

# INTRODUCTION

## How to Use This Manual

This supplement contains information for the 1991 ACCORD. Refer to following shop manual for service procedures and data not included in this supplement.

Description	Code No.
ACCORD CHASSIS Maintenance and Repair 90	62SM400
F18A/F20A/F22A ENGINE Maintenance and Repair	62PT400
H2 MANUAAL TRANSMISSION Maintenance and Repair	62PX500
PX4B AUTOMATIC TRANSMISSION Maintenance and Repair	62PX400

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.

## 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 American Honda, might be done, or of the possible hazardous consequences of each conceivable way, nor could American Honda investigate all such ways. Anyone using service procedures or tools, whether or not recommended by American Honda, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

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\*(Asterisk) marked sections are not included in this manual.

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HONDA MOTOR CO., LTD.  
Service Publication Office

General Info



Special Tools



Specifications

specs

Maintenance



Engine



Fuel and Emissions



Transaxle



Steering \*



Suspension \*



Brakes \*



Body \*



Heater and  
Air Conditioner



Electrical \*



# Outline of Model Changes

ITEM	DESCRIPTION	91 MODEL	REFERENCE SECTION
Engine	Tightening torque changed <ul style="list-style-type: none"> <li>• Engine mounting bolts and nuts</li> <li>• Main bearing cap nut</li> <li>• Exhaust pipe-to-muffler connecting nut.</li> </ul> Changed <ul style="list-style-type: none"> <li>• Exhaust manifold (KQ model)</li> <li>• Crank bore marking method</li> </ul>	○	5
Carburation	Adapted <ul style="list-style-type: none"> <li>• KE with CATA model.</li> </ul> Modified <ul style="list-style-type: none"> <li>• Vacuum connection.</li> </ul>	○	6
PGM-FI	Adapted <ul style="list-style-type: none"> <li>• KE with CATA model (2.0 ℓ )</li> </ul> Modified <ul style="list-style-type: none"> <li>• KQ model (2.2 ℓ )</li> <li>• Electronic control unit (ECU)</li> <li>• Vacuum connections</li> <li>• TDC/CRANK/CYL sensors</li> <li>• Fuel pressure</li> <li>• Constant vacuum control (CVC) valve</li> </ul>	○	6
Manual Transmission	Modified <ul style="list-style-type: none"> <li>• Change lever</li> <li>• 3rd/4th synchro hub and 3rd/4th synchro sleeve</li> <li>• 5th synchro hub and 5th synchro sleeve</li> <li>• 1st/2nd synchro hub</li> </ul>	○	8
Power Steering	Changed <ul style="list-style-type: none"> <li>• High pressure pipe for power steering pump</li> </ul>	○	5

- For the reason of environment conservation and to secure the required quantity of Freon, the Freon collector has been adapted and its maintenance procedure has been described (See Section 15).



## **General Information**

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# Chassis and Engine Numbers

## Vehicle Identification Number (1.8 l Carbureted Engine)

JHM CB1 5 2 0 0 C 0 00001

**Manufacturer Code and Vehicle Type**  
JHM: HONDA MOTOR CO., LTD., JAPAN.  
HONDA Passenger Car

**Body and Engine Type**  
CB1: ACCORD 1.8 l

**Door and Transmission Type**  
5 : 4-door, 5-speed Manual

**Vehicle Grade**  
2 : LX (KB)  
3 : EX (KB)

**Fixed Code**

**Auxiliary Number**

**Factory Code**  
C : Sayama Factory in Japan

**Model Year**  
1 : 1991

**Serial Number**

## Vehicle Identification Number (2.0 l Fuel-Injected Engine)

JHM CB3 5 4 0 0 1 0 00001

**Manufacturer Code and Vehicle Type**  
JHM: HONDA MOTOR CO., LTD., JAPAN.  
HONDA Passenger Car

**Body and Engine Type**  
CB3: ACCORD 2.0 l

**Door and Transmission Type**  
5 : 4-door, 5-speed Manual  
6 : 4-door, 4-speed Automatic

**Vehicle Grade**  
4 : 2.0i, F20A4 with CATA (KG, KS)  
F20A4 without CATA (KF, KE)  
F20A5 (KB, KW)  
2.0i with anti-lock brake system  
F20A4 with CATA (KG, KX, KS, KE)  
F20A4 without CATA (KF, KE)  
F20A5 (KB)  
EXi, F20A5 (KU)  
EXi with anti-lock brake system, F20A5 (KU)

**Fixed Code**

**Auxiliary Number**

**Factory Code**  
C : Sayama Factory in Japan

**Model Year**  
1 : 1991

**Serial Number**

## Vehicle Identification Number (2.0 l Carbureted Engine)

JHM CB3 5 2 0 0 C 1 00001

**Manufacturer Code and Vehicle Type**  
JHM: HONDA MOTOR CO., LTD., JAPAN.  
HONDA Passenger Car

**Body and Engine Type**  
CB3: ACCORD 2.0 l

**Door and Transmission Type**  
5 : 4-door, 5-speed Manual  
6 : 4-door, 4 speed Automatic

**Vehicle Grade**  
2 : DX, F20A2 (KG, KS)  
F20A3 (KW)  
: LX, F20A3 (KP, KT, KY)  
3 : EX, F20A2 with CATA (KG, KX, KS)  
F20A2 without CATA (KF, KE)  
F20A3 (KB, KW, KP, KT, KU, KY)  
F20A6 (KG)  
:EX with anti-lock brake system  
F20A2 with CATA (KG, KS, KE)  
F20A2 without CATA (KF)  
F20A3 (KB)

**Fixed Code**

**Auxiliary Number**

**Factory Code**  
C : Sayama Factory in Japan

**Model Year**  
1 : 1991

**Serial Number**

## Vehicle Identification Number (2.2 l Fuel-Injected Engine)

JHM CB7 5 5 0 0 C 0 00001

**Manufacturer Code and Vehicle Type**  
JHM: HONDA MOTOR CO., LTD., JAPAN.  
HONDA Passenger Car

**Body and Engine Type**  
CB7: ACCORD 2.2 l

**Door and Transmission Type**  
5 : 4-door, 5-speed Manual  
6 : 4-door, 4-speed Automatic

**Vehicle Grade**  
5 : 2.2i, F22A3 with CATA (KF, KG, KX, KS, KE)  
EXi, F22A2 (KY)  
F22A9 with CATA (KQ)

**Fixed Code**

**Auxiliary Number**

**Factory Code**  
C : Sayama Factory in Japan

**Model Year**  
1 : 1991

**Serial Number**



**Engine Number**  
**(DX: European, LX: General and**  
**EX: KG 90 ps)**

F18A2 - 20 00001

**Engine Type**

- F18A2 : 1.8 l SOHC Carbureted  
Leaded gasoline: KB
- F20A2 : 2.0 l SOHC Carbureted  
Unleaded gasoline with CATA  
: KG/KS (DX)
- F20A3 : 2.0 l SOHC Carbureted  
Leaded gasoline: KW (DX),  
KP/KT/KU/KY (LX)
- F20A6 : 2.0 l SOHC Carbureted (90ps)  
Unleaded gasoline with CATA  
: KG (EX 90ps)

**Transmission Type**

- 20: 5-speed manual
- 25: 4-speed automatic

**Serial Number**

**Engine Number**  
**(2.2i: European)**

F22A3 - 20 00001

**Engine Type**

- F22A3 : 2.2 l SOHC Fuel-Injected  
Unleaded gasoline with CATA

**Transmission Type**

- 20: 5-speed manual
- 25: 4-speed automatic

**Serial Number**

**Engine Number**  
**(EXi: KQ, KY)**

F22A2 - 2000001

**Engine Type**

- F22A2 : 2.2 l SOHC Fuel-Injected  
Leaded gasoline: KY
- F22A9 : 2.2 l SOHC Fuel-Injected  
Unleaded gasoline with CATA  
: KQ

**Serial Number**

- F22A2: 2000001~
- F22A9: 1000001~

**Engine Number**  
**(EX except KG 90 ps)**

F20A2 - 20 00001

**Engine Type**

- F20A2 : 2.0 l SOHC Carbureted  
Unleaded gasoline with CATA  
: KG, KX, KS, KE
- 2.0 l SOHC Carbureted  
Unleaded gasoline without CATA  
: KF, KE
- F20A3 : 2.0 l SOHC Carbureted  
Leaded gasoline  
: KB, KW, KP, KT, KU, KY

**Transmission Type**

- 20: 5-speed manual
- 25: 4-speed automatic

**Serial Number**

**Manual Transmission Number**

H2C4 - 2000001

**Transmission Type**

- H2C4: 2.0 l Fuel-Injected and 2.2 l Fuel-Injected  
except KQ
- H2S8: 1.8 l and 2.0 l Carbureted
- H2U5: 2.2 l Fuel-Injected: KQ

**Serial Number**

**Automatic Transmission Number**

MPXA - 2000001

**Transmission Type**

**Serial Number**

**Engine Number**  
**(2.0i: European and EXi: KU)**

F20A4 - 20 00001

**Engine Type**

- F20A4 : 2.0 l SOHC Fuel-Injected  
Unleaded gasoline with CATA  
: KG, KX, KS, KE
- 2.0 l SOHC Fuel-Injected  
Unleaded gasoline without  
CATA: KF, KE
- F20A5 : 2.0 l SOHC Fuel-Injected  
Leaded gasoline: KB, KW, KU

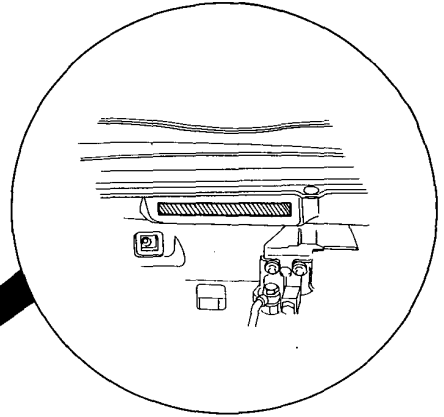
**Transmission Type**

- 20: 5-speed manual
- 25: 4-speed automatic

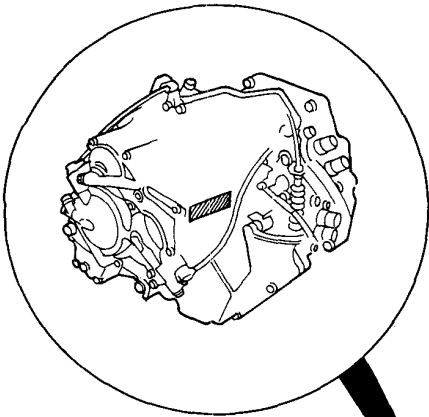
**Serial Number**

# Identification Number Locations

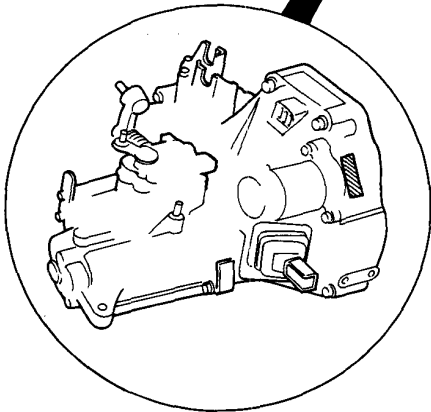
Vehicle Identification Number



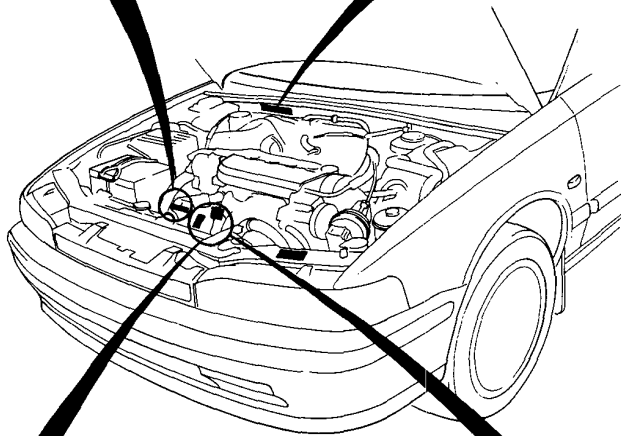
Transmission Number  
(Automatic)

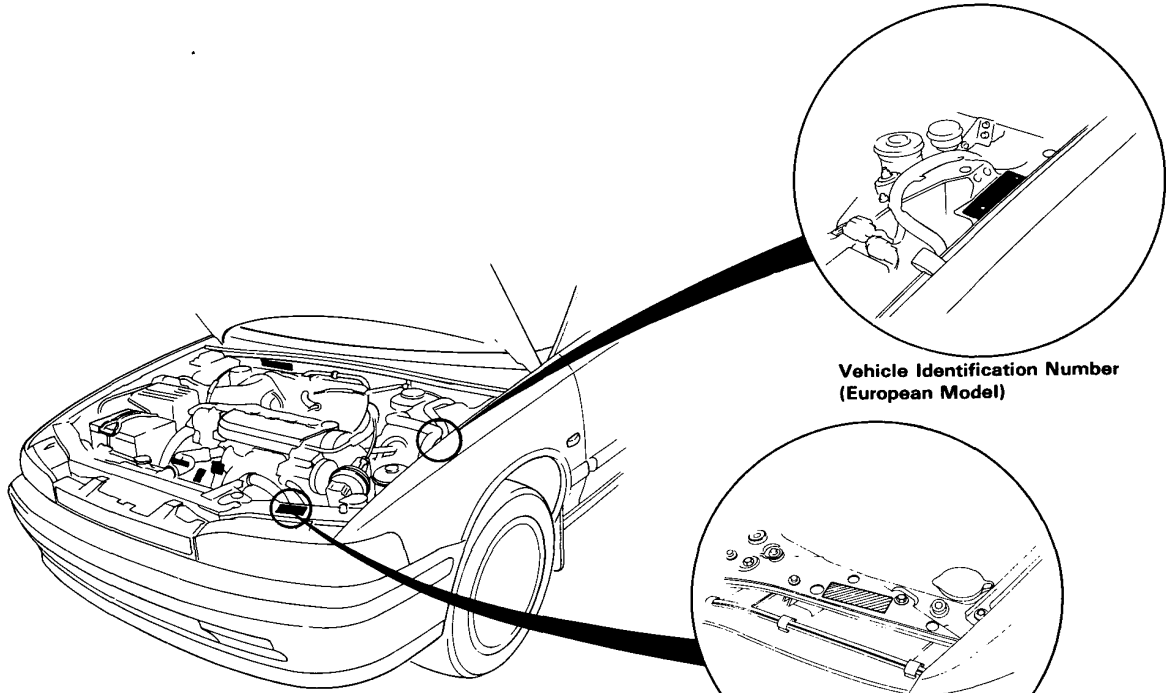


Transmission Number  
(Manual)



Engine Number

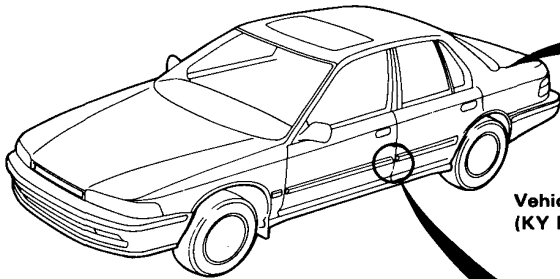




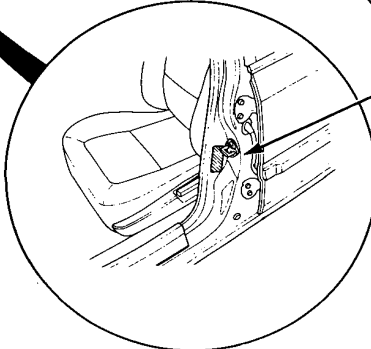
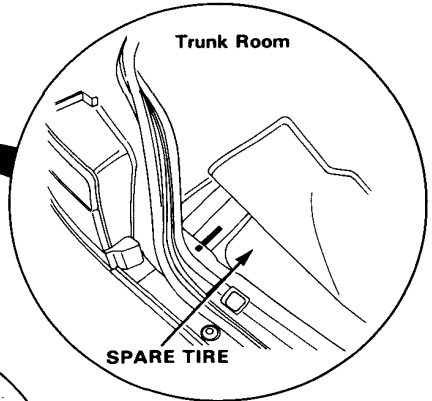
**Vehicle Identification Number  
(European Model)**

**Vehicle Identification Number  
(KQ, KT Model)**

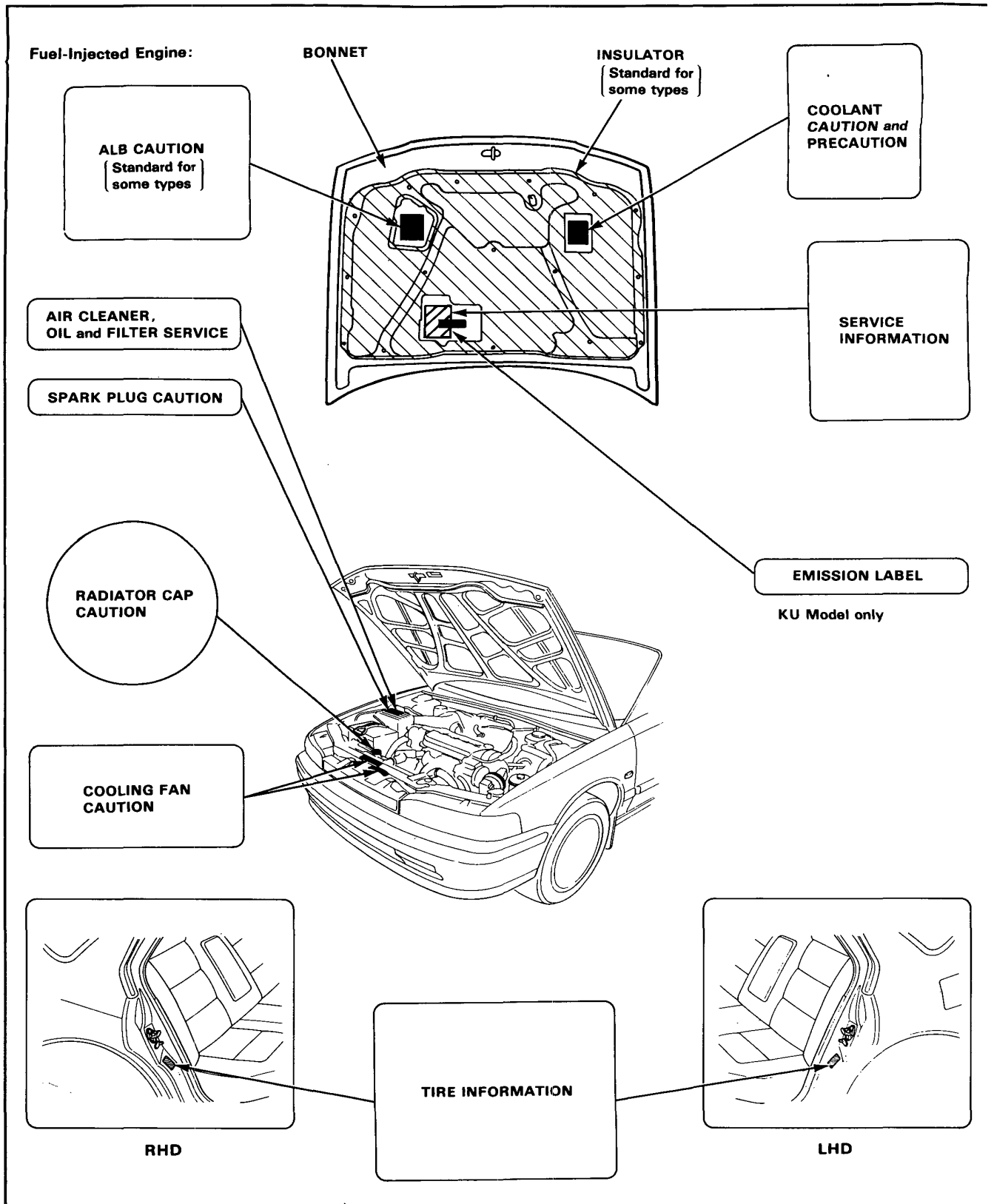
**Vehicle Identification Number  
(KS Model only)**



**Vehicle Identification Number  
(KY Model only)**



# Label Locations







Carbureted Engine:

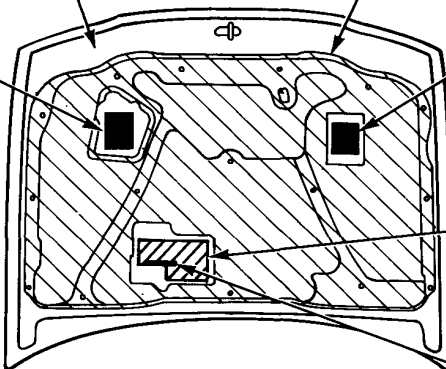
BONNET

INSULATOR  
(Standard for  
some types)

ALB CAUTION  
(Standard for  
some types)

COOLANT  
CAUTION and  
PRECAUTION

SERVICE  
INFORMATION



EMISSION LABEL

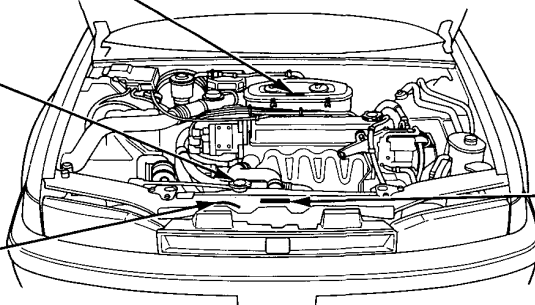
KU Model only

AIR CLEANER,  
OIL and FILTER SERVICE

RADIATOR CAP  
CAUTION

COOLING FAN  
CAUTION

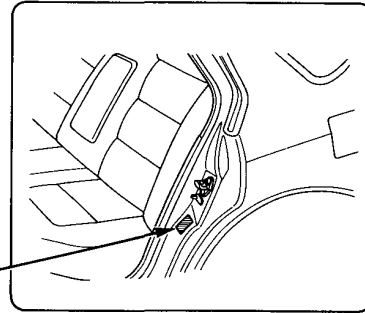
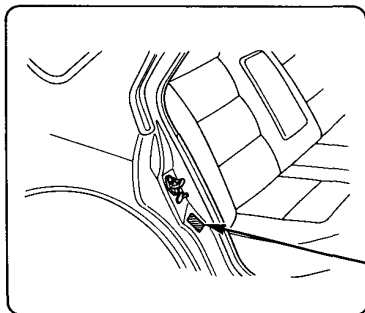
COOLING FAN  
CAUTION



RHD

TIRE INFORMATION

LHD



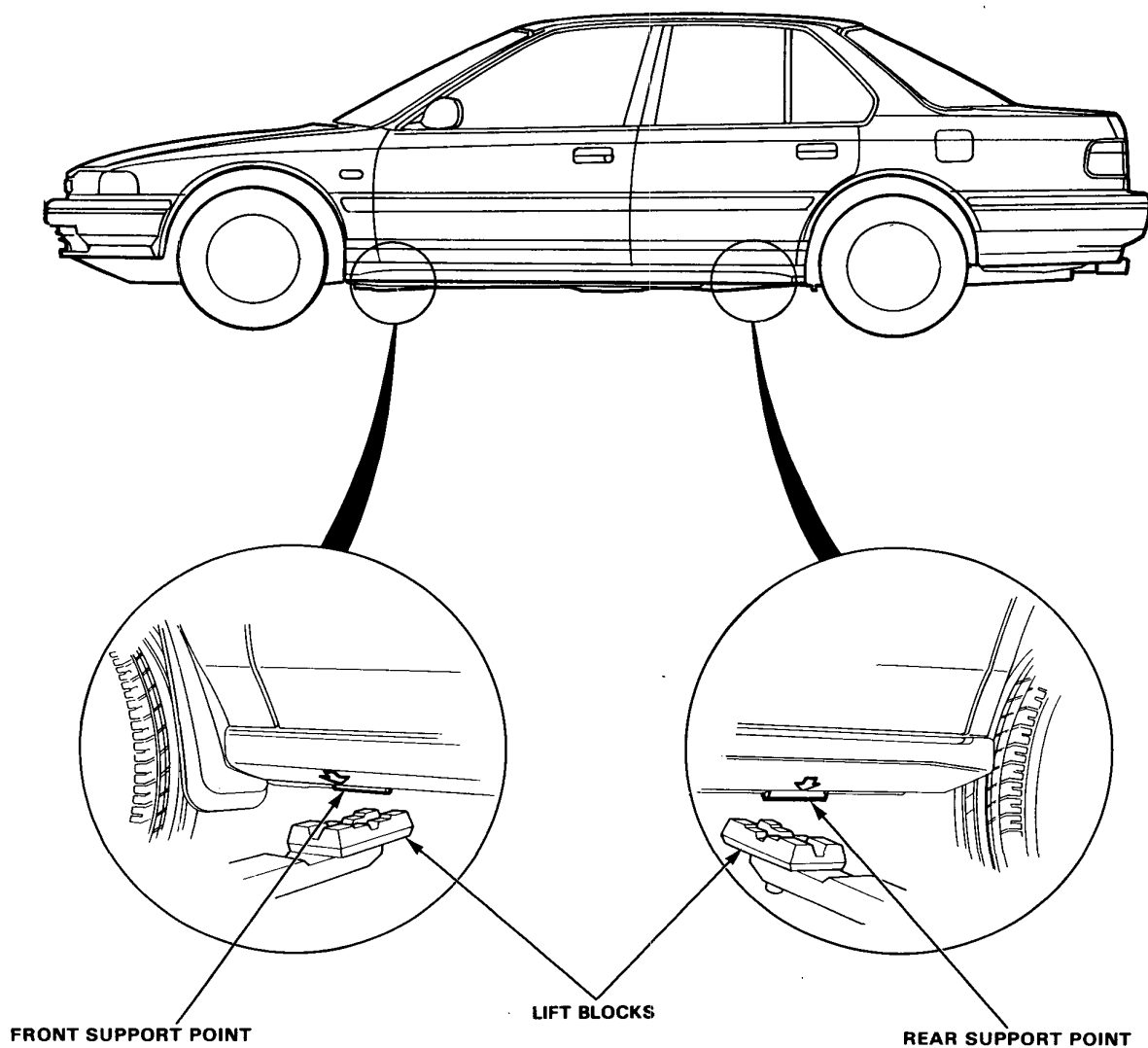
# Lift and Support Points

## 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 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 weighs approximately 14 kg (30 lbs), placing the front wheels in the trunk will assist with the weight transfer.





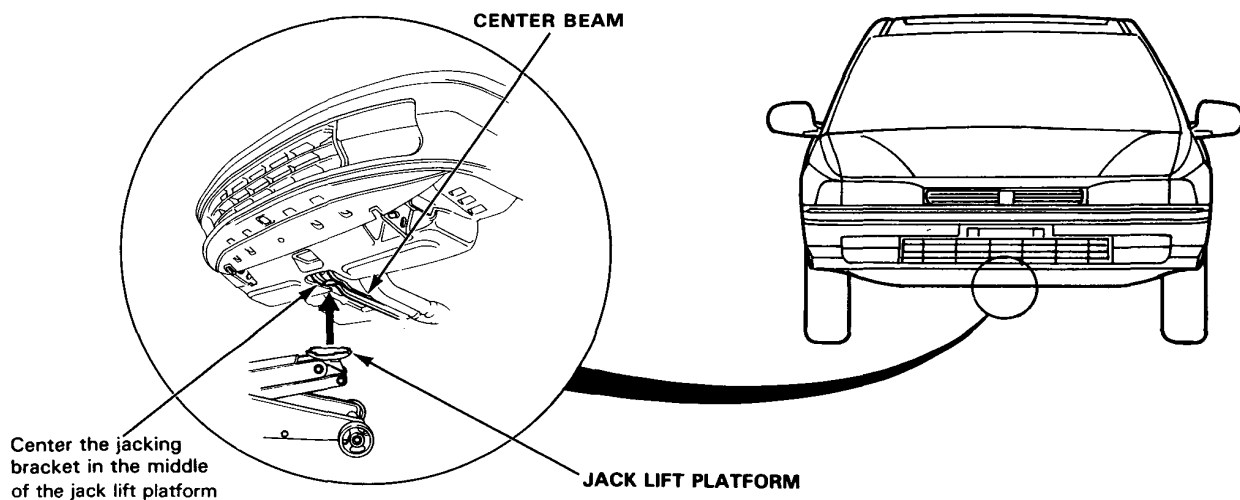
## Floor Jack

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 1-8 so the car will be approximately level, then lower the car onto the stands.

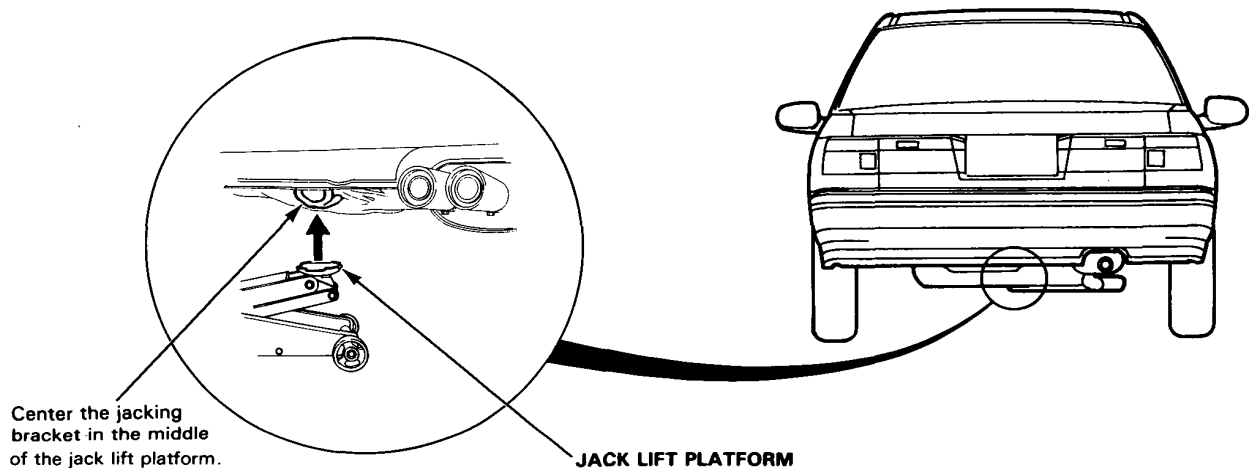
### ▲ WARNING

- 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



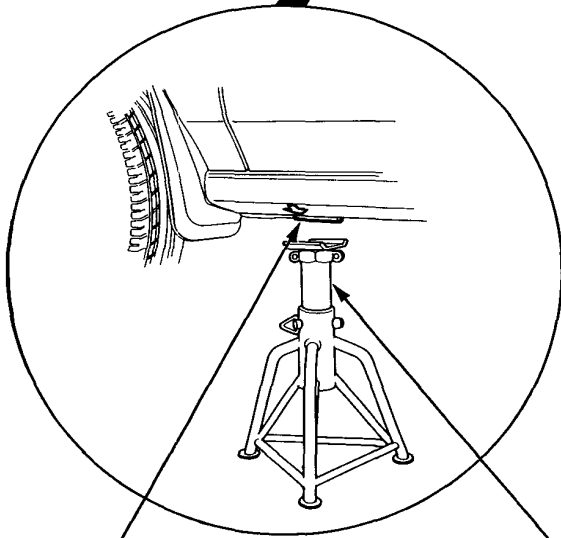
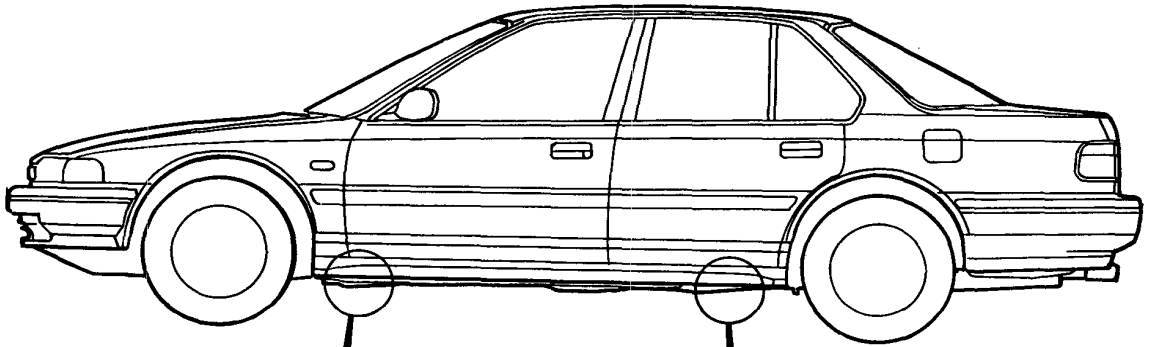
### Rear



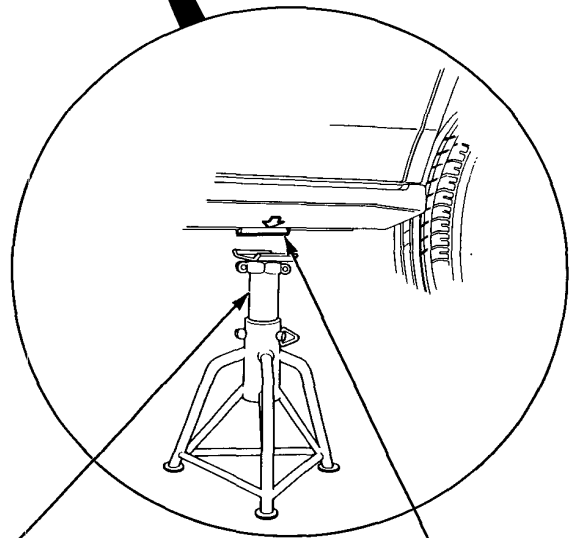
(cont'd)

# Lift and Support Points (cont'd)

## Safety Stands



FRONT SUPPORT POINT



REAR SUPPORT POINT

SAFETY STANDS



If possible, always tow the car with the front wheels off the ground. The tow truck driver should position wood spacer blocks between the car's frame and his chains and lift straps, to avoid damaging the bumper and the body under it.

Do not use the bumpers to lift the car or to support the car's weight while towing. Check local regulations for towing. A chain may be attached to the hook shown in the picture. Do not attach a tow bar to either bumper.

**▲ WARNING**

**DO NOT push or tow a car to start it. The forward surge when the engine starts could cause a collision. On some types, also, under some conditions, the catalytic converter could be damaged. A car equipped with an automatic transmission cannot be started by pushing or torwing.**

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

**Manual Transmission**

Shift the transmission to Neutral and turn the ignition key to the "I" position.

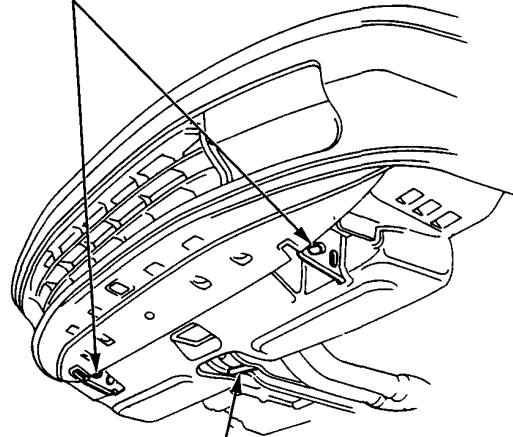
**Automatic Transmission**

First, check the automatic transmission fluid level. Start the engine and shift to D<sub>4</sub>, then to N. Return the ignition key to the "I" position.

**CAUTION:**

- Do not tow with front wheels on the ground when the automatic transmission fluid level is low or the transmission cannot be shifted with the engine running.
- Do not exceed 55 km/h (35 mph) or tow for distances of more than 80 km (50 miles).
- When towing a car with 4WS even with the front wheels off the ground, turn the wheels straight ahead and tie the steering wheel in place.

**TIE DOWN BRACKETS**



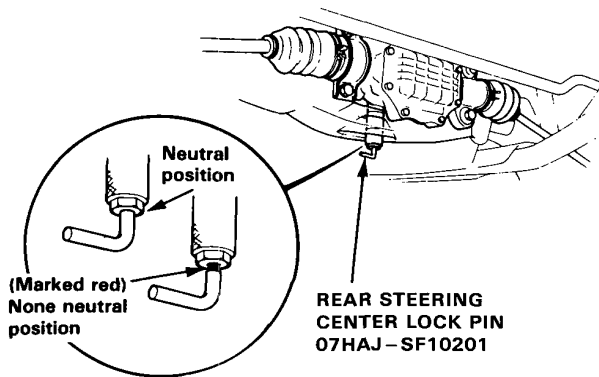
**TOWING HOOK**

# Preparation of Work

## Special Caution Items For This Car

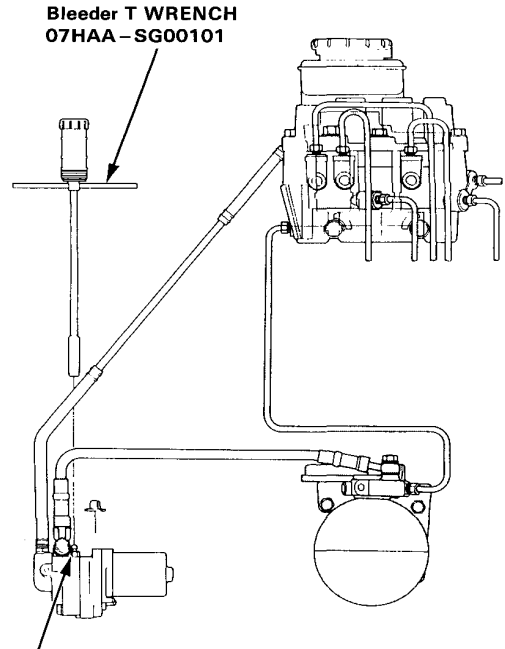
### 1. 4WS system servicing (with 4WS)

- Do not disassemble the rear steering gear box.
- When towing the car even with the front wheels off the ground, center the steering and tie the steering wheel in place.
- When testing or adjusting the wheel alignment, attach the rear steering center lock pin to the rear steering gear box. Make sure that the rear steering gear box is located at the neutral position.



