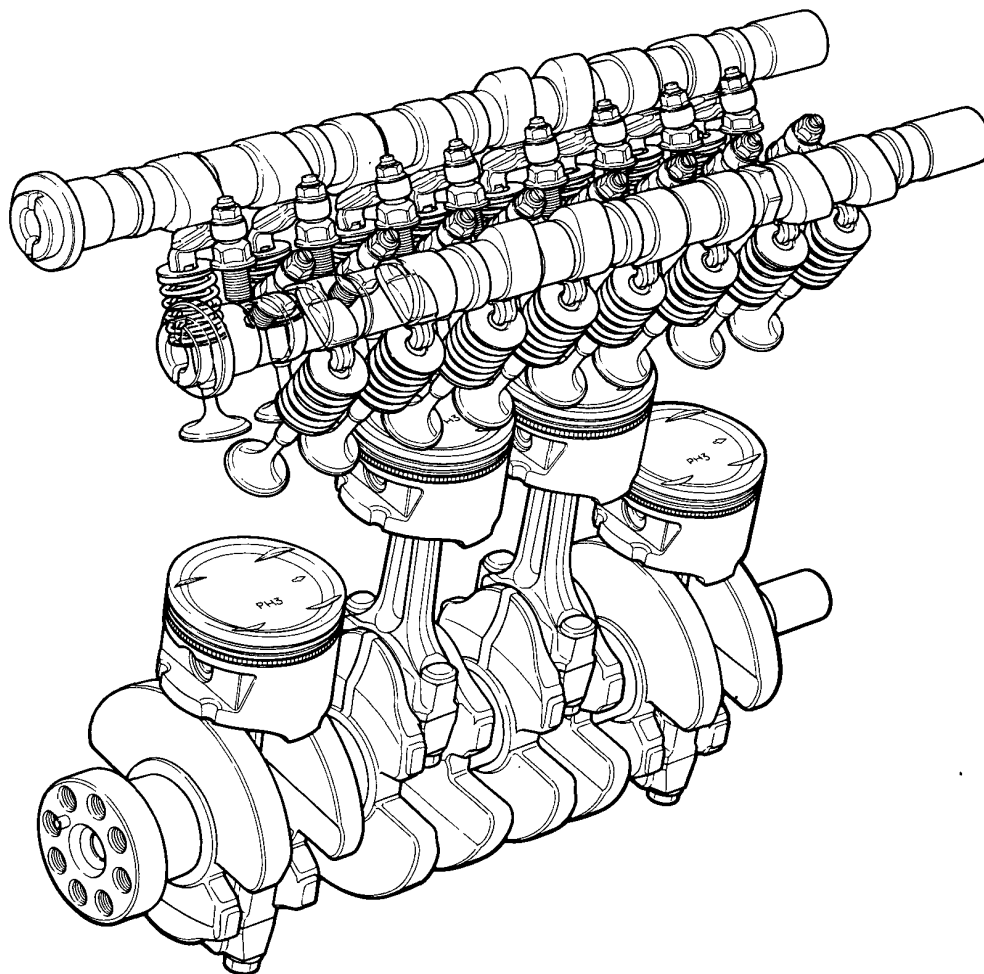


Valve Train

The DOHC mechanism with 4 valves per cylinder (2 intake and 2 exhaust valves) incorporates a new center plug layout. The DOHC mechanism has the following features:

- The large valve opening area contributes to high intake/exhaust efficiency.
- The center plug layout displays minimum flame propagation time.
- The small inertial mass of the valves contribute to accurate operation at high speed.

And the high lift valve design of Honda's Inside Pivot Swing-arm System maximize the efficiency.

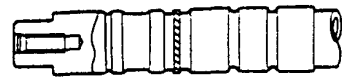


Description

Camshaft

In order to reduce weight, hollow camshafts are newly employed.

INDICATION MARK



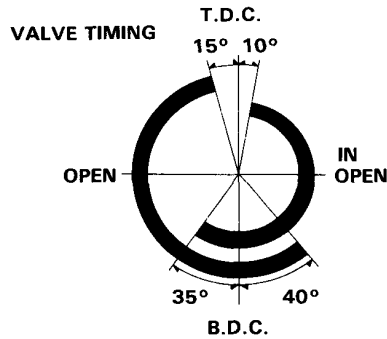
INTAKE SIDE



EXHAUST SIDE

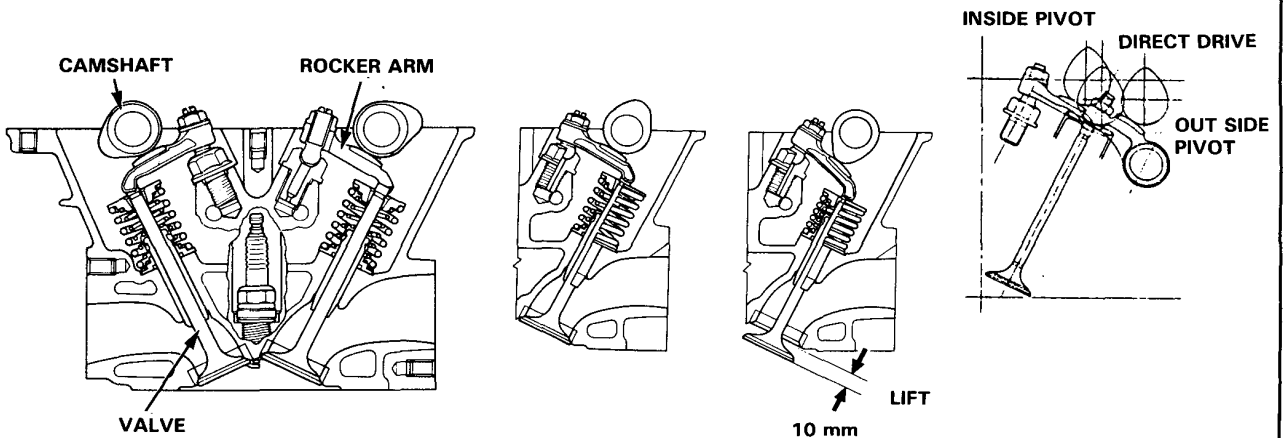


HOLLOW



Valve Mechanism

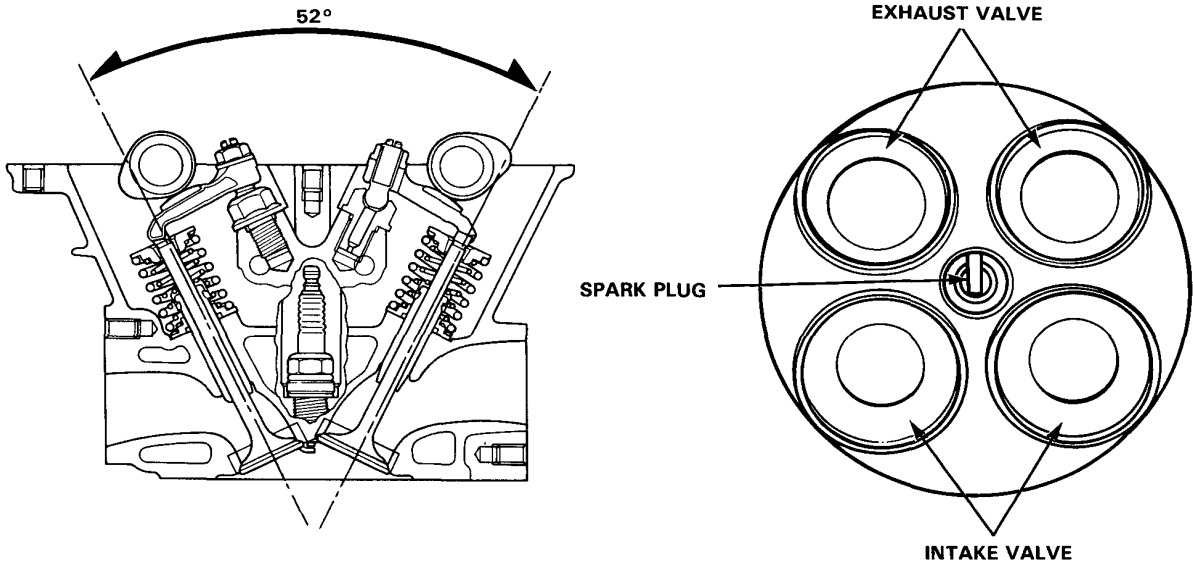
The inside pivot swing arm provides high valve lift without increasing the cam height of the camshaft, does away with the large diameter tappets of the direct drive valve system and reduces the inertial mass to an appropriate level while cylinder head width to a minimum.





Cylinder Head

The cylinder head is an aluminum alloy casting monoblock piece. And the combustion chambers are of the compact roof type with center spark plugs, two exhaust valves and two intake valves installed as shown below.



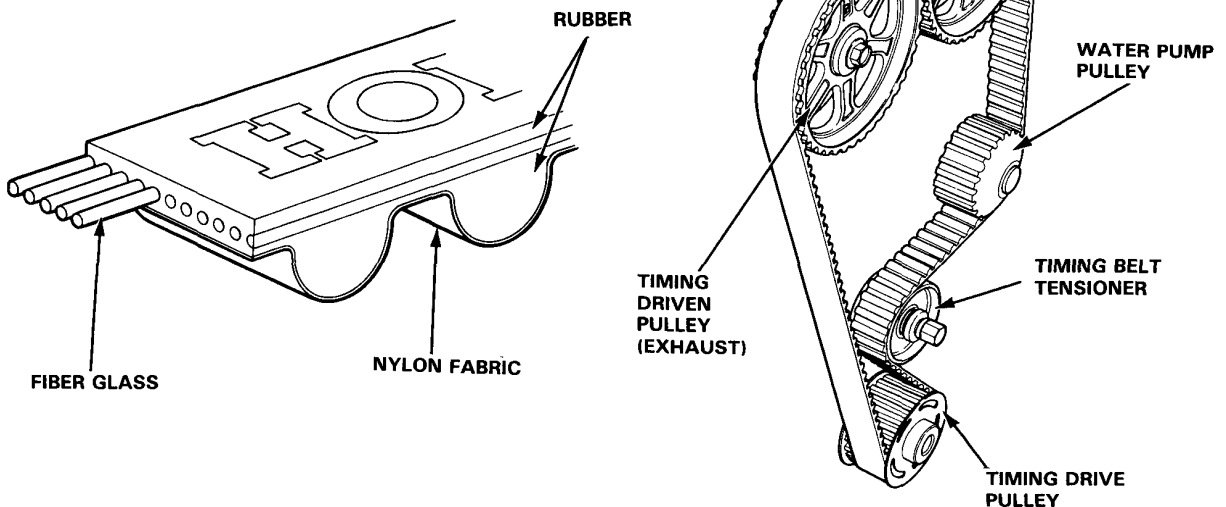
33 mm diameter intake valves and 28 mm diameter exhaust valves contribute maximum intake/exhaust efficiency.

Timing Belt

The structure of the belt is identical to the belt used in the Accord 2 liter engine.

Specifications

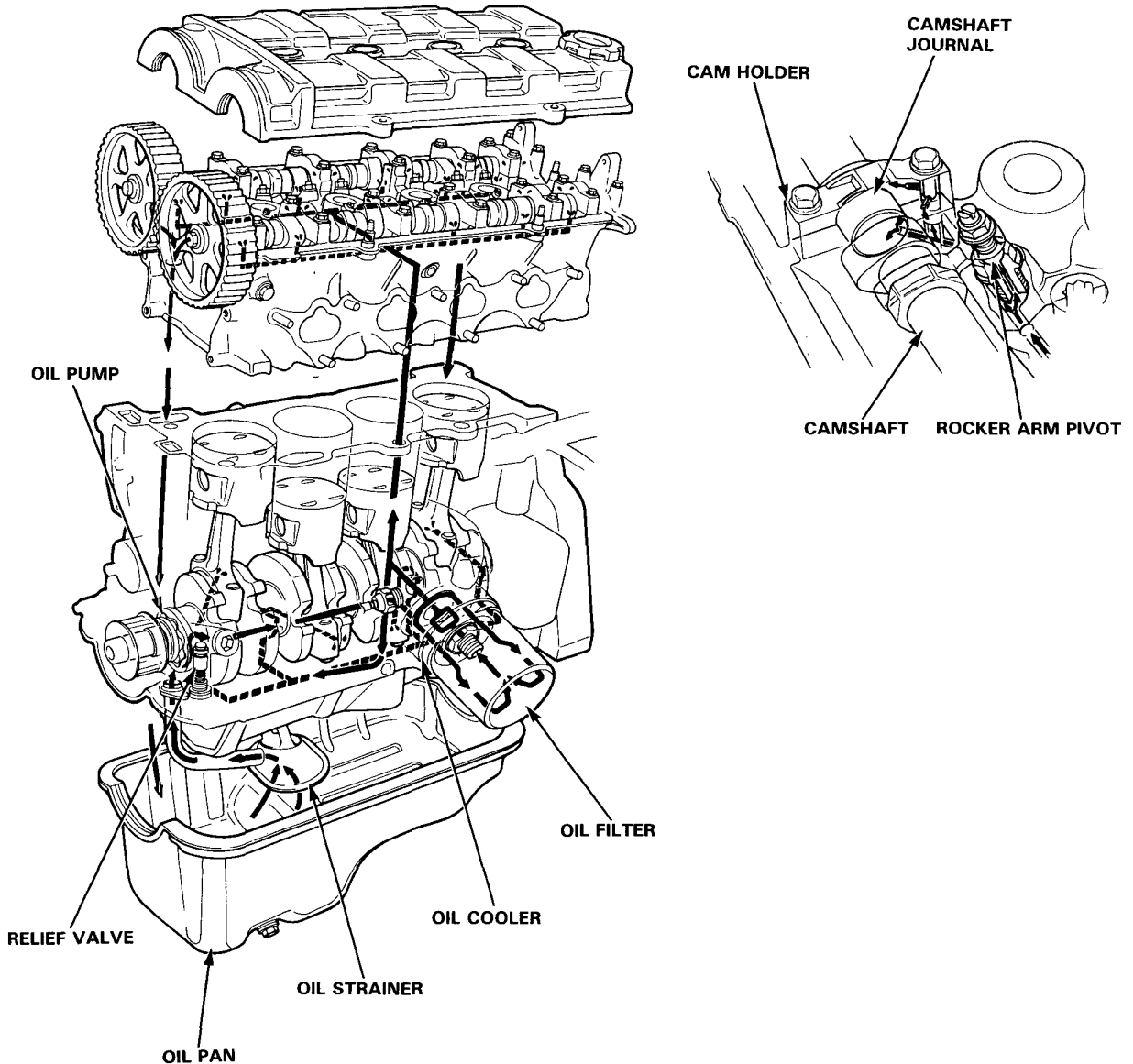
Belt Width	24 mm
Pitch	9.525 mm
Number of Teeth	133



Description

Lubrication System

The lubrication system is a full-filtration, force fed. The trochoid type oil pump is directly driven by the crankshaft and pumps oil from the oil pan up through the strainer to the respective engine part for lubrication. The relief valve is installed in the oil pump body and relieved oil is re-circulated to the intake port of the oil pump directly. An oil cooler is provided at the oil filter base on the cylinder block. Oil flow to the cylinder head is regulated by a control orifice, that lubricates the journals of the two camshafts, rocker arm pivots and cam surfaces.



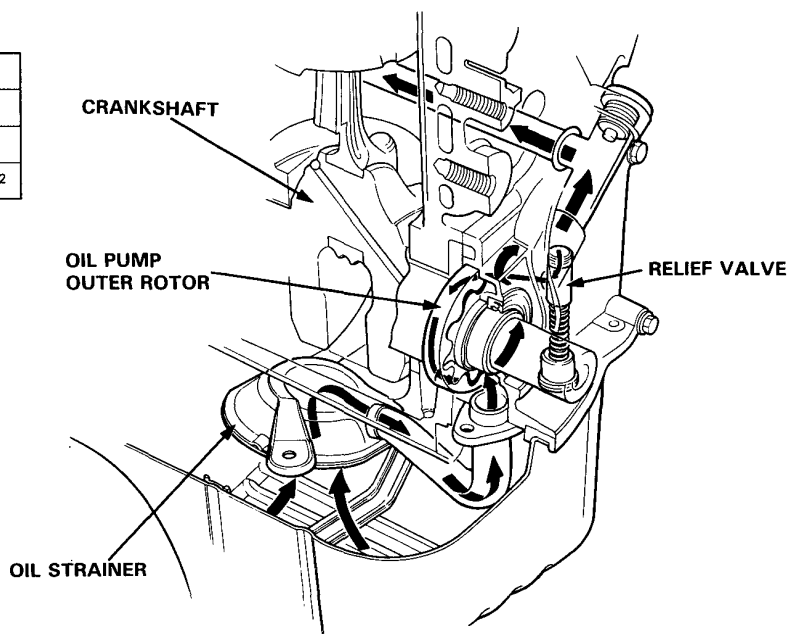


Oil Pump

The oil pump is directly driven by the crankshaft and the oil pump body serves as well as the cylinder block side cover. An internal recirculation pressure relief system helps to prevent aeration of the oil.

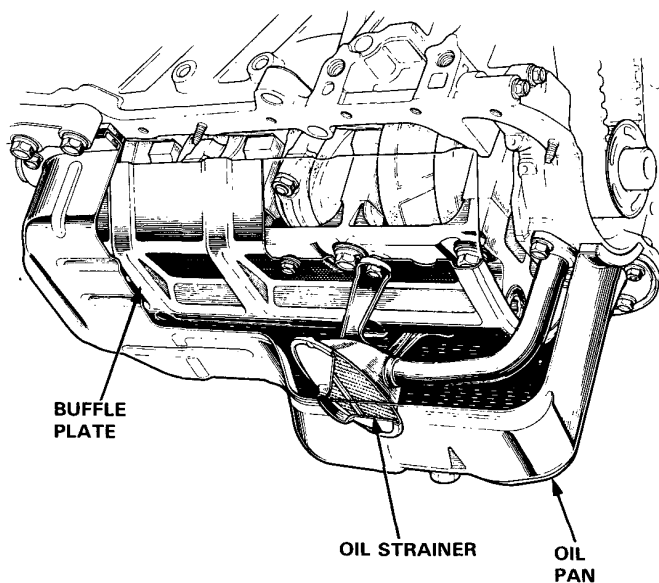
Specifications

No. of Teeth	Inner rotor	9
	Outer rotor	10
Displacement at 5000 min ⁻¹	54 ℓ/min	
Relief Valve Setting Pressure	5.35 kg/cm ²	



Baffle Plate and Bearing Cap

The baffle plate and oil strainer are also secured on the bearing cap by bolts. Bearing caps and cap bridge are now separated pieces. Identification marks of journals and direction marks are indicated on the caps.



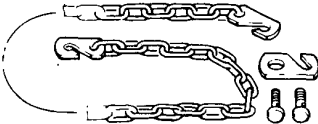
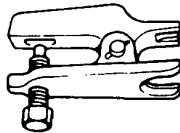
Engine Removal/Installation

B20A2 Engine 5-12



Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07941-6920002	Ball Joint Remover	1	
②	07966-6340011	Engine Block Hanger	1	



① ②

Engine Removal/Installation

WARNING

- Make sure jacks and safety stands are placed properly (pages 1-6 thru 8), and hoist brackets are attached to correct positions on the engine (page 5-16).
- Apply parking brake and block rear wheels, so car will not roll off stands and fall on you while working under it.

CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Disconnect the battery negative terminal first, then the positive terminal.
2. Remove the air intake duct and air cleaner case.
3. Unbolt the hood brackets and remove the hood.
 - Disconnect the washer fluid tube.**CAUTION:** Use care when storing the hood to avoid damaging the paint.

4. Drain the engine oil. Remove the oil filler cap to speed draining. Reinstall the drain plug with a new washer.

CAUTION: Do not re-use old washer.

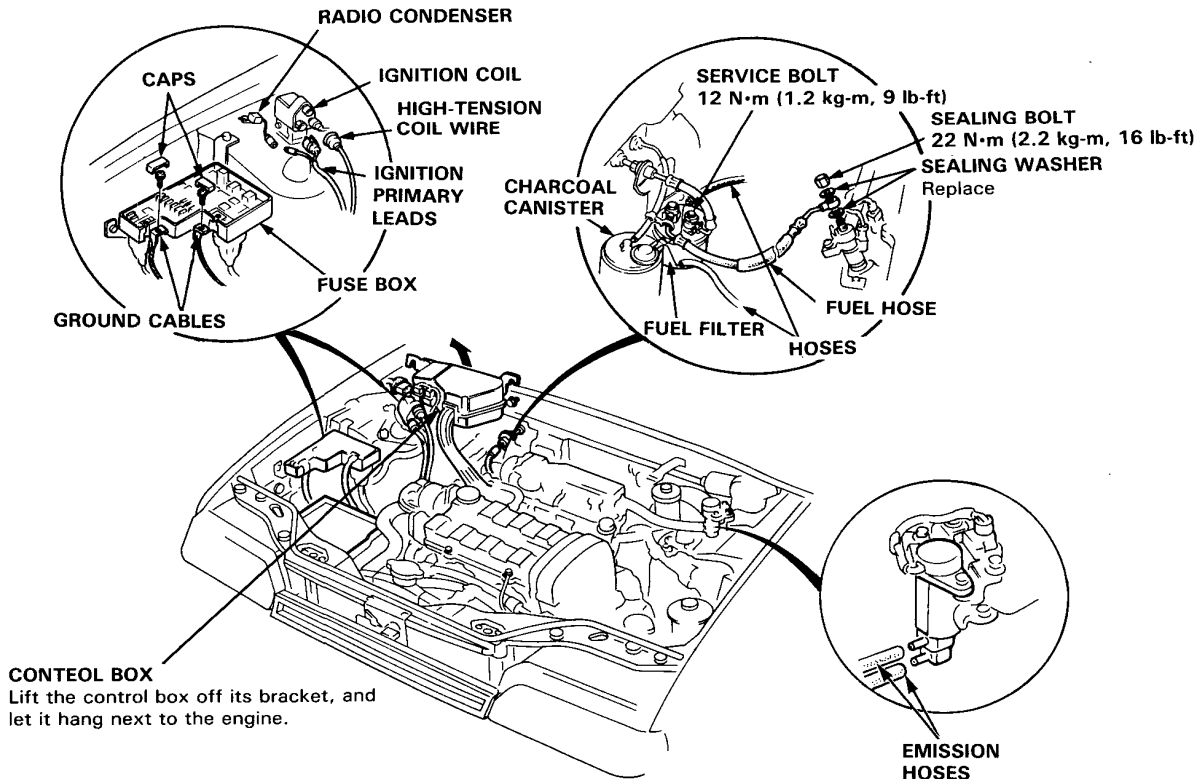
5. Drain the coolant from the radiator into a clean pan so it may be re-used. Remove the radiator cap to speed draining.

 WARNING Use care when removing radiator cap to avoid scalding by hot coolant or steam.

6. Drain transmission oil. Use a 3/8" drive socket wrench to remove the drain plug. Remove the oil filler plug to speed draining. Reinstall the drain plug with a new washer.
7. Remove the air cleaner case mounting bolts (nuts) then remove the air cleaner case.
8. Relieve fuel pressure.

 WARNING Do not smoke while working on fuel system. Keep open flame away from work area. Drain fuel only into an approved container.

CAUTION: Before disconnecting the fuel line, fuel pressure should be relieved by loosening the service bolt on the top of the fuel filter while engine is stopped.

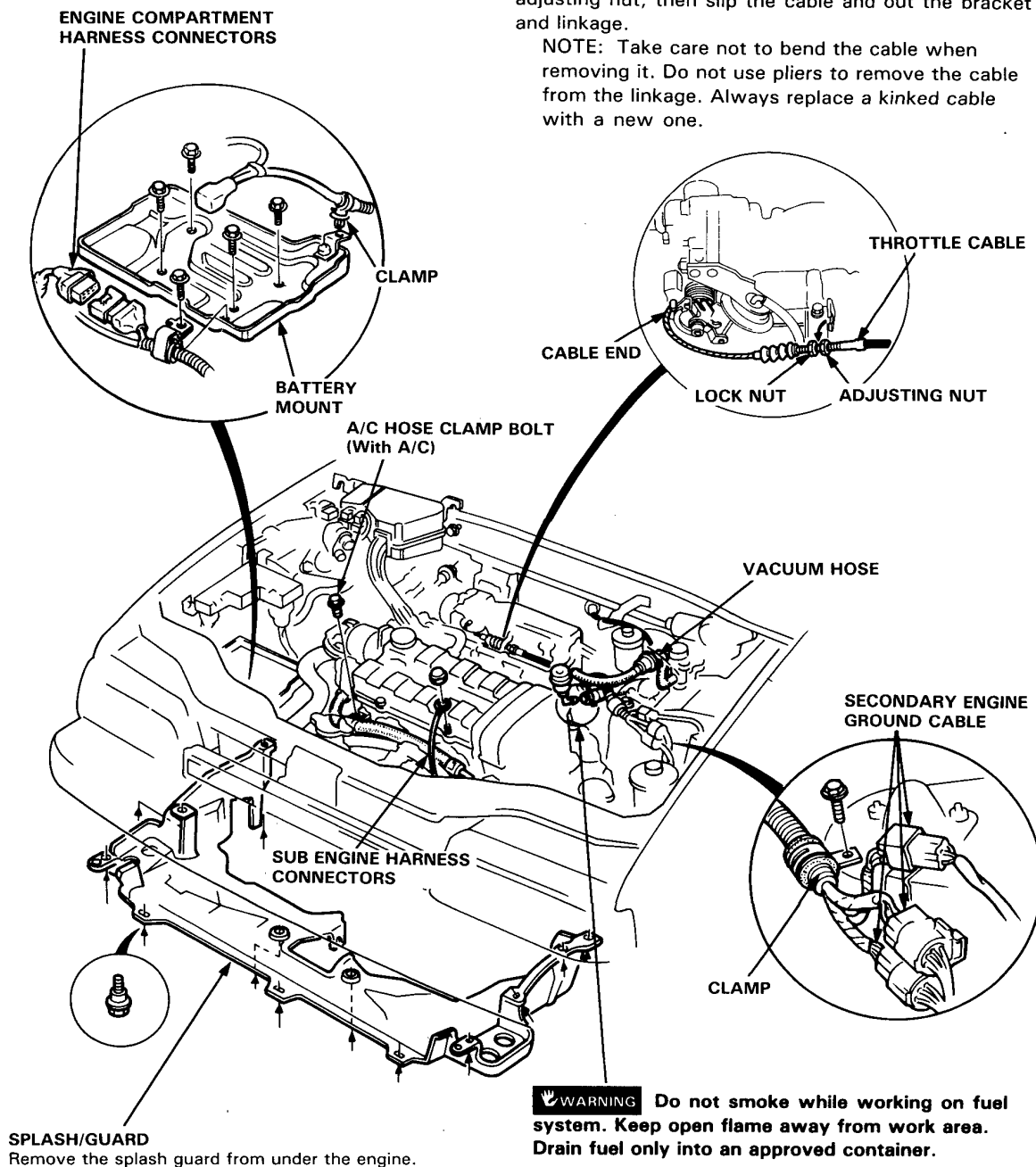




THROTTLE CABLE

Remove the throttle cable by loosening the locknut and adjusting nut, then slip the cable and out the bracket and linkage.

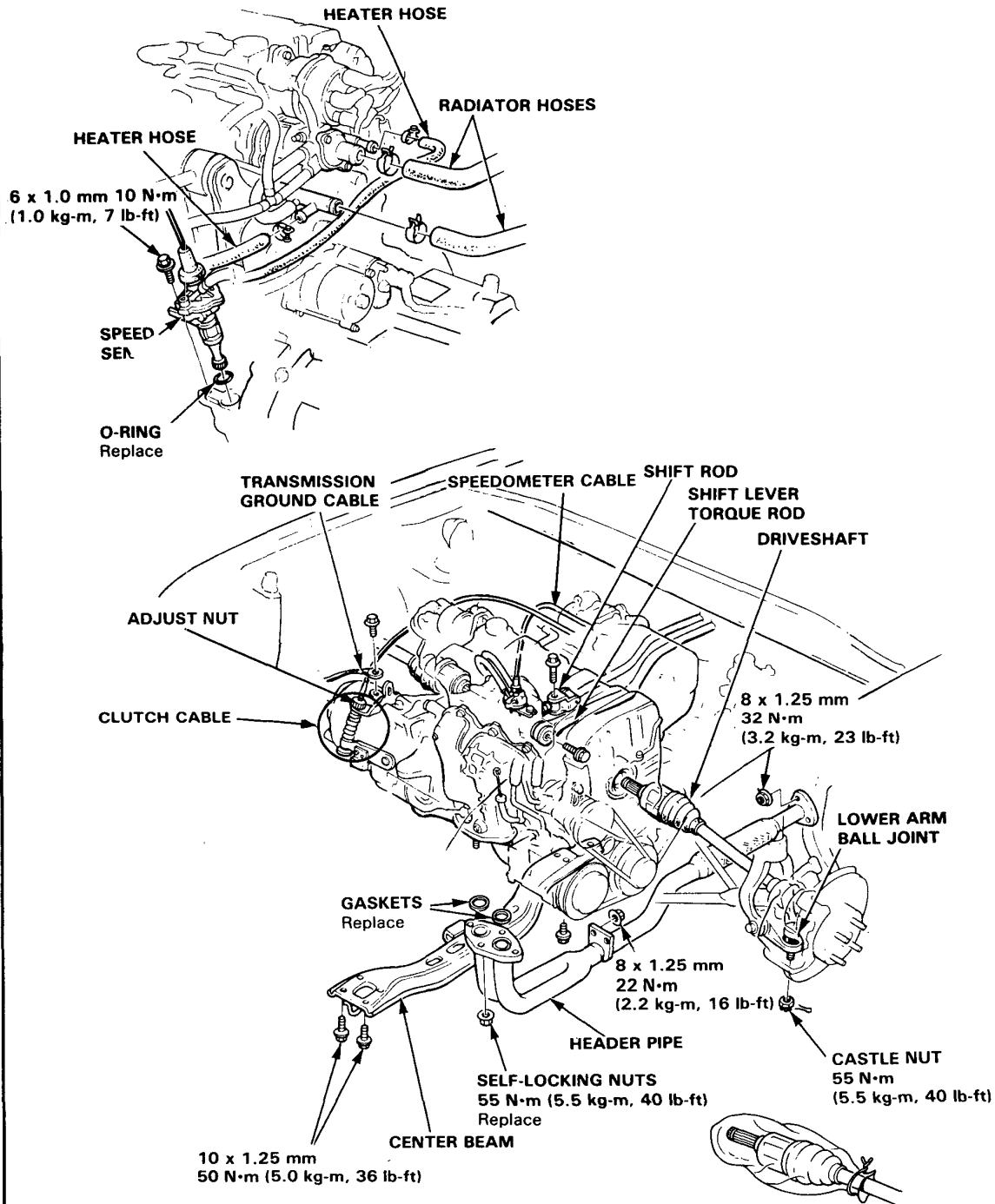
NOTE: Take care not to bend the cable when removing it. Do not use pliers to remove the cable from the linkage. Always replace a kinked cable with a new one.



(cont'd)

Engine Removal/Installation (cont'd)

- Remove speed sensor complete with hoses.





POWER STEERING PUMP

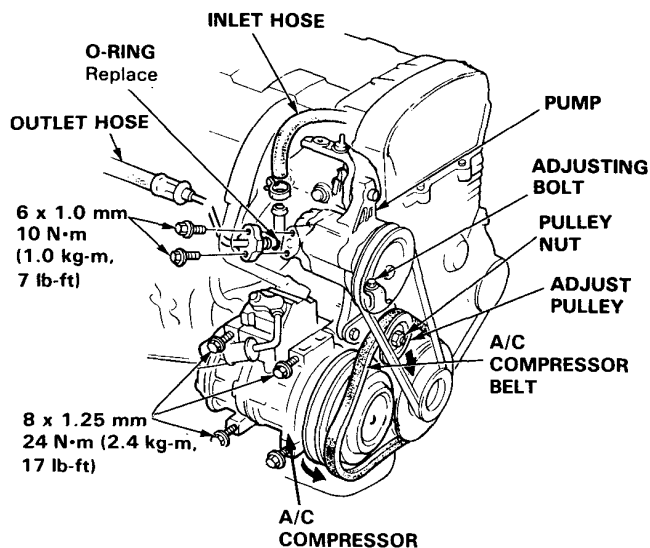
- Disconnect the inlet hose.
- Remove the two bolts then remove the outlet hose.

A/C COMPRESSOR

- Loosen the adjust pulley nut and belt adjusting bolt.

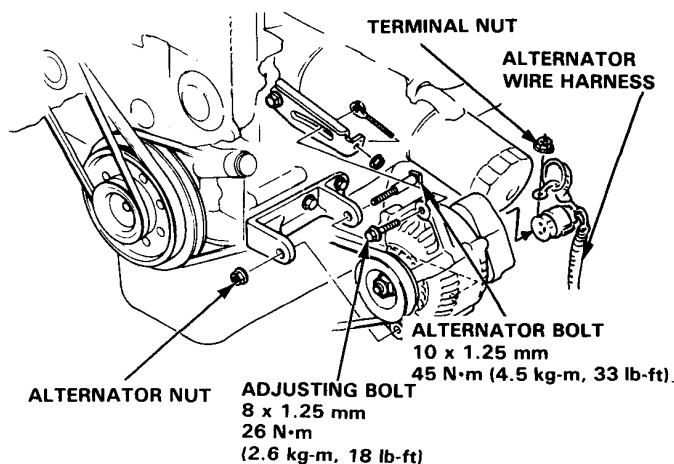
NOTE: The compressor can be moved without discharging the air conditioner system.

- Remove the compressor mounting bolts, then lift the compressor out of the bracket with hoses attached, and wire it up to the front bulkhead.



ALTERNATOR

- Disconnect the alternator wire harness connectors.
- Remove the belt adjusting bolt and remove the belt.
- Remove the alternator mount bolt and remove the alternator.



(cont'd)

Engine Removal/Installation (cont'd)

9. Attach a chain hoist to the engine block and raise the hoist just enough to remove slack from chain.
10. Check that the engine/transaxle is completely free of vacuum, fuel, and coolant hoses, and electrical wires.
11. Remove the bolt from the rear torque rod at the engine, then loosen the bolt in the frame mount and swing the rod up out of the way.
12. Raise the engine just enough to let the engine mounting brackets clear the mounting studs, then lower the engine onto the mounts. Shorten the length of the chain from 13 to 7 links on the timing belt side, then raise the engine all the way and remove it from the car.

13. Install the engine in the reverse order of removal. After the engine is in place:

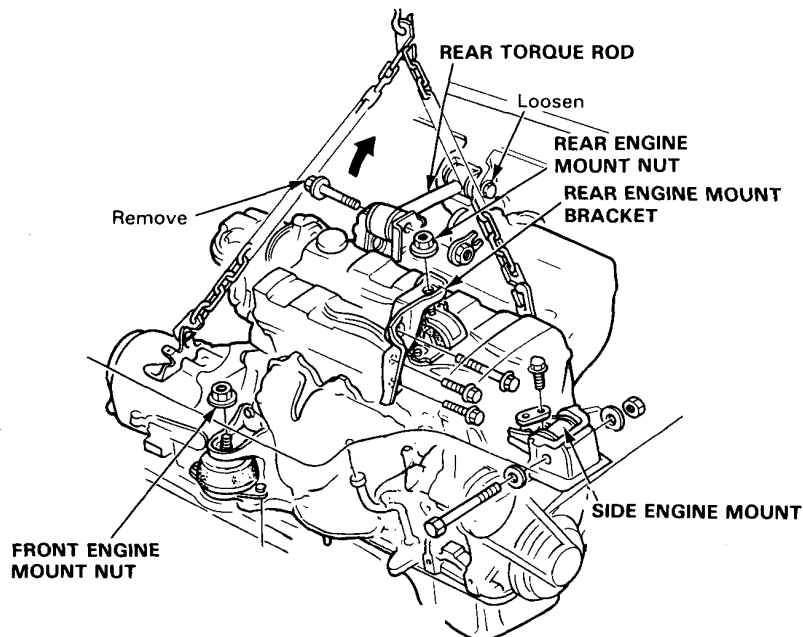
- Torque engine mount bolts in sequence shown on next page.

CAUTION: Failure to tighten the bolts in the proper sequence can cause excessive noise and vibration, and reduce bushing life; check that the bushings are not twisted or offset.

- Check that the spring clip on the end of each driveshaft clicks into the differential.

CAUTION: Use new spring clips on installation.

- Bleed air from the cooling system at the bleed bolt with the heater valve open.

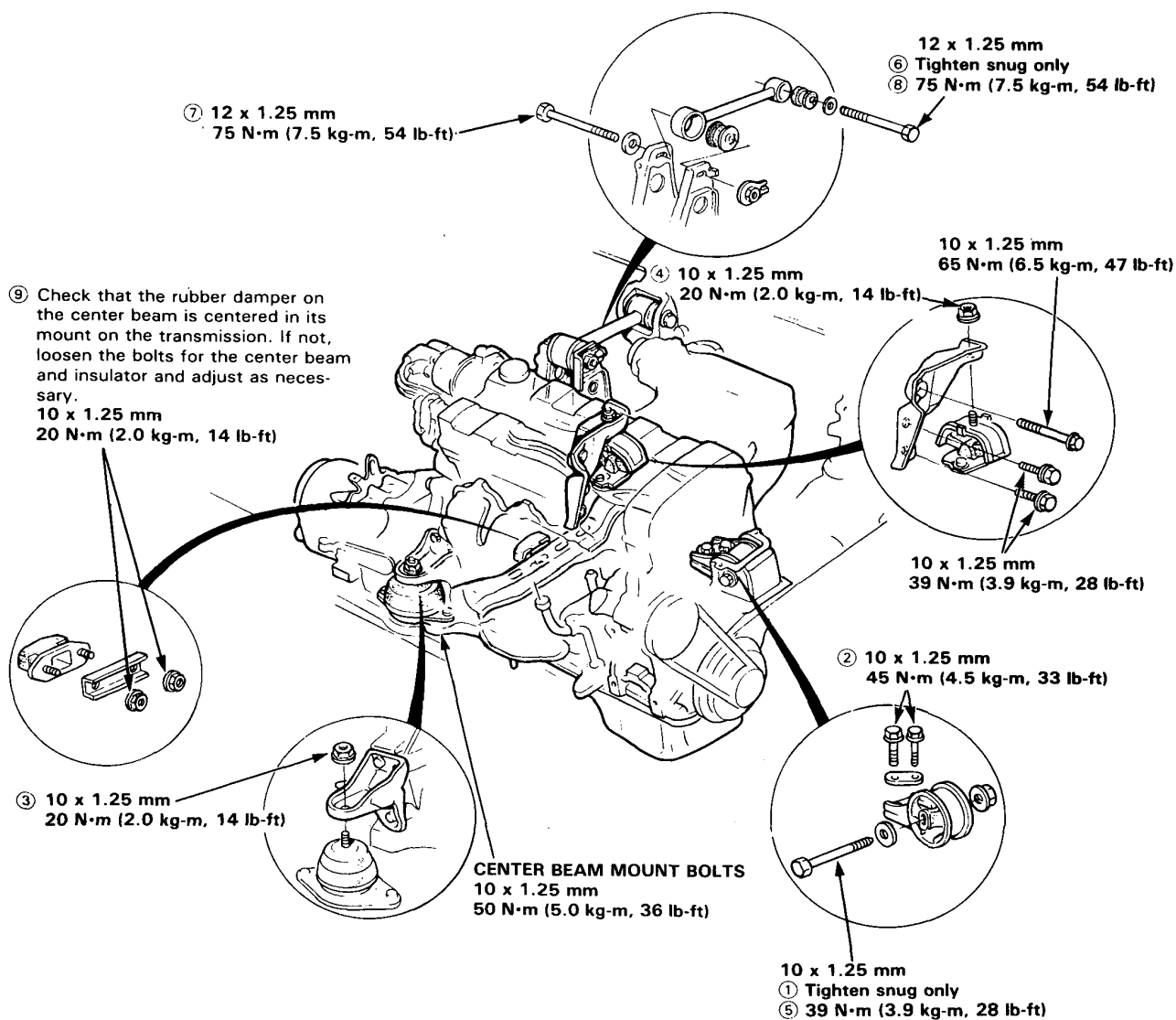


- Adjust the throttle cable tension.
- Adjust the alternator belt tension.
- Check the clutch pedal free play.
- Check that the transmission shifts into gear smoothly.
- Connect the air conditioning hoses, wiring and V-belt.
- Clean battery posts and cable terminals with sandpaper, assemble, then apply grease to prevent corrosion.



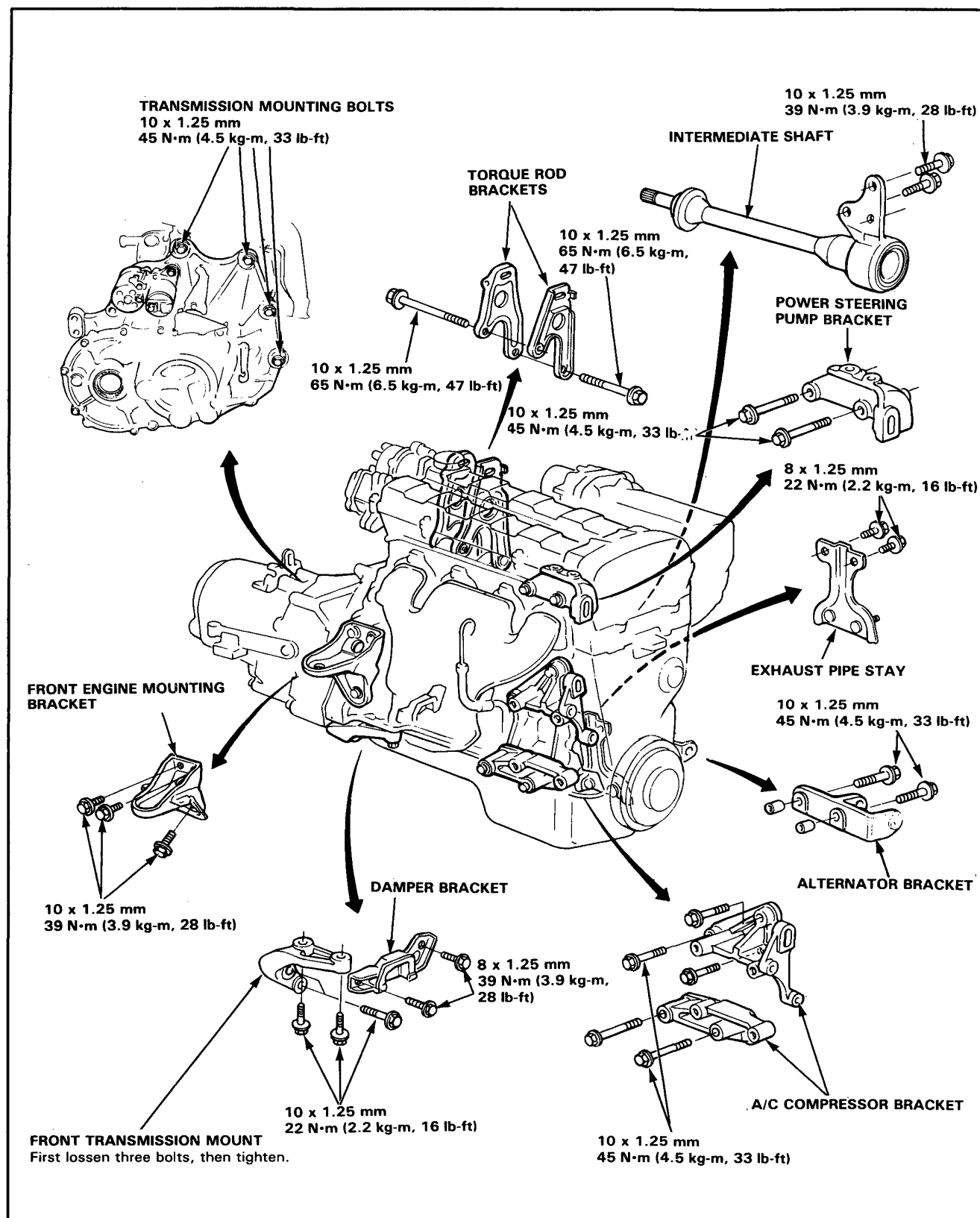
NOTE:

- For proper suppression of noise and vibration, and maximum bushing life, tighten the bolts in the sequence shown with the bushings centered in their mounts.
- From step 5 on, the car must be sitting level; make sure that the engine hoist is not holding up the engine and car.



(cont'd)

Engine Removal/Installation (cont'd)



Cylinder Head/Valve Train

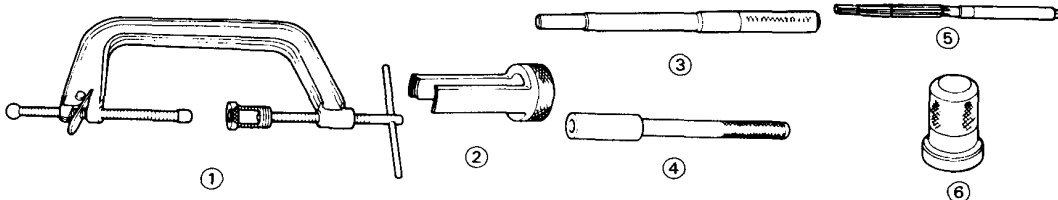
B20A2 Engine

Illustrated Index	6-2
Cylinder Head Removal	6-4
Camshaft Pulleys	6-5
Casshafts	6-5
Valves	6-7
Valve Seats	6-8
Valve Guides and Valves	6-10
Valve Spring	6-11
Cylinder Head Installation	6-12
Camshaft/Rocker Arms and Camshaft Seals/Pulleys	6-13
Timing Belt	6-15
Valve Clearance Adjustment	6-18



Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07757-0010000	Valve spring Compressor	1	
②	07757-PJ10100	Valve spring Compressor Attachment	1	Use changed to 07757-0010000 attachment
③	07942-6570100	Valve Guide Driver, 6.6 mm	1	07942-6110000 may also be used.
④	07743-0020000	Adj. Valve Guide Driver	1	
⑤	07984-6570100	Valve Guide Reamer, 6.6 mm	1	07984-6110000 may also be used.
⑥	07947-SB00100	Camshaft Seal Driver	1	

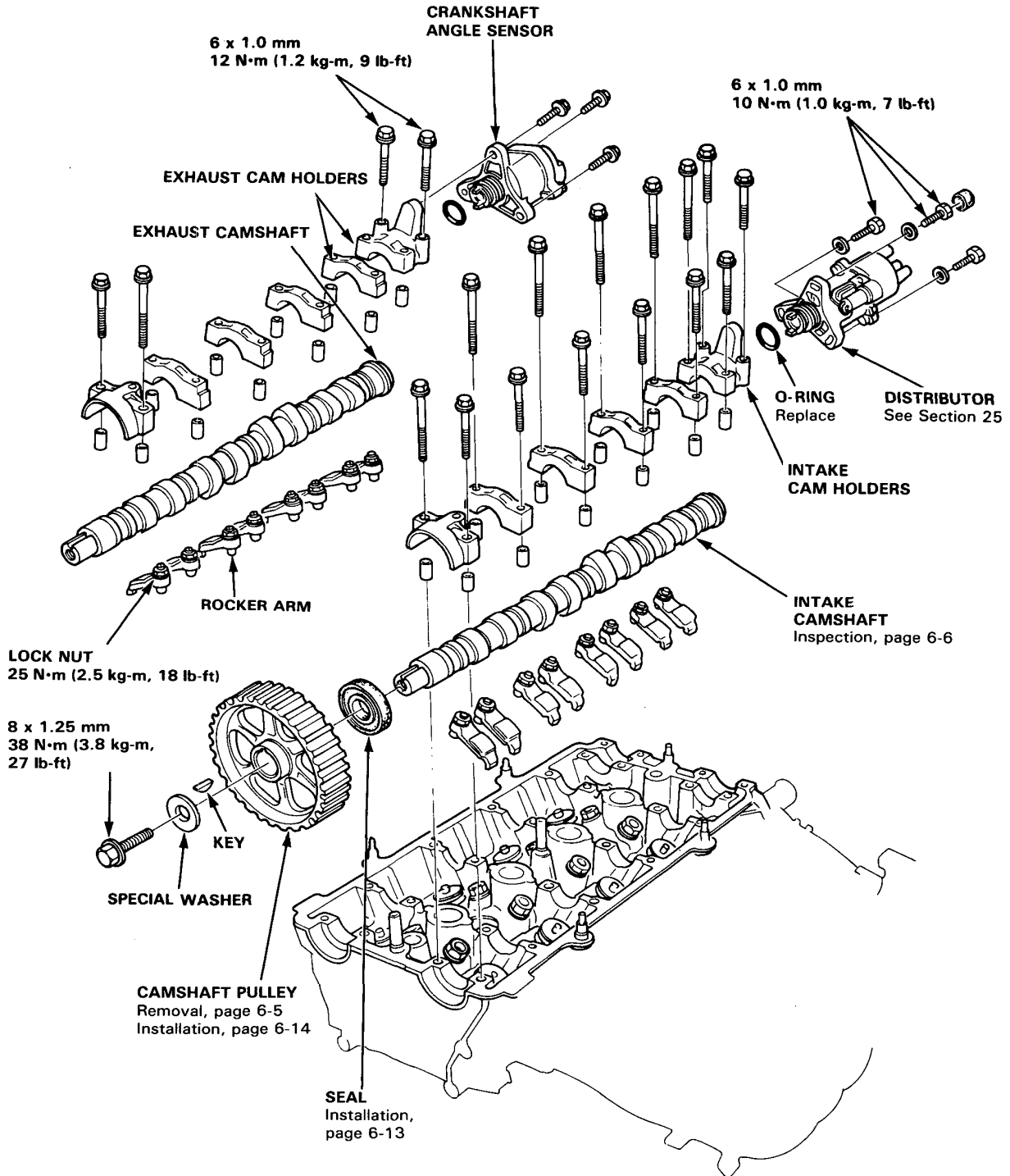


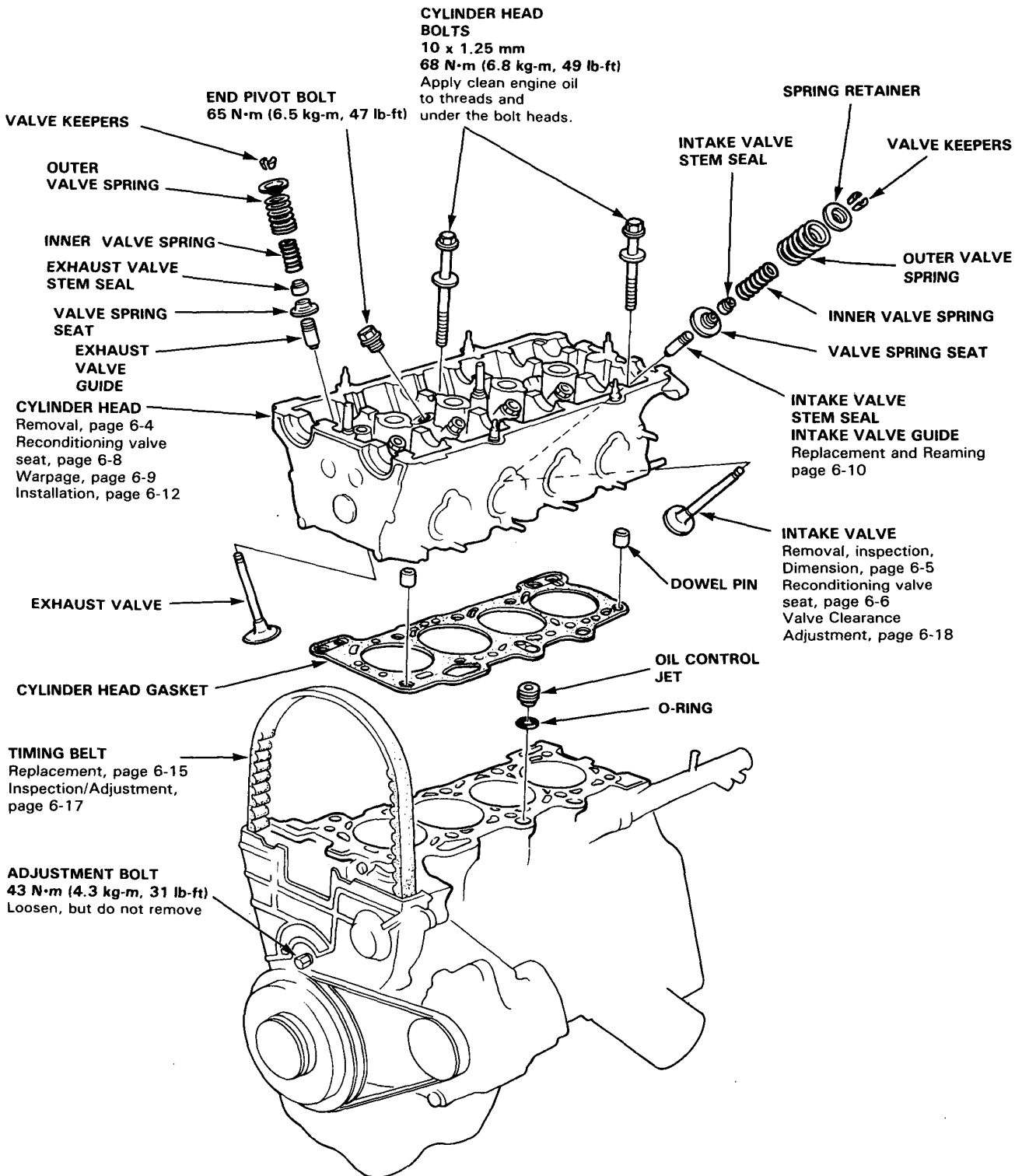
Cylinder Head/Valve Train

Illustrated Index

CAUTION: To avoid damaging the cylinder head, wait until the coolant temperature drops below 38°C (100°F) before removing it.

NOTE: Use new O-rings and gaskets whenever reassembling.





Cylinder Head

Removal (engine removal not required)

CAUTION: Do not remove the cylinder head until the coolant temperature drops below 38°C (100°F)

NOTE:

- Inspect the timing belt before removing the cylinder head.
- Before removal of the cylinder head, turn the flywheel so that the No. 1 cylinder is at top-dead-center (page 6-16).
- Mark all emissions hoses before disconnecting them.

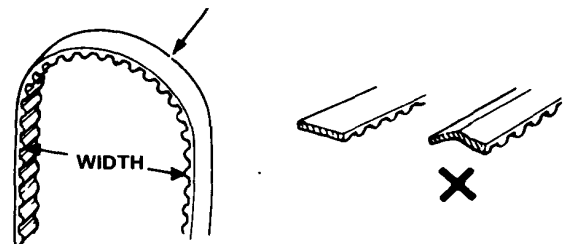
1. Disconnect the negative terminal from the battery.
2. Drain the cooling system.
3. Remove the brake booster vacuum tube from the tubing manifold.
4. Remove the engine secondary ground cable from the valve cover (page 5-3).
5. Disconnect the radio noise condenser connector, coil wire and ignition primary connector (page 5-2).
6. Remove the air cleaner cover.
7. Relieve fuel pressure.

WARNING Do not smoke while working on fuel system, keep open flame or spark away from work area. Drain fuel only into an approved container.

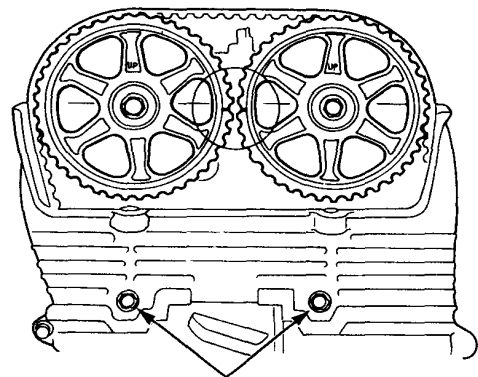
8. Disconnect the fuel hose and fuel return hose (page 5-2).
9. Disconnect the throttle cable at the throttle body (page 5-3).
10. Disconnect the charcoal canister tube at the throttle valve.
11. Disconnect the engine sub harness connectors and couplers from the cylinder head and intake manifold.
 - Four injector couplers
 - TA sensor connector
 - Temperature unit connector
 - Ground terminal near by the fuel pipe
 - Throttle sensor connector
 - TW sensor connector
 - Crankshaft angle sensor coupler
 - Four wire harness clamps
12. Disconnect the upper radiator hose, heater hose, and bypass inlet hose from the cylinder head (page 5-4).
13. Remove the hose between the thermostat housing and the intake manifold.
14. Disconnect the connecting pipe-to-valve body hose and bypass outlet hose.
15. Remove the power steering oil pump but do not disconnect the pump hoses (page 5-5).

16. Remove the hose clamp bolt on the cylinder head.
17. Remove the power steering pump bracket from the cylinder head.
18. On cars equipped with air conditioning, disconnect the idle control solenoid hoses.
19. Remove the exhaust header pipe nuts.
20. Remove the header pipe bracket and pull the pipe clear of the exhaust manifold.
21. Remove the air cleaner base mount bolts.
22. Disconnect the hose from the intake manifold to the breather chamber.
23. Remove the valve cover and the timing belt upper cover.
24. Loosen the tensioner adjustment bolt, then remove the timing belt.

CAUTION: Do not crimp or bend timing belt more than 90° or less than 25 mm (1 in.) in diameter.



25. Remove the timing belt middle cover bolts, which are tighten to the cylinder head.



MIDDLE COVER BOLTS

26. Remove the camshaft holder bolts, then remove the camshaft holders, camshafts and rocker arms.
27. Remove the cylinder head bolts, then remove the cylinder head.

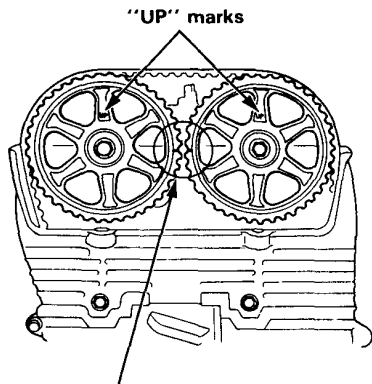
CAUTION: To prevent warpage, unscrew bolts 1/3 turn each time and repeat sequence until loose.

28. Remove the exhaust manifold from the cylinder head.
29. Remove the intake manifold from the cylinder head.

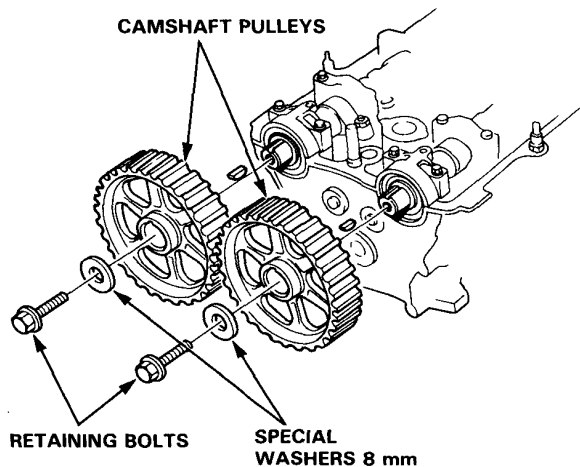
Camshaft Pulleys

Removal

1. To ease reassembly, turn the pulley until the "UP" marks faces up, and the front timing marks are aligned with the both mark on the pulleys.



2. Remove the pulley retaining bolts and washers, then remove the pulleys.



NOTE: Before removing camshafts assembly, check camshaft end play.

Camshafts



Inspection

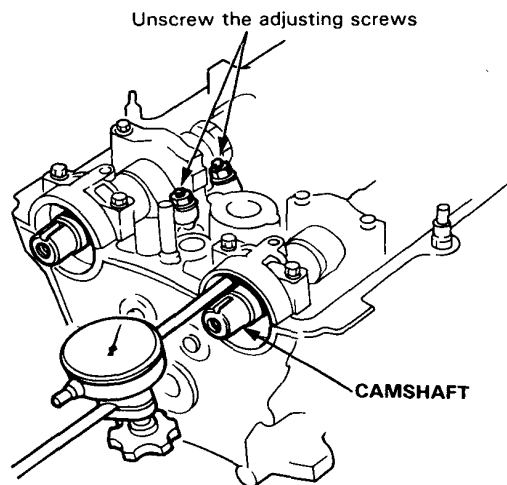
NOTE: Do not rotate camshaft during inspection; loosen the adjusting screws before starting.

1. Seat camshafts by prying it toward distributor end of head with screwdriver.
2. Zero dial indicator against end of distributor drive, then pry camshafts back and forth, and read end play.

Camshaft End Play:

Standard (New): 0.05—0.15 mm
(0.002—0.006 in.)

Service Limit: 0.5 mm (0.02 in.)



3. Remove the bearing cap bolts from the cylinder head.

NOTE: Unscrew the rocker arm bolts, two turns at a time, in a criss-cross pattern, to prevent damaging valves or rocker arms.

- Lift camshaft out of cylinder head, wipe clean, then inspect lift ramps. Replace camshaft if lobes are pitted, scored, or excessively worn.
- Clean the camshaft bearing surfaces in the cylinder head, then set camshaft back in place.
- Insert plastigage strip across each journal.
- Install the bearing caps and torque bolts to valves and in sequence shown on page 6-13, then remove the bolts and the bearing caps.

(cont'd)

Camshafts

Inspection (cont'd)

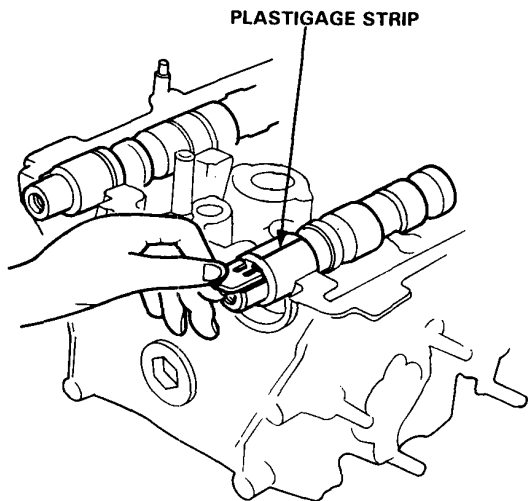
4. Measure widest portion of plastigage on each journal.

Camshaft Bearing Radial Clearance:

Standard (New): 0.050–0.089 mm

(0.002–0.004 in.)

Service Limit: 0.15 mm (0.006 in.)



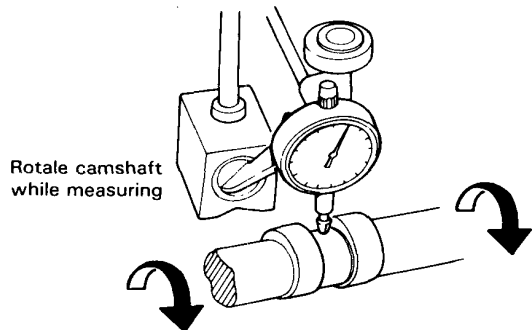
5. If camshaft bearing radial clearance is out of tolerance:

- And camshaft has already been replaced, you must replace the cylinder head.
- If camshaft has not been replaced, first check total runout with the camshaft supported on V-blocks.

Camshaft Total Runout:

Standard (New): 0.03 mm (0.001 in.)

Service Limit: 0.06 mm (0.002 in.)



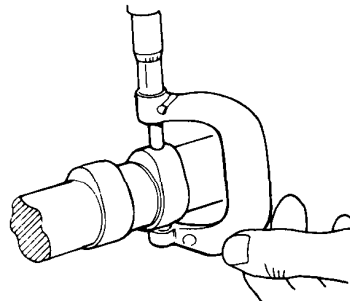
- If the total runout of the camshaft is within tolerance, replace the cylinder head.

- If the total runout is out of tolerance replace the camshaft and recheck. If the bearing clearance is still out of tolerance, replace the cylinder head.

6. Measure camshaft height.

Intake Standard: 33.716 mm (1.3274 in.)

Exhaust Standard: 33.781 mm (1.3300 in.)



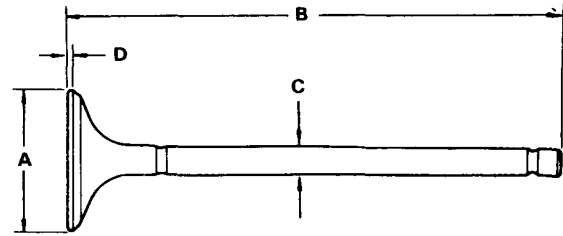
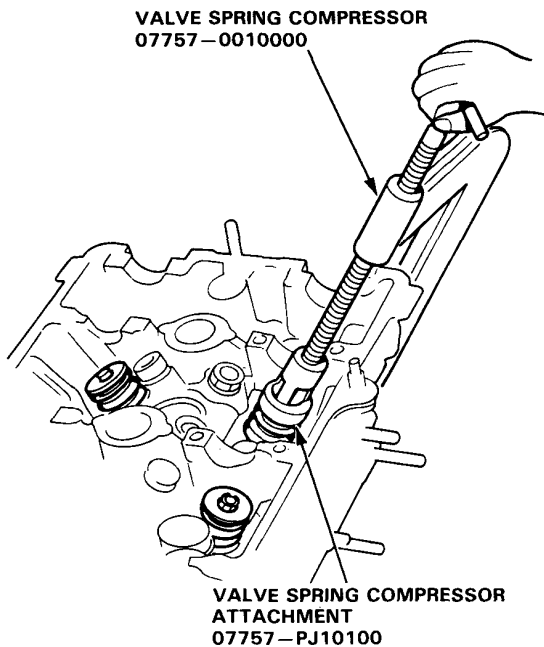
Valves



Replacement

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

1. Tap each valve stem with a plastic mallet to loosen valve keepers before installing spring compressor.
2. Install spring compressor. Compress spring and remove valve keeper.



Intake Valve Dimensions

A Standard (New):	32.9–33.1 mm (1.295–1.303 in.)
B Standard (New):	140.3–140.6 mm (5.524–5.535 in.)
C Standard (New):	6.58–6.59 mm (0.2591–0.2594 in.)
C Service Limit:	6.55 mm (0.258 in.)
D Standard (New):	1.35–1.65 mm (0.053–0.065 in.)
D Service Limit:	1.15 mm (0.045 in.)

Exhaust Valve Dimensions

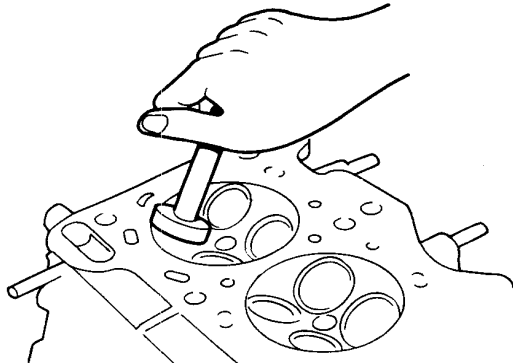
A Standard (New):	27.9–28.1 mm (1.098–1.106 in.)
B Standard (New):	106.5–106.7 mm (4.193–4.201 in.)
C Standard (New):	6.55–6.56 mm (0.2579–0.2583 in.)
C Service Limit:	6.52 mm (0.256 in.)
D Standard (New):	2.35–2.65 mm (0.093–0.104 in.)
D Service Limit:	2.15 mm (0.085 in.)

Valve Seats

Reconditioning

1. Renew the valve seats in the cylinder head using a valve seat cutter.

NOTE If guides are worn (page 6-9), replace them (page 6-10) before cutting valve seats.



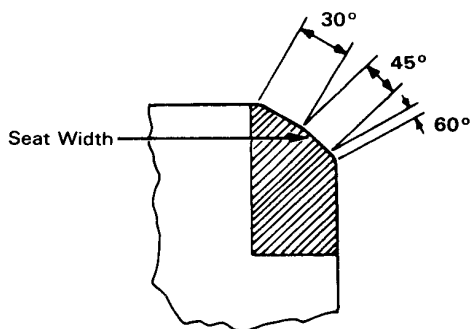
CUTTER	INTAKE	EXHAUST
30°	07780-0012900	07780-0012300
60°	07780-0014000	07780-0014100
45°	07780-0010800	07780-0010400
HOLDER	07781-0010201 and 07781-0010301	

2. Bevel the upper edge of seat with the 30° cutter until required seat width is obtained.
3. Bevel the inner edge of seat slightly with the 60° cutter.
4. Carefully center 45° cutter. Remove as little material as possible. (See measurement after reconditioning shown below.)

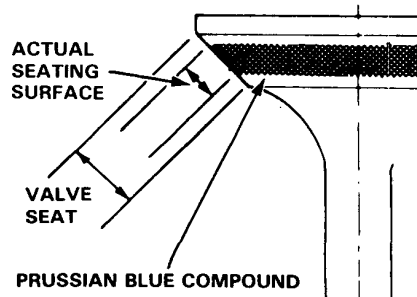
Valve Seat Width:

Standard: 1.25–1.55 mm (0.049–0.061 in.)

Service Limit: 2.0 mm (0.08 in.)



5. After resurfacing seat, inspect for even valve seating: Apply Prussian blue compound to valve face, and insert valve in original location in head, then lift it and snap it closed against seat several times.



6. The actual valve seating surface, 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 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
 - If it is too low (closer to valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

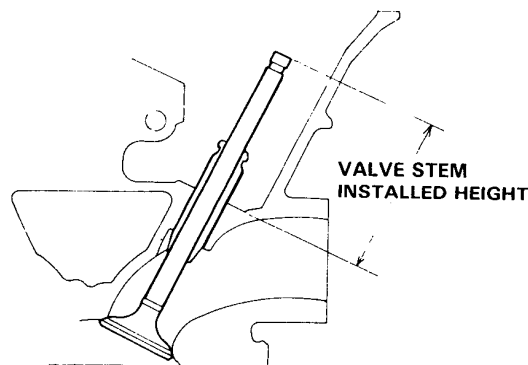
NOTE: The final cut should always be made with the 45° cutter.

7. Insert intake and exhaust valves in head and measure valve stem installed height.

Intake and Exhaust Valve Stem Installed Height:

Standard (New): 42.75 mm (1.683 in.)

Service Limit: 43.54 mm (1.714 in.)



8. If valve stem installed height is over service limit, replace valve and recheck. If still over service limit, replace cylinder head; the valve seat in the head is too deep.



Cylinder Head

Valve Guide-to-Valve Stem Clearance

1. Measure the guide-to-stem clearance with a dial indicator, while rocking the stem in the direction of normal thrust (Wobble Method).

Intake Valve Stem-to-Guide Clearance

Standard (New): 0.04–0.10 mm
(0.0016–0.004 in.)

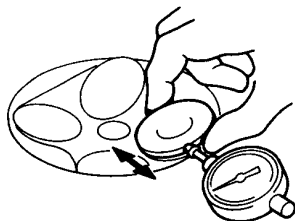
Service Limit: 0.16 mm (0.006 in.)

Exhaust Valve Stem-to-Guide Clearance

Standard (New): 0.10–0.16 mm
(0.004–0.006 in.)

Service Limit: 0.22 mm (0.009 in.)

Valve extended 10 mm out from seat.



- If measurement exceeds the service limit, recheck using new valve.
- If measurement is now within service limit, reassemble using new valve.
- If measurement still exceeds limit, recheck using alternate method below, then replace valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to 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): 0.02–0.05 mm
(0.001–0.002 in.)

Service Limit: 0.08 mm (0.003 in.)

Exhaust Valve Stem-to-Guide Clearance

Standard (New): 0.05–0.08 mm
(0.002–0.003 in.)

Service Limit: 0.11 mm (0.004 in.)

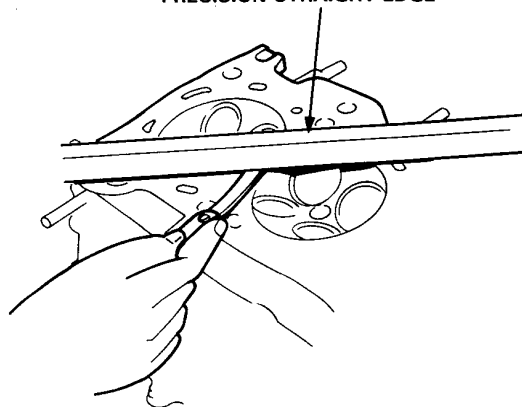
Warpage

NOTE: If camshaft bearing clearances are not within specification, the head cannot be resurfaced (page 6-6).

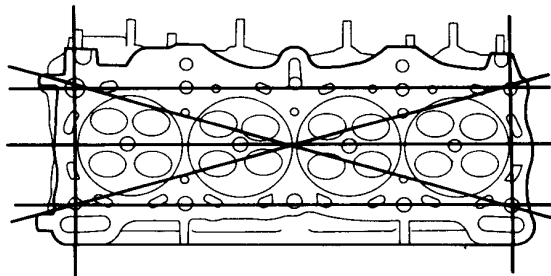
If camshaft bearing radial clearances are within specifications, check head for warpage.

- 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 cylinder head.
- Maximum resurface limit is 0.2 mm (0.008 in.) based on height of 131.8 mm (5.19 in.).

PRECISION STRAIGHT EDGE



Measure along edges, and 3 ways across center.



Cylinder Head Height:

New: 132.0 mm (5.20 in.)

Service Limit: 131.8 mm (5.19 in.)

Valve Guides

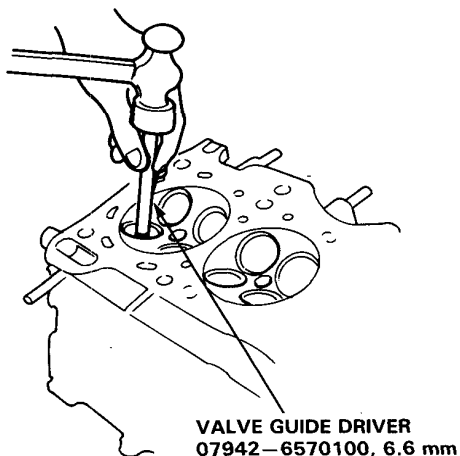
Replacement

NOTE:

- For best results, heat cylinder head to 150°C (300°F) before removing or installing guides.
- It may be necessary to use an air hammer to remove some valve guides.

CAUTION: To avoid burns, use heavy gloves when handling heated cylinder head.

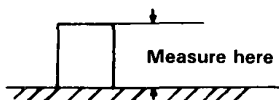
1. Drive the valve guide out from the bottom of the cylinder head.