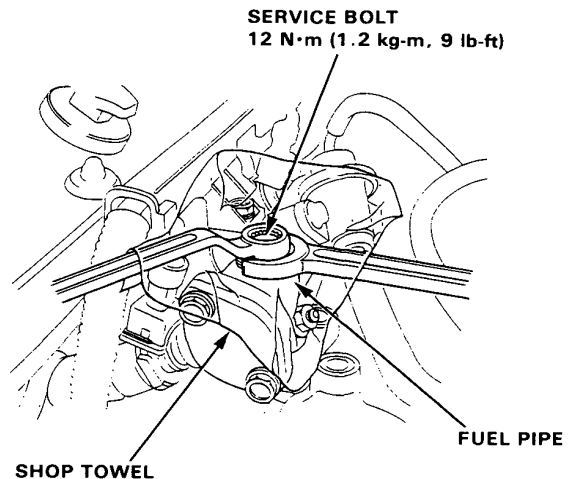
### 2. Anti-lock brake system piping system servicing

- Disassemble the anti-lock brake system piping system after relieve the high-pressured brake fluid.
- Otherwise, the high-pressured brake fluid will burst out and it is very dangerous.
- See section 13 of base manual (62SM400) how to relieve the high-pressured brake fluid.



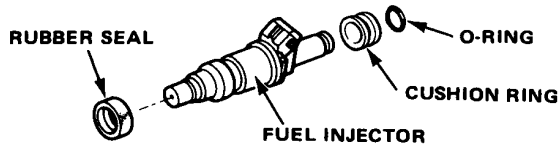
### 3. Fuel Line Servicing

- 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.

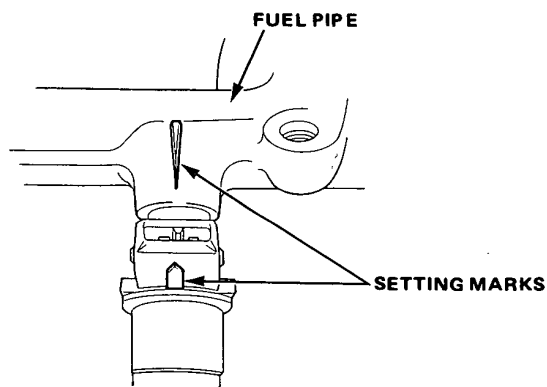




- Be sure to replace washers, O-rings, and rubber seals with new ones when servicing fuel line parts.
- Always apply oil to the surfaces of O-rings and seal rings before installation. Never use brake fluid, radiator fluid, vegetable oils or alcohol-based oils.



- 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.



#### 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.

Care has been taken for the Fuel-Injection, Carburetor, A/T, Cruise control and anti-lock brake system control units and its wiring to prevent erroneous operation from external interference, but erroneous operation of the control units may be caused by entry of extremely strong radio waves. Attention must be paid to the following items to prevent erroneous operation of the control units.

- The antenna and the body of the radio must be at least 200 mm (7.9 in.) away from the control units.

The control unit locations:

- Fuel-Injection, Carburetor, A/T: Passenger's side front floor panel.
- Cruise control: Under dash panel of driver's side.
- Anti-lock brake system: Right side panel of trunk room.
- Do not lead the antenna feeder and the coaxial cable over a long distance parallel to the car's wiring. When crossing the wiring is required, execute crossing at a right angle.
- Do not install a radio with a large output (max. 10 W).

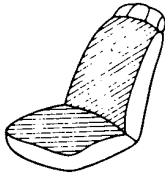
#### 6. Apply liquid gasket to the transmission, oil pump cover, right side cover and water outlet. Use HONDA genuine liquid gasket part No. OY740-99986.

- 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 install the parts if 20 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.
- Wait at least 30 minutes before filling with appropriate liquid (engine oil, coolant and similar fluids).

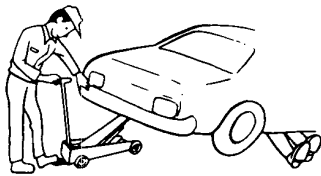
# Preparation of Work

**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. Communicate 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.



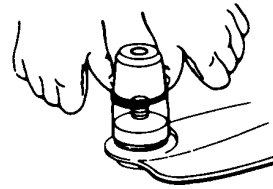
3. Prior to removing or disassembling parts, they must be inspected carefully to isolate the cause for which service is necessary. Observe all safety notes and precautions and follow the proper procedures as described in this manual.



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

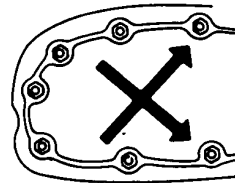


5. Use the special tools when use of such is specified.

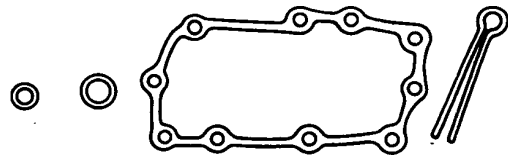


6. Parts must be assembled with the proper torque according to the maintenance standards established.

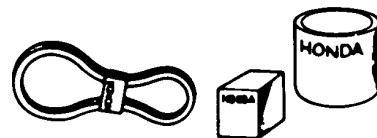
7. When tightening a series of bolts or nuts, begin with the center or larger diameter bolts and tighten them in crisscross pattern in two or more steps.



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



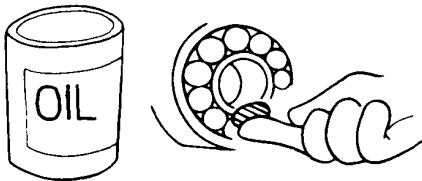
9. Use genuine HONDA parts and lubricants or those equivalent. When parts are to be reused, they must be inspected carefully to make sure they are not damaged or deteriorated and are in good usable condition.







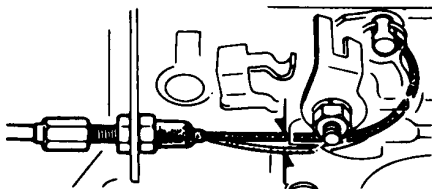
10. Coat or fill parts with specified grease as specified (Page 4-2). Clean all removed parts with solvent upon disassembly.



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

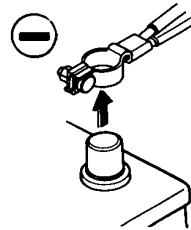


- Keep disassembled parts from air-borne dust and abrasives.
  - Check that parts are clean before assembly.
12. Avoid oil or grease getting on rubber parts and tubes, unless specified.
13. Upon assembling, check every part for proper installation and operation.

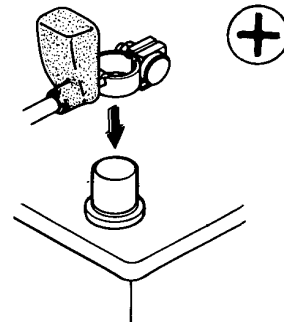


## Electrical

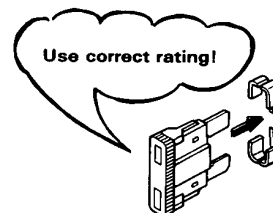
- Before making any repairs on electric wires or parts, disconnect the battery cables from the battery starting with the negative (-) terminal.



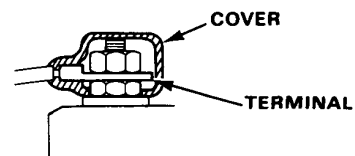
- After making repairs, check each wire or part for proper routing and installation. Also check to see that they are connected properly.
- Always connect the battery positive (+) cable first, then connect the negative (-) cable.



- 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.



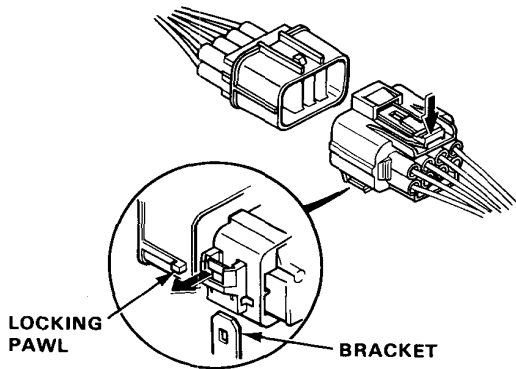
(cont'd)

# Preparation of Work

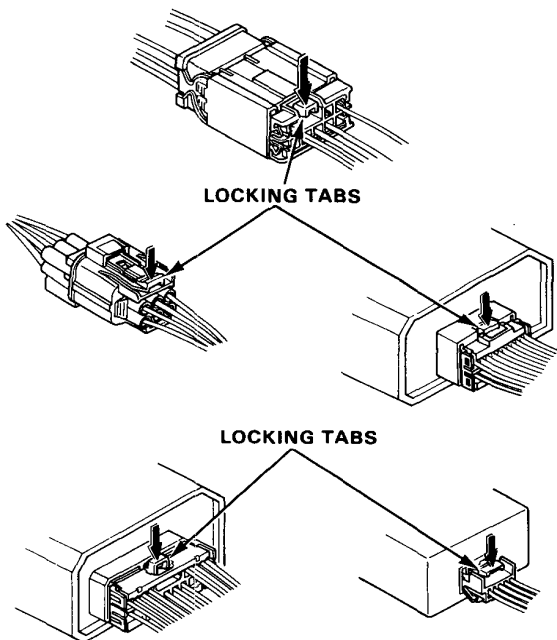
## Electrical (cont'd)

Since new type connectors are used, connection and disconnection of them should be done paying attention to the following precautions.

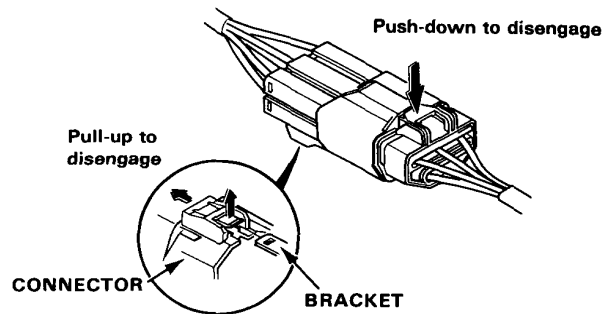
- Because all the connectors except terminal of 1-P are equipped with push-down type locks, unlock them first before disconnecting the connectors.
- On the connectors installed on the bracket a pull type lock is equipped between the bracket and the connector. Some connectors of this type can not be disconnected unless they are removed from their brackets. When disconnecting, check their shapes.
- On the bracket mounted connector with dual locks, remove the connector from the bracket before disconnecting.



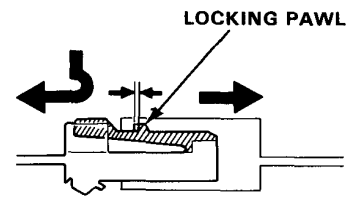
- Push the locking tab to disconnect.



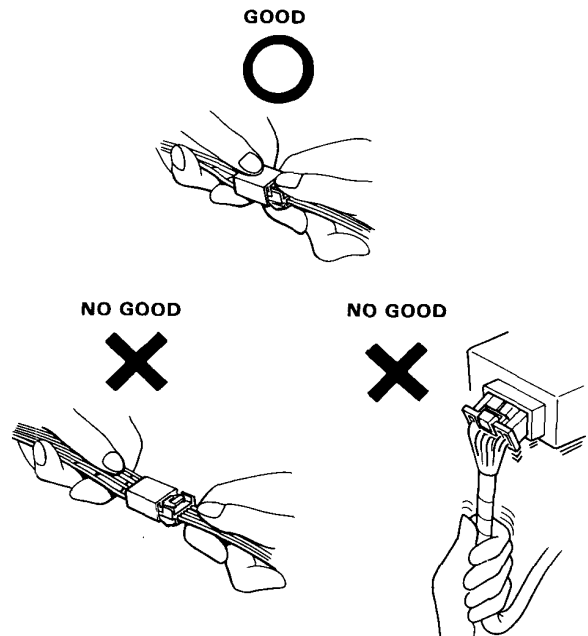
- Pull up the locking tab to remove the connector from the bracket.



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



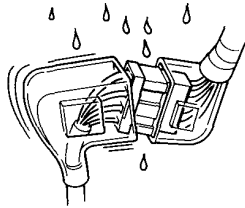
- When disconnecting a connector, pull it off from the mating coupler by holding on both connectors.
- Never try to disconnect connectors by pulling on their wires.





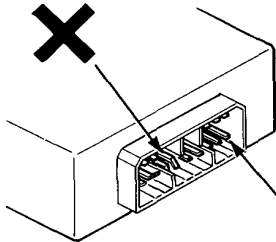
- Place the plastic cover over the mating connector after reconnecting. Also check that the cover is not distorted.

NO GOOD



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

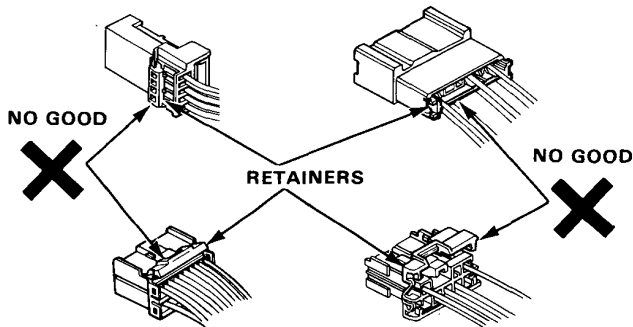
NO GOOD



GOOD



- Check for loose retainers and rubber seals. The illustration shows examples of terminal and seal abnormality.

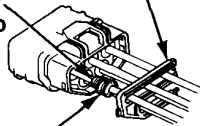


Example of waterproof connector:

NO GOOD

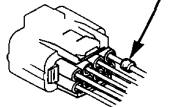


RETAINER

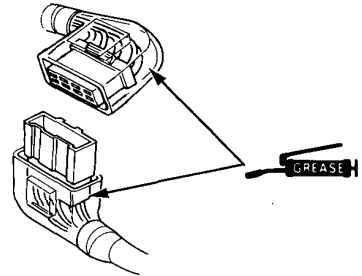


RUBBER SEAL

RUBBER SEAL



- For the connector which uses insulation grease, clean the connector then apply grease if the grease is insufficient or contaminated.



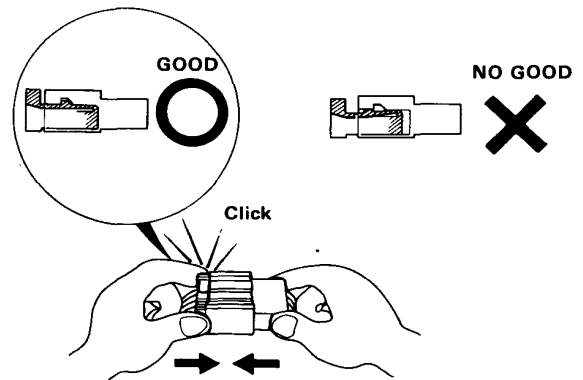
- Insert the connector tightly and make sure it is securely locked.
- Check all the wire harnesses are connected.
- There are two types of locking tab: one that you have to push and the other you should not touch when connecting the connector. Check the shape of the locking tab before connecting.
- The locking tab having a taper end should not be touched when connecting.



- The locking tab with an angle end should be pushed when connecting.



- Insert connectors fully until they will no longer go.
- The connectors must be aligned and engaged securely.
- Don't use wire harnesses with a loose wire or coupler.

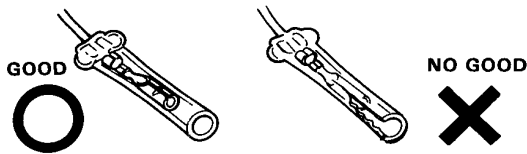


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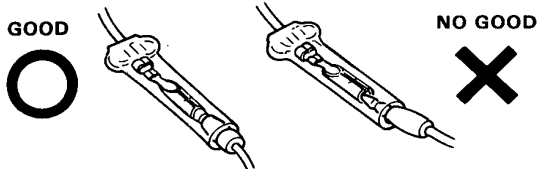
# Preparation of Work

## Electrical (cont'd)

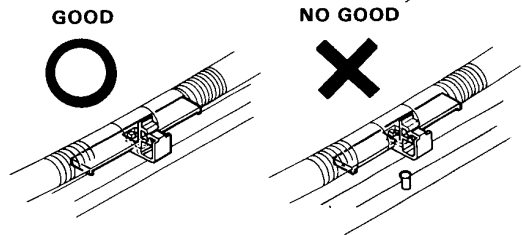
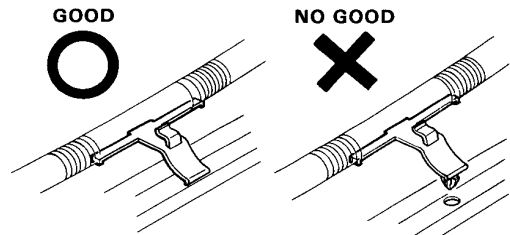
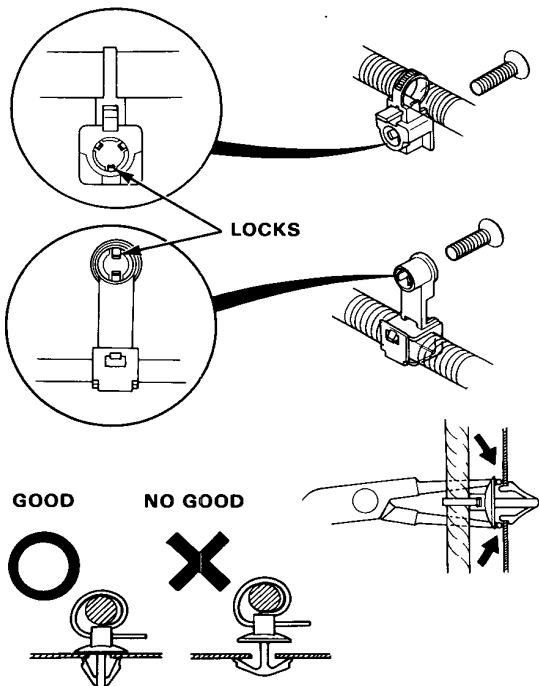
- Before connecting, check each connector cover for damage. Also make sure that the female connector is tight and not loosened from the previous use.



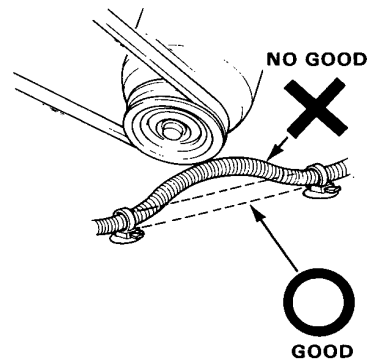
- Insert male connectors into the female connectors fully until they will no longer go.
- Be sure that plastic cover is placed over the connection.
- Position the wires so that the open of the cover is not facing upward.



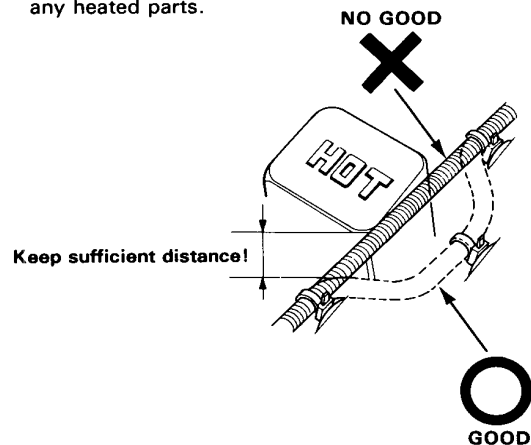
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Position the wiring in the bands so that only the insulated surfaces contact the wires or wire harnesses.
- Remove with care not to damage the lock.



- 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.

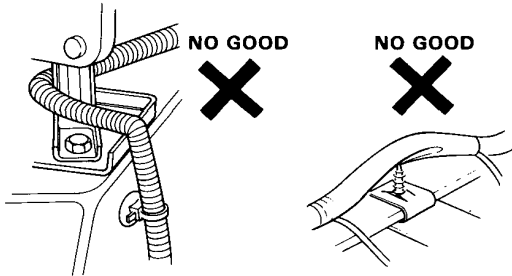


- Always keep a safe distance between wire harnesses and any heated parts.

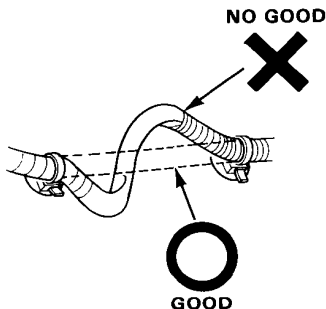




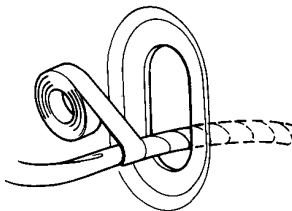
- Do not bring wire harnesses in direct contact with sharp edges or corners.
- Also avoid contact with the projected ends or bolts, screws and other fasteners.



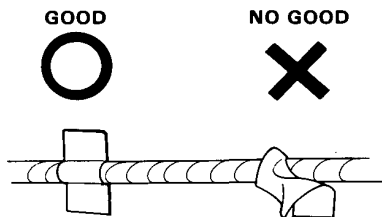
- Route harnesses so they are not pulled taut or slackened excessively.



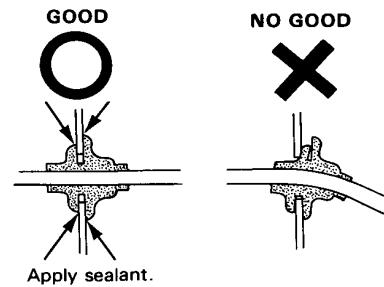
- Protect wires and harnesses with a tape or a tube if they are in contact with a sharp edge or corner.



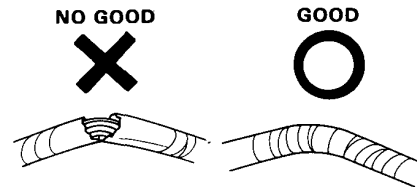
- Clean the attaching surface thoroughly if an adhesive is used. First, wipe with solvent or alcohol if necessary.



- Seat grommets in their grooves properly.



- Do not damage the insulation when connecting a wire.
- Do not use wires or harnesses with a broken insulation. Repair by wrapping with 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 interfering with adjacent or surrounding parts in all steering positions.

(cont'd)

# Preparation of Work

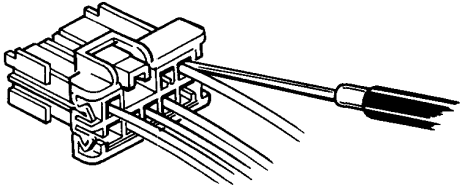
## Electrical (cont'd)

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

Are range and porarity correct?

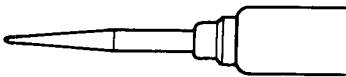


- Always insert the probe of the tester from the wire harness side (except waterproof connectors).

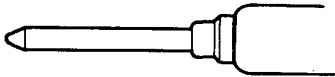


- Make sure to use the probe with a taper tip.

GOOD

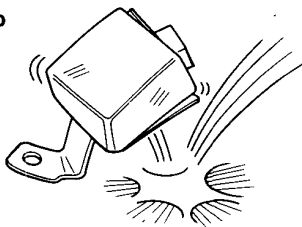


NO GOOD



- Do not drop parts.

NO GOOD



# Symbol Marks

The following symbols stand for:



:Apply engine oil.



:Apply brake fluid.



:Apply grease.



:Apply DEXRON® II Automatic Transmission Fluid.



:Apply Power Steering Fluid.



:Apply or check vacuum.

①, ②, ③,.....  
①, ②, ③,.....

:Sequence for removal or installation.

# Abbreviation



2WS	Front Wheel Steering	P	Parking
4WS	Four Wheel Steering	R	Reverse
A/C	Air Conditioner	N	Neutral
A/T	Automatic Transmission	D <sub>4</sub>	Drive Position (1st—4th)
ATF	Automatic Transmission Fluid	D <sub>3</sub>	Drive Position (1st—3rd)
B or BAT	Battery	2	Fixed 2nd speed
CATA	Catalytic Converter	1	Fixed 1st speed
EACV	Electronic Air Control Valve	S	S Signal/S Switch
ECU	Electronic Control Unit for Fuel-Injection System		
EGR	Exhaust Gas Recirculation		
EX	Exhaust		
GND	Ground		
IG	Ignition		
IN	Intake		
INT	Intermittent		
L.	Left		
LHD	Left Hand Drive		
M/T	Manual Transmission		
PCV	Positive Crankcase Ventilation		
PGM-FI	Programmed Fuel-Injection		
P/S	Power Steering		
R.	Right		
RHD	Right Hand Drive		
SW	Switch		
SOL.V	Solenoid Valve		
TDC	Top Dead Center		

# Special Tools

## 5. Engine

Number	Tool Number	Description	Q'ty	Remarks
①	07GAF-PH70100	Pilot Collar	1	
②	07HAD-PJ70200	Valve Guide Seal Installer	1	
③	07HAF-PL20102	Piston Base Head	1	
④	07HAH-PJ70100	Valve Guide Reamer 5.5mm	1	
⑤	07JAB-0010000	Crank Pulley Holder Set	1	
⑤-1	07JAA-0010200	Socket Wrench 19 mm	(1)	
⑤-2	07JAB-0010200	Handle	(1)	
⑥	07JAB-0010400	Pulley Holder Attachment HEX 50 mm	1	
⑦	07JAZ-SH20100	R.P.M. Connecting Adaptor	1	
⑧	07JGG-0010100	Belt Tension Gauge	1	
⑨	07KAK-SJ40100	Engine Tilt Hanger Set	1	
⑩	07LAF-PT20100	Bearing Replacement Tool Set	1	
⑪	07LAG-PT20100	Balancer Shaft Lock Pin	1	
⑫	07LAZ-PT30100	R.P.M. Connecting Adaptor	1	
⑬	07LAZ-PT30110	R.P.M. Connecting Adaptor (A)	1	Component Tools
⑭	07LAZ-PT30120	R.P.M. Connecting Adaptor (B)	1	
⑮	07406-0030000	Oil Pressure Gauge Adaptor	1	
⑯	07746-0010300	Driver Attachment 42 x 47 mm	1	for Crankshaft
⑰	07746-0010400	Driver Attachment 52 x 55 mm	1	for Balancer Shaft
⑱	07749-0010000	Driver	1	
⑲	07757-0010000	Valve Spring Compressor	1	
⑳	07912-6110001	Oil Filter Socket	1	
㉑	07924-PD20003 or 07924-PD20002	Ring Gear Holder	1	
㉒	07942-0010100	Valve Guide Remover 5.5 mm	1	
㉓	07942-8920000	Valve Guide Driver 5.5 mm	1	
㉔	07948-SB00101	Driver Attachment	1	
㉕	07973-PE00310	Piston Pin Driver Shaft	1	
㉖	07973-PE00320	Piston Pin Driver Head	1	
㉗	07973-PE00400	Piston Pin Base Insert	1	
㉘	07973-6570500	Piston Base	1	
㉙	07973-0570600	Piston Base Spring	1	





## 6. Fuel and Emissions

Number	Tool Number	Description	Q'ty	Remarks
①	07JAZ—SH20100	R.P.M. Connecting Adaptor	1	
②	07LAA—PT50100	O <sub>2</sub> Sensor Socket Wrench	1	
③	07LAJ—PT30100	ECU Test Harness	1	
④	07LAJ—PT30200	Test Harness	1	
⑤	07LAZ—PT30100	R.P.M. Connecting Adaptor	1	
⑤-1	07LAZ—PT30110	R.P.M. Connecting Adaptor (A)	(1)	Component Tools
⑤-2	07LAZ—PT30120	R.P.M. Connecting Adaptor (B)	(1)	
⑥	07406—0040001	Fuel Pressure Gauge Set	1	
⑥-1	07406—0040100	Pressure Gauge	(1)	Component Tools
⑥-2	07406—0040201	Hose Assembly	(1)	
⑦	07411—0020000	Digital Circuit Tester	1	
⑧	07614—0050100	Fuel Line Clamp	1	

## 7. Clutch

Number	Tool Number	Description	Q'ty	Remarks
①	07JAF—PM7011A	Clutch Alignment Disc	1	
②	07LAF—PT00110	Clutch Alignment Shaft	1	
③	07924—PD20003 or 07924—PD20002	Ring Gear Holder	1	
④	07936—3710100	Handle	1	

## 8. Manual Transmission

Number	Tool Number	Description	Q'ty	Remarks
①	07GAJ—PG20102	Mainshaft Inspection Tool Set	1	
①-1	07GAJ—PG20110	Mainshaft Holder	(1)	Component Tools
①-2	07GAJ—PG20130	Mainshaft Base	(1)	
②	07HAJ—PK40201	Preload Inspection Tool	1	
③	07JAC—PH80000	Adjusting Bearing Remover Set	1	
③-1	07JAC—PH80100	Bearing Remover Attachment	(1)	Component Tools
③-2	07JAC—PH80200	Bearing Remover Handle	(1)	
③-3	07741—0010201	Bearing Remover Weight	(1)	
④	07JAD—PH80400	Pilot Driver 28 mm	1	
⑤	07JAD—SH30100	Oil Seal Driver	1	
⑥	07744—0010400	Pin Driver 5.0 mm	1	07944—6110100 may also be used
⑦	07746—0010300	Attachment 42 x 47 mm	1	
⑧	07746—0010400	Attachment 52 x 55 mm	1	
⑨	07746—0010500	Attachment 62 x 68 mm	1	
⑩	07746—0010600	Attachment 72 x 75 mm	1	
⑪	07746—0030100	Driver	1	
⑫	07746—0030200	Inner Driver 25 mm	1	
⑬	07749—0010000	Driver	1	
⑭	07944—SA00000	Pin Driver 4.0 mm	1	
⑮	07947—6110501	Oil Seal Driver	1	
⑯	07979—PJ40001	Magnet Stand Base	1	

# Special Tools

## 9. Automatic Transmission

Number	Tool Number	Description	Q'ty	Remarks
①	07GAB—PF50100	Mainshaft Holder	1	
②	07GAD—PG20100	Pin Driver 5.0 mm	1	
③	07GAE—PG40200	Clutch Spring Compressor Set	1	
③-1	07HAE—PL50100	Clutch Spring Compressor Attachment	(1)	Component Tools
③-2	07GAE—PG40200	Clutch Spring Compressor Bolt Assembly	(1)	
③-3	07960—6120101	Clutch Spring Compressor Attachment	(1)	
④	07GAJ—PG20200	Preload Inspection Tool	1	
⑤	07HAC—PK40101	Housing puller	1	
⑤-1	07HAC—PK40110	Puller Base, Replacement	(1)	May also be used when combined with 07HAC—PK40100
⑥	07JAC—PH80000	Adjusting Bearing Remover Set	1	
⑥-1	07JAC—PH80100	Bearing Remover Attachment	(1)	Component Tools
⑥-2	07JAC—PH80200	Bearing Handle Assembly	(1)	
⑥-3	07741—0010201	Remover Weight	(1)	
⑦	07JAD—PH80101	Driver Attachment	1	
⑧	07JAD—PH80400	Pilot Driver 28 x 30 mm	1	
⑨	07JAD—PN00100	Driver Attachment	1	
⑩	07LAF—PX40100	Clutch Spring Compressor Attachment	1	
⑪	07LAJ—PT30100	ECU Test Harness	1	
⑫	07406—0020003	Oil Pressure Gauge	1	
⑬	07406—0020201	Oil Pressure Gauge Hose	1	
⑭	07406—0070000	Low Pressure Gauge	1	
⑮	07746—0010400	Attachment 52 x 55 mm	1	
⑯	07746—0010500	Attachment 62 x 68 mm	1	
⑰	07746—0010600	Attachment 72 x 75 mm	1	
⑱	07746—0030100	Driver 40 mm I.D.	1	
⑲	07749—0010000	Driver	1	
⑳	07947—6340500	Driver Attachment E	1	

## 10. Driveshafts

Number	Tool Number	Description	Q'ty	Remarks
①	07GAD—PG40100	Seal Driver Attachment	1	
②	07GAF—SD40700	Hub Dis/Assembly Base	2	
③	07LAD—SM40100	Seal Driver Attachment	1	
④	07LAF—SM40300	Support Base Attachment	1	
⑤	07746—0010200	Attachment, 37 x 40 mm	1	
⑥	07746—0010300	Attachment, 42 x 47 mm	1	
⑦	07746—0030100	Driver, 40 mm I.D.	1	
⑧	07749—0010000	Driver	1	
⑨	07947—SD90101	Seal Driver Attachment	1	
⑩	07965—SD90100	Support Base	1	



## 11. Steering

Number	Tool Number	Description	Q'ty	Remarks
①	07GAG—SD40300	Cylinder End Seal Slider	1	
②	07HAG—SF10100	Piston Seal Ring Guide	1	
③	07HAG—SF10200	Piston Seal Ring Sizing Tool	1	
④	07HAG—SF10300	Pinion Seal Ring Guide	1	
⑤	07JGG—0010100	Belt Tension Gauge	1	
⑥-1	07LAK—SM40110	P/S Joint Adaptor (Pump)	1	
⑥-2	07LAK—SM40120	P/S Joint Adaptor (Hose)	1	
⑦	07406—0010001	P/S Pressure Gauge Set	1	
⑦-1	07406—0010300	Pressure Control Valve	1	
⑦-2	07406—0010400	Pressure Gauge	1	
⑧	07406—0010101	Bypass Tube Joint (included with 07406—0010001)	1	
⑨	07725—0030000	Universal Holder	1	
⑩	07746—0010300	Attachment 42 x 47 mm	1	
⑪	07749—9910000	Driver	1	
⑫	07916—SA50001	Locknut Wrench 40 mm	1	
⑬	07941—6920003	Ball Joint Remover	1	
⑭	07947—6340300	Driver Attachment	1	
⑮	07974—SA50600	Pinion Seal Guide	1	

## 11. Steering (4WS only)

Number	Tool Number	Description	Q'ty	Remarks
①	07HAG—SF10000	4WS Tool Kit	1	
①-1	07HAG—SF10400	Pinion Seal Ring Sizing Tool	1	
①-2	07HAG—SF10500	Driven Seal Ring Guide	1	
②	07HAJ—SF10100	Rack Adjuster Gauge Holder Set	1	
③	07HAJ—SF10201	Rear Steering Center Lock Pin	1	
④	07HAJ—SF10300	Stroke Rod Holder Set	1	
⑤	07HAJ—SF10400	Inspection Adaptor	1	
⑥	07LAA—SM40100	Locknut Wrench, 43 mm	1	
⑦	07LAA—SM40200	Locknut Socket 36 x 43 mm	1	
⑧	07LAG—SM40000	4WS Tool Kit	1	
⑧-1	07LAG—SM40100	Piston Seal Ring Guide	1	
⑧-2	07LAG—SM40200	Piston Seal Ring Sizing Tool	1	
⑧-3	07LAG—SM40300	Cylinder End Seal Slider	1	
⑧-4	07LAG—SM40400	Cylinder End Seal Guide	1	
⑧-5	07LAG—SM40500	Tool Box	1	
⑨	07703—0010101	TORX® Bit T40	1	

# Special Tools

## 12. Suspension

Number	Tool Number	Description	Q'ty	Remarks
①	07GAE—SE00101	Spring Compressor	1	
②	07GAF—SD40100	Hub Assembly Pin	1	
③	07GAF—SD40330	Ball Joint Remover/Installer	1	4WS Only
④	07GAF—SE00200	Hub Assembly Guide Attachment	1	4WS Only
⑤	07GAG—SD40700	Ball Joint Clip Installation Guide	1	
⑥	07HAF—SF10100	Ball Joint Dis/Assembly Tool set	1	
⑥-1	07HAF—SF10110	Ball Joint Remover Base	1	
⑥-2	07HAF—SF10120	Ball Joint Installer Base	1	
⑥-3	07HAF—SF10130	Ball Joint Remover/Installer	1	
⑦	07HAJ—SF10201	Rear Steering Center Lock Pin	1	
⑧	07HGJ—0010000	Toe Inspection Gauge Set	1	4WS Only
⑨	07HGK—0010200	Wheel Alignment Gauge Attachment	1	
⑩	07703—0010100	TORX® BIT T40	1	4WS Only
⑪	07749—0010000	Driver	1	
⑫	07941—6920003	Ball Joint Remover	1	
⑬	07947—SB00100	Oil Seal Driver	1	4WS Only
⑭	07965—6340301	Hub Dis/assembly Base	2	
⑮	07965—6920201	Hub Dis/Assembly Base	1	

## 13. Brakes

Number	Tool Number	Description	Q'ty	Remarks
①	07GAG—SE00100	Pushrod Adjustment Gauge	1	
②	07HAE—SG00100	Brake Spring Compressor	1	
③	07HAK—SG00110	Pressure Gauge Joint Pipe	1	
④	07LAF—SM40200	Brake spring installer	1	
⑤	07404—5790300	Pressure Gauge Attachment	1	
⑥	07406—5790200	Pressure Gauges	2	
⑦	07410—5790100	Pressure Gauge Attachment	2	
⑧	07410—5790500	Tube Joint Adaptor	1	
⑨	07510—6340100	Pressure Gauge Joint Pipe	1	
⑩	07510—6340300	Vacuum Joint Tube A	1	
⑪	07914—SA50001	Snap Ring Pliers	1	
⑫	07921—0010001	Flare Nut Wrench	1	
⑬	07973—SA50000	Rear Caliper Guide	1	

## 13. Brakes (ALB only)

Number	Tool Number	Description	Q'ty	Remarks
①	07HAA—SG00101	Bleeder T-Wrench	1	
②	07HAJ—SG00601	ALB Checker	1	
	or			
	07508—SB00000	ALB Checker	1	
	—07HAJ—SG00400	Adaptor	1	



### 14. Body

Number	Tool Number	Description	Q'ty	Remarks
①	07GAZ—SE30100	Torsion Bar Assembly Tool	1	

### 15. Heater and Air Conditioner

Number	Tool Number	Description	Q'ty	Remarks
①	07JGG—0010100	Belt Tension Gauge	1	
②	07LAB—SK70100	A/C Clutch Holder	1	
③	07LAJ—PT30100	ECU Test Harness	1	

### 16. Electrical

Number	Tool Number	Description	Q'ty	Remarks
①	07GAC—SE00200	Fuel Sender Wrench	1	
②	07JGG—0010100	Belt Tension Gauge	1	

# Standards and Service Limits

## 5. Engine/Cylinder Head, Valve Train

MEASUREMENT		STANDARD (NEW)		SERVICE LIMIT	
Compression	250 min <sup>-1</sup> (rpm) and wide-open throttle	1.8 ℓ	Nominal Minimum Maximum variation	1,177 kPa (12.0 kg/cm <sup>2</sup> , 171 psi) 931 kPa (9.5 kg/cm <sup>2</sup> , 135 psi) 196 kPa (2 kg/cm <sup>2</sup> , 28 psi)	
		2.0 ℓ	Nominal Minimum Maximum variation	1226 kPa (12.5 kg/cm <sup>2</sup> , 178 psi) 931 kPa (9.5 kg/cm <sup>2</sup> , 135 psi) 196 kPa (2 kg/cm <sup>2</sup> , 28 psi)	
		2.2 ℓ	Nominal Minimum Maximum variation	1226 kPa (12.5 kg/cm <sup>2</sup> , 178 psi) 931 kPa (9.5 kg/cm <sup>2</sup> , 135 psi) 196 kPa (2 kg/cm <sup>2</sup> , 28 psi)	
Cylinder head	Warpage Height	99.95—100.05 (3.935—3.938)		0.05 (0.002)	
Camshaft	End play	0.05—0.15 (0.002—0.006)		0.50 (0.020)	
	Oil clearance	0.05—0.089 (0.002—0.0035)		0.150 (0.006)	
	Runout	0.015 (0.0006)		0.030 (0.001)	
	Cam lobe height	IN	1. F18A2:	38.095 (1.4998)	—
			2. F20A2:	38.526 (1.5167)	—
			3. F20A3:	38.526 (1.5167)	—
			4. F20A4:	38.741 (1.5252)	—
			5. F20A5:	38.741 (1.5252)	—
			6. F20A6:	38.526 (1.5167)	—
			7. F22A2:	38.741 (1.5252)	—
			8. F22A3:	39.167 (1.5420) MT 38.741 (1.5252) AT	—
			9. F22A9:	38.741 (1.5252)	—
	EX	1. F18A2:	37.890 (1.4917)	—	
		2. F20A2:	38.778 (1.5266)	—	
		3. F20A3:	38.778 (1.5266)	—	
		4. F20A4:	38.972 (1.5343)	—	
		5. F20A5:	38.972 (1.5343)	—	
		6. F20A6:	38.778 (1.5266)	—	
		7. F22A2:	38.972 (1.5343)	—	
8. F22A3:		39.356 (1.5494) MT 38.972 (1.5343) AT	—		
9. F22A9:		38.972 (1.5343)	—		
Valve	Valve clearance	IN	0.24—0.28 (0.0094—0.0110)	—	
		EX	0.28—0.32 (0.0110—0.1259)	—	
	Valve stem O.D.	IN *1	5.485—5.495 (0.2159—0.2163)	5.455 (0.2147)	
		*2	5.480—5.490 (0.2157—0.2161)	5.450 (0.2145)	
	Stem-to-guide clearance	EX	5.450—5.460 (0.2145—0.2149)	5.420 (0.2133)	
		IN *1	0.020—0.045 (0.0007—0.0017)	0.075 (0.0029)	
EX *2	0.025—0.050 (0.0009—0.0019)	0.080 (0.0031)			
EX	0.055—0.080 (0.0021—0.0031)	0.12 (0.0047)			
Valve seat	Width	IN and EX	1.25—1.55 (0.049—0.0610)	2.00 (0.0787)	
	Valve stem installed height	IN EX	48.245—48.715 (1.8994—1.9179) 50.315—50.785 (1.9809—1.9994)	—	
Valve spring	Free Length	IN (NH)	1. F18A2:	56.28 (2.2157)	
			2. F20A2:	54.82 (2.1582)	
			3. F20A3:	54.82 (2.1582)	
			4. F20A4:	53.15 (2.0925)	
			5. F20A5:	53.15 (2.0925)	
			6. F20A6:	54.82 (2.1582)	
			7. F22A2:	53.15 (2.0925)	
			8. F22A3:	53.15 (2.0925)	
			9. F22A9:	53.15 (2.0925)	
		(CH)	1. F18A2:	56.26 (2.2149)	
			2. F20A2:	54.81 (2.1578)	
			3. F20A3:	54.81 (2.1578)	
			4. F20A4:	53.16 (2.0929)	
			5. F20A5:	53.16 (2.0929)	
			6. F20A6:	54.81 (2.1578)	
			7. F22A2:	53.16 (2.0929)	
			8. F22A3:	53.16 (2.0929)	
			9. F22A9:	53.16 (2.0929)	

1. F18A2: 1.8 ℓ CARB  
 2. F20A2: 2.0 ℓ CARB with CATA  
 3. F20A3: 2.0 ℓ CARB  
 4. F20A4: 2.0 ℓ PGM-FI with CATA  
 5. F20A5: 2.0 ℓ PGM-FI  
 6. F20A6: 2.0 ℓ CARB with CATA  
 7. F22A2: 2.2 ℓ PGM-FI  
 8. F22A3: 2.2 ℓ PGM-FI with CATA  
 9. F22A9: 2.2 ℓ PGM-FI with CATA for KQ  
 NH: NIHON HATSUJO  
 CH: CHUO HATSUJO

- \*1: CARB, 7. F22A2 and 9. F22A9  
 \*2: PGM-FI except 7. F22A2 and 9. F22A9

## 5. Engine/Cylinder Head, Valve Train

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Valve spring	Free length	EX (NH)			
		1. F18A2:	59.89 (2.3578)	—	
		2. F20A2:	59.89 (2.3578)	—	
		3. F20A3:	59.89 (2.3578)	—	
		4. F20A4:	55.78 (2.1960)	—	
		5. F20A5:	55.78 (2.1960)	—	
		6. F20A6:	59.89 (2.3578)	—	
		7. F22A2:	55.78 (2.1960)	—	
		8. F22A3:	55.78 (2.1960)	—	
		9. F22A9:	55.78 (2.1960)	—	
		(CH)			
		1. F18A2:	59.88 (2.3574)	—	
		2. F20A2:	59.88 (2.3574)	—	
		3. F20A3:	59.88 (2.3574)	—	
		4. F20A4:	55.80 (2.1968)	—	
		5. F20A5:	55.80 (2.1968)	—	
		6. F20A6:	59.88 (2.3574)	—	
		7. F22A2:	55.80 (2.1968)	—	
8. F22A3:	55.80 (2.1968)	—			
9. F22A5:	55.80 (2.1968)	—			
Valve guide	I.D.	IN and EX	5.515–5.530 (0.2171–0.2177)	5.53 (0.2177)	
	Valve guide installed height	IN EX	23.75–24.25 (0.9148–0.9547) 15.05–15.55 (0.5925–0.6122)	— —	
Rocker arm	Arm-to-shaft clearance	IN	0.017–0.050 (0.0007–0.0020)	0.080 (0.0031)	
		EX	0.018–0.054 (0.0007–0.0021)	0.080 (0.0031)	

## 5. Engine/Engine Block

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter		85.00–85.02 (3.3464–3.3472)	85.07 (3.3492)
	Bore taper		—	0.05 (0.002)
	Reboring limit		—	0.5 (0.02)
Piston	Skirt O.D. (At 21 mm (0.83 in.) from bottom of skirt)	A	84.98–84.99 (3.3456–3.4605)	84.97 (3.3452)
		B	84.97–84.98 (3.3452–3.3456)	84.96 (3.3448)
Piston ring	Piston-to-ring clearance	Top	0.035–0.060 (0.0014–0.0024)	0.130 (0.0051)
		Second	0.030–0.055 (0.0011–0.0022)	0.130 (0.0051)
	Ring end gap	Top	0.20–0.35 (0.0079–0.0138)	0.60 (0.0236)
		Second	0.40–0.55 (0.0157–0.0217)	0.70 (0.0276)
Connecting rod	Pin-to rod interference		0.013–0.032 (0.0005–0.0013)	—
		Small end bore diameter	21.968–21.981 (0.8649–0.8654)	—
	Large end bore diameter	1.8 ℓ, 2.0 ℓ	Nominal 48 (1.890)	—
		2.2 ℓ	Nominal 51 (2.008)	—
End play installed on crankshaft		0.15–0.30 (0.006–0.012)	0.40 (0.016)	
Crankshaft	Main journal diameter	No. 1, 2 Journals	49.976–50.000 (1.9676–1.9685)	—
		No. 3 Journal	49.972–49.996 (1.9674–1.9683)	—
		No. 4, 5 Journals	49.948–50.008 (1.9665–1.9688)	—
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter	1.8 ℓ, 2.0 ℓ	44.976–45.000 (1.7710–1.7717)	—
	2.2 ℓ	47.976–48.000 (1.8888–1.8898)	—	
Taper/out-of-round, rod journal		0.005 (0.0002) max.	0.010 (0.0004)	
End play		0.10–0.35 (0.004–0.014)	0.45 (0.018)	
Runout		0.015 max (0.0006)	0.020 (0.0008)	
Bearings	Main bearing-to journal oil clearance	No. 1, 2 Journals	0.021–0.045 (0.0009–0.0018)	0.05 (0.002)
		No. 3 Journal	0.025–0.049 (0.001–0.0019)	0.054 (0.0021)
		No. 4, 5 Journals	0.013–0.037 (0.0005–0.0015)	0.05 (0.002)
	Rod bearing-to journal oil clearance	2.2 ℓ	0.021–0.049 (0.0008–0.0019)	0.05 (0.002)
others		0.015–0.043 (0.0006–0.0017)	0.05 (0.002)	

1. F18A2: 1.8 ℓ CARB
2. F20A2: 2.0 ℓ CARB with CATA
3. F20A3: 2.0 ℓ CARB
4. F20A4: 2.0 ℓ PGM-FI with CATA
5. F20A5: 2.0 ℓ PGM-FI
6. F20A6: 2.0 ℓ CARB with CATA
7. F22A2: 2.2 ℓ PGM-FI
8. F22A3: 2.2 ℓ PGM-FI with CATA
9. F22A9: 2.2 ℓ PGM-FI with CATA

# Standards and Service Limits

## 5. Engine/Engine Block

		MEASUREMENT		STANDARD (NEW)		SERVICE LIMIT
Balancer Shaft	Journal diameter	No.1 journal (Front)	(Front)	42.722—42.734	(1.6820—1.6824)	—
		No.2 journal (Rear)	(Rear)	20.938—20.950	(0.8243—0.8248)	—
		No.3 journal		38.712—38.724	(1.5241—1.5246)	—
	Journal taper			34.722—34.734	(1.3670—1.3674)	—
				0.005	(0.0002)	—
	End play		(Front)	0.100—0.350	(0.0040—0.0138)	—
			(Rear)	0.060—0.180	(0.0024—0.0070)	—
Runout			0.020	(0.0008)	—	
Oil Clearance	No.1 journal (Rear)	(Rear)	0.050—0.075	(0.0020—0.0030)	—	
	No.1, 3 journal		0.066—0.118	(0.0026—0.0046)	—	
	No.2, journal		0.076—0.128	(0.0030—0.0050)	—	
					—	
Balancer Shaft Bearing	I.D	No.1 journal (Front)	(Front)	42.800—42.820	(1.6850—1.6858)	—
		No.1 journal (Rear)	(Rear)	21.000—21.013	(0.8268—0.8273)	—
		No.2 journal		38.800—38.820	(1.5276—1.5283)	—
		No.3 journal		34.800—34.820	(1.3701—1.3710)	—

## 5. Engine/Engine Lubrication

		MEASUREMENT		STANDARD (NEW)		SERVICE LIMIT
Engine oil	Capacity (US. qt., Imp. qt.)			4.9 (5.2, 4.3) After engine disassembly 3.8 (4.0, 3.3) After oil change, including oil filter 3.5 (3.7, 3.1) After oil change, without oil filter		
Oil pump	Displacement			43.9 ℓ (11.6 US. gal., 9.7 Imp. gal.)/6,000 min <sup>-1</sup> (rpm)		
	Inner-to-outer rotor radial clearance			0.02—0.16	(0.0008—0.0063)	0.2 (0.008)
	Pump body-to-rotor radial clearance			0.10—0.19	(0.0040—0.0075)	0.21 (0.0083)
	Pump body-to-rotor side clearance			0.02—0.07	(0.001—0.003)	0.12 (0.005)
Relief valve	Pressure setting 80°C (176°F)	Idle		69 kPa (0.7 kg/cm <sup>2</sup> , 10 psi) min.		
		3,000 min <sup>-1</sup> (rpm)		3431 kPa (3.5 kg/cm <sup>2</sup> , 50 psi)		



## 5. Engine/Cooling

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Thermostat	Starts to open Full open Valve lift at full open	78°C±2 (172°F±3) 90°C (194°F) 8 (0.31) max.	86–90°C (187–194°F)
Water Pump	Displacement	160 ℓ (42.2 US gal, 35.2 Imp gal)/6,000 min <sup>-1</sup> (rpm)	
Radiator	Capacity (incl. heater) ℓ (US qt., Imp. qt) (Includes reservoir tank 0.6 (0.63, 0.53) after overhaul	1. F18A2: MT: 6.6 (6.97, 5.81) AT: 6.5 (6.87, 6.72) 2. F20A2: 7.2 (7.61, 6.34) 7.1 (7.50, 6.23) 3. F20A3: 7.2 (7.61, 6.34) 7.1 (7.50, 6.23) 4. F20A4: 7.2 (7.61, 6.34) 7.1 (7.50, 6.23) 5. F20A5: 7.2 (7.61, 6.34) 7.1 (7.50, 6.23) 6. F20A6: 7.2 (7.61, 6.34) 7.1 (7.50, 6.23) 7. F22A2: 6.6 (6.97, 5.81) 7.1 (7.50, 6.23) 8. F22A3: 7.2 (7.61, 6.34) 7.1 (7.50, 6.23) 9. F22A9: 6.6 (6.97, 5.81) 7.1 (7.50, 6.23)	
	at change	1. F18A2: MT: 3.0 (3.17, 2.64) AT: 2.9 (3.06, 2.55) 2. F20A2: 3.6 (3.80, 3.17) 3.5 (3.70, 3.08) 3. F20A3: 3.6 (3.80, 3.17) 3.5 (3.70, 3.08) 4. F20A4: 3.6 (3.80, 3.17) 3.5 (3.70, 3.08) 5. F20A5: 3.6 (3.80, 3.17) 3.5 (3.70, 3.08) 6. F20A6: 3.6 (3.80, 3.17) 3.5 (3.70, 3.08) 7. F22A2: 3.0 (3.17, 2.64) 3.0 (3.17, 2.64) 8. F22A3: 3.6 (3.80, 3.17) 3.6 (3.80, 3.17) 9. F22A9: 3.0 (3.17, 2.64) 3.5 (3.70, 3.08)	
	pressure cap opening pressure	93 123 kpa (0.95–1.25 kg/cm <sup>2</sup> , 13.5–17.8 psi)	
Cooling fan	"ON" temperature "OFF" temperature "ON" temperature (Fan timer) "OF" temperature (Fan timer)	87°–93°C (189°–199°F) 80°–91°C (176°–196°F) 105°–111°C (221°–231°F) 98°–109°C (208°–228°F)	

1. F18A2: 1.8 ℓ CARB
2. F20A2: 2.0 ℓ CARB with CATA
3. F20A3: 2.0 ℓ CARB
4. F20A4: 2.0 ℓ PGM-FI with CATA
5. F20A5: 2.0 ℓ PGM-FI
6. F20A6: 2.0 ℓ CARB with CATA
7. F22A2: 2.2 ℓ PGM-FI
8. F22A3: 2.2 ℓ PGM-FI with CATA
9. F22A9: 2.2 ℓ PGM-FI with CATA

# Standards and Service Limits

## 6. Fuel and Emissions

	MEASUREMENT		STANDARD (NEW)
Fuel Pump (PGM-FI)	Delivery pressure Displacement (minimum in 10 seconds) Relief valve opening pressure		240–279 Pa (2.45–2.85 kg/cm <sup>2</sup> , 35–41 lb-ft) 230 cc (7.8 US oz., 8.1 Imp oz.) 441–588 kPa (4.5–6.0 kg/cm <sup>2</sup> , 64–85 psi)
Fuel Pump (CARB)	Delivery pressure Displacement (minimum in minute at 12V)		9–14 kPa (0.09–0.14 kg/cm <sup>2</sup> , 1.3–2.0 psi) 760 cc (25.7 US oz., 26.8 Imp gal.)
Pressure Regulator (PGM-FI)	Pressure with regulator vacuum hose disconnected		240–279 kPa (2.45–2.85 kg/cm <sup>2</sup> , 35–41 psi)
Fuel Tank	Capacity	2WS: 4WS:	65 ℓ (17.2 US gal., 14.3 Imp gal.) 60 ℓ (15.9 US gal., 13.2 Imp gal.)
Engine	Fast idle		1,400 ± 200 min <sup>-1</sup> (rpm)
	Idle speed (with headlights and cooling fan OFF)	MT with carbureted engine: MT with PGM-FI engine: AT with carbureted engine: AT with PGM-FI engine:	800 ± 50 min <sup>-1</sup> (rpm) 770 ± 50 min <sup>-1</sup> (rpm) 750 ± 50 min <sup>-1</sup> (rpm) in [D] position 770 ± 50 min <sup>-1</sup> (rpm) in [D] or [N] positions
	Idle CO	With CATA: Without CATA:	0.1% maximum 1.0 ± 1.0%

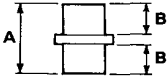
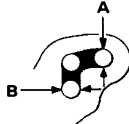
## 7. Clutch

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal height	210 (8.3) to floor	—
	Stroke	142.0 (5.6)	—
	Pedal play	9–15 (0.4–0.6)	—
	Disengagement height	90 (3.5) min. to floor 80 (3.1) min. to carpet	—
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)
Clutch disc	Rivet head depth	1.3 (0.05) min.	0.2 (0.008)
	Surface runout	0.8 (0.03) max.	1.0 (0.04)
	Thickness	8.5–9.2 (0.33–0.36)	6.1 (0.24)
Clutch cover	Unevenness of diaphragm spring	0.6 (0.02) max.	0.8 (0.03)

## 8. Manual Transmission

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (U.S. qt., Imp. qt.)	1.9 (2.0, 1.7) at assembly 2.0 (2.1, 1.8) at oil change	
Mainshaft	End play	0.10–0.16 (0.0039–0.0063)	Adjust with a shim.
	Diameter of ball bearing contact area	27.977–27.990 (1.1015–1.1020)	29.93 (1.1783)
	Diameter of third gear contact area	37.984–38.000 (1.4954–1.4961)	37.930 (1.4933)
	Diameter of ball bearing contact area Runout	27.987–28.000 (1.1018–1.1024) 0.02 (0.008) max.	27.940 (1.1000) 0.05 (0.002)
Mainshaft third and fourth gears	I.D.	43.009–43.025 (1.6933–1.6939)	43.080 (1.6961)
	End play	0.06–0.21 (0.0024–0.0083)	0.30 (0.012)
	Thickness 3rd gear 4th gear	32.42–32.47 (1.276–1.278) 30.92–30.97 (1.217–1.219)	32.3 (1.27) 30.8 (1.21)
Mainshaft fifth gear	I.D.	43.009–43.025 (1.6933–1.6939)	43.080 (1.6961)
	End play	0.06–0.21 (0.0024–0.0083)	0.30 (0.012)
	Thickness	30.42–30.47 (1.198–1.200)	30.3 (1.193)
Countershaft	End play	0.05–0.21 (0.0019–0.0083)	0.50 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing needle bearing contact area	24.987–25.000 (0.9837–0.9845)	24.94 (0.982)
	Diameter of low gear contact area Runout	39.984–40.000 (1.5742–1.5748) 0.02 (0.0008) max.	39.93 (1.572) 0.05 (0002)

## 8. Manual Transmission

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Countershaft low gear	I.D. End play	46.009–46.025 (1.8114–1.8120) 0.04–0.10 (0.002–0.004)	46.08 (1.814) Adjust with a washer.
Countershaft second gear	I.D. End play Thickness	50.009–50.025 (1.9689–1.9695) 0.04–0.10 (0.002–0.004) 33.92–33.97 (1.335–1.337)	50.08 (1.972) Adjust with a collar. 32.8 (1.2913)
Spacer collar (Countershaft second gear)	I.D. O.D. Length	36.48–36.49 (1.4362–1.4366) 43.989–44.000 (1.7318–1.7323) 29.03–29.05 (1.1429–1.1437) 28.98–29.00 (1.1409–1.1417)	36.50 (1.437) 43.94 (1.730) — —
Spacer collar (Mainshaft fourth and fifth gears)	I.D. O.D. Length	31.002–31.012 (1.2205–1.2209) 37.989–38.000 (1.4956–1.4961) 56.45–56.55 (2.222–2.226) 26.03–26.08 (1.0248–1.0268)	31.06 (1.223) 37.94 (1.494) — 26.01 (1.024)
		A B	
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 (0.7909) 0.160 (0.006)
Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.85–1.10 (0.0335–0.0433)	0.40 (0.016)
Shift fork	Synchronizer sleeve groove width Fork-to-synchronizer sleeve clearance	6.75–6.85 (0.266–0.270) 0.35–0.65 (0.014–0.026)	— 1.0 (0.039)
Reverse shift fork	Pawl groove width Fork-to-reverse idle gear clearance Groove width Fork-to fifth/reverse shift Shaft clearance	13.0–13.3 (0.51–0.52) 0.5–1.1 (0.02–0.43) 7.05–7.25 (0.278–0.2854) 7.4–7.7 (0.29–0.30) 0.05–0.35 (0.002–0.014) 0.4–0.8 (0.02–0.03)	— 1.8 (0.07) — — 0.5 (0.02) 1.0 (0.04)
		at A at B at A at B	
Shift arm	I.D. Shift arm-to-shaft clearance Shift fork diameter at contact area Shift-arm-to-shift fork shaft clearance	15.973–16.000 (0.6289–0.6299) 0.005–0.059 (0.0002–0.0023) 12.9–13.0 (0.508–0.512) 0.2–0.5 (0.01–0.02)	— — — 0.6 (0.02)
Select lever	Pin size of contact area Shaft outer diameter Shift arm cover clearance	7.9–8.0 (0.311–0.315) 15.41–15.68 (0.607–0.617) 0.032–0.102 (0.0013–0.0040)	— — —
Shift arm lever	O.D. Transmission housing clearance	15.941–15.968 (0.6276–0.6287) 0.027–0.139 (0.0011–0.0055)	— —
Inter lock	Bore diameter Shift arm lever clearance	16.00–16.05 (0.630–0.632) 0.032–0.109 (0.0013–0.0043)	— —
Ring gear	Backlash	0.085–0.142 (0.0033–0.0056)	0.200 (0.0079)
Differential carrier	Pinion shaft bore diameter Carrier-to-pinion shaft clearance Driveshaft bore diameter Carrier-to-driveshaft clearance	18.000–18.018 (0.7087–0.7094) 0.017–0.047 (0.0007–0.0019) 28.005–28.025 (1.1026–1.1033) 0.020–0.062 (0.0008–0.0024) 0.055–0.091 (0.0022–0.0036)	— 0.100 (0.0039) — 0.120 0.150
		R L	
Differential pinion gear	Backlash Pinion gear bore diameter Pinion gear-to-pinion shaft clearance	0.05–0.15 (0.002–0.006) 18.042–18.066 (0.7103–0.7113) 0.059–0.095 (0.0023–0.0037)	Selection with 7 types of washers. — 0.150 (0.0059)
Differential taper roller bearing	Preload	1.4–2.6 N·m (14–26 kg-cm, 1.0–1.9 lb-ft)	Selection with 20 types of shims.

# Standards and Service Limits

## 9. Automatic Transmission

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (U.S. qt., Imp. qt.)		2.4 (2.5, 2.1) at oil change 6.0 (6.4, 5.2) at assembly	
Hydraulic pressure	Line pressure at 2,000 min <sup>-1</sup> (rpm)	Carburetor	760 kPa (7.75 kg/cm <sup>2</sup> , 110 psi) Throttle valve full- closed  808 kPa (8.25 kg/cm <sup>2</sup> , 117 psi) Throttle valve more than 2/8 open	710 kPa (7.25kg/cm <sup>2</sup> , 103 psi) Throttle valve more than 2/8 open
		PGM-FI	784 kPa (8.0 kg/cm <sup>2</sup> , 113 psi) Throttle valve full-closed  833 kPa (8.5 kg/cm <sup>2</sup> , 120psi) Throttle valve more than 2/8 open	735 kPa (7.5 kg/cm <sup>2</sup> , 106 psi) Throttle valve more than 2/8 open
	4th clutch pressure at 2,000 min <sup>-1</sup> (rpm)	Carburetor	411 kPa (4.2 kg/cm <sup>2</sup> , 59 psi) Throttle valve full-closed  808 kPa (8.25 kg/cm <sup>2</sup> , 117 psi) Throttle Valve more than 2/8 open	352 kPa (3.6 kg/cm <sup>2</sup> , 51 spi) Throttle valve full-closed  710 kPa (7.25 kg/cm <sup>2</sup> , 103 psi) Throttle valve more than 2/8 open
		PGM-FI	509 kPa (5.2 kg/cm <sup>2</sup> , 74 psi) Throttle valve full-closed  833 kPa (8.5 kg/cm <sup>2</sup> , 120 psi) Throttle valve more than 2/8 open	460 kPa (4.7 kg/cm <sup>2</sup> , 66 psi) Throttle valve full-closed  735 kPa (7.5 kg/cm <sup>2</sup> , 106 psi) Throttle valve more than 2/8 open
	3rd clutch pressure at 2,000 min <sup>-1</sup> (rpm)	Carburetor	392 kPa (4.0 kg/cm <sup>2</sup> , 57 psi) Throttle valve full-closed  808 kPa (8.25 kg/cm <sup>2</sup> , 117 psi) Throttle valve more than 2/8 open	352 kPa (3.6 kg/cm <sup>2</sup> , 51 psi) Throttle volve full-closed  710 kPa (7.25 kg/cm <sup>2</sup> , 103 psi) Throttle volve more than 2/8 open
		PGM-FI	490 kPa (5.10 kg/cm <sup>2</sup> , 71 psi) Throttle valve full-closed  833 kPa (8.5 kg/cm <sup>2</sup> , 120 psi) Throttle valve more than 2/8 open	441 kPa (4.5 kg/cm <sup>2</sup> , 64 psi) Throttle valve full-closed  735 kPa (7.5 kg/cm <sup>2</sup> , 106 psi) Throttle valve more than 2/8 open
	2nd clutch pressure at 2,000 min <sup>-1</sup> (rpm)	Carburetor	392 kPa (4.0 kg/cm <sup>2</sup> , 57 psi) Throttle valve full-closed  808 kPa (8.25 kg/cm <sup>2</sup> , 117 psi) Throttle valve more than 2/8 open	352 kPa (3.6 kg/cm <sup>2</sup> , 51 psi) Throttle valve full-closed  710 kPa (7.25 kg/cm <sup>2</sup> , 103 psi) Throttle valve more than 2/8 open
		PGM-FI	490 kPa (5.0 kg/cm <sup>2</sup> , 71 psi) Throttle valve full-closed  833 kPa (8.5 kg/cm <sup>2</sup> , 120 psi) Throttle valve more than 2/8 open	441 kPa (4.5 kg/cm <sup>2</sup> , 64 psi) Throttle valve full-closed  735 kPa (7.5 kg/cm <sup>2</sup> , 106 psi) Throttle valve more than 2/8 open
	1st clutch pressure at 2,000 min <sup>-1</sup> (rpm)	Carburetor	750–808 kPa (7.75–8.25 kg/cm <sup>2</sup> , 110–117 psi)	710 kPa (7.25 kg/cm <sup>2</sup> , 103 psi)
		PGM-FI	784–833 kPa (8.0–8.5 kg/cm <sup>2</sup> , 113–120 psi)	735 kPa (7.5 kg/cm <sup>2</sup> , 106 psi)

## 9. Automatic Transmission

MEASUREMENT		STANDARD (NEW)		SERVICE LIMIT	
Hydraulic pressure	Governor pressure at (37.5 mph) 60 km/h	Carburetor with CATA	225–235 kPa (2.30–2.40 kg/cm <sup>2</sup> , 32–34 psi)	220 kPa (2.25 kg/cm <sup>2</sup> , 32 psi)	
		Carburetor without CATA	166–176 kPa (1.70–1.80 kg/cm <sup>2</sup> , 24–25 psi)	162 kPa (1.65 kg/cm <sup>2</sup> , 23 psi)	
	Throttle pressure A	Carburetor with CATA	closed	0	—
			open	514–530 kPa (5.25–5.4 kg/cm <sup>2</sup> , 74–76 psi)	509 kPa (5.2 kg/cm <sup>2</sup> , 73 psi)
		Carburetor without CATA	closed	0	—
			open	485–500 kPa (4.95–5.10 kg/cm <sup>2</sup> , 70–72 psi)	480 kPa (4.9 kg/cm <sup>2</sup> , 69 psi)
	Throttle pressure B	Carburetor	closed	0	—
			open	760–808 kPa (7.75–8.25 kg/cm <sup>2</sup> , 110–117 psi)	710 kPa (7.25 kg/cm <sup>2</sup> , 103 psi)
PGM-FI		closed	0	—	
		open	784–833 kPa (8.0–8.5 kg/cm <sup>2</sup> , 113–120 psi)	735 kPa (7.5 kg/cm <sup>2</sup> , 106 psi)	
Stall speed	Check with car on level ground	Carburetor (1.8 l)	2.450–2.750 min <sup>-1</sup> (rpm)		
		Others	2.350–2.650 min <sup>-1</sup> (rpm)		
Clutch	Clutch initial clearance	1st hold	0.8–1.0 (0.031–0.039)	—	
		1st, 2nd	0.65–0.85 (0.026–0.033)	—	
		3rd, 4th	0.4–0.6 (0.016–0.024)	—	
	Clutch return spring free length	Carburetor	1st	33.9 (1.334)	31.9 (1.255)
			2nd	30.3 (1.192)	28.3 (1.114)
	3rd		32.1 (1.263)	30.1 (1.185)	
	4th		32.1 (1.263)	30.1 (1.185)	
		PGM-FI	1st, 2nd, 3rd, 4th	33.5 (1.318)	31.5 (1.240)
	Clutch disc thickness			1.88–2.0 (0.074–0.079)	Until grooves worn out
	Clutch plate thickness	Carburetor	1st, 3rd, 4th	1.95–2.05 (0.0767–0.0807)	Discoloration
2nd			2.55–2.65 (0.1003–0.1043)		
PGM-FI		1st	1.95–2.05 (0.0767–0.0807)		
		2nd	2.55–2.65 (0.1003–0.1043)		
		3rd, 4th	2.25–2.35 (0.0885–0.0925)		
Clutch end plate thickness	Mark 1 Mark 2 Mark 3 Mark 4 Mark 5 Mark 6 Mark 7 Mark 8 Mark 9 *Mark 10		2.05–2.10 (0.081–0.83)	Discoloration	
			2.15–2.20 (0.085–0.087)		
			2.25–2.30 (0.089–0.091)		
			2.35–2.40 (0.093–0.094)		
			2.45–2.50 (0.096–0.098)		
			2.55–2.60 (0.100–0.102)		
			2.65–2.70 (0.104–0.106)		
			2.75–2.80 (0.108–0.110)		
			2.85–2.90 (0.112–0.114)		
			2.95–3.00 (0.116–0.118)		

\* Carbureted engine only.

# Standards and Service Limits

## 9. Automatic Transmission (cont'd)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Valve body	Stator camshaft needle bearing contact area I.D. (torque converter side)	27.000—27.021 (1.0630—1.0638)	Wear or damage
	Stator camshaft needle bearing contact area I.D. (oil pump side)	29.000—29.013 (1.417—1.1422)	—
	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
	Oil pump gear side clearance	0.03—0.05 (0.0012—0.0020)	0.07 (0.0028)
	Oil pump gear-to-body clearance	0.21—0.265 (0.0083—0.0104)	—
	Drive	0.07—0.125 (0.0027—0.0049)	—
Regulator valve body	Sealing ring contact area diameter	35.000—35.025 (1.3780—1.3789)	35.050 (1.3799)
Accumulator body	Sealing ring contact area diameter	32.000—32.025 (1.2598—1.2608)	32.05 (1.2618)
Stator camshaft	Sealing ring contact area diameter	29.000—29.013 (1.1417—1.1422)	29.05 (1.1436)
Shifting device and parking brake control	Reverse shift fork thickness	5.90—6.00 (0.232—0.236)	5.40 (0.213)
	Parking brake ratchet pawl	—	Wear or other defect
	Parking gear	—	Wear or other defect
	Throttle cam stopper	18.5—18.6 (0.7283—0.7322)	—
	Carburetor PGM-FI	17.0—17.1 (0.6692—0.6732)	—
Servo body	Shift fork Shaft I.D.	14.000—14.005 (0.5512—0.5514)	—
		14.006—14.010 (0.5514—0.5516)	—
		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)
Transmission	Diameter of needle bearing contact area	22.980—23.000 (0.9047—0.9055)	Wear or damage
	On mainshaft and stator shaft	31.984—32.000 (1.2592—1.2598)	↑ Wear or damage
	On mainshaft 4th gear collar	41.984—42.000 (1.6529—1.6535)	
	On mainshaft 3rd gear collar	45.984—46.000 (1.8103—1.8110)	
	Carburetor PGM-FI	40.984—42.000 (1.6135—1.6535)	
	On counter shaft 1st gear collar	35.980—35.996 (1.4165—1.4171)	
	On counter shaft 4th gear collar	35.984—36.000 (1.4166—1.4173)	
	On counter shaft reverse gear collar	39.984—40.000 (1.5741—1.5748)	
	On counter shaft parking gear	31.975—31.991 (1.2588—1.2594)	
	On secondary shaft 1st gear	35.984—36.000 (1.4166—1.4173)	
	On secondary shaft 2nd gear	14.416—14.434 (0.5675—0.5682)	
	Reverse idle shaft holder I.D.	52.000—52.019 (2.0472—2.0479)	
	Mainshaft 3rd gear I.D.	38.000—38.016 (1.4960—1.4966)	
	4th gear I.D.		



# Standards and Service Limits

## 9. Automatic Transmission (cont'd)

Unit of length: mm (in.)