2. Drive in a new valve guide to the specified depth.

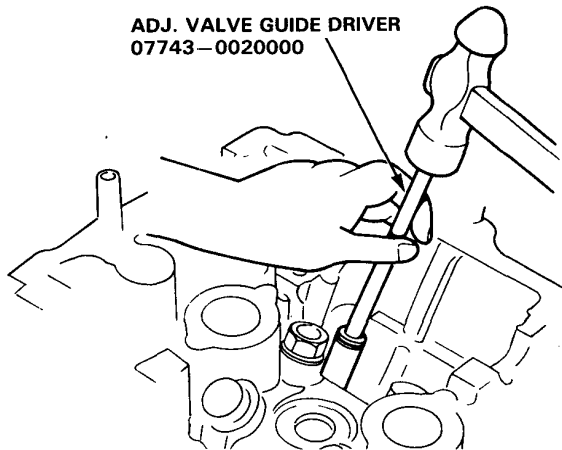
Intake: 16.0 mm (0.63 in.)

Exhaust: 16.0 mm (0.63 in.)



NOTE: If using adjustable valve guide driver 07743-0020000, adjust the collar depth to correspond with the measurements given above.

ADJ. VALVE GUIDE DRIVER
07743-0020000



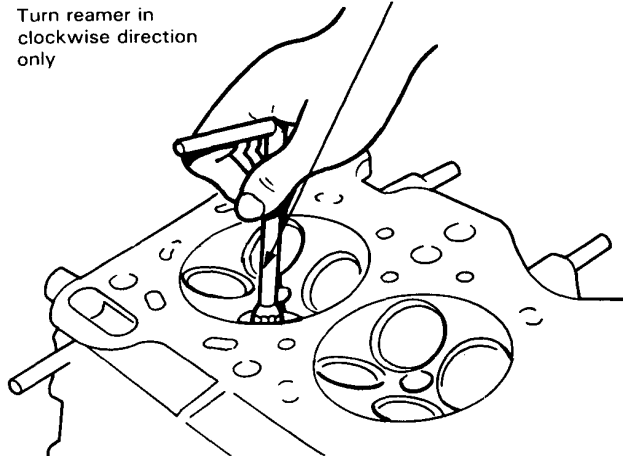
Reaming

NOTE: For new valve guides only.

1. Coat reamer and valve guide with cutting oil.
2. Rotate reamer clockwise the full length of the valve guide bore.

VALVE GUIDE REAMER, 6.6 mm
07984-6570100

Turn reamer in
clockwise direction
only



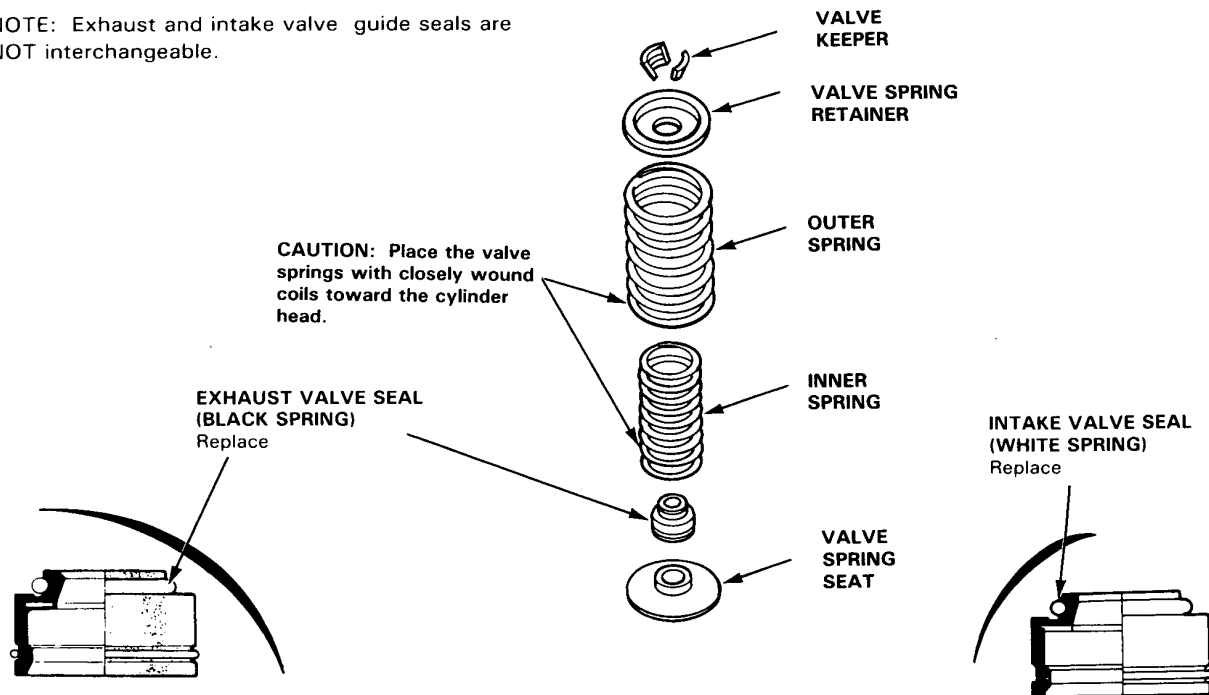
3. Continue to rotate reamer clockwise while removing.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check clearance with valve (page 6-9).



Valve Springs, Valves

Valve Spring Installation Sequence

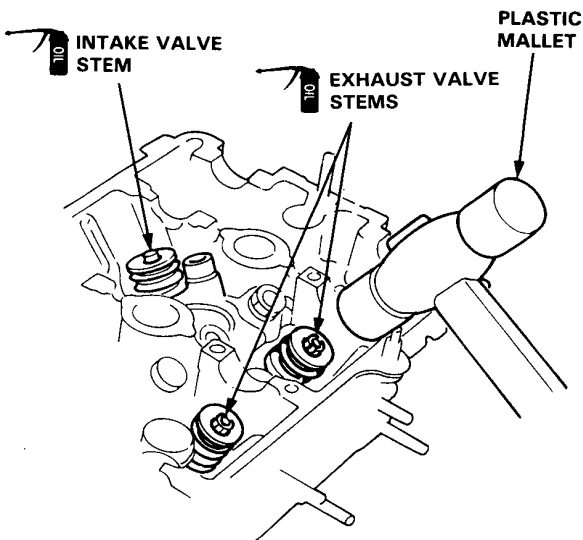
NOTE: Exhaust and intake valve guide seals are NOT interchangeable.



Valve Installation

When installing valves in cylinder head, coat valve stems with oil before inserting into valve guides, and make sure valves move up and down smoothly.

When valves and springs are in place, lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of valve and valve keepers.

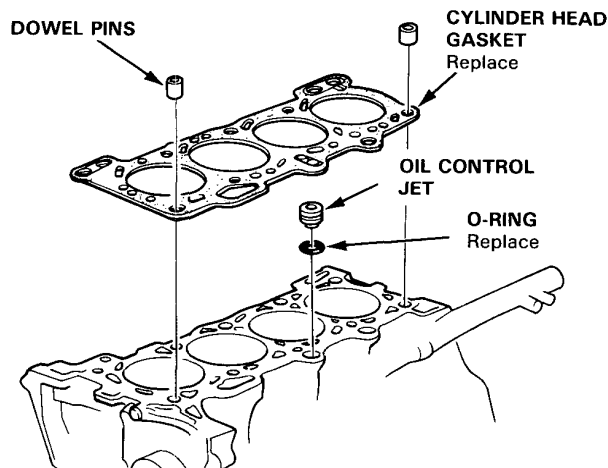


Cylinder Head

Installation

1. Install the cylinder head in the reverse order of removal:
 - Always use a new head gasket.
 - Cylinder head and engine block surface must be clean.
 - "UP" mark on timing belt pulley should be at the top.

2. Cylinder head dowel pins and oil control jet must be aligned.

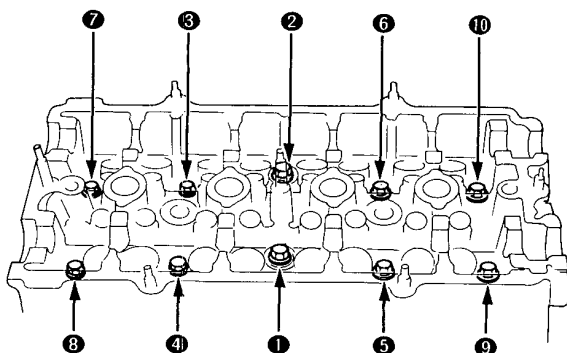


3. Tighten cylinder head bolts in two steps. In the first step tighten all bolts and nuts, in sequence, to about 30 N·m (3.0 kg-m, 22 lb-ft); in the final step tighten, in same sequence, to 68 N·m (6.8 kg-m, 49 lb-ft).

NOTE:

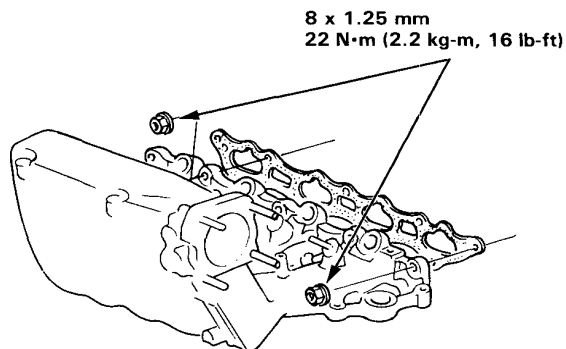
- Apply engine oil to the cylinder head bolts and the washer.
- Use the longer bolts at the position No. 1 and No. 2 as shown.

CYLINDER HEAD TORQUE SEQUENCE

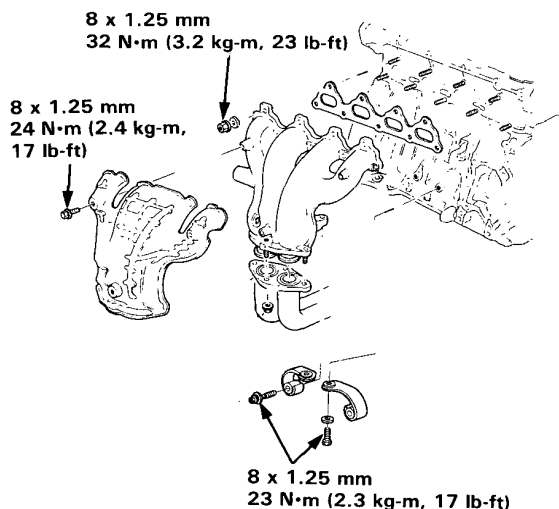


CYLINDER HEAD BOLT
10 x 1.25 mm
68 N·m (6.8 kg-m, 49 lb-ft)

4. Install the intake and exhaust manifolds and tighten the nuts in a criss-cross pattern in 2 or 3 steps, beginning with the inner nuts.



5. Install the exhaust manifold and bracket.



Camshafts/Rocker Arms and Camshaft Seals/Pulleys

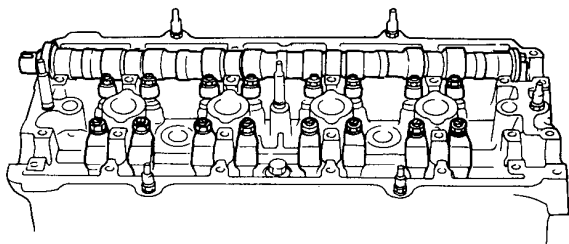


Installation

CAUTION:

- Make sure that the keyway on the camshafts is facing UP (No. 1 cylinder TDC).
- Valve locknuts should be loosened and adjusting screws backed off before installation.
- In case of reassembling, place the rocker arms at same position.

1. Place the rocker arms on the pivot bolts and the valve stems.

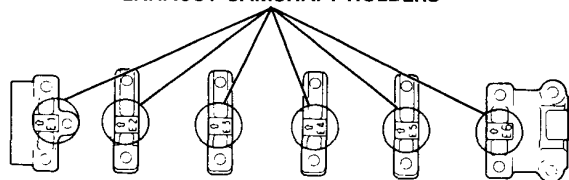


2. Install the camshafts and the camshaft seals with the open side (spring) facing in.

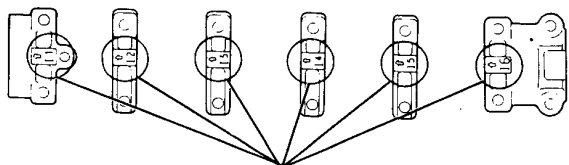
NOTE:

- "I" or "E" marks are stamped on the each camshaft holders. Install correct one.
- Do not apply oil to the holder mating surface of camshaft seal.

EXHAUST CAMSHAFT HOLDERS



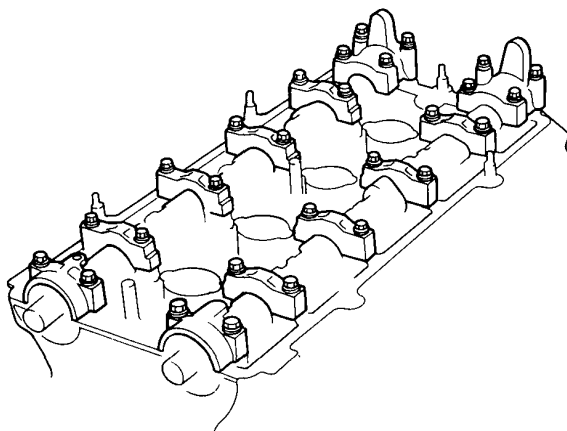
INTAKE CAMSHAFT HOLDERS



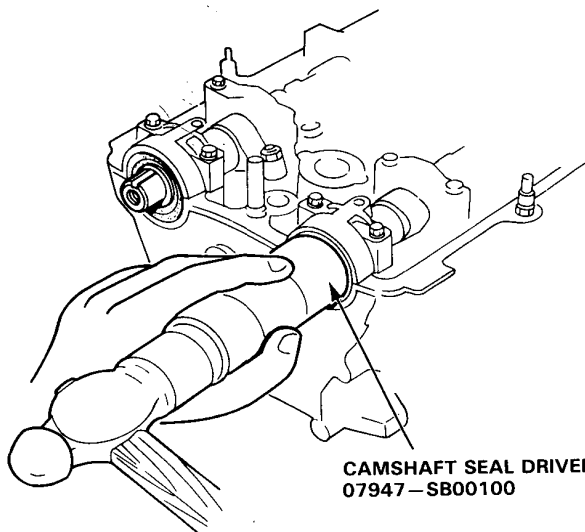
3. Apply liquid gaskets to the head mating surface of the No. 1 and No. 6 camshaft holders and place them on top of the cylinder along with the No. 2, 3, 4 and 5.

4. Tighten the camshaft holders temporarily.

NOTE: Make sure that the rocker arms contact correctly with the valve stems.



5. Drive in the camshaft seal securely with the special tools.

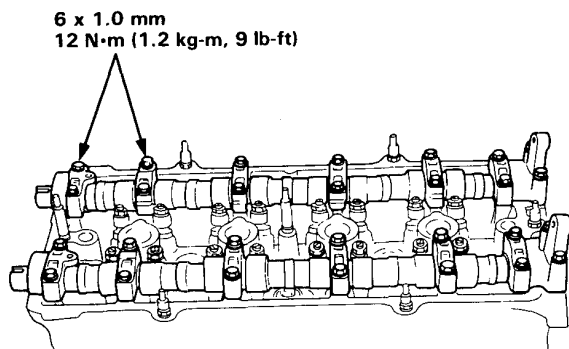


(cont'd)

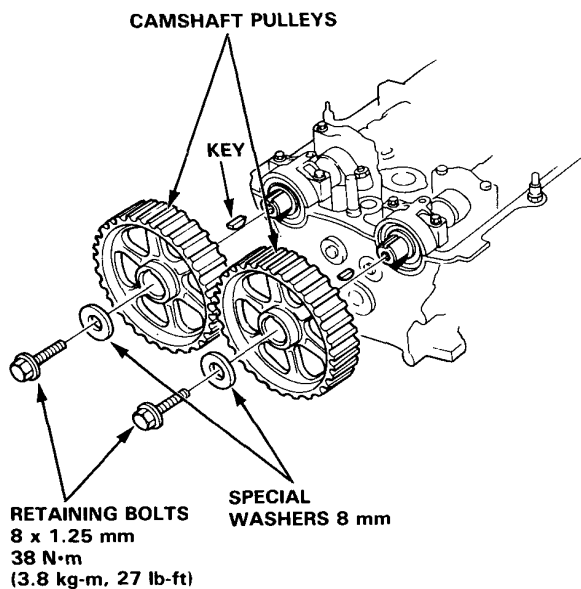
Camshafts/Rocker Arms and Camshaft Seals/Pulleys

Installation (cont'd)

6. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.



7. Install key into groove in camshafts.



8. Push camshaft pulleys onto camshafts, then tighten retaining bolts to torque shown.
9. Adjust the valve timing (page 6-16).
10. After the installation, check that the all tubes, hoses and connectors are installed correctly.

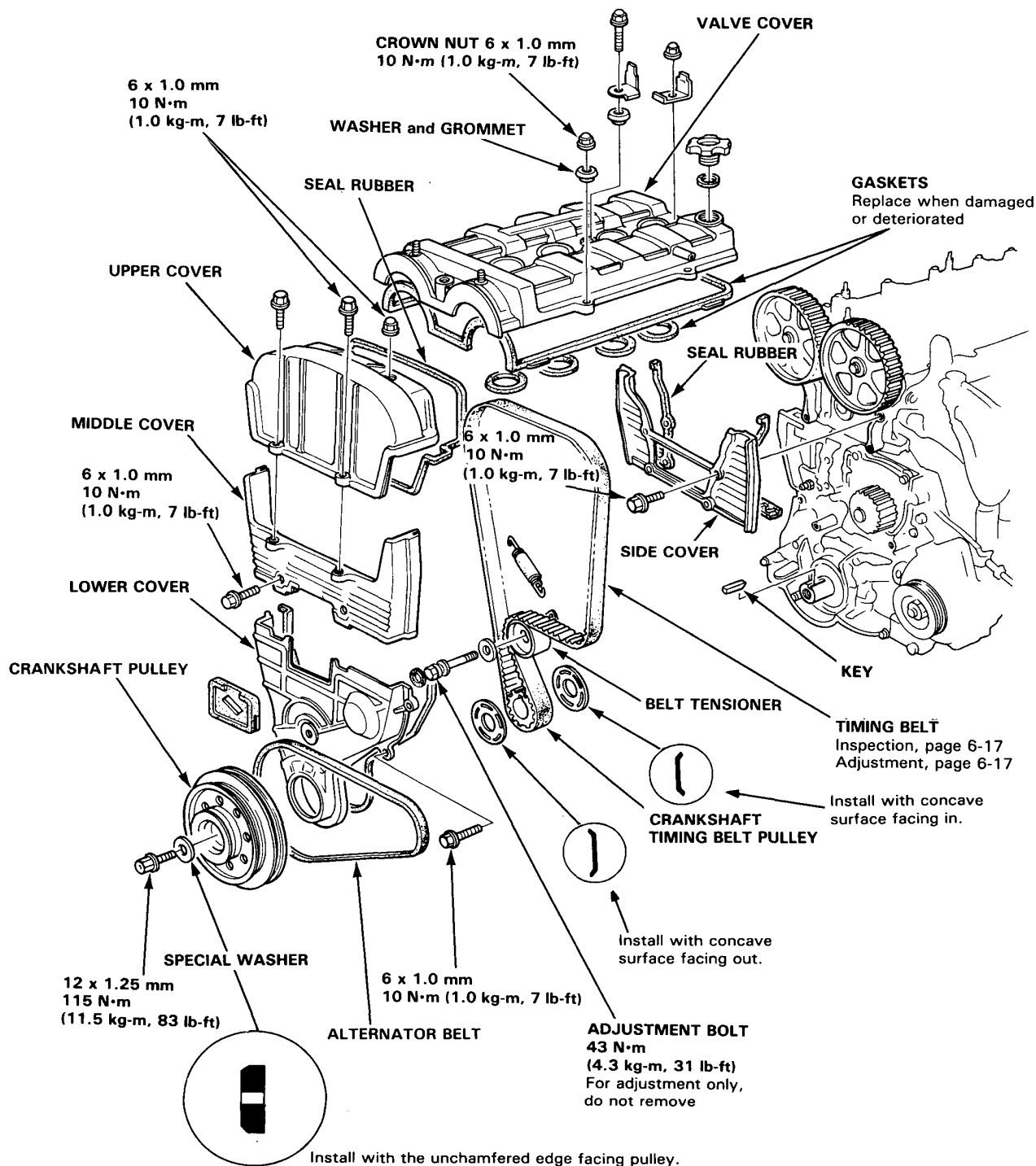
Timing Belt



Replacement

NOTE:

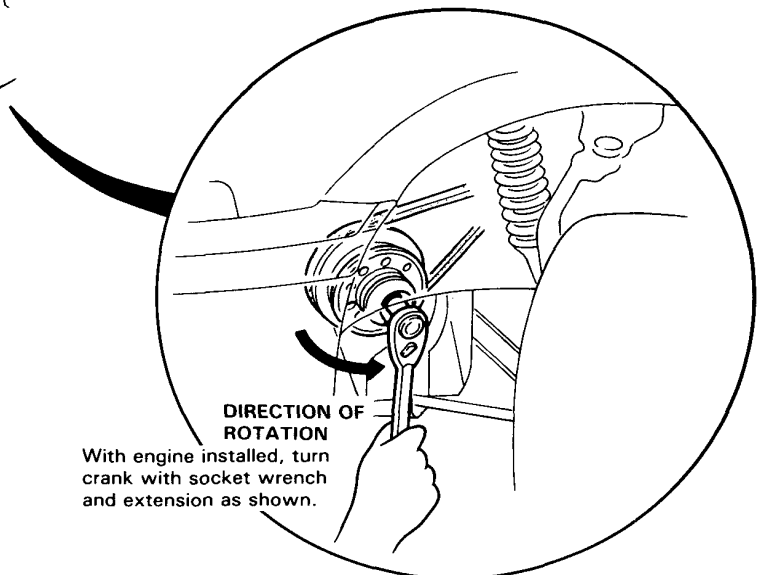
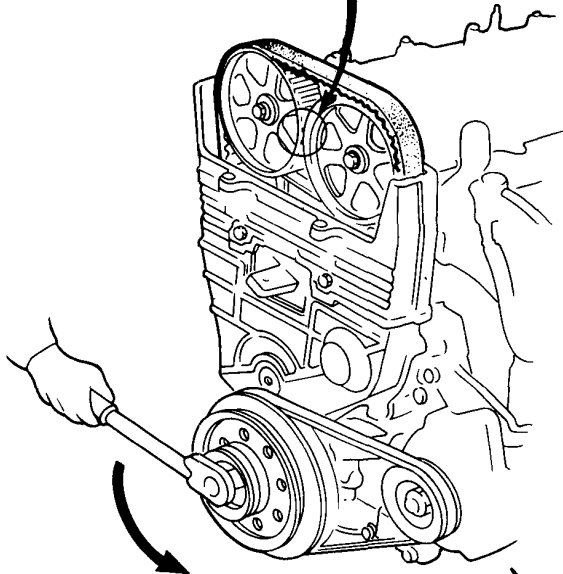
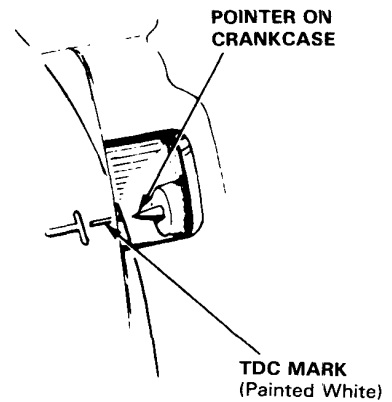
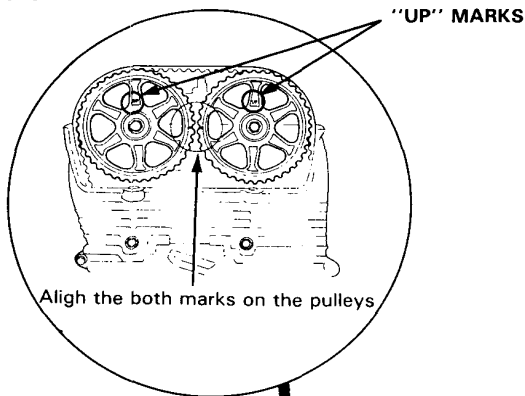
- Refer to next page for positioning crank and pulley before installing belt.
- Mark direction of rotation before removing.



Timing Belt

Positioning Crankshaft Before Installing Timing Belt

NOTE: Install the timing belt with the No. 1 piston at TDC (Top Dead Center) of the compression stroke.



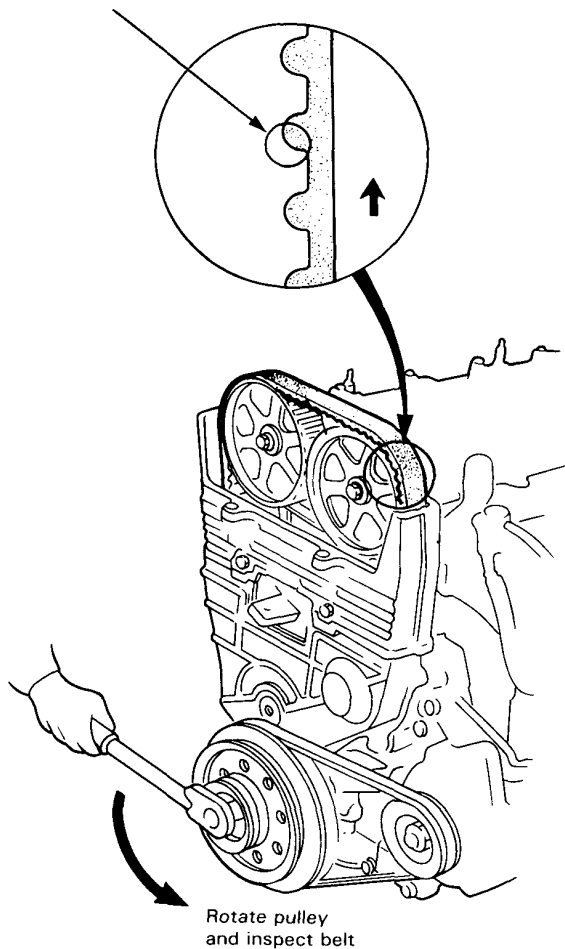


Inspection

NOTE:

- Replace belt if oil soaked.
- Remove any oil or solvent that gets on the belt.

Inspect this area for wear.



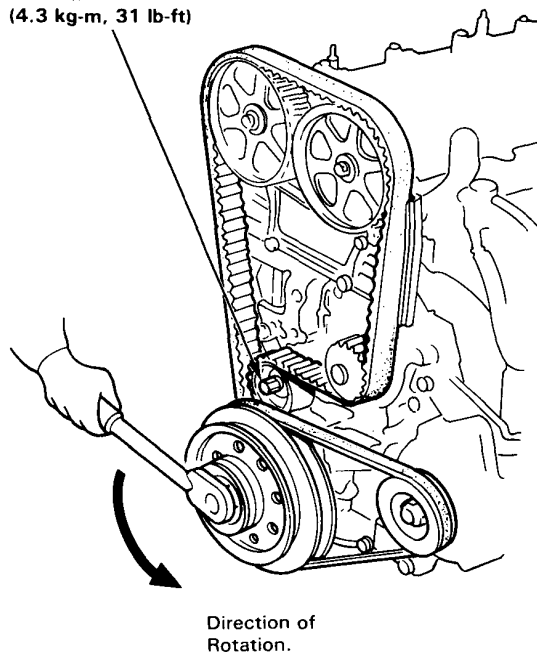
Tension Adjustment

CAUTION: Always adjust timing belt tension with the engine cold.

NOTE: Tensioner is spring-loaded to apply proper tension to the belt automatically after making the following adjustment:

1. Set the No. 1 piston at TDC.
2. Loosen adjusting bolt.

ADJUSTING BOLT
43 N·m
(4.3 kg-m, 31 lb-ft)



3. Rotate crankshaft counterclockwise 3-teeth on camshaft pulley to create tension on timing belt.
4. Tighten adjusting bolt.
5. If pulley bolt broke loose while turning crank, re-torque it to 115 N·m (11.5 kg-m, 83 lb-ft).

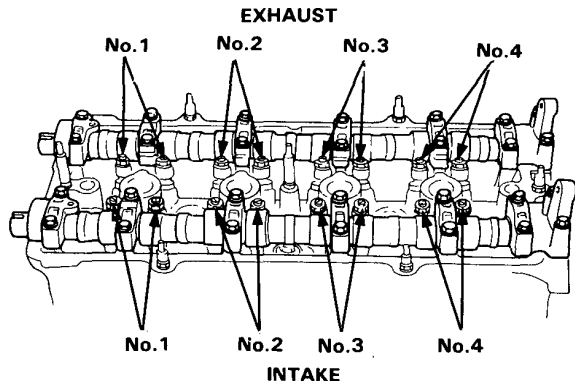
NOTE: Put transmission in gear and set parking brake before retorquing pulley bolt.

Valve

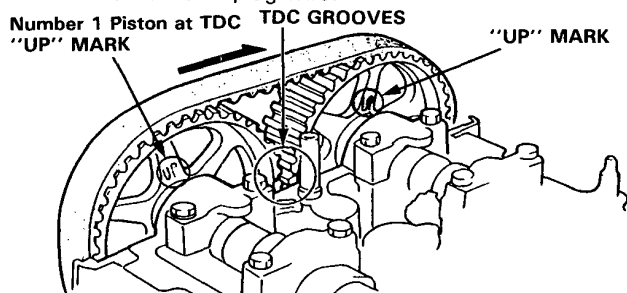
Adjustment

NOTE: Valves should be adjusted cold when the cylinder head temperature is less than 38°C (100°F). Adjustment is the same for intake and exhaust valves.

1. Remove the valve cover.

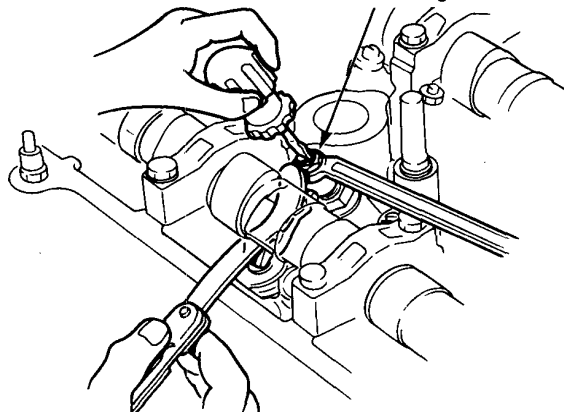


2. Set the No. 1 piston at TDC. "UP" marks in the pulleys should be at top, and the TDC grooves on back side of pulley should align with cylinder head surface. The distributor rotor must be pointing towards No. 1 plug wire.



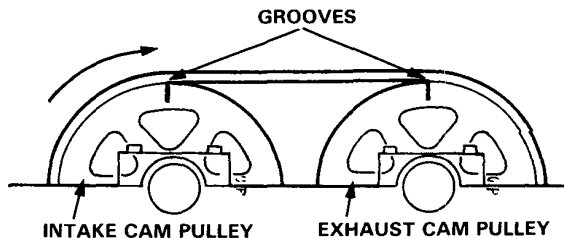
3. Adjust valves on No. 1 cylinder.
Intake: 0.08–0.12 mm (0.003–0.005 in.)
Exhaust: 0.16–0.20 mm (0.006–0.008 in.)
4. Loosen locknut and turn adjustment screw until feeler gauge slides back and forth with slight amount of drag.

LOCKNUTS 7 x 0.75 mm
25 N·m (2.5 kg-m, 18 lb-ft)



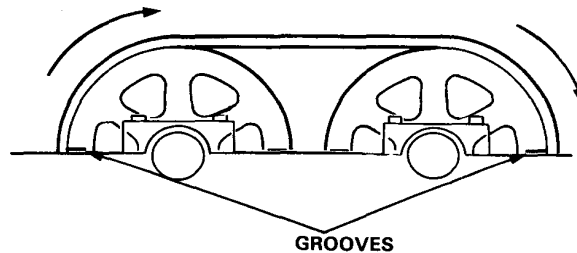
5. Tighten locknut and check clearance again. Repeat adjustment if necessary.
6. Rotate crankshaft 180° counterclockwise (cam pulley turns 90°). The "UP" marks should be at exhaust side. Distributor rotor should point to No. 3 plug wire. Adjust valves on No. 3 cylinder.

Number 3 piston at TDC



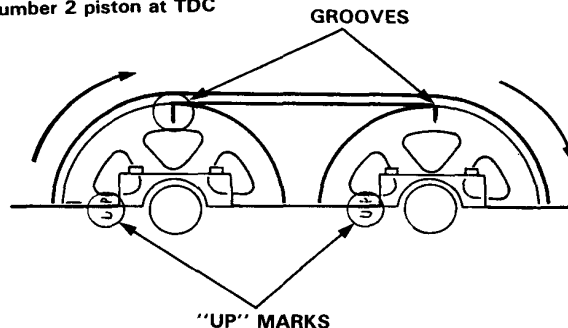
7. Rotate crankshaft 180° counterclockwise to bring No. 4 piston to TDC. Both "UP" marks should be at bottom and distributor rotor points to No. 4 plug wire. Adjust valves on No. 4 cylinder.

Number 4 piston at TDC



8. Rotate crankshaft 180° counterclockwise to bring No. 2 piston to TDC. "UP" marks should be at intake side. Distributor rotor should point to No. 2 plug wire. Adjust valves on No. 2 cylinder.

Number 2 piston at TDC



Engine Block

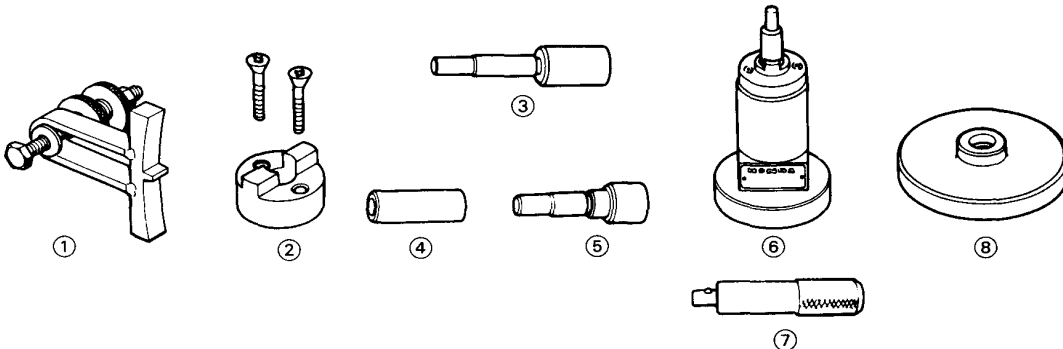
B20A2 Engine

Illustrated Index	7-2
Flywheel	7-4
Rod and Main Bearings	7-5
Crankshaft/Pistons	7-7
Pistons	7-9
Piston Pins	7-11
Piston Rings	7-14
Oil Seal	7-16
Crankshaft	7-17



Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07924—PD20002	Ring Gear Holder	1	Not included in base set. Use each with the base set.
②	07973—SB00100	Piston Base Head	1	
③	07973—SB00400	Piston Pin Base Insert	1	
④	07973—SB00200	Pilot Collar	1	
⑤	07973—PE00302	Adj. Piston Pin Driver	1	
⑥	07973—6570002	Piston Pin Insert Base Set	1	07949—6110000 may also be used.
⑦	07749—0010000	Driver	1	
⑧	07948—SB00101	Driver Attachment	1	Crankshaft Seal (Clutch Side)

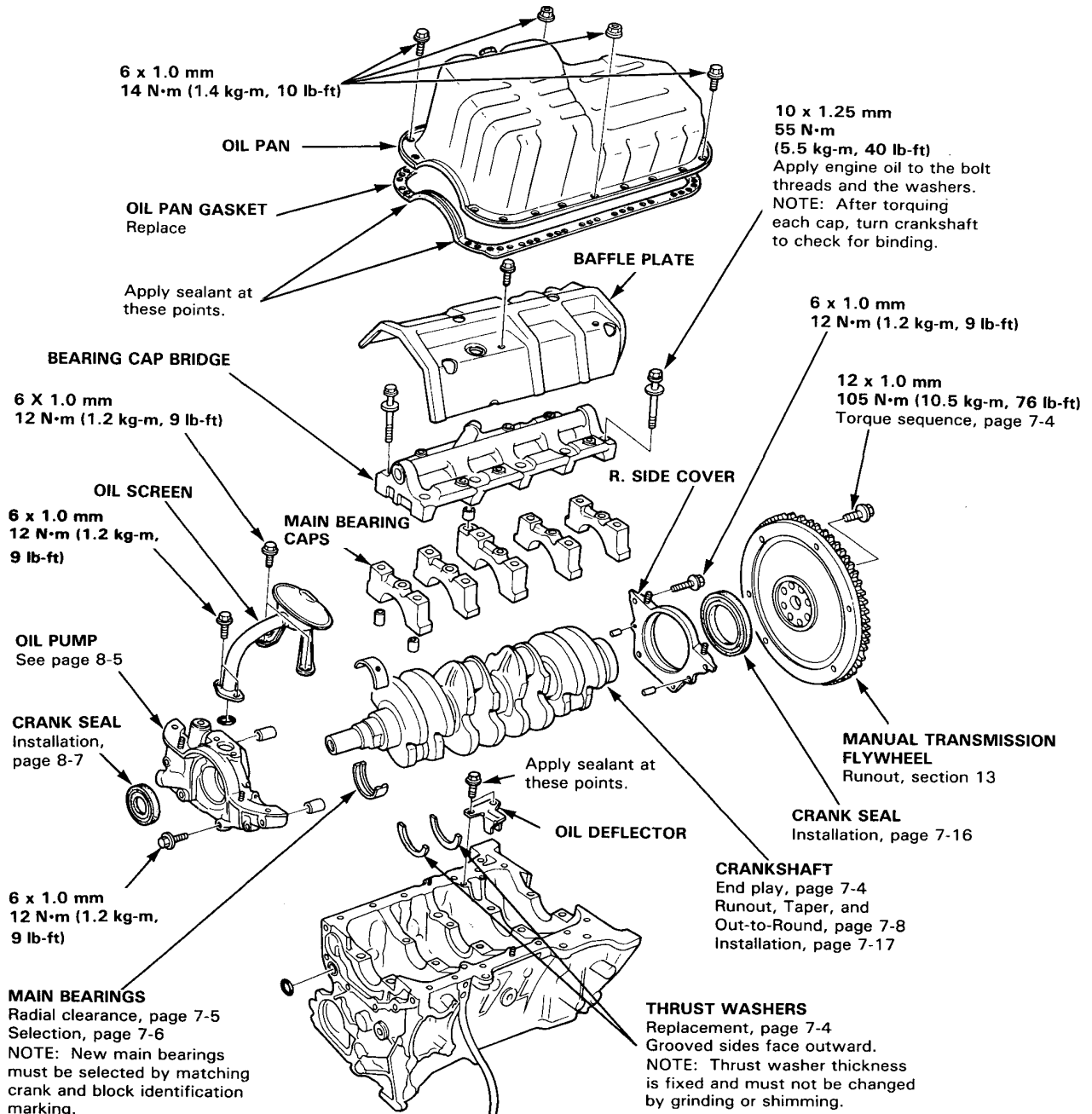


Engine Block

Illustrated Index

 Lubricate all internal parts with engine oil during reassembly.

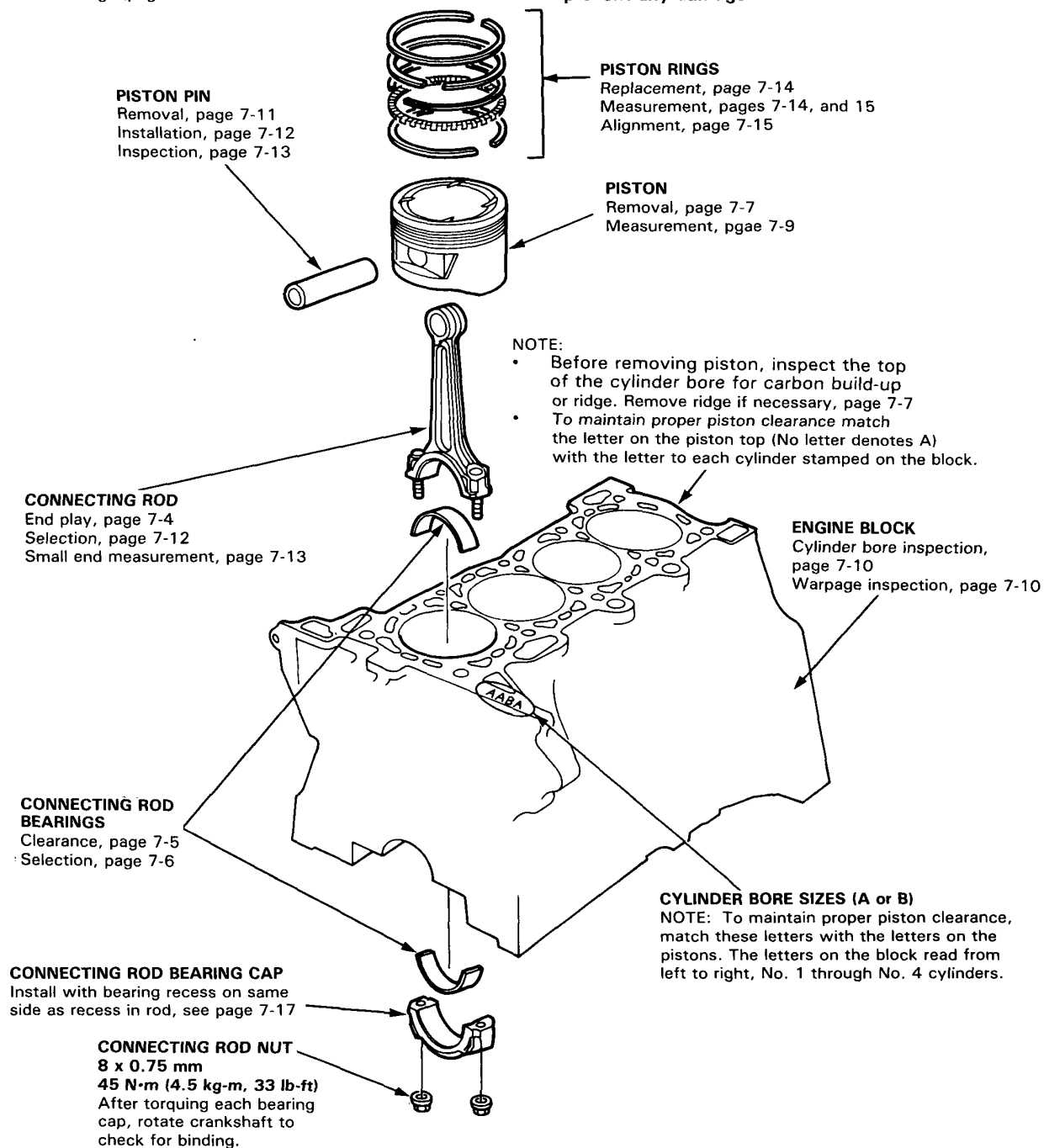
NOTE: Apply non-hardening liquid gasket to the mating surfaces of the right side cover and oil pump case, before installing them.





NOTE: New rod bearings must be selected by matching connecting rod and crankshaft identification markings (page 7-6).

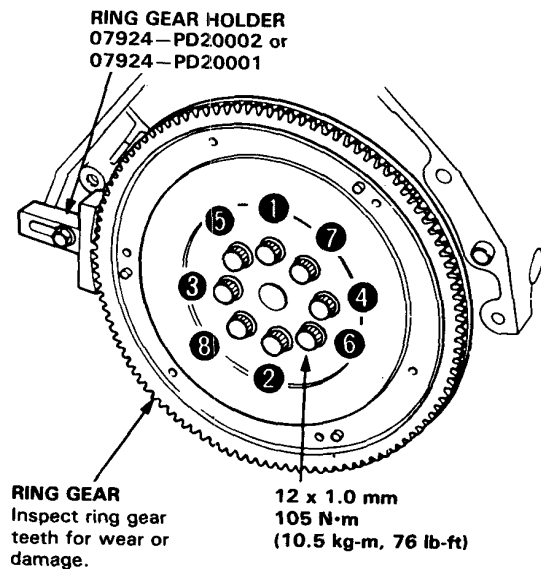
CAUTION: The piston skirts is coated with molybdenum: handle the piston carefully to prevent any damage.



Engine Block

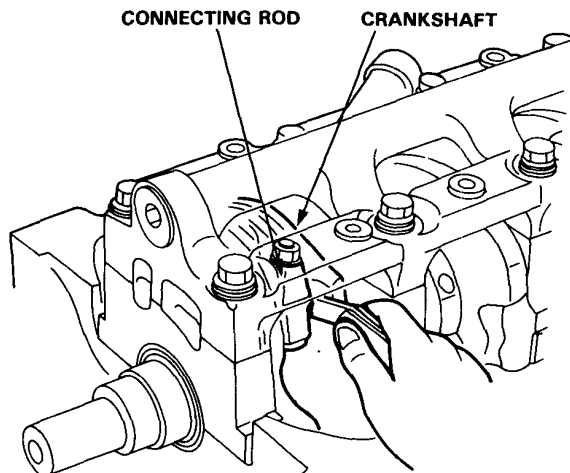
Flywheel Replacement (Manual Transmission)

Remove the eight flywheel bolts, then separate the flywheel from the crankshaft flange. After installation, tighten the bolts in the sequence shown.



Connecting Rods End Play

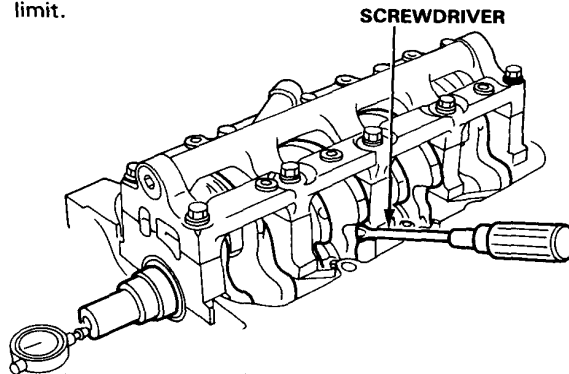
Standard (New): 0.15—0.30 mm
(0.006—0.012 in.)
Service Limit: 0.40 mm (0.016 in.)



- If out-of tolerance, install new connecting rod.
- If still out-of-tolerance, replace crankshaft (page 7-7 and 7-17).

Crankshaft End Play

Push crank firmly away from dial indicator, and zero dial against end of crank. Then pull crank firmly back toward indicator; dial reading should not exceed service limit.



Standard (New): 0.1—0.35 mm
(0.004—0.014 in.)
Service Limit: 0.45 mm (0.018 in.)

- If end play is excessive, inspect thrust washers and thrust surface on crankshaft. Replace parts as necessary.

NOTE: Thrust washer thickness is fixed and must not be changed either by grinding or shimming. Thrust washers are installed with grooved sides outward.

Main Bearings

Clearance

1. To check main bearing clearance, remove the main caps and bearing halves.
2. Clean each main journal and bearing half with a clean shop rag.
3. Place one strip of plastigage across each main journal.

NOTE: If the engine is still in the car when you bolt the main cap down to check clearance, the weight of the crank and flywheel will flatten the plastigage further than just the torque on the cap bolts, and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights and check only one bearing at a time.

4. Reinstall the bearings and caps, then torque the bolts to 55 N·m (5.5 kg-m, 40 lb-ft).
5. Remove the caps and bearings again, and measure the widest part of the plastigage.

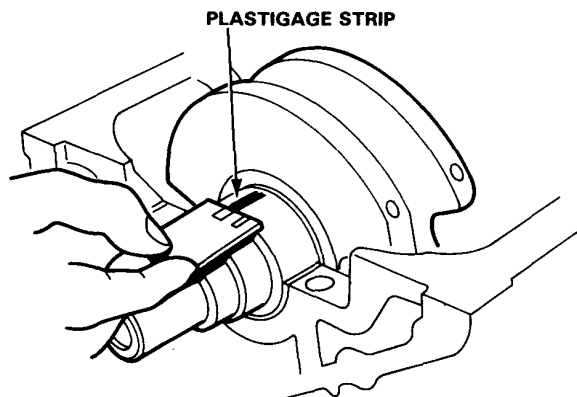
Main Bearing Clearance:

Standard (New):

No. 1, 2, 4 and 5 Journals 0.024–0.042 mm
(0.0010–0.0017 in.)

No. 3 Journal 0.030–0.048 mm
(0.0012–0.0019 in.)

Service Limit: 0.05 mm (0.002 in.)



6. If the plastigage measures too wide or too narrow, (remove the engine if it's still in the car), remove the crank, remove the upper half of the bearing, then install a new, complete bearing with the same color code (select the color as shown on the next page), and recheck the clearance.

CAUTION: 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.
NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crank and start over.

Rod Bearings

Clearance

1. Remove the connecting rod cap and bearing half.
2. Clean the crankshaft rod journal and bearing half with a clean shop rag.

3. Place plastigage across the rod journal.

4. Reinstall the bearing half and cap, and torque the nuts to 45 N·m (4.5 kg-m, 33 lb-ft).

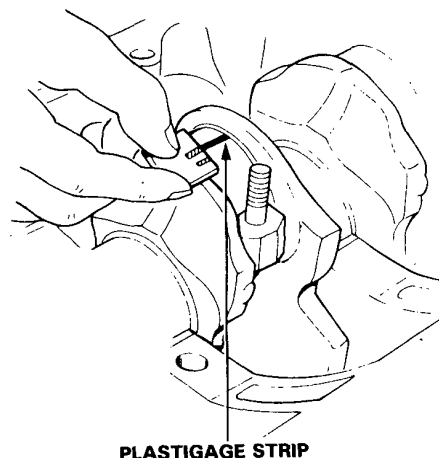
NOTE: Do not rotate the crank during inspection.

5. Remove the rod cap and bearing half and measure the widest part of the plastigage.

Connecting Rod Bearing Clearance:

Standard (New): 0.026–0.044 mm
(0.0010–0.0017 in.)

Service Limit: 0.05 mm (0.002 in.)



6. 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 (select color as shown on next page), and recheck the clearance.

CAUTION: Do not file, shim, or scrape the bearing 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 clearance again.

NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crank and start over.

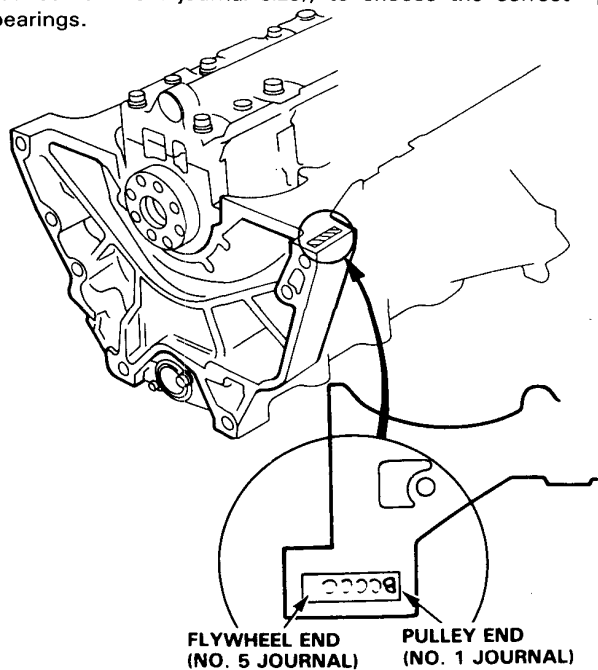


Main Bearings

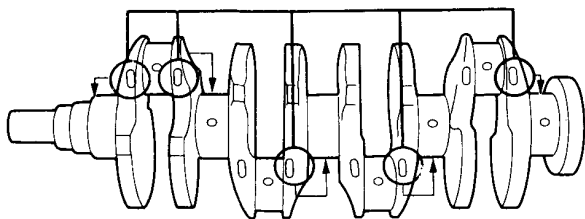
Selection

Crank Bore Code Location (Letters)

Letters have been stamped on the end of the block as a code for the size of each of the 5 main journal bores. Use them, and the numbers stamped on the crank (codes for main journal size), to choose the correct bearings.



Main Journal Code Locations (Numbers)



Bearing Identification

Color code is on the edge of the bearing

→ Larger crank bore			
A or I	B or II	C or III	D or IIII
→ Smaller bearing (thicker)			

Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

1 or I
2 or II
3 or III
4 or IIII

Smaller main journal
Smaller bearing (thicker)

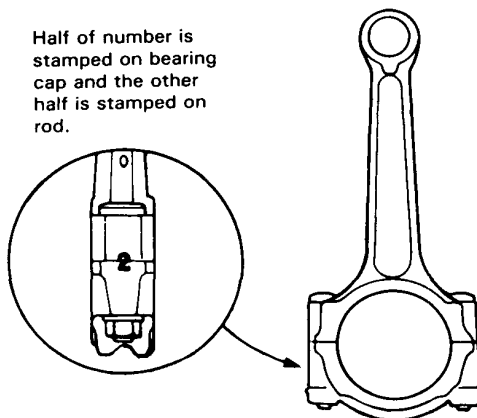
Rod Bearings

Selection

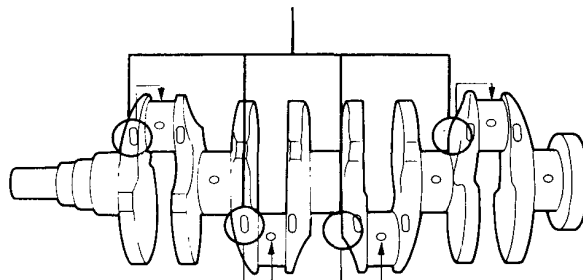
Rod Code Location (Numbers)

Numbers have been stamped on the side of each connecting rod as a code for the size of the big end. Use them, and the letters stamped on the crank (codes for rod journal size), to choose the correct bearings.

Half of number is stamped on bearing cap and the other half is stamped on rod.



Rod Journal Code Locations (Letters)



Bearing Identification

Color code is on the edge of the bearing

→ Larger big end bore			
1 or I	2 or II	3 or III	4 or IIII
→ Smaller bearing (thicker)			

A or I
B or II
C or III
D or IIII

Smaller rod journal
Smaller bearing (thicker)

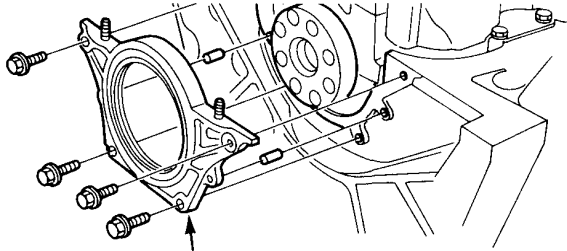
Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

Crankshaft/Pistons



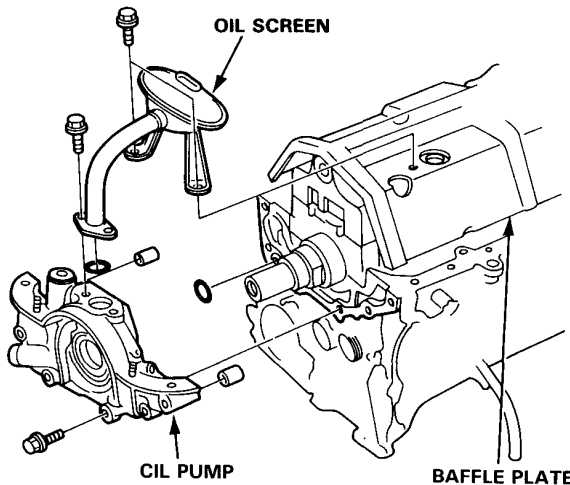
Removal

1. Remove the right side cover.



RIGHT SIDE COVER

2. Remove the oil screen.

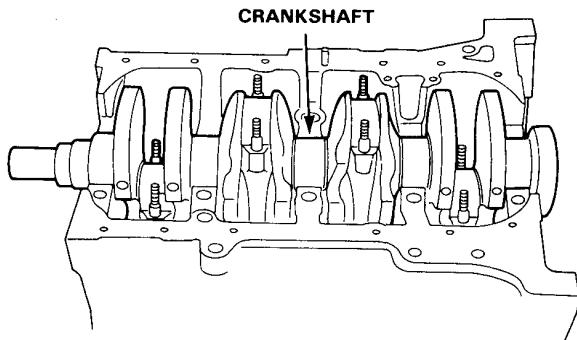


OIL SCREEN

OIL PUMP

BAFFLE PLATE

3. Remove the oil pump.
4. Remove the baffle plate.
5. Turn the crankshaft so No. 2 and 3 crankpins are at the bottom.
6. Remove the rod caps/bearings and main caps/bearings. Keep all caps/bearings in order.
7. Lift the crankshaft out of engine, being careful not to damage journals.

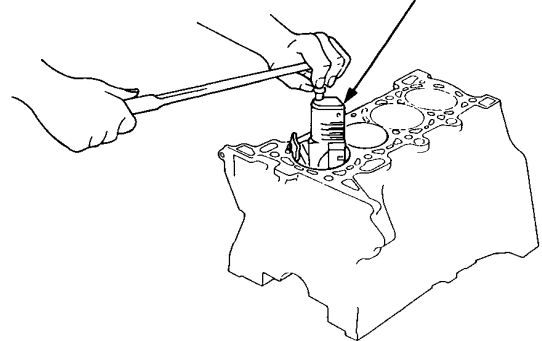


CRANKSHAFT

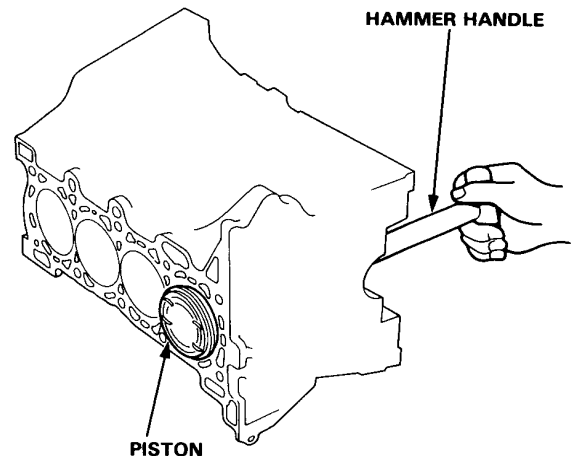
8. Remove upper bearing halves from connecting rods and set aside with their respective caps.
9. Reinstall main cap and bearings on engine in proper order.
10. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer. Follow reamer manufacturer's instructions.

CAUTION: If the ridge is not removed, it may damage the pistons as they are pushed out.

RIDGE REAMER



11. Use the wooden handle of a hammer to drive out pistons.



HAMMER HANDLE

PISTON

12. Reinstall the rod bearings and caps after removing each piston/connecting rod assembly.
13. Mark piston/connecting rod assemblies with cylinder numbers to avoid mixup on reassembly.

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

Crankshaft

Inspection

- Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
- Check the keyway and threads.

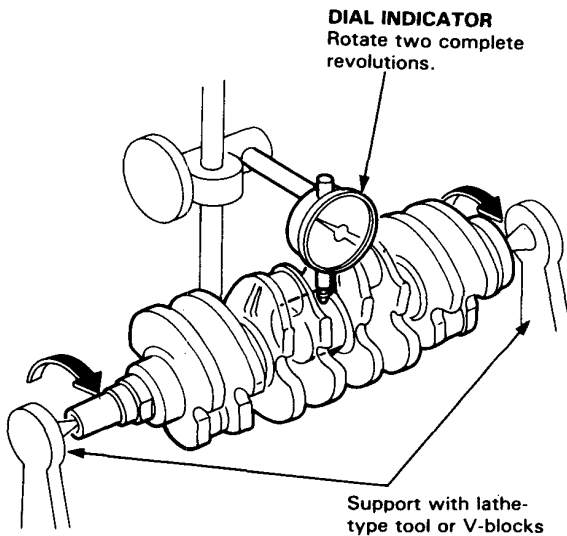
Alignment

- Measure runout on all main journals to make sure the crank is not bent.
- The difference between measurements on each journal must not be more than the service limit.

Crankshaft Total Indicate Runout:

Standard (New): 0.02 mm (0.0008 in.)

Service Limit: 0.03 mm (0.0012 in.)



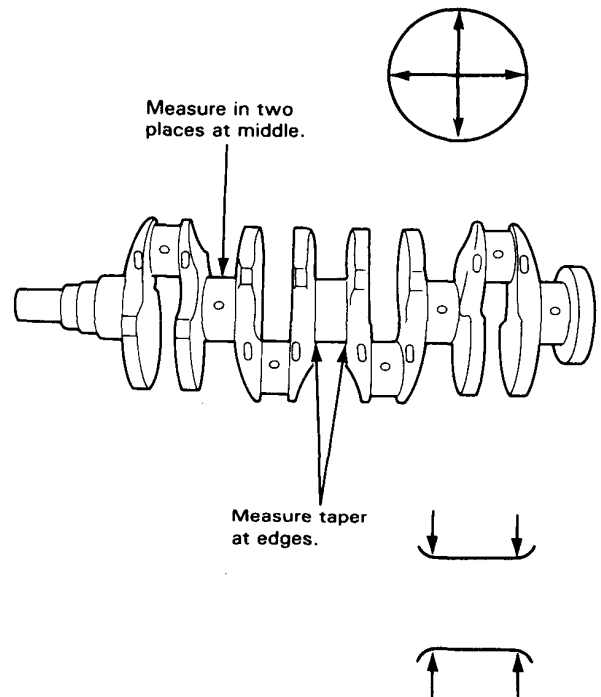
Out-of-Round and Taper

- 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.)

Service Limit: 0.010 mm (0.0004 in.)



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

Journal Taper:

Standard (New): 0.005 mm (0.0002 in.)

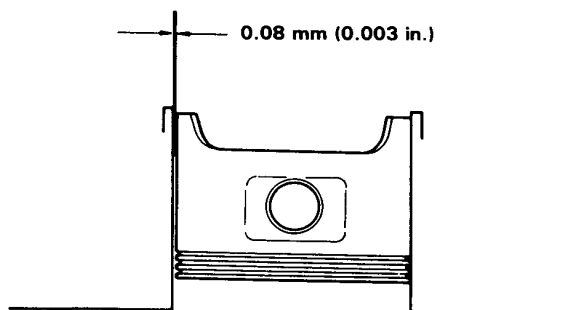
Service Limit: 0.010 mm (0.0004 in.)

Cylinder Block

Piston-to-Block Clearance

1. Make a preliminary piston-to-block clearance check with a feeler gauge:

Service Limit: 0.08 mm (0.003 in.)



If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.

To confirm the feeler gauge check, further measurement with a micrometer will be necessary.

2. Calculate difference between cylinder bore diameter on page 7-10 and piston diameter.

Piston-to-Cylinder Clearance:

Standard (New): 0.02–0.04 mm
(0.0008–0.0016 in.)

Service Limit: 0.08 mm (0.003 in.)

Pistons



Inspection

1. Check the piston for distortion or cracks.

NOTE: If cylinder is bored, an oversized piston must be used.

2. Measure piston diameter at a point 21 mm (0.83 in.) from bottom of skirt.

NOTE: There are two standard-size pistons (No letter denotes A). The letter is stamped on the top of the piston.

These letters are also stamped on the block as cylinder bore sizes.

Piston A Diameter

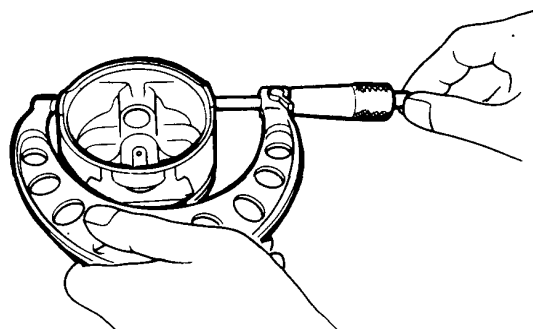
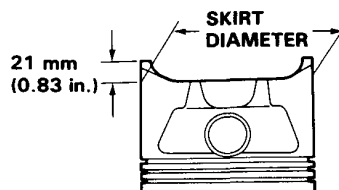
Standard (New): 80.98–80.99 mm
(3.1882–3.1886 in.)

Service Limit: 80.97 mm (3.1878 in.)

Piston B Diameter

Standard (New): 80.97–80.98 mm
(3.1878–3.1882 in.)

Service Limit: 80.96 mm (3.1874 in.)



Oversize Piston Diameter

Standard 0.25: 81.248–81.249 mm
(3.19873–3.19877 in.)

Standard 0.5: 81.498–81.499 mm
(3.20858–3.20862 in.)

3. Check the piston pin-to-piston clearance. Coat the piston pin with engine oil. It should then be possible to push the piston pin into the piston hole with thumb pressure.

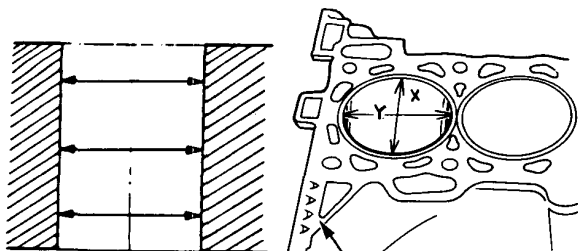
Piston Pin-to-Piston Clearance:

Service limit: 0.012–0.024 mm
(0.0005–0.0009 in.)

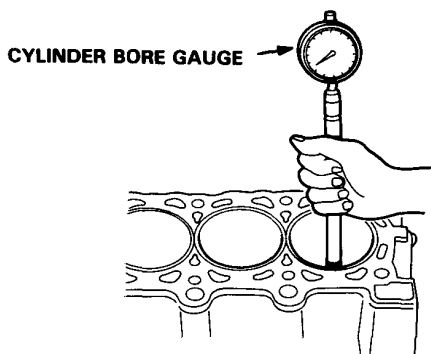
Cylinder Block

Inspection

1. Measure wear and taper in directions X and Y at three levels in each cylinder as shown.



CYLINDER BORE SIZES (A or B)
Read the letters from left-to-right for No. 1 through No. 4 cylinders.



Cylinder Bore Size A

Standard (New): 81.01–81.02 mm

(3.1894–3.1898 in.)

Service Limit: 81.05 mm (3.1909 in.)

Cylinder Bore Size B

Standard (New): 81.00–81.01

(3.1890–3.1894 in.)

Service Limit: 81.04 mm (3.1905 in.)

Oversize

Standard 0.30 (New): 83.01–83.02 mm

(3.2681–3.2685 in.)

Bore Taper

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

- If measurements in any cylinder are beyond Oversize Bore Service Limit, replace the block.
- If block is to be rebored, refer to Piston Clearance Inspection (page 7-9) after reboring.

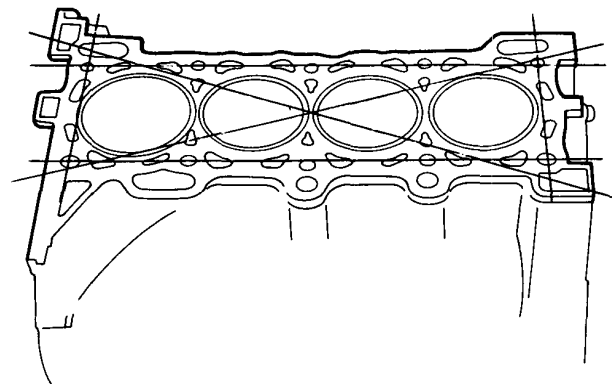
NOTE: Scored or scratched cylinder bores must be honed.

Out-of-Round

Service Limit: 0.5 mm (0.02 in.)

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

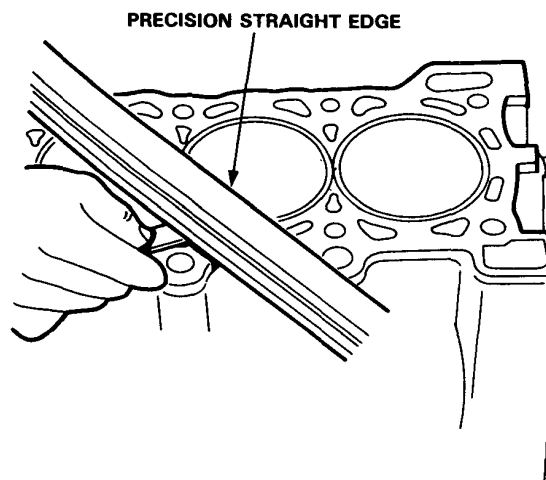
SURFACES TO BE MEASURED



Engine block Warpage:

Standard (New): 0.07 mm (0.003 in.)

Service Limit: 0.10 mm (0.004 in.)

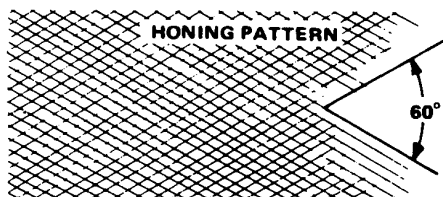




Piston Pins

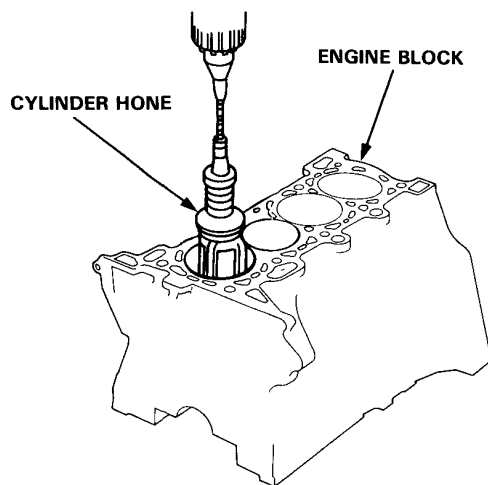
Bore Honing

1. Measure cylinder bores as shown on page 7-10. If the block is to be re-used, hone the cylinders and remeasure the bores.
2. Hone cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree cross-hatch pattern.



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 immediately to prevent rusting.
4. If Scoring or scratches are still present in cylinder bores after honing to service limit, rebore the engine block.

NOTE: 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.



Removal

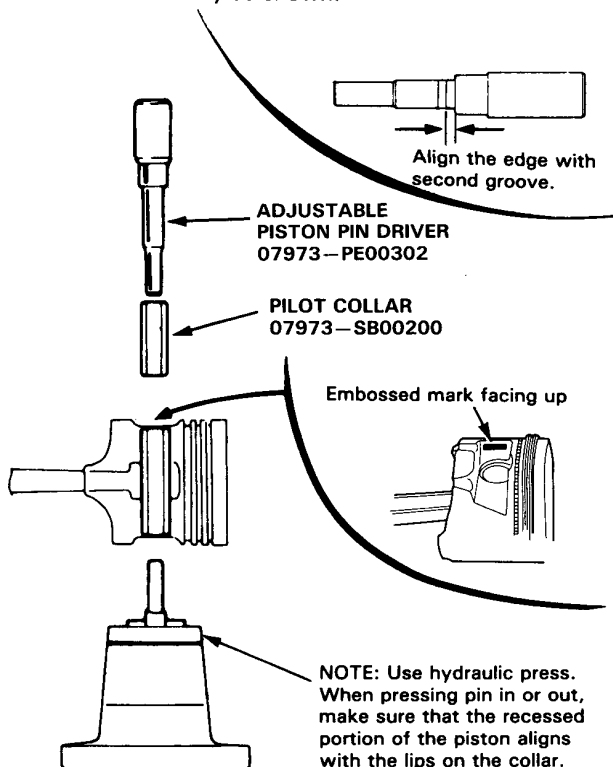
1. Install the attachment on the piston base.

PISTON BASE HEAD
07973-SB00100

PISTON PIN BASE INSERT
07973-SB00400

PISTON PIN INSERT
BASE SET
07973-6570002

2. Turn the handle of the piston pin driver so that the end of the drive aligns with the second groove of the driver body as shown.



3. Place the piston on the piston base and press the pin out with a hydraulic press.

Connecting Rods

Selection

Each rod is sorted into one of four tolerance ranges (from +0.006 to 0.024 mm, in 0.006 mm increments) depending on the size of its big end bore. It's then stamped with a number (1, 2, 3, or 4) indicating that tolerance. You may find any combination of 1, 2, 3, or 4, in any engine.

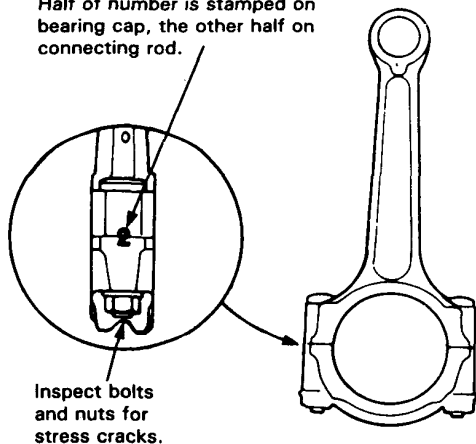
Normal Bore Size: 51 mm (2.01 in.)

NOTE:

- Reference numbers are for big end bore size and do NOT indicate the position of rod in engine.
- Inspect connecting rod for cracks and heat damage.

CONNECTING ROD BORE REFERENCE NUMBER

Half of number is stamped on bearing cap, the other half on connecting rod.



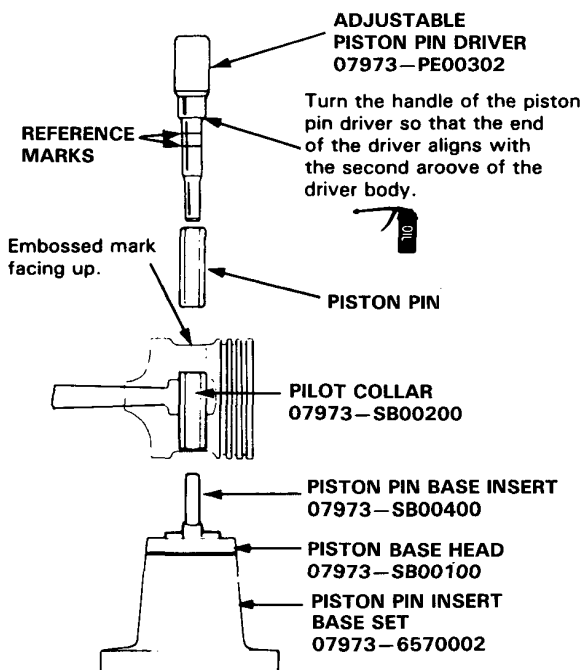
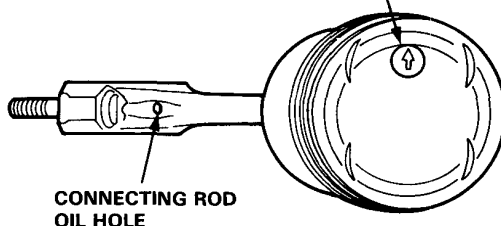
Piston Pins

Installation

1. Use a hydraulic press for installation.

- When pressing pin in or out, be sure you position the recessed flat on the piston against the lugs on the base attachment.

The arrow must face the timing belt side of the engine and the connecting rod oil hole must face the intake manifold.



NOTE: Install the assembled piston and rod with the oil hole facing the intake manifold.



Inspection

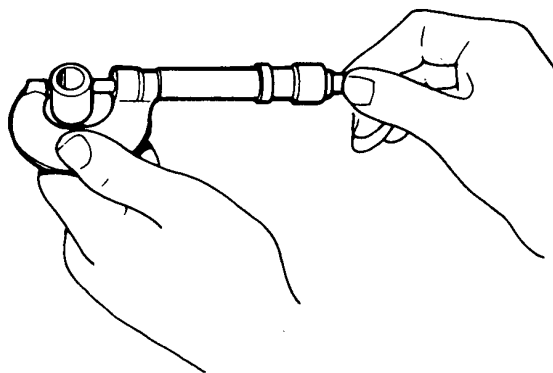
1. Measure the diameter of the piston pin.

Piston Pin Diameter:

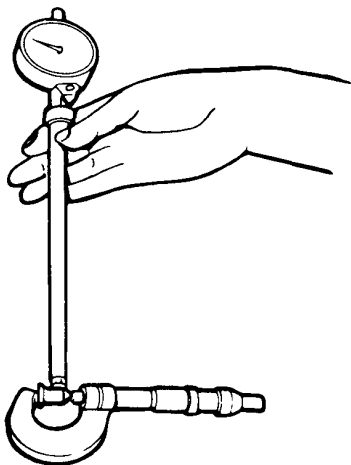
Standard (New): 19.994–20.0 mm
(0.7872–0.7874 in.)

Oversize: 19.997–20.003 mm
(0.7873–0.7875 in.)

NOTE: All replacement piston pins are oversize.



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



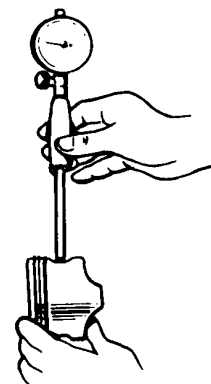
3. Measure the piston pin-to-piston clearance.

NOTE: Check the piston for distortion or cracks.

If the piston pin clearance is greater than 0.024 mm (0.0009 in.), re-measure using an oversize piston pin.

Piston Pin-to-Piston Clearance:

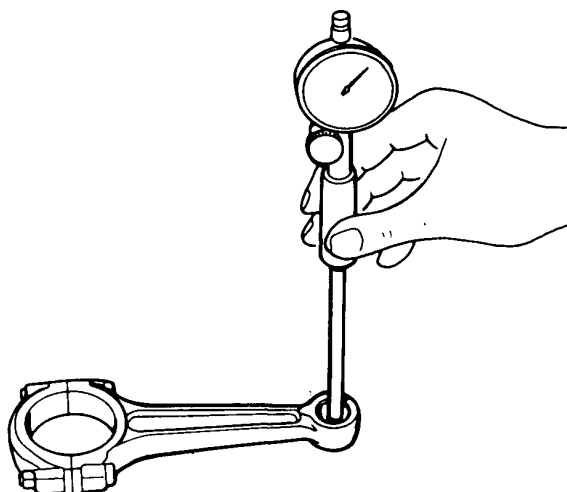
Service Limit: 0.012–0.024 mm
(0.0005–0.0009 in.)



4. Check the difference between piston pin diameter and connecting rod small end diameter.

Piston Pin-to-Connecting Rod Interference:

Standard (New): 0.013–0.032 mm
(0.0005–0.0013 in.)



Piston Rings

End Gap

1. Using a piston, push a new ring into the cylinder bore 15–20 mm (0.6–0.8 in.) from the bottom.
2. Measure the piston ring end-gap 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, re-check the cylinder bore diameter against the wear limits on page 7-10. If the bore is over limit, the engine block must be rebored.

Piston Ring End-Gap:

Top Ring

Standard (New): 0.25–0.35 mm
(0.010–0.014 in.)

Service Limit: 0.6 mm (0.02 in.)

Second Ring

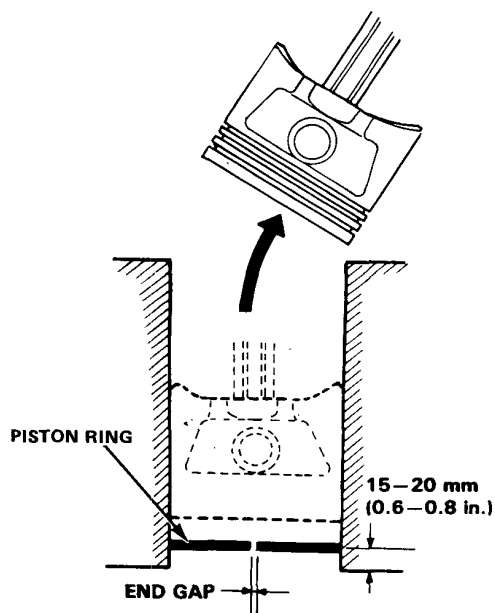
Standard (New): 0.35–0.45 mm
(0.014–0.018 in.)

Service Limit: 0.7 mm (0.03 in.)

Oil Ring

Standard (New): 0.2–0.7 mm (0.008–0.028 in.)

Service Limit: 0.8 mm (0.03 in.)



Replacement

1. Using ring expander, remove old piston rings.

2. Clean all ring grooves thoroughly.

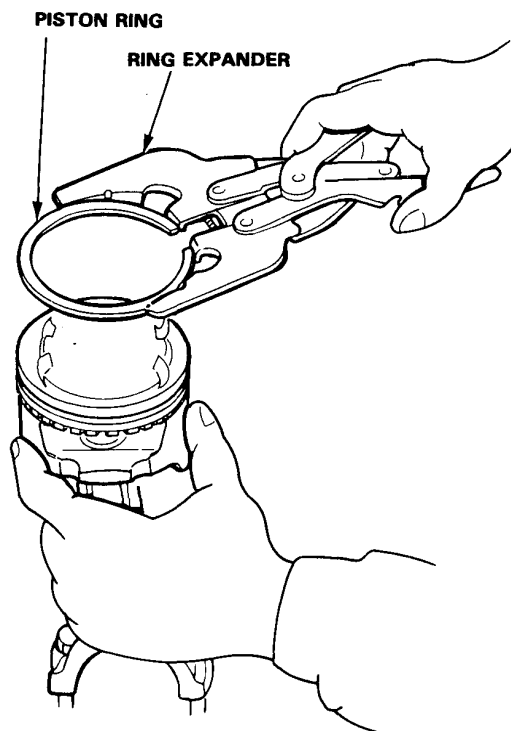
NOTE: Use squared-off broken ring, or file down blade on ring groove cleaner to fit (compression rings are 1.5 mm wide; oil ring is 4.0 mm wide).

CAUTION: Do not use a wire brush to clean ring lands, or cut ring lands deeper with cleaning tool.

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

3. Install new rings in proper sequence and position (page 7-15).

NOTE: Do not re-use old piston rings.





Land Clearances

After installing a new set of rings, measure ring-to-land clearances:

Top Ring Clearance:

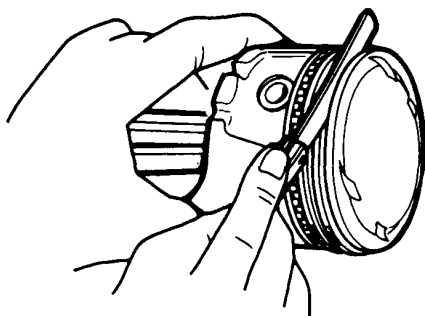
Standard (New): 0.035–0.060 mm
(0.0014–0.0024 in.)

Service Limit: 0.13 mm (0.005 in.)

Second Rings Clearance

Standard (New): 0.030–0.055 mm
(0.0012–0.0022 in.)

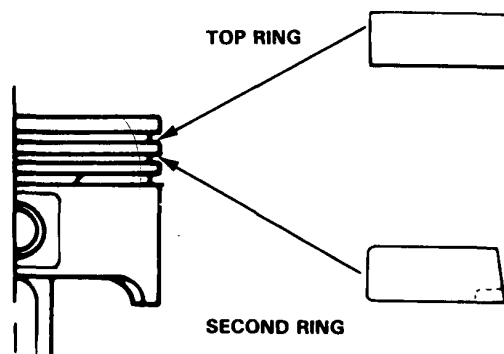
Service Limit: 0.13 mm (0.005 in.)



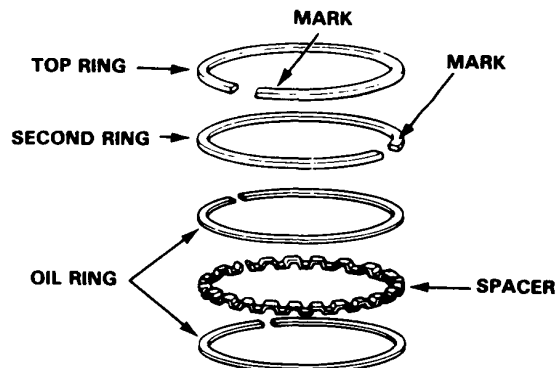
Alignment

1. Install the rings as shown on page 7-14.

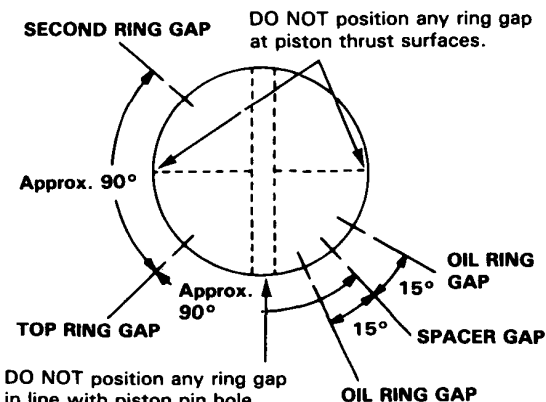
Identify top and second rings by the chamfer on the edge, and make sure they are in proper grooves on piston.



2. Rotate the rings in grooves to make sure they do not bind.
3. The manufacturing marks must be facing upward



4. Position the ring end gaps as shown:

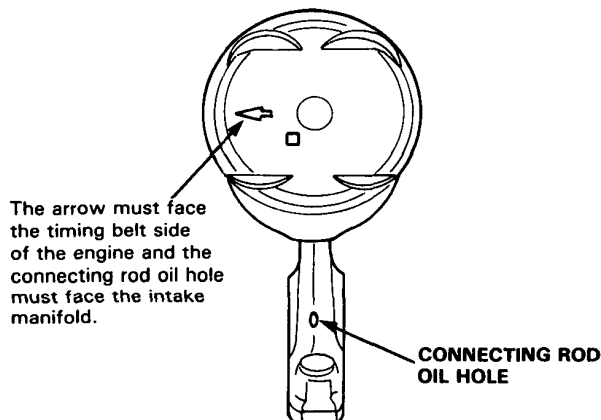


Pistons

Installation

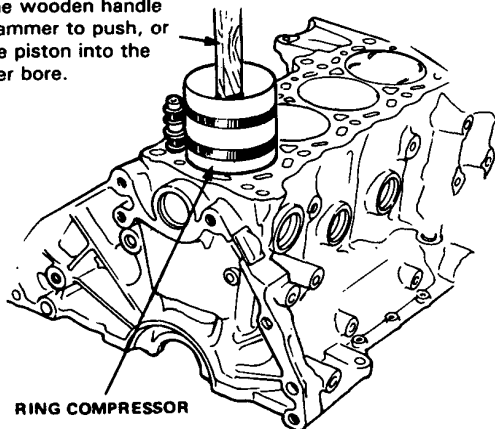
 Before installing the piston, apply a coat of engine oil to the ring grooves and cylinder bores.

1. If the crankshaft is already installed:
 - Remove the connecting rod caps, then slip short sections of rubber hose over the threaded ends of the connecting rod bolts.
 - Install the ring compressor, check that the bearing is securely in place, then position the piston in the cylinder and drive it in using the wooden handle of a hammer.Stop after the ring compressor pops free and check the connecting rod-to-crank journal alignment before driving rod into place.
 - Install the rod caps with bearings, and torque the nuts to 45 N·m (4.5 kg-m, 33 lb-ft).
2. If the crankshaft is not installed:
 - Remove the rod caps and bearings, install the ring compressor, then position the piston in the cylinder and drive it in using the wooden handle of a hammer.
 - Position all pistons at top dead center.



NOTE: Maintain downward force on ring compressor to prevent rings from expanding before entering the cylinder bore.

Use the wooden handle of a hammer to push, or tap the piston into the cylinder bore.

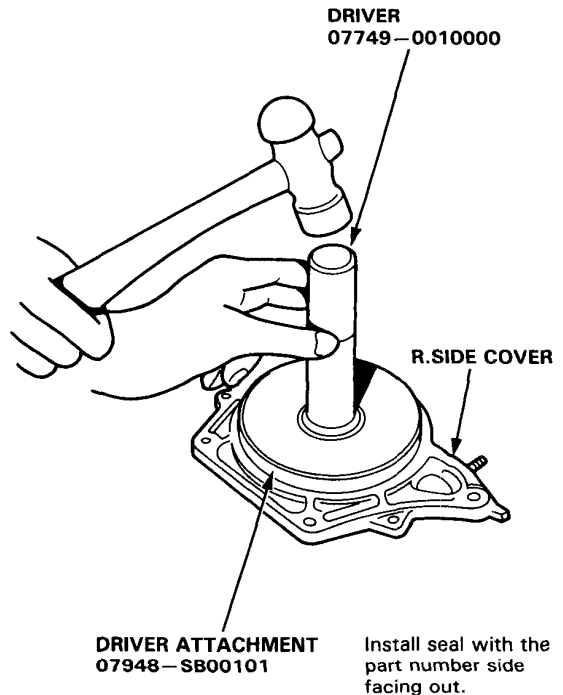


Oil Seal

Installation

 The seal surface on the block should be dry. Apply a light coat of oil to the crankshaft and to the lip of seal.

1. Drive in flywheel-end seal until to bottoms against R. side cover.



NOTE: Refer to page 8-7 for steps on the oil pump side oil seal.

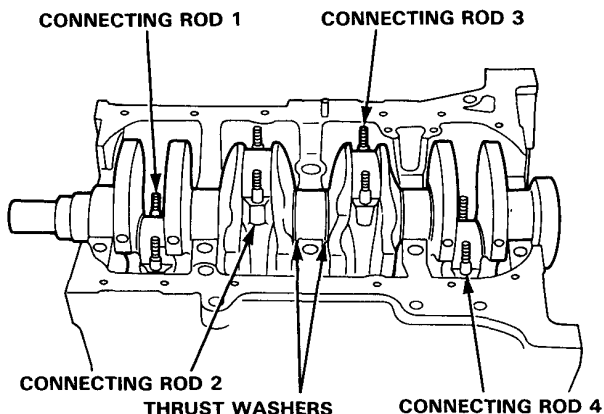
Crankshaft



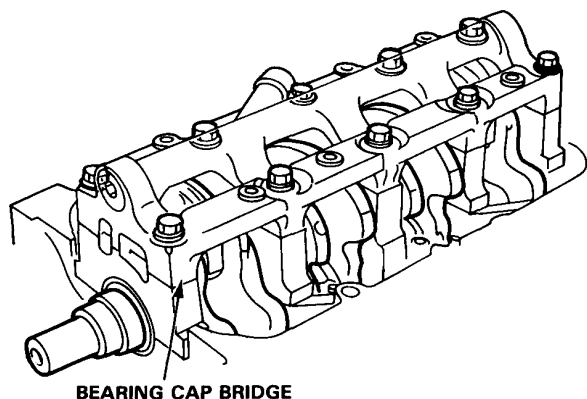
Installation

 Before installing the crankshaft, apply a coat of engine oil to the main bearings and rod bearings.

1. Insert bearing halves in the engine block and connecting rod.
2. Hold the crankshaft so rod journals for cylinder No. 2 and No.3 are straight down.
3. Lower the crankshaft into the block, seating the rod journals into connecting rods No. 2 and No. 3 and install rod caps and nuts finger tight.



4. Rotate the crankshaft clockwise, seat journals into connecting rods No. 1 and No. 4, and install the rod caps and nuts finger tight.
5. Install the thrust washers, main bearing halves caps and cap bridge, check clearance with plastigage (page 7-5), then torque the nuts to 55 N·m (5.5 kg-m, 40 lb-ft). Oil thrust washer surfaces.



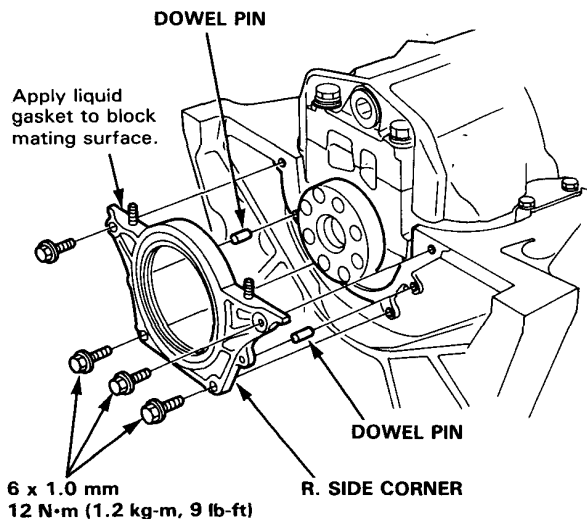
6. Check the rod bearing clearance with plastigage (page 7-5), then torque nuts to 45 N·m (4.5 kg-m, 33 lb-ft).

NOTE: Reference numbers on connecting rod are for big-end bore tolerance and do NOT indicate the position of piston in engine.

CAUTION: Whenever any crankshaft or connecting rod bearing is replaced, after reassembly run the engine at idling speed until it reaches normal operating temperature, then continue to run for approximately 15 minutes.

7. Install the baffle plate.
8. Apply non-hardening liquid gasket to the block mating surface of the right side cover and oil pump case, and install them on the engine block.

R.SIDE COVER SIDE;

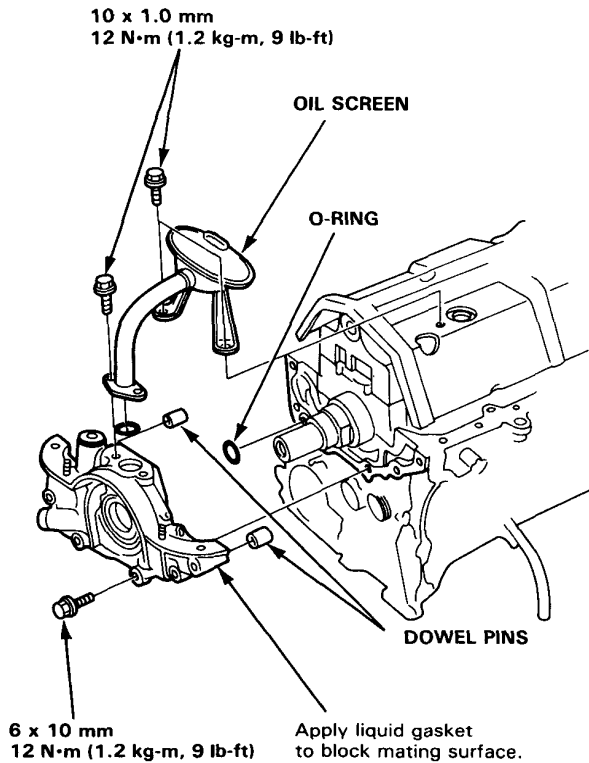


(cont'd)

Crankshaft

Installation (cont'd)

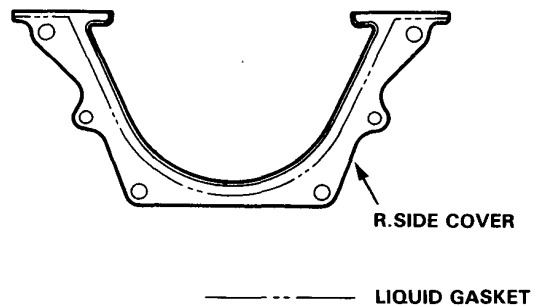
OIL PUMP SIDE:



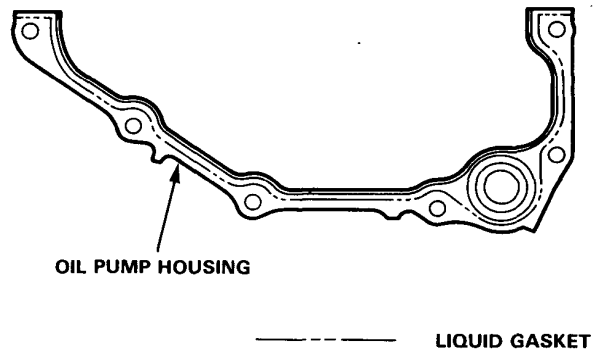
NOTE:

- Use HONDA PART NO 08740-99986 for the liquid gasket.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Apply liquid gasket by starting with an even bend, centered between edges of the mating surface.
- To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.

R.SIDE COVER SIDE:



OIL PUMP SIDE:



- Do not allow the sealant to dry before assembly.
- Wait at least 30 minutes after assembly before filling the engine with oil.

8. Install the oil screen.

9. Install the oil pan.

Engine Lubrication

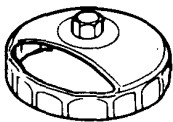
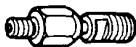
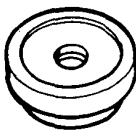
B20A2 Engine

Illustrated Index	8-2
Oil Level Inspection	8-3
Oil Replacement	8-3
Oil Filter Replacement	8-4
Oil Pressure Test	8-4
Oil Pump Illustrated Index	8-5
Oil Pump Removal/Inspection	8-6



Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07912-6110001	Oil Filter Socket Wrench	1	07949-6110000 may also be used.
②	07406-0030000	Oil Pressure Gauge Adaptor	1	
③	07746-0010400	Attachment, 52 x 55 mm	1	
④	07749-0010000	Driver	1	

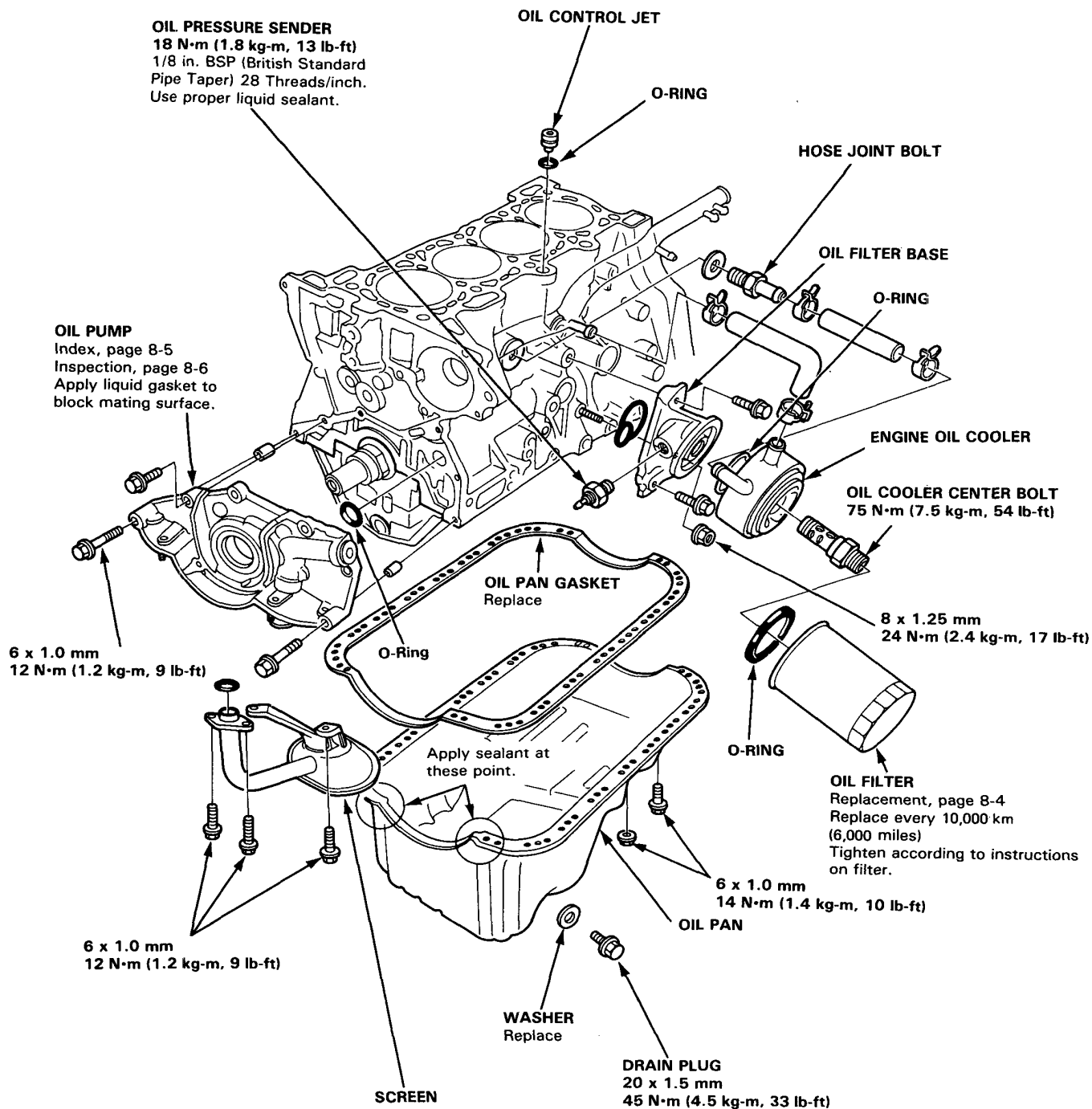
			
①	②	③	④

Engine Lubrication

Illustrated Index

NOTE:

- Use new O-rings whenever reassembling.
- Apply oil to O-rings before Installation.

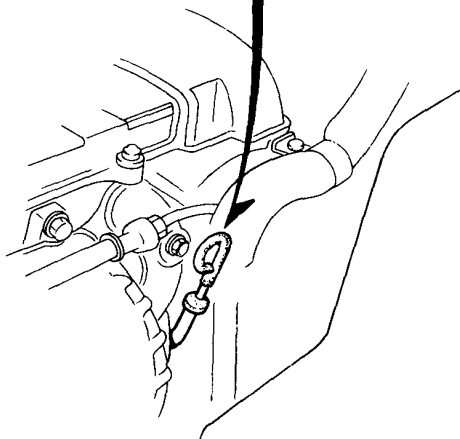
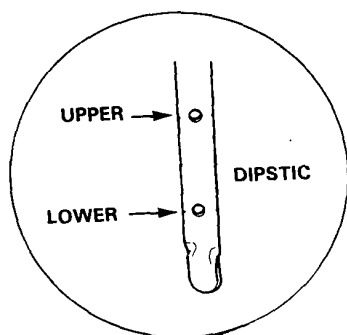


Engine Oil



Level Inspection

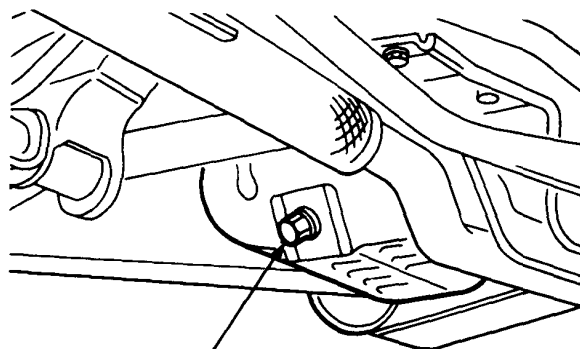
1. Check engine oil with the engine off and the car parked on level ground.
2. Make certain that the oil level indicated on the dipstick is between the upper and lower marks.
3. If the level has dropped close to the lower mark, add oil until it reaches the upper mark.



Replacement

1. Warm up the engine.
2. Drain the engine oil.

NOTE: Remove the filler cap to speed draining.



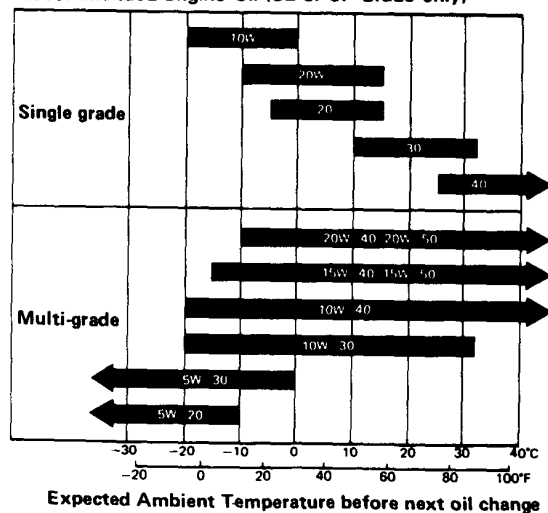
OIL PAN DRAIN PLUG
45 N·m (4.5 kg-m, 33 lb-ft)

3. Reinstall the drain plug with a new washer, and refill with the recommended oil.

Capacity	3.5 lit (3.7 US qt, 3.1 Imp. qt)
	Exclude oil filter
	4.0 lit (4.2 US qt, 3.5 Imp. qt)
	Adding replace oil filter
	5.0 lit (5.3 US qt, 4.4 Imp. qt)
	Means designed value
Change	Every 10,000 km (6,000 miles)

NOTE: Oil filter should be replaced at each oil change.

Recommended Engine Oil (SE or SF Grade only)

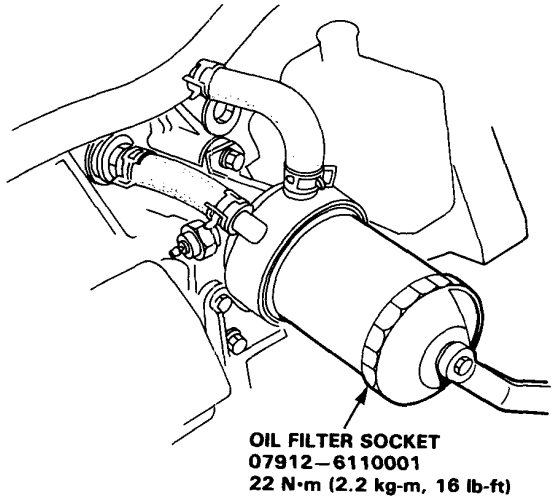


Oil Filter

Replacement

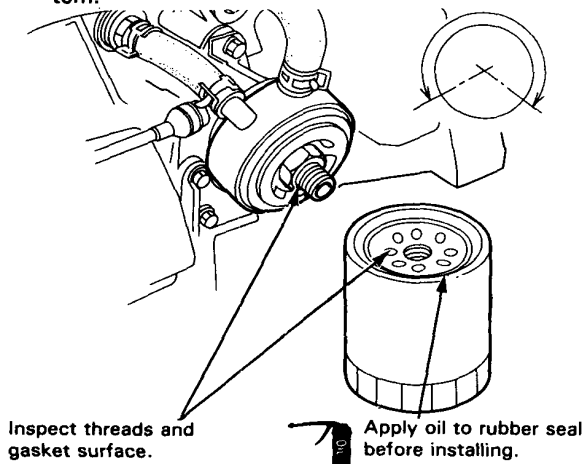
CAUTION: After the engine has been run, the exhaust pipes will be hot; be careful when working around the exhaust manifold.

1. Remove the oil filter with the special oil filter socket.



2. Inspect the threads and gasket on the new filter. Wipe off seat on engine block, then apply a light coat of oil to the gasket, and install filter. Tighten according to instructions on, or with, the filter.

NOTE: Use only filters with a built-in bypass system.



Oil Pressure

Test

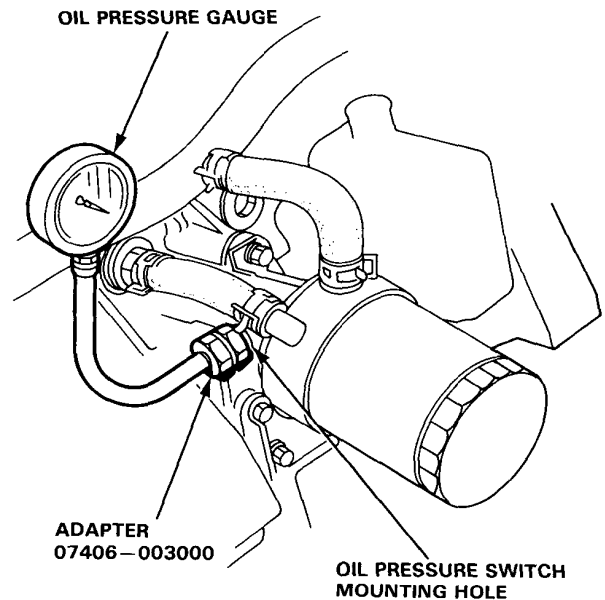
If the oil pressure warning light stays on with the engine running. Check the engine oil level. If the oil level is correct:

1. Remove the oil pressure sender and install an oil pressure gauge.
2. Start the engine and allow to reach operating temperature (fan comes on at least twice).
3. Pressure should be:

Engine Oil Pressure:

at idle: 137 kPa (1.4 kg/cm², 20 psi) minimum
at 3,000 rpm: 470–559 kPa (4.8–5.7 kg/cm²
67-80 psi)

- If oil pressure is within specifications, replace oil pressure sender and recheck.
- If oil pressure is NOT within specifications, inspect oil pump (page 8-6).



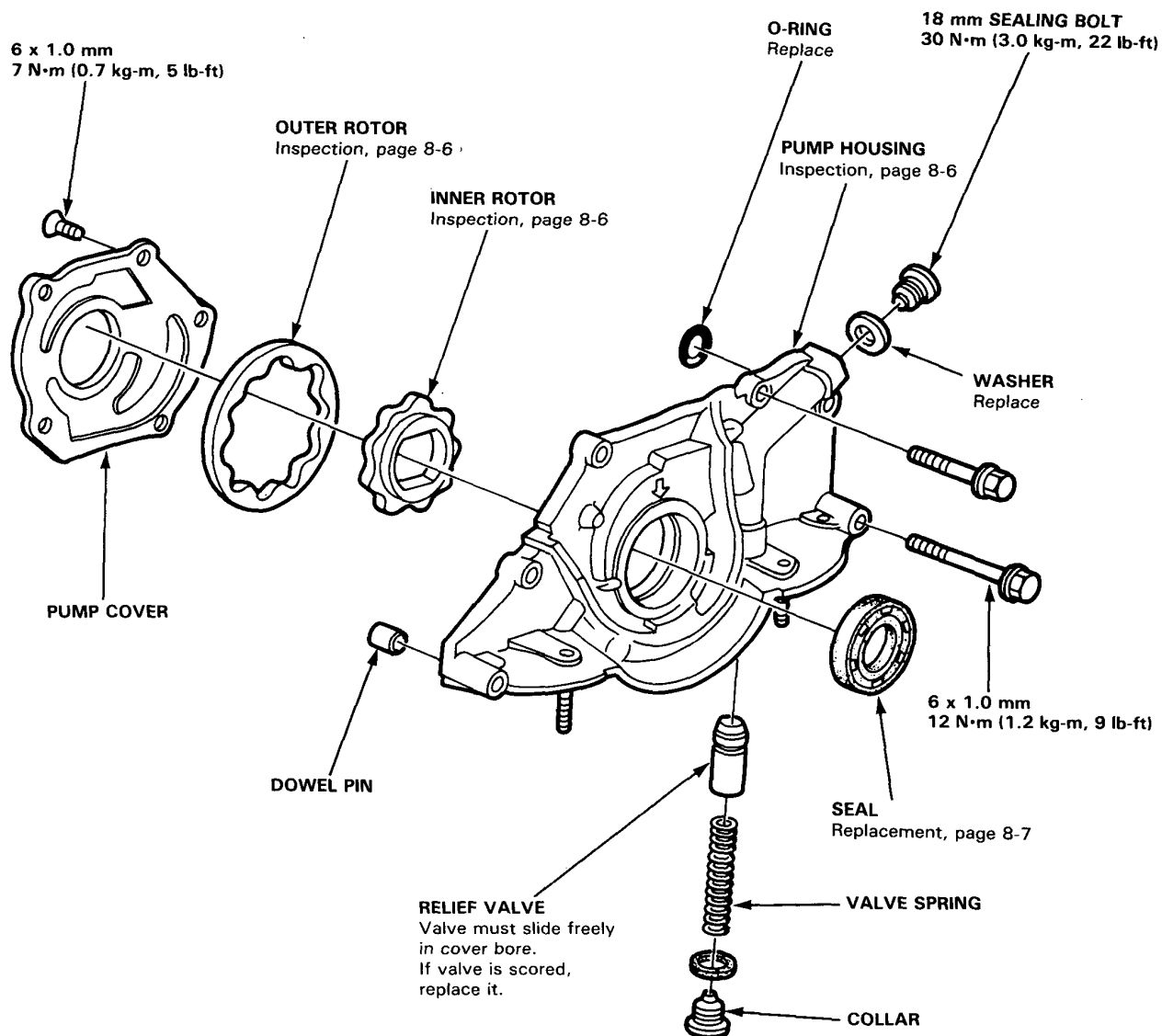
Oil Pump



Illustrated Index

NOTE:

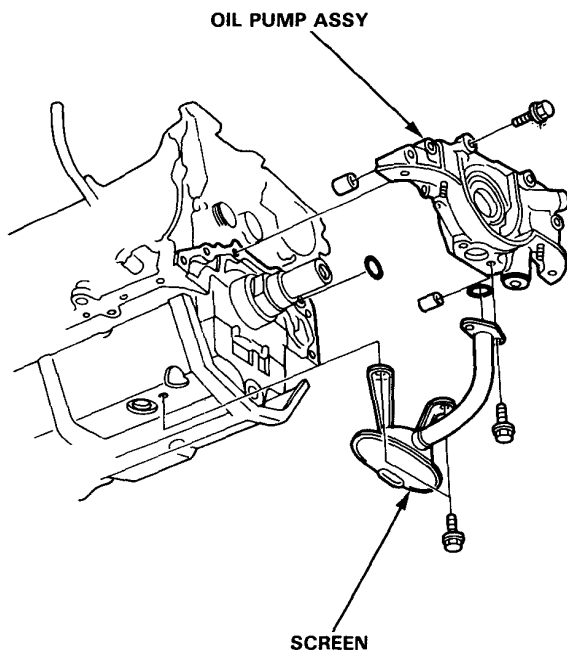
- Note the installation direction of the rotors.
- After assembling, check that the rotors turn smoothly.



Oil Pump

Removal/Inspection

1. Drain the engine oil.
2. Turn the crankshaft and align the "T" mark on the crankshaft pulley with the index mark on the cover.
3. Remove the cylinder head cover and timing belt upper cover.
4. Remove the alternator belt.
5. Remove the crankshaft pulley and remove the timing belt lower cover.
6. Replace the belt tensioner, and remove the timing belt and driven pulley.
7. Remove the oil pan.
8. Remove the oil screen.
9. Remove the mounting bolts and the oil pump assembly.



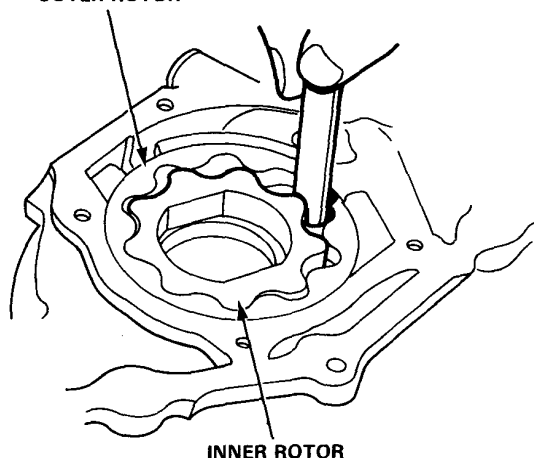
10. Remove the five screws from the pump housing, then separate the housing and cover.
11. Check the radial clearance on the pump rotor.

Rotor Radial Clearance

Standard (New): 0.04–0.16 mm
(0.002–0.006 in.)

Service Limit: 0.2 mm (0.008 in.)

OUTER ROTOR

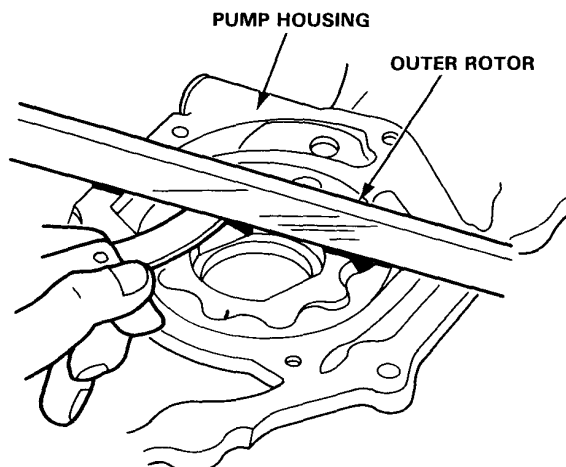


12. Check the axial clearance on the outer pump rotor.

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.)



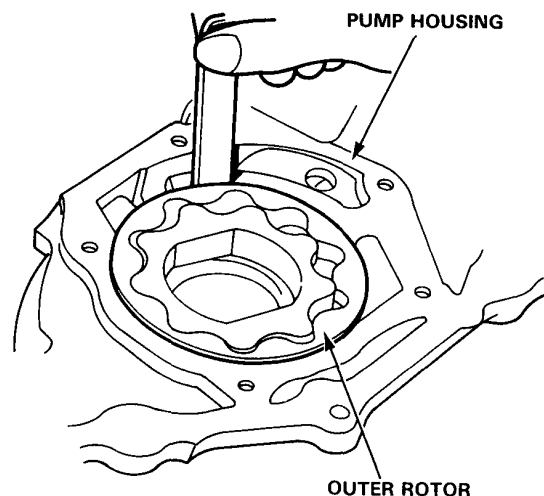


13. Check the radial clearance between the housing and the outer rotor.

Housing-to-Rotor Radial Clearance

Standard (New): 0.1–0.19 mm
(0.004–0.007 in.)

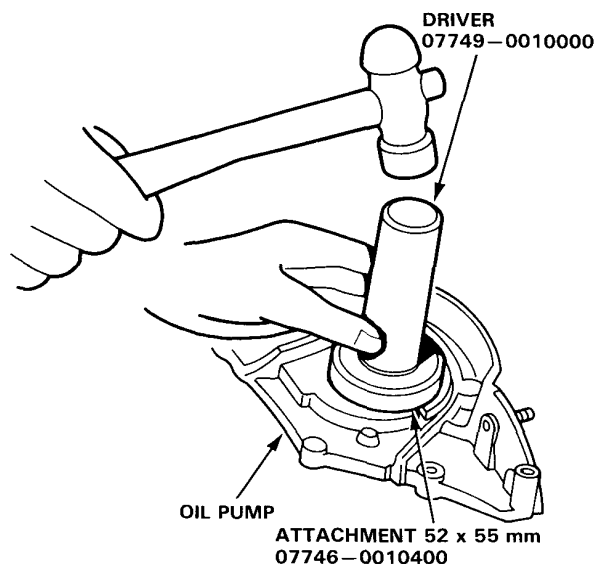
Service Limit: 0.21 mm (0.008 in.)



14. Inspect both rotors and pump housing for scoring or other damage.
Replace parts as necessary.

15. Remove the old oil seal from the oil pump.

16. Gently tap in the new oil seal until the tool bottoms on the pump.



17. Reassemble the oil pump, applying locking fluid to the pump housing screws.

18. Check that the oil pump turns freely.

19. Apply a light coat of oil to the seal lip.

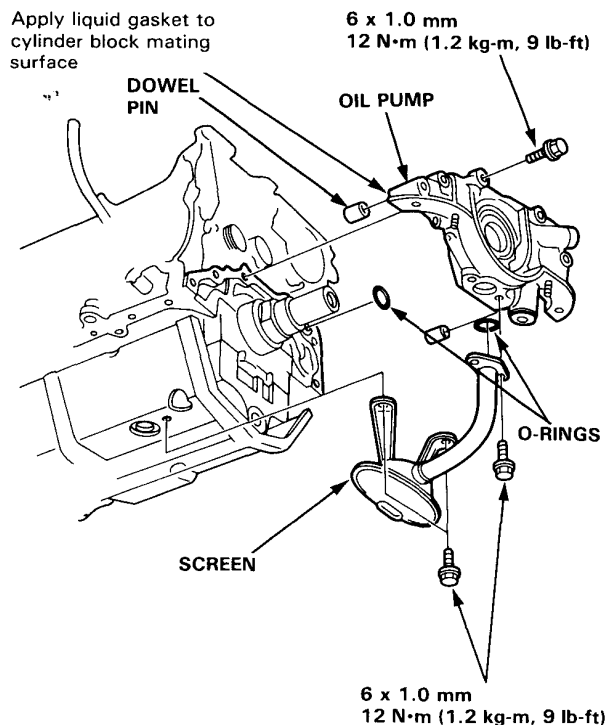
20. Install the two dowel pins and new O-ring on the cylinder block.

21. Apply liquid gasket to the cylinder block mating surface of the oil pump.

NOTE:

- Use HONDA PART NO. 08740–99986 for the liquid gasket.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Apply liquid gasket evenly, in a narrow bead centered on the mating surface.
- To prevent leakage of oil, apply sealant to the inner threads of the bolt holes.
- Do not allow the sealant to dry before assembly.
- Wait at least 30 minutes after assembly before filling the engine with oil.

Apply liquid gasket to cylinder block mating surface



22. Install the oil pump on the cylinder block.

23. Install the oil screen.

Intake Manifold/Exhaust System

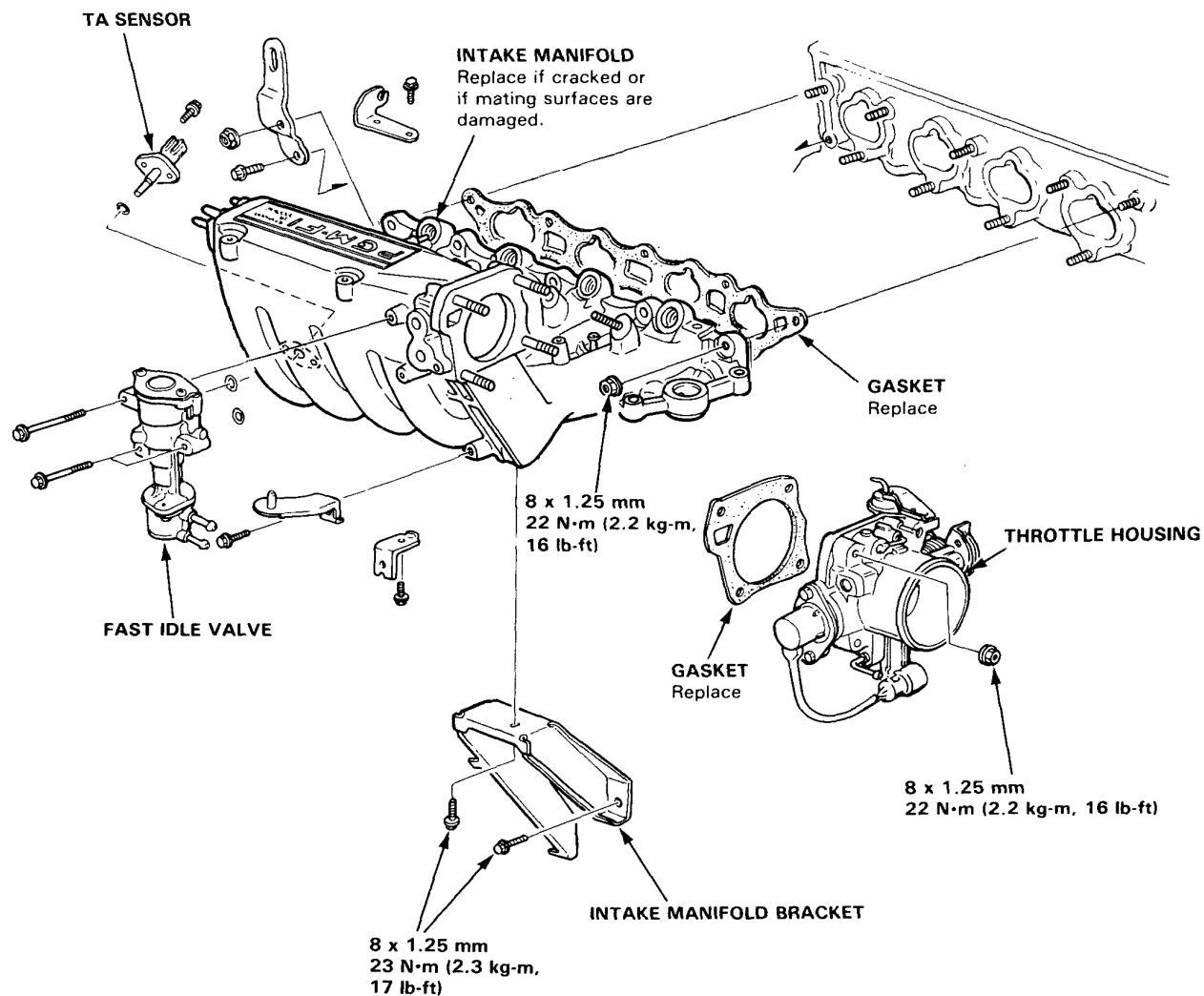
B20A2 Engine

Intake Manifold	9-2
Exhaust Manifold	9-3
Exhaust Pipe and Muffler	9-4



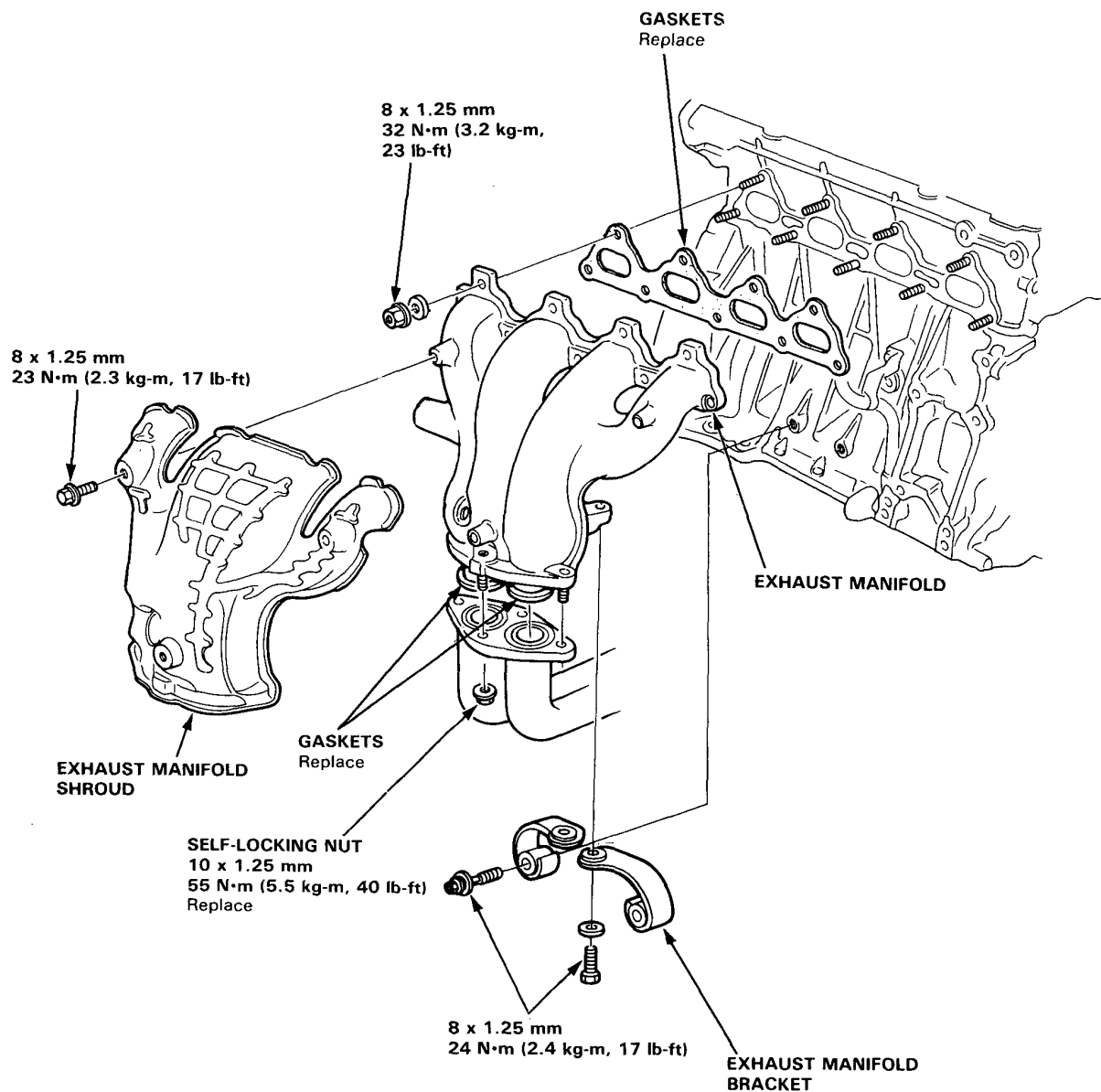
Intake Manifold

Illustrated Index



Exhaust Manifold

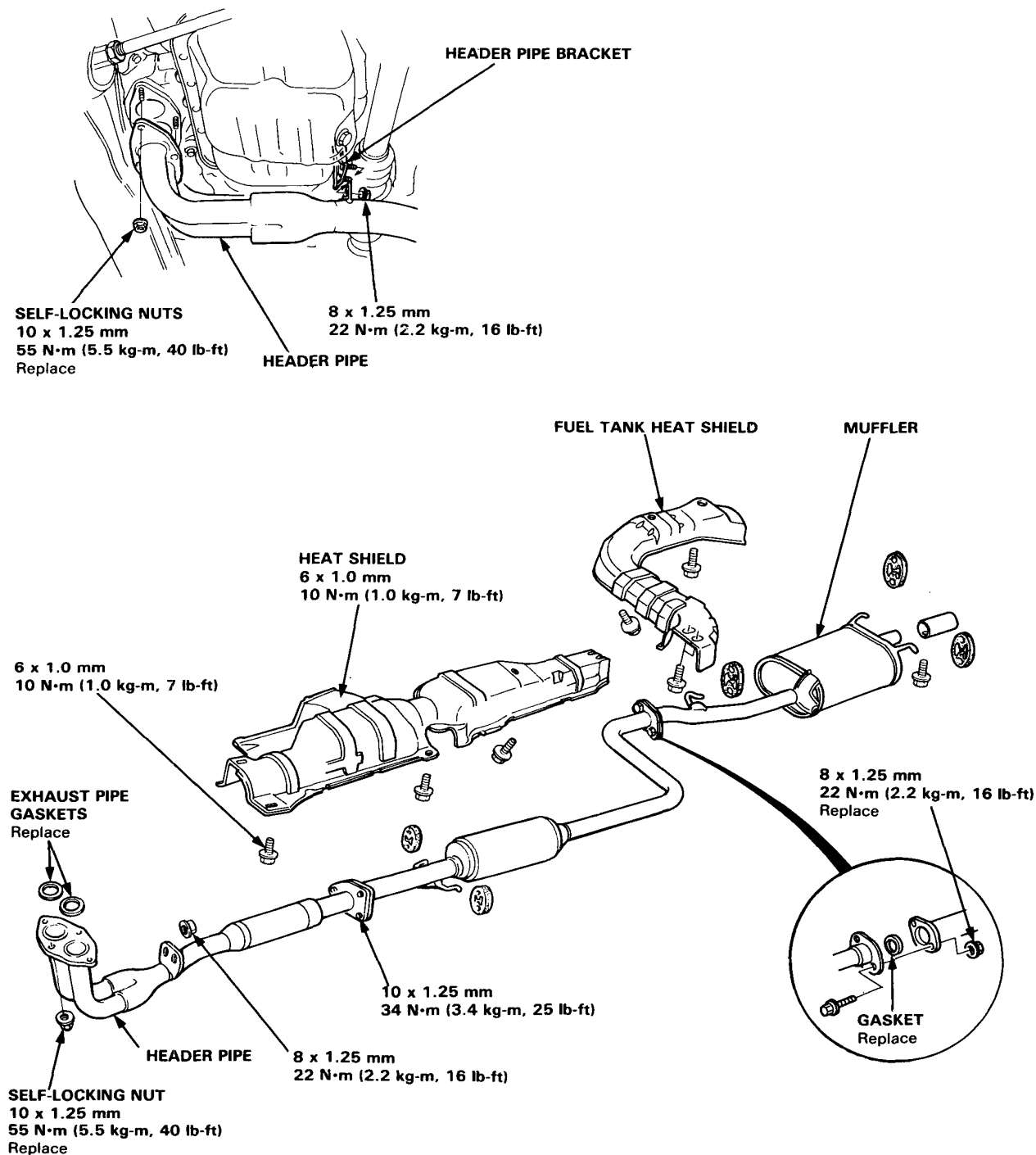
Illustrated Index



(cont'd)

Exhaust Pipe and Muffler

Replacement



Cooling

Radiator

Replacement	10-2
Refilling and Bleeding	10-3
Cap Testing	10-4
Radiator Testing	10-4

Thermostat

Replacement	10-5
Testing	10-5

Water Pump

Replacement	10-6
-------------------	------



Outline of Model Change

B20A2 engine is newly added.

Radiator

Replacement

WARNING

- System is under high pressure when engine is hot. To avoid danger of releasing scalding coolant, remove cap only when engine is cool.

Total Cooling System Capacity (Incl. heater, and reservoir tank): 5.9 liter (1.6 U.S. gal.)

CAUTION: If any coolant spills on painted portions of the body, rinse it off immediately.

NOTE:

- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings whenever reassembling.

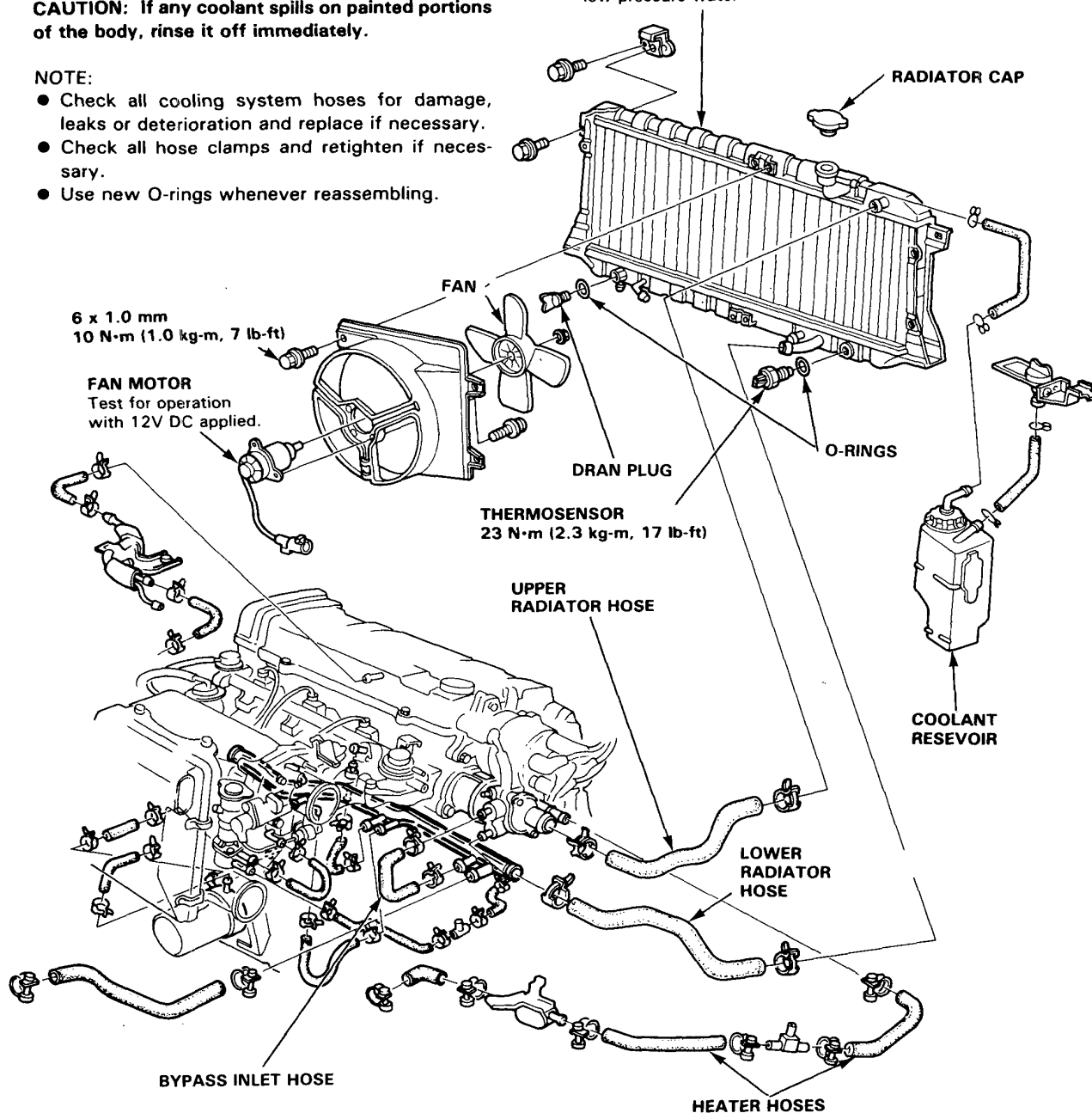
RADIATOR

Refilling and bleeding, page 10-3

Leak test, page 10-4

Inspect soldered joints and seams for leaks.

Blow dirt out from between core fins with compressed air. If insects, etc., are clogging radiator, wash them off with low pressure water





Refilling and Bleeding

1. Set the heater temperature lever to maximum heat.
2. When the radiator is cool, remove the radiator cap and drain plug, and drain the radiator.
3. Reinstall the radiator drain plug and tighten it securely.
4. Remove, drain and reinstall the reserve tank. Fill the tank halfway to the MAX mark with water, then up to the MAX mark with coolant.
5. Mix the recommended anti-freeze with an equal amount of water, in a clean container.

NOTE:

- Use only HONDA-RECOMMENDED anti-freeze/coolant.
- For best corrosion protection, the coolant concentration must be maintained year-round at 50% MINIMUM. Coolant concentrations less than 50% may not provide sufficient protection against corrosion or freezing.
- Coolant concentrations greater than 60% will impair cooling efficiency and are not recommended.

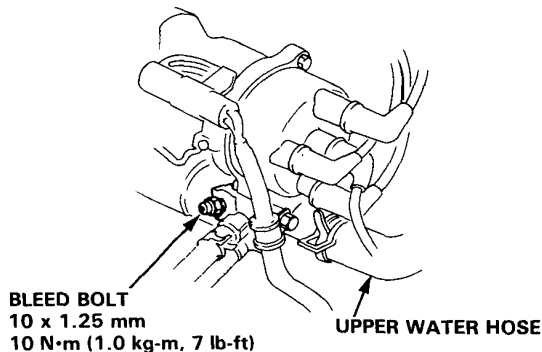
CAUTION:

- Do not mix different brand anti-freeze/coolants.
- Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the recommended coolant.

Radiator Coolant Refill Capacity

5.2 liters (1.4 U.S. gal.)

6. Loosen the air bleed bolt in the water outlet, then fill the radiator to the bottom of the filler neck with the coolant mixture. Tighten the bleed bolt as soon as coolant starts to run out in a steady stream without bubbles.

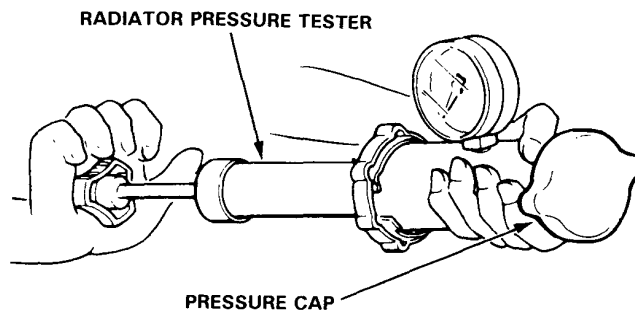


7. With the radiator cap off, start the engine and let it run until warmed up (fan goes on at least twice). Then, if necessary add more coolant mix to bring the level back up to the bottom of the filler neck.
8. Put the radiator cap on, then run the engine again and check for leaks.

Radiator

Cap Testing

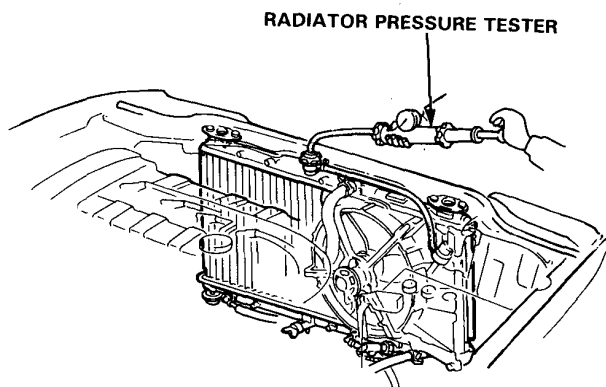
1. Remove the radiator cap, wet its seal with coolant, then install it on the pressure tester.
2. Apply a pressure of 74–103 kPa (0.75–1.05 kg/cm², 11–15 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.



Radiator Testing

1. Wait until the engine is cool, then carefully remove the pressure cap and fill the radiator with coolant to the top of the filler neck.
2. Attach the pressure tester to the radiator and apply a pressure of 74–103 kPa (0.75–1.05 kg/cm², 11–15 psi).
3. Inspect for coolant leaks and a drop in pressure.
4. Remove the tester and reinstall the pressure cap.

NOTE: Check for engine oil in coolant and/or coolant in engine oil.

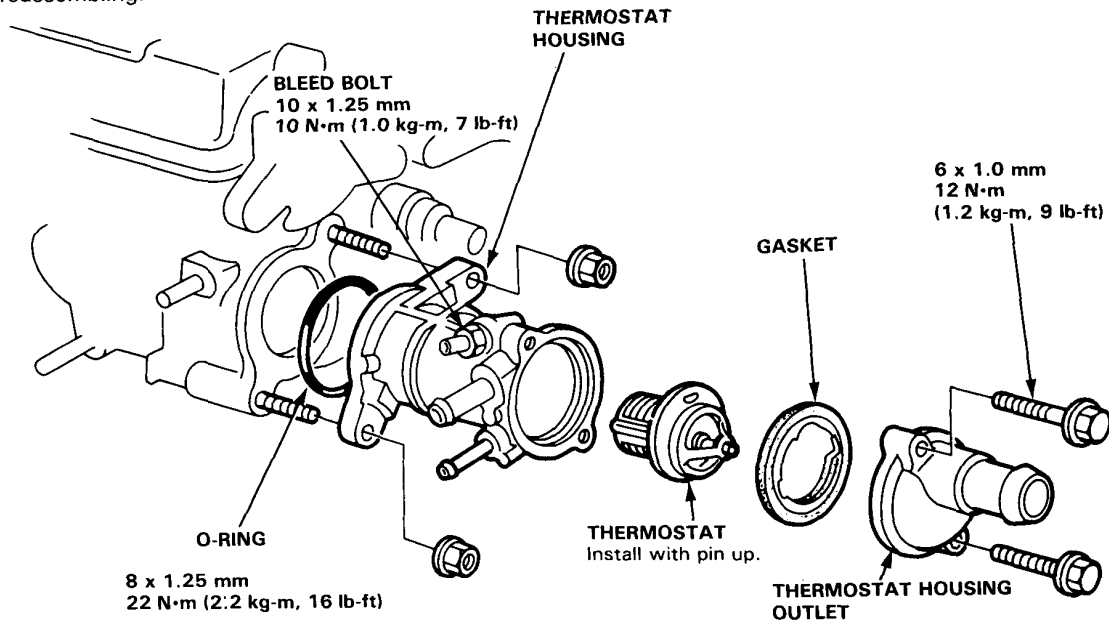




Thermostat

Replacement

NOTE: Use new gaskets and O-rings whenever reassembling.



Testing

Replace thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat in a container of water as shown.
2. Heat the water and check the temperature with a thermometer. Check the temperature at which the thermostat first opens and at full lift.

CAUTION: Do not let thermometer touch bottom of hot container.

3. Measure lift height of thermostat when fully open.

STANDARD THERMOSTAT

Lift height: 8 mm (0.31 in.)

Starts opening:

Primary: 82°C ± 2 (180°F ± 3)

Secondary: 85°C ± 2 (185°F ± 3)

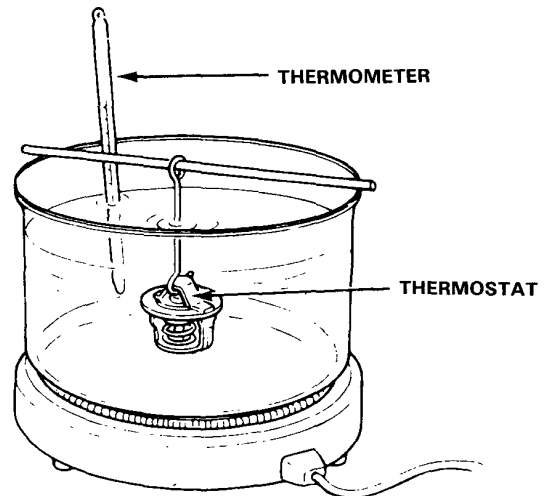
Fully open: 95°C (203°F)

OPTIONAL THERMOSTAT

Lift height: 8 mm (0.31 in.)

Starts opening: 86–90°C (187–194°F)

Fully open: 100°C (212°F)



Water Pump

Replacement

NOTE: Use new gaskets O-rings whenever reassembling.

DRAIN PLUG

32 N·m (3.2 kg-m, 23 lb-ft)

Replace

WATER PUMP

Inspect for signs of seal leakage or bearing deterioration.
NOTE: Small amount of "weeping" from bleed hole is normal.

THERMOSENSOR

28 N·m
(2.8 kg-m, 20 lb-ft)

O-RING

TEMPERATURE GAUGE SENDING UNIT

9 N·m (0.9 kg-m, 7 lb-ft)

BLEED BOLT

10 x 1.25 mm
10 N·m (1.0 kg-m, 7 lb-ft)

TERMOSTAT HOUSING OUTLET

8 x 1.25 mm
22 N·m (2.2 kg-m, 16 lb-ft)

O-RING

6 x 1.0 mm
12 N·m
(1.2 kg-m, 9 lb-ft)

O-RING

6 x 1.0 mm
12 N·m
(1.2 kg-m, 9 lb-ft)

O-RING

WATER PUMP INLET PIPE

Fuel and Emission Controls

A20A4 Engine 12-1

B20A2 Engine 12-9

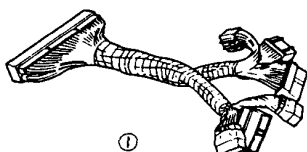


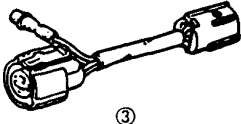
Outline of Model Changes

- A20A4 Engine with Evaporative Control System has been newly applied to KQ model.
- B20A2 Engine has been added (KF, KG, KE models).
 * Emission control system for new engine is basically same as A20A4 engine except B20A2 engine has secondary air supply system.

Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07999—PD6000A	System Checker Harness	1	
②	07411—0020000	Digital Circuit Tester	1	
③	07GAZ—SE00300	R.P.M. Connecting Adapter	1	



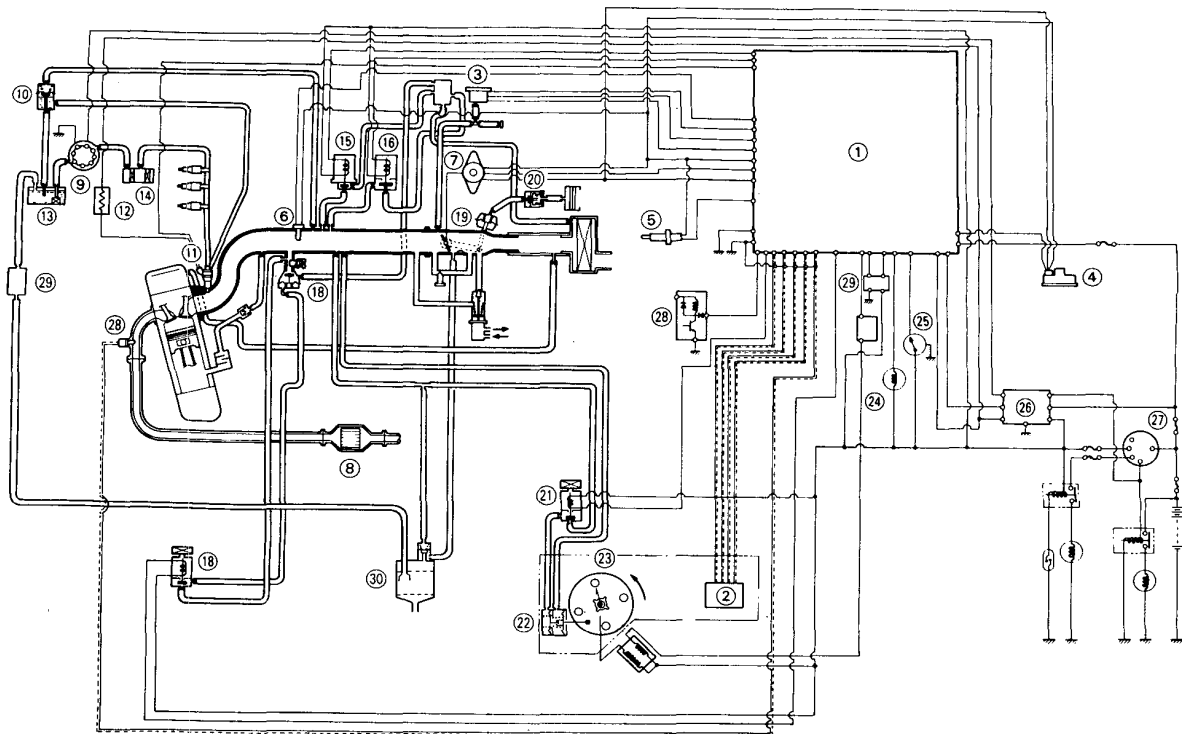


A20A4 Engine

Vacuum and Electrical Connections	12-2
Interconnect Diagram	12-3
Emission Controls	12-5



Vacuum and Electrical Connections

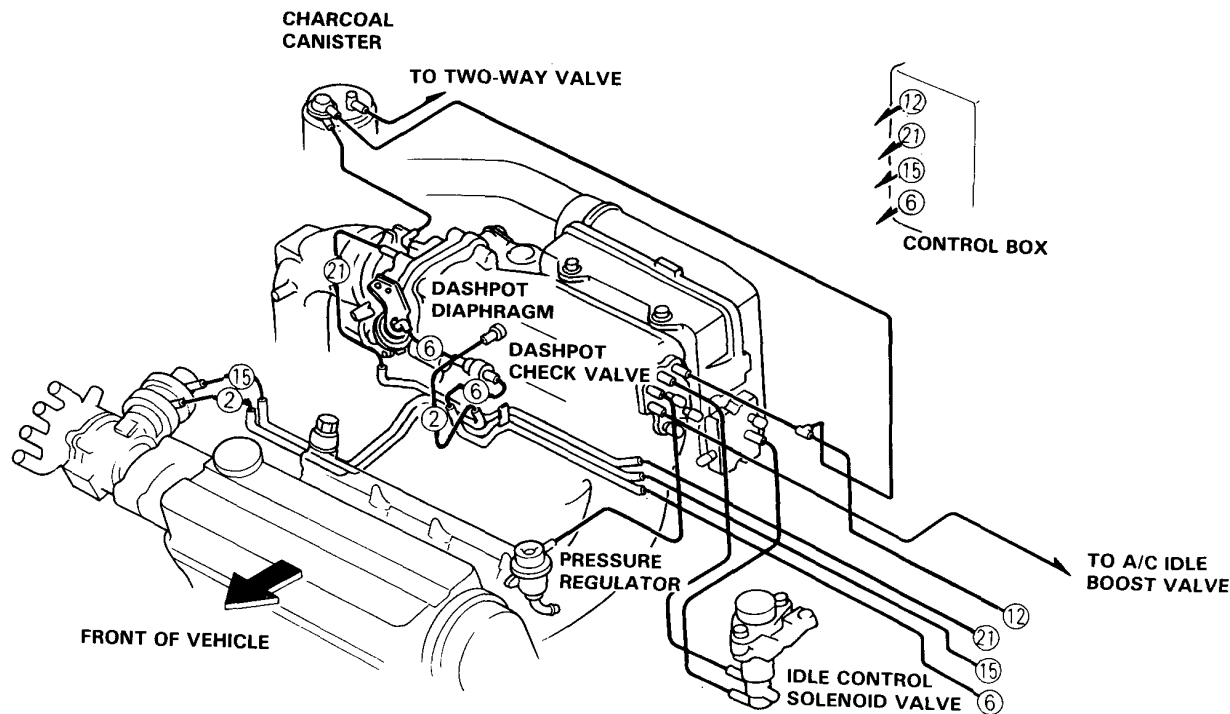


- | | |
|-------------------------------------|---------------------------------|
| ① ELECTRONIC CONTROL UNIT (ECU) | ⑩ IDLE CONTROL SOLENOID VALVE |
| ② CRANK ANGLE SENSOR | ⑪ A/C IDLE BOOST SOLENOID VALVE |
| ③ MANIFOLD ABSOLUTE PRESSURE SENSOR | ⑫ A/C IDLE BOOST VALVE |
| ④ ATMOSPHERIC PRESSURE SENSER | ⑬ DASHPOT DIAPHRAGM |
| ⑤ COOLANT TEMPERATURE SENSOR | ⑭ DASHPOT CHECK VALVE |
| ⑥ INTAKE AIR TEMPERATURE SENSOR | ⑮ COLD ADVANCE SOLENOID VALVE |
| ⑦ THROTTLE ANGLE SENSOR | ⑯ VACUUM ADVANCE DIAPHRAGM |
| ⑧ CATALYTIC CONVERTER | ⑰ DISTRIBUTOR |
| ⑨ FUEL PUMP | ⑱ PGM-FI WARNING LIGHT |
| ⑩ PRESSURE REGULATOR | ⑲ SPEED SENSOR |
| ⑪ INJECTOR | ⑳ MAIN RELAY |
| ⑫ RESISTOR | ㉑ IGNITION SWITCH |
| ⑬ FUEL TANK | ㉒ OXYGEN SENSOR |
| ⑭ FUEL FILTER | ㉓ TWO-WAY VALVE |
| ⑮ A/T IDLE CONTROL SOLENOID VALVE | ㉔ CHARCOAL CANISTER |

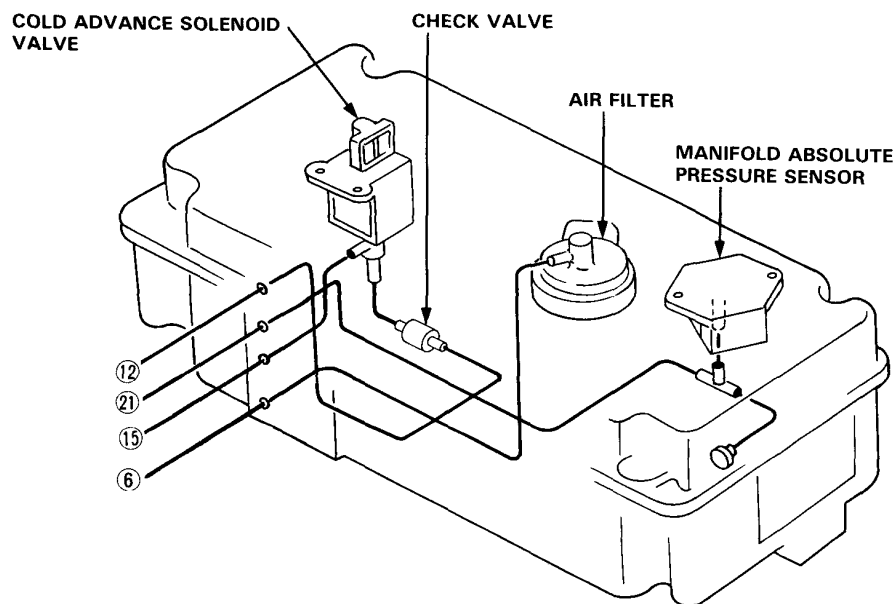
Interconnect Diagram



Manual

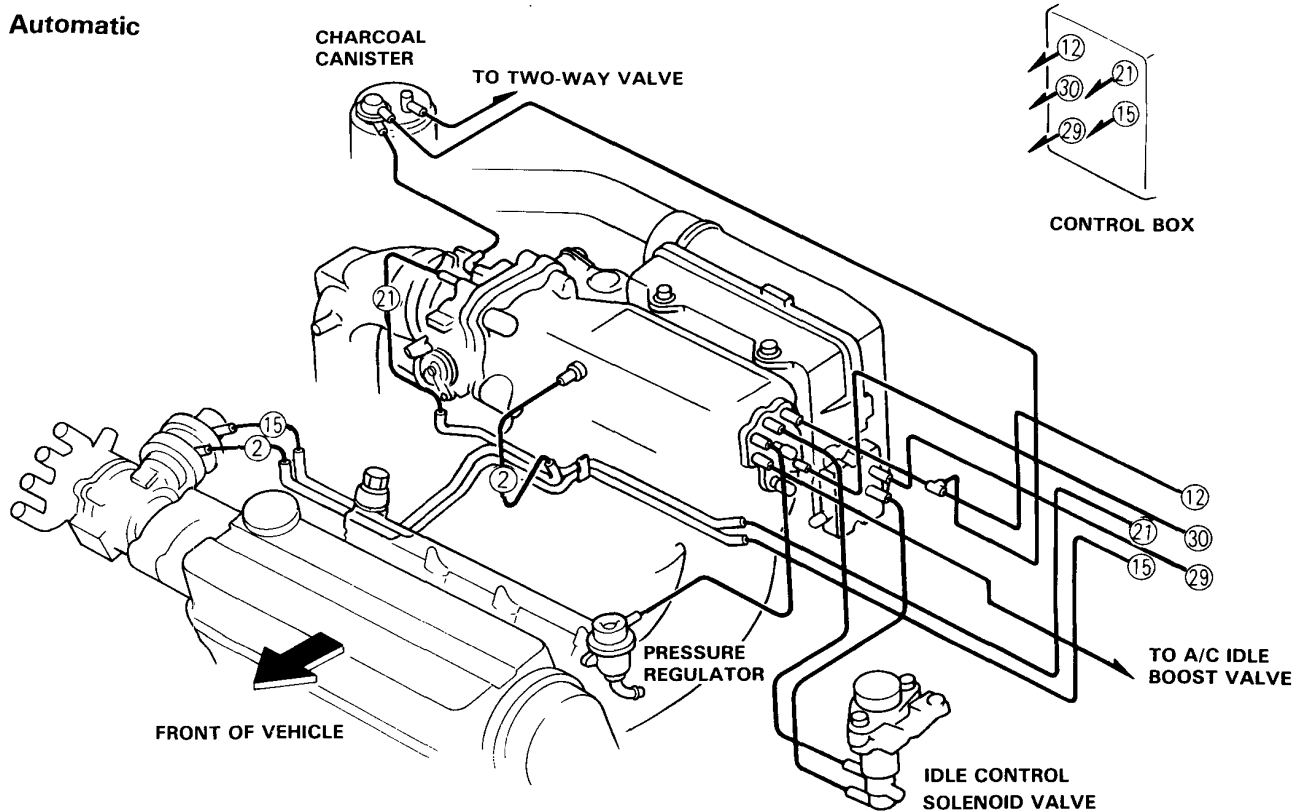


Control Box

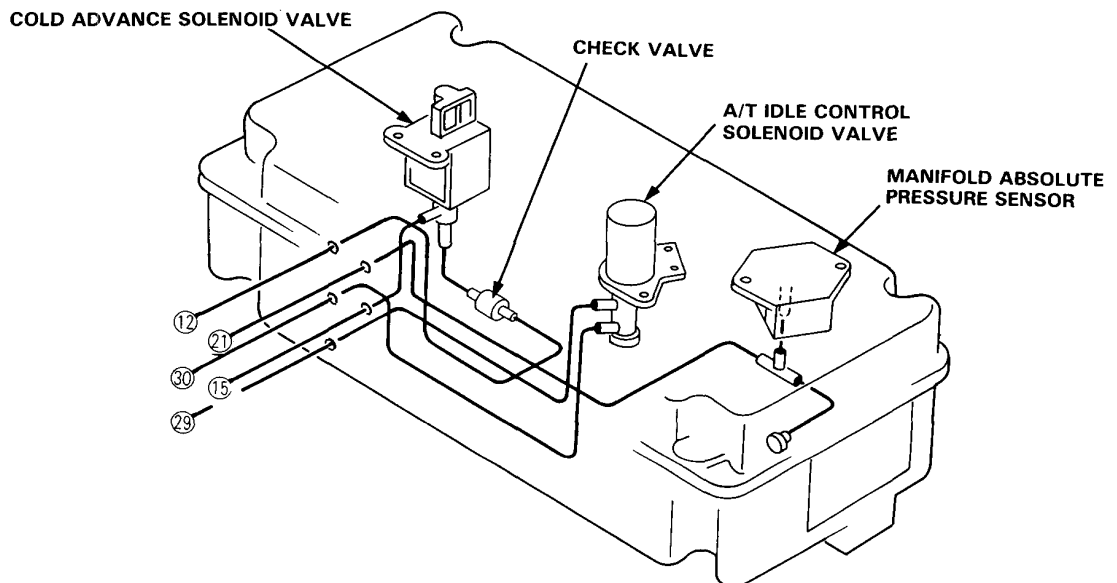


Interconnect Diagram

Automatic



Control Box

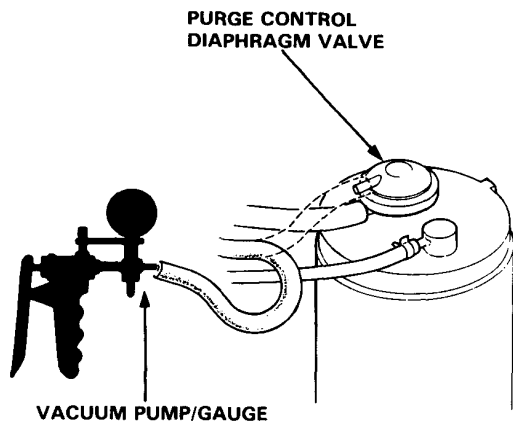


Emission Controls



Evaporative Controls

1. Disconnect the upper vacuum hose of the purge control diaphragm valve (on the charcoal canister) and connect vacuum gauge to the hose.



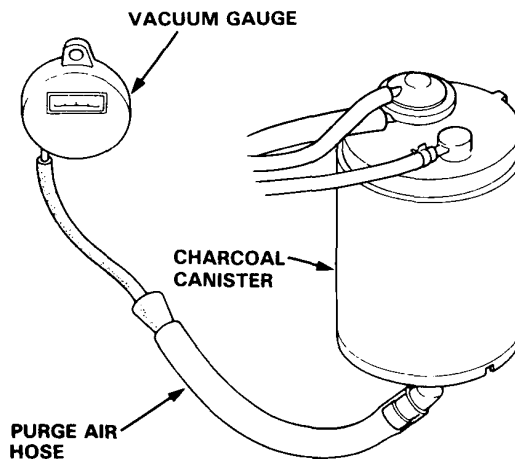
2. Start the engine and allow to idle.

There should be vacuum.

- If vacuum is not available, check the hose for clogging, kinking or leakage.

Charcoal Canister

1. Remove fuel filler cap.
2. Remove canister purge air hose from frame and connect hose to vacuum gauge as shown.



3. Start engine and raise speed to 3500 min⁻¹ (rpm). Vacuum should appear on gauge within 1 minute.
 - If vacuum appears on gauge in 1 minute, remove gauge, test is complete.
 - If no vacuum, disconnect vacuum gauge and re-install fuel filler cap.
4. Remove charcoal canister and check for signs of damage or defects.
 - If defective, replace canister.
 - If OK, go on to step 5.

(cont'd)

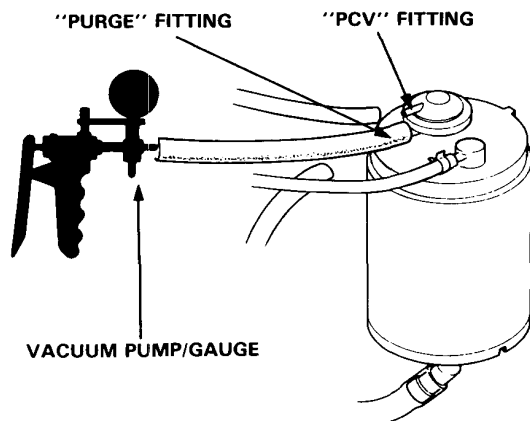
Emission Controls

Evaporative Controls (cont'd)

5. Stop engine. Disconnect the upper vacuum hose of the purge control diaphragm valve from canister "PCV" fitting.

Connect vacuum pump to canister "purge" fitting as shown, and apply vacuum.

Vacuum should remain steady.



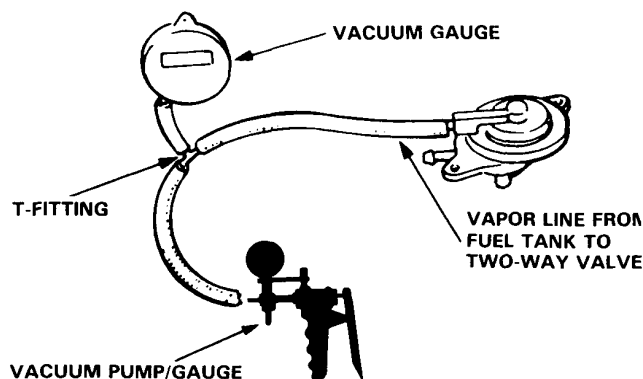
- If vacuum remains steady, go on to step 6.
 - If vacuum drops, replace canister and re-test.
6. Restart engine. Reconnect hose to canister "PCV" fitting.

"PURGE" side vacuum should drop to zero.

- If "PURGE" side vacuum does not drop to zero, replace the canister and re-test.

Two-Way Valve

1. Remove the fuel filler cap.
2. Remove vapor line from the fuel tank and connect to T-fitting from vacuum gauge and vacuum pump as shown.



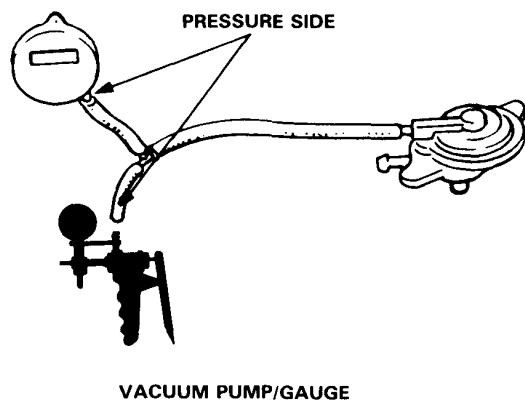
3. Slowly apply a vacuum while watching the gauge.

Vacuum should stabilize at 5 to 15 mmHg (0.2 to 0.6 in.Hg).

- If vacuum stabilizes momentarily (two-way valve opens) between 5 and 15 mmHg (0.2 and 0.6 in.Hg), go on to Step 4.
- If vacuum stabilizes (valve opens) below 5 mmHg (0.2 in.Hg) or above 15 mmHg (0.6 in.Hg), install new valve and re-test.



4. Move vacuum pump hose from vacuum to pressure fitting, and move vacuum gauge hose from vacuum to pressure side as shown.



5. Slowly pressurize the vapor line while watching the gauge.

Pressure should stabilize at:

25 to 55 mmHg (1.0 to 2.2 in.Hg)

- If pressure momentarily stabilizes (valve opens) at above ranges, the valve is OK.
- If pressure stabilizes out of above ranges, install a new valve and re-test.

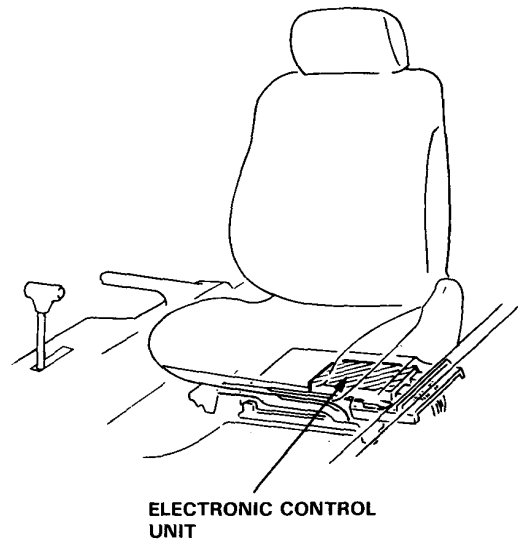
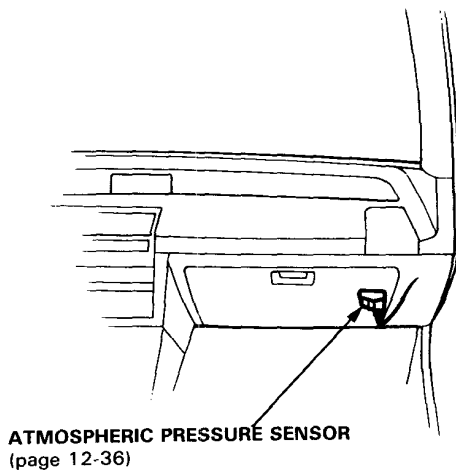
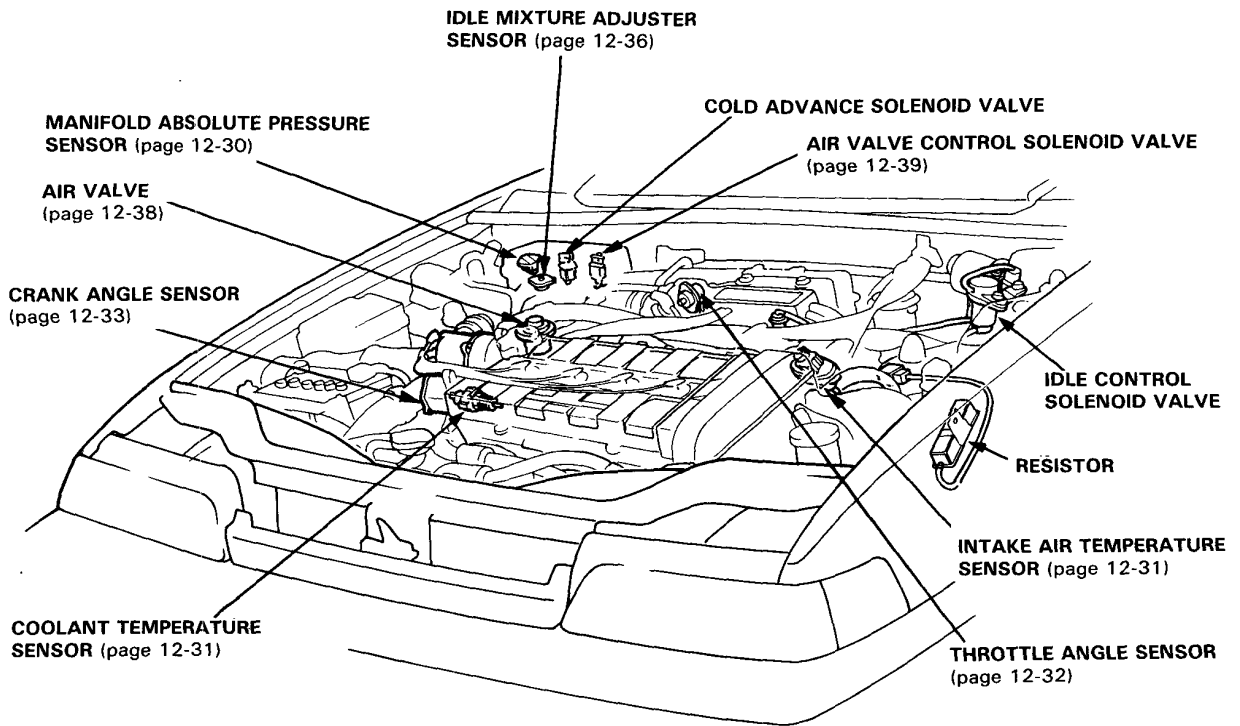
B20A2 Engine

Index	12-10
Vacuum and Electrical Connections	12-14
Interconnect Diagram	12-15
Troubleshooting	
PGM-FI System	12-17
Sensors	12-30
Idle Speed Inspection/Adjustment	12-37
Secondary Air Supply System	12-38
Ignition Timing Controls	12-40



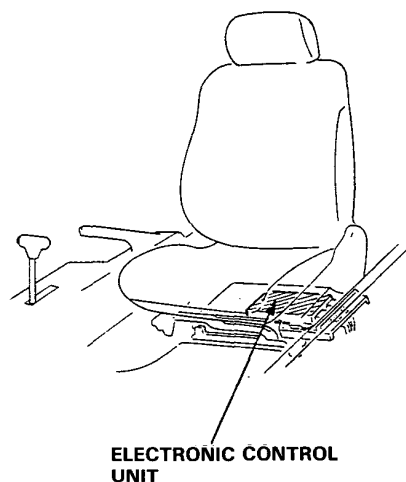
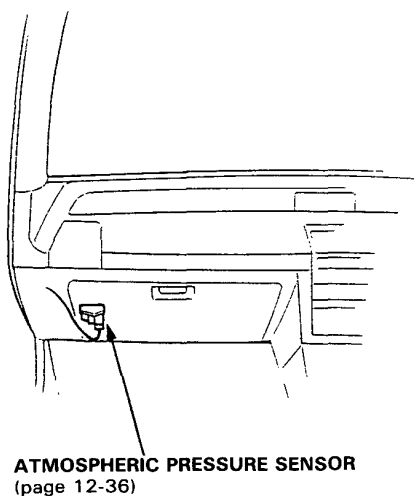
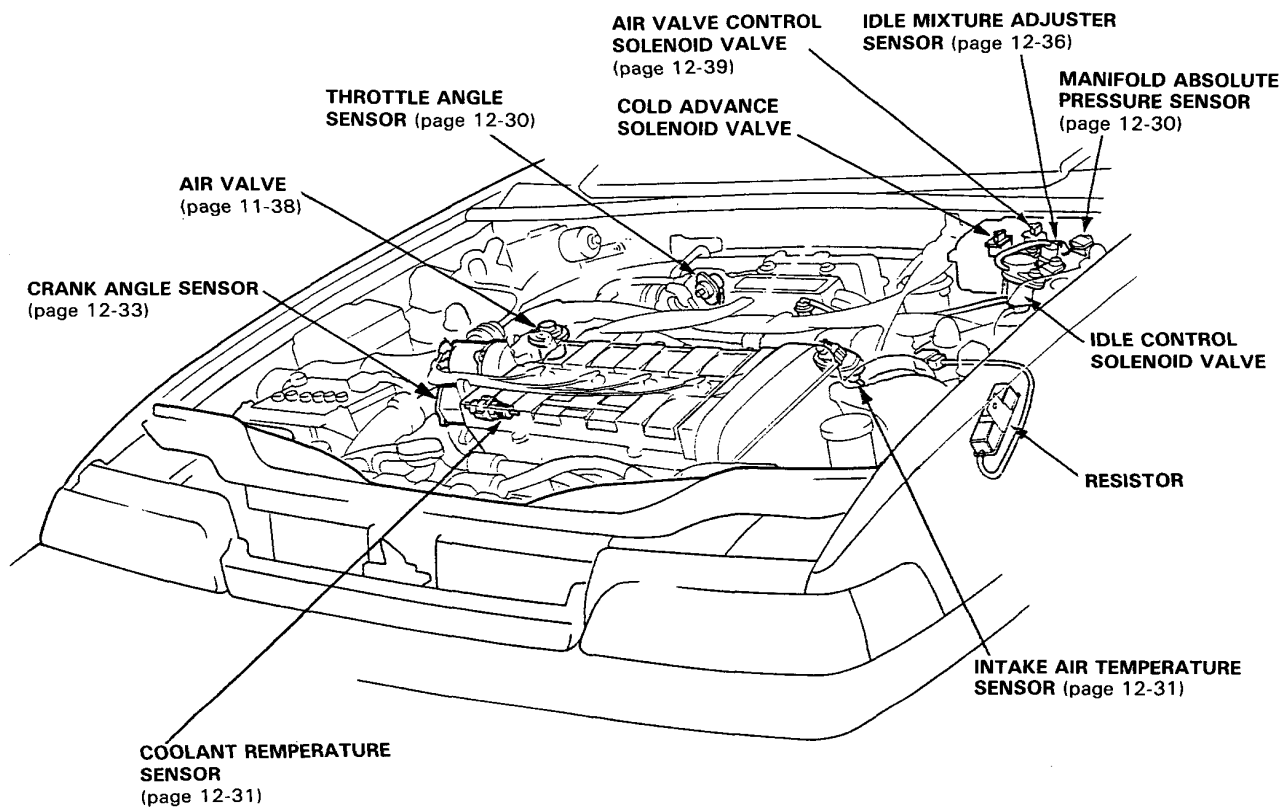
Index

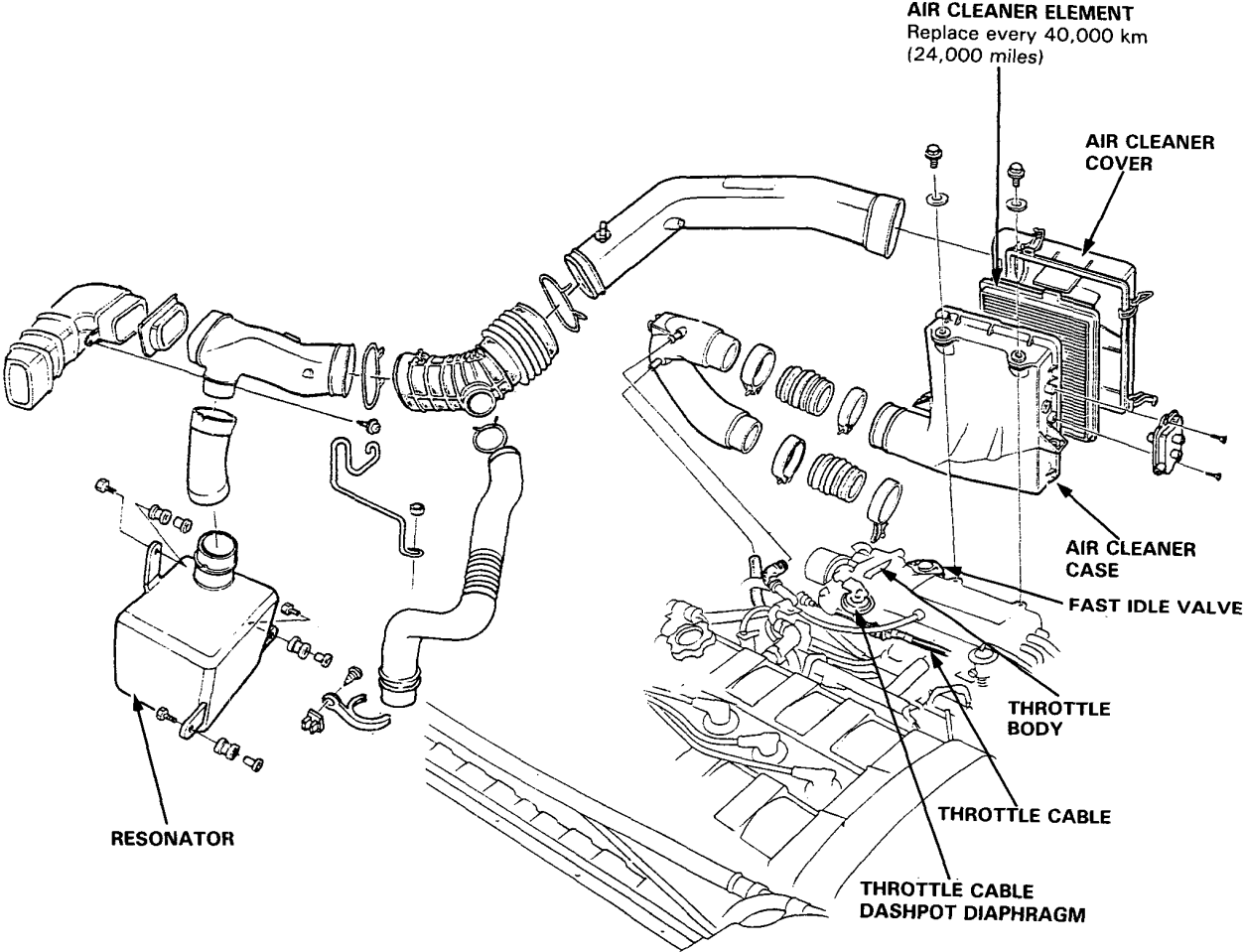
[Except KE model]





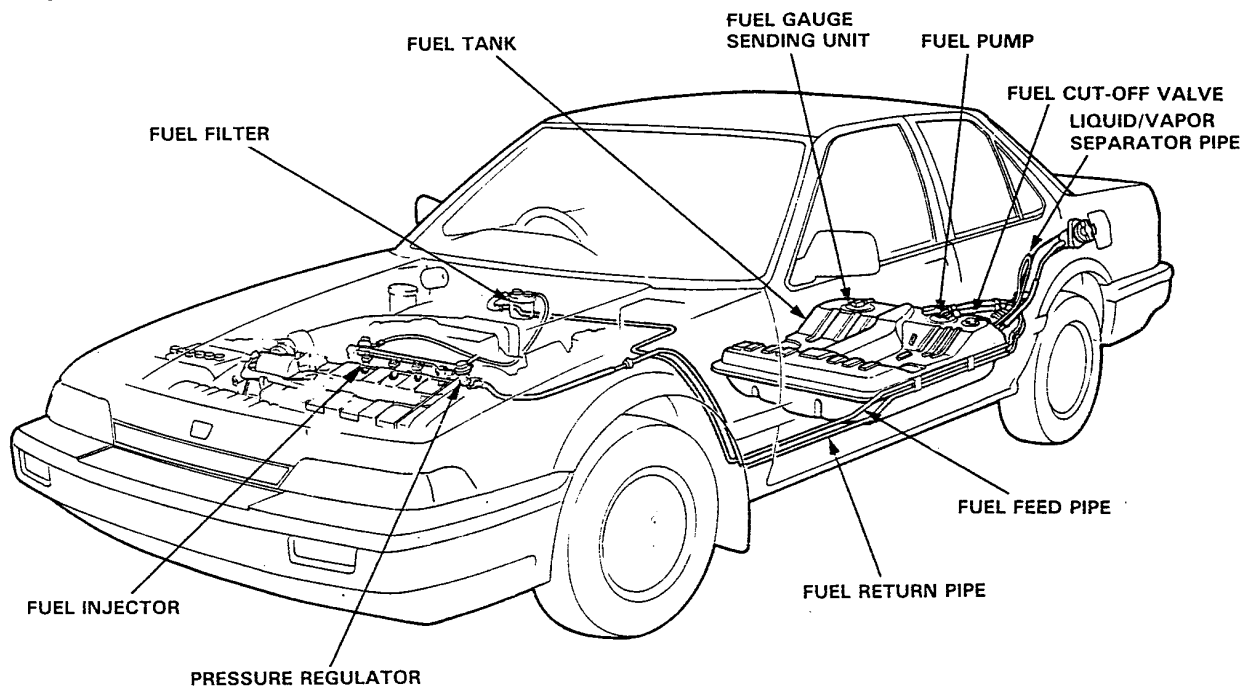
[KE model]



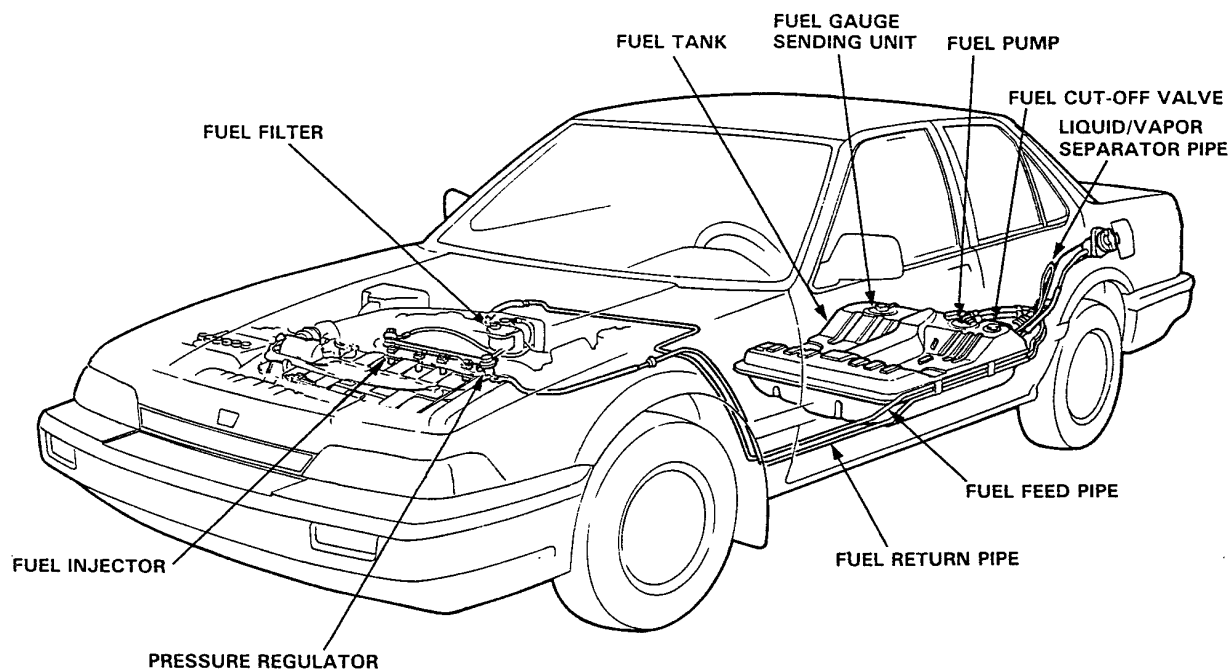




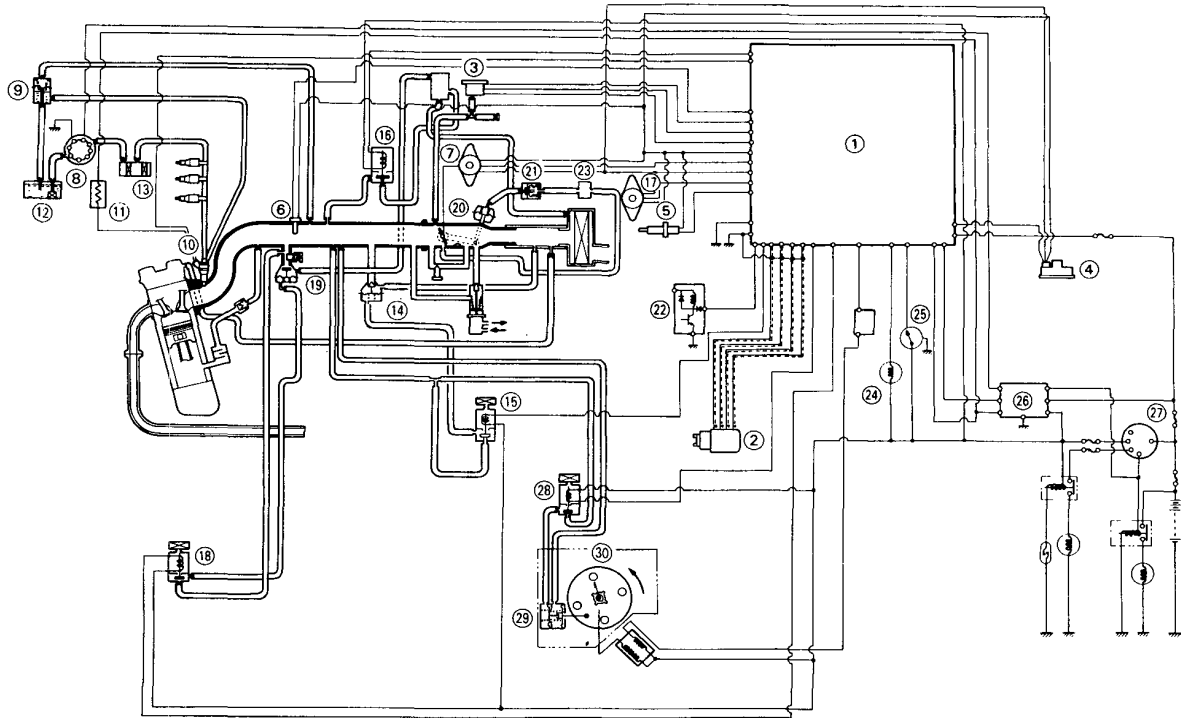
[Except KE model]



[KE model]



Vacuum and Electrical Connections

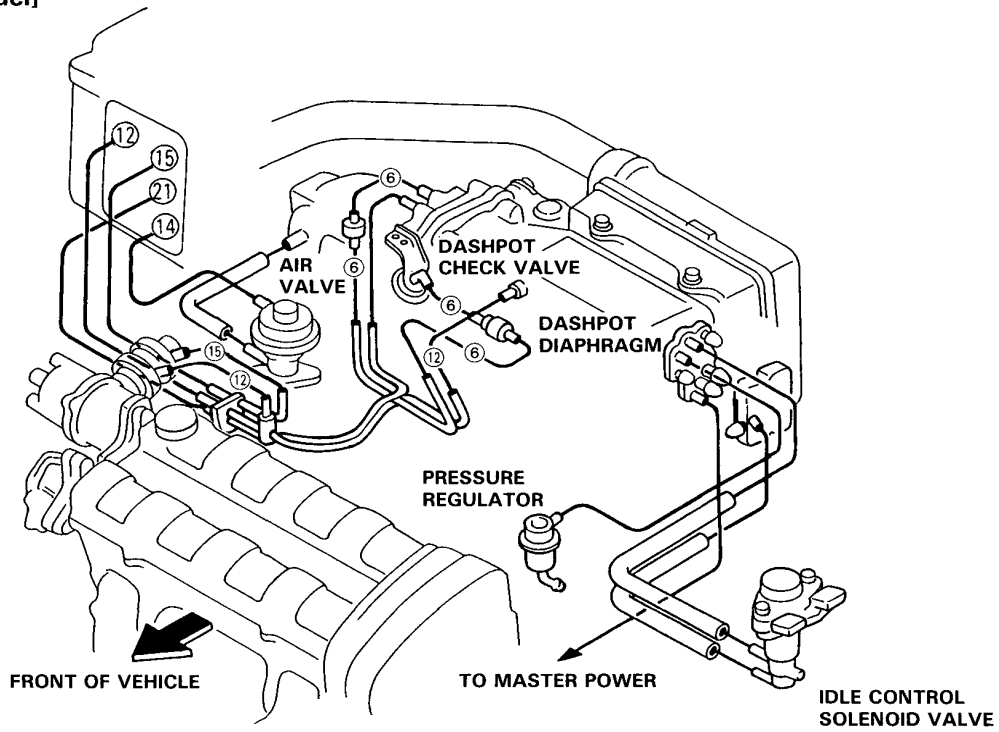


- | | | |
|-------------------------------------|------------------------------------|----------------------------------|
| ① ELECTRONIC CONTROL UNIT (ECU) | ⑩ INJECTOR | ①⑥ IDLE CONTROL SOLENOID VALVE |
| ② CRANK ANGLE SENSOR | ⑪ RESISTOR | ①⑦ IDLE MIXTURE ADJUSTER SENSOR |
| ③ MANIFOLD ABSOLUTE PRESSURE SENSOR | ⑫ FUEL TANK | ①⑧ A/C IDLE BOOST SOLENOID VALVE |
| ④ ATMOSPHERIC PRESSURE SENSOR | ⑬ FUEL FILTER | ①⑨ A/C IDLE BOOST VALVE |
| ⑤ COOLANT TEMPERATURE SENSOR | ⑭ AIR VALVE | ②① DASHPOT CHECK VALVE |
| ⑥ INTAKE AIR TEMPERATURE SENSOR | ⑮ AIR VALVE CONTROL SOLENOID VALVE | ②② ALTERNATOR |
| ⑦ THROTTLE ANGLE SENSOR | | ②③ DASHPOT CHAMBER |
| ⑧ FUEL PUMP | | ②④ PGM-FI WARNING LIGHT |
| ⑨ PRESSURE REGULATOR | | ②⑤ SPEED SENSOR |
| | | ②⑥ MAIN RELAY |
| | | ②⑦ IGNITION SWITCH |
| | | ②⑧ COLD ADVANCE SOLENOID VALVE |
| | | ②⑨ VACUUM ADVANCE DIAPHRAGM |
| | | ③① DISTRIBUTOR |

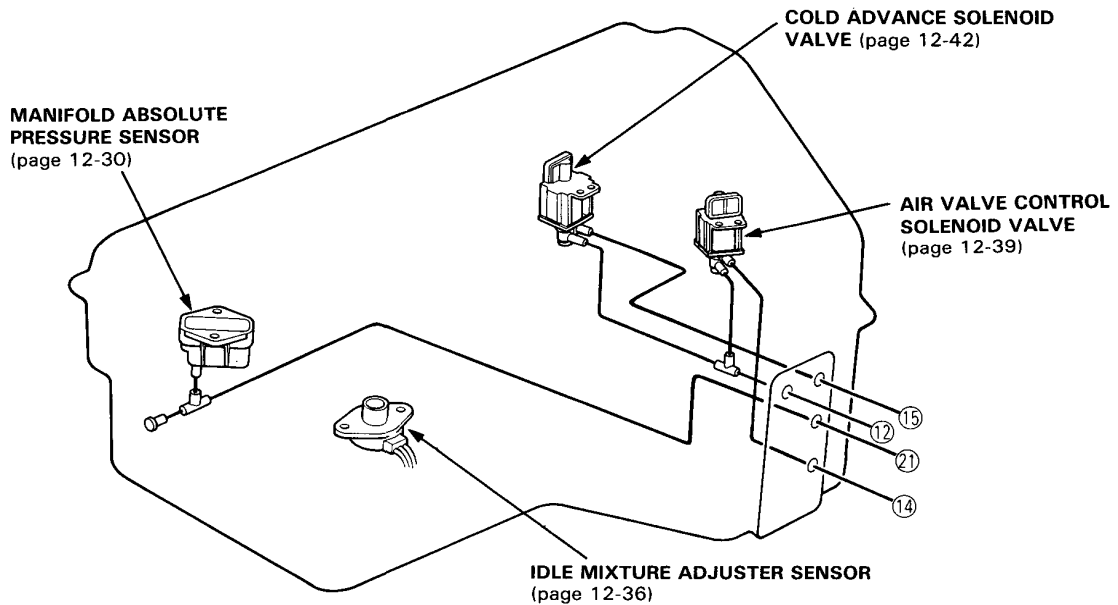
Interconnect Diagram



[Except KE model]

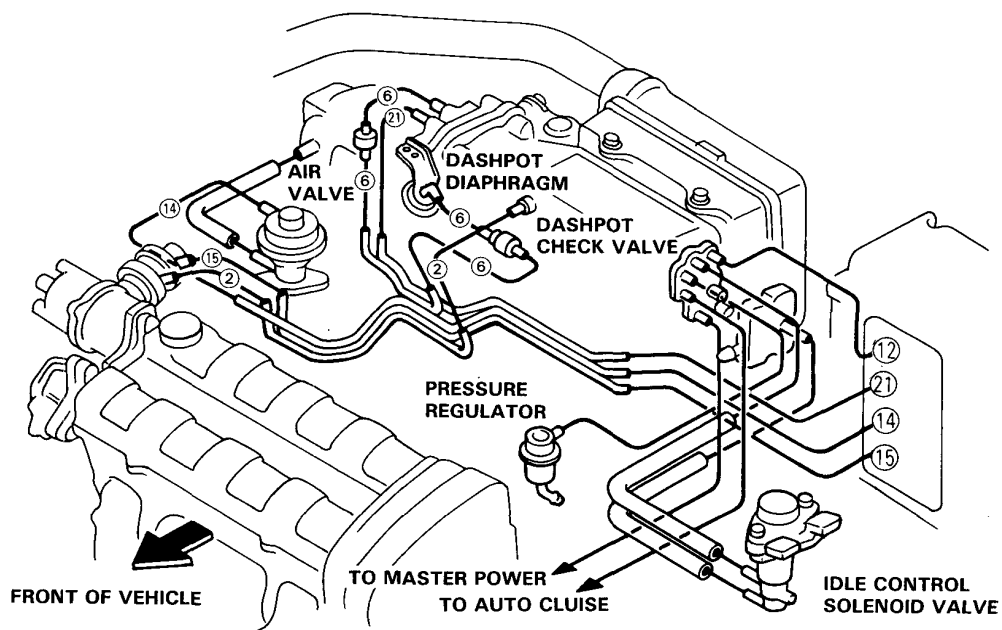


Control Box

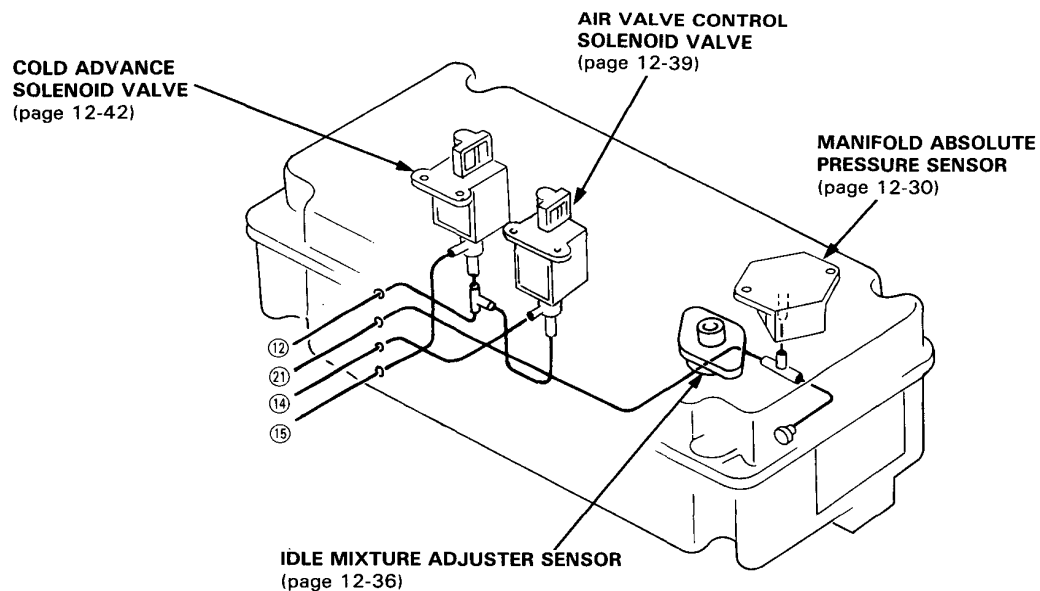


Interconnect Diagram

[KE model]



Control Box





Troubleshooting

Before starting troubleshooting on the PGM-FI system, check that other items that affect engine performance are within specification. Check the valve clearance, air cleaner, and PCV valve. In addition, check the ignition timing, function of the vacuum and centrifugal advance, and the condition of the spark plugs. If those items are all within specifications, begin with the troubleshooting listed.

PGM-FI

Troubleshooting

CAUSAL PART SYMPTOM		ECU	INJECTOR	FUEL PUMP	FUEL LINE	FAST IDLE MECHANISM	THROTTLE BODY	CRANK ANGLE SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR
V	ENGINE WON'T START	FAULTY ECU	• OPEN/SHORT CIRCUIT • DAMAGED INJECTORS	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• FROZEN FUEL LINE • BLOCKED FILTER			• OPEN/SHORT CIRCUIT • FAULTY SENSOR	
	DIFFICULT TO START ENGINE WHEN COLD	↑	• OPEN/SHORT CIRCUIT • FAULTY INJECTOR	↑	• ICE IN FUEL LINE • CLOGGED FILTER	STUCK AIR BYPASS VALVE		↑	
IRREGULAR IDLING	WHEN COLD	↑	• OPEN/SHORT CIRCUIT • STUCK INJECTOR			↑		↑	• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	AFTER WARMING UP	↑	↑			↑		↑	↑
	RPM TOO HIGH					↑	• IDLE ADJUSTING SCREW OUT OF ADJUSTMENT • THROTTLE VALVE STUCK OPEN		↑
	RPM TOO LOW						• IDLE ADJUSTING SCREW OUT OF ADJUSTMENT		
FREQUENT STALLING	WHILE WARMING UP	FAULTY ECU	• OPEN/SHORT CIRCUIT • STUCK INJECTOR	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• IMPROPER LINE PRESSURE • CLOGGED FILTER	STUCK AIR BYPASS VALVE			• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	AFTER WARMING UP	↑	↑	↑	↑		IDLE ADJUSTING SCREW OUT OF ADJUSTMENT	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	↑
POOR PERFORMANCE	POOR DRIVEABILITY HIGH FUEL CONSUMPTION	↑	↑	↑	↑	STUCK AIR BYPASS VALVE		↑	↑
	AFTERBURN	↑	↑						↑
	BACKFIRE	↑	↑	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• IMPROPER LINE PRESSURE • CLOGGED FILTER				↑
	KNOCKING	↑	↑	↑	↑				
	LACK OF POWER AT LOW RPM	↑	↑	↑	↑				
	LACK OF POWER AT MID RPM	↑	↑	↑	↑				• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	LACK OF POWER AT HIGH SPEED	↑		↑	↑				↑
WARNING/INDICATOR LIGHT TURNS ON	PGM-FI WARNING LIGHT	↑						• OPEN/SHORT CIRCUIT • FAULTY SENSOR	↑
	SELF DIAGNOSIS INDICATOR	↑						↑	↑

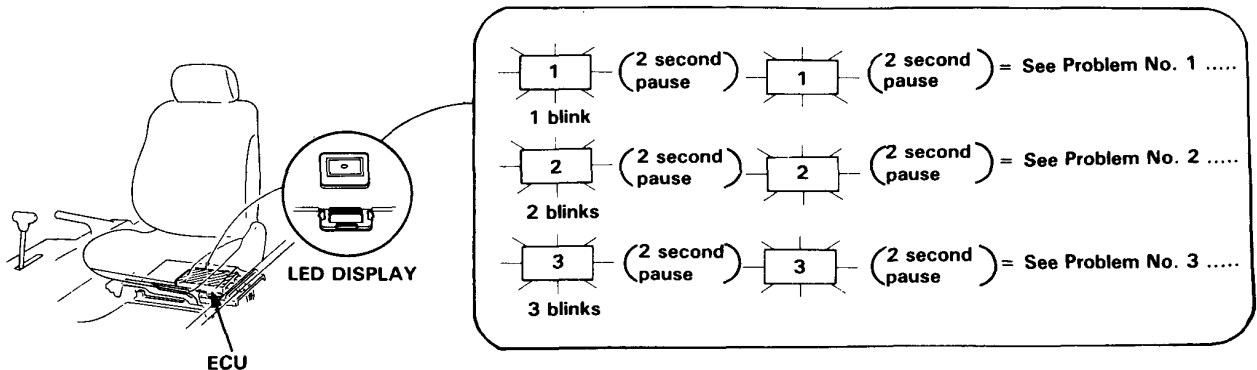


ATMOSPHERIC PRESSURE SENSOR	COOLANT TEMPERATURE SENSOR	THROTTLE ANGLE SENSOR	INTAKE AIR TEMPERATURE SENSOR	SECONDARY AIR SUPPLY SYSTEM	IDLE CONTROL SYSTEM	IDLE MIXTURE ADJUSTER SENSOR	IMPORTANT POINTS
							*CHECK FUEL PUMP/INJECTOR
(AT HIGH ALTITUDE) * OPEN/SHORT CIRCUIT * FAULTY SENSOR	* OPEN/SHORT CIRCUIT * FAULTY SENSOR						*CHECK FUEL PUMP/INJECTOR *POSSIBLE TO START BY OPERATING THROTTLE? (STUCK AIR BYPASS VALVE)
↑	↑						*CHECK IGNITION SYSTEM (SPARKS) AND EACH INJECTOR. POSSIBLE TO START BY OPERATING THROTTLE? (STUCK AIR BYPASS VALVE)
					FAULTY SOLENOID VALVE		↑
				FAULTY SOLENOID VALVE (STUCK OPEN)			*DISCONNECTED OR LEAKY VACUUM LINES *CHECK AIR BYPASS VALVE *CHECK SELF DIAGNOSIS INDICATOR
		SENSOR OUT OF ADJUSTMENT					
	* OPEN/SHORT CIRCUIT * FAULTY SENSOR		* OPEN/SHORT CIRCUIT * FAULTY SENSOR				*CHECK AIR BYPASS VALVE *CHECK COOLANT TEMPERATURE SENSOR
					* FAULTY SOLENOID VALVE (RPM DOWN)		*CHECK IDLE SPEED *CHECK FOR FUEL CUT-OFF OPERATION
	* OPEN/SHORT CIRCUIT * FAULTY SENSOR	* OPEN/SHORT CIRCUIT * FAULTY SENSOR	* OPEN/SHORT CIRCUIT * FAULTY SENSOR		FAULTY SOLENOID VALVE (STUCK OPEN)	OPEN/SHORT CIRCUIT	*CHECK IGNITION TIMING *CHECK FOR FUEL CUT-OFF OPERATION
	↑	↑					↑
	↑	↑					*CHECK IGNITION TIMING *CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR/ INJECTORS
	↑	↑					*CHECK IGNITION TIMING
	↑	↑					*CHECK IGNITION TIMING (DISCONNECTED OR BROKEN LINES) *CHECK INJECTORS
	↑	↑		↑			*CHECK IGNITION TIMING
							*CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR *CHECK IGNITION TIMING
* OPEN/SHORT CIRCUIT * FAULTY SENSOR	* OPEN/SHORT CIRCUIT * FAULTY SENSOR	* OPEN/SHORT CIRCUIT * FAULTY SENSOR	* OPEN/SHORT CIRCUIT * FAULTY SENSOR			* OPEN/SHORT CIRCUIT * FAULTY SENSOR	*CONSULT TROUBLESHOOTING CHART ON PAGE 12-21
↑	↑	↑	↑	↑		↑	↑

Self-Diagnosis Indicator

Troubleshooting

The PGM-FI system's ECU is equipped with a self-diagnosis function. When an abnormality is detected, the PGM-FI dash warning light comes on, and the LED display on the ECU blinks. The location of the PGM-FI control system's trouble can be diagnosed from the frequency of the LED display blinks.



The quick reference chart on the next page covers the failure modes and possible causes for the PGM-FI.

If you run through all the possible causes listed and the problem is still unsolved, go on to the more detailed troubleshooting on the following pages.

Sometimes the PGM-FI dash warning light and/or ECU LED display will come on, indicating a system problem, when, in fact, there is a bad or intermittent electrical connection. To troubleshoot bad connections, note the ECU LED display blink frequency, refer to the diagnosis chart on page 12-21 and check the connectors associated with the items mentioned in the "Possible Cause" column. Clean or repair connections if necessary.

NOTE:

- The memory for the "PGM-FI" dash warning light will be erased when the ignition switch is turned off; however, the memory for the LED display will not be cancelled. Thus, the warning light will not come on when the ignition is again turned on unless the trouble is once more detected. Troubleshooting should be done according to the LED display even if the warning light is OFF.

If the LED display fails to come on when the ignition switch is turned on again, check for:

- Blown No. 11 fuse in the engine compartment (also the fuse for the clock).
- Open circuit in White/Yellow wire between ECU A17 terminal and No. 11 fuse.

Then, if there is no problem, substitute a known-good ECU and re-check.

- Turn the ignition switch ON. The PGM-FI dash warning light should come on for about 2 seconds.

If the warning light won't come on, check for:

- Blown No. 2 fuse (also the fuse for the back-up lights, turn signals, and fuel gauge)
- Open circuit in Yellow wire between No. 2 fuse and combination meter.
- Open circuit in Green/Red wire between combination meter and ECU B6 terminal.
- Open circuit in Black wires between ECU A2, A4 and ground 1.
- Blown warning light bulb.

Then, if there is no problem, substitute a known-good ECU and re-check.

- After making repairs, disconnect the No. 11 fuse for at least 10 seconds to reset the ECU memory. After reconnecting the fuse, check that the LED display is turned off.



No. of LED Blinks between 2 second pauses	Dash warning light	Symptom	Possible cause
0		• Engine will not start	• Disconnected control unit ground wire • Faulty ECU
		• Engine will not start • No particular symptom shown	• Loose or poorly connected power line to ECU • Disconnected control unit ground wire • Short circuit in combination meter or warning light wire • Faulty ECU
3		• Fuel fouled plug • Frequent engine stalling • Hesitation	• Disconnected manifold absolute pressure sensor coupler • Short or open circuit in manifold absolute pressure sensor wire • Faulty manifold absolute pressure sensor
5		• Hesitation • Fuel fouled plug • Frequent engine stalling	• Disconnected manifold absolute pressure sensor piping
6		• High idle speed during warm-up • High idle speed • Hard starting at low temp	• Disconnected coolant temperature sensor coupler • Open or short circuit in coolant temperature sensor wire • Faulty coolant temperature sensor (thermostat housing)
7		• Poor engine response to opening throttle rapidly • High idle speed • Engine does not rev up when cold	• Disconnected throttle angle sensor coupler • Open or short circuit in throttle angle sensor wire • Faulty throttle angle sensor
8		• Engine does not rev up • High idle speed • Erratic idling	• Short or open circuit in crank angle sensor wire • Crank angle sensor wire interfering with spark plug wires • Crank angle sensor at fault
9		• Same as above	• Same as above
10		• High idle speed • Erratic idling when very cold	• Disconnected intake air temperature sensor • Open or short circuit in intake air temperature sensor wire • Faulty intake air temperature sensor
11		• No particular symptom shown • High idle speed	• Disconnected idle mixture adjuster sensor coupler • Shorted or disconnected idle mixture adjuster sensor wire • Faulty idle mixture adjuster sensor
13		• Poor acceleration at high altitude • Hard starting at high altitude when cold	• Disconnected atmospheric pressure sensor coupler • Shorted or disconnected atmospheric pressure sensor wire • Faulty atmospheric pressure sensor

NOTE:

- If the number of blinks between 2 second pauses otherwise above, or if the LED indicator stays on, substitute a known-good ECU and re-check. If the indication goes away, replace the original ECU.
- Some failure indications (such as , one blink) require the full test procedures on the following pages to confirm that the failure has or has not been eliminated.

(cont'd)

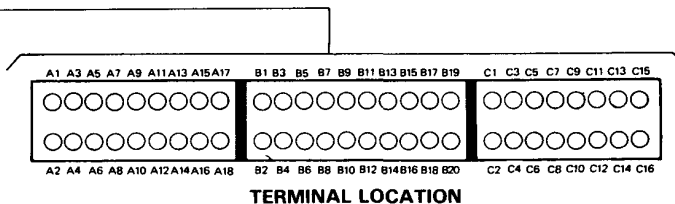
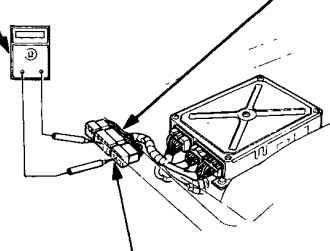
Self-Diagnosis Indicator

Troubleshooting (cont'd)

Use the system checker harness and digital circuit tester to check the system.

**DIGITAL
CIRCUIT
TESTER**
07411-0020000

SYSTEM CHECKER HARNESS
07999-PD6000A



Self-diagnosis indicator remains off — The dash warning light is not lit.

Connect the system checker harness between the ECU and connector.

Check for continuity between the A2 (Black), the A4 (Black) terminals and body ground.

Does continuity exist?

NO

Faulty ground circuit at GND 1.

YES

Substitute a known-good ECU and re-check.
If symptom goes away, replace the original ECU.
If symptom does not go away, check to see if the dash warning light is on and the LED indicator is now blinking, and troubleshoot the true cause.



Self-diagnosis indicator remains off — The dash warning light is lit.

Connect the system checker harness between the ECU and connector.

Check for continuity between the A16 (Brown/Black), the A18 (Black/Red) terminals and body ground.

Does continuity exist?

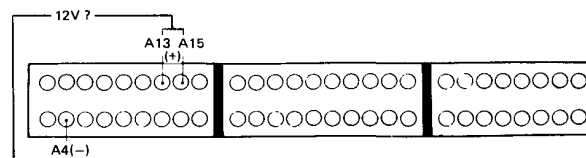
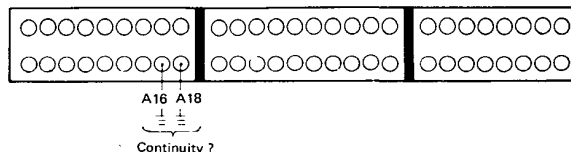
NO

Faulty ground circuit at GND 2.

YES

Turn the ignition switch ON.

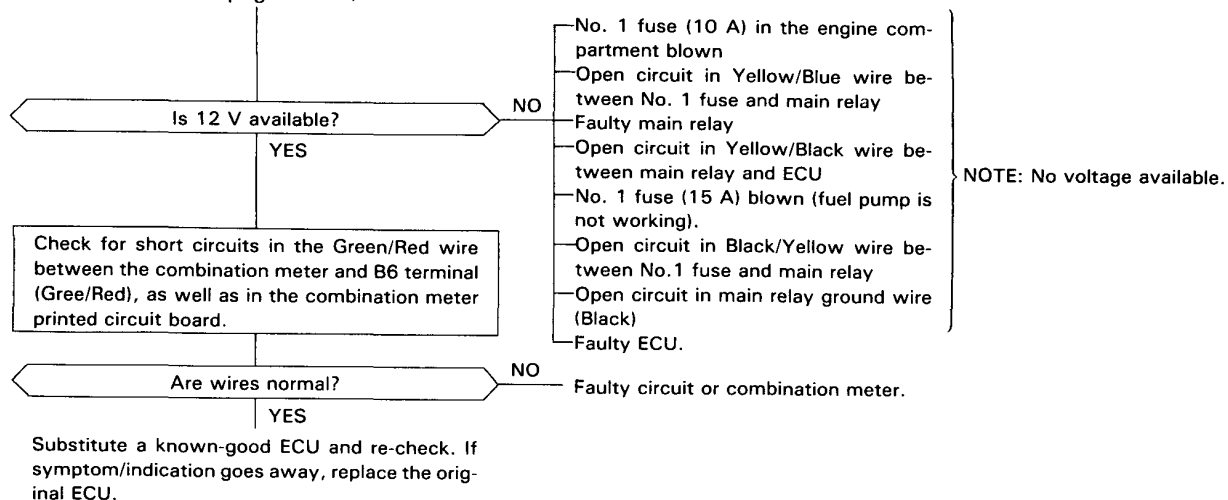
Measure voltage between A15 (Yellow/Black (+)), the A13 (Black/Yellow (+)) terminals and the A4 terminal (Black (-)).



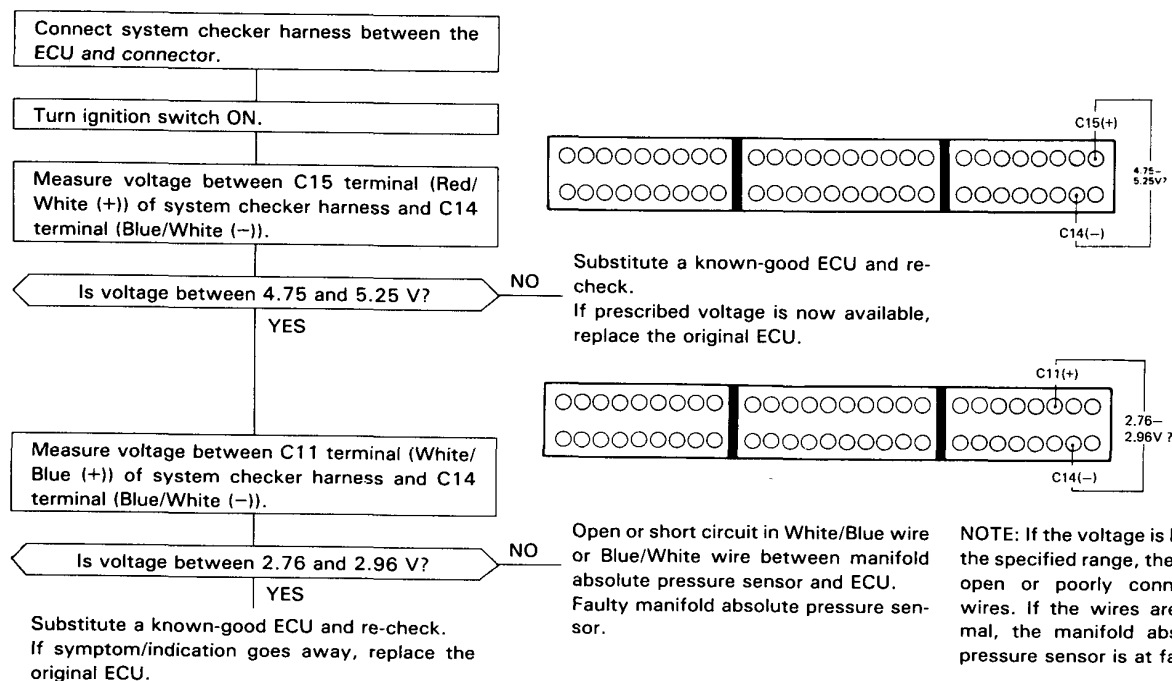
(To page 12-23)



(From page 12-22)



3 Self diagnosis indicator blinks three times.



(cont'd)

Self-Diagnosis Indicator

Troubleshooting (cont'd)



Self diagnosis indicator blinks five times.

Check that the manifold absolute pressure sensor pipe is connected securely.

NOTE: Also check hose routing inside control box.

Is routing normal?

NO

Reconnect routing

YES

Disconnect pipe from manifold absolute pressure sensor and plug open end.

Disconnect vacuum hose #21 from throttle body.

Connect hand vacuum pump to vacuum hose #21 and check for a leak.

Is vacuum maintained?

NO

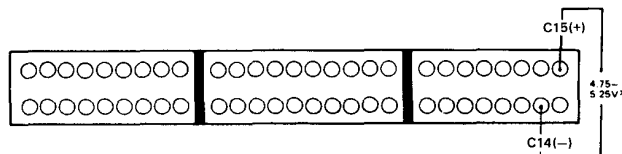
Replace vacuum hose.

YES

Connect system checker harness between the ECU and connector.

Turn ignition switch ON.

Measure voltage between C15 terminal (Red/White (+)) of system checker harness and C14 terminal (Blue/White (-)).



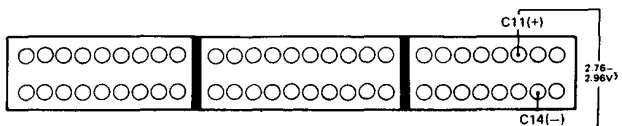
Is voltage between 4.75 and 5.25 V?

NO

Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

YES

Measure voltage between C11 terminal (White/Blue (+)) of system checker harness and C14 terminal (Blue/White (-)).



Is voltage between 2.76 and 2.96 V?

NO

Open or short circuit in White/Blue or Blue/White wire between manifold absolute pressure sensor and ECU.
Faulty manifold absolute pressure sensor.

YES

Connect hand vacuum pump to manifold absolute pressure sensor.

Check that voltage changes as vacuum is applied.

NOTE: If there is no voltage, or if voltage is low, check for a shorted wire.
If voltage is high, wire may be open or bad contact.
If wire is normal, manifold absolute pressure sensor is at fault.

Has voltage changed?

NO

Faulty manifold absolute pressure sensor

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.



6 Self diagnosis indicator blinks six times.

Connect system checker harness between the ECU and connector.

Warm up engine until radiator fan comes on twice.

Measure voltage between C6 terminal (Yellow/Green (+)) of system harness checker and C12 terminal (Green/White (-)).

Is voltage between 0.50 and 0.90 V?

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

NO

Stop engine.

Check for open or short circuit in Yellow/Green and Green/White wires between coolant temperature sensor and the ECU.

Are wires normal?

NO

Faulty wires

YES

Check coolant temperature sensor (page 12-31).

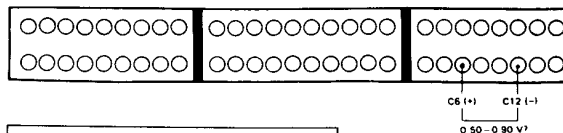
Is sensor normal?

NO

Faulty coolant temperature sensor

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.



NOTE: If there is no voltage or if voltage is low, check for shorted wire. If voltage is high, wire may be open or bad contact.

(cont'd)

Self-Diagnosis Indicator

Troubleshooting (cont'd)

7

Self diagnosis indicator blinks seven times.

Connect system checker harness between ECU and connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (-)).

Is 4.75—5.25 V attained?

NO

YES

Connect voltmeter positive probe to C7 terminal (Red/Yellow), and negative probe to C12 terminal (Green/White (-)) of system checker harness.

Operate accelerator pedal from fully closed to fully open.

Check that 0.4—0.6 V is available at fully closed, and 4.3—4.8 V at fully open.

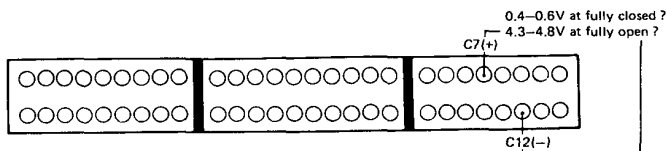
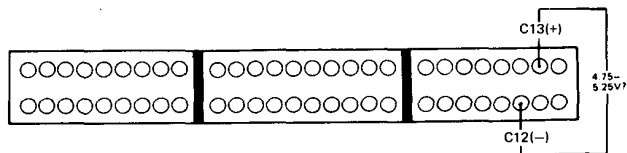
Are voltages within above ranges?

NO

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.



Check for short or open circuit in Red/Yellow and Green/White wires between the ECU and throttle angle sensor.

Are wires normal?

NO

Replace wires

YES

Adjust or replace throttle angle sensor (page 12-39).

8

Self diagnosis indicator blinks eight times.

Check for open or short circuit in Orange/Blue and White/Blue wires between the ECU and crank angle sensor.

Are wires normal?

NO

Replace wires

YES

Check crank angle sensor (page 12-33).

Does crank angle sensor operate properly?

NO

Faulty crank angle sensor

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

NOTE: Check that crank angle sensor harness is not interfering with the spark plug wires.



9

Self diagnosis indicator blinks nine times.

Check for open or short circuit in Orange and White wires between the ECU and crank angle sensor.

NOTE: Check that sensor harness is not interfering with the spark plug wires.

Are wires normal?

NO

Replace wires

YES

Check crank angle sensor (page 12-33).

Is sensor normal?

NO

Faulty crank angle sensor

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

10

Self diagnosis indicator blinks ten times.

Connect system checker harness between the ECU and harness connector.

Attach voltmeter positive probe to C5 terminal (White/Red), and negative probe to C12 terminal (Green/White) of system checker harness.

Turn ignition switch ON.

Check that voltage is correct for the intake air temperature.

Is voltage correct?

NO

Turn ignition switch OFF.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

Check for open or short circuit in White/Red and Green/White wires between intake air temperature sensor and the ECU.

Are wires normal?

NO

Faulty wires

YES

Check intake air temperature sensor (page 12-31).

Is sensor normal?