	MEASUREMENT	STANDARD (NEW)			
		WIRE DIA.	O. D.	FREE LENGTH	No. of COILS
Spring (Carburetor)	1st One way ball spring	0.29 (0.0114)	4.0 (0.01574)	14.0 (0.5511)	13.0
	Regulator valve spring A	1.80 (0.0708)	14.7 (0.5787)	85.1 (3.3503)	16.5
	Regulator valve spring B	1.80 (0.0708)	9.6 (0.3779)	44.0 (1.7328)	7.5
	Stator reaction spring	5.50 (0.2165)	37.4 (1.4724)	30.3 (1.1929)	2.1
	Throttle modulator spring	with CATA 1.20 (0.0472)	9.4 (0.3700)	27.2 (1.0708)	8.0
		without CATA 1.20 (0.0472)	9.4 (0.3700)	26.3 (1.0354)	8.0
	Torque convertor check valve spring	1.10 (0.0433)	8.4 (0.3307)	36.8 (1.4488)	12.0
	Relife valve spring	1.00 (0.0393)	8.4 (0.3307)	39.1 (1.5393)	15.1
	Cooler check valve spring	1.10 (0.0433)	8.4 (0.3307)	46.8 (1.8425)	17.0
	Governor spring A	with CATA 1.0 (0.0393)	18.8 (0.7401)	44.3 (1.7440)	4.0
		without CATA 1.0 (0.0393)	18.8 (0.7401)	25.8 (1.0157)	4.0
	Governor spring B	with CATA 0.9 (0.0354)	11.8 (0.4645)	18.4 (0.7244)	6.2
		without CATA 0.9 (0.0354)	11.8 (0.4645)	21.4 (0.8425)	6.2
	Second olifice control spring	0.7 (0.0275)	6.6 (0.2598)	53.3 (2.0984)	20.5
	Servo olifice spring	0.9 (0.0354)	7.1 (0.2795)	61.2 (2.4094)	28.2
	Throttle spring A	1.0 (0.0393)	8.5 (0.3346)	21.0 (0.8267)	5.8
	Throttle adjust spring A	0.8 (0.0314)	6.2 (0.2440)	30.0 (1.1811)	8.0
	Throttle spring B	1.6 (0.0629)	8.5 (0.3346)	41.4 (1.6299)	11.7
	1-2 shift spring	with CATA 0.5 (0.0196)	4.6 (0.1811)	42.3 (1.6653)	25.0
		without CATA 0.6 (0.0236)	6.1 (0.2401)	42.3 (1.6653)	21.1
	1-2 shiftball spring	with CATA 0.4 (0.0157)	4.5 (0.1771)	13.0 (0.5118)	8.7
		without CATA 0.4 (0.0157)	4.5 (0.1771)	12.6 (0.4960)	8.7
	2-3 shift spring	with CATA 0.9 (0.0354)	7.6 (0.2992)	70.0 (2.7559)	28.2
		without CATA 0.8 (0.0314)	7.6 (0.2992)	58.9 (2.3188)	16.8
	2-3 shift ball spring	with CATA 0.5 (0.0196)	4.5 (0.1771)	11.7 (0.4606)	10.5
		without CATA 0.5 (0.0196)	4.5 (0.1771)	14.1 (0.5551)	10.5
	3-4 shift spring	with CATA 0.9 (0.0354)	9.6 (0.3779)	35.8 (1.4094)	10.3
		without CATA 0.9 (0.0354)	9.6 (0.3779)	27.7 (1.0905)	10.3
	3-4 shift ball spring	with CATA 0.5 (0.0196)	4.5 (0.1771)	11.5 (0.4527)	7.4
		without CATA 0.5 (0.0196)	4.5 (0.1771)	11.3 (0.4448)	7.4
	1st hold accumulator spring	4.0 (0.1574)	21.5 (0.8464)	71.7 (2.8228)	8.3
	1st accumulator spring	2.1 (0.0826)	16.3 (0.6417)	96.0 (3.7795)	17.1
	4th accumulator spring	2.6 (0.1023)	16.0 (0.6292)	84.6 (3.3307)	14.3
	2nd accumulator spring	3.2 (0.1259)	20.7 (0.8149)	80.7 (3.1771)	10.8
	3rd accumulator spring	2.6 (0.1023)	17.5 (0.6889)	78.6 (3.0944)	11.0
	L/C shift spring	0.9 (0.0354)	7.6 (0.2992)	73.7 (2.9015)	32.0
	L/C timing spring B	with CATA 1.0 (0.0393)	6.6 (0.2598)	84.0 (3.3070)	42.4
		without CATA 1.0 (0.0393)	6.6 (0.2598)	79.1 (3.1141)	42.4
	L/C timing spring A	with CATA 0.9 (0.0354)	6.6 (0.2598)	55.9 (2.2007)	27.3
		without CATA 0.9 (0.0354)	6.6 (0.2598)	50.0 (1.9685)	27.3
	Governor cut spring	0.8 (0.0314)	7.6 (0.2992)	44.5 (1.7519)	17.0
	L/C control spring	0.7 (0.0275)	6.6 (0.2598)	42.9 (1.6889)	14.1
	CPC valve spring	1.4 (0.0551)	9.4 (0.3700)	31.2 (1.2283)	10.9
	3rd kick down spring	0.9 (0.0354)	7.6 (0.2992)	62.7 (2.4684)	27.5
	Reverse control spring	0.7 (0.0275)	7.1 (0.2795)	40.0 (1.5748)	20.8
	L/C cut spring	0.7 (0.0275)	7.6 (0.2992)	31.0 (1.2204)	12.7
	Accumulator control spring	1.2 (0.0472)	7.7 (0.3031)	45.6 (1.7952)	21.8
	2nd kick down spring	1.2 (0.0472)	7.1 (0.2795)	46.9 (1.8464)	20.6
	Servo control spring	0.9 (0.0354)	6.4 (0.2519)	32.5 (1.2795)	17.5
	2-1 timing spring	0.7 (0.0275)	5.6 (0.2204)	33.0 (1.2992)	21.7
4th exhaust spring	0.8 (0.0314)	6.1 (0.2401)	51.1 (2.0118)	26.6	



**9. Automatic Transmission**

	MEASUREMENT	STANDARD (NEW)			
		WIRE DIA.	O. D.	FREE LENGTH	No. of COILS
Spring (PGM-FI)	Regulator valve Spring A	1.8 (0.0709)	14.7 (0.5887)	86.5 (3.4055)	16.5
	Regulator valve Spring B	1.8 (0.0709)	6.0 (0.2336)	44.0 (1.7323)	12.7
	Stator reaction spring	5.5 (0.2165)	37.4 (1.4724)	30.3 (1.1929)	2.1
	Torque converter check valve spring	1.1 (0.0433)	8.4 (0.3307)	33.8 (1.3307)	12.5
	Relief valve spring	1.0 (0.0394)	8.4 (0.3307)	39.1 (1.5393)	15.1
	Cooler check valve spring	1.1 (0.0433)	8.4 (0.3307)	46.8 (1.8425)	17.0
	2nd orifice spring	0.6 (0.0236)	6.6 (0.2598)	52.2 (2.0551)	21.0
	Servo orifice spring	0.8 (0.0315)	6.6 (0.2598)	52.2 (2.0551)	33.0
	4th exhaust spring	0.9 (0.0354)	7.1 (0.2795)	60.8 (2.3936)	28.9
	1-2 shift spring	1.0 (0.0393)	8.6 (0.3386)	41.3 (1.6259)	16.9
	2-3 shift spring	0.9 (0.0354)	7.6 (0.2992)	57.0 (2.2440)	26.8
	1st accumulator spring	2.1 (0.0826)	16.3 (0.6417)	96.0 (3.7795)	17.1
	4th accumulator spring	2.9 (0.1142)	22.0 (0.8661)	84.5 (3.3267)	10.9
	2nd accumulator spring	3.2 (0.1260)	20.7 (0.8149)	80.7 (3.1771)	10.8
	3rd accumulator spring	2.8 (0.1102)	17.5 (0.6889)	94.2 (3.7086)	16.1
	L/C shift spring	0.9 (0.0354)	7.6 (0.2992)	73.7 (2.9016)	32.0
	L/C timing spring	0.8 (0.0314)	6.6 (0.2598)	64.0 (2.5196)	40.1
	D-inhibitor spring	1.0 (0.0394)	8.1 (0.3188)	52.6 (2.0708)	22.4
	3rd kick-down spring	1.1 (0.0433)	7.6 (0.2992)	48.3 (1.9015)	23.3
	2nd kick-down spring	1.2 (0.0472)	7.1 (0.2795)	46.9 (1.8464)	20.6
	Throttle adjust spring	0.8 (0.0314)	6.2 (0.2440)	30.0 (1.1811)	8.0
	Throttle B spring	1.5 (0.0591)	8.5 (0.3346)	41.5 (1.6334)	11.2
	1st hold spring	4.0 (0.1574)	25.0 (0.9842)	64.7 (2.5472)	7.3
	L/C modulator valve spring	1.4 (0.0551)	9.4 (0.3700)	33.0 (1.2992)	10.5
L/C control spring	0.8 (0.0314)	6.6 (0.2598)	41.0 (1.6141)	25.0	

# Standards and Service Limits

## 9. Automatic Transmission (cont'd)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Rign gear	Backlash	0.085—0.142 (0.003—0.006)	0.200 (0.008)
Differential carrier	Pinion shaft bore diameter	18.000—18.018 (0.7087—0.7094)	—
	Carrier-to-pinion shaft clearance	0.017—0.047 (0.001—0.002)	0.100 (0.004)
	Driveshaft bore diameter	28.005—28.025 (1.1026—1.1033)	—
	Carrier-to driveshaft clearance	0.025—0.066 (0.001—0.003)	0.120 (0.005)
Differential pinion gear	Backlash	0.08—0.15 (0.03—0.006)	Adjust with a washer
	Pinion gear bore diameter	18.042—18.066 (0.710—0.711)	—
	Pinion gear-to pinion shaft clearance	0.059—0.095 (0.002—0.004)	0.150 (0.006)
Differential taper roller bearing preload	For used bearing	2.5—3.7 N·m (25—37 kg-cm, 1.8—2.7 lb-ft)	Adjust with a washer
	After replacement of bearing	2.8—4.0 N·m (28—48 kg-cm, 2.0—2.9 lb-ft)	Adjust with a washer

## 11. Steering

	MEASUREMENT	STANDARD (NEW)
Steering wheel	Play	10 (0.39) maximum
Gearbox	Pinion starting torque	Below 1.0N-m (10 kg-cm, 0.72 lb-ft)
	Angle of rack guide screw loosend from locked position	35° ± 5°
Pump	Pump pressure with valve closed (oil temperature: 40°C/104°F minimum) Do not run for more than 5 seconds	7,845—8,826 kPa (80—90 kg/cm <sup>2</sup> , 1,138—1,280 psi) at idle
Power steering fluid	Capacity	0.5 ℓ (0.53 US qt., 0.44 Imp qt.)
	Reservoir At change (approx.)	1.8 ℓ 1.90 US qt. 1.58 Imp qt.)
Power steering belt	Deflection between pulleys with 98 N (10 kg, 22 lbs) force	For used belt
		For new belt
Belt tension between pulleys (measured with tension gauge)	For used belt	12.5—16.0 (0.50—0.62)
		For new belt
		343—490 N (35—50 kg, 77—110 lb)
		686—882 N (70—90 kg, 154—198 lb)

## 12. Suspension

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Wheel alignment	Total toe	Front	0±2 (0±0.08)
		Rear	IN 2±2 (0.08±0.08)
		4WS:	IN 3±2 (0.12±0.08)
	Camber	Front	0° 00' ± 1'
		Rear	-0° 30' ± 1'
		2WS:	-0° 20' ± 1'
		4WS:	3° 00' ± 1'
	Caster	Front	3° 00' ± 1'
		Front Wheel turning angle	Inward wheel
	1.8 ℓ engine:		40° 50' ± 2'
4WS:	38° 50' ± 2'		
Outward wheel (reference)	2.0/2.2 ℓ engine: 29° 30'		
Rear Wheel turning angle (4WS only)	Inward wheel	5° 50' ± 1'	
	Outward wheel (reference)	6° 10' ± 1'	
Wheel	Rim runout	Steel wheel	Below 1.0 (0.04)
		Aluminum wheel	Below 1.0 (0.04)
	Axial	Radial	Below 0.7 (0.03)
		Radial	Below 0.7 (0.03)
Wheel bearing	End play	Front	0—0.05 (0—0.002)
		Rear	0—0.05 (0—0.002)

Unit of length: mm (in.)

### 13. Brakes

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Parking brake lever	Play in stroke 200 N (20 kg, 44 lbs)	To be locked when pulled 4-8 notches	---	
Foot brake pedal	Pedal height (from floor)	190 (7.5) 195 (7.7)	---	
Master cylinder	Piston-to-push rod clearance	0-0.4 (0-0.016)	---	
Brake drum	I.D.	220 (8.66)	221 (8.70)	
Lining	Thickness	4.5 (0.18)	2.0 (0.08)	
Disc brake	Disc thickness	23.0 (0.91)	21.0 (0.83)	
	Disc runout	10.0 (0.39)	8.0 (0.32)	
	Disc parallelism	---	0.10 (0.004)	
	Pad thickness	---	0.15 (0.006)	
		---	0.015 (0.0006)	
Brake booster	Characteristics at 20 kg (44 lbs) pedal pressure	Line pressure Unit: kPa (kg/cm <sup>2</sup> /psi)		
		Vacuum	Brakes	Conventional type
		0 mm (0 in) Hg	922 (9.4/134) minimum	813 (8.3/118) minimum
		300 mm (11.8 in) Hg	5,494 (56/796) minimum	6,076 (62/882) minimum
		500 mm (19.7 in) Hg	8,535 (87/1,237) minimum	8,134 (83/1,180) minimum

### 15. Air Conditioner

MEASUREMENT		STANDARD (NEW)
Air conditioner system	Lubricant capacity	10 cc (0.3 US oz., 0.4 Imp oz.) 25 cc (0.8 US oz., 0.9 Imp oz.) 10 cc (0.3 US oz., 0.4 Imp oz.) 10 cc (0.3 US oz., 0.4 Imp oz.)
Compressor	Lubricant capacity Stator coil resistance at 20°C (68°F) Pulley-to pressure plate clearance	900-950 g (31.7-33.5 oz) 3.4-3.8 Ω 0.35-0.65 (0.014-0.026)
Compressor belt	Deflection between pulleys with 98N (10 kg, 22 lbs) force	For used belt: 10-12 (0.4-0.5) For new belt: 8.5-11 (0.3-0.4)
	Belt tension between pulleys (measured with tension gauge)	For used belt: 441-588 N (45-60 kg, 99-132 lbs) For new belt: 931-1,127 N (95-115 kg, 209-254 lbs)

# Standards and Service Limits

## 16. Electrical

Unit of length: mm (in.)

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Ignition coil	Rated voltage	12 Volts		
	Winding resistance	Primary	0.6—0.8 $\Omega$ (0.5—0.7 $\Omega$ )	
		Secondary	12.9—19.3 k $\Omega$ (14.4—21.6 k $\Omega$ )	
< >: Carbureted engine				
Ignition wire	Resistance	25 k $\Omega$ maximum		
Spark plug	Type	ZFR6F-11 (NGK) or KJ20CR-L11 (ND) KP, KT: ZFR5F-11 (NGK) or KJ16CR-L11 (ND)		
	( ) : Manufacturer	* : ZFR5F-11 (NGK) or KJ16CR-L11 (ND) KP, KT only: ZFR6F-11 (NGK) or KJ20R-L11 (ND) Except KP, KT: ZFR7F-11 (NGK) or KJ22CR-L11 (ND)		
	Option	* : Except 2.2 l engines other than KQ, KY types		
	Gap	1.0—1.1 (0.039—0.043)		
Ignition timing	At idling KF, KB, KE, KW, KU, KT, KP (AT) KY (AT/MT)	15' $\pm$ 2' BTDC		
		10' $\pm$ 2' BTDC		
		10' $\pm$ 2' BTDC		
Battery	Lighting capacity (20-hours ratio) < >: KY, KQ, KP, KT	65Ah (47Ah)		
	Starting capacity (voltage after 5 sec.)	8.4 V minimum/300 ampere draw at -15°C (59°F)		
Alternator	Output < >: Carbureted engine (except KS, KW, KY)	80A (70A)		
	Rotor coil resistance	2.8—3.0 $\Omega$ 14.4 (0.57)		
	Slip ring O.D.	10.5 (0.41)		
	Brush length Brush spring tension	300—360 g (10.6—12.7 oz)		
Alternator belt	Deflection at midway between pulleys with 98 N (10 kg, 22 lbs) force Belt tension between pulleys (measured with tension gauge)	10—12 (0.39—0.47) for used belt 8.5—11.0 (0.33—0.43) for new belt		
		294—441 N (35—45 kg, 77—99 lb) for used belt 441—637 N (45—65 kg, 99—143 lb) for new belt		
Starting motor	Output	European Except European	MT: 1.4 kw (2.2 l : 1.6 kw) AT: 1.6 kw MT: 1.4 kw	
	Manufacturer: Mitsuba	Mica depth	0.4—0.5 (0.016—0.02)	0.15 (0.006)
		Commutator runout	0—0.02 (0—0.001)	0.05 (0.002)
		Commutator O.D.	28.0—28.1 (1.10—1.11)	27.5 (1.08)
		Brush length Brush spring tension	15.8—16.2 (0.62—0.64) 16—18N (1.6—1.8 kg, 3.5—4.0 lbs)	10.0 (0.39)
	Manufacturer: ND	Mica depth	0.5—0.8 (0.02—0.03)	0.2 (0.01)
		Commutator runout	0—0.02 (0—0.001)	0.05 (0.002)
Commutator O.D. Brush length Brush spring tension		29.9—30.0 (1.18—1.18) 15.0—15.5 (0.59—0.61) 19—24N (1.9—2.4 kg, 4.2—5.3 lbs)	29.0 (1.14) 10.0 (0.39)	

# Design Specifications

	ITEMS		METRIC	ENGLISH	NOTES				
<b>DIMENSIONS</b>	Overall length		4,685 mm 4,680 mm 4,695 mm 4,700 mm	184.4 in 184.3 in 184.8 in 185.0 in	KY KQ KW (Finish)				
	Overall width		1,695 mm 1,720 mm 1,725 mm	66.7 in 67.7 in 67.9 in					
	Overall height		1,390 mm 1,400 mm	54.7 in 55.1 in					
	Wheelbase		2,720 mm	107.1 in	KY KQ				
	Track		1,475 mm 1,480 mm	58.1 in 58.3 in					
	Ground clearance		160 mm 170 mm	6.3 in 6.7 in	KY				
	Seating capacity			Five					
	Turning circle diameter (at tire center)		4.9 m 5.4 m	16.1 ft 17.7 ft	4WS 2WS				
	<b>WEIGHT</b>	Curb weight		See page 3-19					
		Max permissible weight (for European)							
<b>ENGINE</b>	Type		Water-cooled, 4-stroke OHC						
	Cylinder arrangement		In-line, 4-cylinders						
	Bore and stroke		85×81.5 mm 85×88 mm 85×95 mm	3.35×3.21 in 3.35×3.46 in 3.35×3.74 in	1.8 ℓ 2.0 ℓ 2.2 ℓ				
	Displacement		1,849 cm <sup>3</sup> 1,997 cm <sup>3</sup> 2,156 cm <sup>3</sup>	112.8 cu. in 121.8 cu. in 131.5 cu. in	1.8 ℓ 2.0 ℓ 2.2 ℓ				
	Compression ratio	Carbureted	9.0 : 1 < 8.9 : 1 >		< > : With catalytic converter				
		2.0 ℓ fuel-injected	9.6 : 1 < 9.5 : 1 >						
		2.2 ℓ European	9.8 : 1						
		2.2 ℓ KY	8.9 : 1						
	2.2 ℓ KQ		8.8 : 1						
	Valve train		Belt driven, Single Overhead Camshaft						
Lubrication system		Forced and wet sump							
<b>STARTER</b>	Type		Gear reduction						
	Normal output	European	MT: 1.4 kw (2.2 ℓ : 1.6 kw)	AT: 1.6 kw					
		Except European	MT: 1.4 kw	AT: 1.4 kw					
	Nominal voltage		12 V						
	Hour rating		30 seconds						
	Direction of rotation		Clockwise as viewed from gear end						
Weight	ND	4.75 kg	10.5 lb						
	Mitsuba 1.6 kw Mitsuba 1.4 kw	3.7 kg 3.5 kg	8.2 lb 7.7 lb						
<b>TRANSMISSION</b>	Clutch		Single plate dry, diaphragm spring						
	Clutch lining area		Torque converter with lock-up clutch						
	Transmission		217 cm <sup>2</sup>   33.6 sq. in						
	Primary reduction ratio		Synchronized 5-speed forward, 1 reverse 4-speed forward automatic, 1 reverse or Electronically controlled dual range 4-speed forward automatic, 1 reverse 1 : 1 (Direct)						
	Gear ratio		MT				AT		
	①: Carbureted ②: 2.0 ℓ PGM-FI ③: 2.2 ℓ (except KQ) ④: 2.2 ℓ KQ ⑤: Carbureted 2.0 ℓ PGM-FI (KT) 2.2 ℓ KY ⑥: 2.0 ℓ PGM-FI/2.2 ℓ (except KT, KQ, KY) ⑦: 2.2 ℓ KQ	Gear	①	②	③	④	⑤	⑥	⑦
			1st	3.307	3.307	3.307	3.307	2.705	2.705
		2nd	1.857	1.809	1.809	1.809	1.464	1.366	1.464
		3rd	1.269	1.230	1.230	1.230	1.028	1.028	1.028
		4th	0.966	0.933	0.933	0.903	0.731	0.731	0.674
5th		0.787	0.757	0.757	0.705	—	—	—	
Reverse		3.000	3.000	3.000	3.000	2.047	2.047	2.047	
Final	4.266	4.266	4.266	4.062	4.285	4.285	4.285		

# Design Specifications

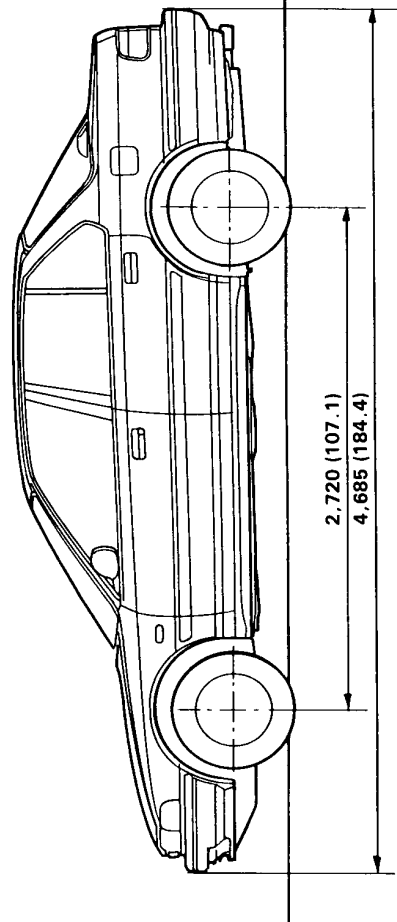
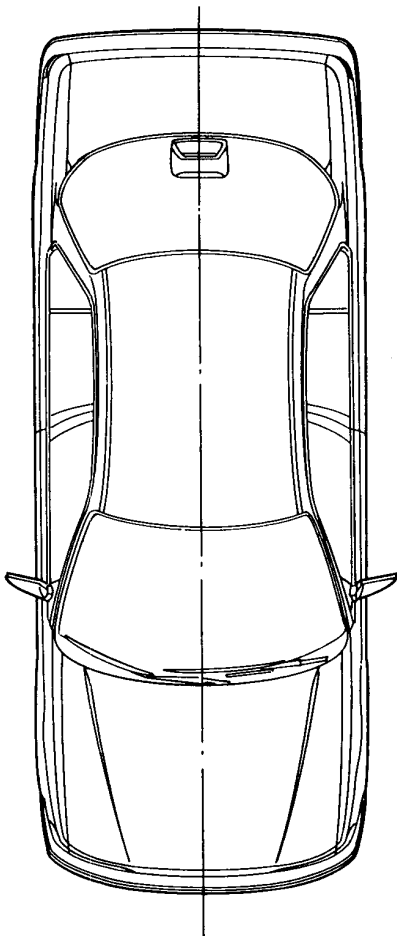
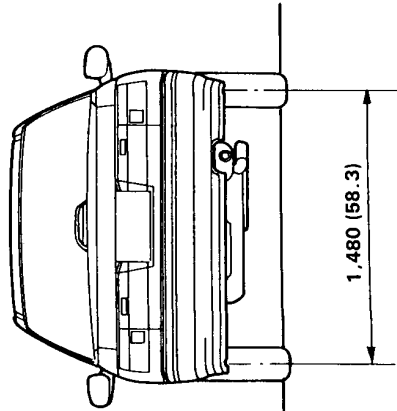
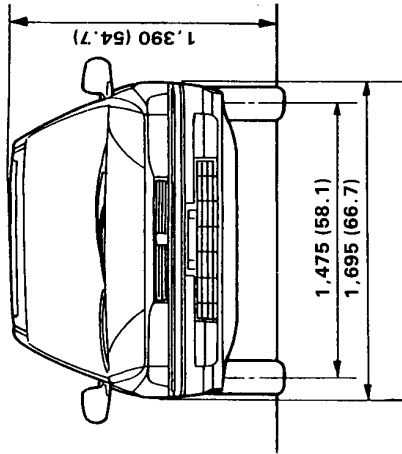
	ITEMS		METRIC	ENGLISH	NOTES
<b>AIR CONDITIONER</b>	Cooling capacity		4,350 kcal/h	17,259 BTU/h	
	-Condition: Compressor speed		1,900 min <sup>-1</sup> (rpm)		
	Outside air temperature		27°C	81°F	
	Outside air humidity		50 %		
	Condenser air temperature		35°C	95°F	
Condenser air velocity		4.5 m/sec.	14.8 ft/sec.		
Blower capacity		440 m <sup>3</sup>	15,542 cu.ft/h		
Compressor		Type	Swash-plate		
No. of cylinders			10		
Capacity			178 cc/rev.	10.9 cu.in/rev.	
Maximum speed			8,800 min <sup>-1</sup> (rpm)		
Lubricant capacity			90-120 cc	3.0-4.0 US oz. 3.2-4.2 Imp oz.	
Condenser			Corrugated fin type		
Evaporator			Corrugated fin type		
Blower		Type	Sirocco fan		
Motor input			210 W (12 V)		
Speed control			5-speed		
Maximum capacity			500 m <sup>3</sup> /h	17,662 cu.ft/h	
Temperature control			Air-mix type		
Clutch		Type	Dry single-plate		
Power consumption			40W (12V) maximum		
Refrigerant		Type	R-12		
Quantity			0.90-0.95 kg	2.0-2.1 lb	
<b>STEERING SYSTEM</b>	Type		Rack and pinion		
	Overall ratio		16.1 : 1 <13.0 : 1>		< >: 4WS
	Turns, lock-to-lock		3.13 <2.5>		< >: 4WS
	Steering wheel diameter		375 mm	14.8 in	
	Power steering fluid capacity		1.8 ℓ	1.9 US qt. 1.6 Imp qt.	
Power steering fluid		Genuine Power Steering Fluid P/N: 08208-99961			
<b>SUSPENSION</b>	Type	Front	Independent double wishbone, coil spring		
		Rear	Independent double wishbone, coil spring		
Shock absorber	Front and rear		Telescopic, hydraulic (nitrogen gas-filled)		( ): except KP, KT
<b>WHEEL ALIGNMENT</b>	Total toe	Front	0±3 mm	0±0.12 in	
		Rear	IN 2±2 mm	0.08±0.08 in	
			IN 3±2 mm	0.12±0.08 in	
	Camber	Front	0° 00' ± 1'		
		Rear	-0° 30' ± 1'		
			-0° 20' ± 1'		
Caster	Front	3°00'			
<b>BRAKE SYSTEM</b>	Type	Front	Ventilated disc		
		Rear	Drum		
	Pad and lining swept area (total)		2.2 ℓ (except KY) or ALB or 4WS: Solid disc		
		Front	15 in	415 cm <sup>2</sup>	64 sq. in
		Rear	14 in	311 cm <sup>2</sup>	48 sq. in
		Rear Drum	242 cm <sup>2</sup>	38 sq. in	
		Disc	281 cm <sup>2</sup>	44 sq. in	
<b>TIRES</b>	Size		185/70R14 88H 185/65R15 87H 195/60R15 87V 195/60R15 87H T105/70 D14 T135/90 D15		
	Spare tire				
<b>ELECTRICAL</b>	Fuses In the anti-lock brake system fuse box		15A, 40A		
	In the fuse box		7.5A, 10A, 15A, 30A		
	In the relay box		7.5A, 10A, 15A, 20A, 30A, 40A, 50A, 80A		
	Headlights	High/Low	12V-65/55W		
	Turn signal lights	Front	12V-21W		
		Rear	12V-21W		
	Position lights		12V-5W		
	License plate light		12V-5W		
	Buck-up lights		12V-21W		
	Stop lights		12V-21W		
	High mount brake light		12V-45CP		
	Taillight		12V-5W		
	Rear fog light		12V-21W		
	Dome lights		12V-8W		
	Door courtesy lights		12V-3.4W		
	Vanity mirror light		12V-1.8W		
	Trunk light		12V-3.4W		
	Gauge lights		12V-3.4/1.4W		
	Indicator lights		12V-0.84/0.91/1.12/1.4W		
	Warning lights		12V-1.4/3.4W		
	Glove box light		12V-3.4W		
	Illumination and pilot lights		12V-1.4/1.2W LED: 0.91W, 0.84W		
Heater illumination lights		12V-1.2/1.4W			

# WEIGHT SPECIFICATIONS

ENGINE	TYPE	GRADE	Manual Transmission		Automatic Transmission	
			CARB WEIGHT	WEIGHT DISTRIBUTION (FR/RR)	CARB WEIGHT	WEIGHT DISTRIBUTION (FR/RR)
1.8 l Carbureted	KB	LX	1,200 (2,646)	730/470 (1,609/1,036)	—	—
		EX	1,215 (2,679)	735/480 (1,620/1,058)	—	—
2.0 l Carbureted	KG	DX, EX	1,220 (2,690)	740/480 (1,631/1,058)	1,245 (2,745)	765/480 (1,687/1,058)
	KX	EX	1,220 (2,690)	740/480 (1,631/1,058)	1,245 (2,745)	765/480 (1,687/1,058)
	KS	DX	1,225 (2,701)	745/480 (1,642/1,058)	1,250 (2,756)	770/480 (1,698/1,058)
	KS	EX	1,230 (2,712)	750/480 (1,653/1,058)	1,255 (2,767)	775/480 (1,709/1,058)
	KF	EX	1,220 (2,690)	740/480 (1,631/1,058)	1,245 (2,745)	765/480 (1,687/1,058)
	KB	EX	1,215 (2,679)	740/475 (1,631/1,047)	1,240 (2,734)	765/475 (1,687/1,047)
	KE	EX	1,225 (2,701)	740/485 (1,631/1,069)	1,250 (2,756)	765/485 (1,687/1,069)
	KW	DX, EX	1,225 (2,701)	745/480 (1,642/1,058)	1,250 (2,756)	770/480 (1,698/1,058)
	KP,KT	LX	1,215 (2,679)	735/480 (1,620/1,058)	1,245 (2,745)	765/480 (1,687/1,058)
	KU, KP, KT	EX	1,220 (2,690)	735/485 (1,620/1,069)	1,250 (2,756)	765/485 (1,687/1,069)
	KY	LX	1,245 (2,745)	760/485 (1,675/1,069)	1,275 (2,811)	790/485 (1,742/1,069)
	KY	EX	1,250 (2,756)	765/485 (1,687/1,069)	1,280 (2,822)	795/485 (1,753/1,069)
2.0 l PGM-FI	KG	2.0i	1,240 (2,734)	750/490 (1,653/1,080)	1,270 (2,800)	780/490 (1,720/1,080)
	KX	2.0i	1,265 (2,789)	770/495 (1,698/1,091)	1,295 (2,855)	800/495 (1,764/1,091)
	KS	2.0i	1,250 (2,756)	760/490 (1,675/1,080)	1,280 (2,822)	790/490 (1,742/1,080)
	KF, KB, KW	2.0i	1,245 (2,745)	755/490 (1,664/1,080)	1,275 (2,811)	785/490 (1,731/1,080)
	KE	2.0i	1,255 (2,767)	760/495 (1,675/1,091)	1,285 (2,833)	790/495 (1,742/1,091)
	KU, KP, KT	EXi	1,240 (2,734)	750/490 (1,653/1,080)	1,275 (2,811)	785/490 (1,731/1,080)
2.2 l PGM-FI	KG	2.2i-2WS	1,305 (2,877)	795/510 (1,753/1,124)	1,335 (2,943)	825/510 (1,819/1,124)
	KG	2.2i-4WS	1,330 (2,932)	795/535 (1,753/1,179)	1,360 (2,998)	825/535 (1,819/1,179)
	KX, KS	2.2i-2WS	1,310 (2,888)	800/510 (1,764/1,124)	1,340 (2,954)	830/510 (1,830/1,124)
	KX, KS	2.2i-4WS	1,335 (2,943)	800/535 (1,764/1,179)	1,365 (3,009)	830/535 (1,830/1,179)
	KF	2.2i-2WS	1,290 (2,844)	785/505 (1,731/1,113)	1,320 (2,910)	815/505 (1,797/1,113)
	KF	2.2i-4WS	1,315 (2,899)	785/530 (1,731/1,168)	1,345 (2,965)	815/530 (1,797/1,168)
	KE	2.2i-2WS	1,300 (2,866)	790/510 (1,742/1,124)	1,330 (2,932)	820/510 (1,808/1,124)
	KE	2.2i-4WS	1,325 (2,921)	790/535 (1,742/1,179)	1,355 (2,987)	820/535 (1,808/1,179)
	KQ	EXi	1,240 (2,734)	745/495 (1,642/1,091)	1,270 (2,800)	775/495 (1,709/1,091)
	KY	EXi	1,320 (2,910)	790/530 (1,742/1,168)	1,350 (2,976)	825/525 (1,819/1,157)

# Body Specifications

Unit: mm (in)













## **Maintenance**

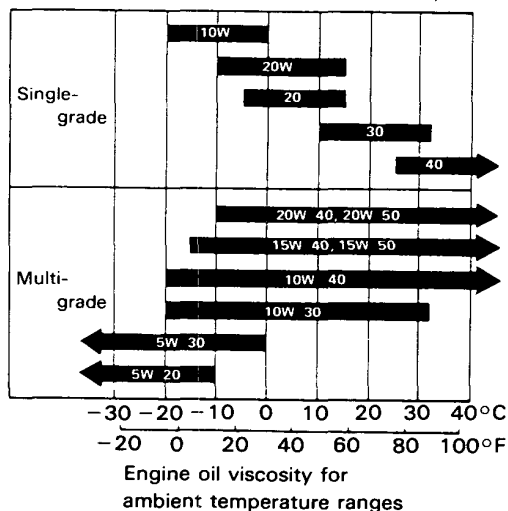
Lubrication Points.....	4-2
Maintenance Schedule .....	4-4



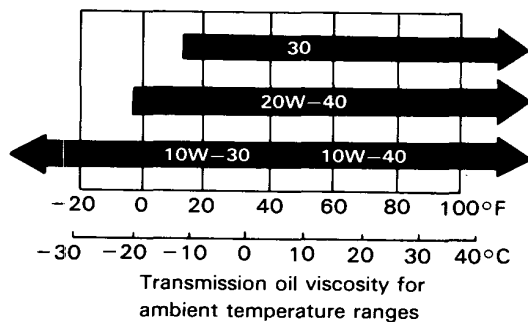
# Lubrication Points

No.	LUBRICATION POINTS	LUBRICANT
1	Engine	API Service Grade: SF or SG 10 W-30 SAE Viscosity: See chart below
2	Transmission Manual Automatic	API Service Grade: SE or SF SAE Viscosity: See chart below DEXRON® or DEXRON® II Automatic transmission fluid
3	Brake line	Brake fluid DOT3 or DOT4
4	Clutch line	Brake fluid DOT3
5	Power steering gearbox	Steering grease P/N 08733-B070E
6	Shift lever pivots (Manual)	Silicone grease with molybdenum disulfide
7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22	Steering ball joints Suspension ball joints Steering boots Steering column bushings Select lever (Automatic) Pedal linkage Intermediate shaft Brake master cylinder pushrod Trunk hinges Door hinges upper and lower Door opening detents Fuel filler lid Engine hood hinges Engine hood latch Tilt lever Rear brake shoe linkage	Multi-purpose grease
23	Caliper Piston seal Dust seal Caliper pin Piston	Silicone grease
24	Power steering system	Power steering fluid P/N 08208-99961

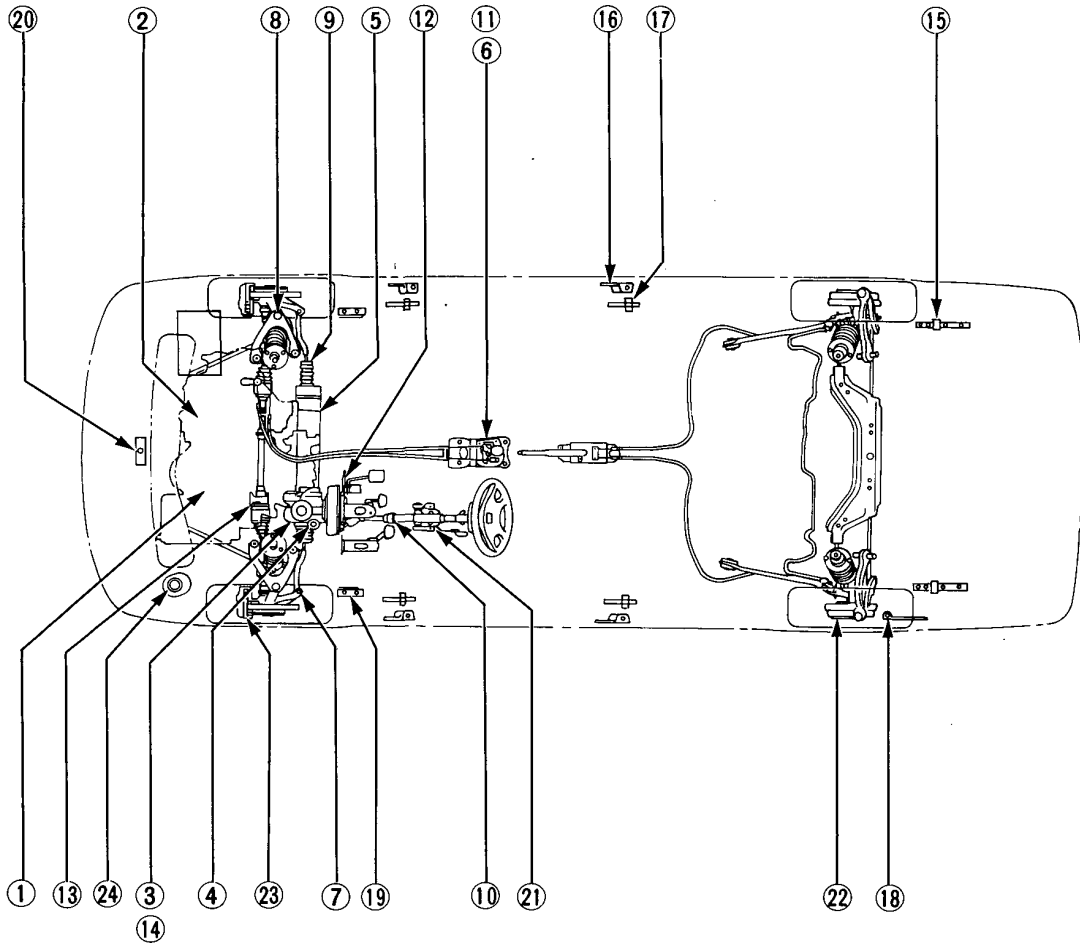
Recommended Engine Oil  
(SF or SG Grade 10W-30 Oil)



Recommended Manual Transmission Oil  
(SE or SF Grade Oil)



**CAUTION:** Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.



# Maintenance Schedule

Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.	R—Replace C—Clean		I—Inspect. After inspection, clean, adjust, repair or replace if necessary.				
	x 1,000 km x 1,000 miles months	20 12 12	40 24 24	60 36 36	80 48 48	100 60 60	
Idle speed and idle CO*3		I	I	I	I	I	
Idle speed and idle CO*4						I	
Valve clearance		I	I	I	I	I	
Alternator drive belt			I		I		
Timing belt and timing balancer belt						R	
Water pump						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 (Standard for some types)						I	
Secondary air supply system (Standard for some types)						I	
Air cleaner element (Viscous type for European and KQ models)			R		R		
Air cleaner element (Dry type except European and KQ models)	R	R	R	R	R	R	
Fuel filter (Including aux filter*5)			R		R		
Tank, fuel line and connections			I		I		
Intake air temp. control system*3, *5						I	
Throttle control system*3, *5			I		I		
Throttle control system*4, *5						I	
Choke mechanism*5 (except KS models)			I		I		
Choke mechanism*5 (KS model)				C*7		I	
Choke opener operation (only for carburetor automatic choke type)						I	
Evaporative emission control system*6						I	
Ignition timing and control system*3			I		I		
Ignition timing and control system*4						I	
Spark plugs (for cars using unleaded gasoline)			R*2		R*2		
Spark plugs (for cars using leaded gasoline)	R	R	R	R	R	R	
Distributor cap and rotor*3			I		I		
Distributor cap and rotor*4						I	
Ignition wiring*3			I		I		
Ignition wiring*4						I	
Positive crankcase ventilation valve*3			I		I		
Positive crankcase ventilation valve*4						I	
Blow-by filter*5			I		I		

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

\*1 Thereafter, replace every 2 years or 40,000 km (24,000 miles), whichever comes first.