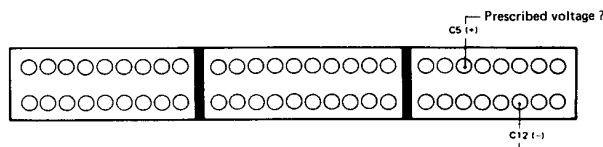
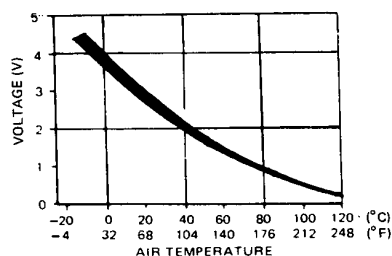
NO

Faulty intake air temperature sensor

YES

Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

NOTE: If voltage is low, or there is no voltage, check wires for short circuit. If voltage is high, probability is open or bad contact.



(cont'd)

Self-Diagnosis Indicator

Troubleshooting (cont'd)

11 Self diagnosis indicator blinks eleven times

Connect system checker harness between the ECU and harness connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (-)).

Is 4.75–5.25 V available?

NO

Replace ECU

YES

Measure voltage between B20 terminal (Brown (+)) of system checker harness and C12 terminal (Green/White (-)).

Is 0.3–4.9 V available?

NO

Turn Ignition switch OFF.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Check for open or short circuit in Brown and Green/White wires between idle mixture adjuster sensor and the ECU.

Are wires normal?

NO

Faulty wires.

YES

Check idle mixture adjuster sensor (page 12-36).

Does sensor operate properly?

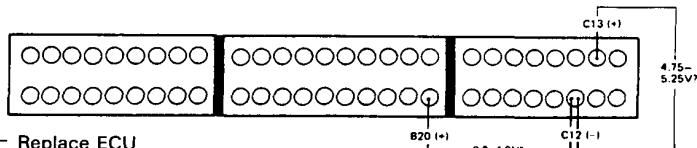
NO

Faulty idle mixture adjuster sensor.

YES

Substitute a known-good ECU and re-check.

If symptom/indication goes away, replace the original ECU.



NOTE: If there is no voltage, check for short circuit in the wires. If voltage is high, probability is open or bad contact.



13

Self diagnosis indicator blinks thirteen times.

Connect system checker harness between the ECU and harness connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (-)).

Is 4.75–5.25 V available?

NO

YES

Measure voltage between C9 terminal (Red (+)) of system checker harness and C12 terminal (Green/White (-)).

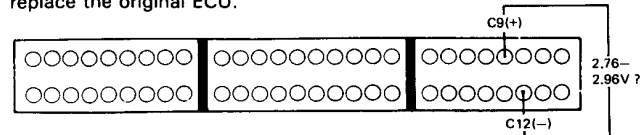
Is 2.76–2.96 V available?

NO

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.



Check for open or short circuit in Red and Green/White wires between atmospheric pressure sensor and the ECU.

Are wires normal?

NO

Faulty wires.

YES

Check atmospheric pressure sensor (page 12-36).

Does sensor operate properly?

NO

Faulty atmospheric pressure sensor.

YES

Substitute a known-good ECU and re-check.

If prescribed voltage is now available, replace the original ECU.

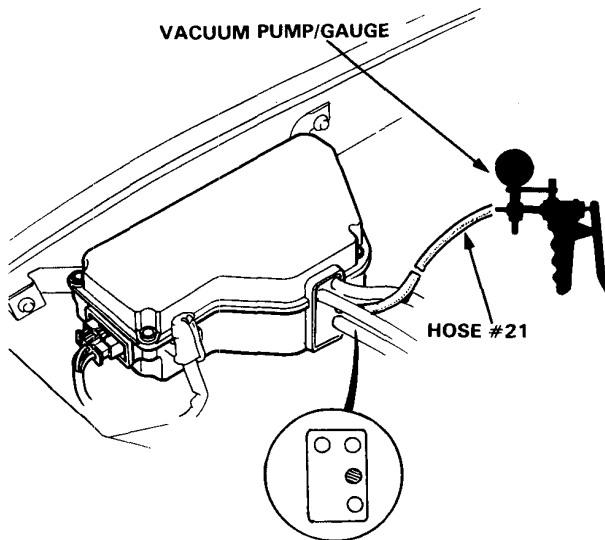
NOTE: If there is no voltage, check for a short circuit. If voltage is high, wires may be open or bad contact.

Sensors

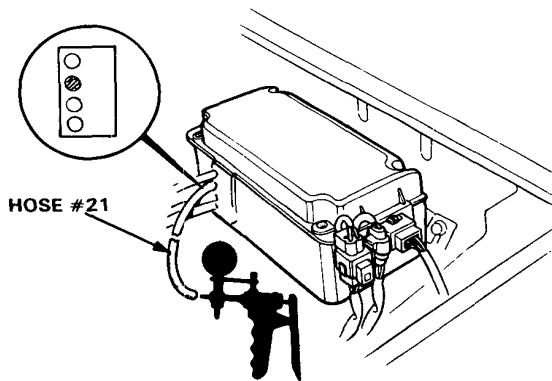
Manifold Absolute Pressure (MAP) Sensor

1. Disconnect the vacuum hose #21 from the throttle body; plug the opening in the throttle body. Connect a vacuum pump to the open end of the vacuum hose.

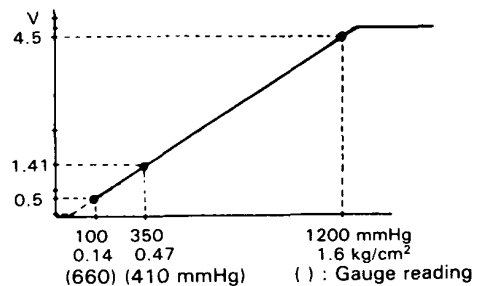
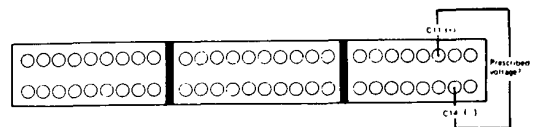
[Except KE model]



[KE model]



2. Disconnect the connector from the control unit. Connect the system checker harness (No. 07999—PD6000A) between the control unit and wire harness connector.
3. Turn the ignition switch ON. Connect a digital voltmeter positive probe to the C11 terminal of the system checker harness and negative probe to the C14 terminal. Measure the voltage between the two terminals.



Voltmeter should indicate voltage along with the chart above.

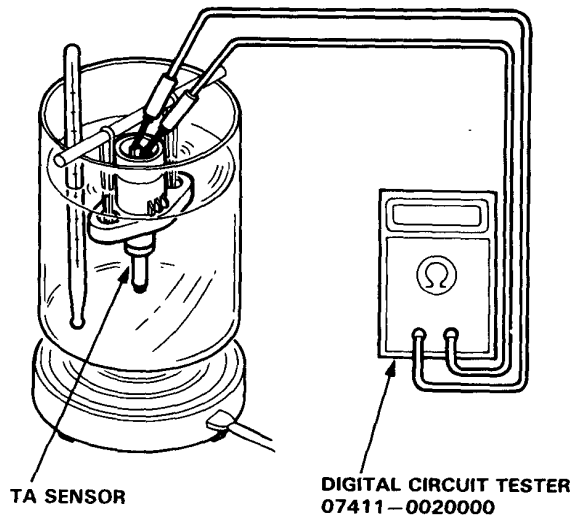
- If the voltage is incorrect, check the vacuum hose for leakage, and wires between the control unit and sensor for open or short circuit. Replace the sensor if the wires are normal.



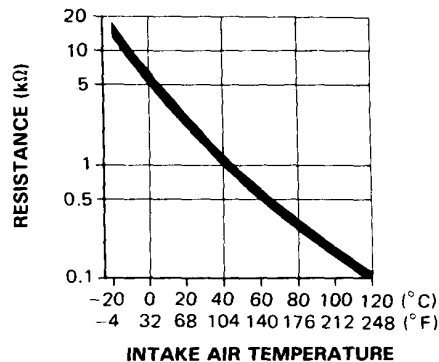
Intake Air Temperature (TA) Sensor

1. Disconnect the connector, then remove the TA sensor from the intake manifold.
2. To test the sensor, suspend it in cold water and heat the water slowly. Make sure more than half of the connector is submerged. Measure the resistance between the terminals.

STANDARDS: 0.98 – 1.34 k Ω at 40°C (104°F)
0.22 – 0.35 k Ω at 80°C (176°F)



3. The chart below shows the change in resistance over a range of intake air temperature.



- Replace the sensor if resistance is outside the range.

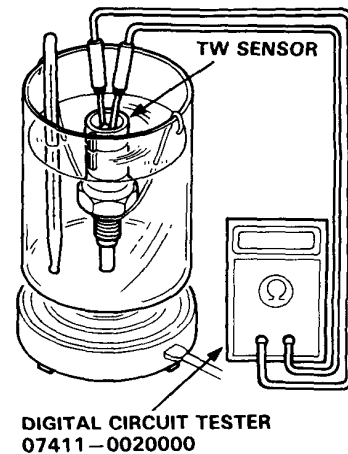
NOTE:

- Don't let the sensor touch the bottom of the container.
- During the test, stir the water in the container to ensure even temperature.

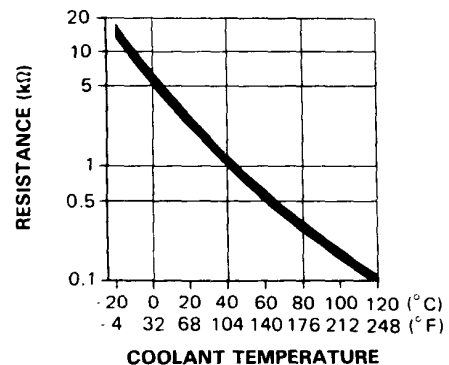
Coolant Temperature (TW) Sensor

1. Disconnect the connector, then remove the TW sensor from the thermostat housing.
2. To test the sensor, suspend it in cold water and heat the water slowly. Make sure more than half of the connector is submerged. Measure the resistance between the terminals.

STANDARDS: 0.98 – 1.34 k Ω at 40°C (104°F)
0.22 – 0.35 k Ω at 80°C (176°F)



3. The chart below shows the change in resistance over a range of coolant temperature.



- Replace the sensor if resistance is outside the range.
- On installing the sensor, torque to:
28 N·m (2.8 kg·m, 20 lb·ft)

NOTE:

- Don't let the sensor touch the bottom of the container.
- During the test, stir the water in the container to ensure even temperature.

Sensors

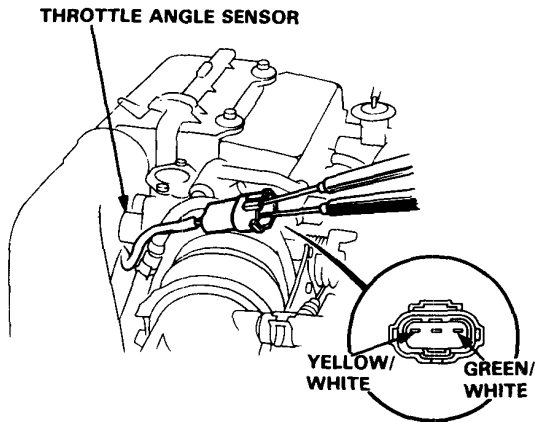
Throttle Angle Sensor

Testing/Removal:

CAUTION: The throttle stop screw is non-adjustable.

1. Disconnect the connector of the throttle angle sensor.
2. Measure full resistance between the Yellow/White terminal and Green/White terminal at the sensor.

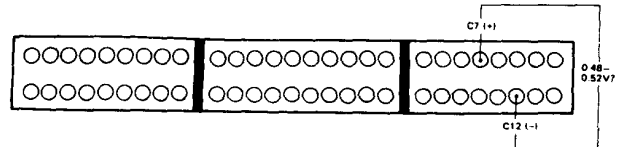
Resistance should be: 4–6 k Ω



- If the resistance is outside the above range, adjust the installation position of the sensor and re-test. Replace if necessary.

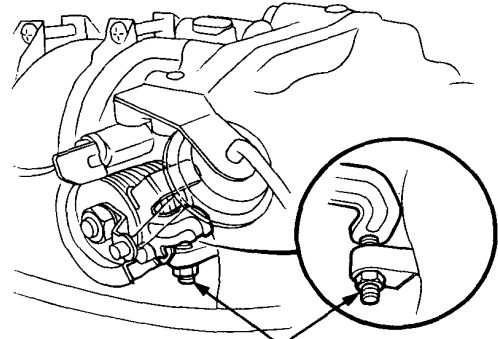
Installation:

1. Align the pin of the sensor with the throttle valve shaft groove and tighten temporarily.
2. Disconnect the control unit connectors and connect the System Checker Harness (NO. 07999–PD6000A) between the control unit and wire harness connector.
3. Connect a digital voltmeter positive probe to C7 terminal of the system checker harness and negative probe to C12 terminal.

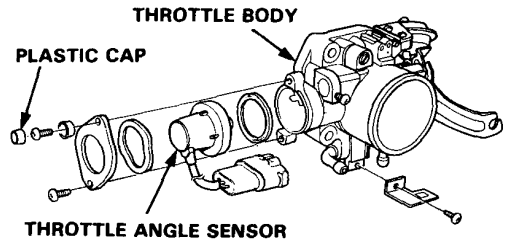


4. With the ignition switch turned ON, adjust the sensor to a position where the throttle stop lever just touches the stop screw. Then measure the voltage between the two terminals.

There should be: 0.48–0.52 V



5. If the voltage is within specification, tighten the screws provisionally.



6. After reassembling the sensor, test the deceleration fuel cut-off system.
 - If the deceleration fuel cut-off system is OK, tighten the screws.
 - If the deceleration fuel cut-off system does not work, repeat steps 1 through 5 and check the voltage.



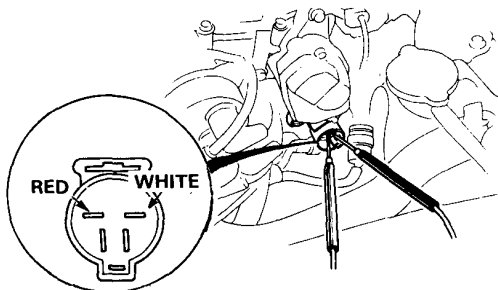
Crank Angle Sensor Inspection

NOTE: If either the CYL or TDC sensor tests bad, replace the crank angle sensor coil assembly.

CYL Sensor Inspection

1. Disconnect the connector of the crank angle sensor.
2. Measure the resistance between the White terminal and Red terminal at the sensor.

Resistance should be: 0.65–0.85 k Ω

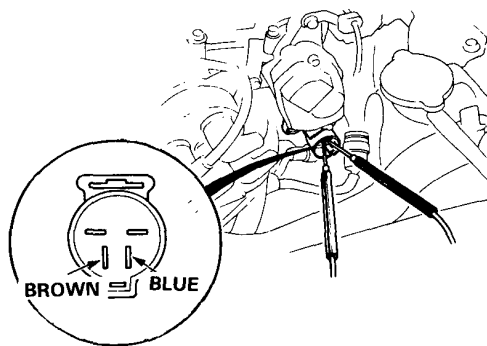


3. Measure the resistance between the White and Red terminals, and crank angle sensor housing. Resistance should be: 100 k Ω or more

TDC Sensor Inspection

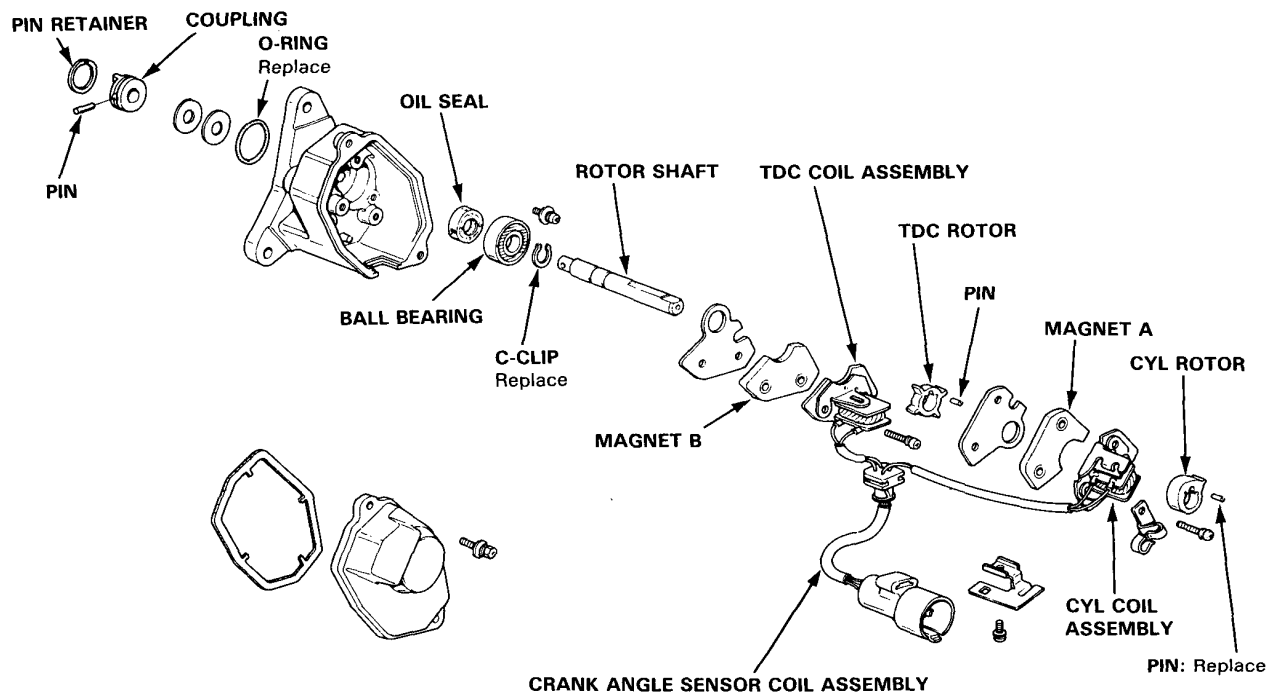
1. Disconnect the connector of the crank angle sensor.
2. Measure the resistance between the Brown terminal and Blue terminal at the sensor.

Resistance should be: 0.65–0.85 k Ω



3. Measure the resistance between the Brown and Blue terminals, and crank angle sensor housing. Resistance should be: 100 k Ω or more

Crank Angle Sensor Disassembly

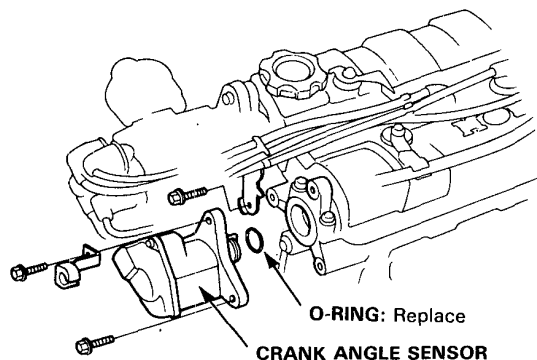


(cont'd)

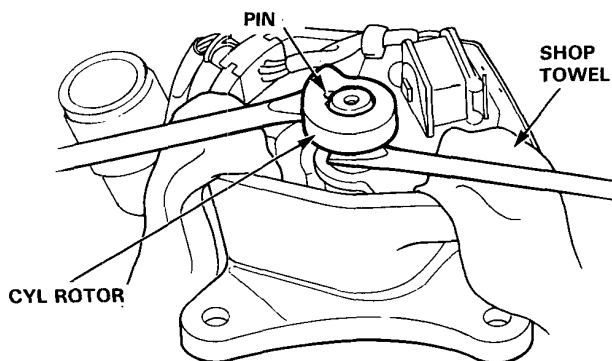
Sensors

Crank Angle Sensor Disassembly (cont'd)

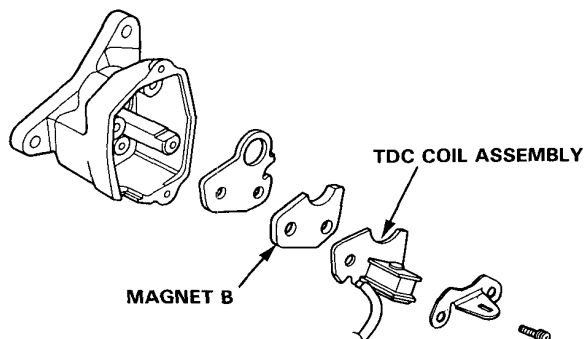
1. Remove the crank angle sensor from the engine.



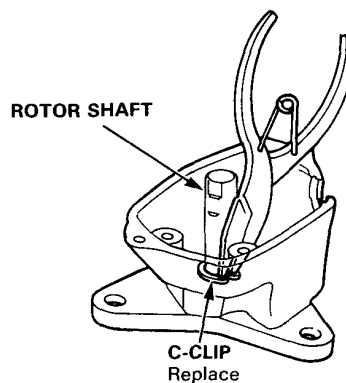
2. Carefully pry up the CYL rotor by using two screwdrivers as shown. Do not damage the CYL rotor.



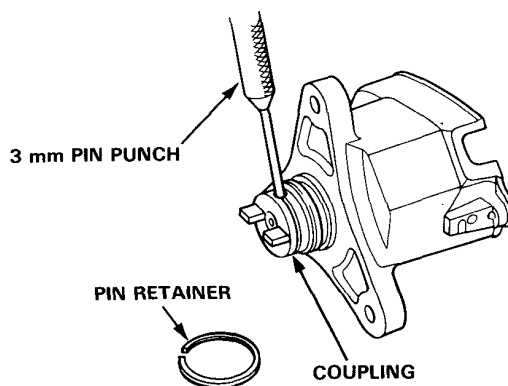
3. Pull the CYL coil assembly and magnet A out from the rotor shaft by removing the screws.
4. Pry up the TDC rotor in the same order of prying up the CYL rotor.
5. Pull the TDC coil assembly and magnet B out from the rotor shaft by removing the screws.



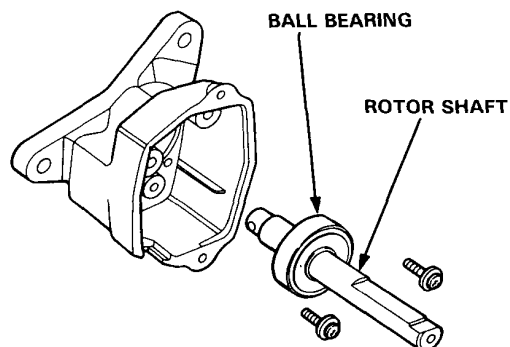
6. Remove the C-clip.



7. Slide off the pin retainer being careful not to stretch it.
8. Separate the coupling from the shaft by removing the roll pin as shown.



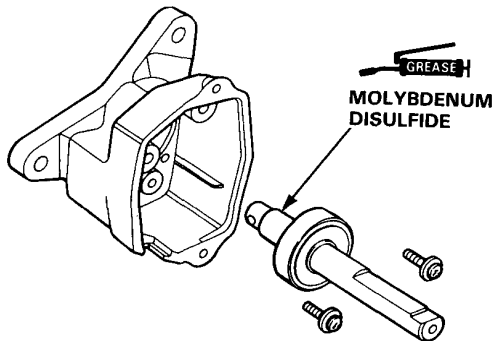
9. Remove the ball bearing and rotor shaft as an assembly by removing the screws.



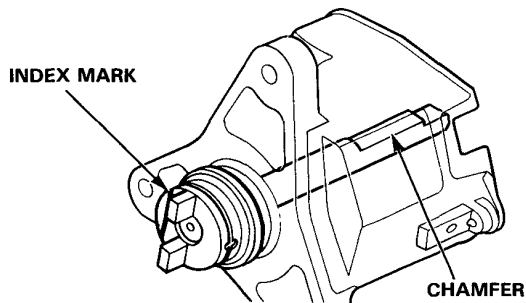


Crank Angle Sensor Reassembly

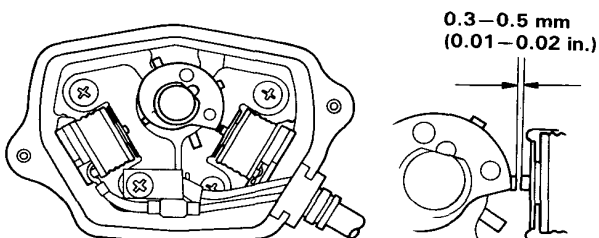
1. Apply a molybdenum disulfide grease to the tip of the rotor shaft, then install it on the sensor housing with 4 mm screws.



2. Install the coupling with its index mark facing in the direction shown, install the pin, and install the pin retainer.

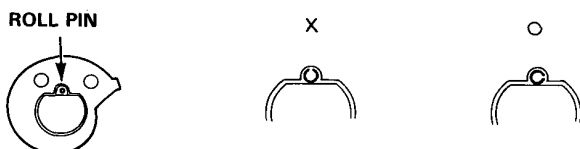


3. Install a new C-clip on the rotor shaft.
4. Install the TDC coil assembly and TDC rotor so that the air gap is 0.3–0.5 mm (0.01–0.02 in.), then install the CYL coil assembly and CYL rotor in the same way.



NOTE:

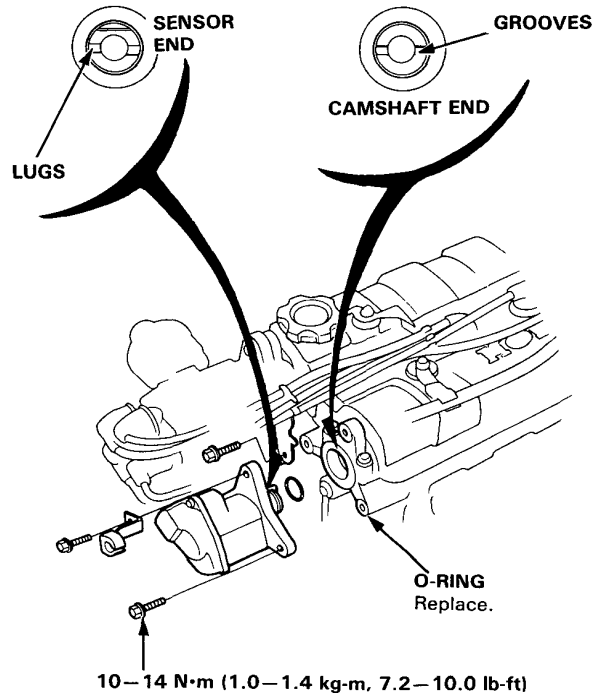
- Install the rotors with the part number facing up.
- Install the roll pin so that it faces as shown below.



Crank Angle Sensor Installation

1. Install a new O-ring on the sensor housing.
2. Slip the sensor into the position.

NOTE: The lugs on the end of the sensor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.



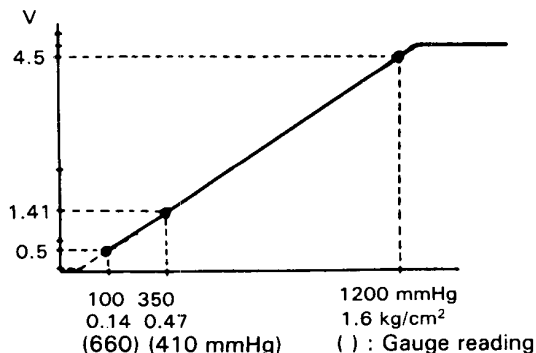
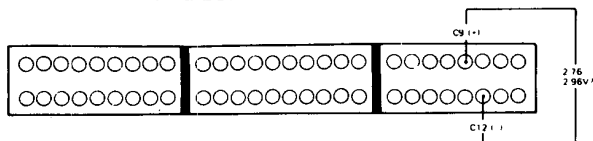
Sensors

Atmospheric Pressure (PA) Sensor

NOTE: Check the sensor at the ECU connector.

1. Disconnect the wire harness connector from the control unit and connect the system checker harness (No. 07999—PD6000A) to the control unit and wire harness connector.
2. Turn the ignition switch ON. Connect a digital voltmeter positive probe to the C9 terminal of the system checker harness and negative probe to the C12 terminal.

There should be: 2.76—2.96 V

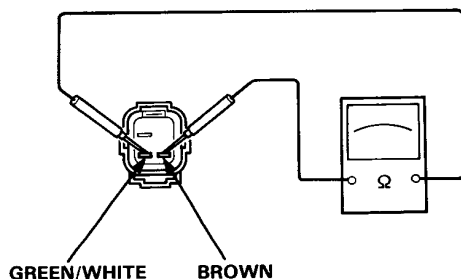
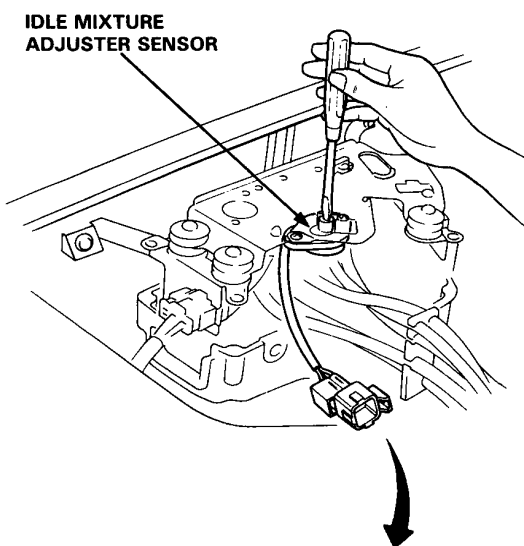


- If voltage is outside ranges, check for open or short circuit between the ECU and PA sensor. Replace the PA sensor with a new one if the wires are in good condition.
- On installing the sensor, torque to: 5 N·m (0.5 kg-m, 4 lb-ft)

Idle Mixture Adjustor (IMA) Sensor

1. Open the control box lid and disconnect the connector of the IMA sensor at the control box.
2. Turning the adjusting screw on the sensor fully, measure resistance between the Brown terminal and the Green/White terminal at the sensor.

Resistance should be: 0.25—6.2 KΩ



- If resistance is outside above ranges, replace IMA sensor.

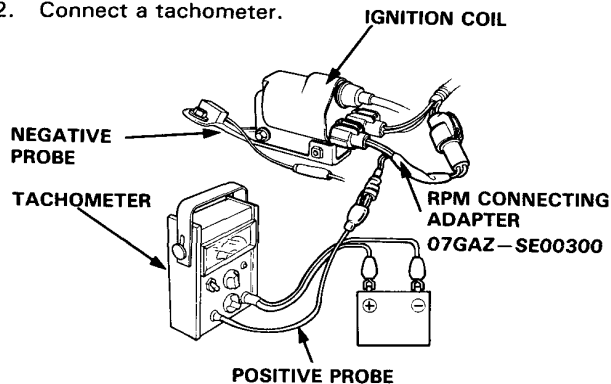
NOTE: Whenever the inspection or the replacement of IMA sensor is performed, check specification for CO.

Idle Speed

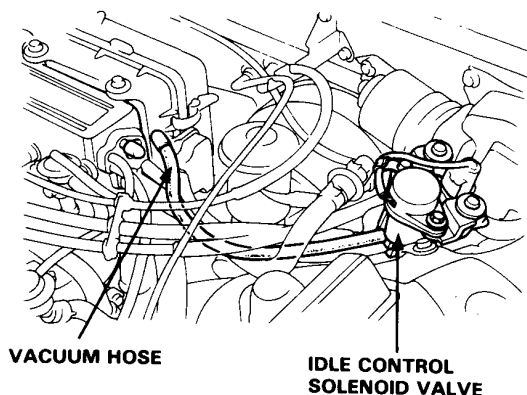


Inspection/Adjustment

1. Start the engine and warm it up to normal operating temperature (the cooling fan goes on twice).
2. Connect a tachometer.



3. Disconnect the upper vacuum hose of the idle control solenoid valve (between the valve and intake manifold) from the intake manifold.
4. Cap the end of the hose and intake manifold.

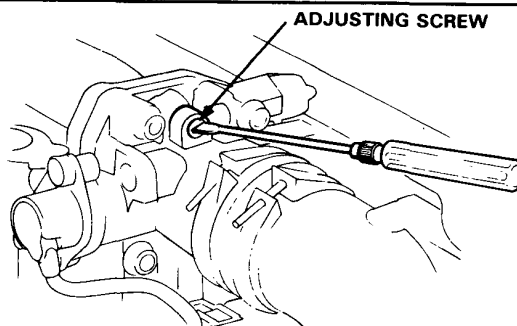


5. Adjust the idle speed with headlights, heater blower, rear window defroster, cooling fan and air conditioner off.

Idle Speed should be:

$800 \pm 50 \text{ min}^{-1} \text{ (rpm)}$

Adjust the idle speed, if necessary, by turning the adjusting screw on the top of the throttle body.

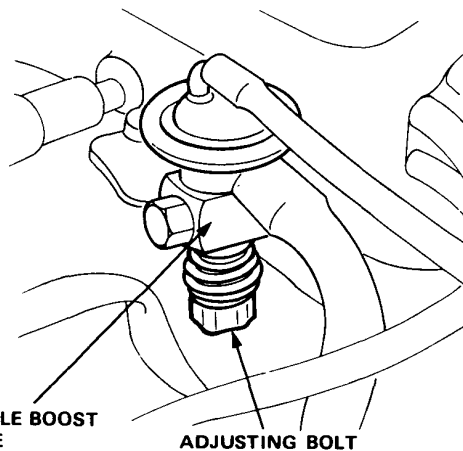


6. Check the idle speed with heater fan switch at HI (right end) and air conditioner on.

Idle Speed should be:

$800 \pm 50 \text{ min}^{-1} \text{ (rpm)}$

Adjust idle speed, if necessary, by turning the adjusting bolt on the A/C idle boost valve.



7. After adjustment, connect the idle control solenoid valve vacuum hose.
9. Check the idle speed with headlights, heater blower, rear window defroster, and cooling fan on but air conditioner off.

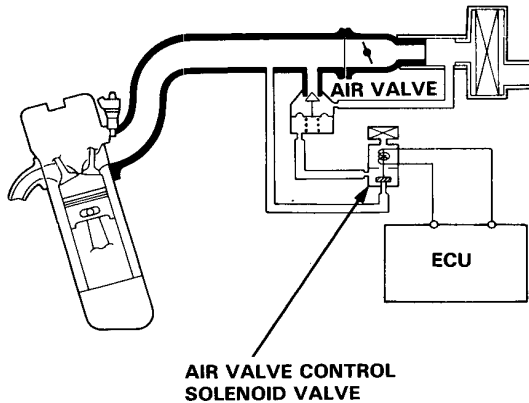
It should be the same as normal idle speed.

NOTE: If the idle speed is not within specifications, see Troubleshooting.

Secondary Air Supply System

Description

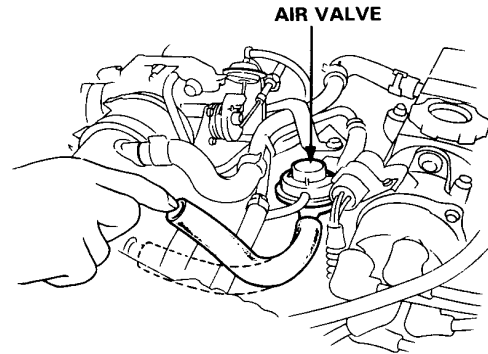
At deceleration, the ECU causes the air control solenoid valve to open the air valve. This supplies secondary air into the intake manifold, preventing rise in negative pressure in the manifold.



Inspection

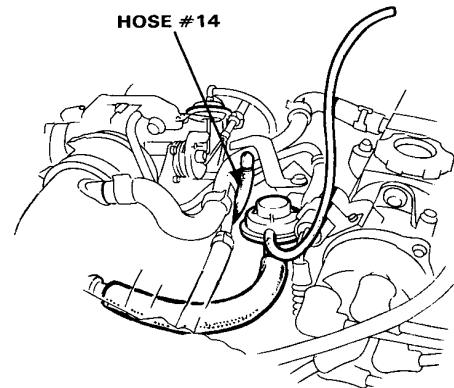
Air Valve

1. Start the engine and warm up the engine to normal operating temperature (the cooling fan comes on).
2. Raise the engine speed to around 4,000 min⁻¹ (rpm).
3. Check for vacuum at the accelerator pedal released.



- If there is no vacuum, go to step 4.

4. Disconnect the #26 vacuum hose from the air valve.



5. Raise the engine speed to around 4,000 min⁻¹ (rpm).
 6. Check for vacuum at the accelerator pedal released.
There should be vacuum.
- If there is vacuum, replace the air valve and re-test.
 - If there is no vacuum, air valve control solenoid valve.



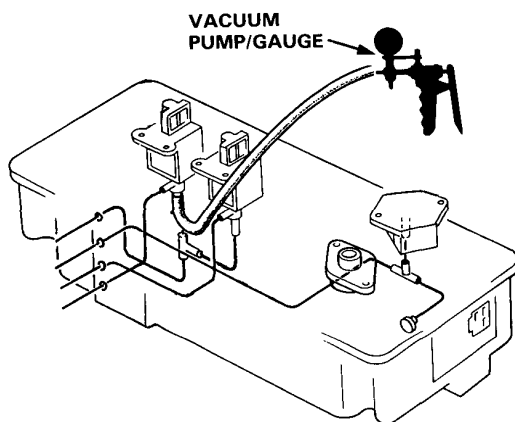
Air Valve Control Solenoid Valve

1. Open the control box lid and disconnect the rectangular connector from the control box.
2. Disconnect the lower vacuum hose of the air valve control solenoid valve (between the solenoid valve and the three-way joint) from the joint.
3. Apply vacuum to the hose.

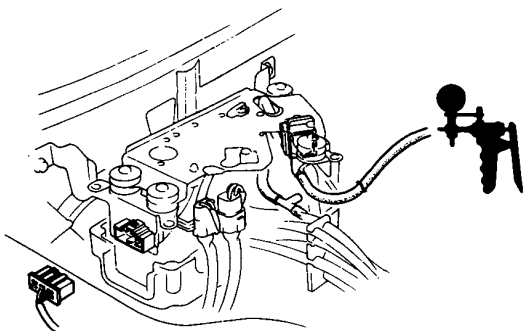
It should hold vacuum.

- If it does not hold vacuum, replace the valve.

[KE Model]



[Other Models]



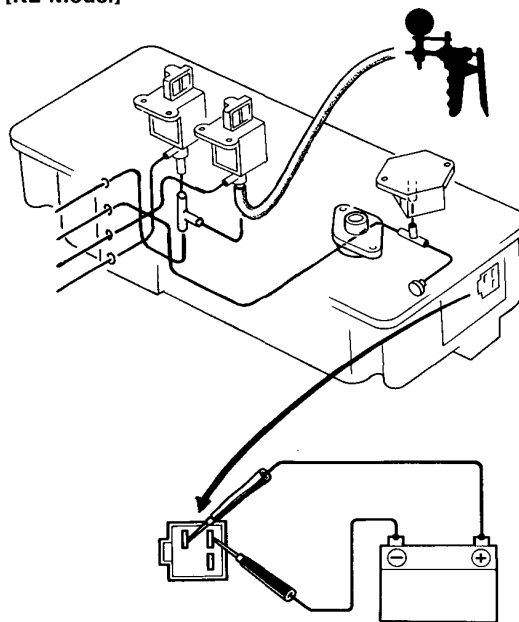
4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler, and the negative terminal to the Orange terminal.

5. Apply vacuum to the hose.

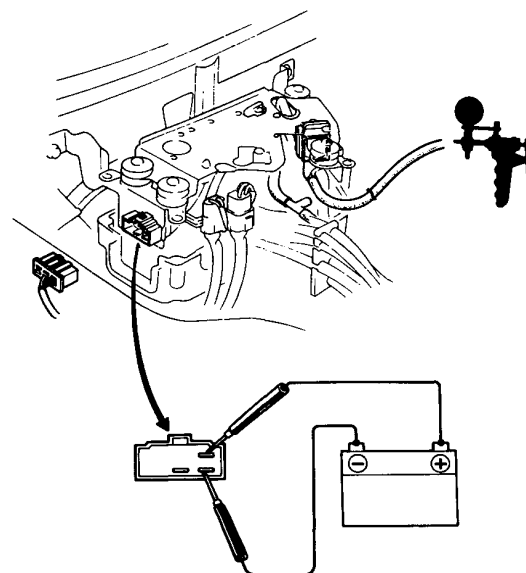
It should not hold vacuum.

- If it holds vacuum, replace the valve.

[KE Model]



[Other Models]

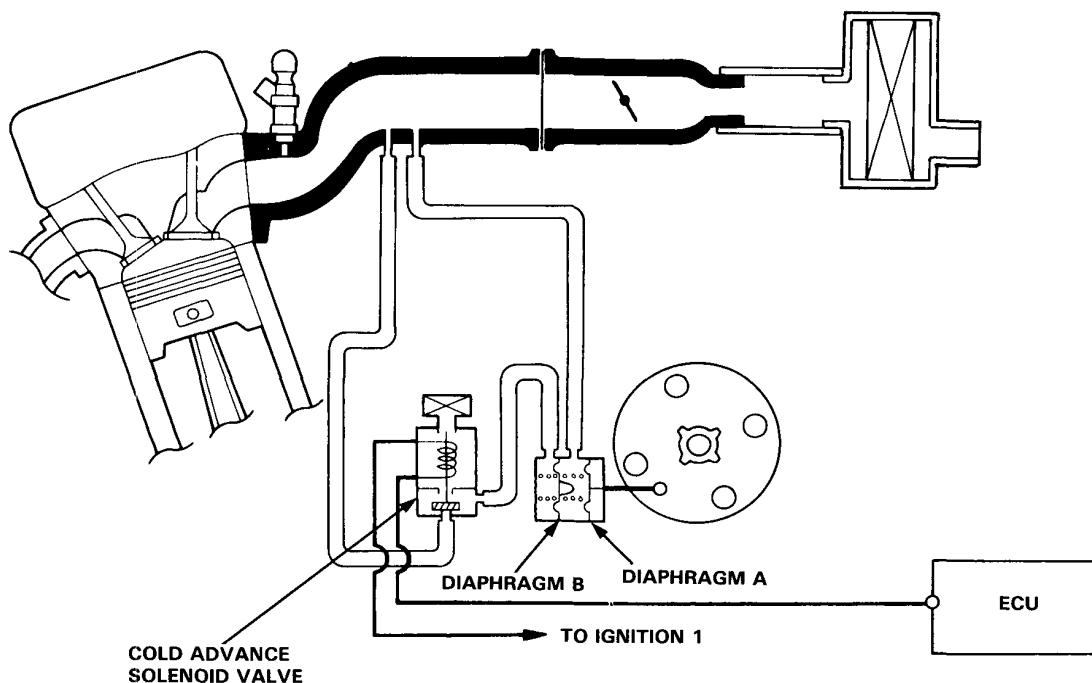


Ignition Timing Controls

Description

Ignition timing control, combined with the internal distributor control (centrifugal advance), affects the time at which each spark plug ignites the air-fuel mixture, in accordance with engine speed, load and coolant temperature. This control system gives vacuum advance in response to the manifold vacuum and coolant temperature. This optimizes ignition timing during and after engine warm-up to control emission levels while maximizing fuel economy and engine performance.

The distributor has two separate vacuum advance diaphragms which operate on manifold vacuum. Diaphragm B also has a solenoid valve (cold advance solenoid valve) in the line. It is operated by the control unit which receives signals from the engine coolant temperature, engine speed and manifold vacuum. When the solenoid valve is open, it sends vacuum to Diaphragm B to improve cold engine performance.





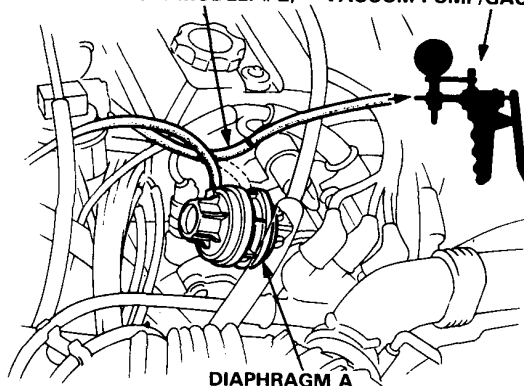
Inspection

NOTE:

- Engine coolant temperature must be below 60°C (140°F).
- Intake air temperature must be below 20°C (68°F).

1. Disconnect vacuum hose #12 (KE Model: #2) from the vacuum advance diaphragm A on the distributor and connect a vacuum pump/gauge to the hose.

HOSE #12 (KE MODEL: #2) VACUUM PUMP/GAUGE



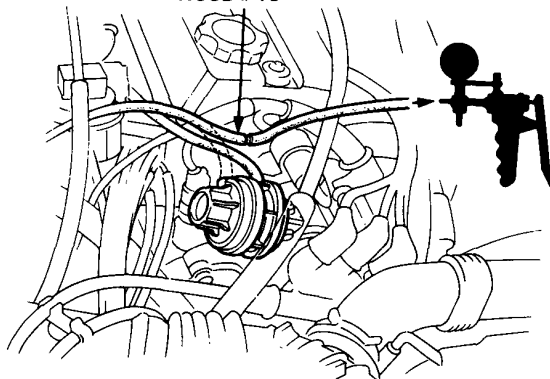
2. Start the engine, allow it to idle and check for vacuum.

There should be vacuum.

- If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose and re-test.
- If there is vacuum, go on to step 3.

3. Disconnect vacuum hose #15 from the vacuum advance diaphragm B on the distributor and connect a vacuum pump/gauge to the hose.

HOSE #15



4. Allow the engine to idle and check for vacuum.

There should be vacuum.

- If there is vacuum, go on to step 5.
- If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose. If no problem, go on the cold advance solenoid valve inspection (page 12-42).

5. Wait for the engine to warm up (cooling fan comes on).

Check for vacuum at idle.

There should be no vacuum.

- If there is no vacuum, go on to step 6.
 - If there is vacuum, go on to cold advance solenoid valve inspection (page 12-42).
6. If there is no abnormality at each test, inspect the vacuum advance diaphragm.

(cont'd)

Ignition Timing Controls

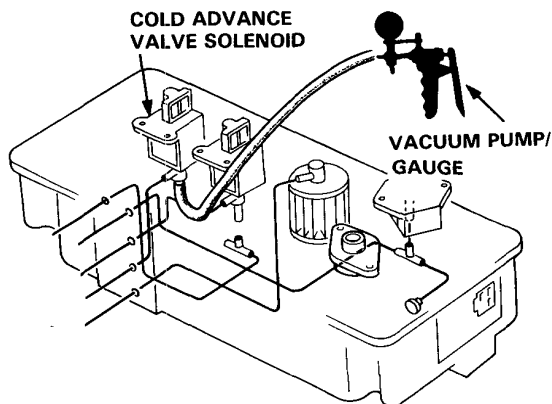
Inspection (cont'd)

Cold Advance Solenoid Valve

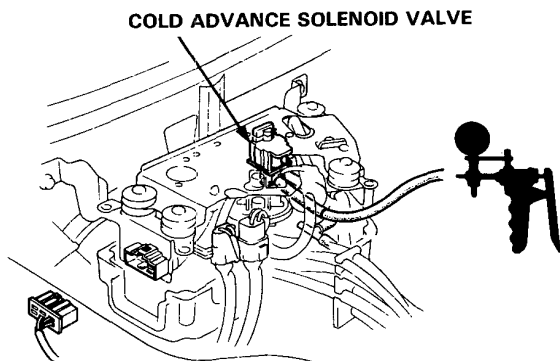
The cold advance solenoid valve is activated by commands from the ECU. When the solenoid valve opens, this causes vacuum in the #15 vacuum hose and sends vacuum to diaphragm B to improve cold engine performance under the following conditions:

- Whenever the coolant temperature is below 60°C (140°F) and the intake air temperature is below 20°C (68°F)
1. Open the control box lid and disconnect the rectangular connector from the control box.
 2. Disconnect the lower vacuum hose of the cold advance solenoid valve (between the solenoid valve and the three-way joint) from the three-way joint.
 3. Apply vacuum to the hose. It should hold vacuum. If it does not hold vacuum, replace the valve.

[KE Model]

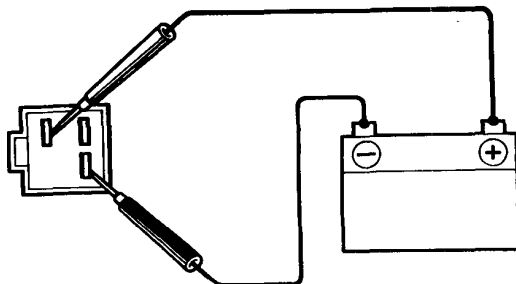


[Except KE Model]

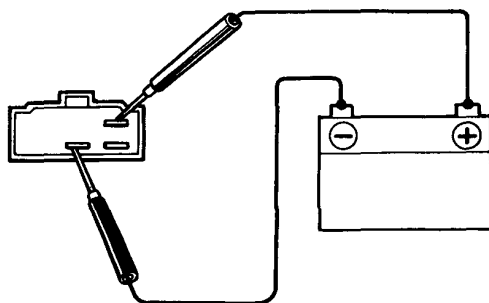


4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler, and the battery negative terminal to the Yellow/Green terminal.

[KE Model]



[Except KE Model]



5. Apply vacuum to the hose. It should not hold vacuum. If it holds vacuum, replace the valve.

Transaxle

Clutch <Type B2: for B20A2 Engine>

Clutch Adjustment 13-2

Pressure Plate 13-3

Manual Transmission

<Type B2: for B20A2 Engine>

Removal 14-2

Illustrated Index 14-4

Transmission Housing

Removal 14-6

Transmission Assembly

Reassembly 14-25

Driveshafts <B20A2 Engine>

Driveshafts 17-2

Intermediate Shaft 17-3



Clutch <Type B2: for B20A2 Engine>

Clutch Adjustment 13-2

Pressure Plate 13-3

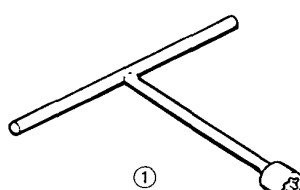
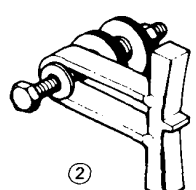
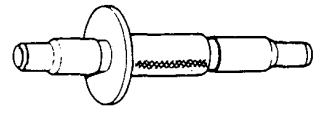


Outline of Model Changes

On models equipped with B20A2 engine, clutch pedal arrangement and clutch disc alignment tool are changed.

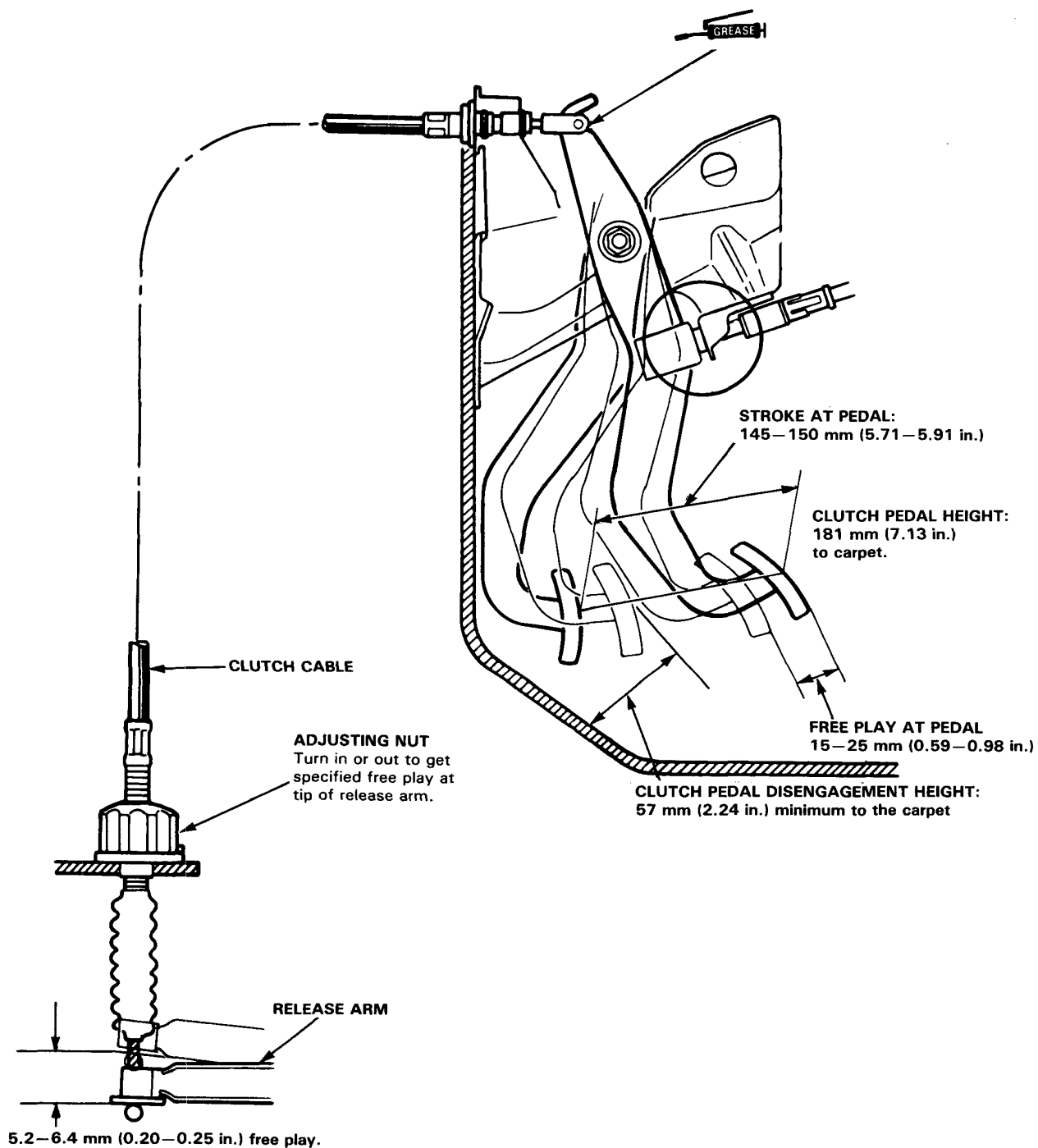
Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07708—0010102	10 mm T-Wrench	1	
②	07924—PD20002	Ring Gear Holder	1	
③	07GAG—PF50100	Clutch Disc Alignment Tool	1	

Clutch

Adjustment



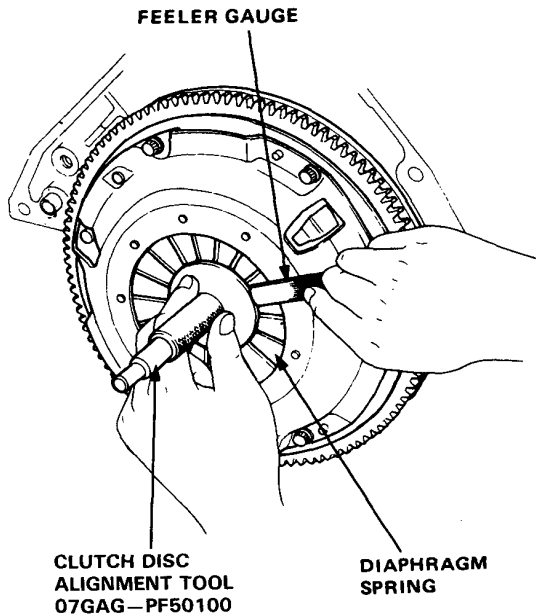
Pressure Plate



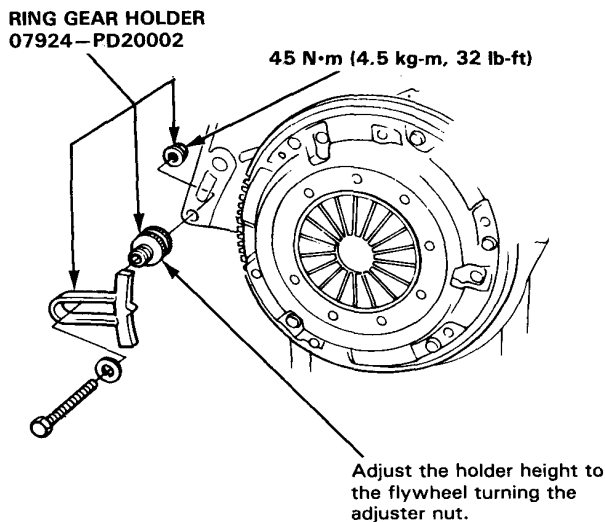
Removal/Inspection

1. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.
2. Check the diaphragm spring fingers for height using the Clutch Disc Alignment Tool and feeler gauge.

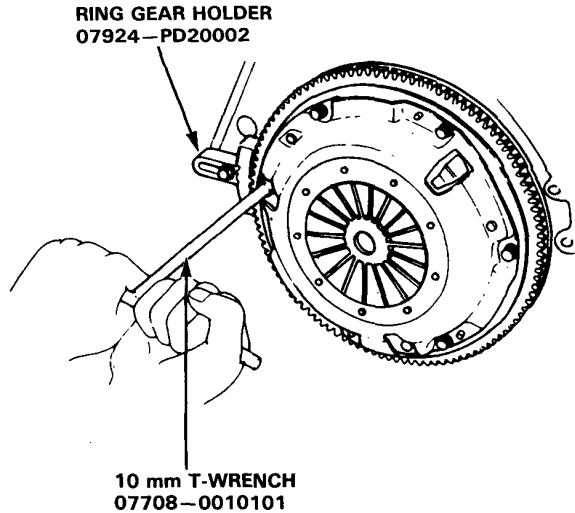
Service Limit: 1.0 mm (0.04 in.) Max.



3. Install the Ring Gear Holder.

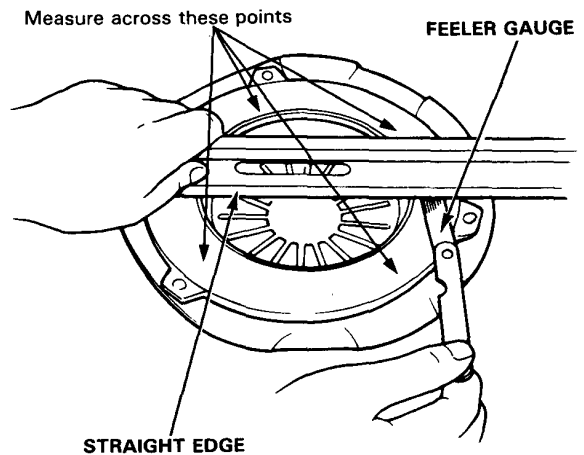


4. To prevent warping, unscrew the pressure plate mounting bolts two turns at a time in a crisscross pattern using a 10 mm T-wrench, then remove the pressure plate and clutch disc.



5. Inspect the pressure plate surface for wear, cracks, or burning.
6. Inspect for warpage using a straight edge and feeler gauge.

Service Limit: 0.15 mm (0.006 in.) Max.



Manual Transmission <Type B2: for B20A2 Engine>

Outline of model change	14-2	Mainshaft/Countershaft	
Special Tools	14-2	Thrust Shim Selection	14-16
Maintenance	14-3	Mainshaft Assembly	
Transmission Assembly		Index	14-18
Removal	14-4	Countershaft Assembly	
Illustrated Index	14-6	Index	14-19
Transmission Housing		Gear and Synchro Ring	
Removal	14-8	Inspection	14-20
Reverse Shift Fork/		Shift Fork/Synchro Sleeve/Synchro	
5th Reverse Shift Fork		Hub/Shift Piece	
Clearance Inspection	14-9	Shift Fork to Synchro	
Reverse Shift Fork/		Sleeve Clearance	14-21
Reverse Idle Gear		Installing Synchro	
Clearance Inspection	14-9	Hubs in Sleeves	14-21
Removal	14-10	Synchro Sleeve and	
Shift Arm Holder/		Hub Inspection	14-21
Shift Piece		4th Shift Fork to Shift	
Clearance Inspection	14-10	Piece Clearance	14-21
Selector Arm/Interlock		Mainshaft	
Clearance Inspection	14-11	Inspection	14-22
Removal	14-11	Countershaft	
Shift Arm Holder		Inspection	14-22
Disassembly	14-12	Countershaft Assembly	
Clearance Inspection	14-12	Clearance Inspection	14-23
Transmission Assembly		Mainshaft Assembly	
Removal	14-13	Clearance Inspection	14-25
Shift Arm Holder		Transmission Assembly	
Clearance Inspection	14-14	Reassembly	14-27
Shift Fork		Installation	14-32
Removal	14-15	Back-up Light Switch	
Countershaft Bearing (Clutch Housing)		Test	14-33
Replacement	14-15	Gearshift Mechanism	
Mainshaft Bearing/Oil Seal (Clutch Housing)		Overhaul	14-34
Replacement	14-16		



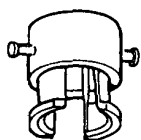
Outline of Model Changes, Special Tools

Outline of Model Change

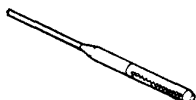
On models equipped with B20A2 engine, B2 type manual transmission is newly added.

Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07936-6890101	Bearing Remover Attachment	1	Use changed to 07936-6340000 attachment
②	07744-0010200	Pin Punch, 3.0 mm	1	
③	07744-0010400	Pin Punch, 5.0 mm	1	07944-6110100 may also be used.
④	07746-0010200	Attachment, 37 x 40 mm	1	
⑤	07746-0010400	Attachment, 52 x 55 mm	1	07949-6340200 may also be used.
⑥	07746-0010500	Attachment, 62 x 68 mm	1	
⑦	07749-0010000	Driver	1	07949-6110000 may also be used.
⑧	07936-6340000	Bearing Remover Set	1	



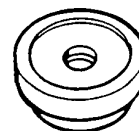
①



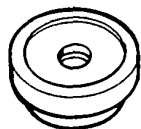
②



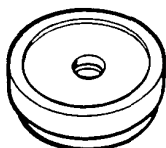
③



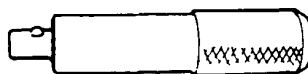
④



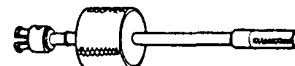
⑤



⑥



⑦



⑧

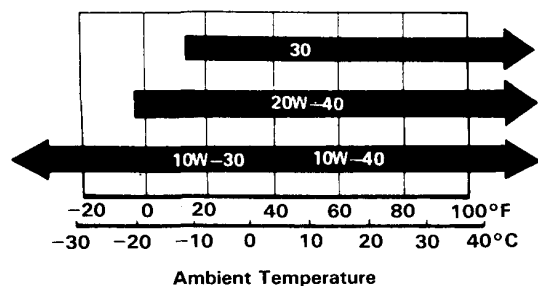


Oil Level Inspection

1. Check with oil at operating temperature, engine OFF, and car on level ground.
2. Remove oil filler plug and check level with finger.
3. Oil level must be up to fill hole. If it is below hole, add oil until it runs out, then reinstall plug.

Oil Change

Change oil every 40,000 km (24,000 miles).
Use only SAE30, 10W-30, 10W-40, or 20W-40 weight oil rated SE or SF grade.



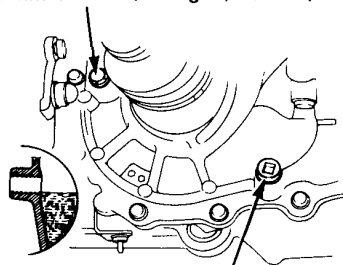
1. With transmission oil at operating temperature, engine OFF, and car on level ground, remove drain plug and drain transmission.
2. Reinstall drain plug with new washer, and refill to proper level.

NOTE: Drain plug washer should be replaced at every oil change.

Oil Capacity

- 1.9 l (2.0 U.S. qt.) after drain.
- 2.0 l (2.1 U.S. qt.) after overhaul.

OIL FILLER PLUG
20 x 15 mm 45 N·m (4.5 kg-m, 33 lb-ft)



DRAIN PLUG 14 x 1.5 mm
40 N·m (4.0 kg-m, 29 lb-ft)

Removal

Car on Ground

1. Disconnect the ground cable at battery and at transmission.
2. Release the steering lock and place gear selector in neutral position.
3. Disconnect the engine compartment wiring as follows:
 - Battery positive cable from starter motor.
 - Black/white wire from starter solenoid.
 - Green/black and yellow wires from back-up light switch.
4. Release the engine sub wire harness from clamp at clutch housing.
5. Disconnect the clutch cable at the release arm.
6. Remove the two upper transmission mounting bolts.

Car Raised on Hoist

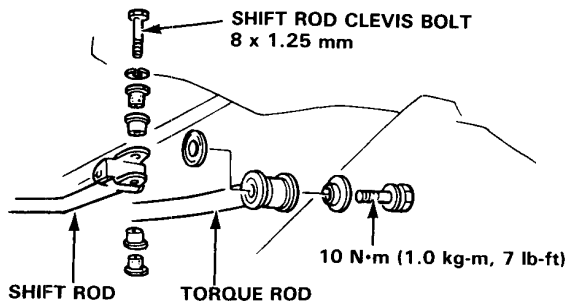
7. Drain transmission oil. Reinstall drain plug and washer.
8. Remove front wheels.
9. Place transmission jack securely beneath transmission.
10. Remove bolt securing speedometer drive holder and pull assembly out of transmission.

(cont'd)

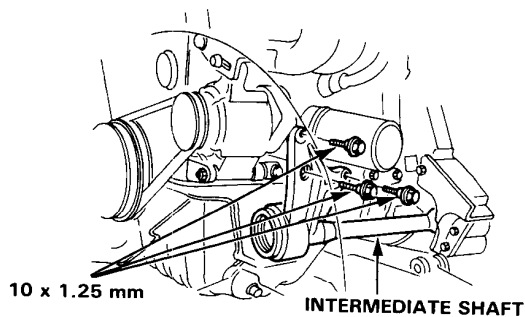
Transmission Assembly

Removal (cont'd)

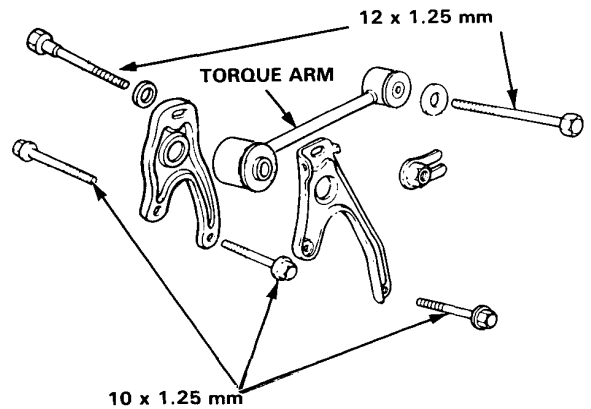
11. Disconnect shift lever torque rod from clutch housing.
12. Remove bolt from shift rod clevis.



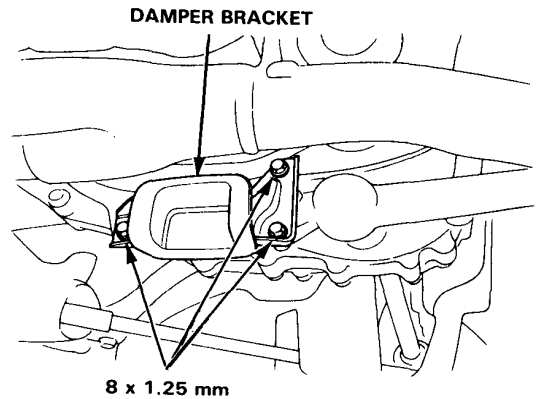
13. Disconnect the tie-rod ball joints and remove using the Ball Joint Remover.
14. Remove the lower arm ball joint bolt from the rightside lower control arm, then use a puller to disconnect the ball joint from the knuckle. Remove the damper fork bolt.
15. Turn each steering knuckle to its most outboard position. With screwdriver, pry right-side CV joint out approximately 1/2", then pull sub-axle out of transmission housing. Repeat on opposite side. Remove the right-side radius rod.
16. Remove the intermediate shaft from clutch housing.



17. Remove the torque arm bracket bolts from the clutch housing.

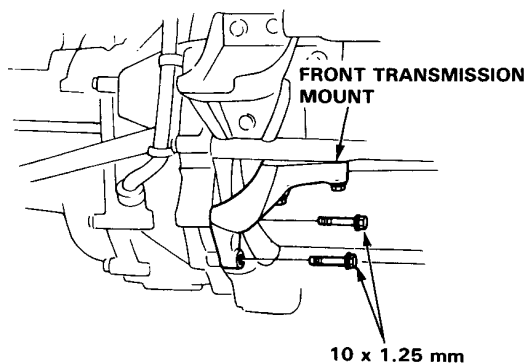


18. Remove the damper bracket from the transmission.

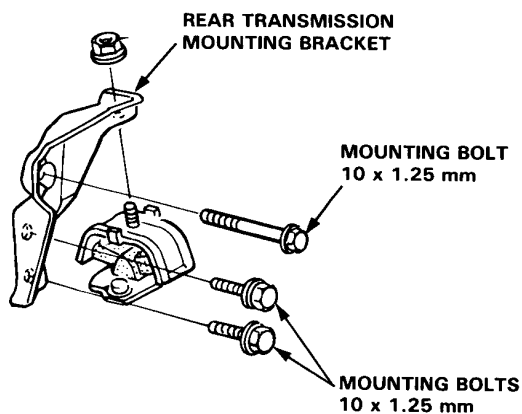




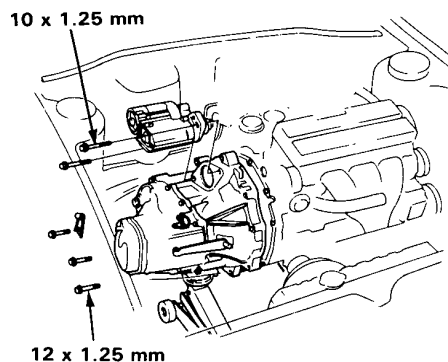
19. Remove the clutch housing bolts from the front transmission mount.



20. Remove the clutch housing bolts from the rear transmission mounting bracket.



21. Remove the clutch cover.
22. Remove the starter mounting bolts. Detach the starter motor and lower through chassis.
23. Remove the front transmission mounting bolt.
24. Pull transmission away from the engine block to clear the two 14 mm dowel pins and lower on transmission jack.



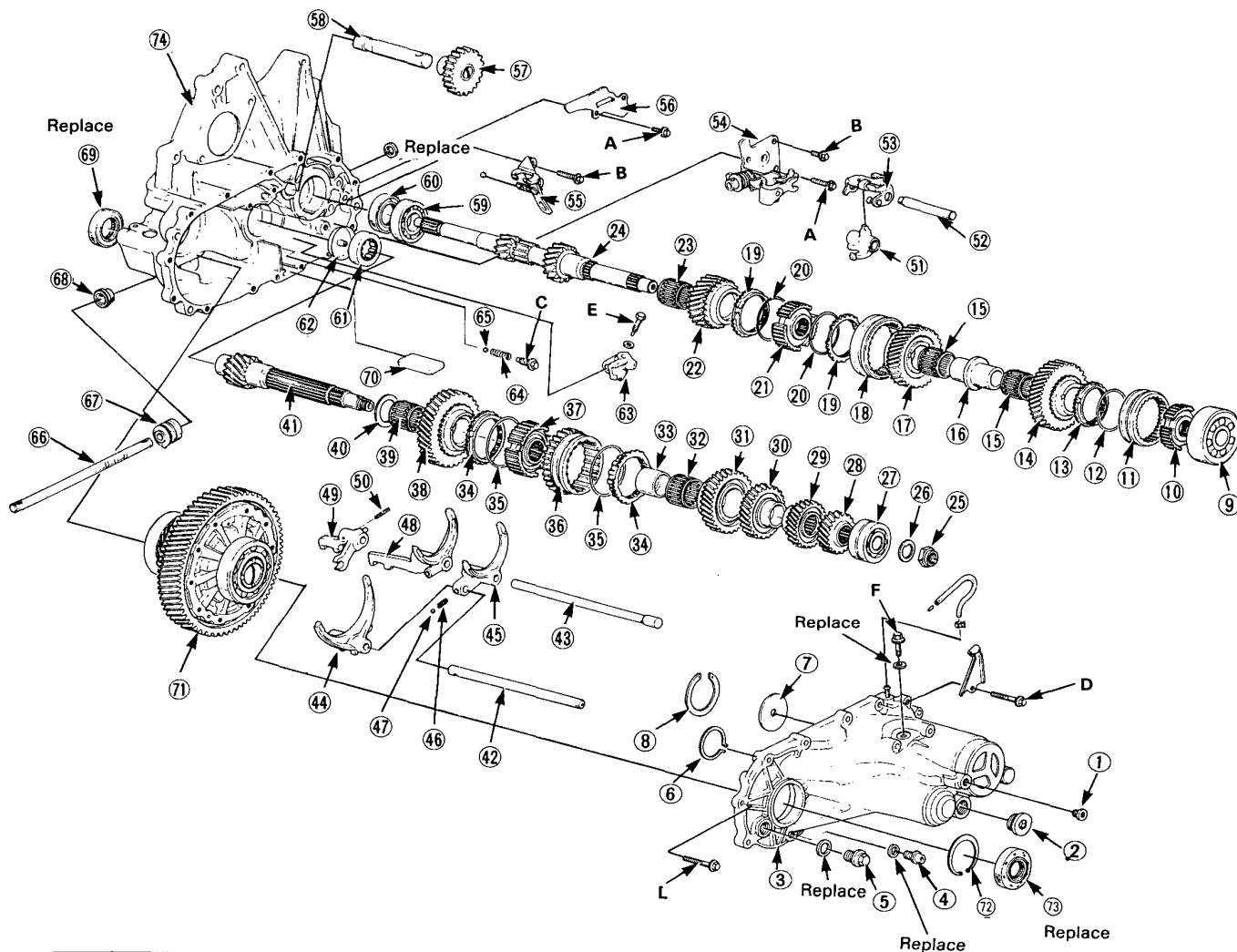
Illustrated Index

Clean all parts thoroughly in solvent and dry with compressed air.



Lubricate all parts with oil before reassembly.

NOTE: This transmission uses no gaskets between the major housings; use Honda P/N 08740—99986 sealant. Assemble the housings within 20 minutes after applying the sealant and allow it to cure at least 30 minutes after assembly before filling the transmission with oil.



Torque Value	Bolt Size
A-12 N·m (1.2 kg-m, 9 lb-ft)	1-6 x 1.0 mm
B-14 N·m (1.4 kg-m, 10 lb-ft)	2-8 x 1.25 mm
C-22 N·m (2.2 kg-m, 16 lb-ft)	3-10 x 1.5 mm
D-26 N·m (2.6 kg-m, 19 lb-ft)	
E-29 N·m (2.9 kg-m, 21 lb-ft)	
F-55 N·m (5.5 kg-m, 40 lb-ft)	

NOTE: Always clean the magnet (70) whenever the transmission housing is disassembled.