\*2 For KS type, replace every 2 years or 40,000 km (24,000 miles) whichever comes first after 30,000 km (18,000 miles).

\*3 Except KS, KX models

\*4 KS, KX models

\*5 Only for carbureted type

\*6 Except KP, KT and 2.0 i of KE, KF

\*7 Recommended by manufacturer only





Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.	R—Replace		I—Inspect. After inspection, clean, adjust, repair or replace if necessary.				
	x 1,000 km x 1,000 miles months	20 12 12	40 24 24	60 36 36	80 48 48	100 60 60	
ITEM							
Brake hoses and lines (Including anti-lock brake system hoses and pipes for anti-lock brake system models)		I	I	I	I	I	
Brake fluid (Including anti-lock brake system Fluid for anti-lock brake system models)			R		R		
Front brake discs and calipers		I	I	I	I	I	
Front brake pads		Inspect every 10,000 km (6,000 miles) or 6 months					
Rear brake discs, calipers and pads (for disk brake type)			I		I		
Rear brake drums, wheel cylinders and linings (for drum brake type)			I		I		
Parking brake		I	I		I		
Exhaust pipe and muffler		I	I	I	I	I	
Suspension mounting bolts		I	I	I	I	I	
Front wheel alignment (except 4WS models)		I	I	I	I	I	
Front and rear wheel alignment (4WS models)		I	I	I	I	I	
Steering operation, tie rod ends, steering gear box and boots (Including center shaft for 4WS models)	Except 4WS models		I		I		
	4WS models		I	I	I	I	I
Anti-lock brake system high pressure hose (for anti-lock brake system models)					R		
Anti-lock brake system operation (for Anti-lock brake system models)		I	I		I		
Power steering system		I	I	I	I	I	
Power steering pump belt			I		I		
Catalytic converter heat shield (Standard for some types)							I

**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 brake discs, calipers and pads	I	Every 20,000 km (12,000 miles) or 12 months
. B C . E .	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

**CAUTION: Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.**

# Maintenance Schedule

Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.	R—Replace C—Clean		I—Inspect. After inspection, clean, adjust, repair or replace if necessary.				
	x 1,000 km x 1,000 miles months	20 12 12	40 24 24	60 36 36	80 48 48	100 60 60	
Idle speed and idle CO*3		I	I	I	I	I	
Idle speed and idle CO*4						I	
Valve clearance		I	I	I	I	I	
Alternator drive belt			I		I		
Timing belt and timing balancer belt						R	
Water pump						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 (Standard for some types)						I	
Secondary air supply system (Standard for some types)						I	
Air cleaner element (Viscous type for European and KQ models)			R		R		
Air cleaner element (Dry type except European and KQ models)	R		R	R	R	R	
Fuel filter (Including aux filter*5)			R		R		
Tank, fuel line and connections			I		I		
Intake air temp. control system*3, *5						I	
Throttle control system*3, *5			I		I		
Throttle control system*4, *5						I	
Choke mechanism*5 (except KS models)			I		I		
Choke mechanism*5 (KS model)				C*7		I	
Choke opener operation (only for carburetor automatic choke type)						I	
Evaporative emission control system*6						I	
Ignition timing and control system*3			I		I		
Ignition timing and control system*4						I	
Spark plugs (for cars using unleaded gasoline)			R*2		R*2		
Spark plugs (for cars using leaded gasoline)	R		R	R	R	R	
Distributor cap and rotor*3			I		I		
Distributor cap and rotor*4						I	
Ignition wiring*3			I		I		
Ignition wiring*4						I	
Positive crankcase ventilation valve*3			I		I		
Positive crankcase ventilation valve*4						I	
Blow-by filter*5			I		I		

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

\*1 Thereafter, replace every 2 years or 40,000 km (24,000 miles), whichever comes first.

\*2 For KS type, replace every 2 years or 40,000 km (24,000 miles) whichever comes first after 30,000 km (18,000 miles).

\*3 Except KS, KX models

\*4 KS, KX models

\*5 Only for carbureted type

\*6 Except KP, KT and 2.0 i of KE, KF

\*7 Recommended by manufacturer only



Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.	R—Replace		I—Inspect. After inspection, clean, adjust, repair or replace if necessary.				
	x 1,000 km x 1,000 miles months	20 12 12	40 24 24	60 36 36	80 48 48	100 60 60	
ITEM							
Brake hoses and lines (Including anti-lock brake system hoses and pipes for anti-lock brke system models)		I	I	I	I	I	
Brake fluid (Including anti-lock brake system Fluid for anti-lock brake system models)			R		R		
Front brake discs and calipers		I	I	I	I	I	
Front brake pads		Inspect every 10,000 km (6,000 miles) or 6 months					
Rear brake discs, calipers and pads (for disk brake type)			I		I		
Rear brake drums, wheel cylinders and linings (for drum brake type)			I		I		
Parking brake		I	I		I		
Exhaust pipe and muffler		I	I	I	I	I	
Suspension mounting bolts		I	I	I	I	I	
Front wheel alignment (except 4WS models)		I	I	I	I	I	
Front and rear wheel alignment (4WS models)		I	I	I	I	I	
Steering operation, tie rod ends, steering gear box and boots (Including center shaft for 4WS models)	Except 4WS models		I		I		
	4WS models		I	I	I	I	I
Anti-lock brake system high pressure hose (for anti-lock brake system models)					R		
Anti-lock brake system operation (for Anti-lock brake system models)		I	I		I		
Power steering system		I	I	I	I	I	
Power steering pump belt			I		I		
Catalytic converter heat shield (Standard for some types)							I

**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

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C : Driving in severe cold weather

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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 brake discs, calipers and pads	I	Every 20,000 km (12,000 miles) or 12 months
. B C . E .	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

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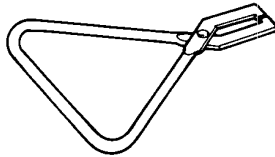
# Special Tools

## Special Tools

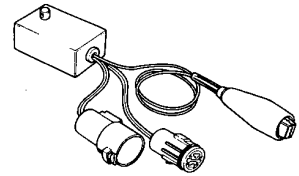
Ref. No.	Tool Number	Description	Q'ty	Remark
①	07411-0020000	Digital Circuit Tester	1	
②	07614-0050100	Fuel Line Clamp	1	
③	07JAZ-SH20100	R.P.M. Connecting Adaptor	1	
④	07LAJ-PT30100	ECU Test Harness	1	
⑤	07LAJ-PT30200	Test Harness	1	
⑥	07LAZ-PT30100	R.P.M. Connecting Adaptor	1	
⑥-1	07LAZ-PT30110	R.P.M. Connecting Adaptor (A)	(1)	┌ Component Tools
⑥-2	07LAZ-PT30120	R.P.M. Connecting Adaptor (B)	(1)	
⑦	07LAA-PT50100	O <sub>2</sub> Sensor Socket Wrench	1	



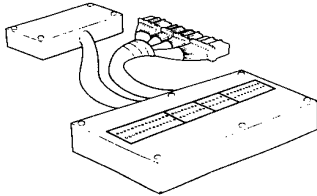
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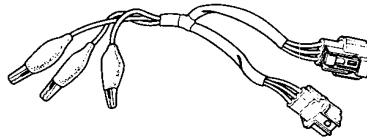
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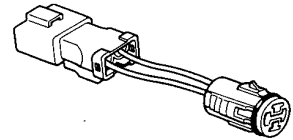
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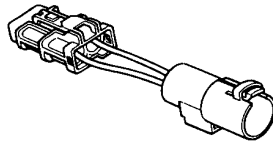
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⑤



⑥(⑥-1)



⑥(⑥-2)



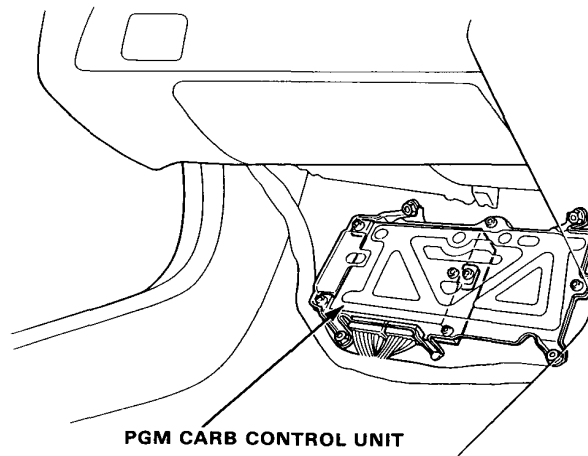
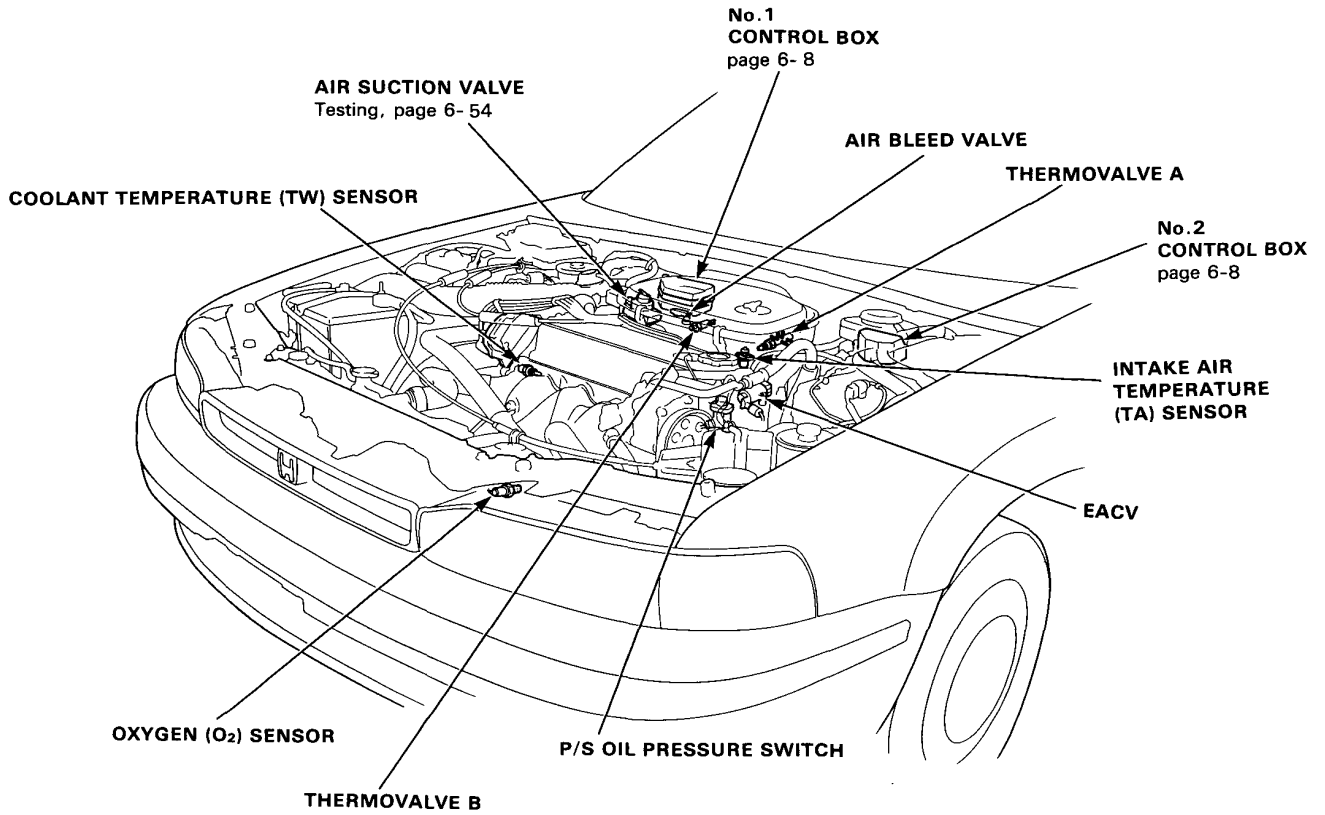
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# Component Locations

## Index



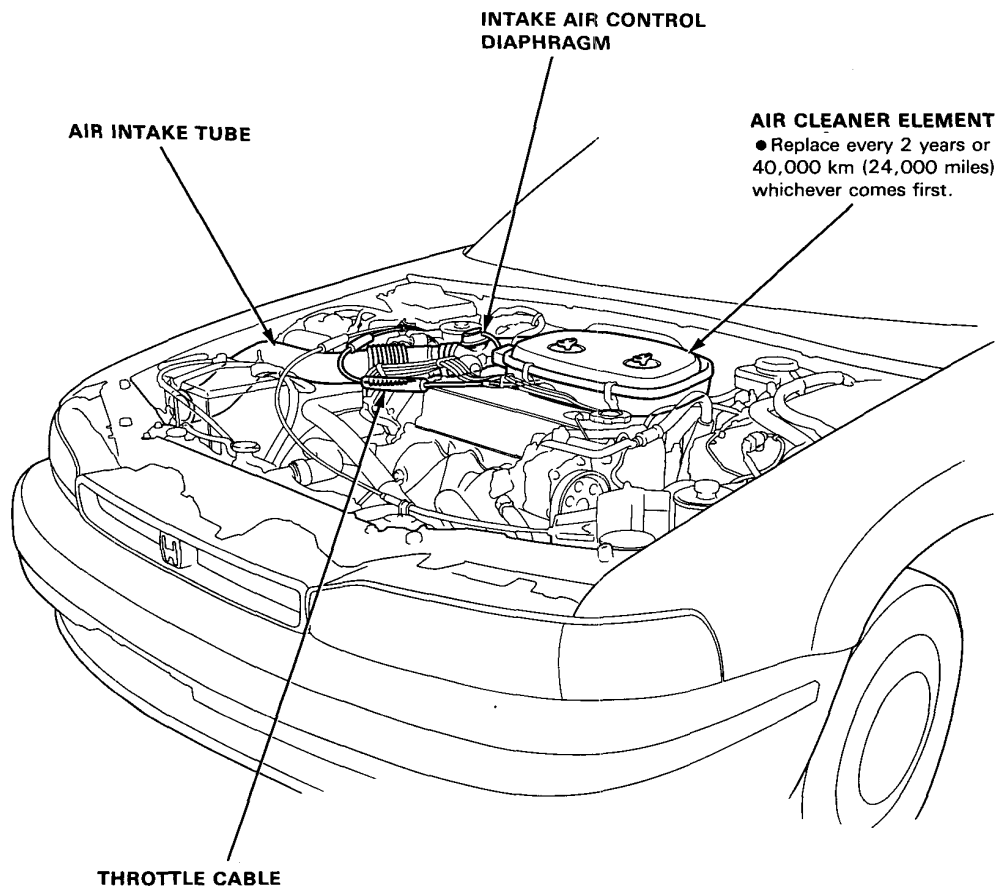
(KE with CATA)

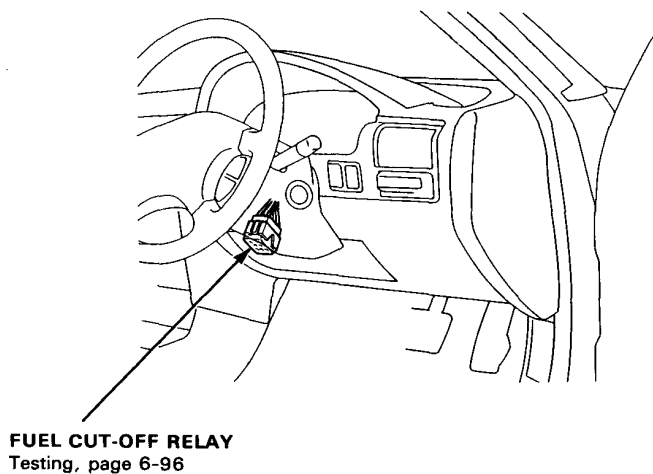
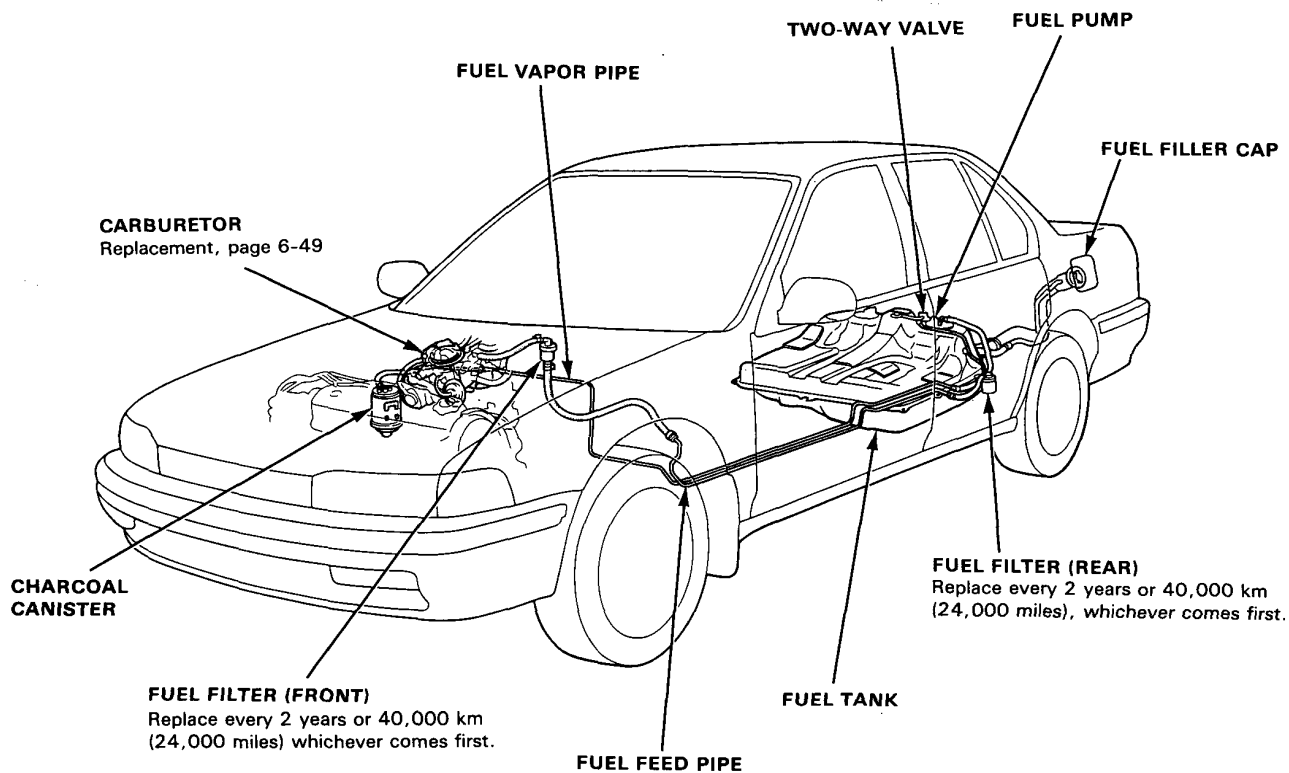


# Component Locations

## Index

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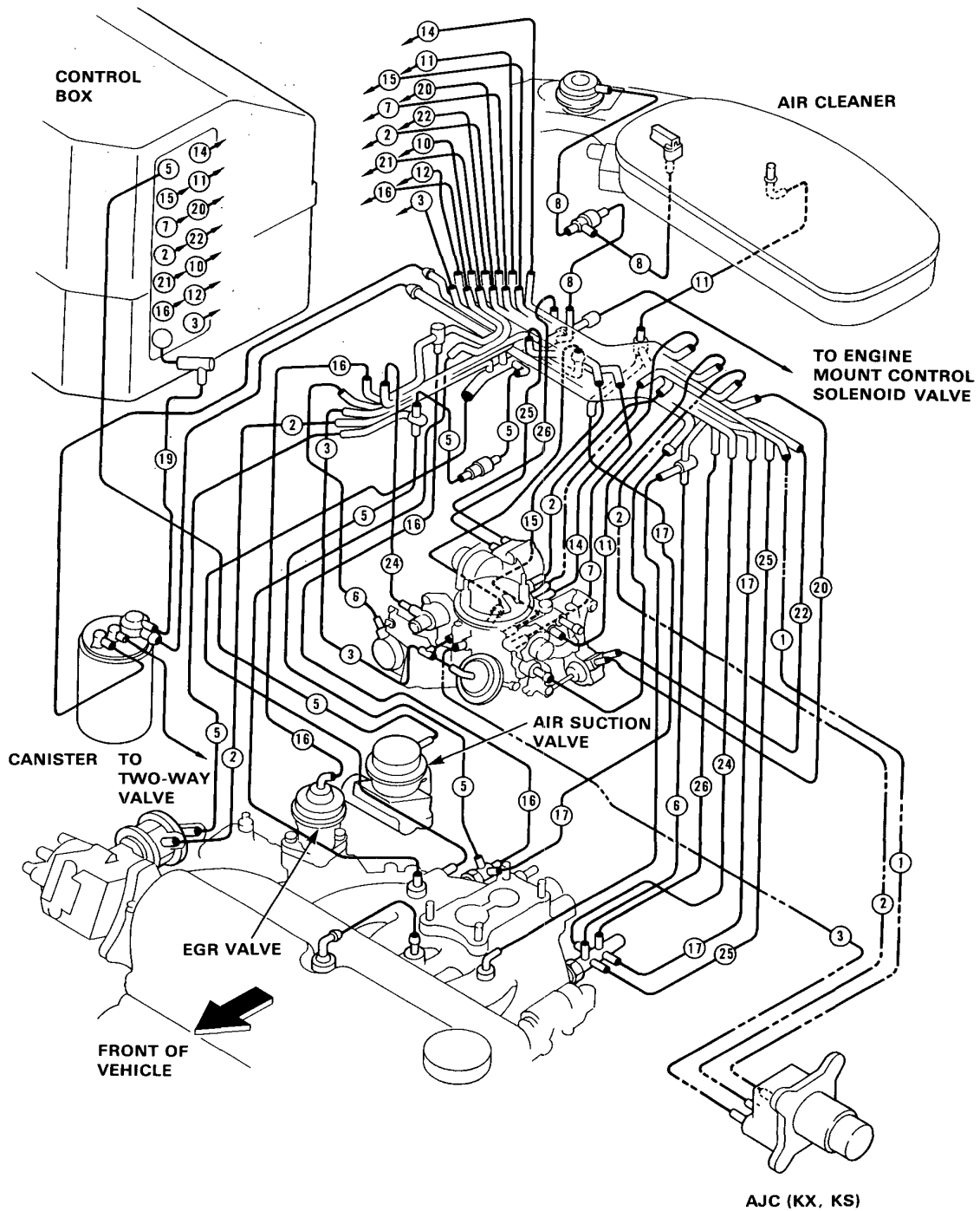




# System Description

## Vacuum Connections

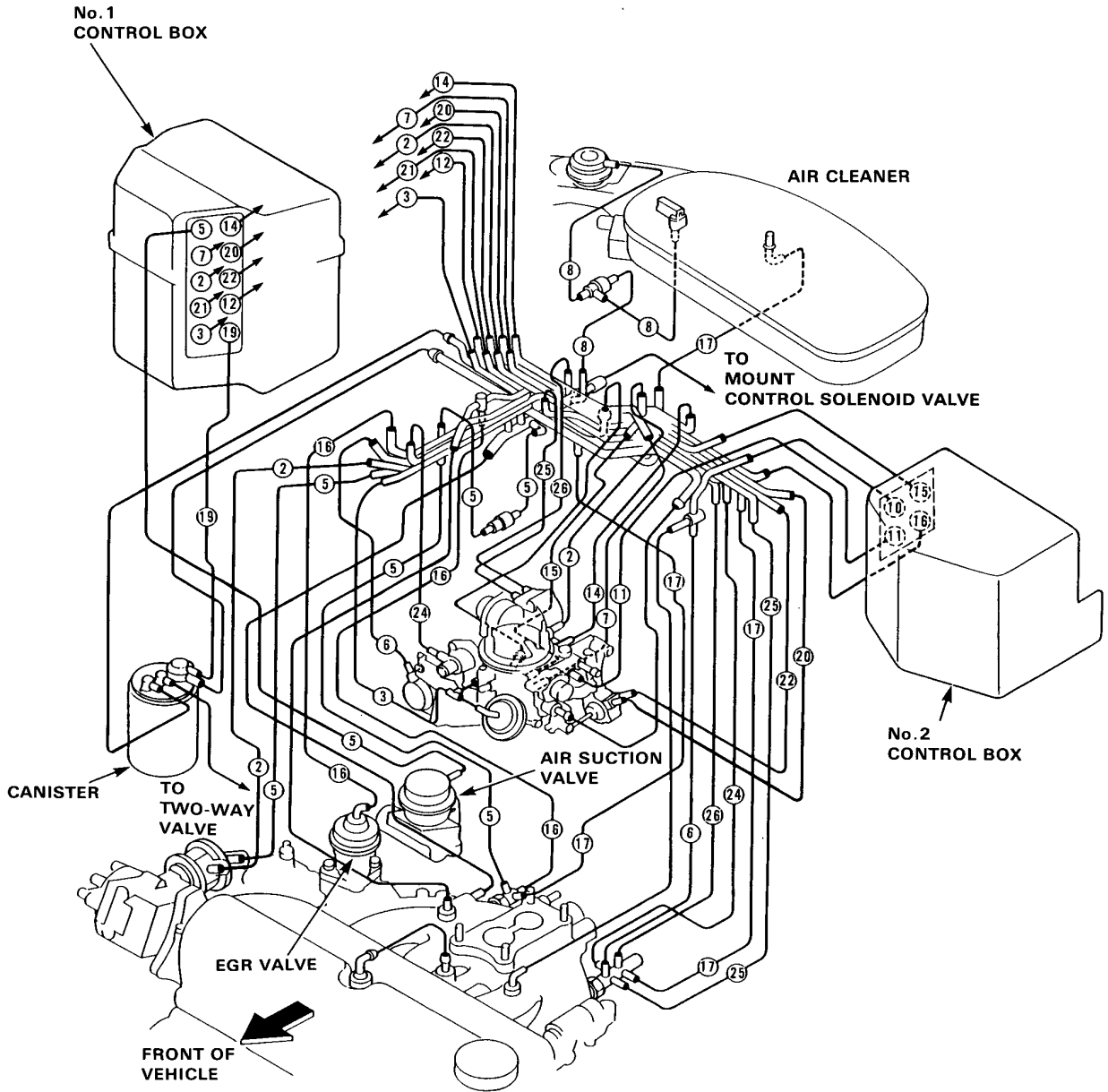
(KX, KS, KG)







(KE with CATA)

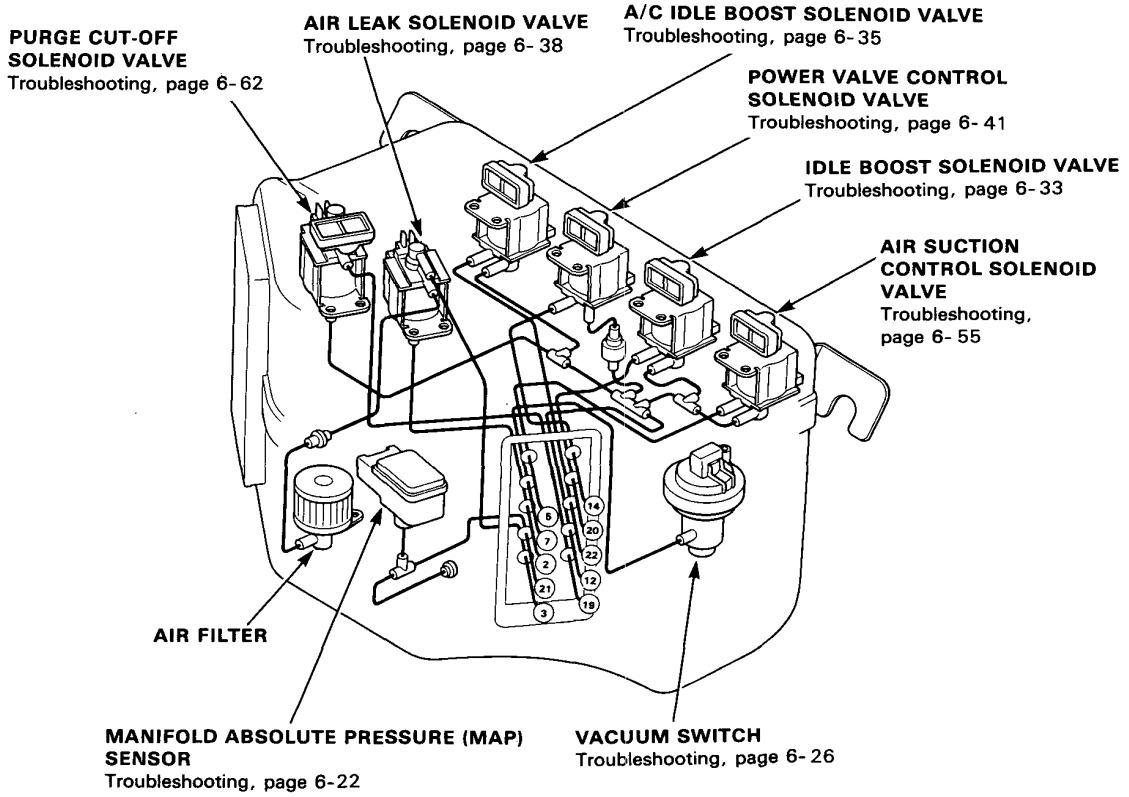


# System Description

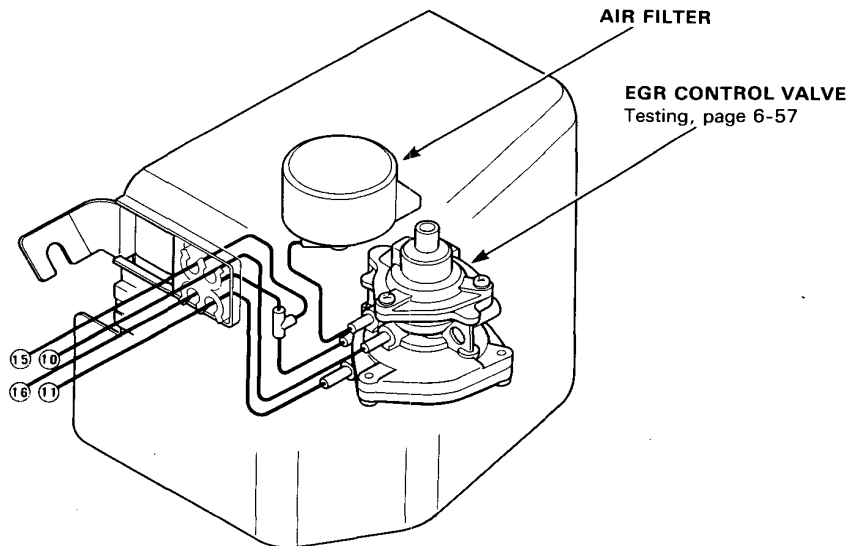
## Vacuum Connections

(KE with CATA)

### No.1 Control Box

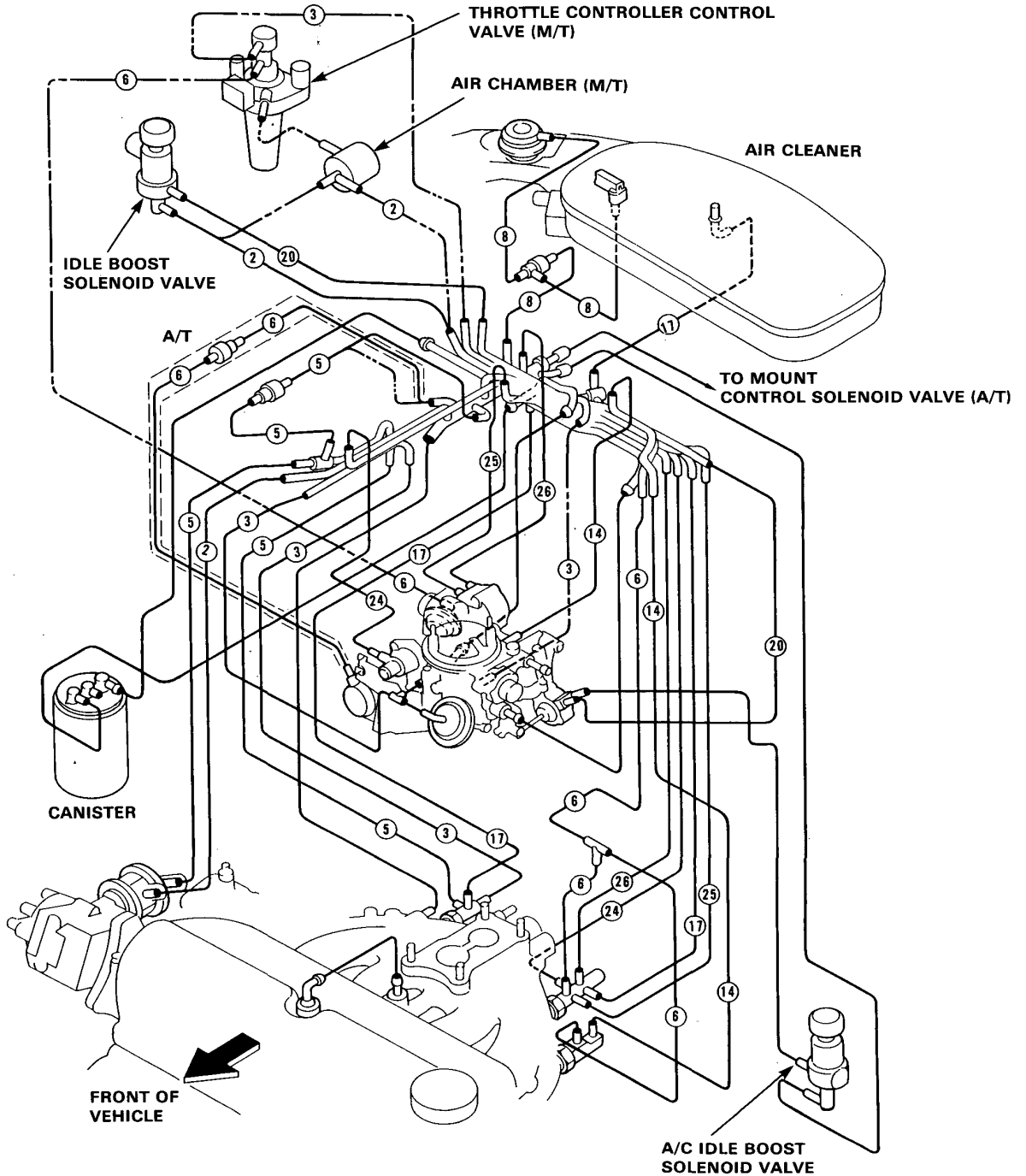


### No.2 Control Box





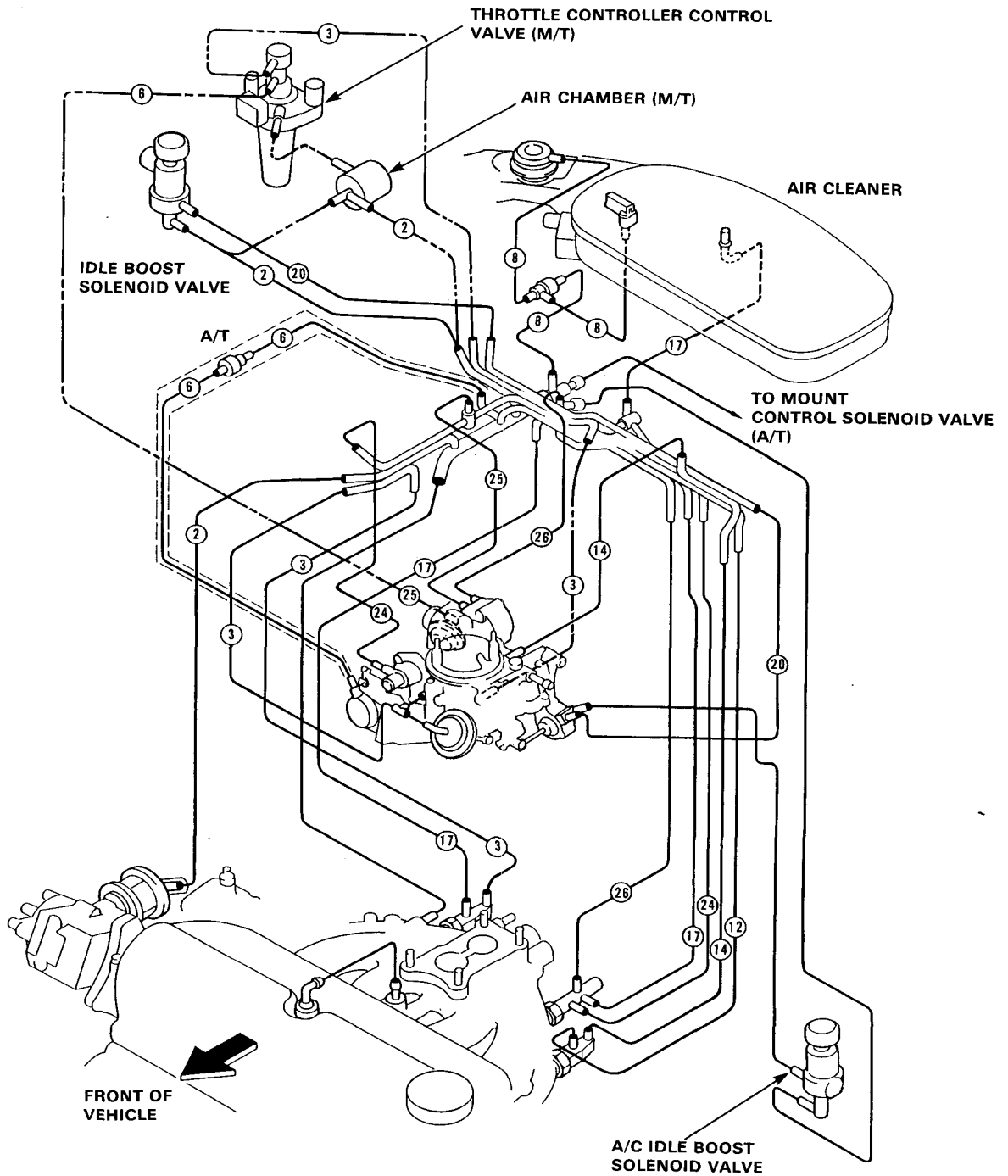
(KF, KB, KW, KE, KU)



# System Descriptions

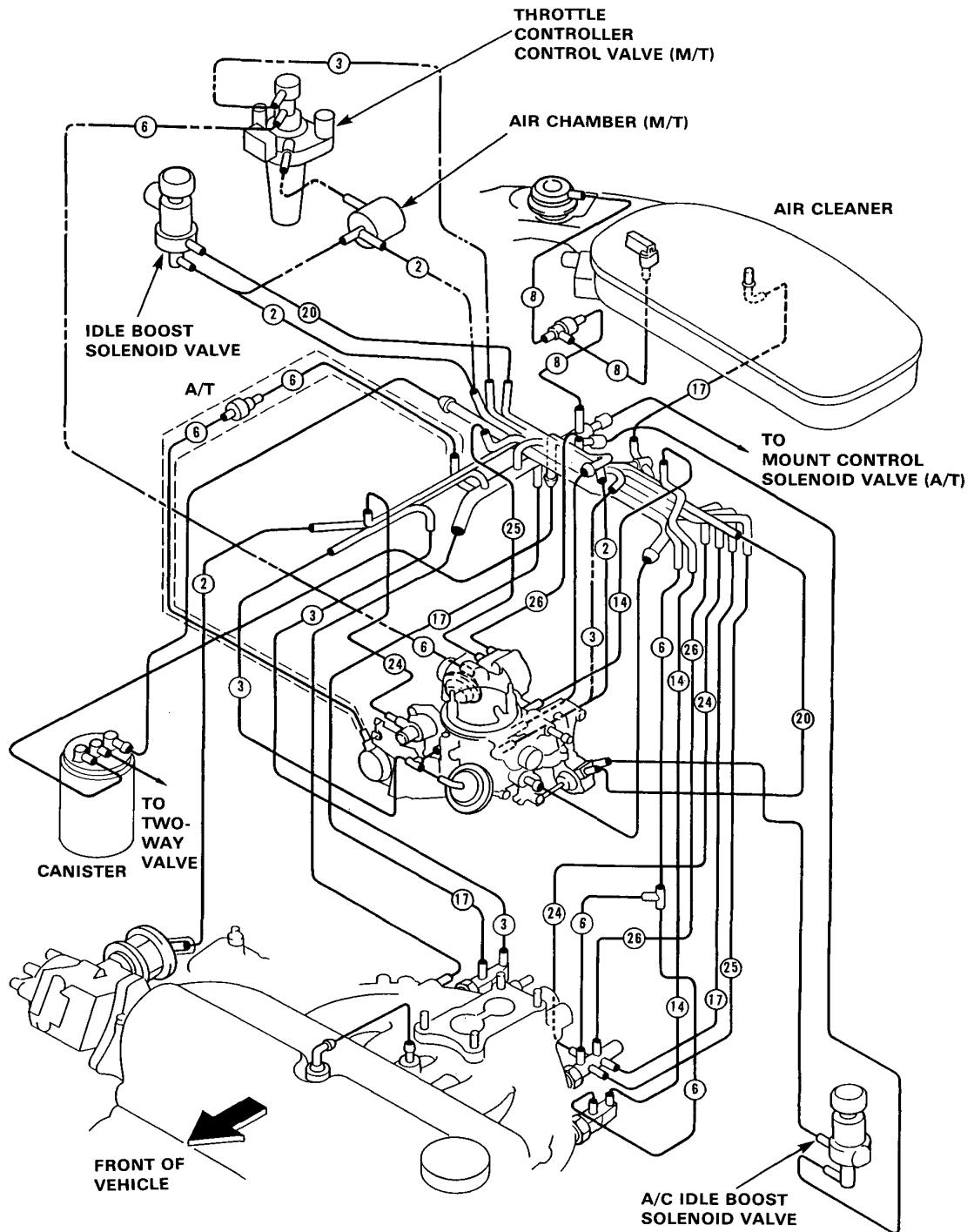
## Vacuum Connections

(KP, KT)





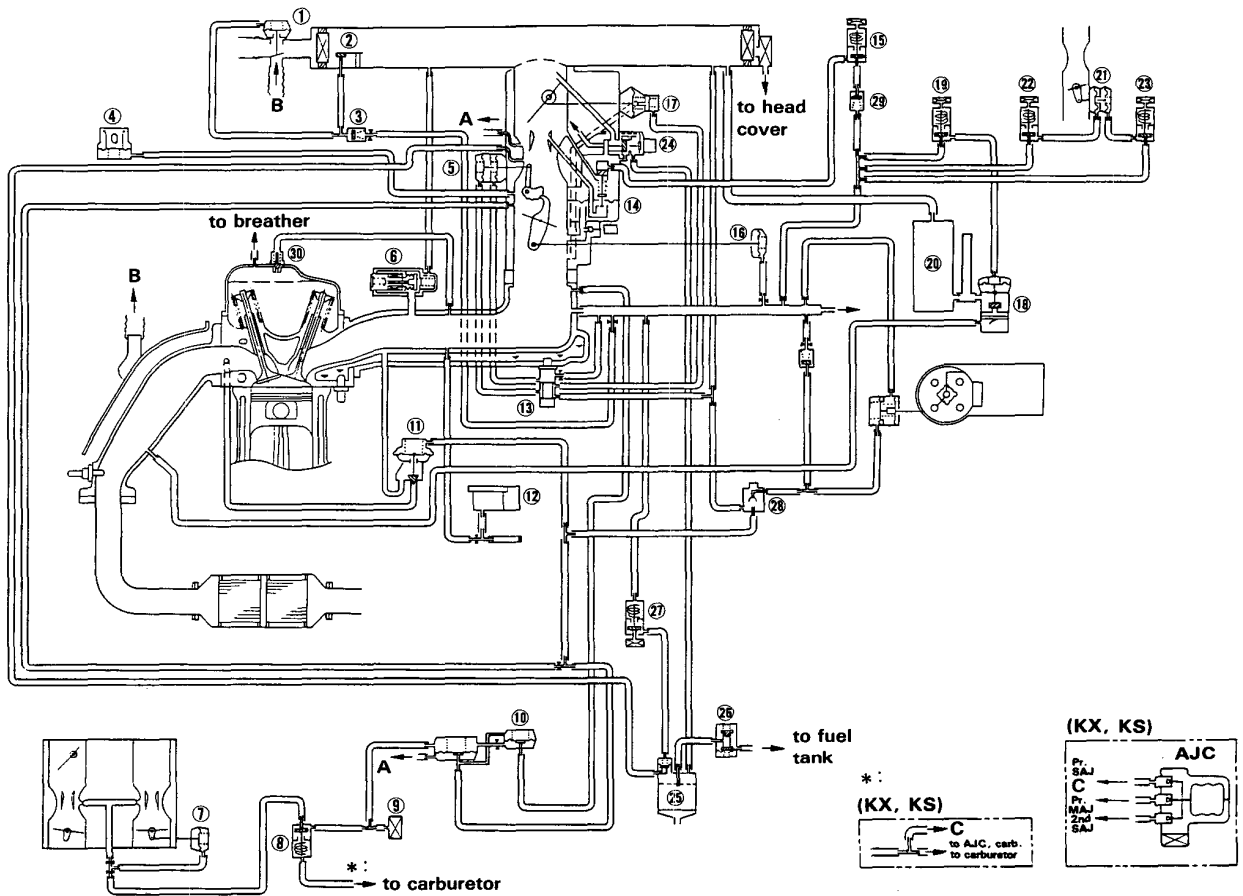
(KY)



# System Descriptions

## Vacuum Connections

(KX, KS, KG, KE with CATA)

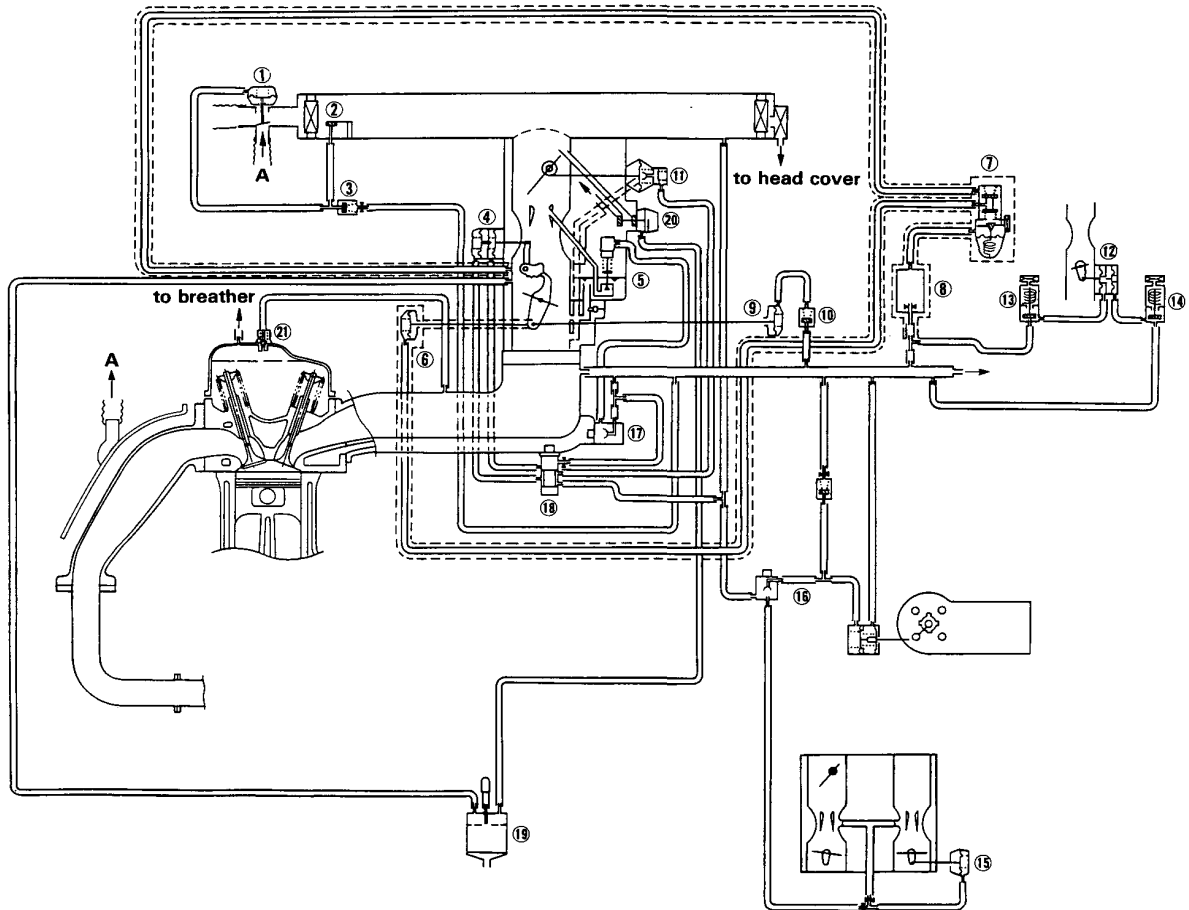


- ① AIR CONTROL DIAPHRAGM
- ② AIR BLEED VALVE
- ③ CHECK VALVE
- ④ VACUUM SWITCH
- ⑤ FAST IDLE UNLOADER
- ⑥ EACV
- ⑦ SECONDARY DIAPHRAGM
- ⑧ AIR LEAK SOLENOID VALVE
- ⑨ AIR FILTER
- ⑩ EGR CONTROL VALVE
- ⑪ EGR VALVE
- ⑫ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
- ⑬ THERMOVALVE A
- ⑭ POWER VALVE
- ⑮ POWER VALVE CONTROL SOLENOID VALVE

- ⑯ THROTTLE CONTROLLER
- ⑰ CHOKE OPENER
- ⑱ AIR SUCTION VALVE
- ⑲ AIR SUCTION CONTROL SOLENOID VALVE
- ⑳ AIR CHAMBER
- ㉑ IDLE BOOST THROTTLE CONTROLLER
- ㉒ IDLE BOOST SOLENOID VALVE
- ㉓ A/C IDLE BOOST SOLENOID VALVE
- ㉔ AIR VENT CUT-OFF SOLENOID VALVE
- ㉕ CANISTER
- ㉖ TWO-WAY VALVE
- ㉗ PURGE CUT-OFF SOLENOID VALVE
- ㉘ THERMOVALVE B
- ㉙ CHECK VALVE
- ㉚ PCV VALVE



(KF, KB, KW, KE, KU)



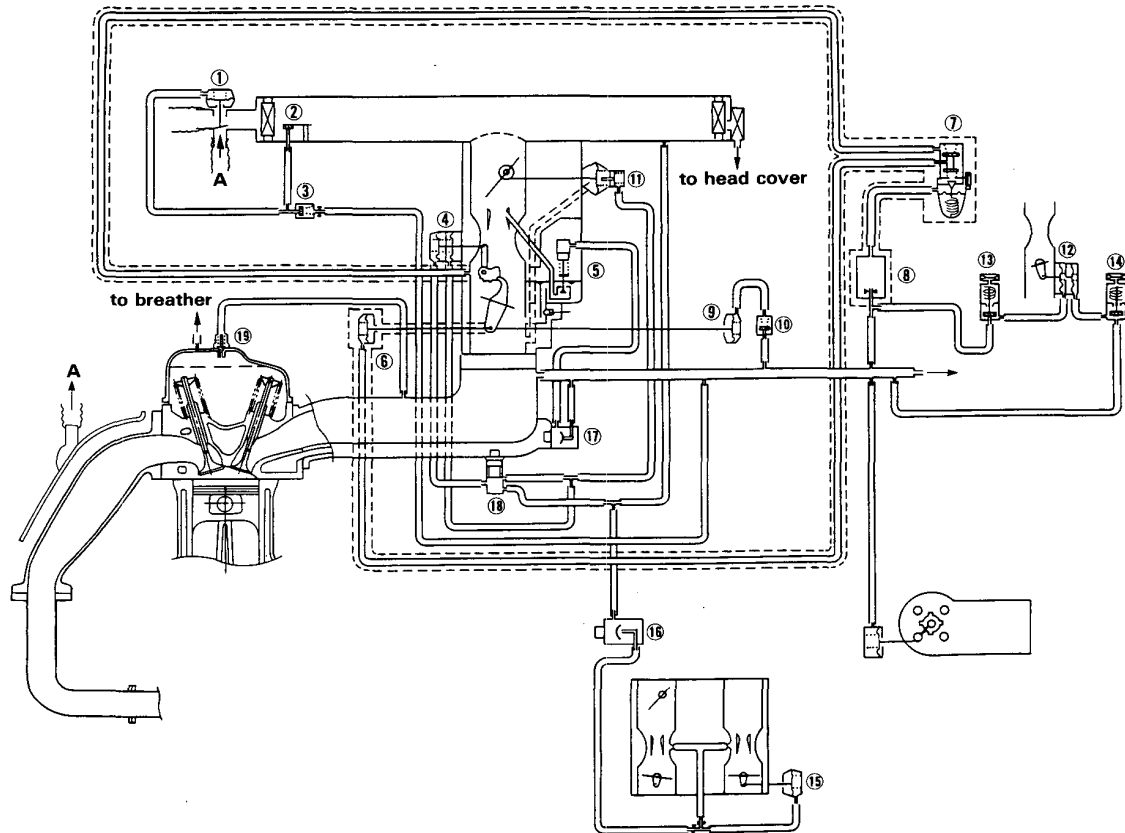
- ①AIR CONTROL DIAPHRAGM
- ②AIR BLEED VALVE
- ③CHECK VALVE
- ④FAST IDLE UNLOADER
- ⑤POWER VALVE
- ⑥THROTTLE CONTROLLER (M/T)
- ⑦THROTTLE CONTROLLER CONTROL VALVE (M/T)
- ⑧AIR CHAMBER (M/T)
- ⑨THROTTLE CONTROLLER (A/T)
- ⑩CHECK VALVE (A/T)

- ⑪CHOKE OPENER
- ⑫IDLE BOOST THROTTLE CONTROLLER
- ⑬IDLE BOOST SOLENOID VALVE
- ⑭A/C IDLE BOOST SOLENOID VALVE
- ⑮SECONDARY DIAPHRAGM
- ⑯THERMOVALVE D
- ⑰THERMOVALVE C
- ⑱THERMOVALVE A
- ⑲CANISTER
- ⑳AIR VENT CUT-OFF SOLENOID VALVE
- ㉑PCV VALVE

# System Descriptions

## Vacuum Connections

(KP, KT)



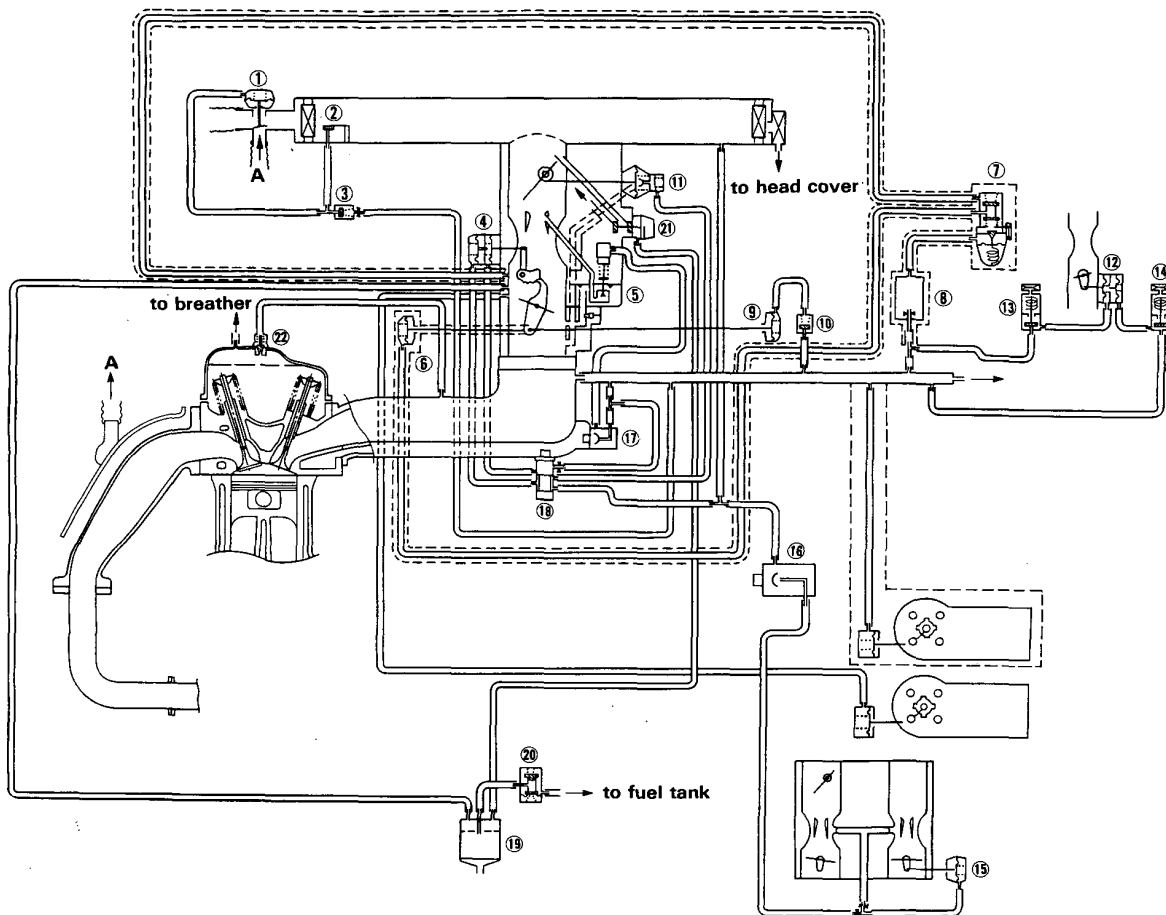
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- ③ CHECK VALVE
- ④ FAST IDLE UNLOADER
- ⑤ POWER VALVE
- ⑥ THROTTLE CONTROLLER (M/T)
- ⑦ THROTTLE CONTROLLER CONTROL VALVE (M/T)
- ⑧ AIR CHAMBER (M/T)
- ⑨ THROTTLE CONTROLLER (A/T)
- ⑩ CHECK VALVE (A/T)

- ① CHOKE OPENER
- ② IDLE BOOST THROTTLE CONTROLLER
- ③ IDLE BOOST SOLENOID VALVE
- ④ A/C IDLE BOOST SOLENOID VALVE
- ⑤ SECONDARY DIAPHRAGM
- ⑥ THERMOVALVE D
- ⑦ THERMOVALVE C
- ⑧ THERMOVALVE A
- ⑨ PCV VALVE





(KY)



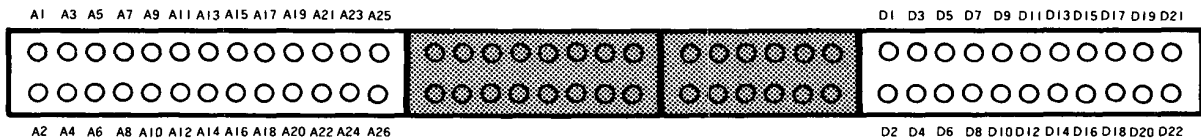
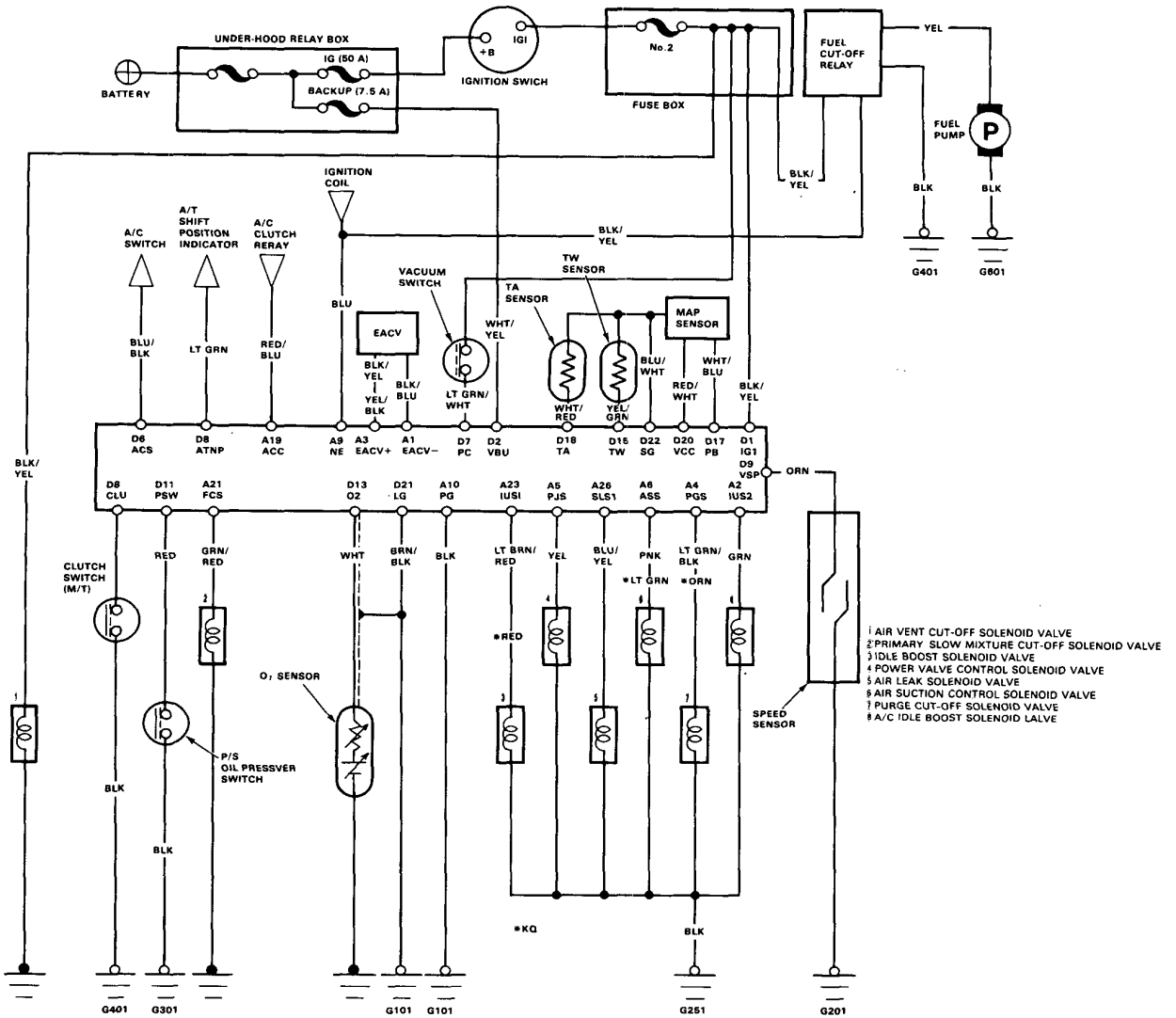
- ①AIR CONTROL DIAPHRAGM
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- ④FAST IDLE UNLOADER
- ⑤POWER VALVE
- ⑥THROTTLE CONTROLLER (M/T)
- ⑦THROTTLE CONTROLLER CONTROL VALVE (M/T)
- ⑧AIR CHAMBER (M/T)
- ⑨THROTTLE CONTROLLER (A/T)
- ⑩CHECK VALVE (A/T)
- ⑪CHOKE OPENER

- ⑫IDLE BOOST THROTTLE CONTROLLER
- ⑬IDLE BOOST SOLENOID VALVE
- ⑭A/C IDLE BOOST SOLENOID VALVE
- ⑮SECONDARY DIAPHRAGM
- ⑯THERMOVALVE D
- ⑰THERMOVALVE C
- ⑱THERMOVALVE A
- ⑲CANISTER
- ⑳TWO-WAY VALVE
- ㉑AIR VENT CUT-OFF SOLENOID VALVE
- ㉒PCV VALVE

# System Descriptions

## Electrical Connections

(KE with CATA)

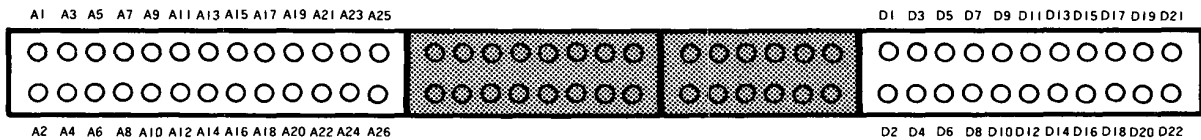
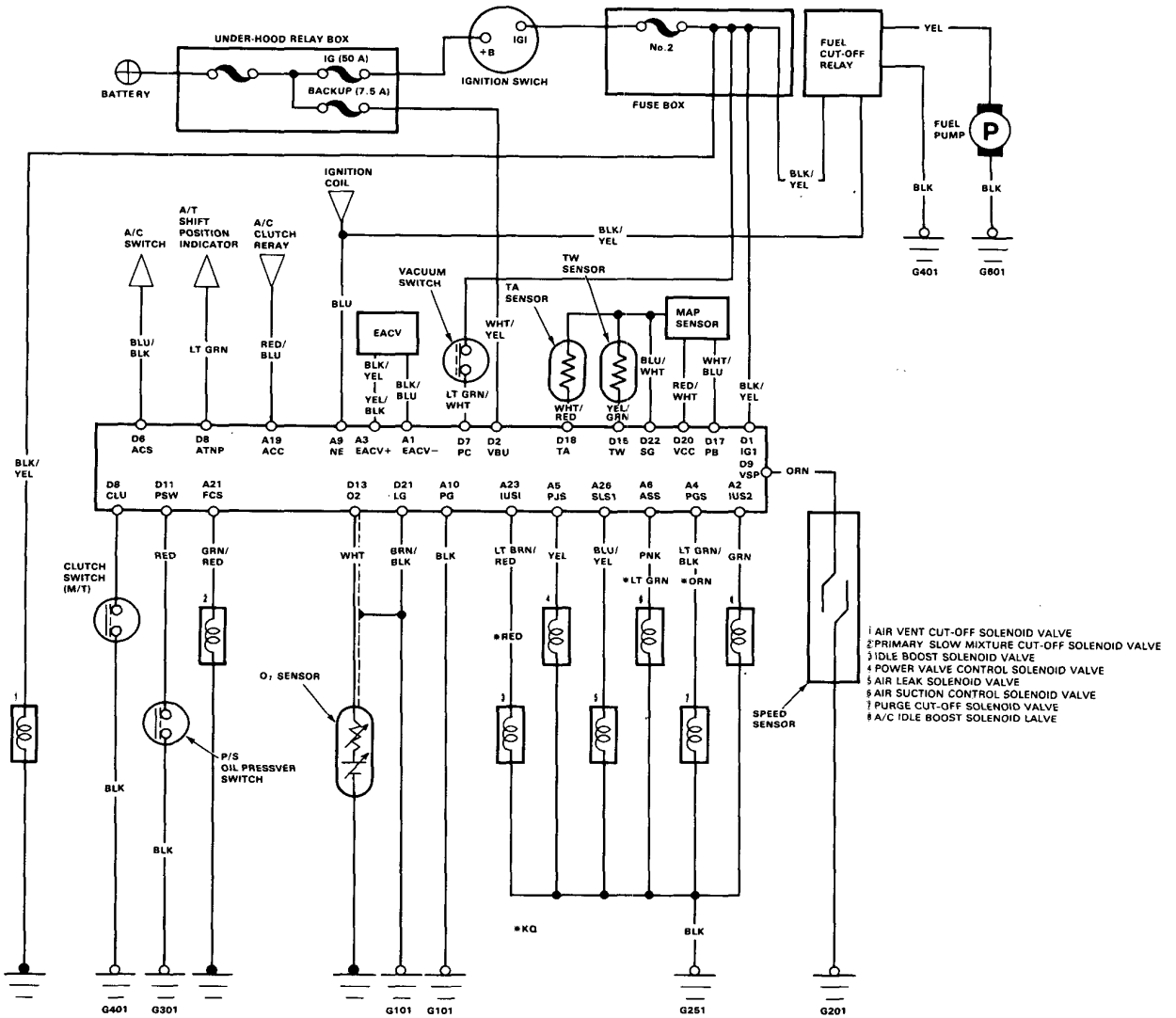


**TERMINAL LOCATION**

# System Descriptions

## Electrical Connections

(KE with CATA)



**TERMINAL LOCATION**

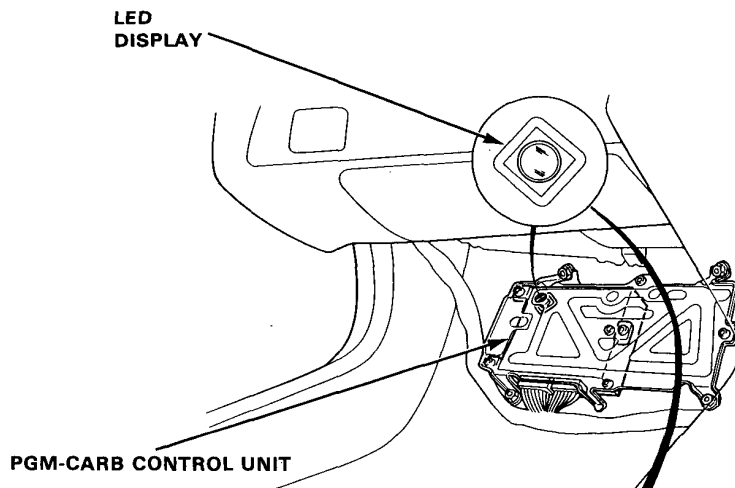


# Troubleshooting

## Self-Diagnostic Procedure

Turn the ignition on, pull down the passenger's side carpet from under the dashboard and observe the LED on the top of the control unit. The LED indicates a system failure code by its blinking frequency.

The control unit LED can indicate any number of simultaneous component problems by blinking separate codes, one after another.

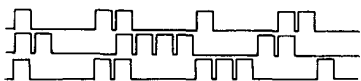


### Separate Problems:



- = See Problem CODE 1
- = See Problem CODE 2
- = See Problem CODE 3

### Simultaneous Problems:



- = See Problem CODE 1 and 2
- = See Problem CODE 2 and 4
- = See Problem CODE 1, 2 and 3

SELF-DIAGNOSIS INDICATOR BLINKS	SYSTEM INDICATED	PAGE
1	OXYGEN CONTENT	---
2	VEHICLE SPEED PULSER	---
3	MANIFOLD ABSOLUTE PRESSURE	6-22
4	VACUUM SWITCH SIGNAL	6-26
5	MANIFOLD ABSOLUTE PRESSURE	6-24
6	COOLANT TEMPERATURE	---
8	IGNITION COIL SIGNAL	---
10	INTAKE AIR TEMPERATURE	---
14	ELECTRONIC AIR CONTROL	---

If CODE 7, 9, 11, 12, 13 (or more than 14), count the number of blinks again; if the indicator is in fact blinking these codes, substitute a known-good control unit and recheck. If the indication goes away, replace the original control unit. The control unit LED may come on, indicating a system problem, when, in fact, there is a poor or intermittent electrical connection. First, check the electrical connections, clean or repair connections if necessary.

(cont'd)



## How to Read Flow Charts

A flow chart is designed to be used from start to final repair. It's like a map showing you the shortest distance. But beware; if you go off the "map" anywhere but a "stop" symbol, you can easily get lost.

**START**

(bold type)

Describes the conditions or situation to start a troubleshooting flow chart.

**ACTION**

Asks you to do something; perform a test, set up a condition, etc.

**DECISION**

Asks you about the result of an action by giving an "answer" and asking did you get the same answer: Yes or No.

**STOP**

(bold type)

The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flow to confirm your repair.