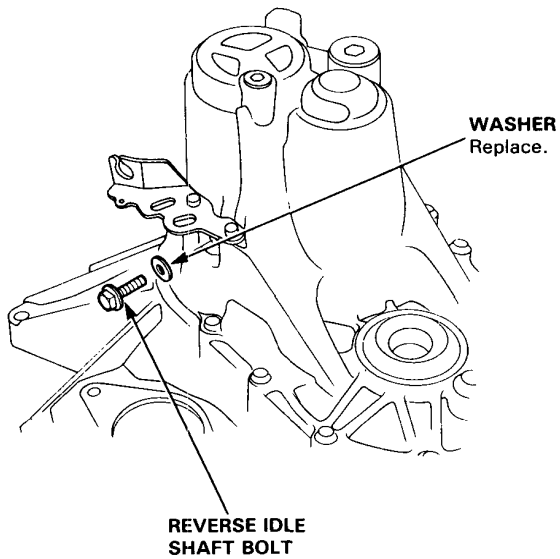


- ① 18 mm SEALING BOLT
35 N·m (3.5 kg-m, 25 lb-ft)
- ② 32 mm SEALING BOLT
70 N·m (7.0 kg-m, 51 lb-ft)
- ③ TRANSMISSION HOUSING
- ④ OIL DRAIN PLUG
40 N·m (4.0 kg-m, 29 lb-ft)
- ⑤ OIL FILLER BOLT
45 N·m (4.5 kg-m, 33 lb-ft)
- ⑥ SNAP RING
- ⑦ OIL GUIDE PLATE
- ⑧ THRUST SHIM
Inspection, page 14-16
- ⑨ MAINSHAFT BALL BEARING
- ⑩ 5th GEAR SYNCHRO HUB
- ⑪ 5th GEAR SYNCHRO SLEEVE
- ⑫ SYNCHRO SPRING
- ⑬ 5th GEAR SYNCHRO RING
- ⑭ 5th GEAR
Inspection, page 14-26
- ⑮ NEEDLE BEARING
- ⑯ COLLAR
Inspection, page 14-26
- ⑰ 4th GEAR
Inspection, page 14-26
- ⑱ SYNCHRO SLEEVE
- ⑲ SYNCHRO RING
- ⑳ SYNCHRO SPRING
- ㉑ SYNCHRO HUB
- ㉒ 3rd GEAR
Inspection, page 14-25
- ㉓ NEEDLE BEARING
- ㉔ MAINSHAFT
Disassembly, page 14-18
Inspection, page 14-20
Measurement, page 14-25
- ㉕ COUNTERSHAFT LOCKNUT
110 N·m (11.0 kg-m, 80 lb-ft)
- ㉖ LOCK WASHER
- ㉗ COUNTERSHAFT BALL BEARING
- ㉘ COUNTERSHAFT 5th GEAR
- ㉙ COUNTERSHAFT 4th GEAR
- ㉚ COUNTERSHAFT 3rd GEAR
- ㉛ COUNTERSHAFT 2nd GEAR
- ㉜ NEEDLE BEARING
- ㉝ COLLAR
- ㉞ SYNCHRO RING
- ㉟ SYNCHRO SPRING
- ㊱ REVERSE GEAR
- ㊲ SYNCHRO HUB
- ㊳ 1st GEAR
- ㊴ NEEDLE BEARING
- ㊵ THRUST WASHER
Inspection, page 14-23
- ㊶ COUNTERSHAFT
Disassembly, page 14-19
Inspection, page 14-22
Measurement, page 14-24
- ㊷ SHIFT FORK SHAFT
- ㊸ SHIFT FORK SHAFT
- ㊹ 1st GEAR SHIFT FORK
- ㊺ 5th GEAR SHIFT FORK
- ㊻ DETENT SPRING
- ㊼ DETENT BALL
- ㊽ 3rd/4th GEAR SHIFT FORK
- ㊾ 5th/REVERSE GEAR SHIFT PIECE
- ㊿ 3 mm SPRING PIN
- ① SHIFT SHAFT GUIDE
- ② SHIFT ARM SHAFT
- ③ INTERLOCK
- ④ GEAR SHIFT ARM HOULDER ASSEMBLY
- ⑤ REVERSE SHIFT FORK
- ⑥ SEPARATOR PLATE
- ⑦ REVERSE IDLE GEAR
- ⑧ REVERSE IDLE GEAR SHAFT
- ⑨ MAINSHAFT BALL BEARING
Removal, page 14-16
Installation, page 14-16
- ⑩ SEAL
Removal, page 14-16
Installation, page 14-16
- ⑪ NEEDLE BEARING
Removal, page 14-15
Installation, page 14-15
- ⑫ OIL GUIDE PLATE
- ⑬ GEAR SHIFT ARM
- ⑭ DETENT SPRING
- ⑮ DETENT BALL
- ⑯ GEAR SHIFT ROD
- ⑰ BOOT
- ⑱ SEAL
- ⑲ SEAL
- ㉑ MAGNET
- ㉒ DIFFERENTIAL
- ㉓ SNAP RING
- ㉔ SEAL
- ㉕ CLUTCH HOUSING

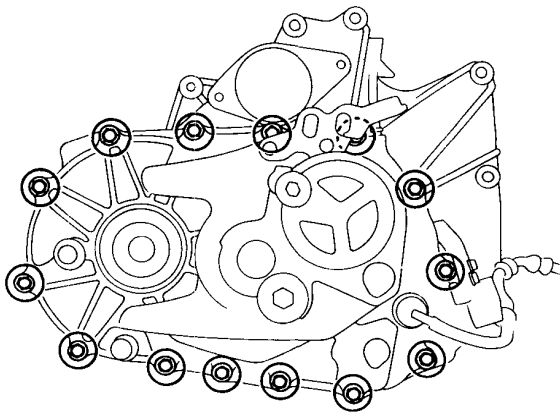
Transmission Housing

Removal

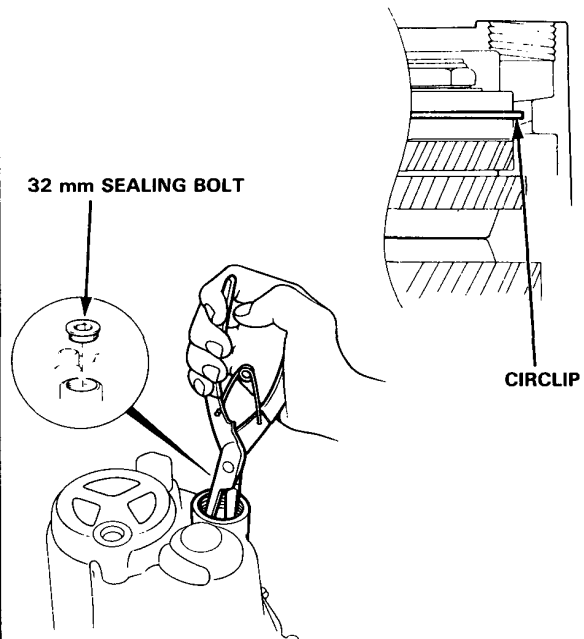
1. Remove the reverse idle shaft bolt shown from the transmission housing.



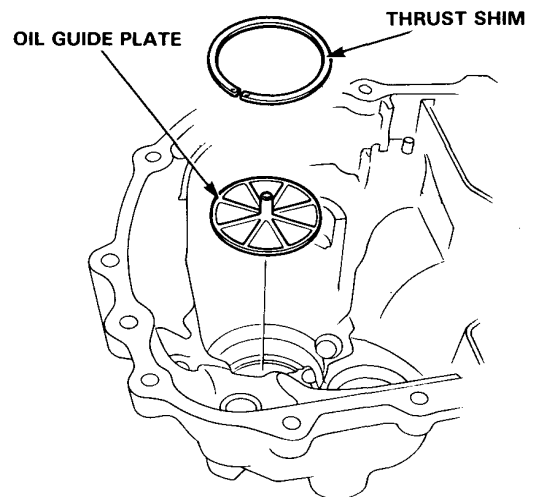
2. Remove 8 mm bolts attaching the clutch housing to the transmission housing.



3. Remove the 32 mm sealing bolt and the circlip holding the countershaft ball bearing.



4. Separate the clutch housing from the transmission housing. Clean the mating surfaces thoroughly.
5. Remove the thrust shim and oil guide plate from the transmission housing.



Reverse Shift Fork/ 5th Reverse Shift Fork

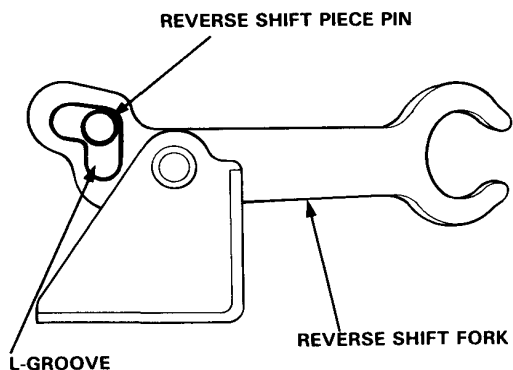
Clearance Inspection

1. Measure the clearance between the reverse shift fork and 5th/reverse shift piece pin.

Standard: 0.05–0.35 mm (0.002–0.014 in.)

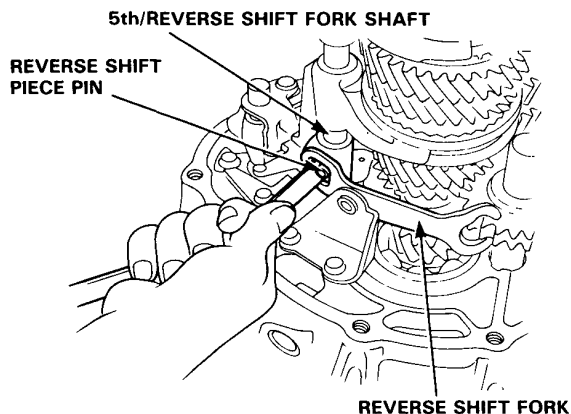
Service Limit: 0.5 mm (0.020 in.)

2. If the clearance is outside the above limits, measure the width of the L-groove in the reverse shift fork.



Standard: 7.05–7.25 mm (0.278–0.285 in.)

3. Replace the reverse shift fork with a new one if the width exceeds 7.25 mm.



Reverse Shift Fork/ Reverse Idle Gear

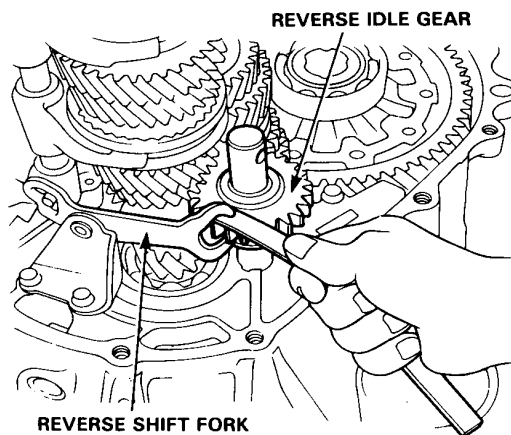


Clearance Inspection

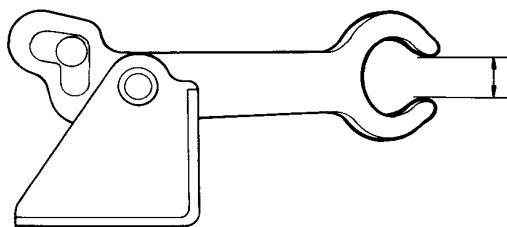
1. Measure the clearance between the reverse idle gear and reverse shift fork.

Standard: 0.5–1.1 mm (0.020–0.043 in.)

Service Limit: 1.8 mm (0.071 in.)



2. If the clearance exceeds 1.8 mm (service limit), measure the width of the reverse shift fork pawl groove.



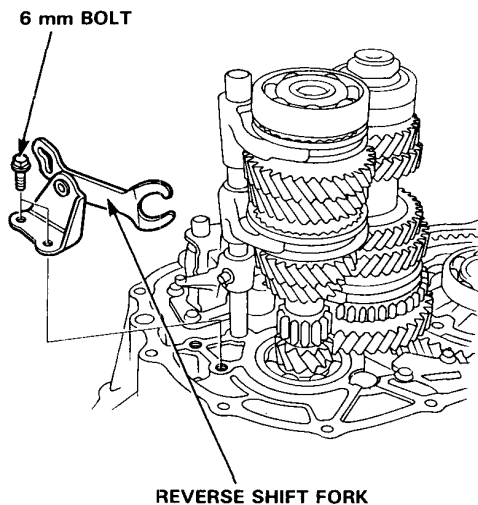
Standard: 13.0–13.3 mm (0.512–0.524 in.)

3. If the width is outside the above limits, replace the shift fork with a new one.

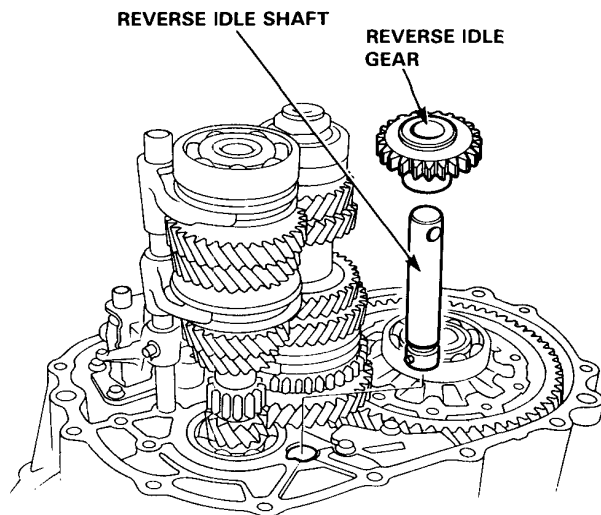
Reverse Shift Fork/ Reverse Idle Gear

Removal

1. Remove the reverse shift fork from the clutch housing.



2. Remove the reverse idle shaft and reverse idle gear from the clutch housing together.



Shift Arm Holder/ Shift Piece

Clearance Inspection

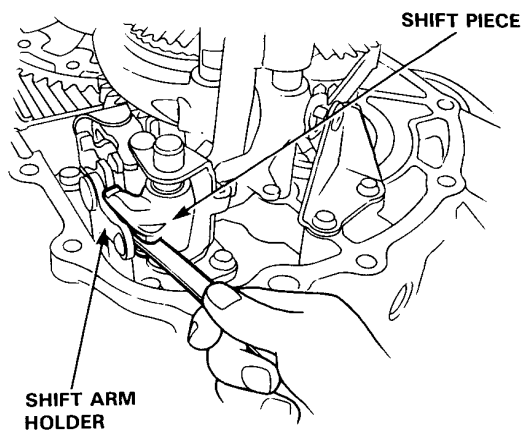
1. Measure the clearance between the shift arm holder and shift piece.

Standard: 0.1—0.3 mm (0.004—0.019 in.)
Service Limit: 0.6 mm (0.024 in.)

2. If the clearance is outside the above limits, measure the width of the groove in the shift piece.

Standard: 7.9—8.0 mm (0.311—0.315 in.)

3. Replace the shift arm with the new one if the width exceeds 8.0 mm.



Selector Arm/Interlock



Clearance Inspection

1. Measure the clearance between the selector arm and interlock.

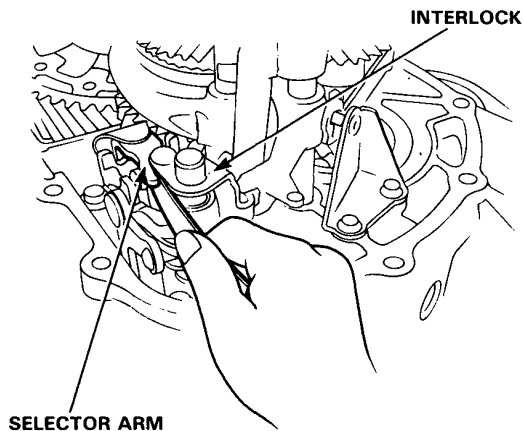
Standard: 0.05–0.20 (0.002–0.008 in.)

Service Limit: 0.45 mm (0.017 in.)

2. If the clearance is outside the above limits, measure the width of the groove in the selector arm.

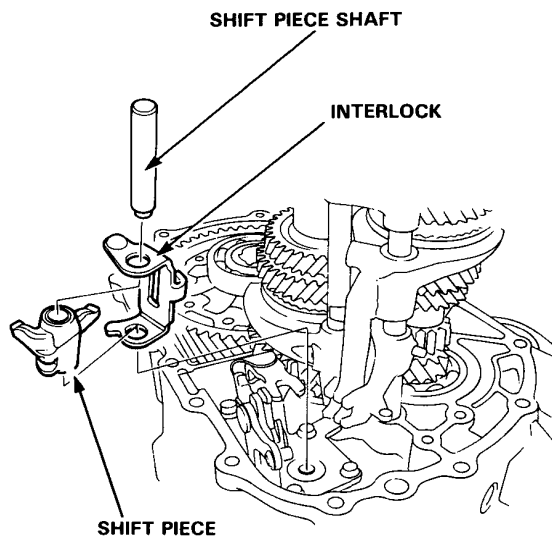
Standard: 9.9–10.0 mm (0.390–0.394 in.)

3. Replace the selector arm with a new one if the width exceeds 10.0 mm (0.394 in.)

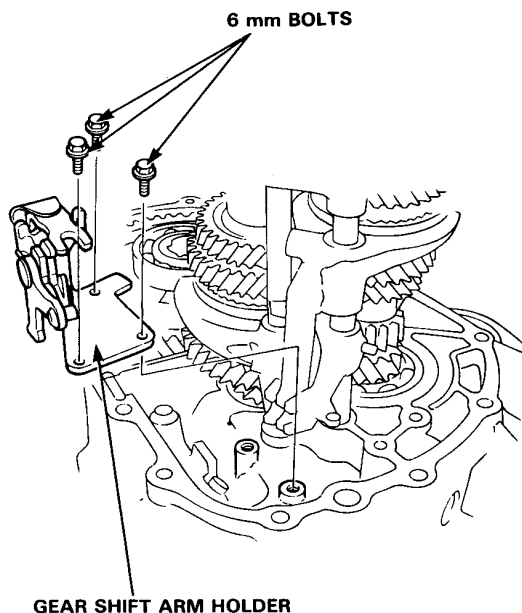


Removal

1. Remove the shift piece shaft, shift piece and interlock from the clutch housing.



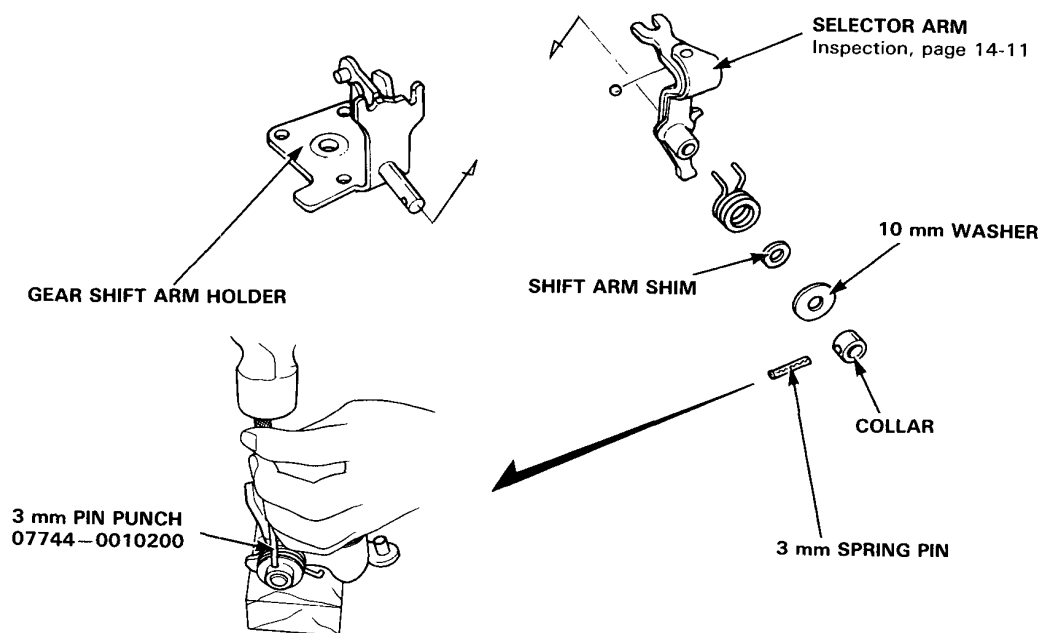
2. Remove the gear shift arm holder assembly from the clutch housing.



Shift Arm Holder

Disassembly

To remove selector arm from holder for shimming or replacement, drive out spring pin with driver.



Clearance Inspection

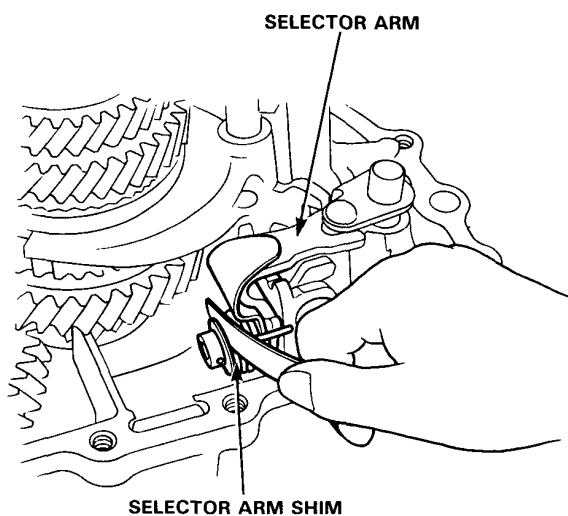
1. Measure the clearance between the gear shift arm holder and the selector arm shim.

Standard: 0.01—0.2 mm (0.0003—0.008 in.)

2. If the clearance is outside the above limits, select the appropriate selector arm shim for the correct clearance from the chart below.

Thickness of Select or Arm Shim

Class	Thickness
A	0.8 mm (0.032 in.)
B	1.0 mm (0.039 in.)
C	1.2 mm (0.047 in.)
D	1.4 mm (0.055 in.)
E	1.6 mm (0.063 in.)

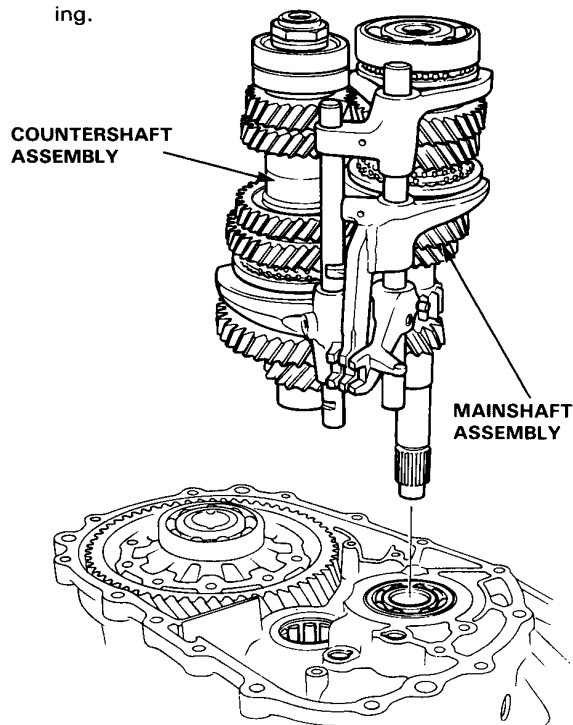




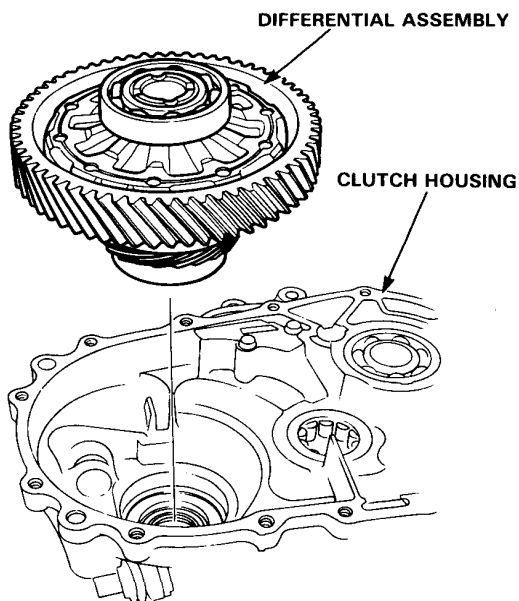
Transmission Assembly

Removal

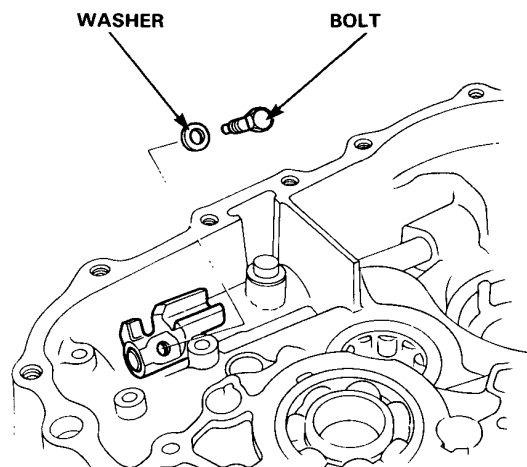
1. Remove the mainshaft assembly and countershaft assembly with the shift fork from the clutch housing.



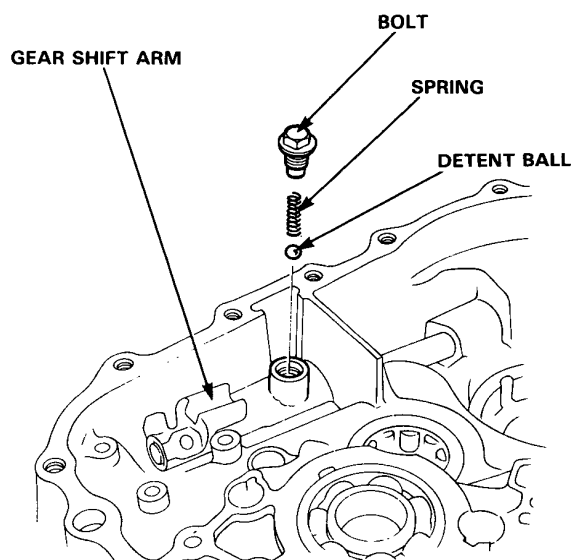
2. Remove the differential assembly from the clutch housing.



3. Remove the bolt and washer which hold the gear shift arm.



4. Remove the detent ball and spring from the clutch housing.

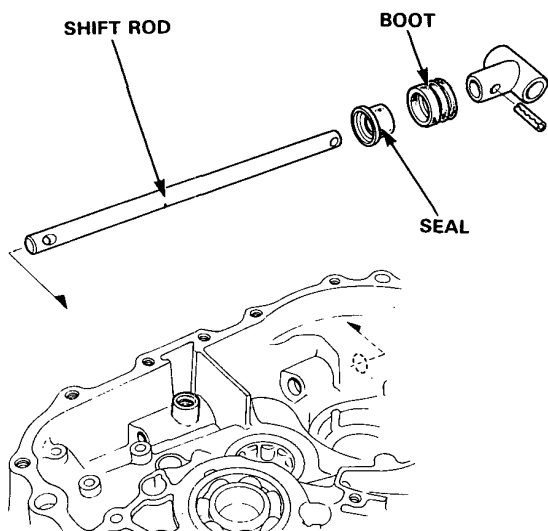


(cont'd)

Transmission Assembly

Removal (cont'd)

5. Remove the shift rod and boot from the clutch housing.



Shift Arm Holder

Clearance Inspection

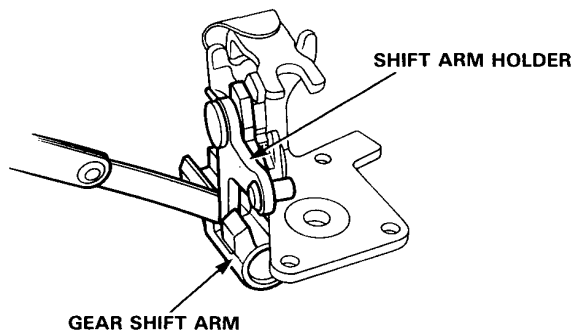
1. Measure the clearance between the shift arm holder and the gear shift arm.

Standard: 0.05–0.35 mm (0.002–0.014 in.)
Service Limit: 0.8 mm (0.032 in.)

2. If the clearance is outside the above limits, measure the width of the groove in the gear shift arm.

Standard: 12.8–13.0 mm (0.504–0.512 in.)

3. If the width of the groove is outside the standard, replace the gear shift arm with a new one.



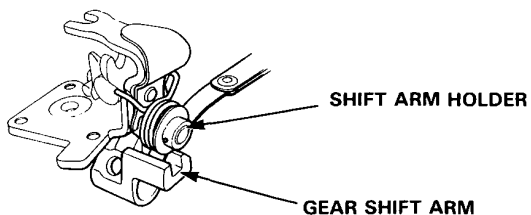
1. Measure the clearance between the selector arm and the gear shift arm.

Standard: 0.05–0.25 mm (0.002–0.010 in.)
Service Limit: 0.5 mm (0.020 in.)

2. If the clearance is outside the limits, measure the width of the groove in the selector arm.

Standard: 11.9–12.0 mm (0.469–0.472 in.)

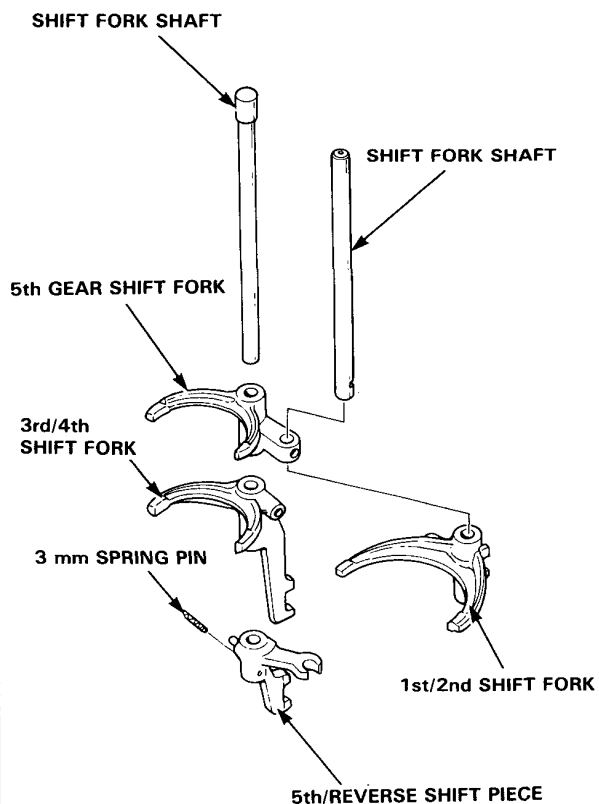
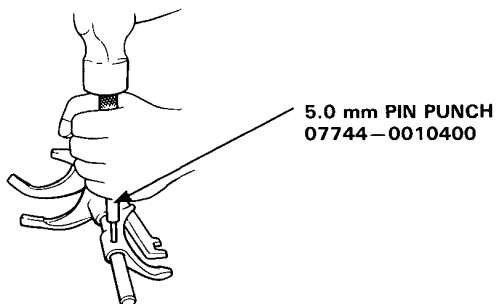
3. If the width is outside the standard, replace the selector arm with a new one.



Shift Fork

Removal

1. Remove the shift fork shaft by removing the spring pin on 5th/Reverse shift piece.

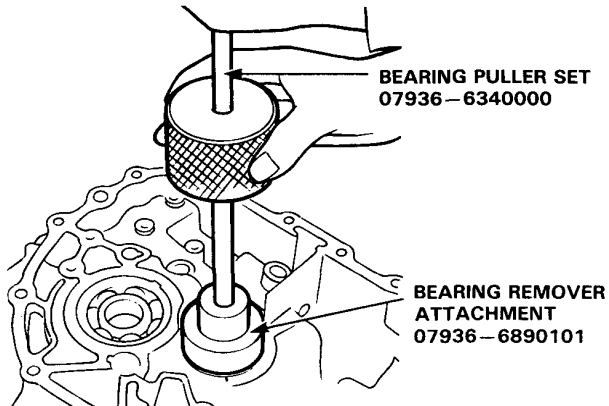


Countershaft Bearing (Clutch Housing)



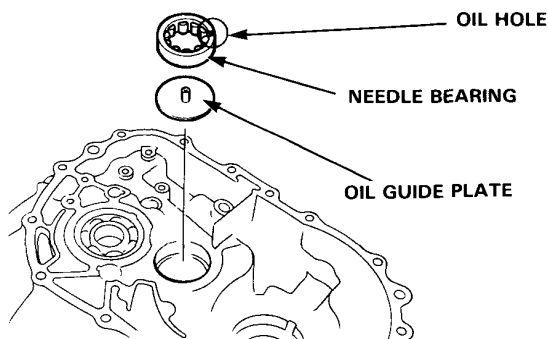
Replacement

1. Remove the needle bearing with the bearing puller.



2. Position the oil guide plate and new needle bearing in the bore of the clutch housing.

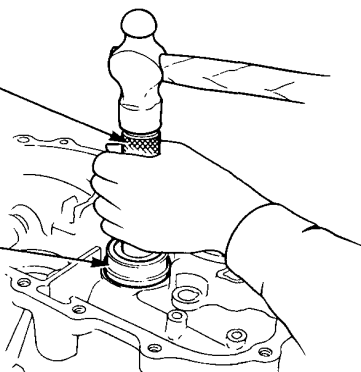
NOTE: Position the needle bearing with the oil hole facing up.



3. Drive the needle bearing in using the tools shown.

DRIVER
07749-0010000

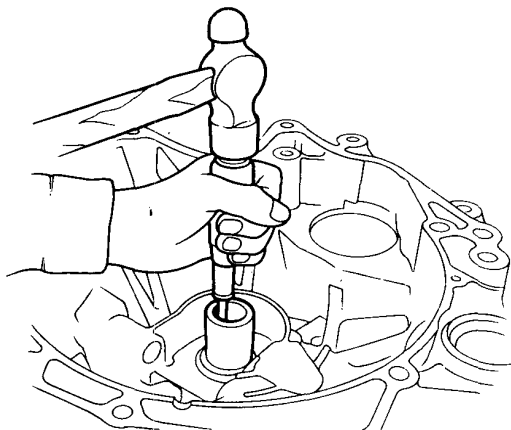
ATTACHMENT
52 x 55
07746-0010400
OR
ATTACHMENT
58 x 72
07947-6340200



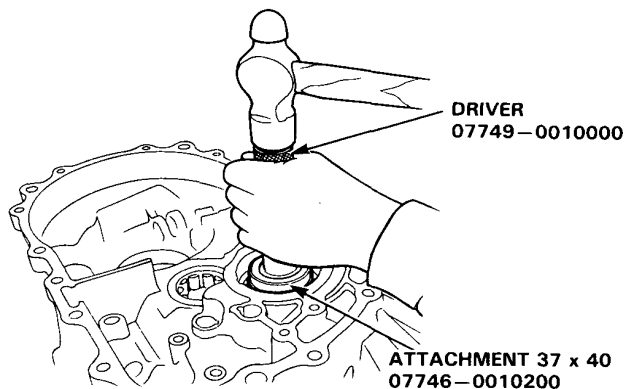
Mainshaft Bearing/Oil Seal (Clutch Housing)

Replacement

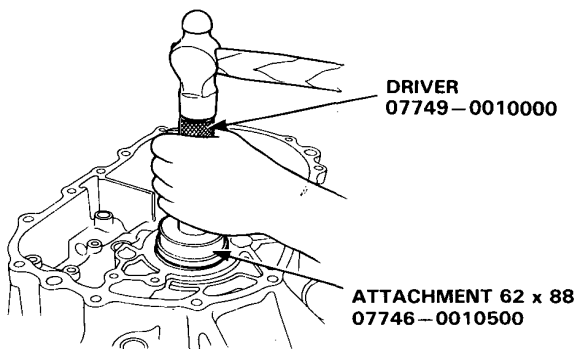
1. Remove the mainshaft bearing and oil seal from the clutch side.



2. Drive in a new oil seal from the transmission side.



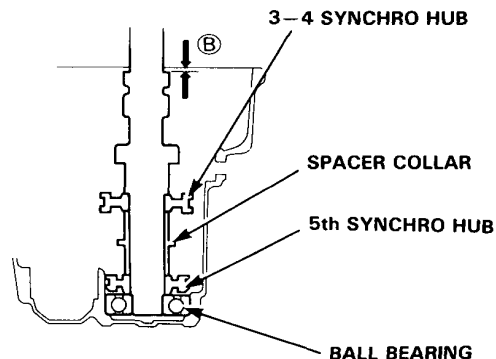
3. Using the tools as shown, drive in a new bearing from the transmission side.



Mainshaft/Countershaft

Thrust Shim Selection

1. Remove the thrust shim and oil guide plate from the transmission housing.
(See Page 14-8).
2. Install the 3-4 synchro hub, spacer collar, 5th synchro hub, and ball bearing on the mainshaft; install the above assembly in the transmission case.



3. Measure distance (B) between the end of the transmission housing and mainshaft.

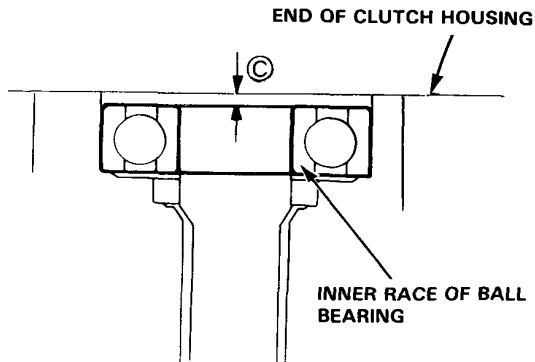
NOTE:

- Use a straight edge and vernier caliper.
- Measure at three locations and average the reading.

4. Measure distance (C) between the end of the clutch housing and bearing inner race.

NOTE:

- Use a straight edge and feeler gauge.
- Measure at three locations and average the readings.





5. Select the correct thickness thrust shim as follows:

(a) Subtract the height (C) of clutch housing ball bearing inner race surface and clutch housing seal surface determined in (step 4) from the measurement (B) of mainshaft and transmission housing end in (step 3).

(b) Subtract the standard clearance 0.14–0.21 mm (0.006–0.008 in.) from the dimension determined in step 5a.

Example

Distance B: 1.74 mm (0.068 in.)

Distance C: $\frac{-0.10 \text{ mm (0.004 in.)}}{1.64 \text{ mm (0.064 in.)}}$

1.64 mm (0.064 in.)

Thrust shim height: $\frac{-0.14 \text{ mm (0.006 in.)}}{1.50 \text{ mm (0.059 in.)}}$

(minimum)

1.64 mm (0.064 in.)

Thrust shim height: $\frac{-0.21 \text{ mm (0.008 in.)}}{1.43 \text{ mm (0.056 in.)}}$

(maximum)

Select the thrust shim in the range between 1.50 mm (0.059 in.) and 1.43 mm (0.056 in.) from the part list.

Part No.	Thickness
23931–PH8–010	1.10 mm (0.043 in.)
23932–PH8–010	1.15 mm (0.045 in.)
23933–PH8–010	1.20 mm (0.047 in.)
23934–PH8–010	1.25 mm (0.049 in.)
23935–PH8–010	1.30 mm (0.051 in.)
23936–PH8–010	1.35 mm (0.053 in.)
23937–PH8–010	1.40 mm (0.055 in.)
23938–PH8–010	1.45 mm (0.057 in.)
23939–PH8–010	1.50 mm (0.059 in.)
23940–PH8–010	1.55 mm (0.061 in.)
23941–PH8–010	1.60 mm (0.063 in.)
23942–PH8–010	1.65 mm (0.065 in.)
23943–PH8–010	1.70 mm (0.067 in.)
23944–PH8–010	1.75 mm (0.069 in.)
23945–PH8–010	1.80 mm (0.071 in.)
23946–PH8–010	1.85 mm (0.073 in.)
23947–PH8–010	1.90 mm (0.075 in.)
23948–PH8–010	1.95 mm (0.077 in.)
23949–PH8–010	2.00 mm (0.079 in.)
23950–PH8–010	2.05 mm (0.081 in.)
23951–PH8–010	2.10 mm (0.083 in.)
23952–PH8–010	2.15 mm (0.085 in.)

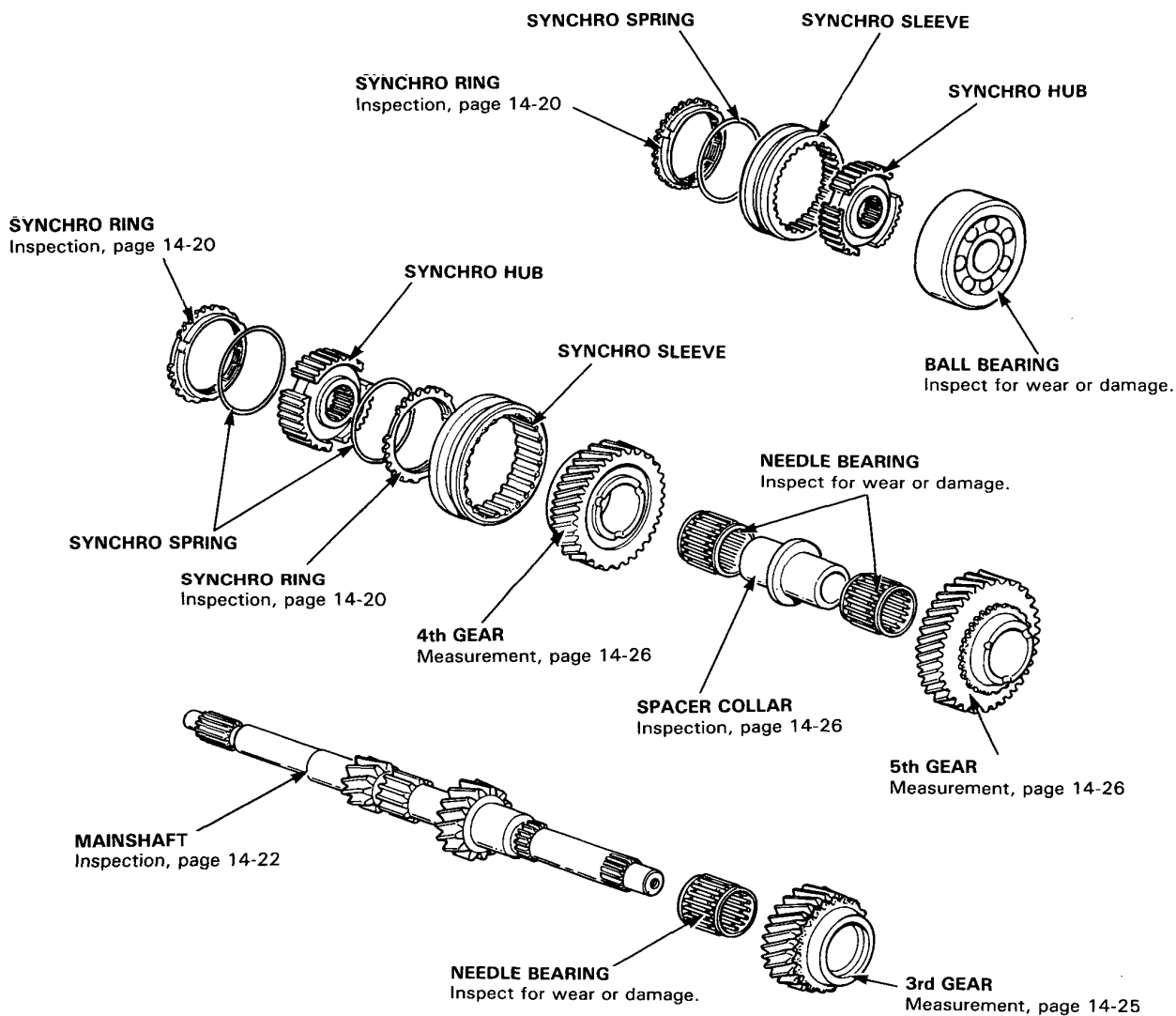
Mainshaft Assembly

Index

NOTE: The needle bearings are of the same size



Before assembling, clean all parts in solvent, dry them with compressed air, then coat them with clean oil.



Countershaft Assembly

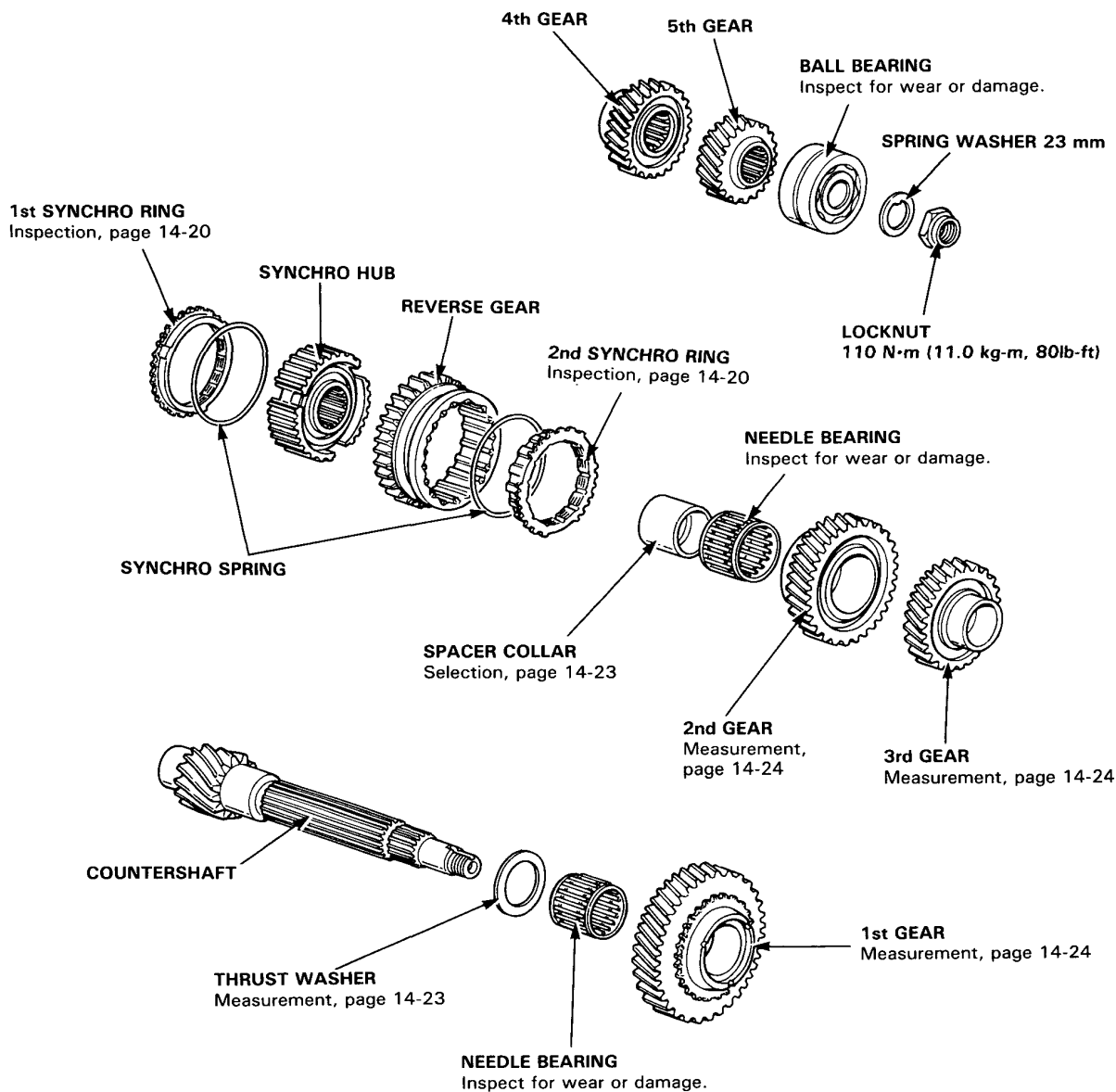


Index

NOTE: The needle bearings are of the same size.

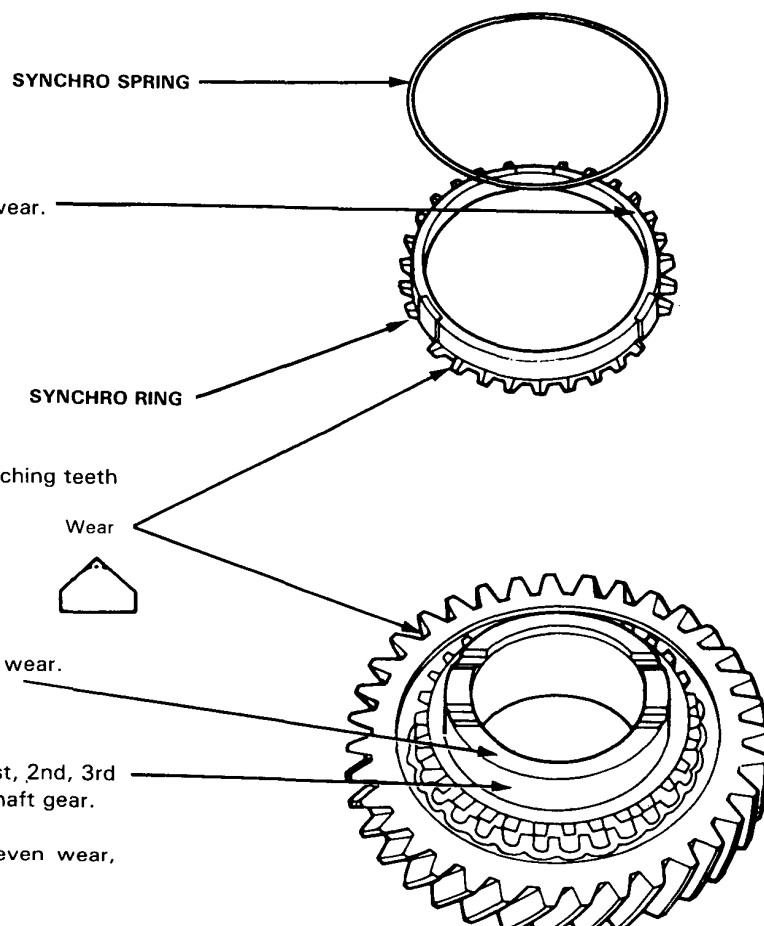


Before assembling, clean all parts in solvent, dry them with compressed air, then coat them with clean oil.



Gear and Synchro Ring

Inspection

- 
1. Inspect the inside of synchro ring for wear.
2. Inspect the synchro ring teeth and matching teeth on gear for wear (rounded off).
3. Inspect the gear hub thrust surface for wear.
4. Inspect the cone surface for wear on 1st, 2nd, 3rd and 4th countershaft gears; 5th mainshaft gear.
5. Inspect the teeth on all gears for uneven wear, scoring, galling, cracks.
6. Place the synchro ring on matching gear cone and rotate until it stops (approx. 10 to 20 degrees), then measure the clearance between ring and gear.
- Ring-to-Gear Clearance:**
Standard (New): 0.85–1.1 mm (0.033–0.043 in.)
Service Limit: 0.4 mm (0.016 in.)
7. Separate the synchro ring and gear, and coat them with oil.
8. Install the synchro spring on synchronizer ring.
9. Put the synchro ring on gear cone again, rotate until it stops, then set it aside for later reassembly.
- SYNCHRO SPRING
- SYNCHRO RING
- Wear
- GEAR
- SYNCHRO RING



Shift Fork/Synchro Sleeve/Synchro Hub/Shift piece

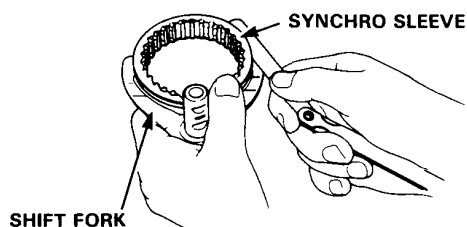
Shift Fork to Synchro Sleeve Clearance

1. Check the clearance between each shift fork and its matching synchro sleeve.

	1st, 2nd, 3rd, 4th	5th
Standard	0.45–0.65 mm (0.018–0.026 in.)	1.0 mm (0.039 in.)
Service Limit	0.25–0.45 mm (0.010–0.018 in.)	0.8 mm (0.032 in.)

2. If the clearance exceeds the service limit, measure the thickness of the shift fork fingers.

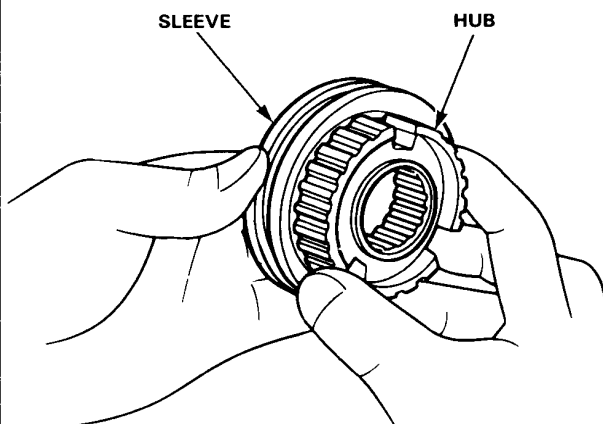
	1st, 2nd, 3rd, 4th	5th
Standard	7.95–8.05 mm (0.313–0.317 in.)	5.75–5.85 mm (0.226–0.230 in.)



Synchro Sleeve and Hub Inspection

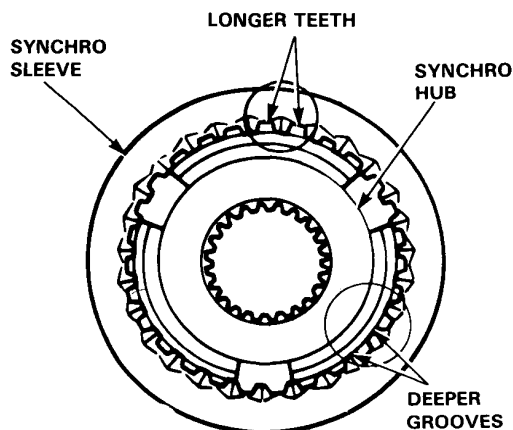
1. Inspect the gear teeth on all synchro hubs and sleeves for rounded off corners, indicating wear.
2. Install each hub in its mating sleeve and check for freedom of movement.

NOTE: If replacement is required, always replace the synchro sleeve and hub as a unit.



Installing Synchro Hubs in Sleeves

Each synchro sleeve has three sets of longer teeth (120 degrees apart) that must be matched with the three sets of deeper grooves in the hub when assembled.



4th Shift Fork to Shift Piece Clearance

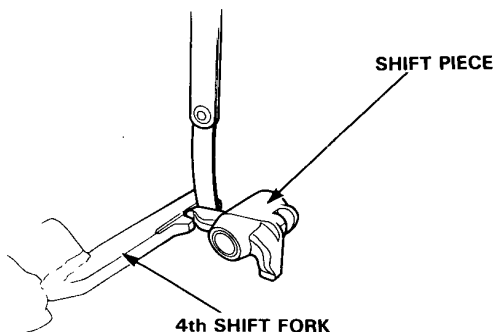
1. Measure the clearance between the 4th shift fork and the shift piece.

Standard: 0.2–0.5 mm (0.008–0.020 in.)
Service Limit: 0.8 mm (0.032 in.)

2. If the clearance exceeds the service limit, measure the width of the shift piece.

Standard: 11.9–12.0 mm (0.469–0.472 in.)

3. Replace the shift piece if the width is outside the standard value with a new one.



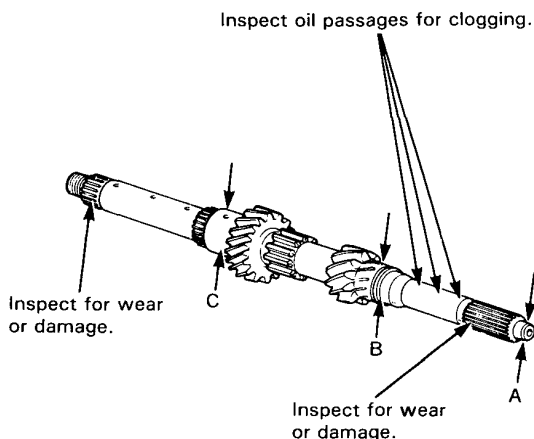
Mainshaft

Inspection

1. Measure gear and bearing O.D.s.

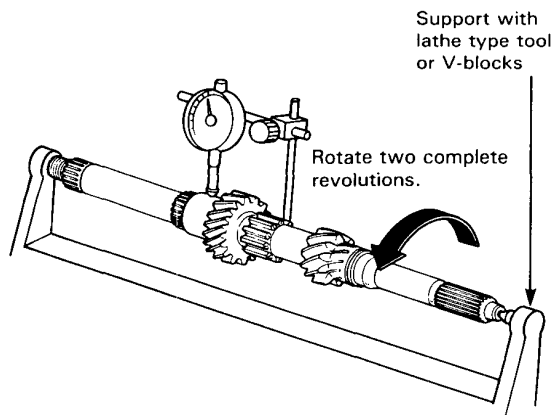
Standard: A: 27.987–28.000 mm (1.102–1.102 in.)
 B: 37.984–38.000 mm (1.495–1.496 in.)
 C: 27.987–28.000 mm (1.102–1.102 in.)

Service Limit A: 27.94 mm (1.099 in.)
 B: 37.93 mm (1.493 in.)
 C: 27.94 mm (1.099 in.)



2. Replace the mainshaft if any readings are out of tolerance.
3. Inspect for runout.

Standard: 0.02 mm (0.0008 in.)
Service Limit: 0.05 mm (0.0020 in.)



4. Replace the mainshaft if the reading is out of tolerance.

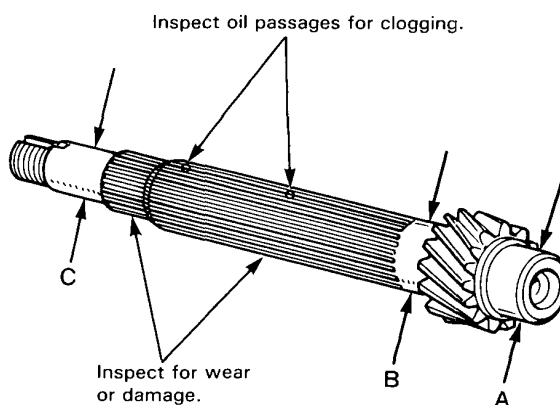
Countershaft

Inspection

1. Measure gear and bearing O.D.s.

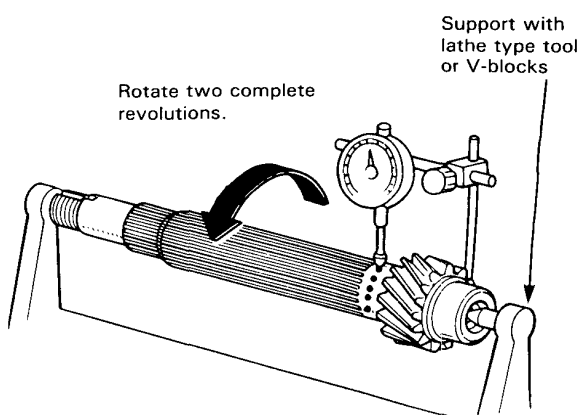
Standard: A: 33.000–33.015 mm (1.299–1.230 in.)
 B: 39.984–40.000 mm (1.574–1.575 in.)
 C: 24.987–25.000 mm (0.984–0.984 in.)

Service Limit: A: 32.95 mm (1.295 in.)
 B: 39.93 mm (1.572 in.)
 C: 24.94 mm (0.980 in.)



2. Replace the countershaft if any readings are out of tolerance.
3. Inspect for runout.

Standard: 0.02 mm (0.0008 in.)
Service Limit: 0.05 mm (0.0019 in.)



4. Replace the countershaft if the reading is out of tolerance.

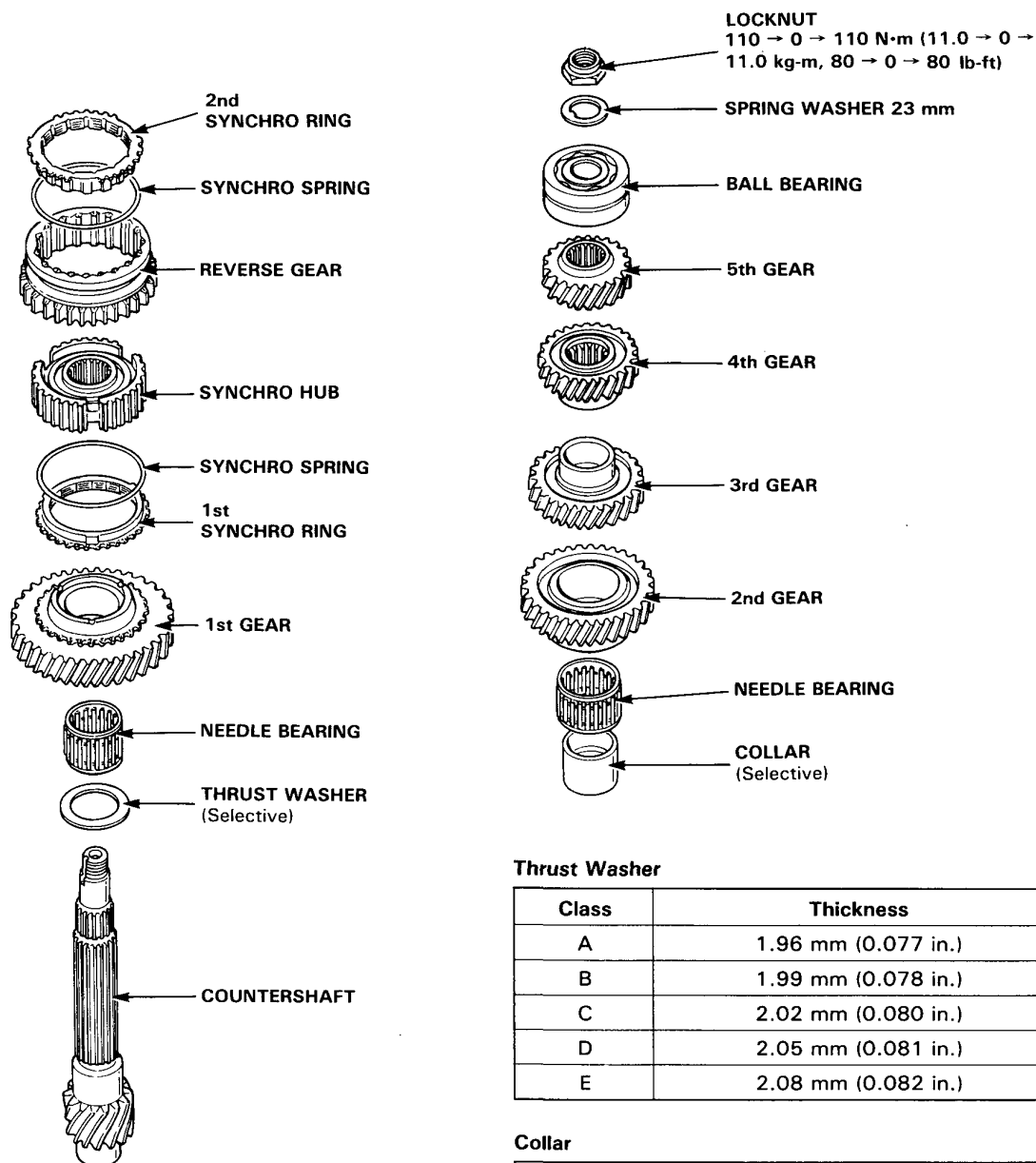
Countershaft Assembly



Clearance Inspection

NOTE: Two types of 36 x 44 x 29 mm collars and four types of thrust washers for 1st gear are available for the adjustment of the clearance between the gears on the countershaft.

1. Assemble the gears, spacer collars, thrust washer, synchro hub, synchro ring, etc. as shown below.



Thrust Washer

Class	Thickness
A	1.96 mm (0.077 in.)
B	1.99 mm (0.078 in.)
C	2.02 mm (0.080 in.)
D	2.05 mm (0.081 in.)
E	2.08 mm (0.082 in.)

Collar

Class	Length
A	29.03–29.05 mm (0.143–0.144 in.)
B	28.98–29.00 mm (1.141–1.142 in.)

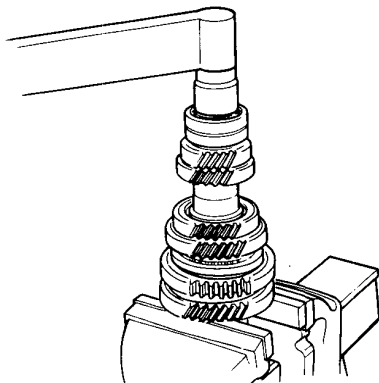
(cont'd)

Countershaft Assembly

Clearance Inspection (cont'd)

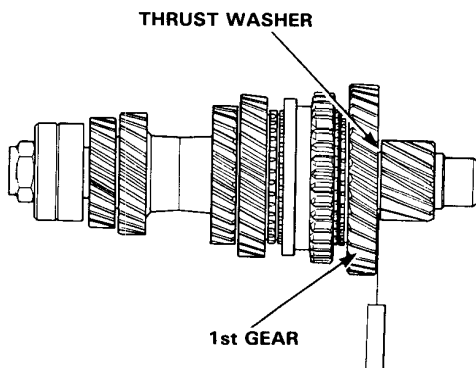
2. Torque the countershaft locknut to $110 \rightarrow 0 \rightarrow 110$ N·m ($11.0 \rightarrow 0 \rightarrow 11.0$ kg-m, $80 \rightarrow 0 \rightarrow 80$ lb-ft) before checking clearance.

NOTE: Put a piece of wood between the vise and the mainshaft.



3. Measure the clearance between 1st gear and the thrust washer.

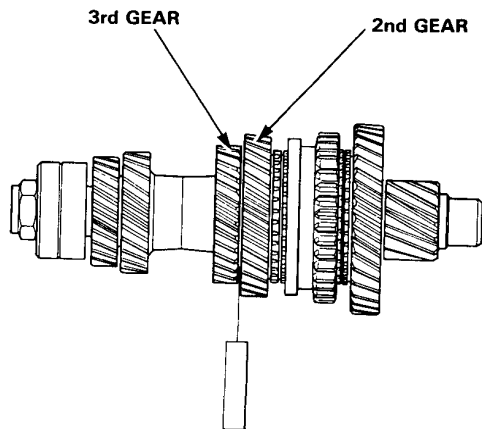
Standard: 0.03–0.08 mm
(0.001–0.003 in.)
Service Limit: 0.18 mm
(0.007 in.)



4. If the clearance is out of tolerance, select the appropriate thrust washer or spacer collar for the correct clearance from the charts on page 14-23.

5. Measure the clearance between the 2nd gear and 3rd gear.

Standard: 0.03–0.08 mm
(0.001–0.003 in.)
Service Limit: 0.18 mm
(0.007 in.)



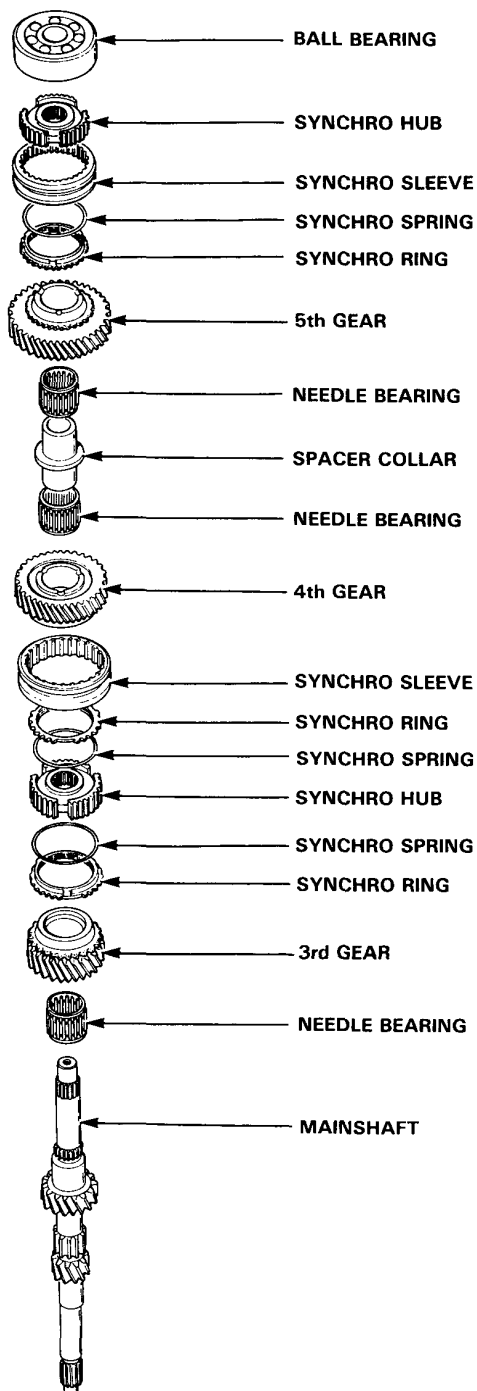
6. If the clearance is out of tolerance, select the appropriate thrust washer or spacer collar for the correct clearance from the charts on page 14-23.

Mainshaft Assembly



Clearance Inspection

1. Assemble the bearings, synchro hub, synchro sleeve, gears, spacer collar, etc. on the mainshaft as instructed below.

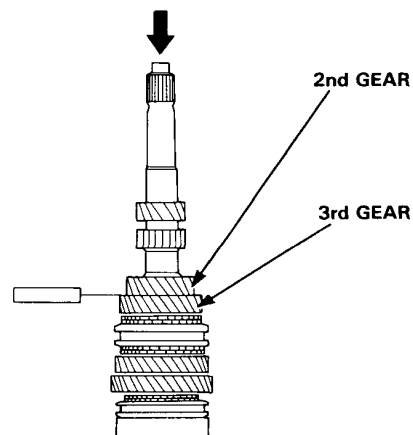


2. Measure the clearance: push down on the bearing race with a socket, and measure the clearance between 3rd and 2nd gears.

3rd Gear Clearance:

Standard: 0.06—0.21 mm
(0.002—0.008 in.)

Service Limit: 0.3 mm (0.012 in.)

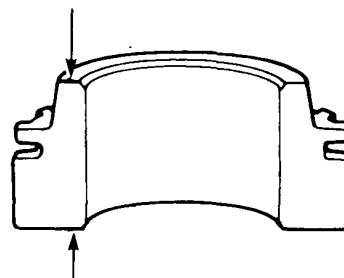


3. If the reading is outside specifications, measure the thickness of 3rd gear.

3rd Gear Thickness:

Standard: 32.42—32.47 mm
(1.276—1.278 in.)

Service Limit: 32.3 mm (1.272 in.)



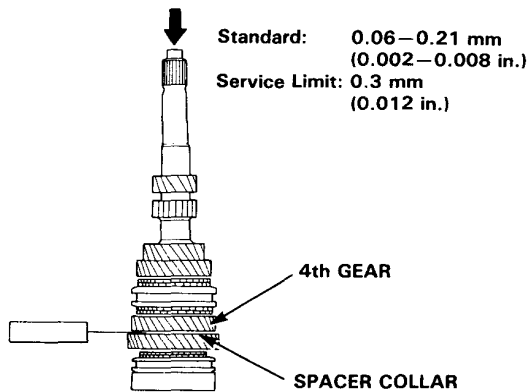
4. If the reading is within specifications, replace the synchro hub.

5. If the service limit is exceeded, replace the gear.
(cont'd)

Mainshaft Assembly

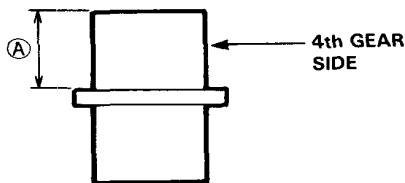
Clearance Inspection (cont'd)

6. Measure the clearance between 4th gear and the spacer collar.



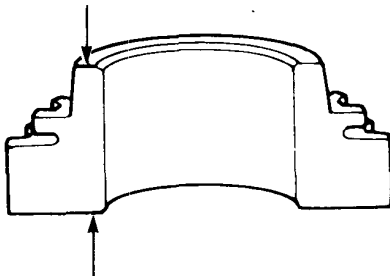
7. If the reading is out of specifications measure distance **(A)** on the spacer collar.

Standard: 26.03–26.08 mm
(1.025–1.027 in.)
Service Limit: 26.01 mm (1.024 in.)



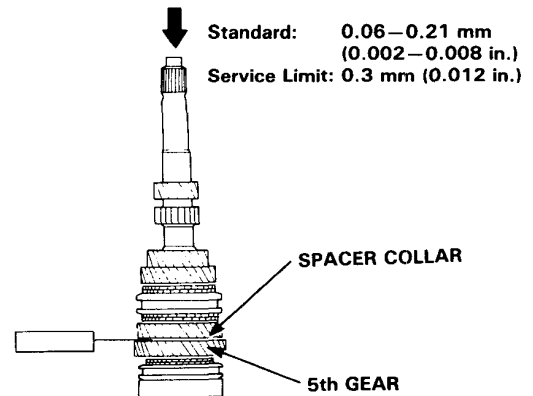
8. If distances **(A)** are within specification, measure the thickness of 4th gear,

4th Gear Thickness:
Standard: 30.92–30.97 mm
(1.217–1.220 in.)
Service Limit: 30.8 mm (1.213 in.)



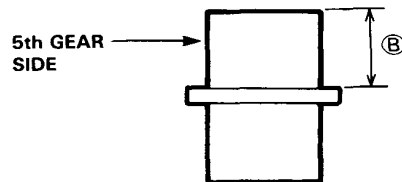
Replace the 4th gear if the respective measurement is out of specification.
Replace the 4th gear synchro hub if the respective measurement is within specification.

9. Measure the clearance between 5th gear and the spacer collar.



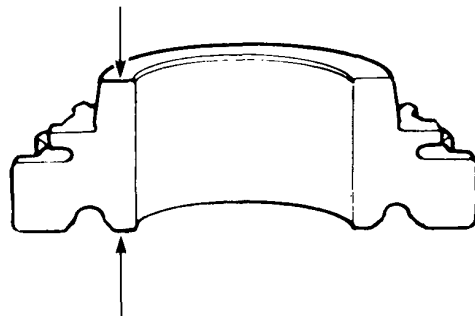
10. If the reading is out of specifications measure distance **(B)** on the spacer collar.