**NOTE:**

- The term "Intermittent Failure" is used several times in these charts. It simply means a system may have had a failure, but it checks out OK through all your tests. You may need to road test the car to reproduce the failure or if the problem was a loose connection, you may have unknowingly solved it while doing the tests.
- "Open" and "Short" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground. In simple electronics, this usually means something won't work at all. In complex electronics (like electronic control units), this can sometimes mean something works, but not the way it's supposed to.
- If the electrical readings are not as specified when using the ECU test harness, check the test harness connections before proceeding.

# Symptom-to System Chart

(KE with CATA)

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE	SYSTEM	PGM-CARB CONTROL SYSTEM						
		PGM-CARB CONTROL UNIT	OXYGEN SENSOR	VEHICLE SPEED PULSER	MANIFOLD ABSOLUTE PRESSURE SENSOR	VACUUM SWITCH	COOLANT TEMPERATURE SENSOR	IGNITION COIL SIGNAL
	SYMPTOM	—	—	—	22, 24	26	—	—
	SELF-DIAGNOSIS INDICATOR (LED) BLINKS	① or *	①	②	③ or ⑤	④	⑥	⑧
	ENGINE WON'T START							
	DIFFICULT TO START ENGINE WHEN COLD	(BU)						
	WHEN COLD FAST IDLE OUT OF SPECIFIC	(BU)						
	ROUGH IDLE	(BU)	③		②			
	WHEN WARM ENGINE SPEED TOO HIGH	(BU)						
	WHEN WARM ENGINE SPEED TOO LOW	(BU)						
	WHILE WARMING UP	(BU)			②		③	
	AFTER WARMING UP	(BU)			②			
	MISFIRE OR ROUGH RUNNING	(BU)	③	③	②			
	FAILS EMISSION TEST	(BU)	②		①			
	LOSS OF POWER	(BU)			③			

\* CODE 7, 9, 11, 12, 13, or exceeds 14: count the number of blinks again. If the indicator is in fact blinking these codes, substitute a known-good control unit and recheck. If the indication goes away, replace the original ECU.

(BU): When the self-diagnosis indicator is on, the back-up system is in operation.

Substitute a known-good control unit and recheck. If the indication goes away, replace the original ECU.



PGM-CARB CONTROL SYSTEM					EMISSION CONTROL				
INTAKE AIR TEMPERATURE SENSOR	A/T SHIFT POSITION SIGNAL	CLUTCH SWITCH SIGNAL	P/S OIL PRESSURE SWITCH	A/C SIGNAL	CARBURETOR	FUEL SUPPLY	AIR INTAKE	ELECTRONIC AIR CONTROL VALVE	OTHER EMISSION CONTROL
---	---	---	---	---	30	50	51	---	52
⑩								⑭	
					②	①			
					①				
③					①				③
③					①			③	③
			③	③	①				
					①				
					①			③	
					①			①	
					①	②			
					②		③	③	③
					③	②	①		②

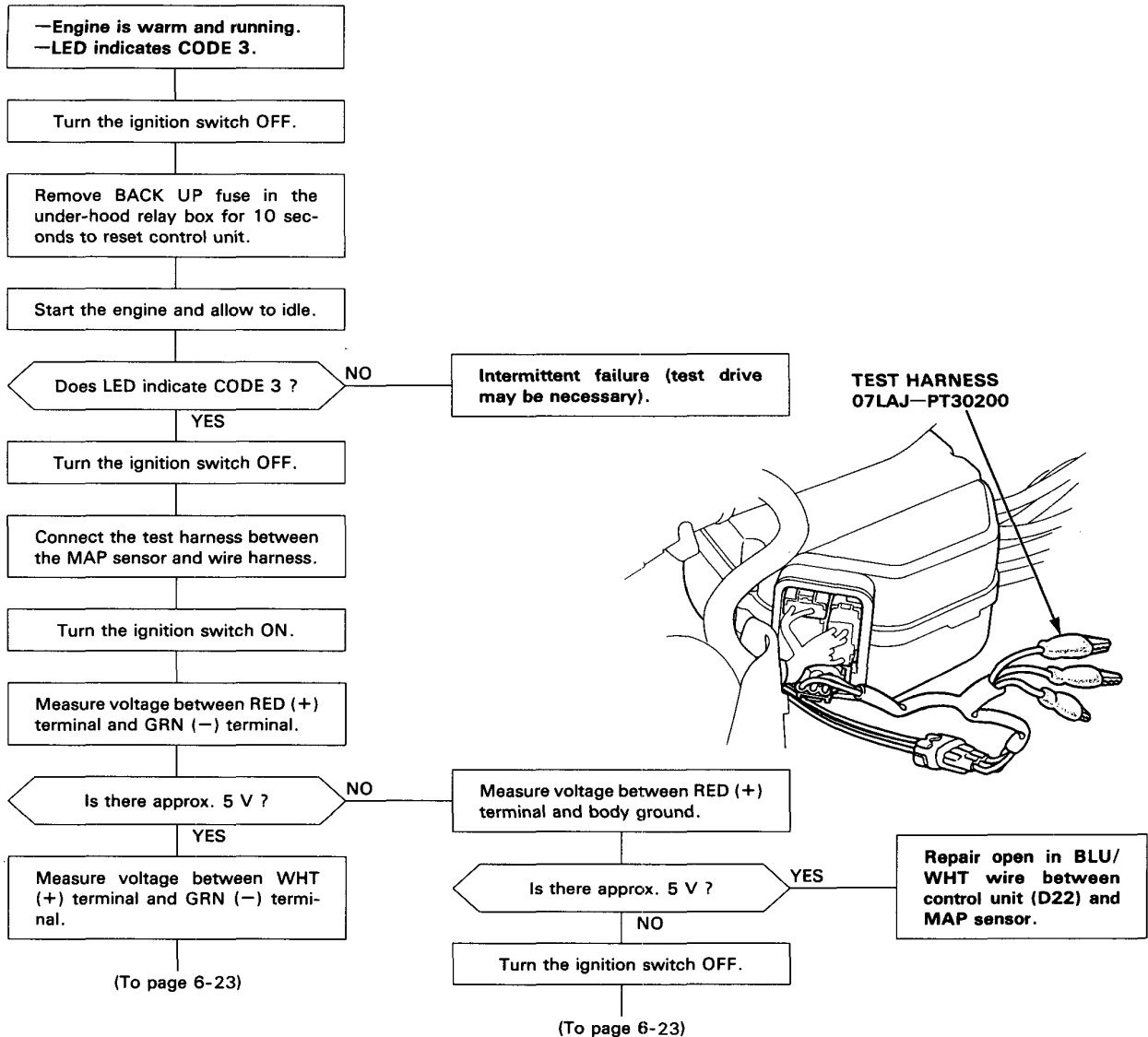
# PGM-CARB Control System

## Troubleshooting Flow Chart — MAP Sensor

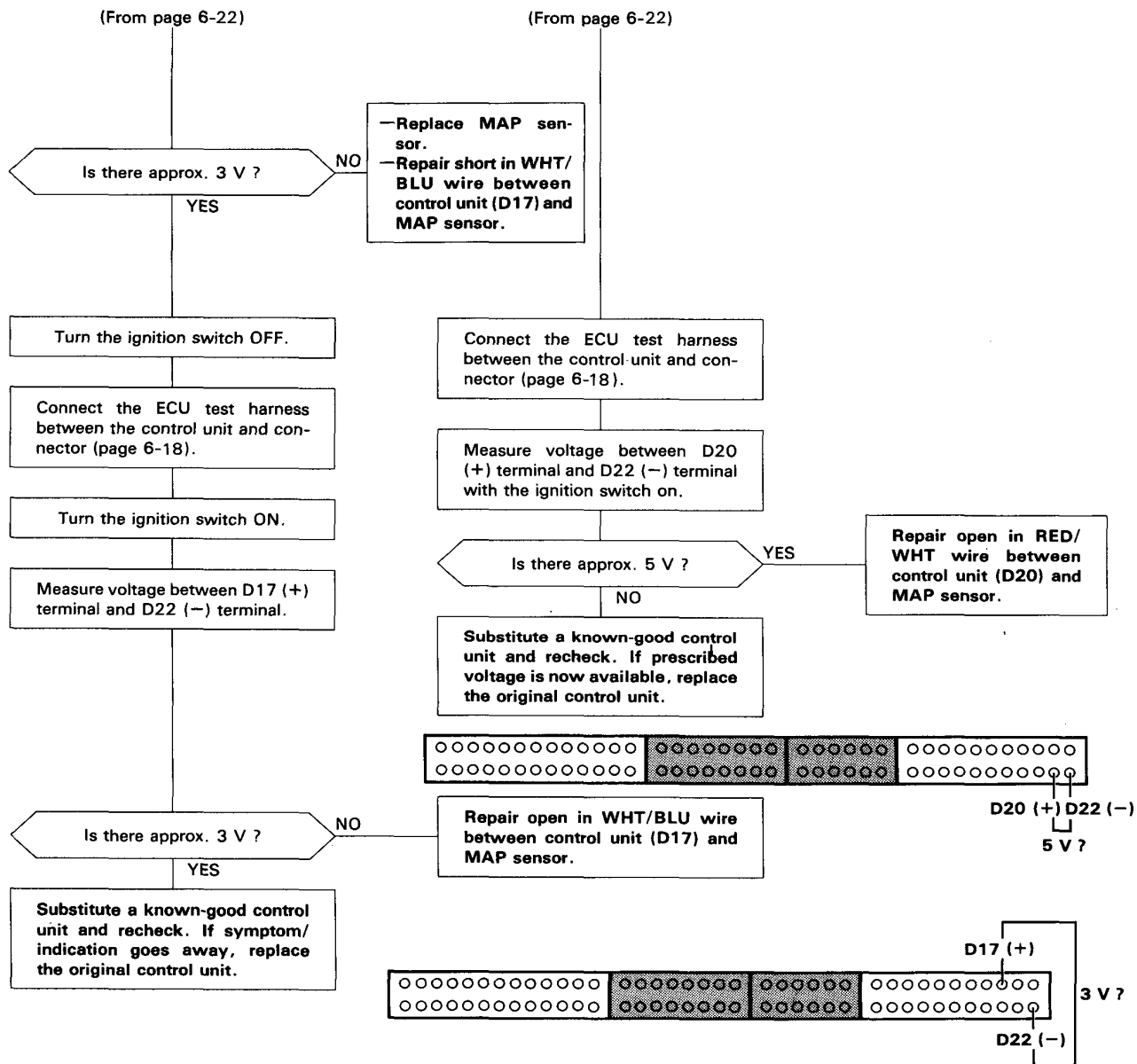
③ Self-diagnosis LED indicator blinks three times: Most likely an electrical problem in the Manifold Absolute Pressure (MAP) Sensor system.

⑤ Self-diagnosis LED indicator blinks five times: Most likely a mechanical problem (broken hose) in the Manifold Absolute Pressure (MAP) Sensor system.

③







(cont'd)

# PGM-CARB Control System

## Troubleshooting Flow Chart — MAP Sensor (cont'd)

5

LED indicates CODE 5.

Turn the ignition switch OFF.

Remove BACK UP fuse in the under-hood relay box for 10 seconds to reset control unit.

Start engine and keep engine speed at idle.

Does LED indicate CODE 5 ?

NO

Intermittent failure (test drive may be necessary).

YES

Stop engine.

Remove #21 hose from the vacuum hose manifold and connect a T-fitting from a vacuum gauge between the vacuum hose manifold and the MAP sensor.

Start engine.

Is there vacuum ?

NO

Repair as necessary.

YES

Connect a vacuum pump to #21 hose and apply vacuum.

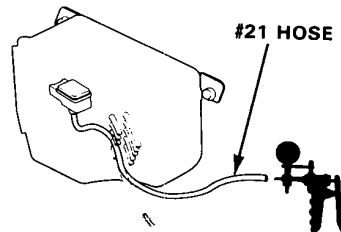
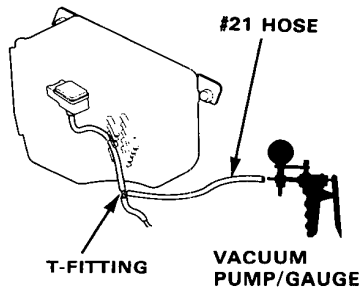
Does it hold vacuum ?

NO

Replace #21 hose.

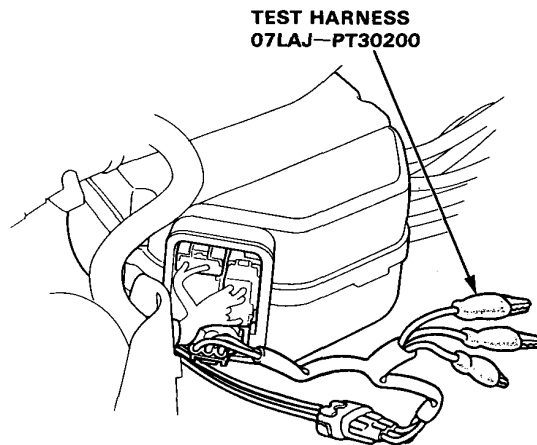
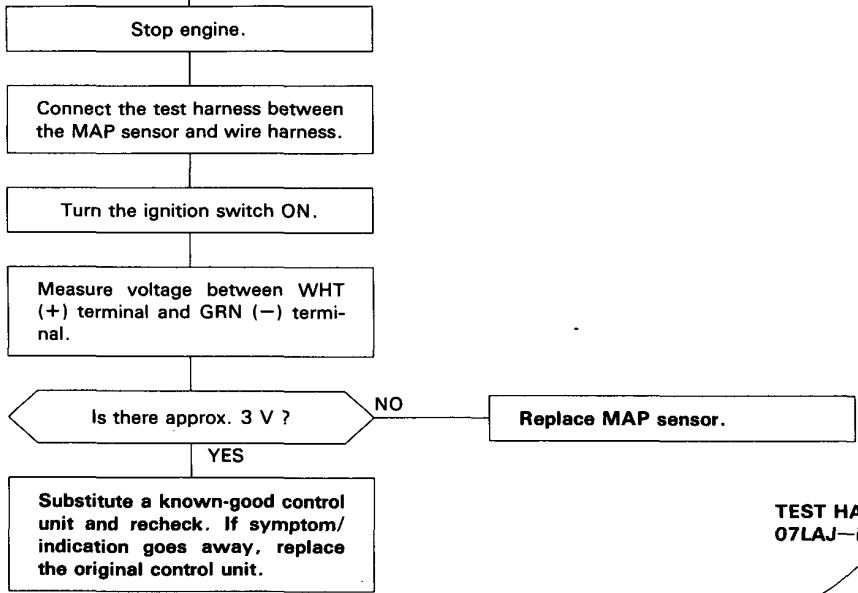
YES

(To page 6-25)





(From page 6-24)



# PGM-CARB Control System

## Troubleshooting Flow Chart — Vacuum Switch

④ Self-diagnosis LED indicator blinks four times: A problem in the vacuum switch.

— Engine is warm running.  
— LED indicates CODE 4.

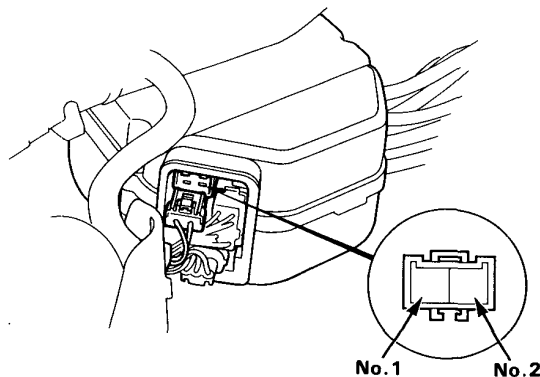
Turn the ignition switch OFF.

Remove BACK UP fuse in the under-hood relay box for 10 seconds to reset control unit.

Disconnect the 2P connector on the control box.

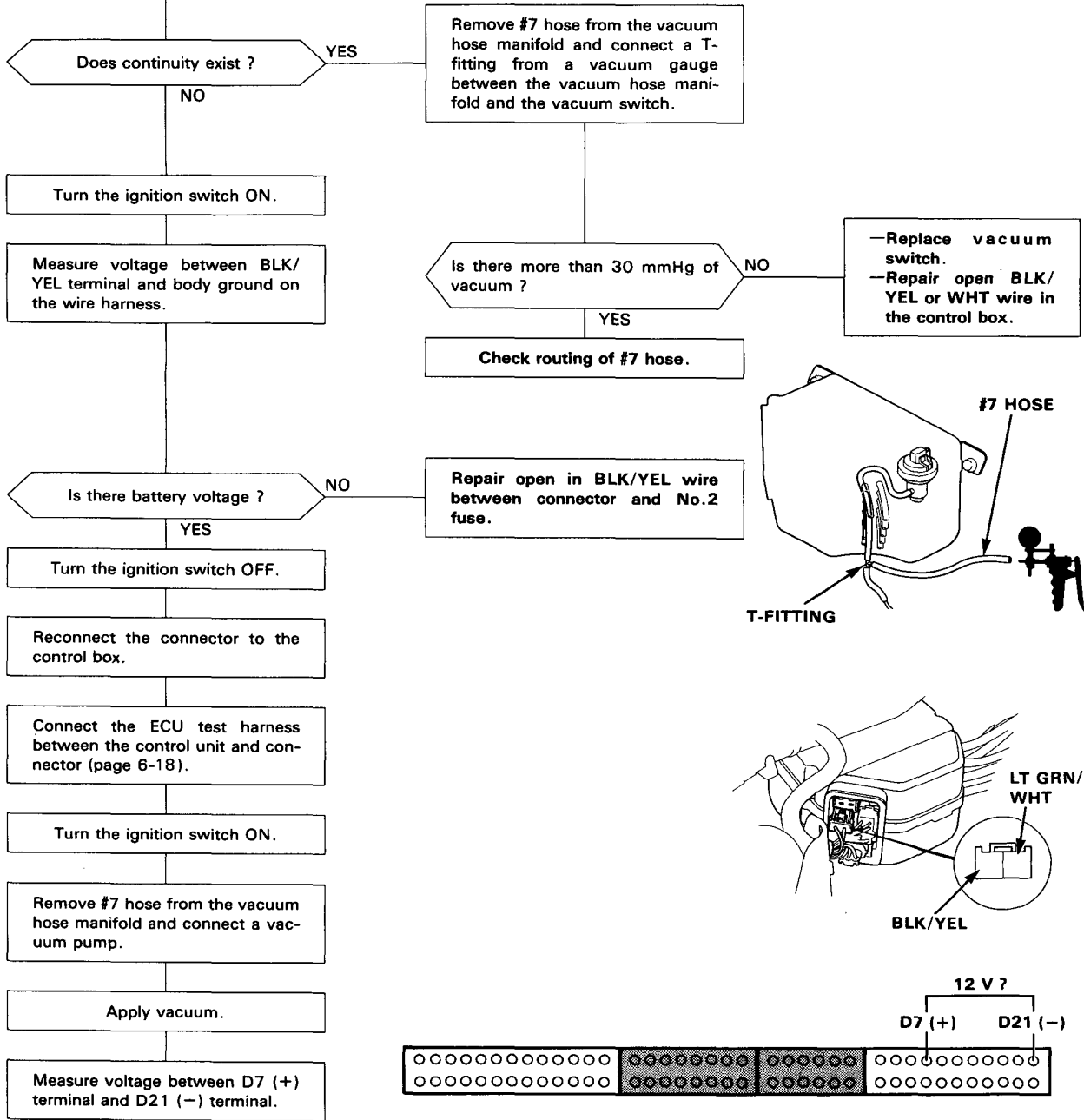
Measure resistance between No. 1 terminal and No.2 terminal on the control box.

(To page 6-27)





(From page 6-26)

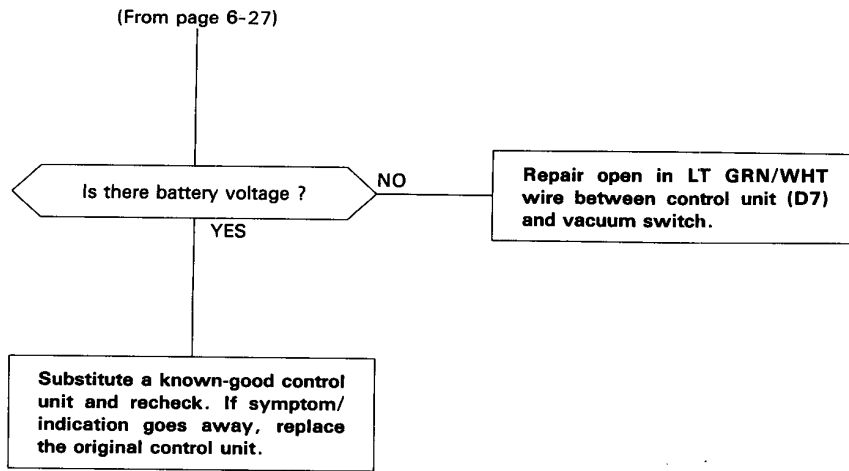


(To page 6-28)

(cont'd)

# PGM-CARB Control System

## Troubleshooting Flow Chart — Vacuum Switch (cont'd)



# Carburetor

## Symptom-to-Sub System Chart

**NOTE:**

- Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.
- Before starting inspection, check that other items that affect engine performance are within specification. Check the self-diagnosis indicator, 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 in pages 6-30 and 6-31.

PAGE		SYSTEM	IDLE SPEED/ MIXTURE	IDLE BOOST	AUTOMATIC CHOKE/ FAST IDLE SYSTEM	AIR VENT CUT-OFF SOLENOID VALVE  FLOAT LEVEL
SYMPTOM			46	32	—	—
ENGINE WON'T START						①
DIFFICULT TO START ENGINE	WHEN COLD				①	②
	WHEN WARM					②
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFICATION			②	①	
	WHEN WARM ENGINE SPEED TOO HIGH	①		②	③	
	WHEN WARM ENGINE SPEED TOO LOW	①		①		
	ROUGH IDLE/ FLUCTUATION	①		③		②
FREQUENT STALLING	WHILE WARMING UP			②	①	
	AFTER WARMING UP	①		②		②
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING				①	①
	LOSS OFF POWER					②
	AFTERBURN	①				
	HESITATION/SURGE					



POWER VALVE	PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE	SLOW AIR JET CONTROL	VACUUM CONTROLLED SECONDARY	ACCELERATOR PUMP
40	—	38	—	—
	②	②		
	①			②
	①	②		
②	②			
		②		
		②		
		③	②	
②	①			
	①	①		
			②	
③			①	③
②				①



# Carburetor

## Idle Control System

### Testing

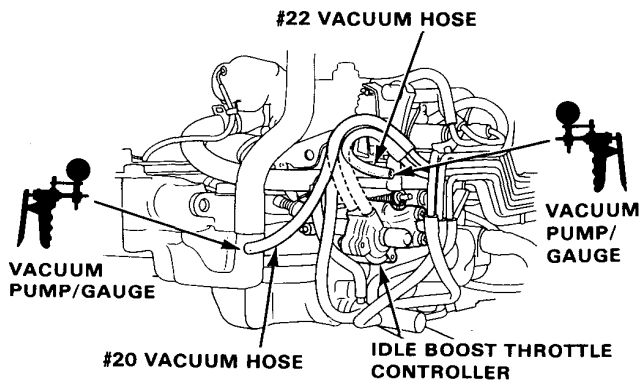
1. Start the engine and warm up to normal operating temperature (the cooling fan comes on).
2. Check the idle speed with headlights, heater blower, rear window defogger, cooling fan and air conditioner off.

Idle speed should be:

Manual	800 ± 50 min <sup>-1</sup> (rpm)
Automatic	750 ± 50 min <sup>-1</sup> (rpm) (in "D")

- If OK, go to step 4.
  - If not, go to step 3.
3. Disconnect the two vacuum hoses at idle boost throttle controller and check each for vacuum.

There should be no vacuum in both hoses.



- If there is no vacuum, check the throttle valve shaft for binding or sticking and replace the idle boost throttle controller.
- If there is vacuum at the #20 vacuum hose, go to idle boost solenoid valve troubleshooting (page 6-33).
- If there is vacuum at the #22 vacuum hose, go to A/C idle boost solenoid valve troubleshooting (page 6-35).

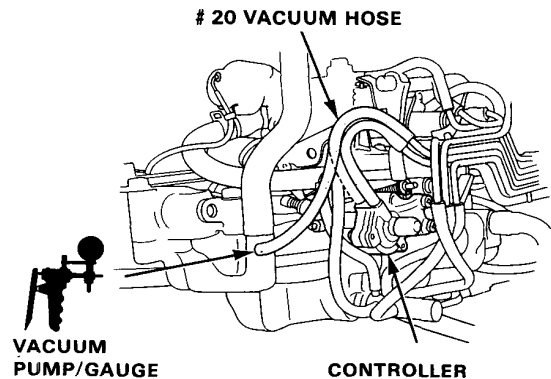
4. Disconnect the connector on the P/S oil pressure switch, and check the idle speed.

Idle speed should be:

Manual	950 ± 50 min <sup>-1</sup> (rpm)
Automatic	820 ± 50 min <sup>-1</sup> (rpm) (in "D")

- If OK, go to step 6.
- If not, go to step 5.

5. Disconnect the #20 vacuum hose at idle boost throttle controller and check vacuum wheel is turning. There should be vacuum.



- If there is vacuum, check the throttle valve shaft for binding or sticking and replace the idle boost throttle controller.
- If there is no vacuum, check the #20 and #12 vacuum line for proper connection, cracks, blockage or disconnected hose. If OK, go to the idle boost solenoid valve troubleshooting (page 6-33).

6. Check the idle speed with the A/C on.

Idle speed should be:

Manual	800 ± 50 min <sup>-1</sup> (rpm)
Automatic	750 ± 50 min <sup>-1</sup> (rpm) (in "D")

- If not, disconnect the two vacuum hoses at idle boost throttle controller and check each for vacuum.
  - If there is no vacuum at the #20 vacuum hose, check the #20 and #12 vacuum line for proper connection, cracks, blockage or disconnected hose. If OK, go to the idle boost solenoid valve troubleshooting (page 6-33).
  - If there is no vacuum at the #22 vacuum hose, check the #22 and #12 vacuum line for proper connection, cracks, blockage or disconnected hose. If OK, go to the A/C idle boost solenoid valve troubleshooting (page 6-35).



## Troubleshooting Flowchart Idle Boost Solenoid Valve

Inspection of Idle Boost Solenoid Valve.

Open the control box.

Disconnect the lower vacuum hose of the solenoid valve from the joint and connect a vacuum pump.

Disconnect #20 vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum gauge.

Start the engine.

Apply vacuum.

Is vacuum indicated on the gauge?

YES

Turn the ignition switch OFF.

Turn steering wheel slowly.

NO

Disconnect the connector on the control box.

Start the engine.

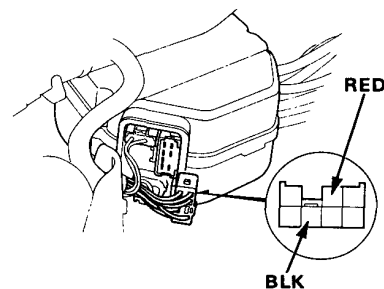
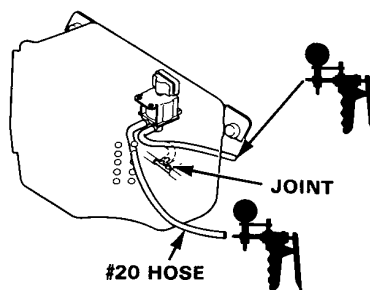
Measure voltage between RED (+) and BLK (-) terminals

Is there voltage?

YES

Replace the solenoid valve.

Check the self-diagnosis indicator (page 6-20). If OK, check the input troubleshooting (page 6-20).



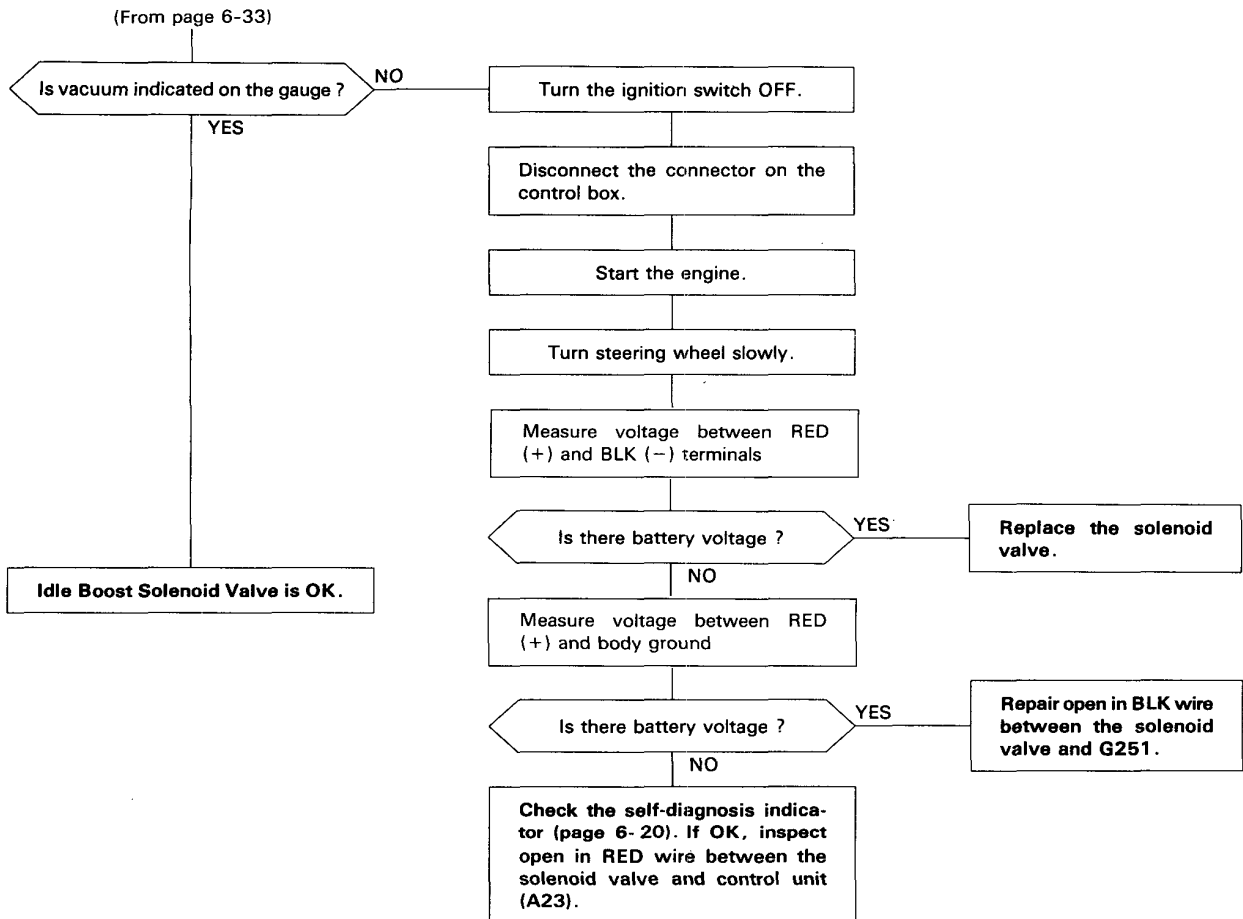
Apply vacuum.

(To page 6-34)

(cont'd)

# Carburetor

## Idle Control System (cont'd)





### Troubleshooting Flowchart A/C Idle Boost Solenoid Valve

Inspection of A/C Idle Boost Solenoid Valve

Open the control box.

Disconnect the lower vacuum hose of the solenoid valve from the joint and connect a vacuum pump.

Disconnect #22 vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum gauge.

Start the engine.

Apply vacuum.

Is vacuum indicated on the gauge ?

YES

Turn the ignition switch OFF.

Blower switch ON.

Disconnect the connector on the control box.

Turn the A/C switch ON.

Start the engine.

Measure voltage between GRN (+) terminal and BLK (-) terminal.

Is there voltage ?

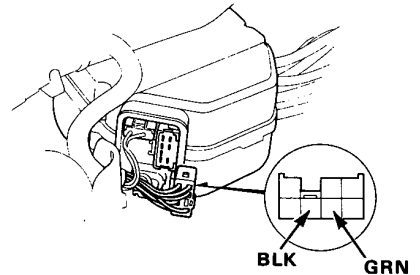
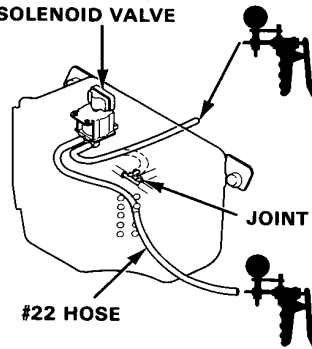
YES

Check the self-diagnosis indicator (page 6-20).  
If OK, check the input troubleshooting (page 6-20).

NO

Replace the solenoid valve.

A/C IDLE BOOST SOLENOID VALVE

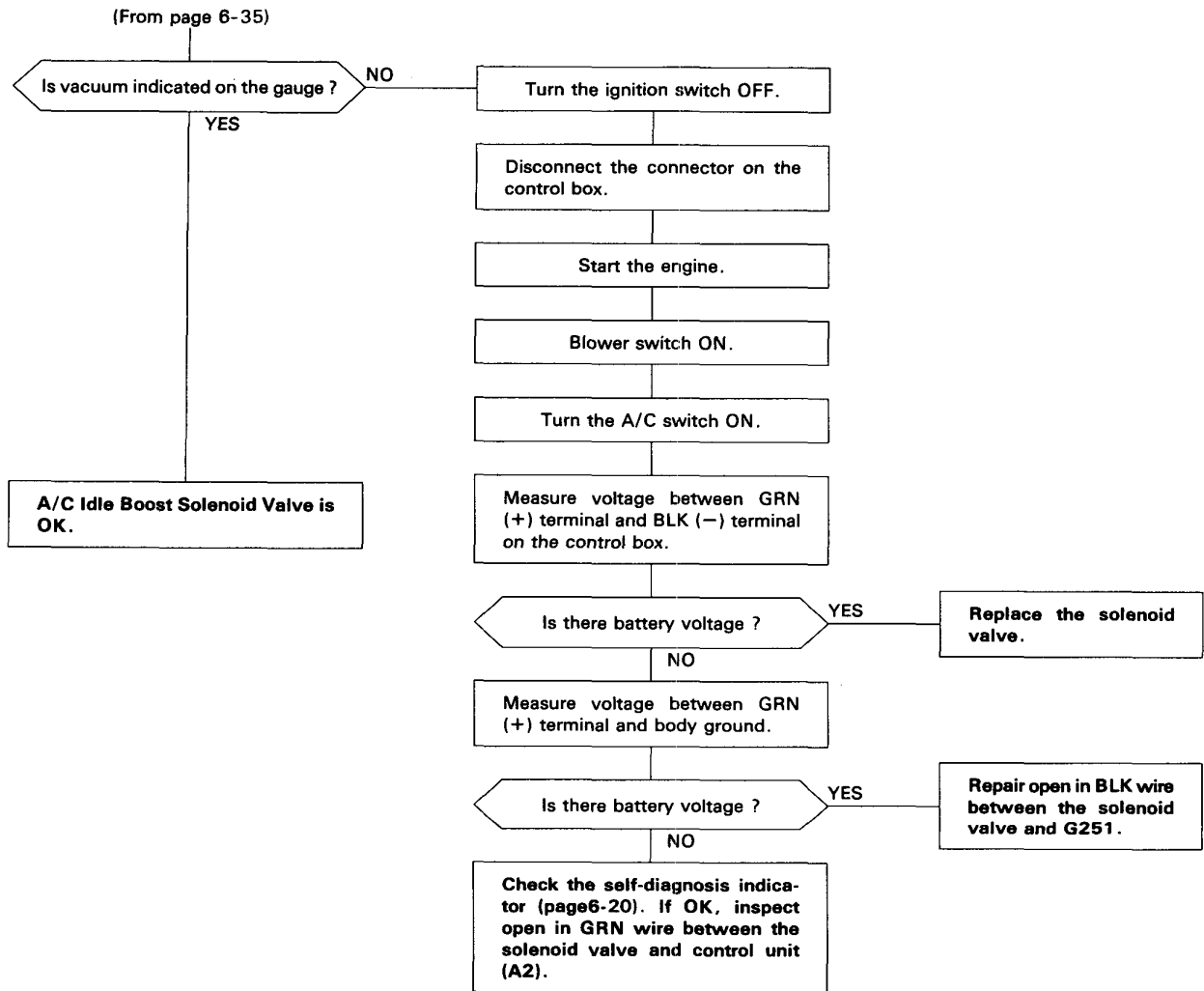


(To page 6-36)

(cont'd)

# Carburetor

## Idle Control System (cont'd)

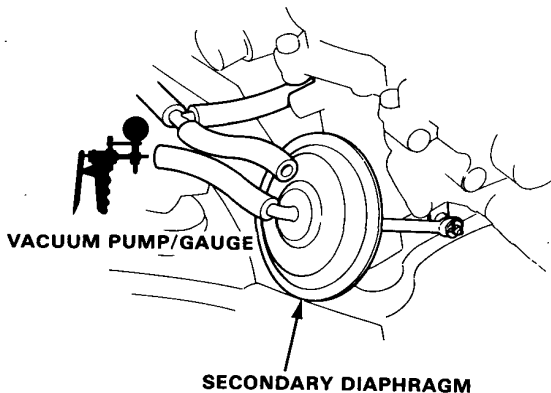




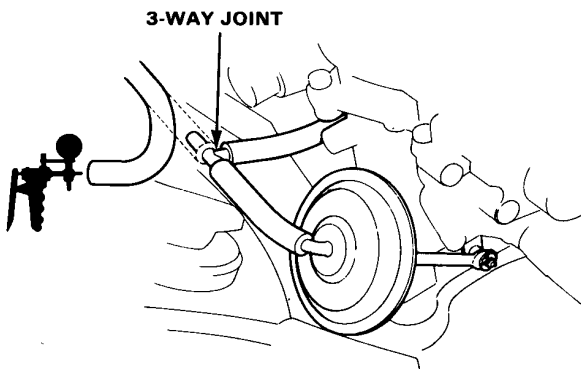
## Vacuum Controlled Secondary

### Testing

1. Disconnect the secondary diaphragm vacuum hose and attach a spare piece of hose between the diaphragm and a vacuum pump.
2. Open the throttle valve fully and apply a vacuum. Check the diaphragm rod moves as vacuum is applied and that the vacuum then remains steady.