Standard: 26.03–26.08 mm
(1.025–1.027 in.)
Service Limit: 26.01 mm (1.024 in.)



11. If distance **(B)** is within specification, measure the thickness of 5th gear.

5th Gear Thickness:
Standard: 30.42–30.47 mm
(1.198–1.200 in.)
Service Limit: 30.3 mm (1.193 in.)



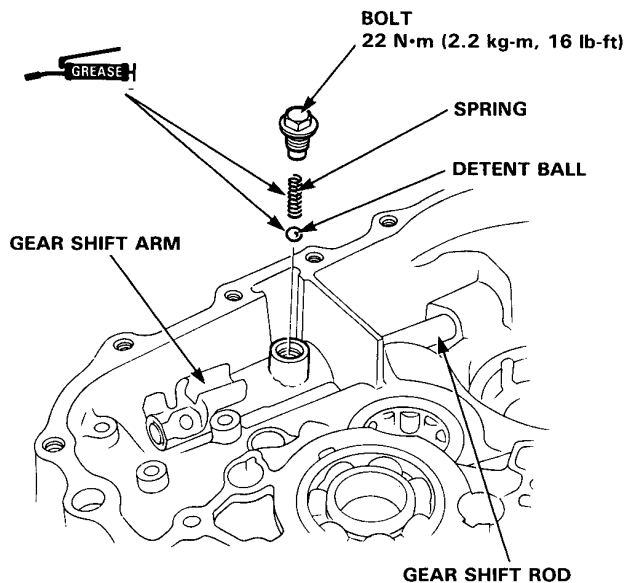
Replace 5th gear if the respective measurement is out of specification.
Replace the 5th gear synchro hub if the respective measurement is within specification.

Transmission Assembly

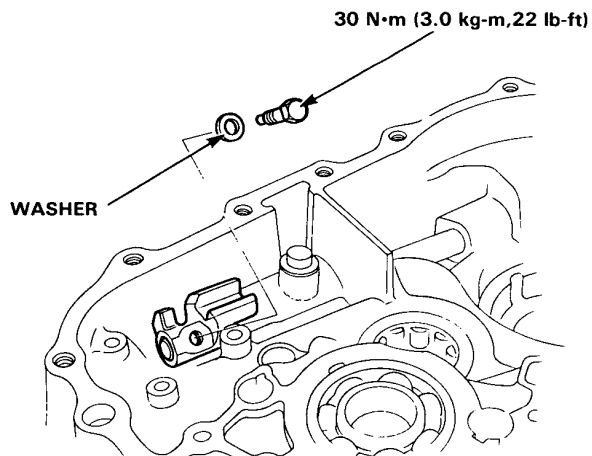


Reassembly

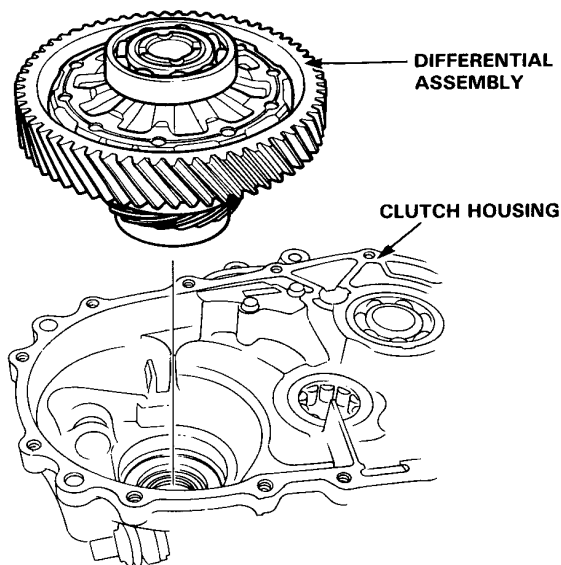
1. Set the gear shift arm.
2. Place the boot for the shift rod.
3. Install the shift rod with its detent hole up.
4. Grease the detent ball and spring, and them in the shift arm.



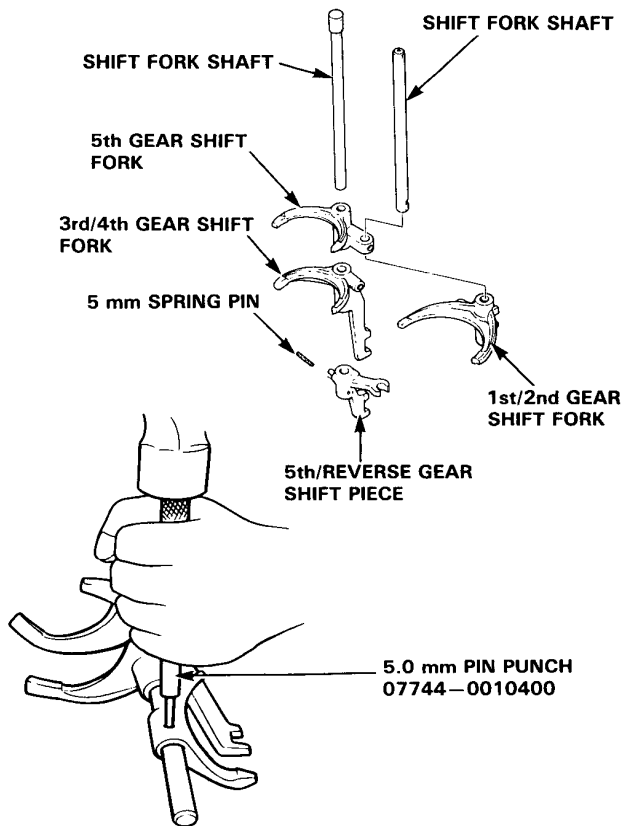
5. Place the bolt and washer holding the gear shift arm.



6. Install the differential assembly in the clutch housing.



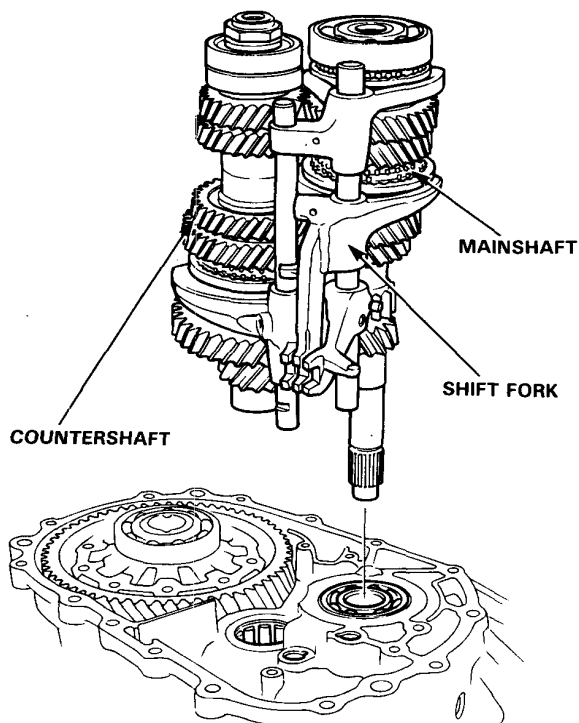
7. Insert the shift fork shafts into the shift forks and drive in the spring pin.



Transmission Assembly

Reassembly (cont'd)

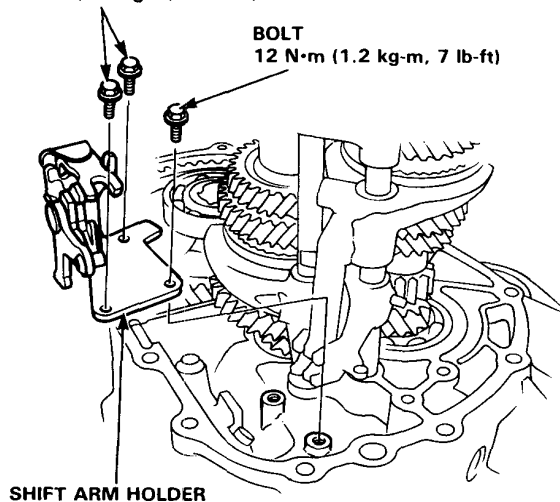
8. Insert the mainshaft and countershaft into the shift forks and install them as an assembly.



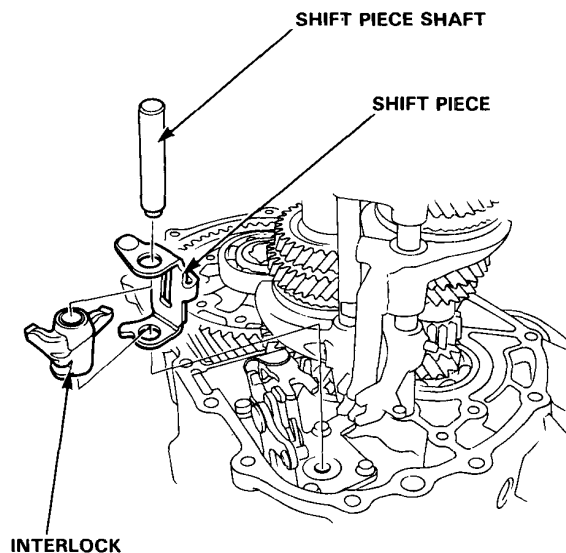
9. Install the gear shift arm holder in the clutch housing.

SPECIAL BOLTS
15 N·m (1.5 kg-m, 11 lb-ft)

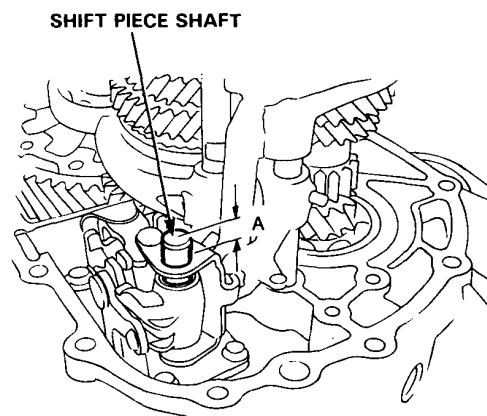
BOLT
12 N·m (1.2 kg-m, 7 lb-ft)



10. Assemble the shift piece and interlock, then insert the shift piece shaft.



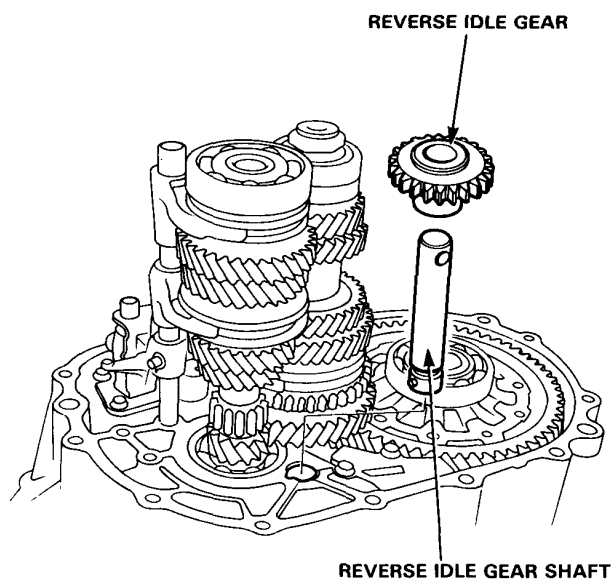
11. Measure the distance A after mounting the shift piece shaft assembly.



Distance A
Standard: 11.9 – 12.3 mm
(0.468 – 0.484 in.)

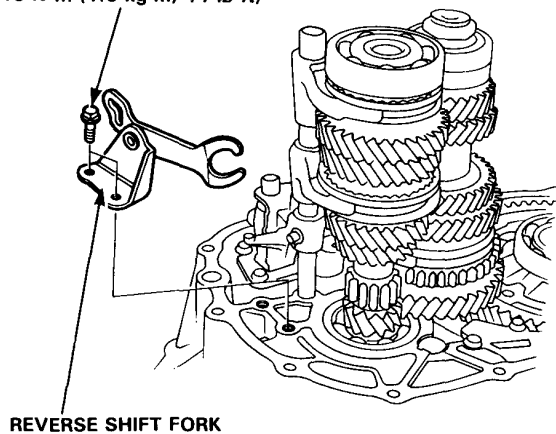


12. Install the reverse idle gear and idle gear shaft in the clutch housing.



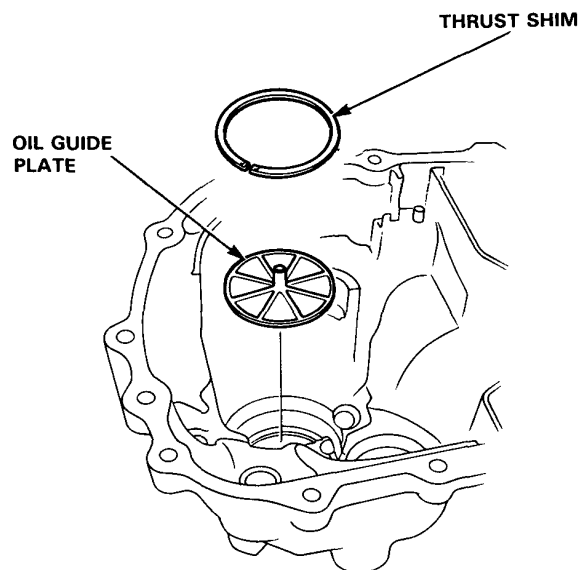
13. Install the reverse shift fork in the clutch housing with the 5th/reverse fork pin matched the groove of the reverse shift fork.

BOLT
15 N·m (1.5 kg-m, 11 lb-ft)

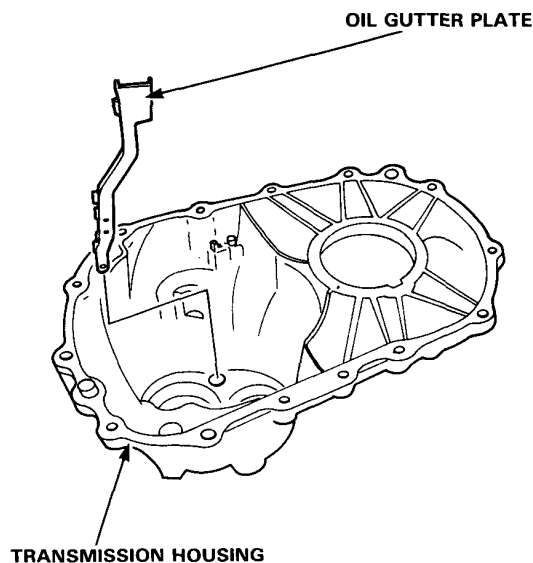


NOTE: Prepare the mainshaft thrust shim of which thrust clearance is set to appropriate value. (See page 14-16)

14. Install the oil guide plate and mainshaft thrust shim into the transmission housing.



15. Install the oil gutter plate into the transmission housing.



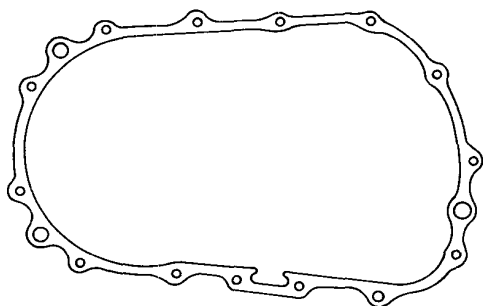
(cont'd)

Transmission Assembly

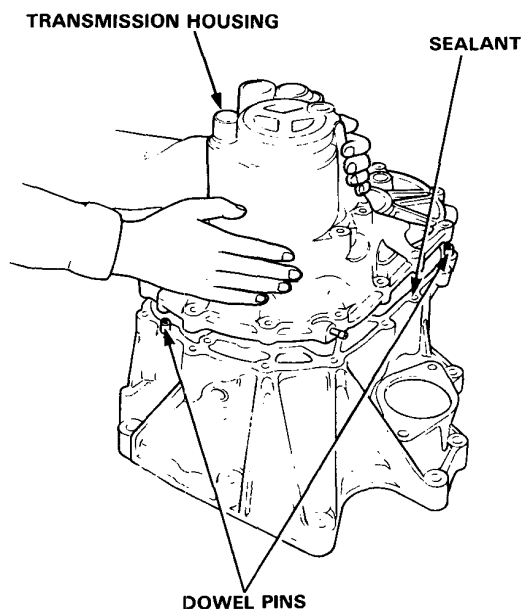
Reassembly (cont'd)

16. Apply sealant on the sealing surface of the transmission housing and clutch housing as shown.

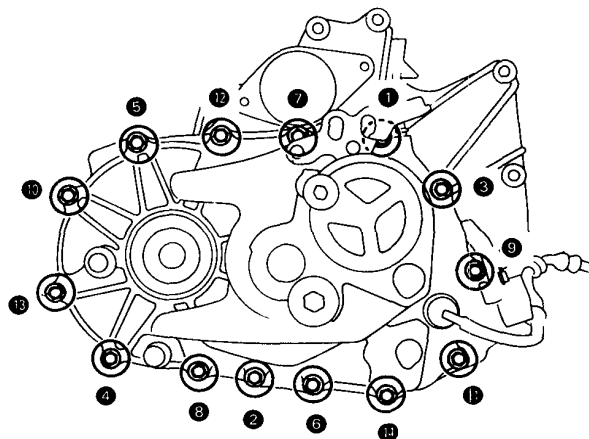
NOTE: This transmission uses no gasket between the major housings; use Honda P/N 08740-99986 sealant. Assemble the housings within 20 minutes after applying the sealant and allow it to cure at least 30 minutes after assembly before filling it with oil.



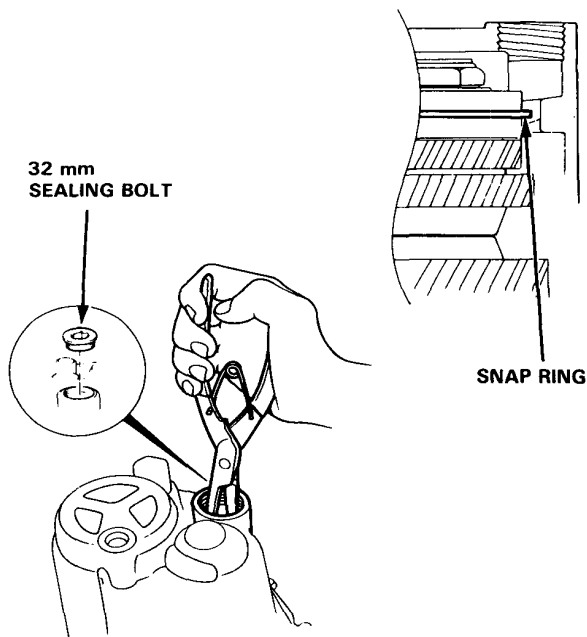
17. Install the dowel pins on the clutch housing.
18. Mount the transmission housing to the clutch housing.



19. Torque bolts (8 x 1.25 mm) in sequence shown, 27 N·m (2.7 kg-m, 20 lb-ft).

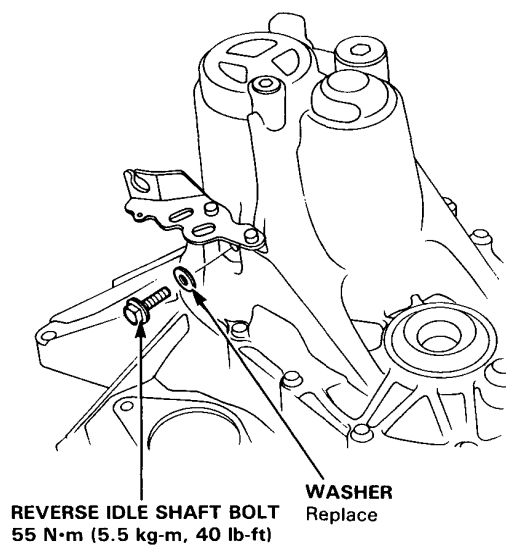


20. Install the snap ring to the countershaft ball bearing and torque 32 mm sealing bolt.





21. Install the reverse idle shaft bolt.



Transmission Assembly

Installation

Car Raised on Hoist

1. Place the transmission on transmission jack.

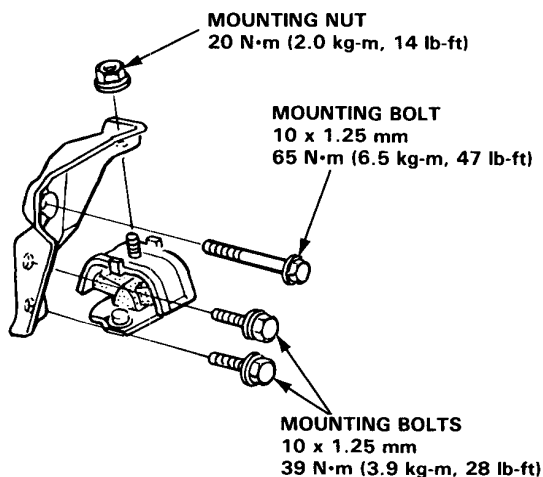
NOTE: Clean and grease release bearing sliding surfaces.

2. Check that two 14 mm dowel pins are installed in the clutch housing.
3. Raise the transmission far enough to align dowel pins with matching holes in block.
4. Roll the transmission toward engine and fit mainshaft into clutch disc splines. If driver's side suspension was left in place, install new spring clips on both axles, then carefully insert left axle into differential as you install transmission.

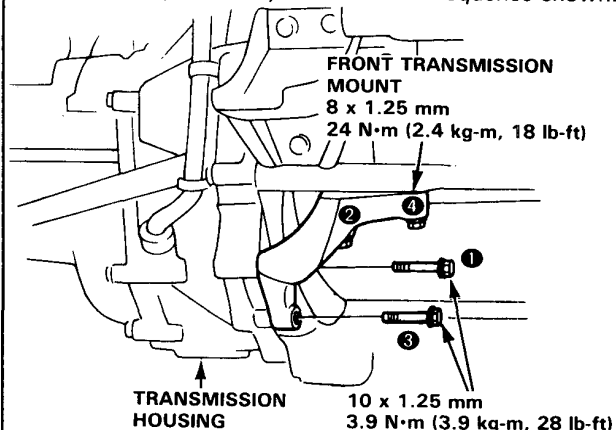
NOTE: New spring clips must be used on both axles.

CAUTION: Make sure that axles fully bottom. Slide axle in until you feel spring clips engage differential.

5. Push and wiggle the transmission until it fits flush with engine flange.
6. Secure transmission to engine with mounting bolts from the engine side (12 x 1.25 x 70 mm). Torque to 68 N·m (6.8 kg-m, 50 lb-ft).
7. Install the rear transmission mount on the transmission housing as shown.

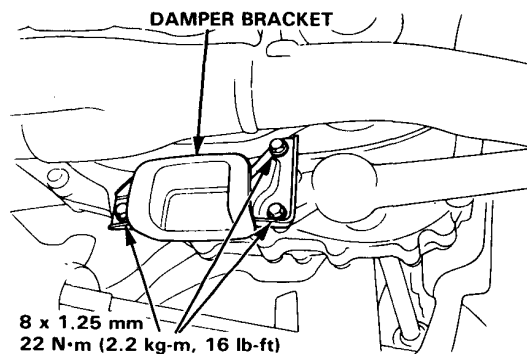


8. Loosely install the bolts for the front transmission mount, then torque them in the sequence shown.

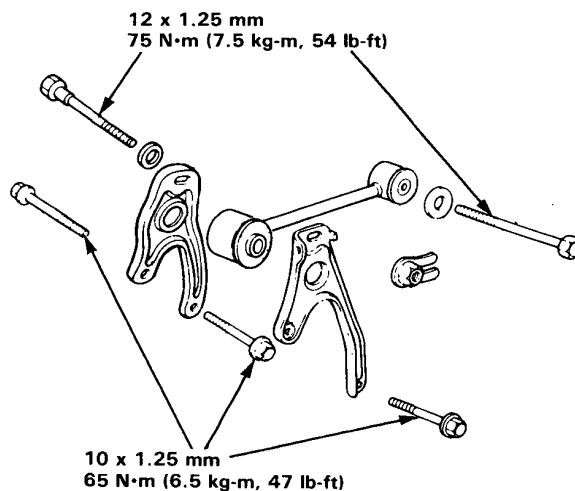


9. Install the starter mounting bolts and torque to 45 N·m (4.5 kg-m, 33 lb-ft).

10. Install the damper bracket in the transmission.



11. Install the upper torque arm and its brackets as shown.





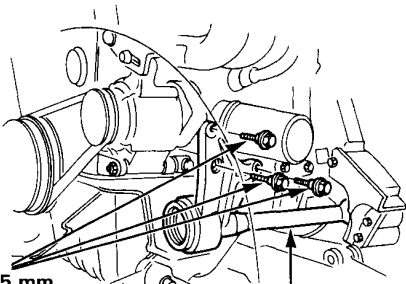
Test

12. Remove the transmission jack.
13. Install the starter with its mounting bolts, 10 x 1.25 mm and torque to 45 N·m (4.5 kg-m, 33 lb-ft).
14. Turn right steering knuckle/axle assembly outward far enough to insert free end of axle into transmission. Repeat on opposite side.

NOTE: New spring clips must be used on both axles.

CAUTION: Make sure that axles fully bottom. Slide axle in until you feel spring clips engage differential.

15. Install lower arm ball joint bolts, tie-rod ball joint nuts and damper fork bolt.
16. Connect shift linkage.
17. Connect shift lever torque rod to clutch housing and torque 8 x 1.25 mm bolt to 22 N·m (2.2 kg-m, 16 lb-ft).
18. Install the Intermediate shaft.



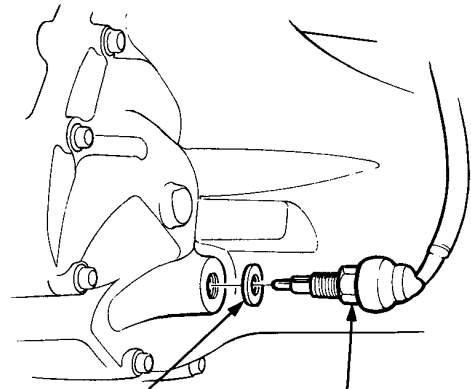
10 x 1.25 mm
39 N·m (3.9 kg-m, 29 lb-ft) INTERMEDIATE SHAFT

19. Install the front wheels.
20. Torque the 14 mm transmission drain plug to 40 N·m (4.0 kg-m, 29 lb-ft).

Car on Ground

21. Install the clutch cable at the release arm.
22. Coat the new O-ring with oil, put it on speedometer gear holder, then install holder in transmission housing and secure with hold-down tab and bolt.
23. Install engine sub wire harness in clamp at clutch housing.
24. Connect the engine compartment wiring:
 - Battery positive cable to starter.
 - Black/white wire to starter solenoid.
 - Green/black and yellow wires to back-up light switch.
25. With ignition key OFF connect ground cable to battery and transmission.
26. Refill transmission with recommend oil (page 14-4).
27. Check transmission for smooth operation.

1. Test the back-up light switch by placing the gear shift lever in reverse and turning the ignition switch to ON.

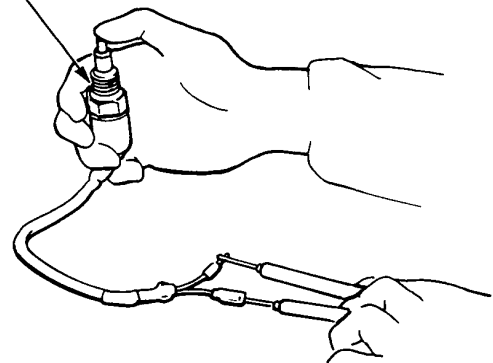


ALUMINUM WASHER
Replace

BACK-UP LIGHT SWITCH
25 N·m (2.5 kg-m, 18 lb-ft)

2. If back-up lights do not go on, remove the back-up light switch.
3. Using an ohmmeter check the switch for continuity while pushing in on the switch plunger.

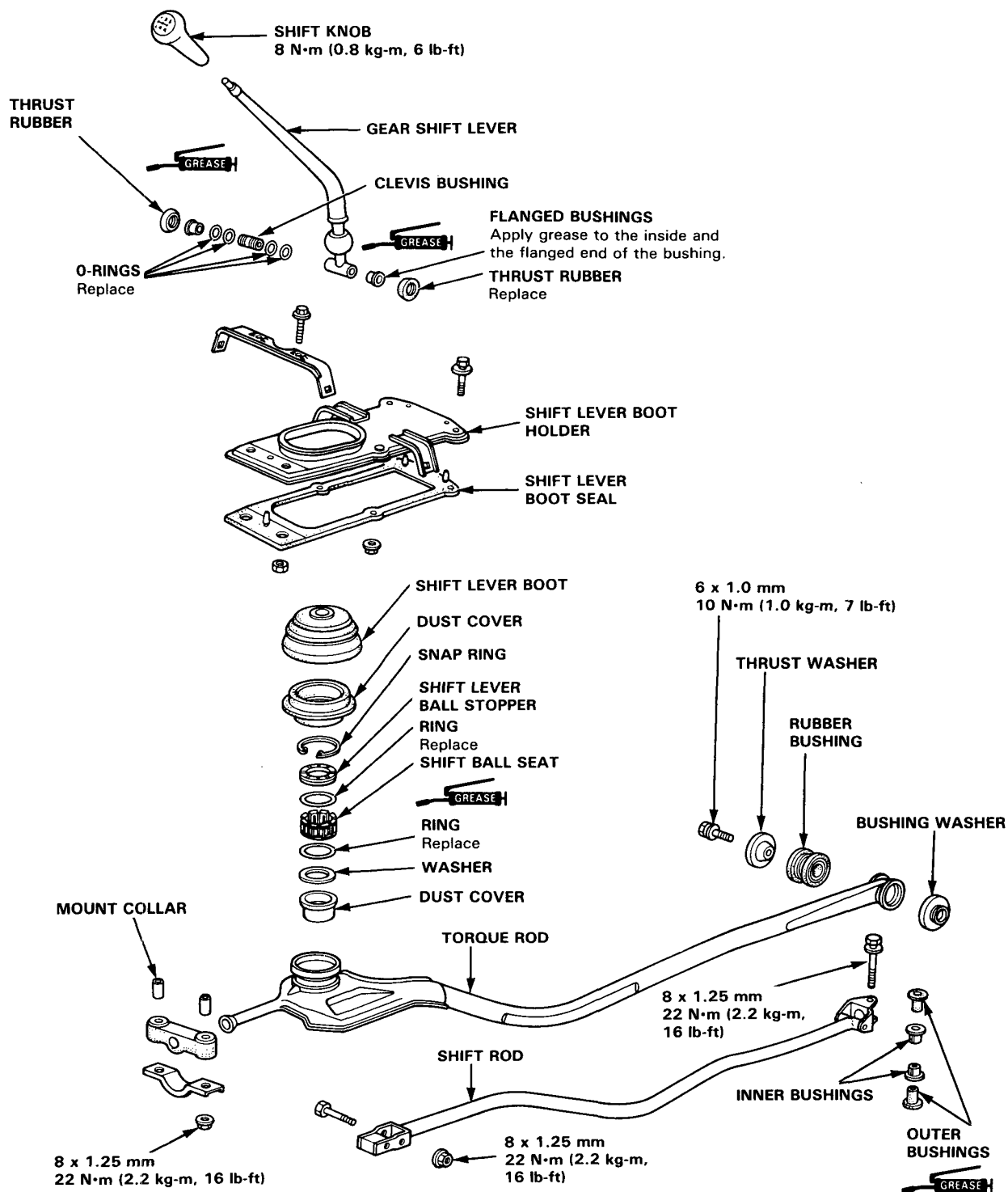
SWITCH PLUNGER



Gearshift Mechanism

Overhaul

NOTE: Inspect rubber parts for wear or damage when disassembling.



Driveshafts

Driveshafts	17-2
Intermediate Shaft	17-3

Outline of Model Change

On models equipped with B20A2 engine, the intermediate shaft is newly used.

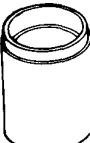


Special Tools

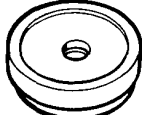
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07749-0010000	Driver	1	07949-6110000 may also be used
②	07746-0040900	Pilot, 40 mm	1	
③	07965-SD90100	Support Base	1	
④	07746-0010400	Attachment, 52 x 55 mm	1	
⑤	07746-0010500	Attachment, 62 x 68 mm	1	
⑥	07GAD-SE00100	Oil Seal Driver Attachment	1	
⑦	07965-SD90200	Support Collar	1	
⑧	07947-SD90200	Oil Seal Driver Attachment	1	


①


②


③


④


⑤


⑥

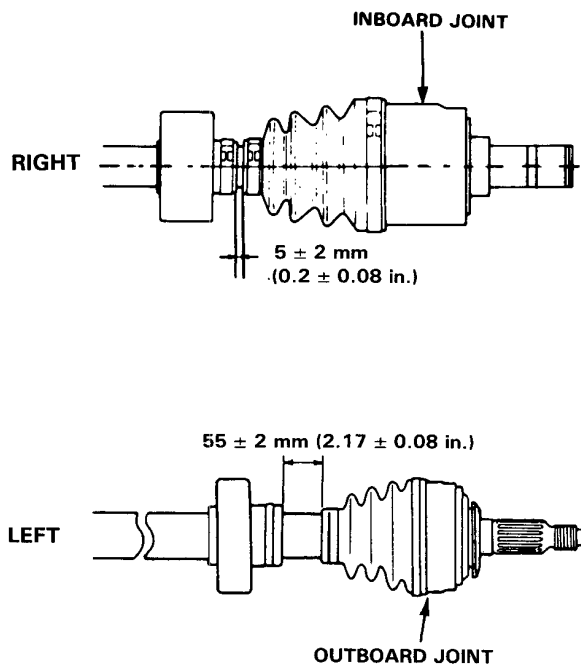

⑦


⑧

Driveshafts

Installation Note

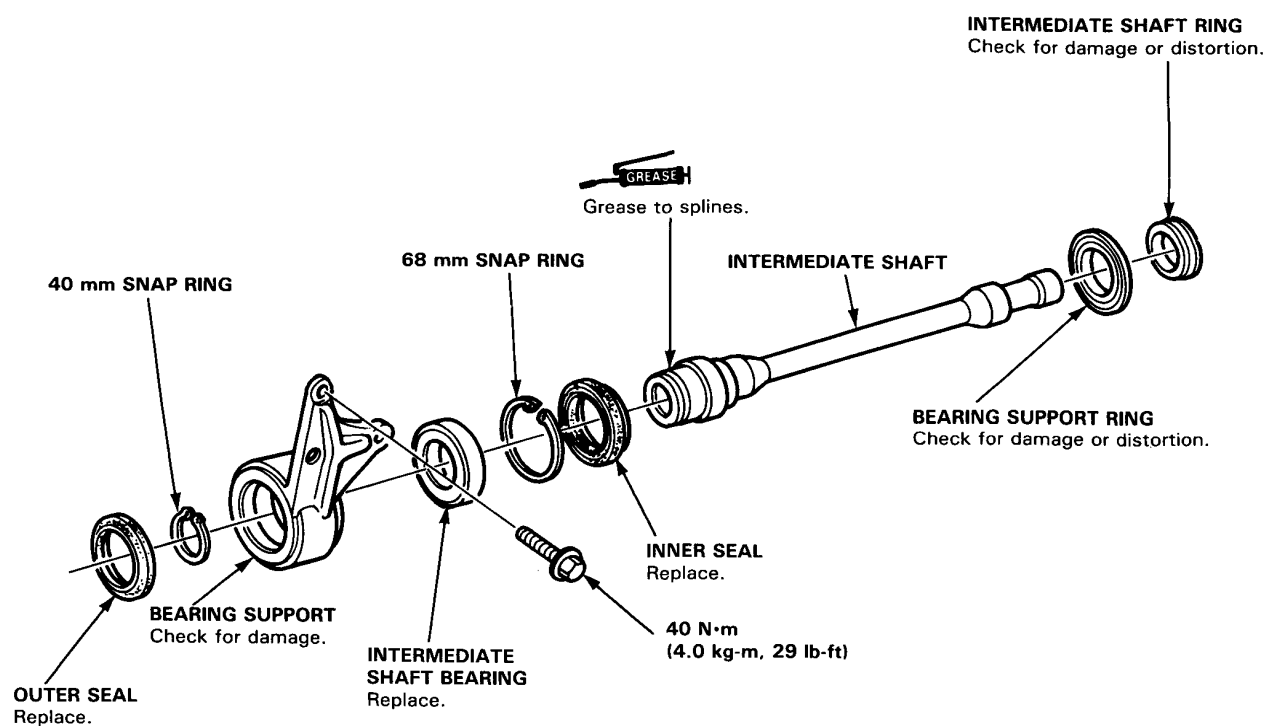
Dinamic Damper Installation



Intermediate Shaft



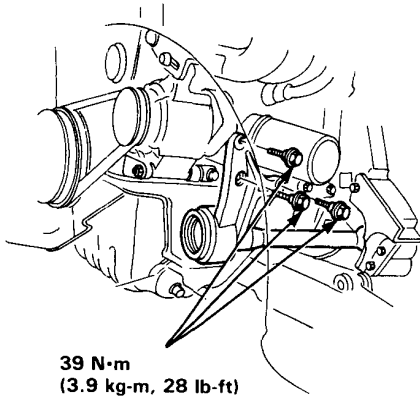
Inspection



Intermediate Shaft

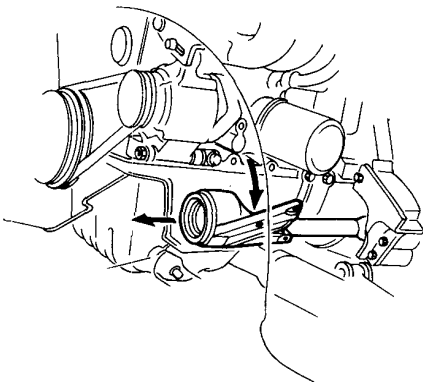
Replacement

1. Drain the transmission oil.
2. Remove the three 10 mm bearing support mounting bolts.



3. Lower the bearing support close to the steering gear box and remove the intermediate shaft from the differential.

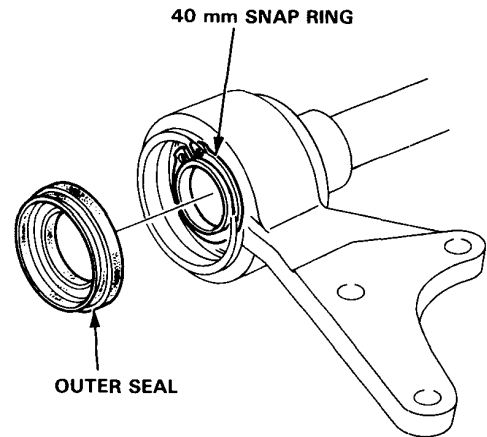
CAUTION: To prevent damage to the differential oil seal, hold the intermediate shaft horizontal until it is clear of the differential.



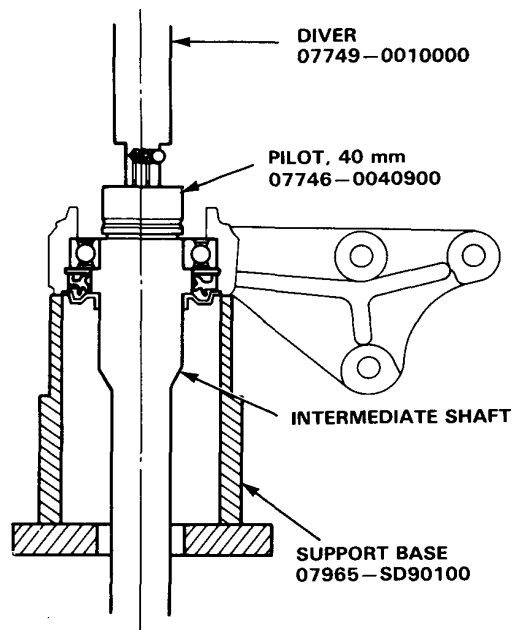
4. Install the intermediate shaft in the reverse order of removal.

Disassembly

1. Remove the intermediate shaft outer seal.
2. Remove the 40 mm snap ring.

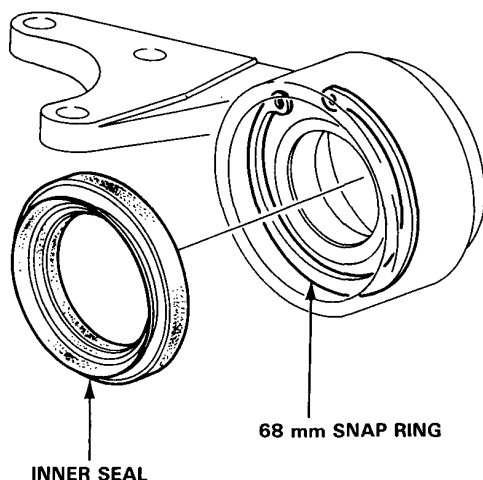


3. Press the intermediate shaft out of the bearing support using the special tools and hydraulic press.

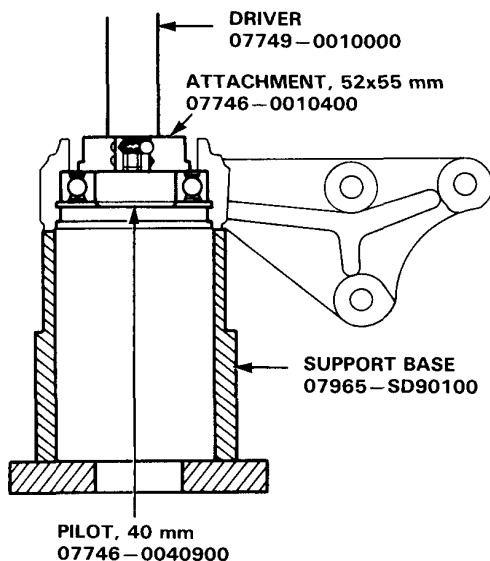




4. Remove the intermediate shaft inner seal.
5. Remove the 68 mm snap ring.

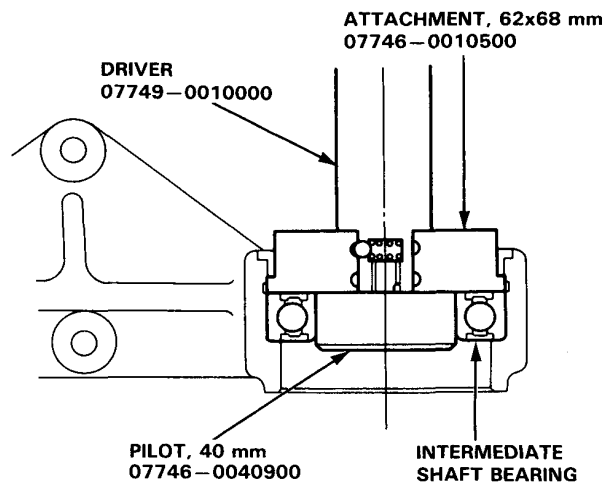


6. Remove the intermediate shaft bearing out of the bearing support using the special tools and hydraulic press as shown.



Reassembly

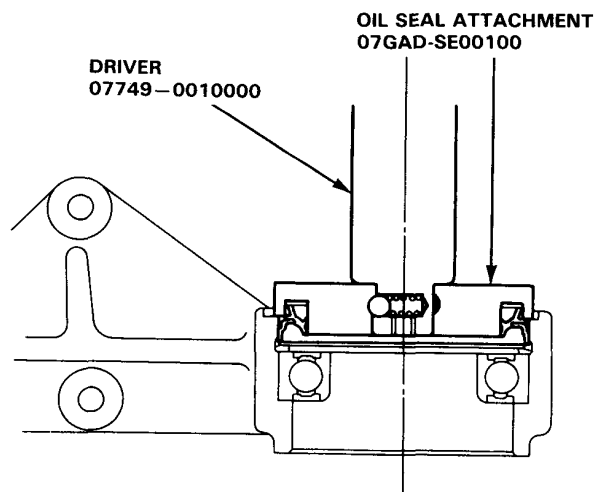
1. Press the intermediate shaft bearing into the bearing support using the special tool and hydraulic press as shown.



2. Install the 68 mm snap ring in the groove in the bearing support.

CAUTION: Install the snap ring with its tapered end facing out.

3. Press the intermediate shaft inner seal into the bearing support using the special tool as shown.

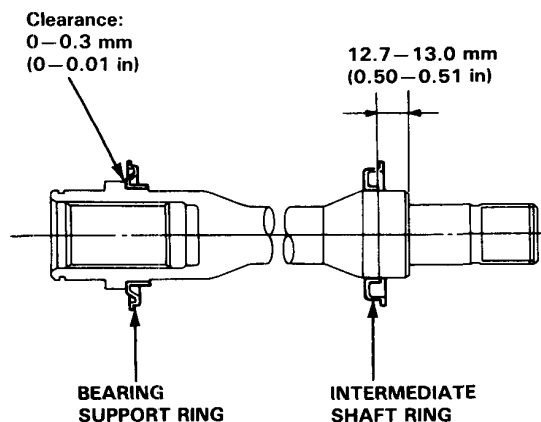


(cont'd)

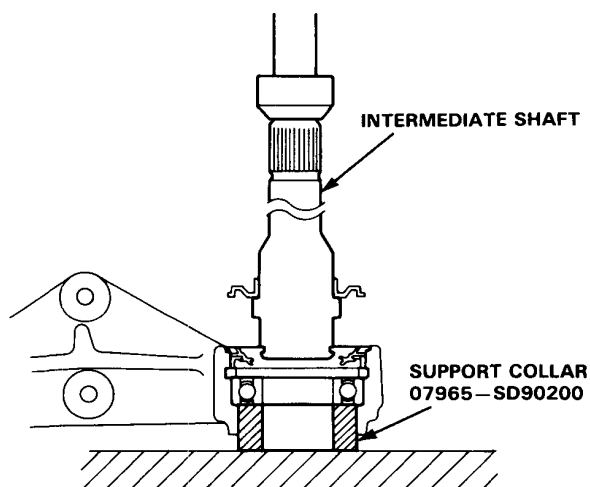
Intermediate Shaft

Reassembly (cont'd)

4. Install the intermediate shaft ring and bearing support ring on the intermediate shaft and position them as shown using a soft hammer.



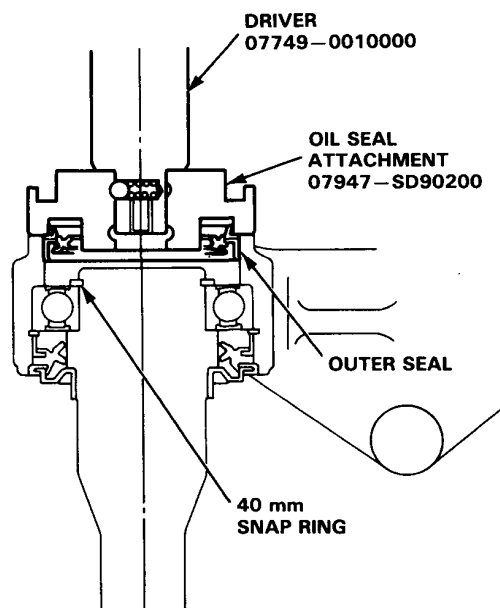
5. Press the intermediate shaft into the bearing support using the special tool and hydraulic press as shown.



6. Install the 40 mm snap ring in the groove in the intermediate shaft.

CAUTION: Install the snap ring with its tapered end facing out.

7. Press the intermediate shaft outer seal into the bearing support using the special tools as shown.



Suspention

Rear Suspension 19-2

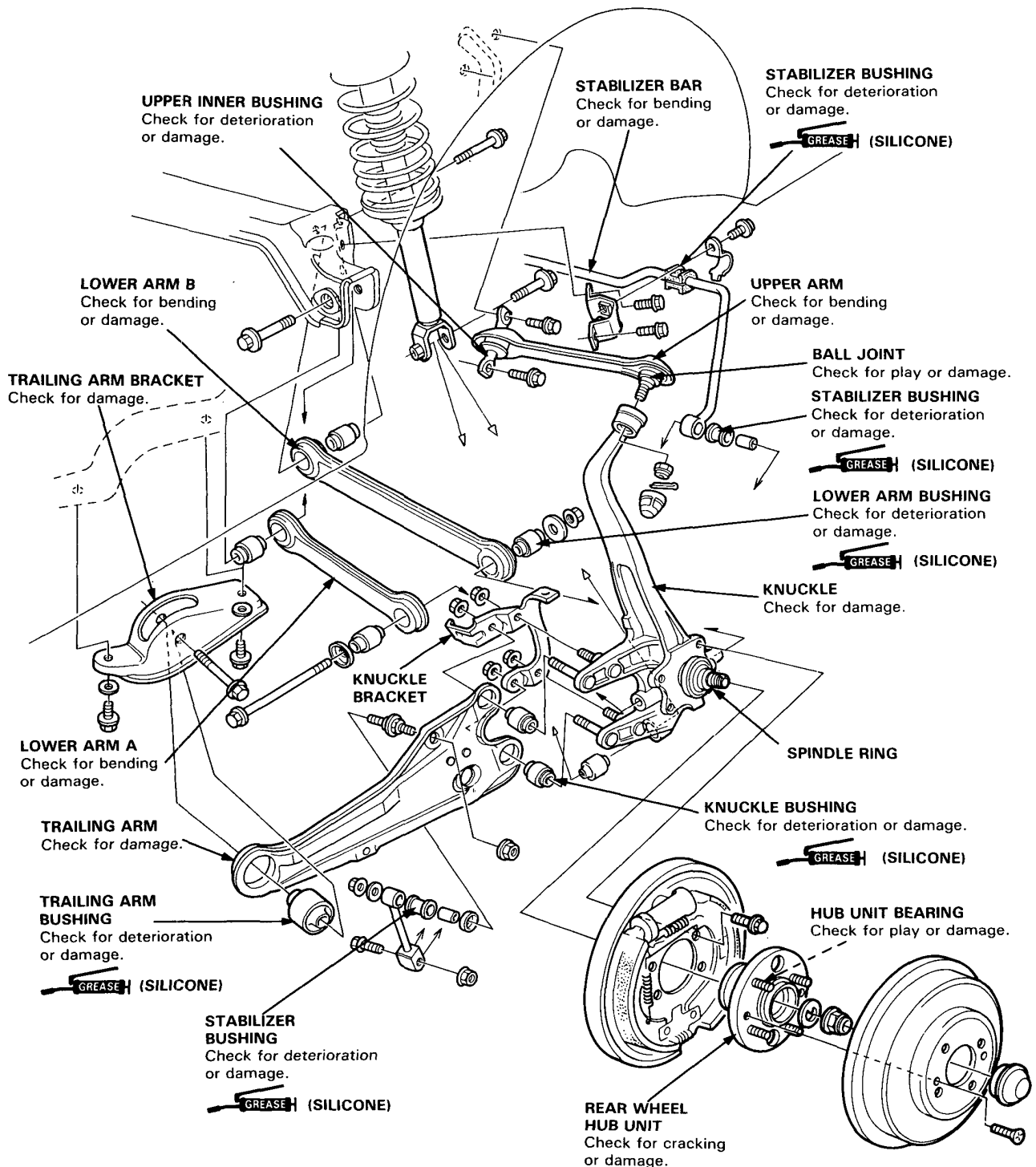


Outline of Model Change

Installation method of the rear knuckle and trailing arm has been changed.

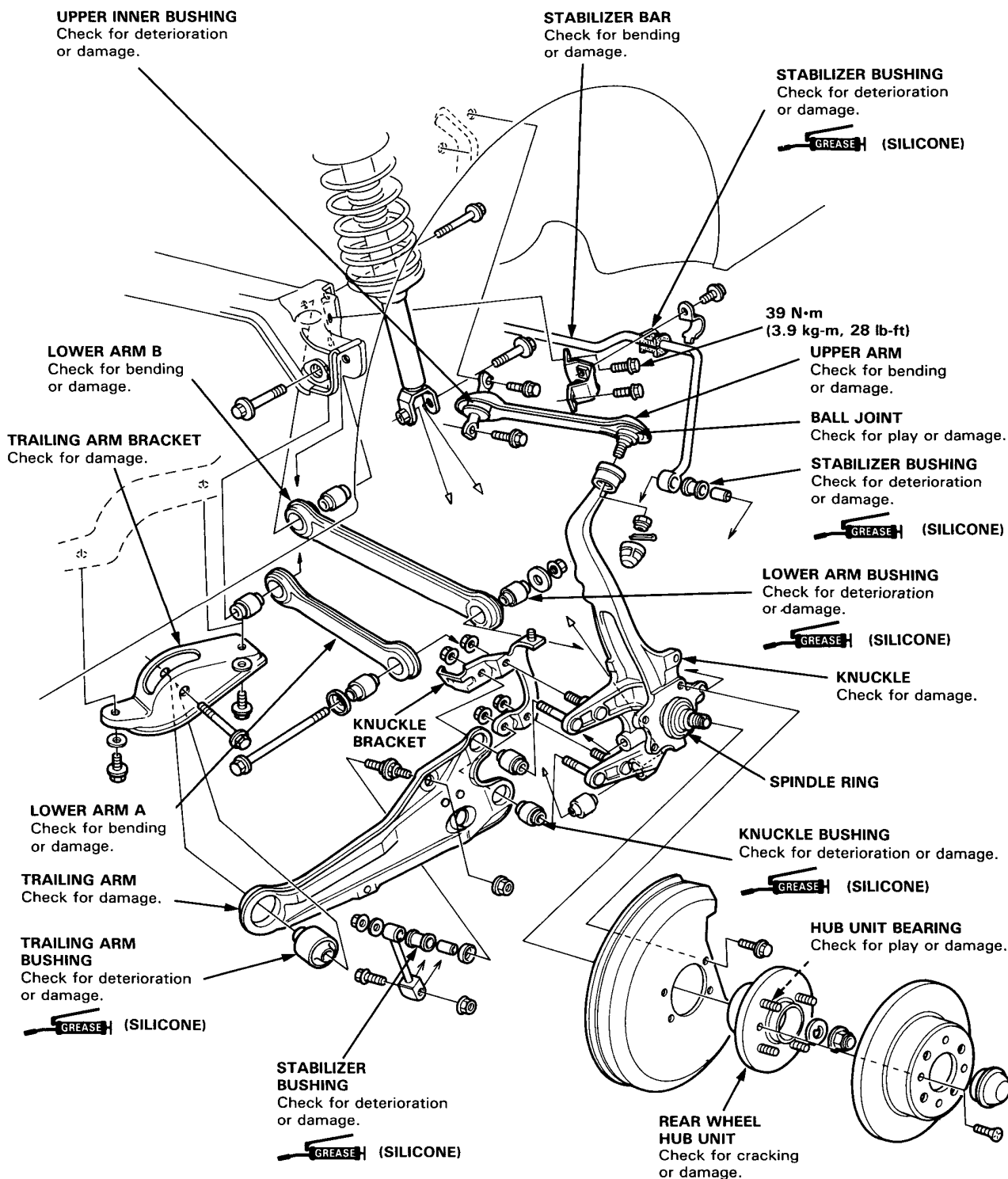
Rear Suspension

Inspection (Drum Brake Model)



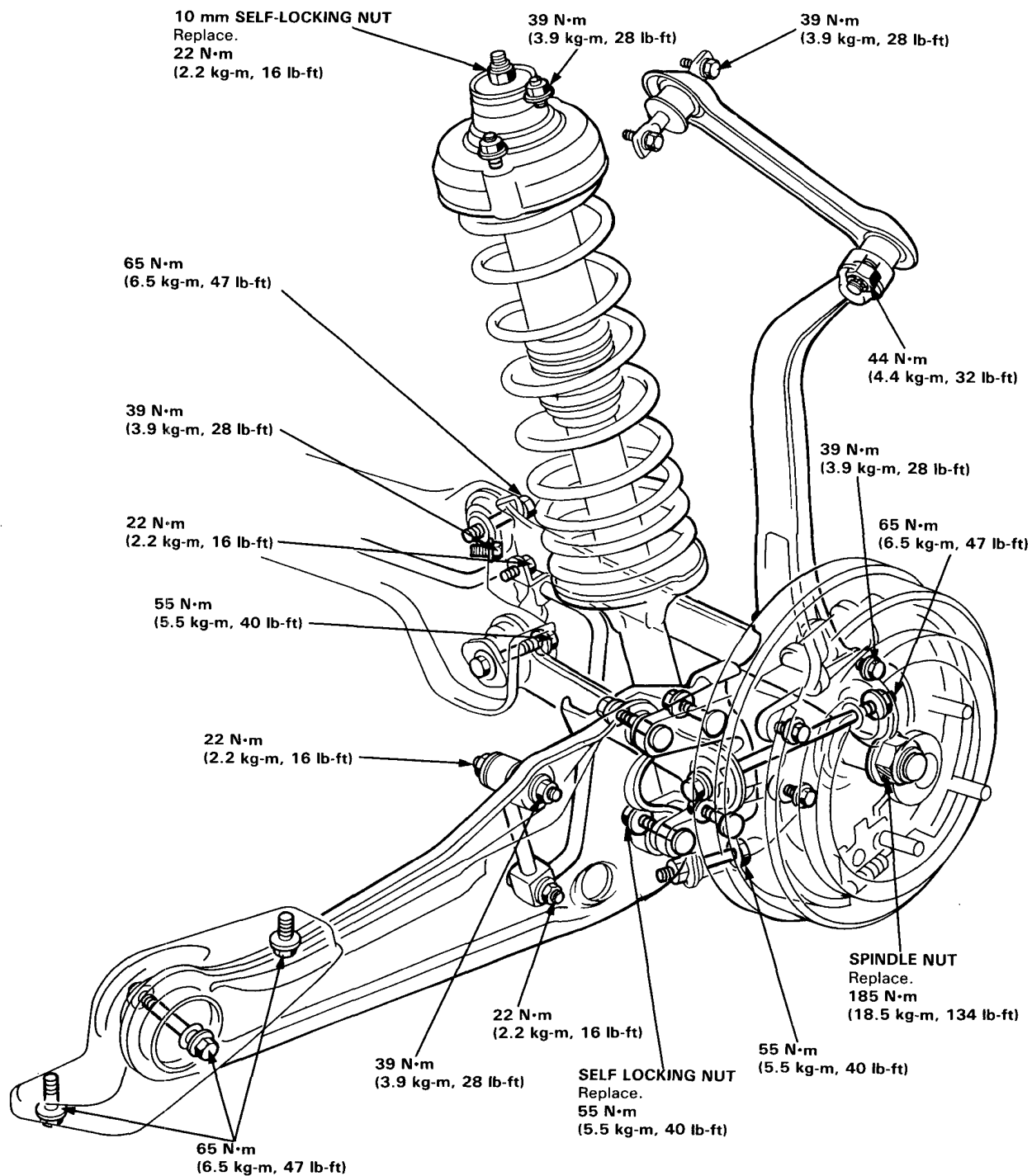


Inspection (Disc Brake Model)



Rear Suspension

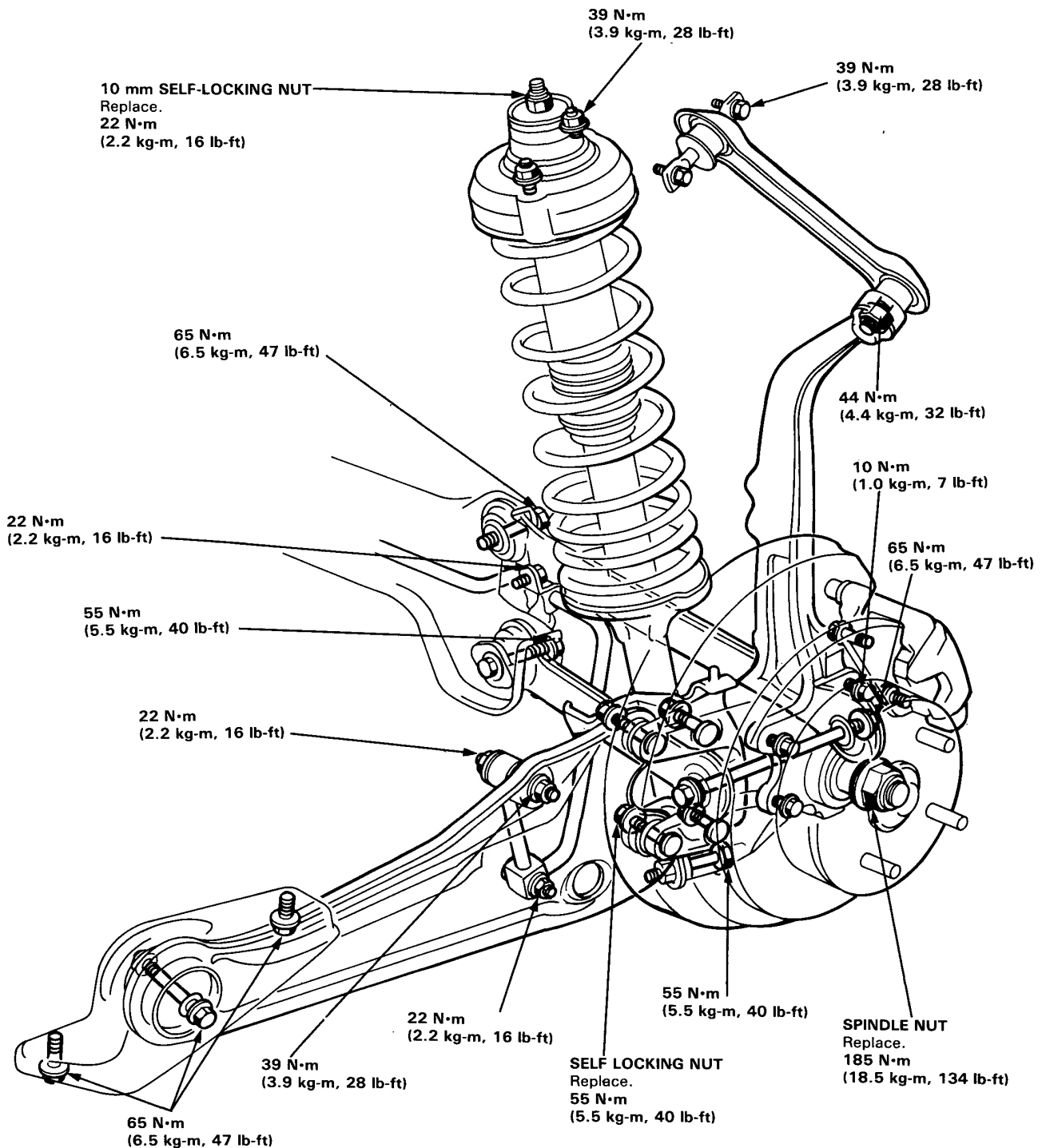
Torque Spec (Drum Brake Model)



CAUTION: Before tightening the bolts or nuts connected to the rubber mount or bushings, the vehicle should be on the ground.



Torque Spec (Disc Brake Model)



CAUTION: Before tightening the bolts or nuts connected to the rubber mount or bushings, the vehicle should be on the ground.

Brakes

Front Brakes	20-2
--------------------	------



Outline of Model Change

On models equipped with B20A2 engine or 4W-ALB (except KS model), the large front caliper and brake disc are newly used.

Front Brake

Inspection

WARNING Do not use an air hose to blow the brake assembly clean.

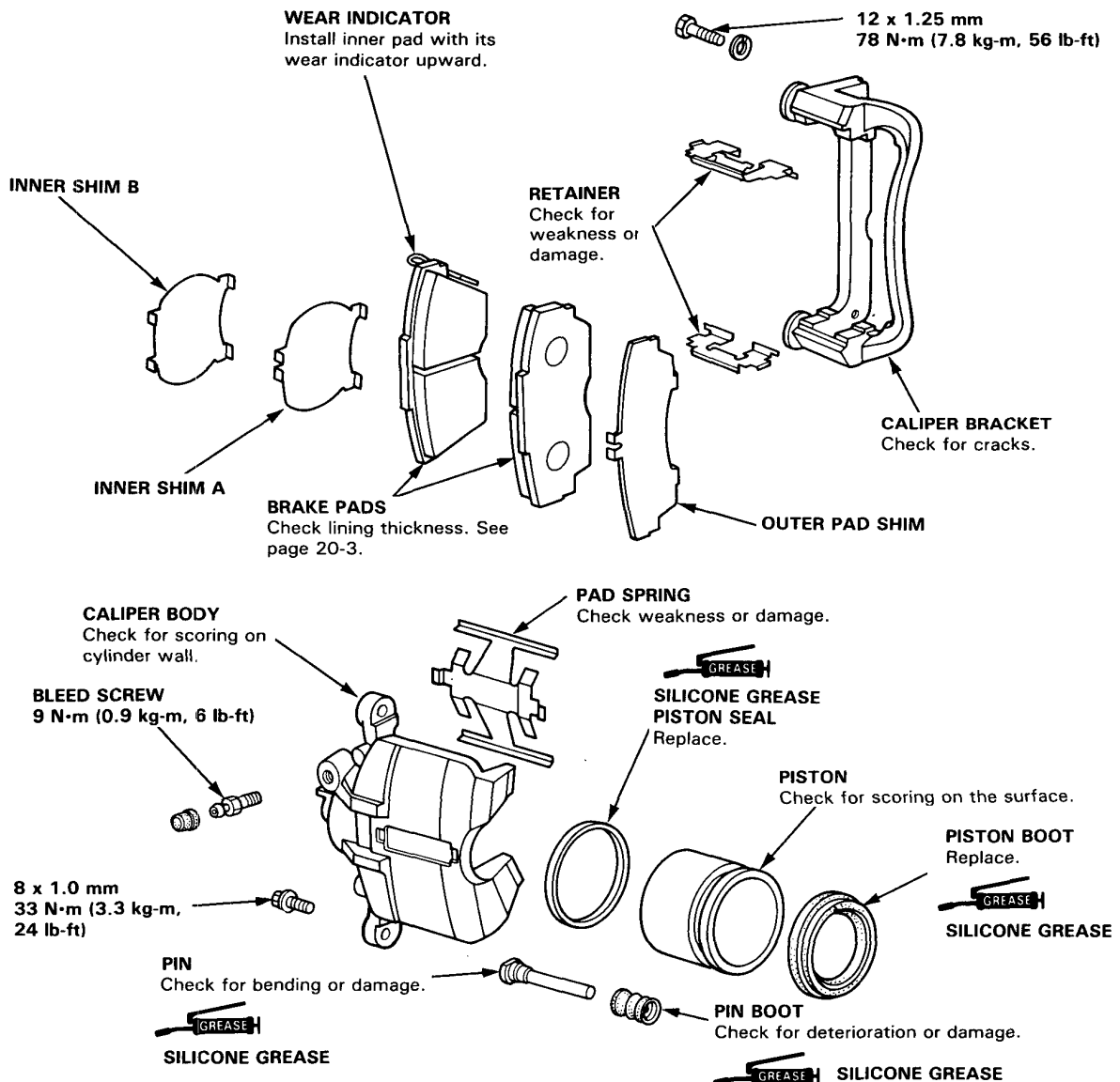
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the 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 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.

NOTE:

- Coat piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.



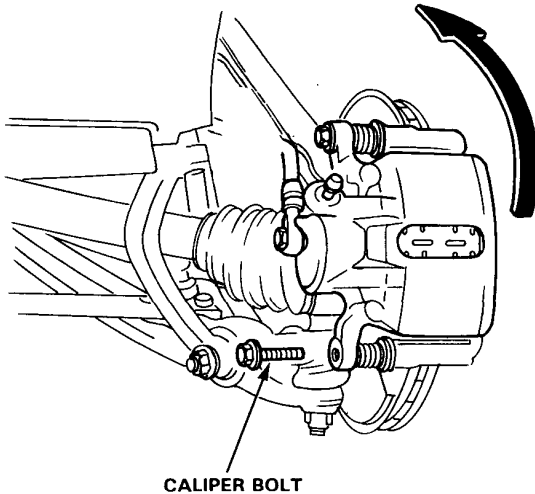
Brake Pad



Inspection/Replacement

WARNING Do not use an air hose to blow the brake assembly clean.

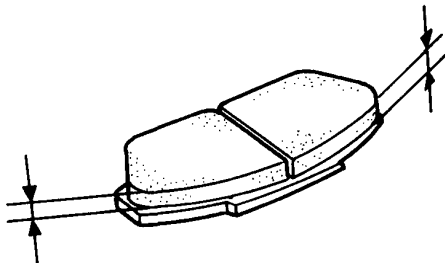
1. Remove the front wheels and support the front of car on safety stands.
2. The brake hose clamp bolts and remove the caliper bolt, then pivot caliper up out of the way.



3. Remove the pad shim, pad retainers and pads.
4. Using a vernier caliper, measure the thickness of each brake pad lining.

Brake Pad Thickness:

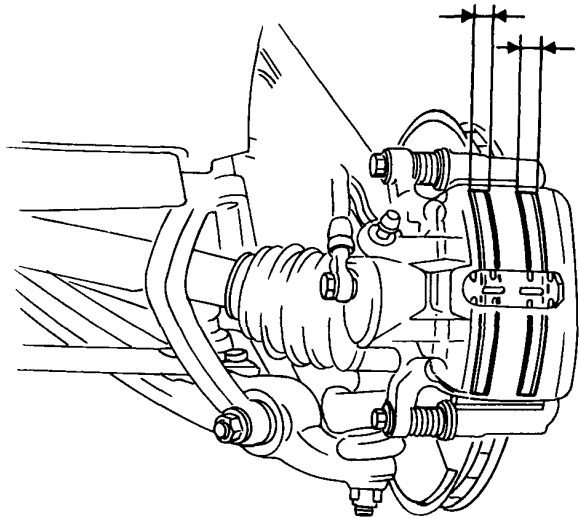
Standard: 11.5 mm (0.45 in)
Service Limit: 3 mm (0.12 in)



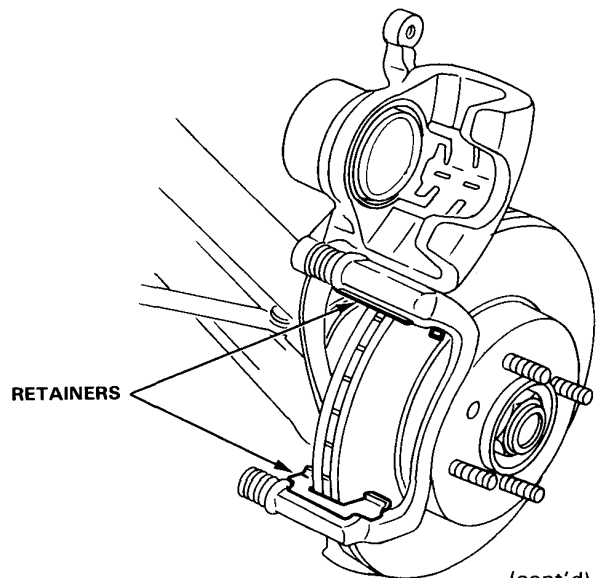
NOTE: Measurement does not include pad backing thickness.

5. If lining thickness is less than service limit, replace both pads as a set.

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.



6. Clean the caliper thoroughly; remove any rust, and check for grooves or cracks.
7. Install the pad retainers.



(cont'd)

Brake Pad

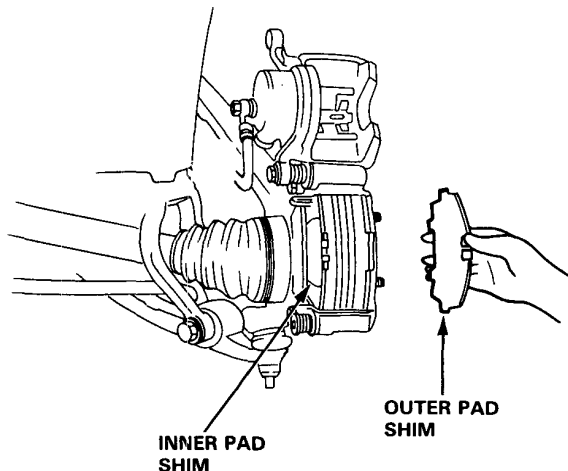
Inspection/Replacement (cont'd)

8. Apply anti-seize compound to both surfaces of the shim and back of the pads.

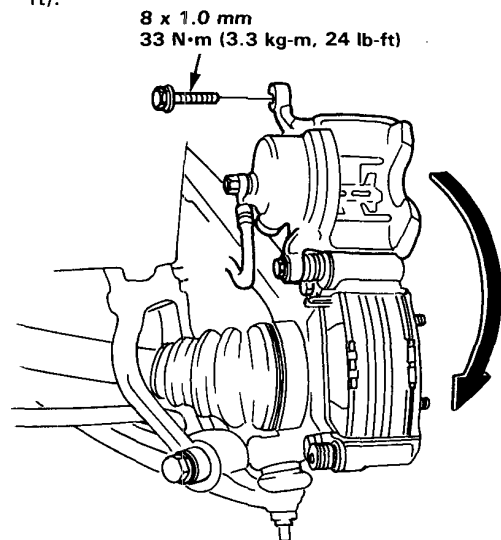
9. Install the brake pads.

NOTE: Apply anti-seize compound between the shims and pads.

10. Install the brake pad shims correctly.



11. Push in the piston so that the caliper will fit over the pads.
12. Pivot the caliper down into position, then install the caliper bolt and tighten to 33 N·m (3.3 kg-m, 24 lb-ft).



13. Depress the brake pedal several times to make sure the brakes work, then road-test.

Brake Caliper

Disassembly

CAUTION:

- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Use only clean brake fluid.
- 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 spill brake fluid on the car, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

1. Remove the banjo bolt and disconnect the brake hose from the caliper.
2. Remove the caliper bolts, then remove the caliper.

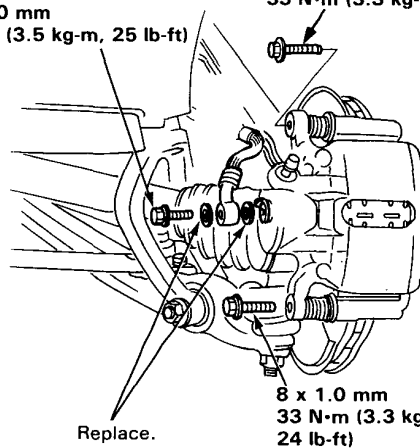
BANJO BOLT

10 x 1.0 mm

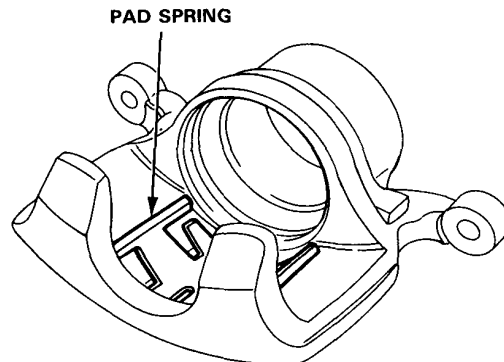
35 N·m (3.5 kg-m, 25 lb-ft)

8 x 1.0 mm

33 N·m (3.3 kg-m, 24 lb-ft)



3. Remove the pad spring from the caliper body.

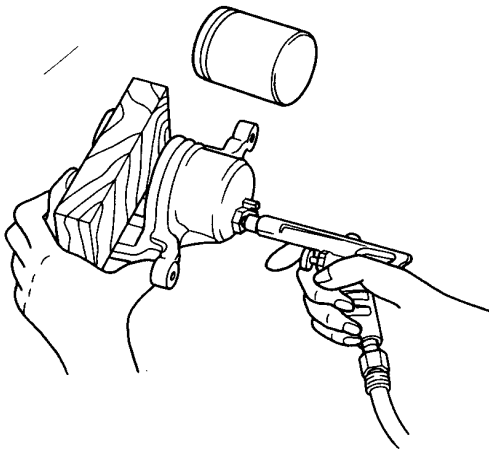




4. Place a wooden block or shop rag in the caliper opposite the piston, then carefully remove the piston from the caliper by applying air pressure through the brake line hole.

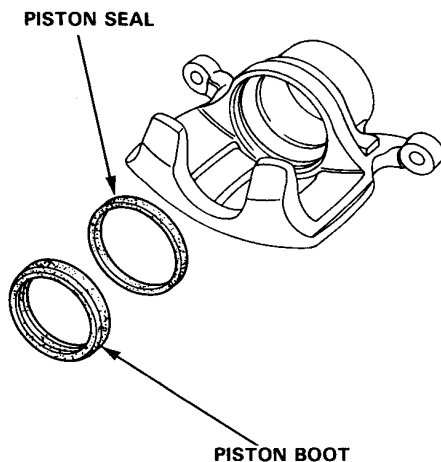
WARNING

- Do not place your fingers in front of the piston.
- Do not use high air pressure.



5. Remove the piston boot and piston seal.

CAUTION: Take care not to damage the cylinder.

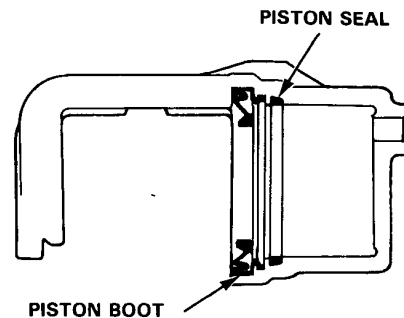


Reassembly

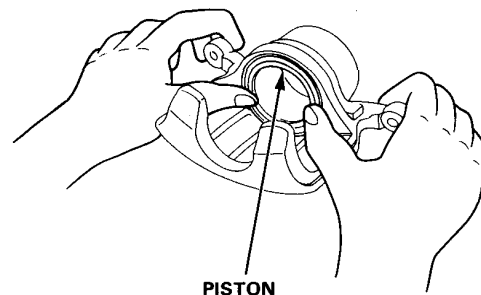
CAUTION:

- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Use only clean brake fluid.
- 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 spill brake fluid on the car; it may damage the paint, if brake fluid does contact the paint; wash it off immediately with water.

1. Clean the piston and caliper bore with brake fluid and inspect for wear or damage.
2. Apply silicone grease to a new piston seal, then install the piston seal in the cylinder groove.
3. Apply silicone grease to a new piston boot, then install the piston boot.



4. Lubricate the caliper cylinder and piston with brake fluid, then install the piston in the cylinder with the dished end facing in.



5. Reinstall the caliper in the reverse order of removal.
6. Fill the brake reservoir up and bleed the brake system.

Brake Disc

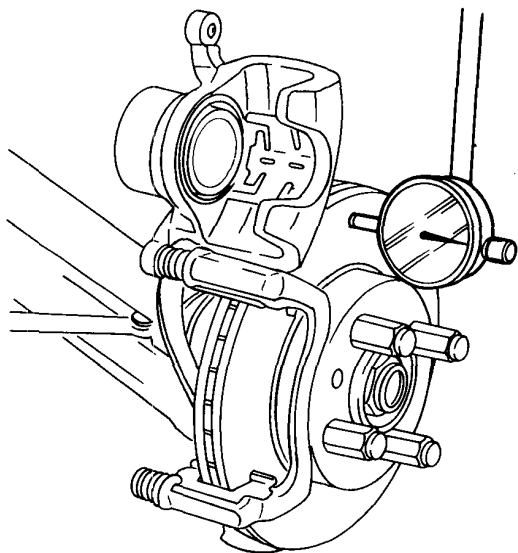
Run-Out Inspection

1. Remove the front wheels, and support the front of the car on safety stands.
2. Remove the brake hose clamp bolts and caliper pin bolt, then pivot the caliper up out of the way on the caliper pin bolt, and remove the pads and pad retainers.
3. Inspect the disc surface for grooves, cracks, and rust. Clean the disc thoroughly and remove all rust.
4. Use the lug nuts to hold the disc securely against the hub, then mount a dial indicator as shown.

Brake Disc Runout:

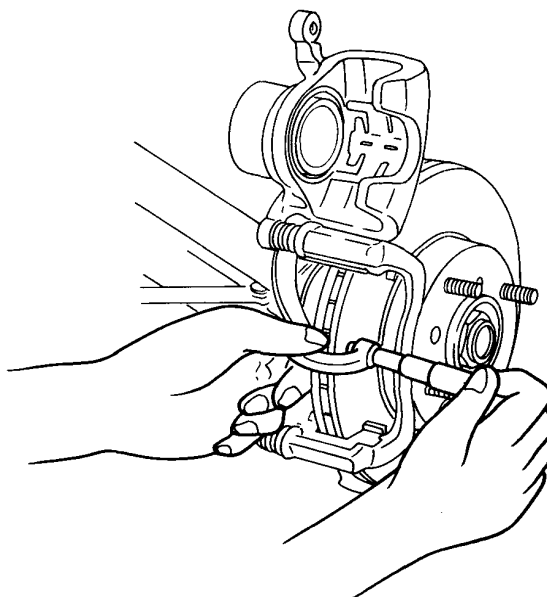
Service Limit: 0.1 mm (0.004 in.)

5. If the disc is beyond the service limit, remove it and install a new one.



Thickness and Parallelism Inspection

1. Remove the front wheels, and support the front of car on safety stands.
2. Move the caliper and pads out of the way as described in the preceding column.
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.39 in.) in from the outer edge of the disc.



Brake Disc Thickness:

Standard: 21 mm (0.83 in.)

Max. Refinishing Limit: 19 mm (0.75 in.)

Brake Disc Parallelism:

The difference between any thickness measurements should not be more than 0.015 mm (0.0006 in.).

4. If the disc is beyond the limits for thickness or parallelism, remove it and install a new one.

Body

Frame Repair Chart 21-2

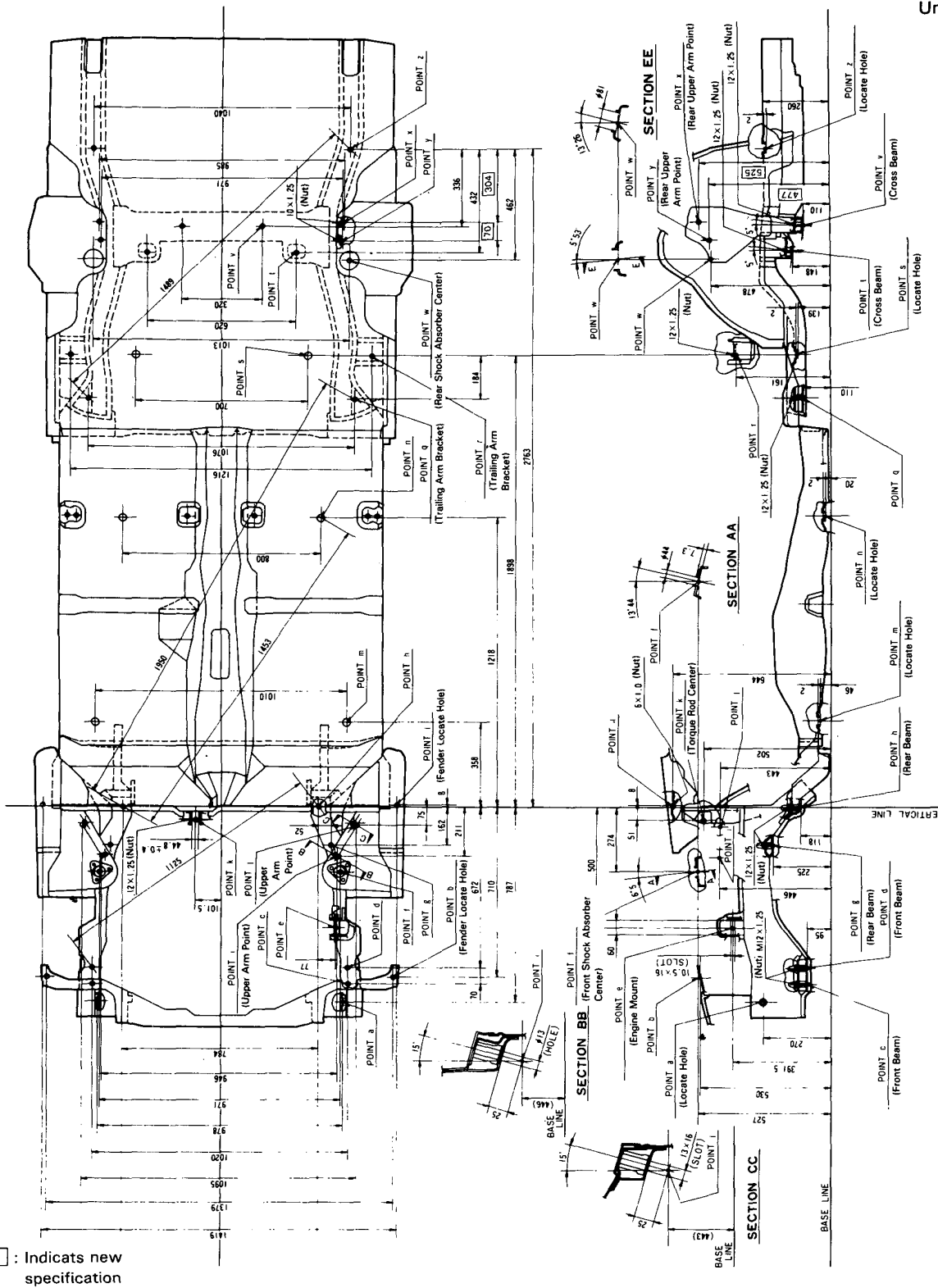


Outline of Model Change

Several specifications for the frame repair chart have been changed due to rear suspension design change.

Frame Repair Chart

Unit: mm



Electrical

Engine Electrical	24-2
Body Electrical	25-2



Engine Electrical

Igniter Unit Test	24-2
Distributor Overhaul	24-4
Alternator Belt Adjustment	24-9
Alternator Replacement	24-10

Outline of Model Change

• A20A1, A20A3 and B20A2 Engines have been added.

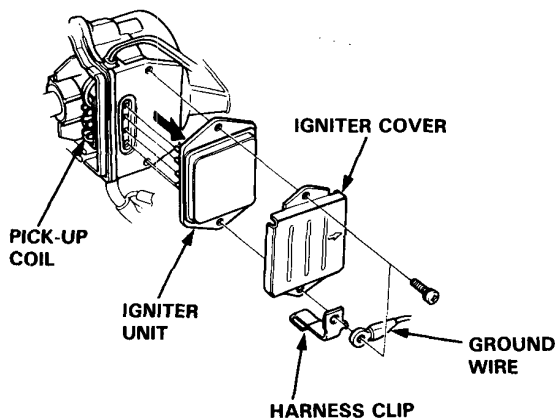


Engine Electrical

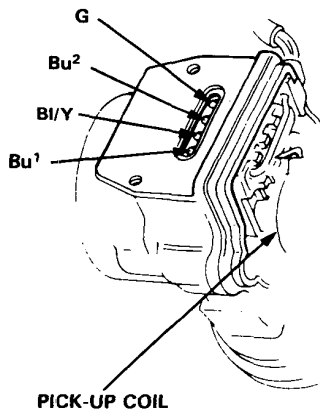
Igniter Unit Test

Toyota Denso:

1. Remove the igniter cover and pull out the igniter unit.



2. Check voltage between the Bu¹ terminal and body ground, then the BI/Y terminal and body ground, with the ignition switch ON. There should be battery voltage.



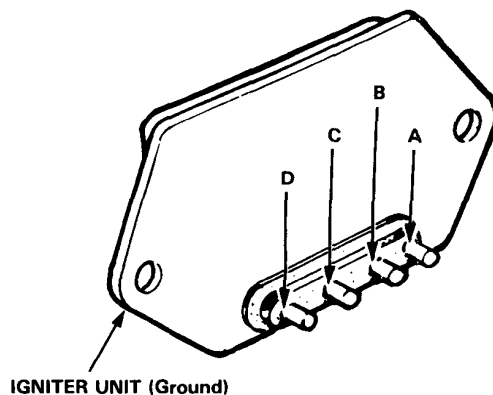
3. Measure resistance between the G and Bu² terminals on the pick-up coil. Replace the pick-up coil if the resistance is not within specifications.

NOTE: Resistance will vary with the coil temperature.

Pick-up Coil Resistance:

Approx. 750 ohms at 20°C (70°F)

4. Check for continuity in both directions between A and B terminals on the igniter output. (RX100 scale). There should be continuity in only one direction.



5. Connect ohmmeter positive probe to D terminal, and negative probe to the igniter unit (ground), then measure resistance on the igniter input.

NOTE: Resistance will vary with the unit temperature.

Igniter Input Resistance:

50,000 ohms or more at 20°C (70°F)

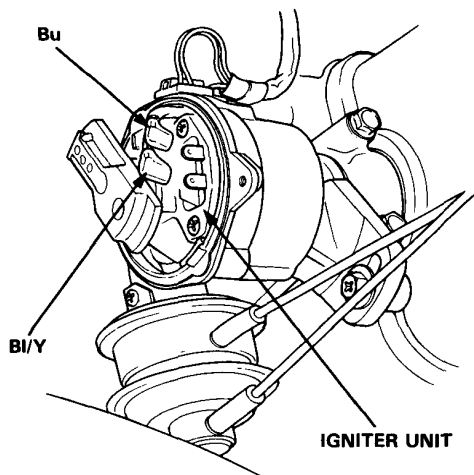
NOTE: When installing the igniter, pack silicone grease in the connector housing.



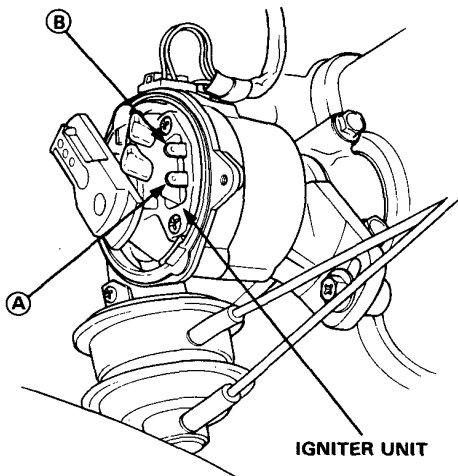
Igniter Unit Test

Hitachi:

1. Remove the distributor cap from the housing.
2. Disconnect the wires from the igniter unit. Check voltage between the Bu wire and body ground, then the BI/Y wire and body ground, with the ignition switch ON.
There should be battery voltage.

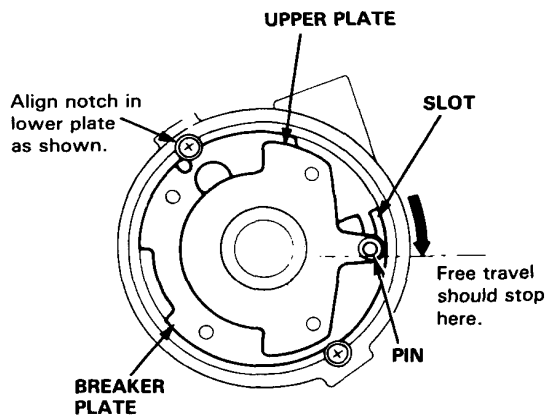


3. With the wires disconnected, check for continuity in both directions between A and B terminals. (RX100 scale)
There should be continuity in only one direction.



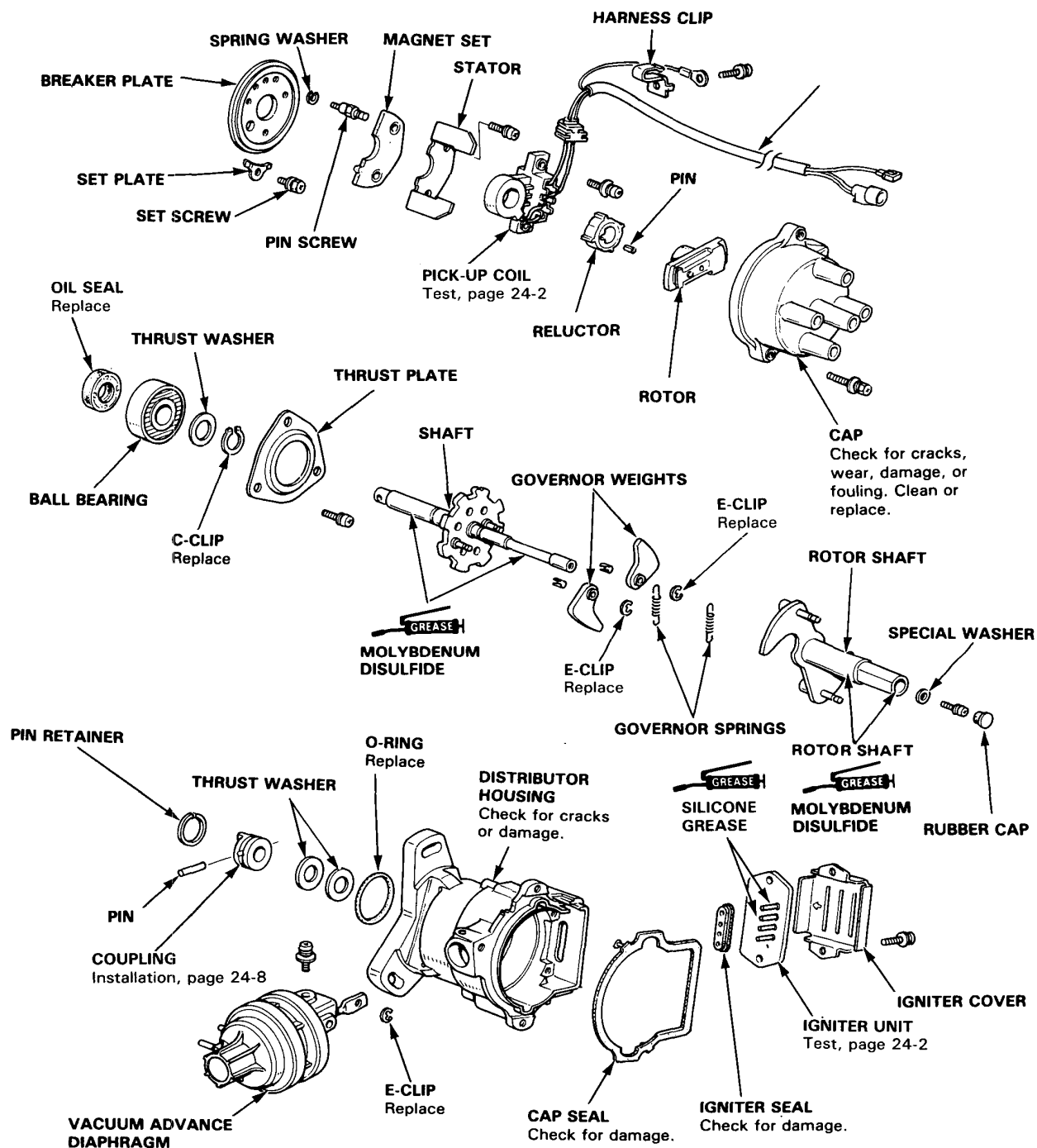
Breaker Plate Installation (Hitachi)

1. Align the breaker plate in the distributor housing as shown before tightening the hold-down screws.
2. Check that the upper plate moves freely. Be sure the diaphragm arm attachment pin does not rotate past the end of the slot in the lower plate. If it does, adjust the range of free travel by forcibly rotating the plate past its limit in the opposite direction, then recheck.



Engine Electrical

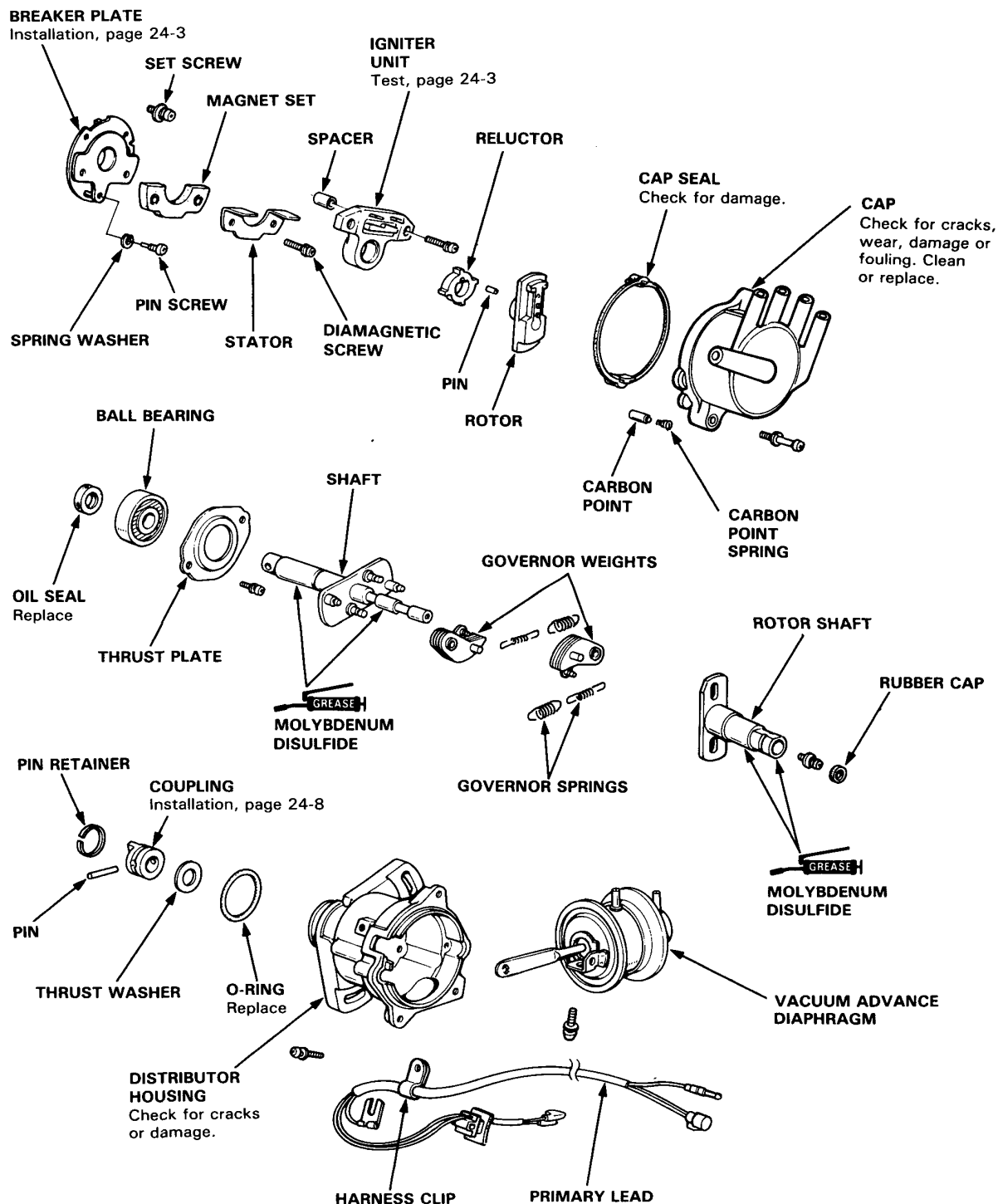
Distributor Overhaul (B20A2 engine)





(A20A1 engine)

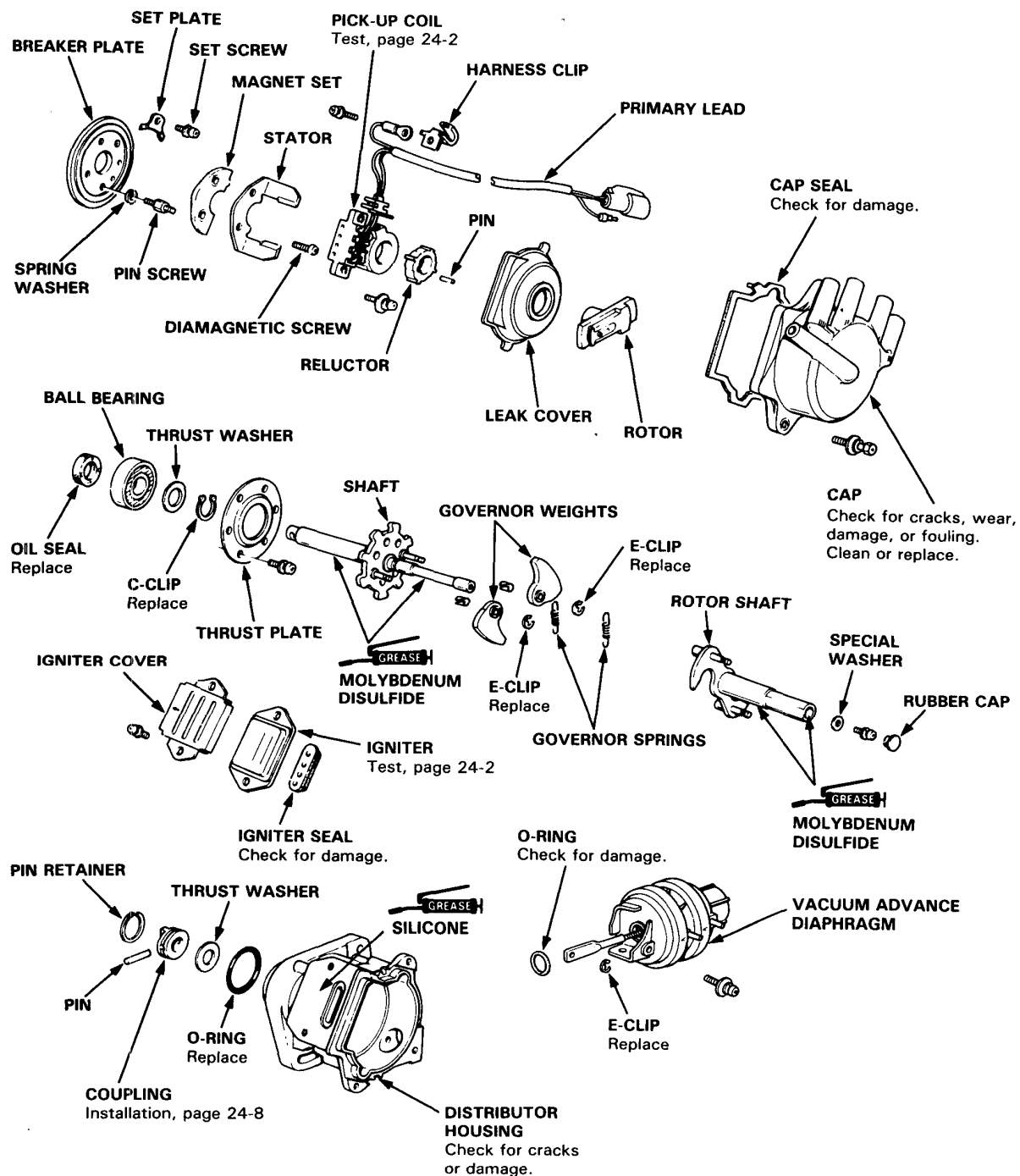
Hitachi:



Engine Electrical

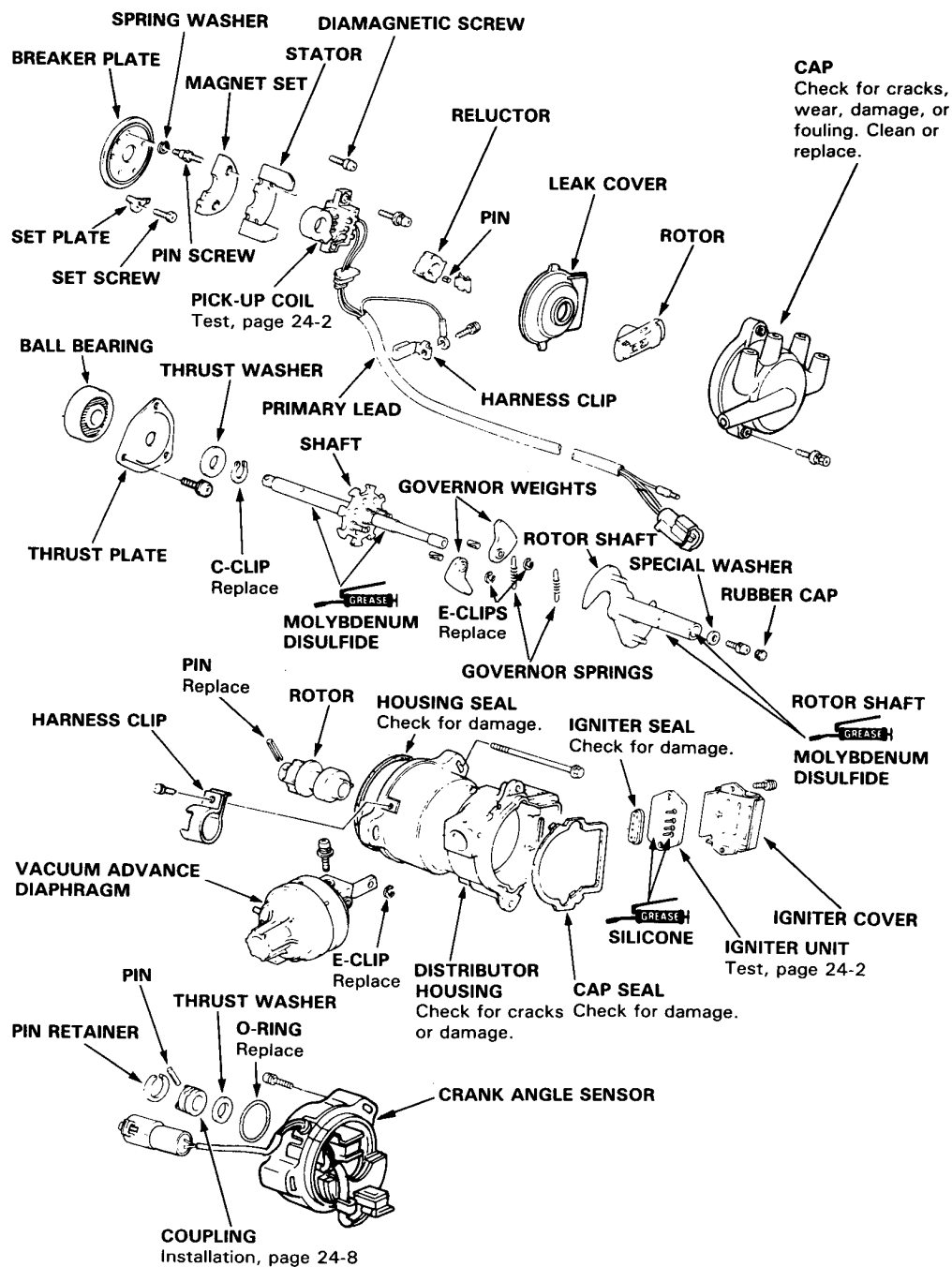
A20A1 engine

Toyo Denso:





(A20A3 engine)

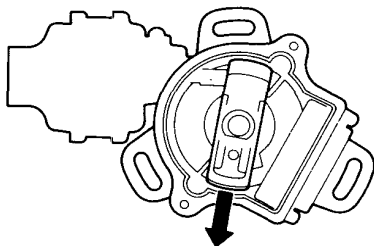


Engine Electrical

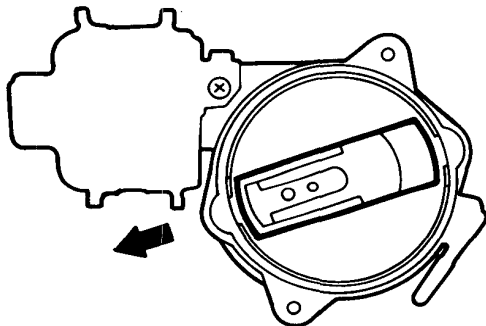
Distributor Coupling Installation

1. Install the rotor, then turn it so that it faces in the direction shown (toward the No. 1 cylinder).

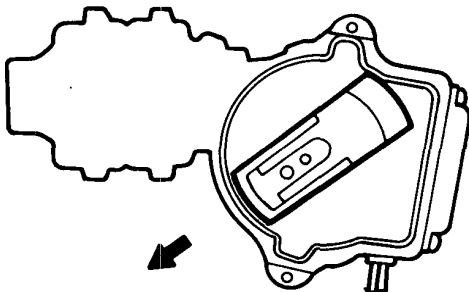
B20A2 engine:



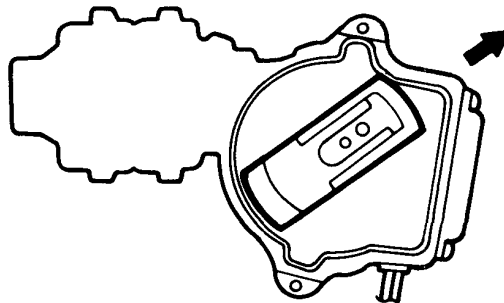
A20A1 engine (Hitachi):



A20A1 engine (Toyo Denso):

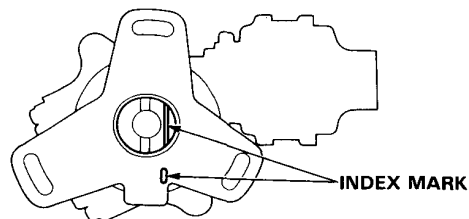


A20A3 engine:

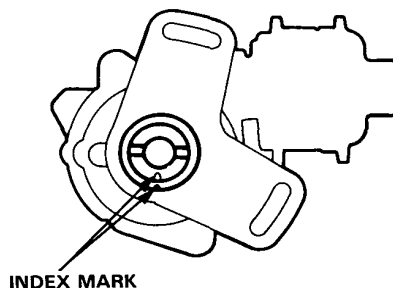


2. Set the thrust washer and coupling on the shaft.
3. Check that the rotor is still pointing toward the No. 1 cylinder, then align the index mark on the housing with the index mark on the coupling.

B20A2 engine:

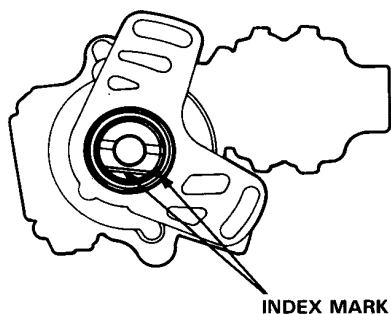


A20A1 engine (Hitachi):

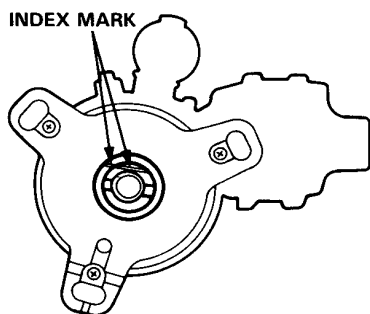




A20A1 engine (Toyo Denso):



A20A3 engine:



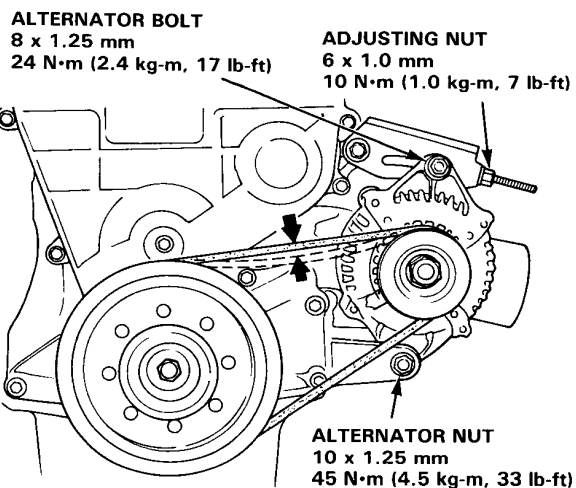
4. Drive in the pin and secure it with the pin retainer.

Alternator Belt Adjustment (B20A2 engine)

1. Apply a force of 98 N (10 kg, 22 lb) and measure the deflection between the alternator and the water pump pulley.

Deflection: 10–13 mm (0.39–0.51 in.)

NOTE: On a brand-new belt, the deflection should be 7–9 mm (0.28–0.35 in.) when first measured.

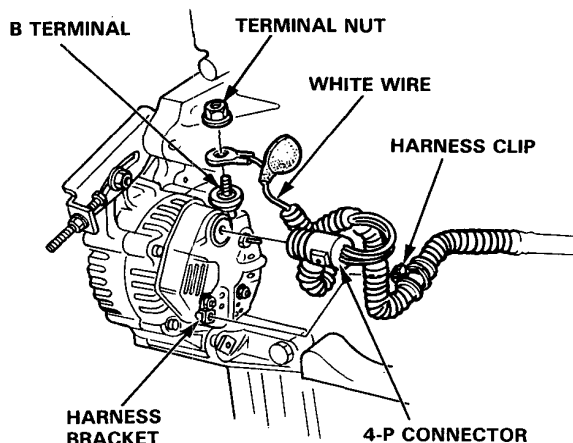


2. Loosen the alternator bolt and nut.
3. Move the alternator by turning the adjusting nut to obtain the proper belt tension, then retighten the bolt and nut.
4. Recheck the deflection of the belt.

Engine Electrical

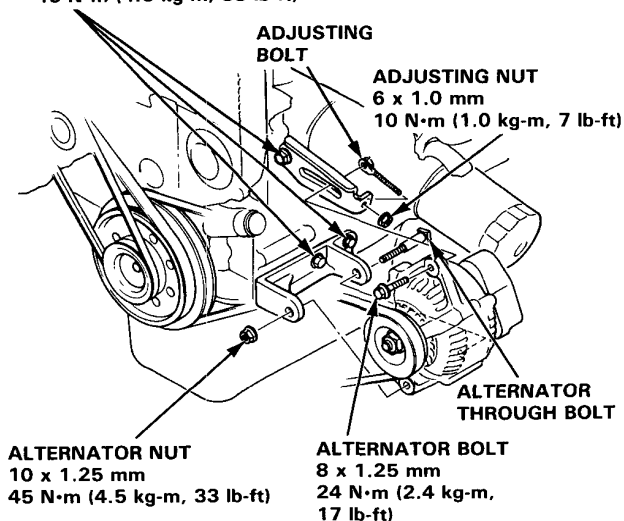
Alternator Replacement (B20A2 engine)

1. Disconnect the ground wire from the battery negative post (-).
2. Disconnect the left driveshaft from the steering knuckle.
3. Disconnect the 4-P connector from the alternator, and remove the clip from the harness bracket.



4. Remove the terminal nut and the white wire from the B terminal.
5. Remove the alternator bolt and nut, then remove the alternator belt from the alternator pulley.

MOUNT BRACKET BOLTS
10 x 1.25 mm
45 N·m (4.5 kg-m, 33 lb-ft)



6. Remove the alternator through bolt, then the alternator.
7. If necessary, remove the mount bracket bolts, and the upper and lower mount brackets.
8. Adjust the alternator belt tension after installing (see page 24-9).

Body Electrical

Lighting System (KE model)

Circuit Diagram	25-2
Component Location Index	25-4
Troubleshooting	25-5
DIM-DIP Control Unit Input/ Output Test	25-6
Relay Test	25-7
Resistor Test	25-7

Gauge Assembly (Analog)

Description	25-8
Circuit Diagram	25-11

Outline of Model Changes

- Maintenance procedures for the lighting system newly equipped with DIM-DIP headlights (KE model only) are new.
- Fuel and coolant temperature gauges of the bobbin (cross coil) type has been newly adopted.

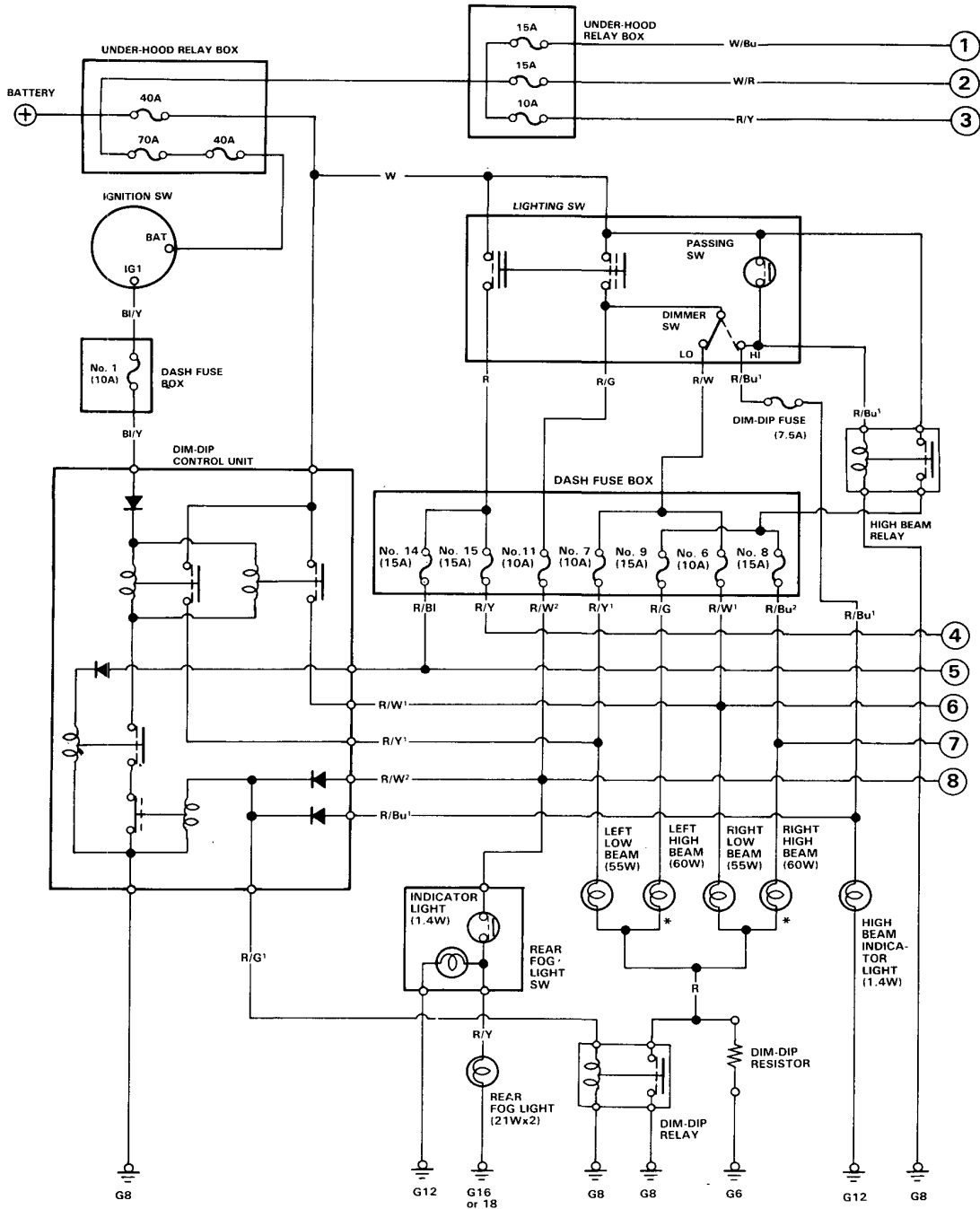


Lighting System (KE model)

Circuit Diagram

Description:

When the lighting switch is set to the first position (+) with the ignition switch ON, the headlights will rise and light up as the DIM-DIP headlights. The light is dimmed to approx. ten percent of the headlights' brightness in the second position (●) of the lighting switch.

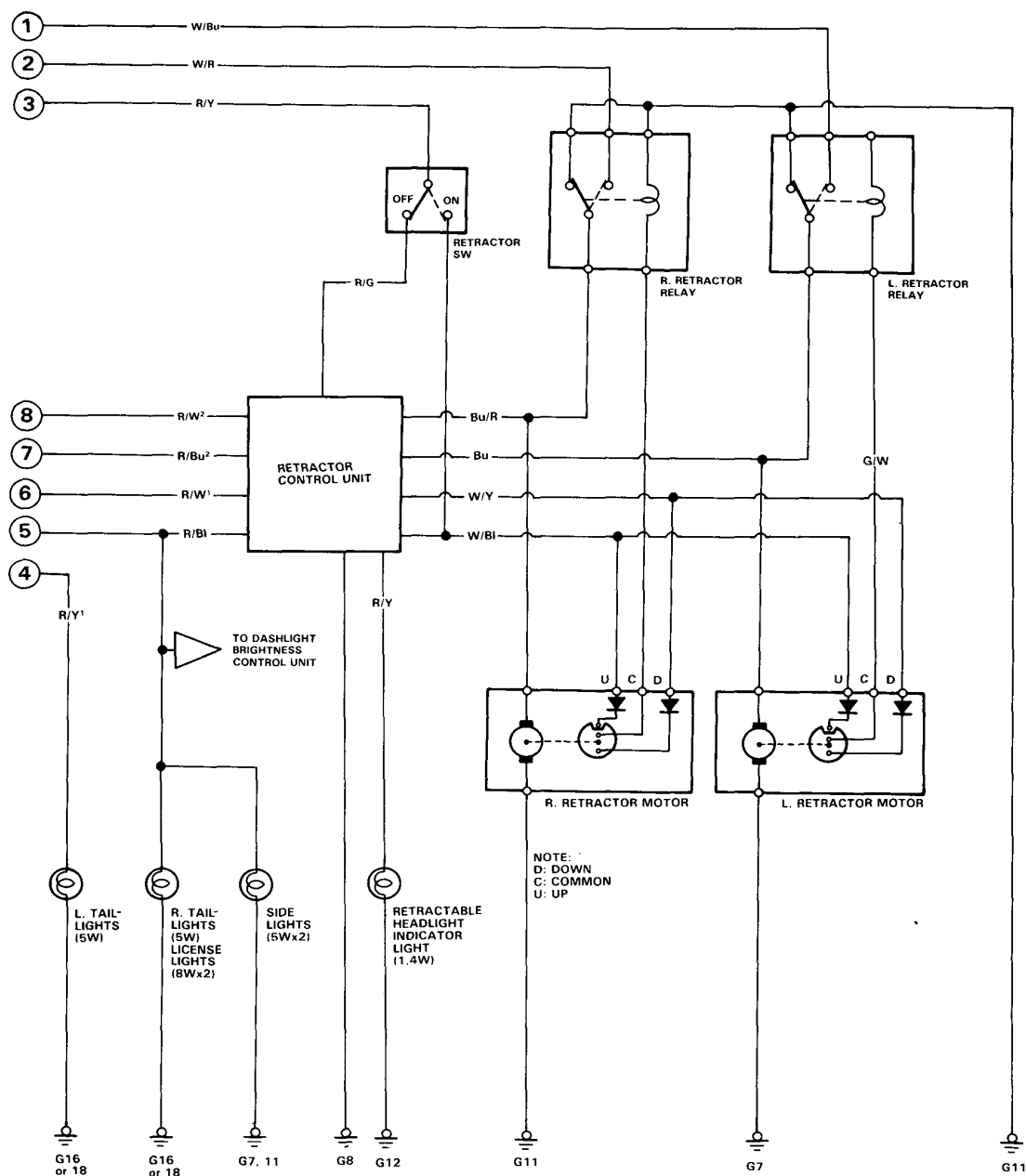


*: For 4D sedan, HIGH BEAM (55W) is added.



Function:

The retractor motors are controlled by their respective relays. The relays are energized by power to either the up wire (W/Bi) or down wire (W/Y), through the slip ring in the retractor motors. The up wire can be powered either by the headlight switch/control unit or via the retractor switch directly. The down wire can only be powered by the control unit via either the headlight switch or switch or the retractor switch.



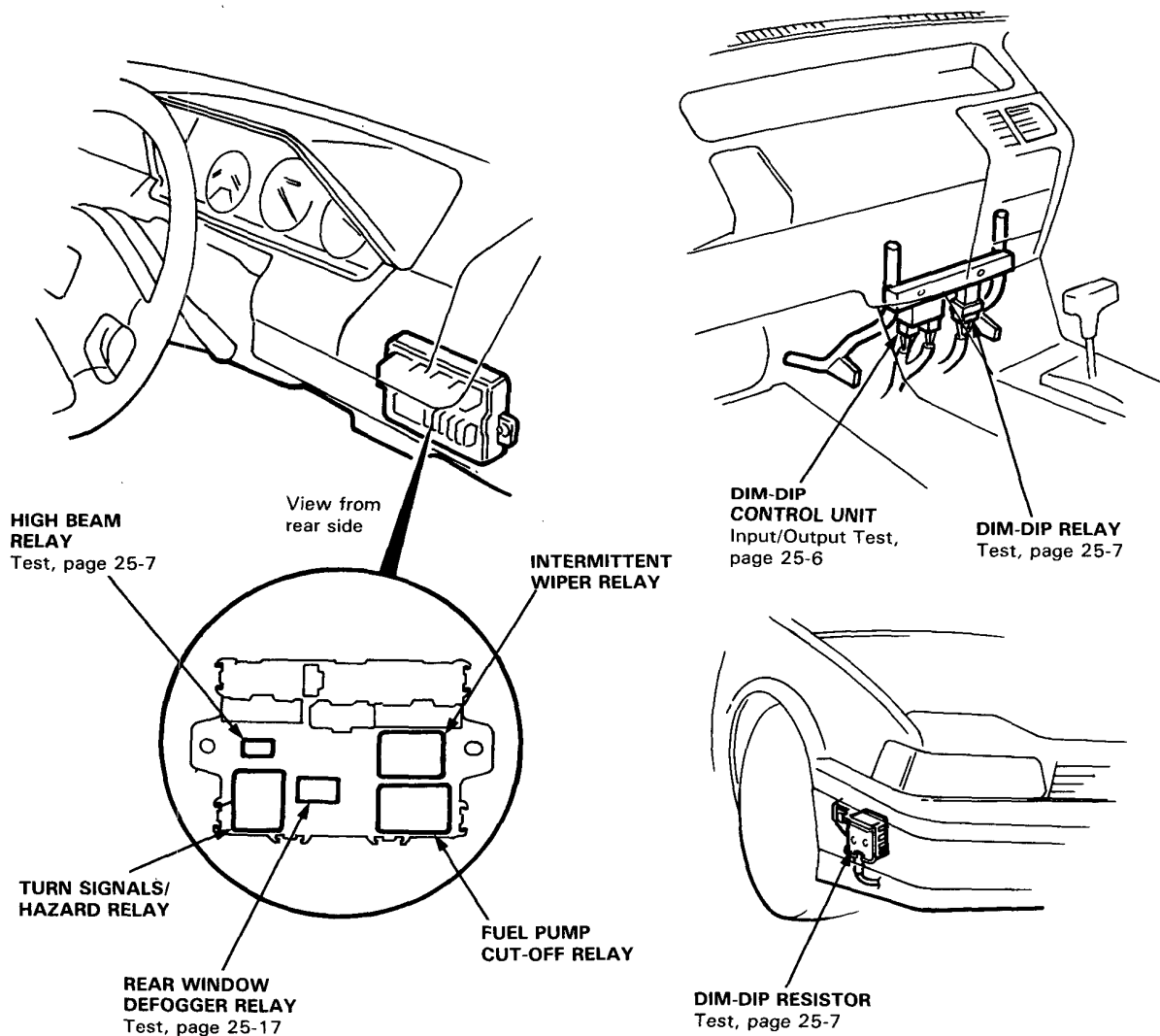
NOTE: Several different wire have the same color. They have been given a number suffix to distinguish them (for example R/W¹ and R/W² are not the same).

Lighting System (KE model)

Component Location Index

NOTE: Refer to the base manual (No. 62SE300) of Accord for service procedures indicated by page or section numbers with superscript "***"

- SYSTEM
Troubleshooting, page 25-5
- LIGHTING SWITCH
Test, page 25-10*
- RETRACTOR SWITCH
Test, page 25-76*
- RETRACTOR MOTOR/RELAY
Test, page 25-77*
- HEADLIGHTS (Sealed Beam Unit)
Replacement, page 25-100*
Adjustment, page 25-101*
- TAILLIGHTS/LICENSE PLATE LIGHTS/
FRONT POSITION LIGHTS
Bulb Replacement, page 25-102* thru 25-105*





Troubleshooting

CAUTION: DIM-DIP resistor becomes very hot in use of DIM-DIP headlights; do not touch it or the attaching hardware immediately after they have been turned off.

NOTE:

- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting:
 - Check the No. 1, 6, 7 and 11 (10A) fuses, No. 8, 9, 14 and 15 (15A) fuses, DIM-DIP fuse (7,5A) in the dash fuse box.
 - Check 40A, 40A and 70A main fuses in the under-hood relay box.
- Several different wires have the same color. They have been given a number suffix to distinguish them (for example R/W¹ and R/W² are not the same).

Items to be inspected			Retractor relay	DIM-DIP relay	Retractor motor	Lighting switch	Retractor switch	Passing switch	Retractor control unit	DIM-DIP control unit	DIM-DIP resistor	Blown bulb	Frozen, stuck, or improperly installed retractor linkage	Poor ground	Open circuit in wires or loose or disconnected terminals
Lighting switch "OFF" to "•"	Headlights rise up.	Any lights to be on do not light up.													R/G or R/BI
		All lights except headlights light up.							2	1			G8 and G6	BI/Y, W R/W ¹ or R/Y ¹	
	Headlights do not rise up.	All lights to be on light up.	4		3				1				2	G7, G8 and G11	R/W ¹ or R/BI
Lighting switch "•" to "●"	Headlight is still dimmed.			1		2				3				G8	R/W ² , R/Bu ¹ or R/G ¹
Lighting switch "●" to "•"	Headlights retract.								1					G8	R/W ¹ or R/BI
Lighting switch "•" to OFF	Headlights do not retract.								1				2	G8	
Retractor switch ON	Headlights cannot be raised.						1		2					G8	R/Y or W/BI
Retractor switch OFF	Headlights cannot be retracted.						1		2					G8	R/Y or R/G
Indicator light is not ON with retractor motors activated.									2			1		G12	R/Bu ²
Indicator light is ON with retractor motors deactivated.									1						

Lighting System (KE model)

DIM-DIP Control Unit Input/Output Test

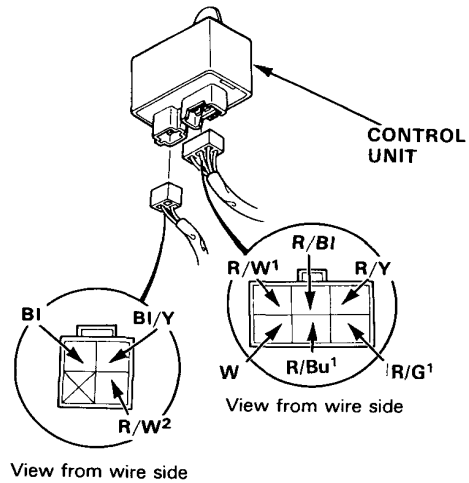
NOTE:

- Several different wires have the same color. They have been given a number suffix to distinguish them (for example R/W¹ and R/W² are not the same).
- Recheck connections between the 6-P connector and the control unit, or the 4-P connector and the control unit, then replace the control unit if all input tests prove OK.

Input Test:

Remove the dashboard lower panel to disconnect the 6-P and 4-P connectors from the control unit.

Make the following input tests at the harness pins.



No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BI	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground (G8). • An open in the wire.
2	BI/Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	• Blown No. 1 (10A) fuse. • An open in the wire.
3	W	Under all conditions.	Check for voltage to ground: should be battery voltage.	• An open in the wire.
4	R/W ²	Lighting switch "●"	Check for voltage to ground: should be battery voltage.	• Blown No. 11 (10A) fuse. • Faulty lighting switch. • An open in the R/Bu or R/W² wire.
5	R/Bu ¹	Lighting switch "●" and dimmer switch Hi or passing switch ON.	Check for voltage to ground: should be battery voltage.	• Blown DIM-DIP fuse (7.5A). • Faulty lighting switch. • An open in the wire.
6	R/BI	Lighting switch "•" or "●"	Check for voltage to ground: should be battery voltage.	• Blown No. 14 (15A) fuse. • Faulty lighting switch. • An open in the wire.

Output Test:

Reconnect the 4-P and 6-P connectors to the control unit.

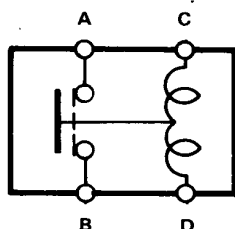
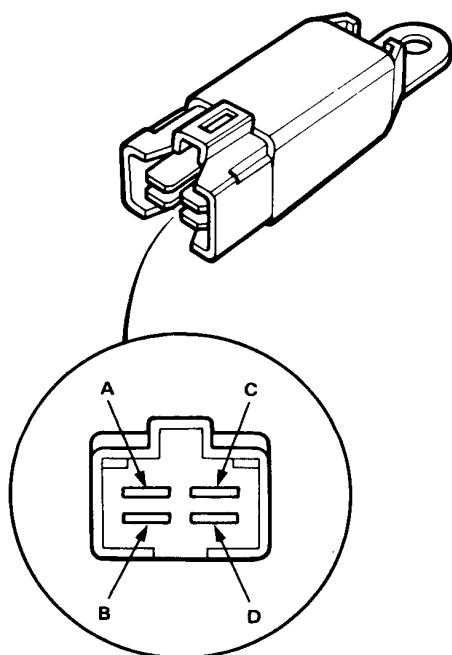
Make the following output tests at the harness pins.

7	R/W ¹	Lighting switch "•".	Check for voltage to ground: should be battery voltage.	Faulty DIM-DIP control unit.
8	R/Y			
9	R/G ¹	Lighting switch "●" and dimmer switch HI or passing switch ON.	Check for voltage to ground: should be battery voltage.	



Relay Test

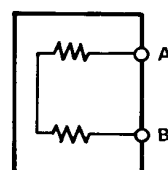
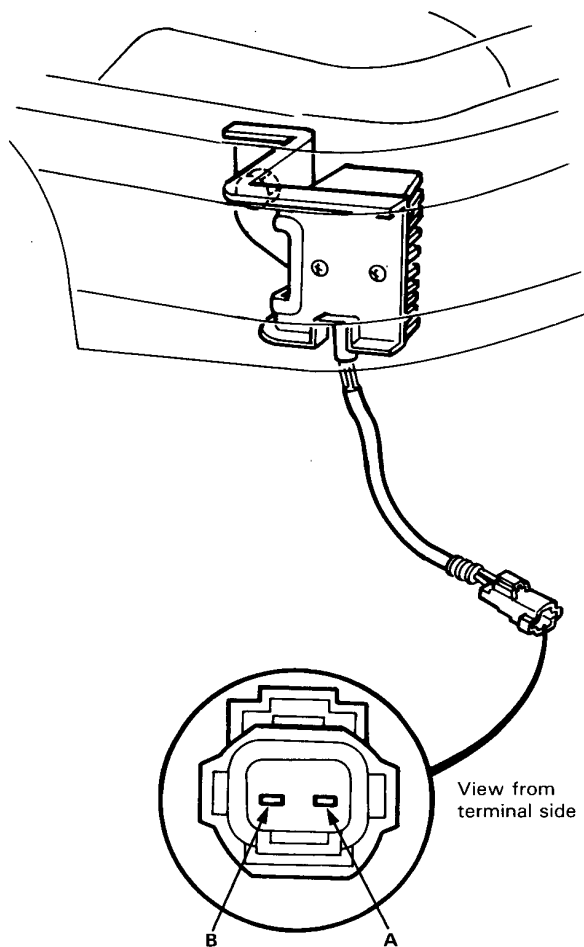
1. Remove the DIM-DIP (located on the back side of the CASSETTE case) or high beam relay (located on the dash fuse box).
2. There should be continuity between the A and B terminals when the battery is connected to the C and D terminals.
There should be no continuity when the battery is disconnected.



Resistor Test

CAUTION: DIM-DIP resistor becomes very hot in use of DIM-DIP headlights; do not touch it or the attaching hardware immediately after they have been turned off.

1. Remove the right side inner fender.
2. Disconnect the 2-P connector from the resistor.
3. Check for continuity between the A and B terminals.
(RX100 scale)
There should be continuity.

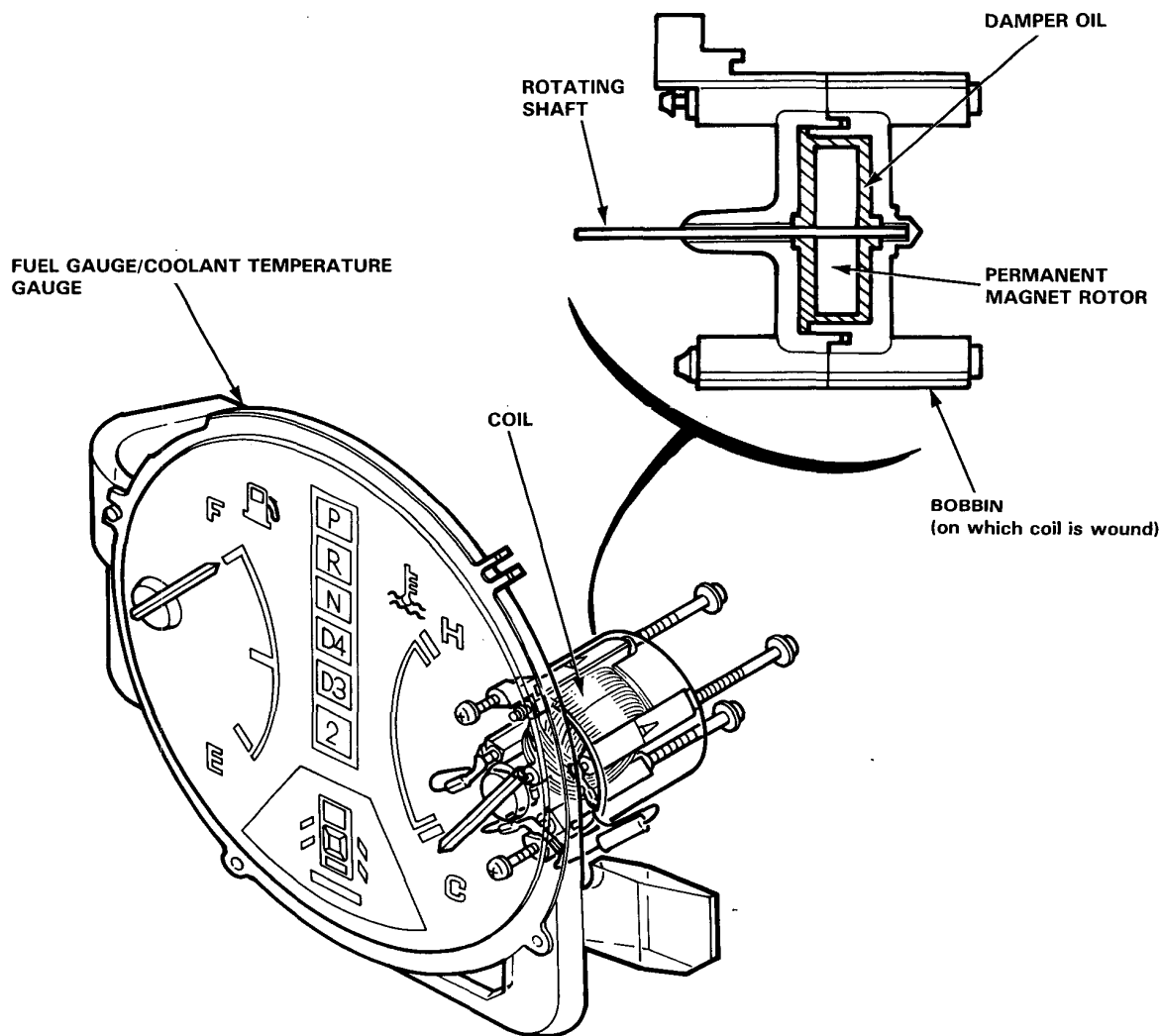


Gauge Assembly (Analog)

Description

Bobbin type (cross coil type) gauges:

- A bobbin type gauge is an electromagnetic instrument in which two orthogonally intersecting coils are wound around the permanent magnet rotor. By varying the resistance of the unit to vary the current which flows through the coil, the magnetic force which excites the coil will vary, causing the rotor (pointer) to operate. A sliding resistance is employed in the fuel gauge just as in a bimetal type gauge, and a thermistor is used in the temperature gauge.
- The rotor of the fuel gauge is immersed in damper oil and its center of gravity lies roughly along the rotating shaft, hence the fuel level is indicated continuously even when the ignition switch is OFF.
- The coolant temperature gauge is a center point stable small indicating angle type which indicates the temperature of the cooling water over the range of between about 80 and 100°C.



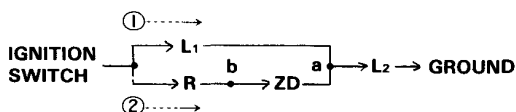


<Coolant Temperature gauge>

Operation:

When the temperature of the coolant is low, the electrical resistance of the coolant temperature gauge sender is large, hence the potential of point "b" in the figure at right becomes higher than the potential at point "a", and the potential difference (b-a) exceeds the *zener voltage of the zener diode (ZD).

The current which flows through each coil is current ① and ② shown in the figure.

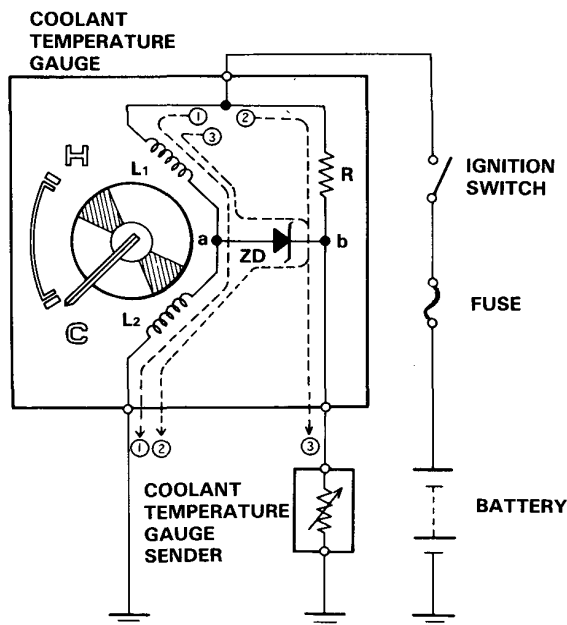


The current (① + ②) which flows from coil L1 to coil L2 increases, and the magnetic force generated by coil L2 increases, causing the rotor to point to the C (cool) side.

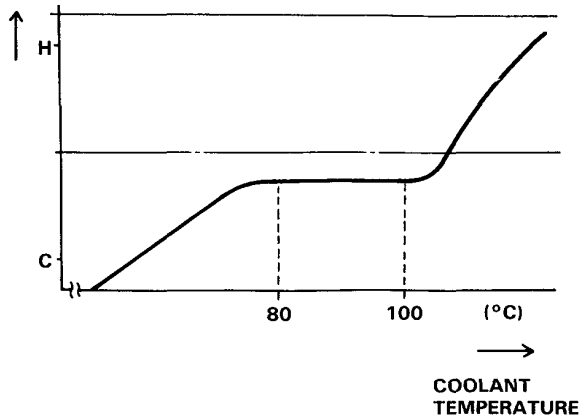
When the coolant temperature rises, the electrical resistance of the sender gradually falls, and the potential of point "b" in the figure decreases. As a result, current ② in the figure decreases, and the magnetic force generated by coil L2 decreases, causing the pointer to rise. When the potential difference (b-a) between points "a" and "b" falls below the zener voltage of ZD, current ② ceases to flow, and the current flowing through L1 and L2 will be current ① only. As a result, the forces generated by coils L1 and L2 act roughly equally on the pointer, causing the pointer to move to the vicinity of the center position. This condition will continue until the potential at point "b" becomes lower than the potential at point "a", and the pointer will remain stable. (center point stable indicator)

Zener Voltage:

When a voltage is applied in the reverse direction (b→a) and gradually increased, a point will be reached where current starts to flow in the direction (b→a). This voltage is called the zener voltage.



POINTER ANGLE

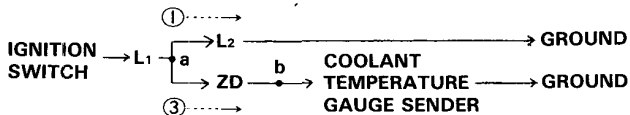


(cont'd)

Gauge Assembly (Analog)

Description (cont'd)

When the coolant temperature rises in summer, the electrical resistance of the sender will fall, causing the potential of point "b" in the figure to fall below the potential of point "a". By applying a voltage in the forward direction (a → b) to ZD, the current which flows through each coil will flow through ① and ③ in the figure.

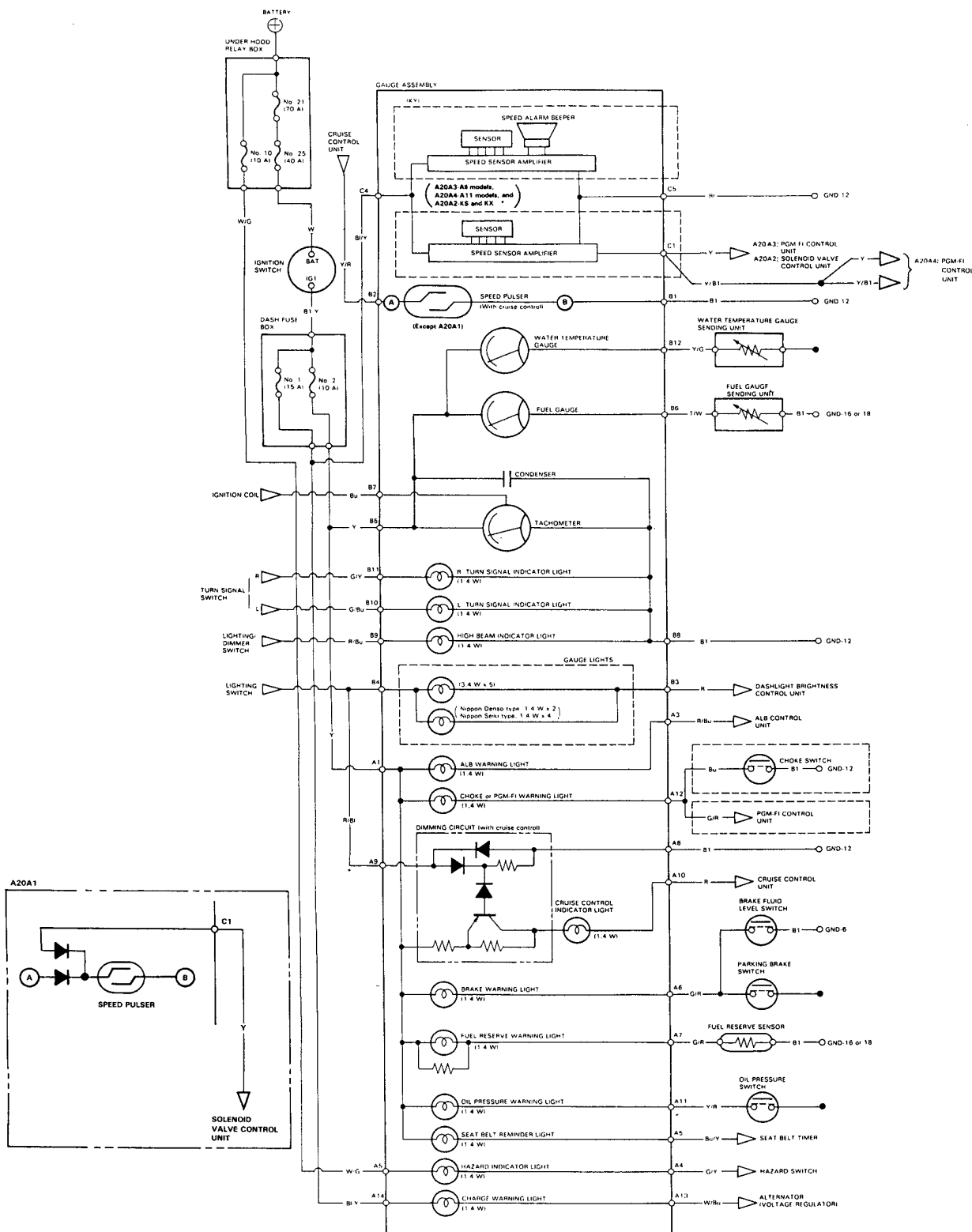


As the electrical resistance of the sender falls, the potential difference (a-b) increases and current ③ increases, hence the magnetic force generated by coil L1 increases, and the pointer once again rises.

<Fuel Gauge>

The basic operation of the fuel gauge is the same as that of the coolant temperature gauge except that a center point stable indication is not necessary. Consequently, a resistor is used instead of the zener diode (ZD) shown in the circuit diagram of the coolant temperature gauge. Along with the rise and fall of the fuel level, the electrical resistance of the fuel gauge sending unit, hence, like the coolant temperature gauge sender, current ② or ③ varies, causing the pointer to indicate the fuel level in accordance with the magnetic force generated in coils L1 and L2.

Circuit Diagram (L.H. Drive)



Gauge Assembly (Analog)

Circuit Diagram (R.H. Drive)