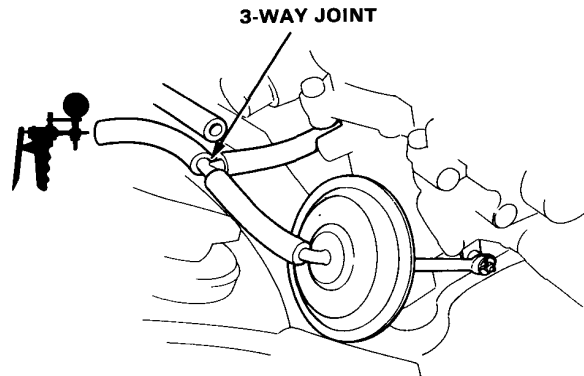
- If the vacuum does not hold or the rod does not move, first check the hose for proper connection and condition, then replace the diaphragm and recheck.
3. Start the engine and warm up to normal operating temperature (the cooling fan comes on).
  4. Disconnect the vacuum hose from the 3-way joint connect a vacuum pump and apply vacuum. It should not hold vacuum.



- If it holds vacuum, check the vacuum line for proper connection or cracks. If OK, go to the air leak solenoid valve troubleshooting (page 6-38).
5. Raise the engine speed to 5,000 min<sup>-1</sup> (rpm), then close the throttle suddenly. And then apply vacuum.

It should hold vacuum.

- If it does not hold vacuum, check the vacuum line for proper connection, blockage or disconnected hose. If OK, go to the air leak solenoid valve troubleshooting (page 6-38).
6. Disconnect the vacuum hose from the 3-way joint and connect to a vacuum pump/gauge. Apply a vacuum. It should not hold vacuum.



- If vacuum does not hold, test is complete.
- If vacuum is held, check the hose, the 3-way joint and clean the vacuum port.

# Carburetor

## Slow Air Jet Control System

### Troubleshooting Flowchart Air Leak Solenoid Valve

Inspection of Air Leak Solenoid Valve.

Disconnect the #2 vacuum hose from the carburetor and connect a vacuum pump, then cap the carburetor.

Start the engine.

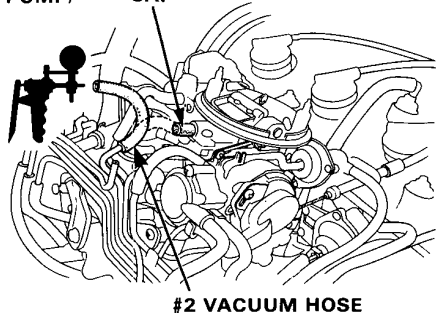
Apply 100 mmHg (4 in. Hg) vacuum to the hose.

Does solenoid valve hold vacuum ?

YES

Raise the engine speed to 5,000 min<sup>-1</sup> (rpm), then close the throttle suddenly.

VACUUM PUMP/  
GAUGE      CAP



NOTE: Engine coolant temperature must be below 63°C (145°F).

Turn the ignition switch OFF.

Disconnect the connector on the control box.

Start the engine.

Measure voltage between BLU/YEL (+) terminal and BLK (-) terminal.

Is there battery voltage ?

YES

Replace the solenoid valve.

NO

Measure voltage between BLU/YEL (+) terminal and body ground.

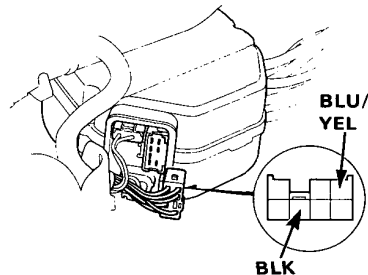
Is there battery voltage ?

YES

Repair open in BLK wire between the solenoid valve and G251.

NO

Check the self-diagnosis indicator (page 6-20). If OK, inspect open in wire between the solenoid valve and control unit (A26).



(To page 6-39)

# Carburetor

## Slow Air Jet Control System

### Troubleshooting Flowchart Air Leak Solenoid Valve

Inspection of Air Leak Solenoid Valve.

Disconnect the #2 vacuum hose from the carburetor and connect a vacuum pump, then cap the carburetor.

Start the engine.

Apply 100 mmHg (4 in. Hg) vacuum to the hose.

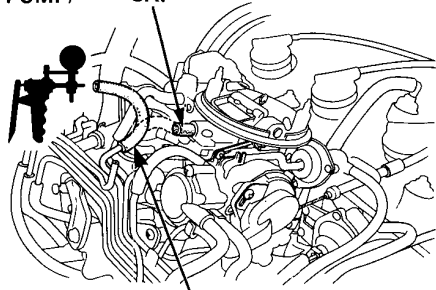
Does solenoid valve hold vacuum ?

YES

Raise the engine speed to 5,000 min<sup>-1</sup> (rpm), then close the throttle suddenly.

VACUUM PUMP/  
GAUGE

CAP



#2 VACUUM HOSE

NOTE: Engine coolant temperature must be below 63°C (145°F).

Turn the ignition switch OFF.

Disconnect the connector on the control box.

Start the engine.

Measure voltage between BLU/YEL (+) terminal and BLK (-) terminal.

Is there battery voltage ?

YES

Replace the solenoid valve.

NO

Measure voltage between BLU/YEL (+) terminal and body ground.

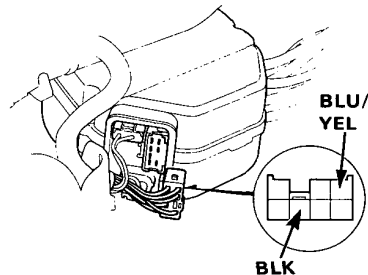
Is there battery voltage ?

YES

Repair open in BLK wire between the solenoid valve and G251.

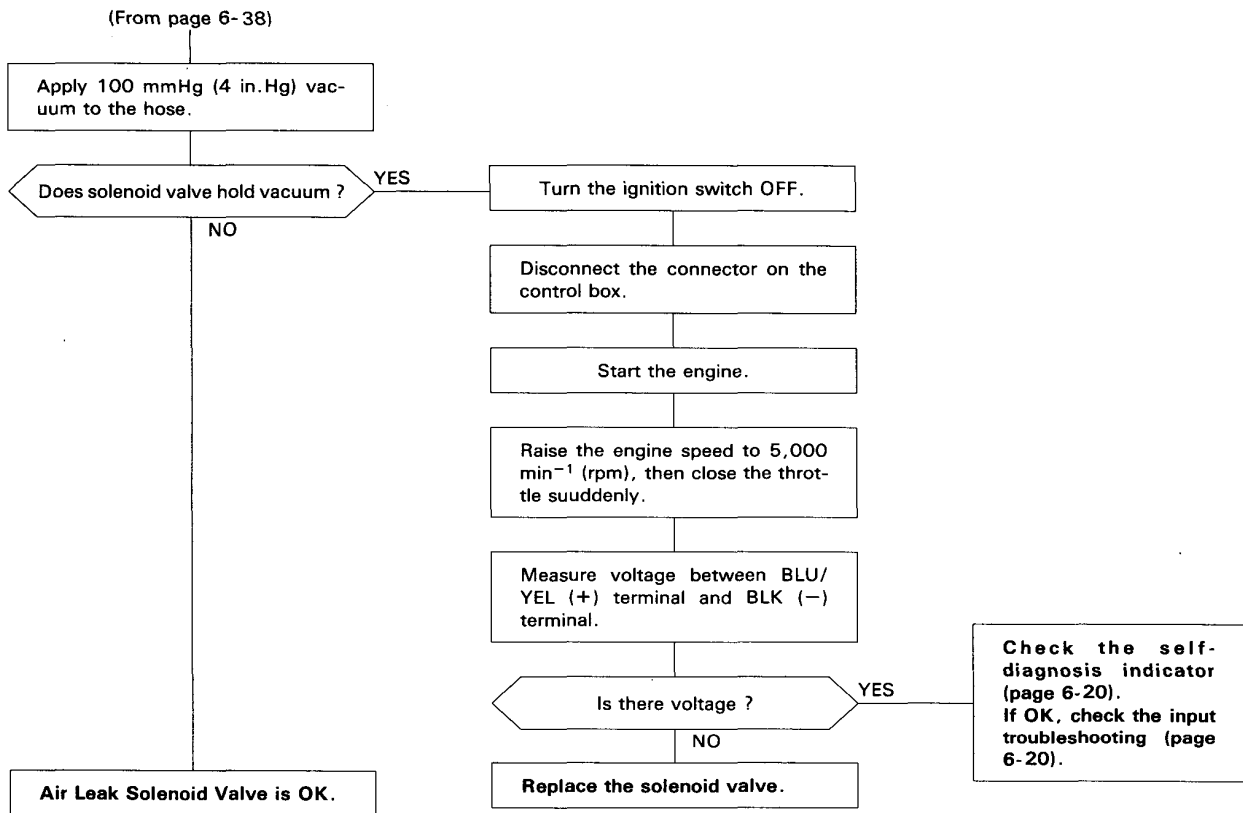
NO

Check the self-diagnosis indicator (page 6-20). If OK, inspect open in wire between the solenoid valve and control unit (A26).



(To page 6-39)





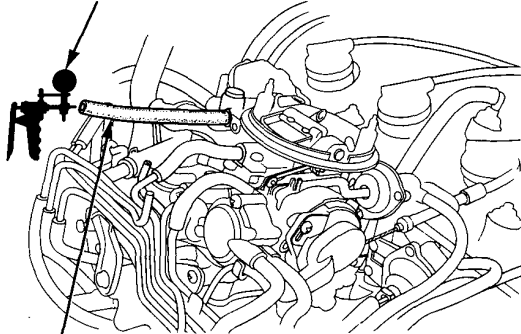
# Carburetor

## Power Valve

### Testing

1. Disconnect the #14 vacuum hose from the vacuum hose manifold and connect a vacuum pump. Apply vacuum and listen for a clicking noise from the power valve.

VACUUM PUMP/GAUGE

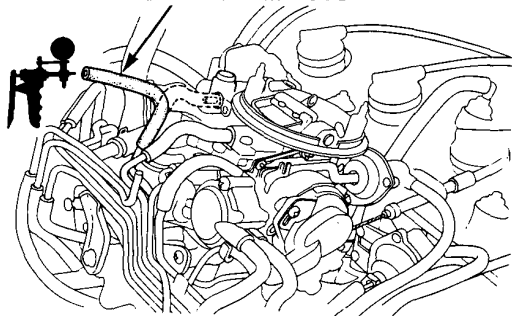


#14 VACUUM HOSE

- If a clicking sound is heard, go on to step 2.
- If no sound is heard, replace the power valve and retest.

2. Disconnect the #14 vacuum hose from the carburetor and connect a vacuum gauge to the hose.

#14 VACUUM HOSE



3. Start the engine and check the vacuum.  
There should be no vacuum for about 3 seconds after the engine is started. And there should be vacuum within 15 seconds after the engine is started.  
NOTE: The engine coolant temperature must be below 30°C (86°F).

- If not, check the #14 and #12 vacuum line for proper connection, cracks, blockage or disconnected hose. If OK, go to the power valve control solenoid valve troubleshooting (page 6-41).

4. Warm up to normal operating temperature (the cooling fan comes on).

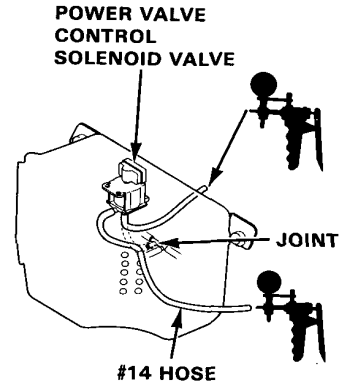
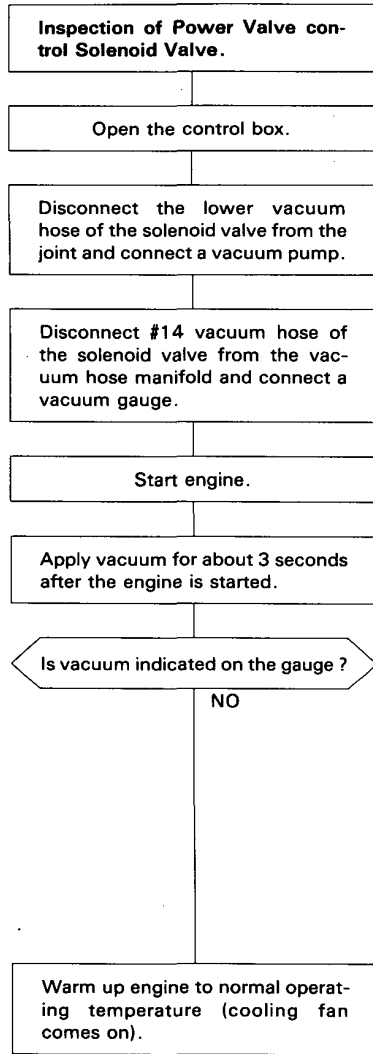
5. Check the vacuum.

There should be vacuum.

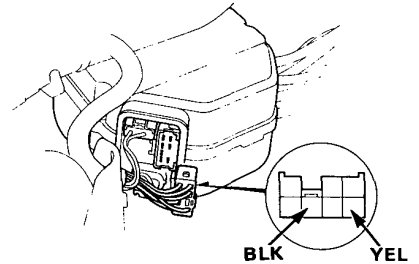
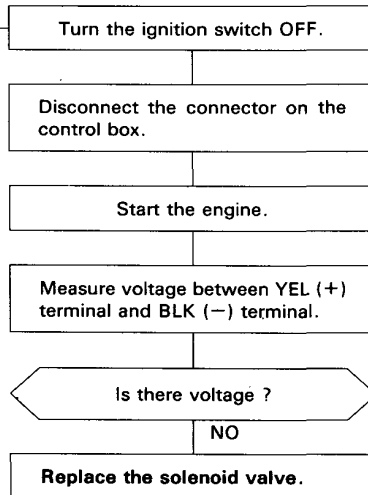
- If not, check the #14 and #12 vacuum line for proper connection, cracks, blockage or disconnected hose. If OK, go to the power valve control solenoid valve troubleshooting (page 6-41).



### Troubleshooting Flowchart Power Valve Control Solenoid Valve



**NOTE:** The engine coolant temperature must be below 30°C (86°F)



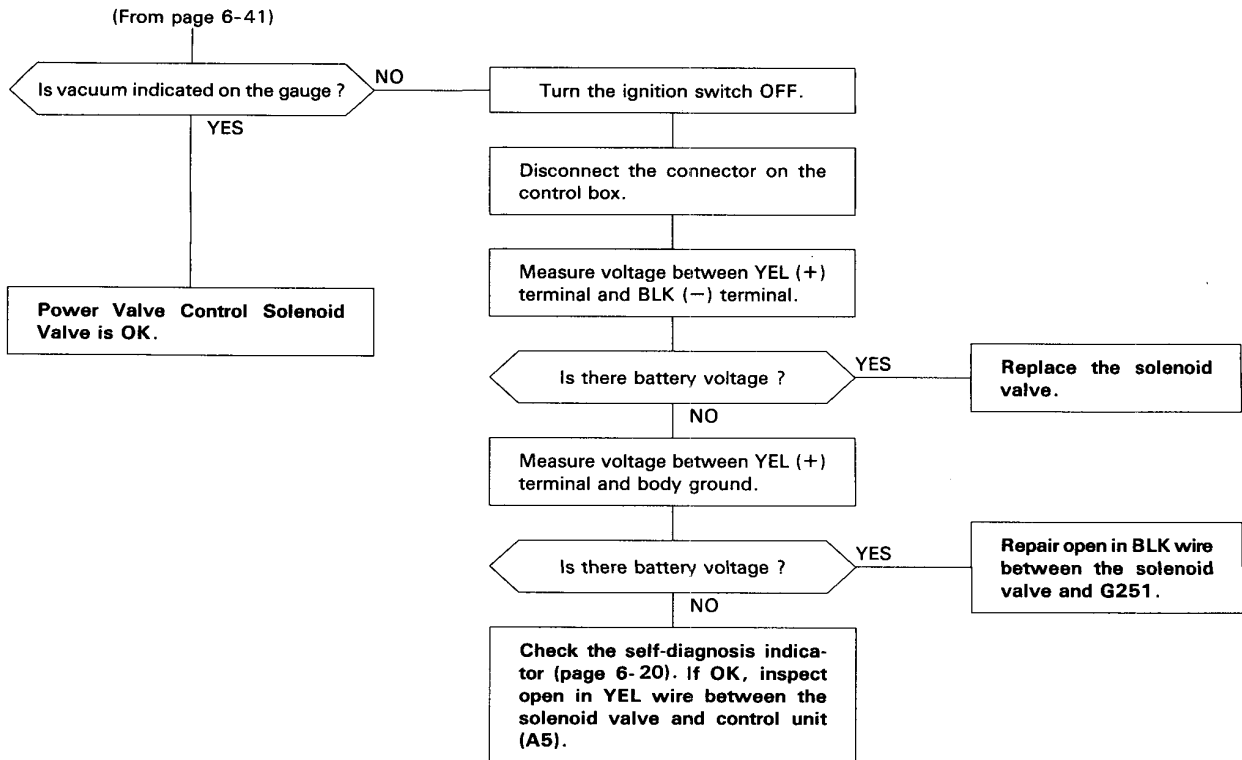
**Check the self-diagnosis indicator (page 6-20). If OK, substitute a known-good control unit and retest. If symptom goes away, replace the original control unit.**

(To page 6-42)

(cont'd)

# Carburetor

## Power Valve (cont'd)





## Idle Speed/Mixture

(KS, KG)

### Inspection/Adjustment

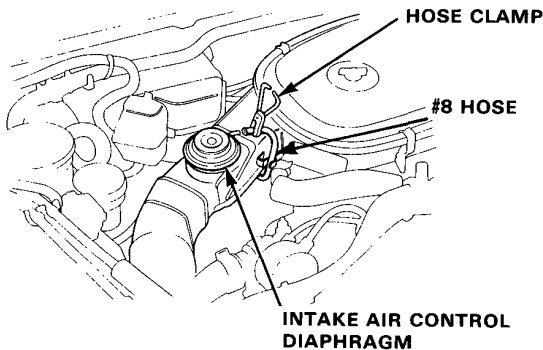
#### Propane Enrichment Method

**⚠ WARNING** Do not smoke during this procedure. Keep any open flame away from your work area.

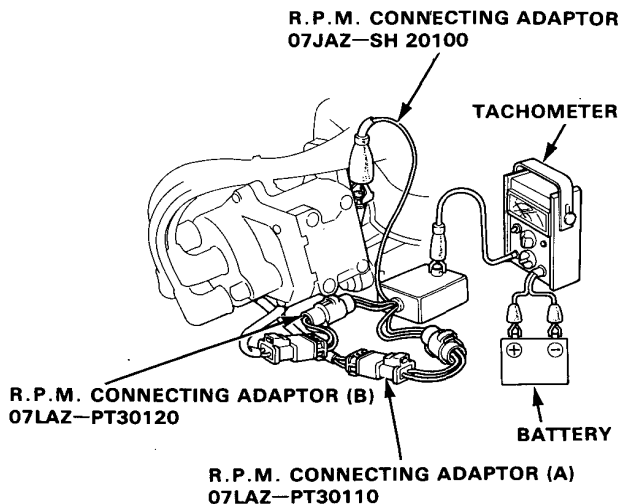
#### NOTE:

- This procedure requires a propane enrichment kit.
- Check that the self diagnosis indicator before making idle speed and mixture inspections.

1. Start the engine and warm up to normal operating temperature (the cooling fan comes twice).
2. Disconnect the #8 vacuum hose from the intake air control diaphragm and clamp the hose end.

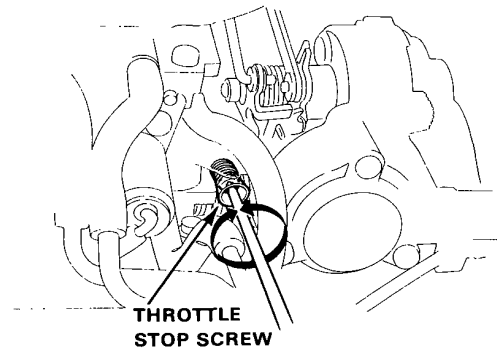


3. Connect a tachometer.



4. Turn the ignition switch OFF. Restart the engine and hold engine at idle for 2 minutes. And hold engine at  $2,500-3,000 \text{ min}^{-1}$  (rpm) for 1 minute. Check idle speed with the headlights, heater blower, rear window defogger, cooling fan and air conditioner off (with DAY LIGHT: headlights on). Idle speed should be:

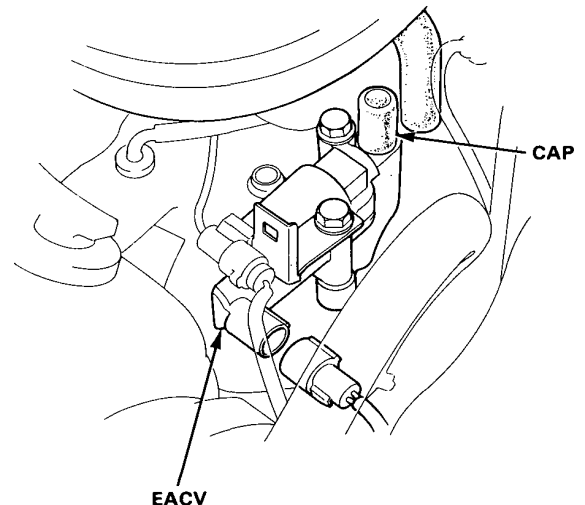
Manual	$800 \pm 50 \text{ min}^{-1}$ (rpm)
Automatic	$750 \pm 50 \text{ min}^{-1}$ (rpm) (in "D")



Adjust the idle speed, if necessary, by turning the throttle stop screw.

NOTE: If the idle speed is excessively high, check the throttle control system (page 6-59)

5. Disconnect the 2P connector from the EACV and disconnect the hose from the EACV, then cap the EACV.

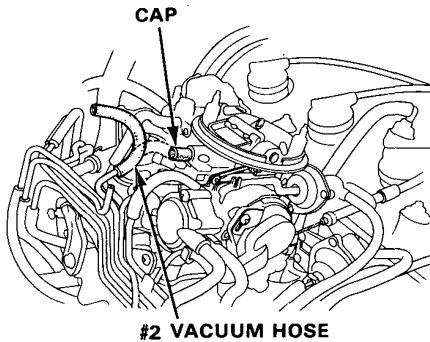


(cont'd)

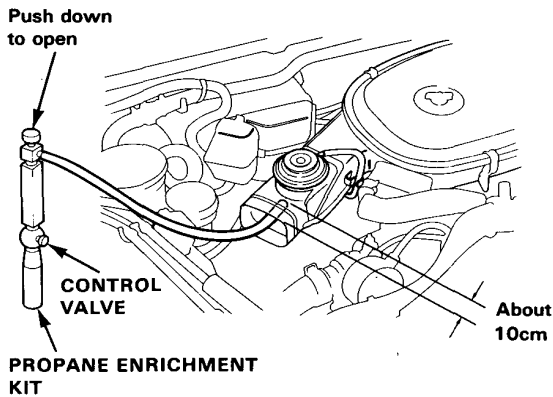
# Carburetor

## Idle Speed/Mixture (cont'd)

6. Disconnect the #2 vacuum hose from the carburetor, then cap the carburetor.

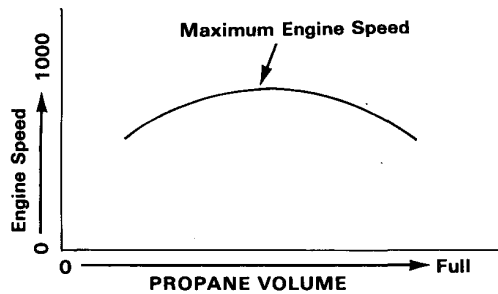


7. Disconnect air cleaner intake tube from air intake duct.
8. Insert the hose of the propane enrichment kit into the intake tube about 10 cm.  
NOTE: Check that propane bottle has adequate gas before beginning test.



9. With engine idling, depress push button on top of propane device, then slowly open the propane control valve to obtain maximum engine speed. Engine speed should increase as percentage of propane injected goes up.

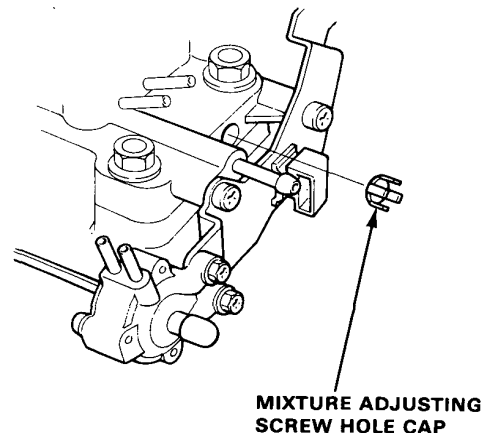
NOTE: Open the propane control valve slowly; a sudden burst of propane may stall the engine.



Engine speed increase should be:

Manual	$160 \pm 20 \text{ min}^{-1} \text{ (rpm)}$
Automatic	$50 \pm 10 \text{ min}^{-1} \text{ (rpm)}$ (in "D")

- If engine speed does not increase per specification, mixture is improperly adjusted. Go to step 10.
  - If engine speed increases per specification, go to step 14.
10. Remove the air cleaner and close the propane control valve.
11. Remove the mixture adjusting screw hole cap.





12. Start engine and warm up to normal operating temperature ; the cooling fan will come on.
13. Reinstall the propane enrichment kit and recheck maximum propane enriched engine speed.

- If the propane enriched speed is too low, mixture is too rich: turn the mixture screw 1/4-turn clockwise and recheck.
- If the propane enriched speed is too high, mixture is too lean: turn the mixture screw 1/4-turn counter-clockwise and recheck.

14. Close the propane control valve speed and remove the BACK UP fuse for 10 seconds to reset control unit. Recheck idle speed.

**Idle speed should be:**

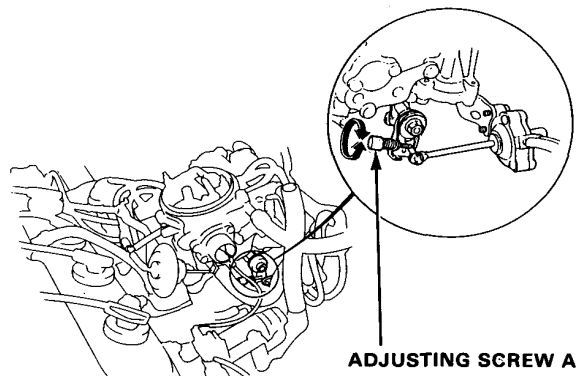
Manual	$800 \pm 50 \text{min}^{-1}$ (rpm)
Automatic	$750 \pm 50 \text{min}^{-1}$ (rpm) (in "D")

- If idle speed is as specified (step 4), go to step 15.
- If idle speed is not as specified, adjust by turning throttle stop screw, then repeat steps 13 and 14.

15. Remove propane enrichment kit and reconnect air cleaner intake tube on the air intake duct.
16. Reinstall the mixture adjusting screw hole cap.
17. Disconnect the connector on the P/S oil pressure switch, and check the idle speed.

**Idle speed should be:**

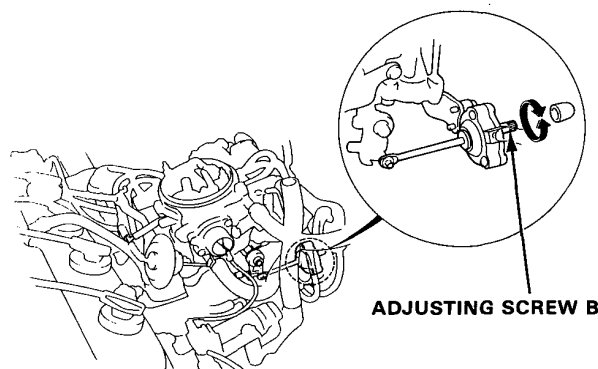
Manual	$950 \pm 50 \text{min}^{-1}$ (rpm)
Automatic	$820 \pm 50 \text{min}^{-1}$ (rpm) (in "D")



Adjust the idle speed, if necessary, by turning the adjusting screw A.

18. If equipped with air conditioner, check the idle speed with the A/C on (with DAY LIGHT: headlights on). **Idle speed should be:**

Manual	$800 \pm 50 \text{min}^{-1}$ (rpm)
Automatic	$750 \pm 50 \text{min}^{-1}$ (rpm) (in "D")



Adjust the idle speed, if necessary, by turning the adjusting screw B.

(cont'd)

# Carburetor

## Idle Speed / Mixture (cont'd)

(Except KS, KG, KQ)

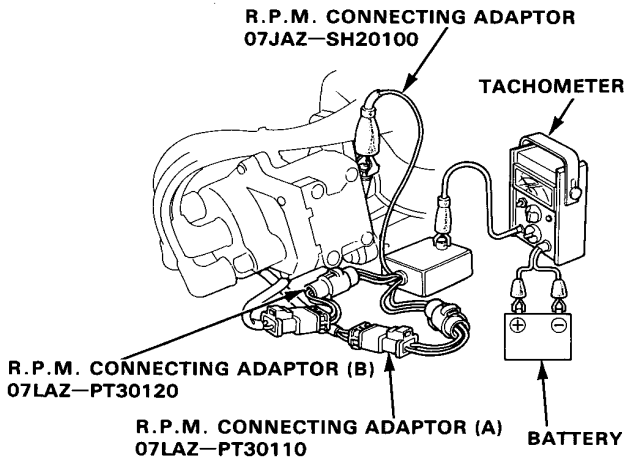
### CO Meter Method

**⚠ WARNING** Do not smoke during this procedure. Keep any open flame away from your work area.

#### NOTE:

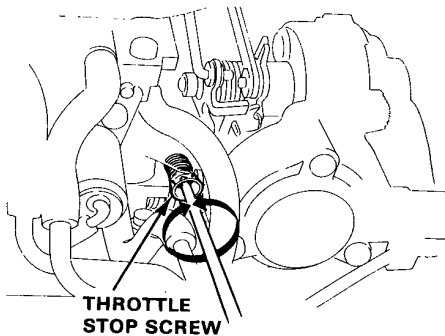
- Check that the self-diagnosis indicator (KX, KE with CATA) before making idle speed and mixture inspections.

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



3. Turn the ignition switch OFF. Restart the engine and hold engine at idle for 2 minutes. And hold engine at 2,500–3,000 $\text{min}^{-1}$  (rpm) for 1 minute. Check idle speed with the headlights, heater blower, rear window defogger, cooling fan and air conditioner off (with DAY LIGHT: headlights on). Idle speed should be:

Manual	800 $\pm$ 50 $\text{min}^{-1}$ (rpm)
Automatic	750 $\pm$ 50 $\text{min}^{-1}$ (rpm)(in "D")



Adjust the idle speed, if necessary, by turning the throttle stop screw.

NOTE: If the idle speed is excessively high, check the throttle control system (page 6-59)

4. Calibrate the NDIR CO Meter in accordance with the manufacturer's recommended procedures. Insert exhaust gas sampling probe into the tailpipe at least 40 cm.
5. Turn the ignition switch OFF. Restart the engine and hold engine at idle for 2 minutes. And hold engine at 2,500–3,000  $\text{min}^{-1}$  (rpm) for 1 minute. Check specification for idle CO with cooling fan, air conditioner OFF and headlights OFF.

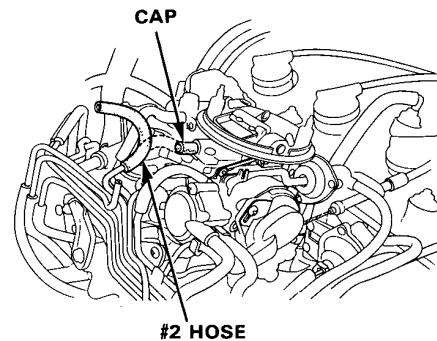
#### Specified CO%:

KX, KE with CATA: 0.1%

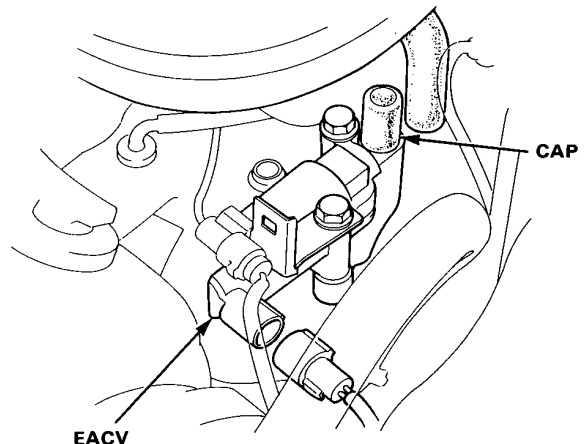
Except KX, KE with CATA: 1 $\pm$ 1%

- If idle CO is as specified, go to step 14.
- If not, go to step 6 through 13.

6. KX : Disconnect the #2 vacuum hose from the carburetor, then cap the carburetor.



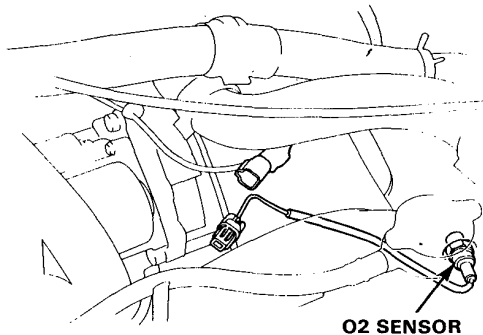
7. KX: Disconnect the 2P connector from the EACV and disconnect the hose from the EACV, then cap the EACV.



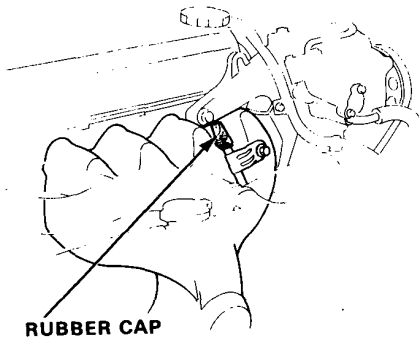




8. **KX:**  
Disconnect the wire harness from the O<sup>2</sup> sensor.



9. **KX:**  
Remove the rubber cap from the gas pipe.



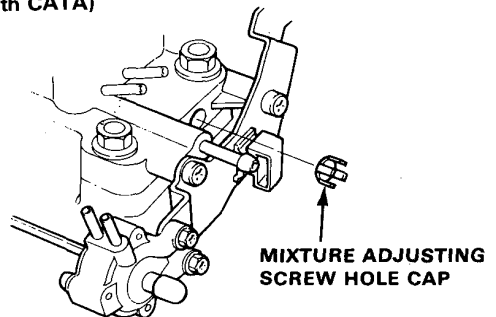
10. **KX:**  
Turn the ignition switch OFF. Restart the engine and hold engine at idle for 2 minutes. And hold engine at 2,500–3,000 min<sup>-1</sup> (rpm) for 1 minute. Check specification for idle CO.

**Specified CO%;**  
**KX: 2.3 ± 1.0%**  
**KE with CATA: 2.5 ± 0.5%**

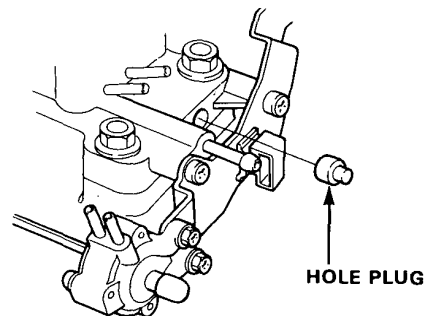
- If not, specification, go to step 11.

11. Remove mixture adjusting screw hole plug and adjust by turning mixture adjusting screw to obtain proper CO reading.

(KX, KE with CATA)



(Except KX, KE with CATA)



— Turning mixture adjusting screw

clockwise: CO reading decreases  
counterclockwise: CO reading increases

Readjust idle speed if necessary, and recheck idle CO.

12. **KX:**  
Reconnect the connector and hose. Remove BACK UP fuse for 10 seconds to reset control unit.

13. **KX, KE with CATA**  
Turn the ignition switch OFF. Restart the engine and hold engine at idle for 2 minutes. And hold engine at 2,500–3,000 min<sup>-1</sup> (rpm) for 1 minute. Recheck idle CO.

**Specified CO%: 0.1%**

- If idle CO is as specified, go to step 14.
- If not, check the self-diagnosis indicator (page 6-20). If not, inspect the EACV and the catalytic converter (page 6-53), then repeat step 6.

14. Recheck idle speed.  
**Idle speed should be:**

Manual	800 ± 50 min <sup>-1</sup> (rpm)
Automatic	750 ± 50 min <sup>-1</sup> (rpm) (in "D")

(cont'd)

# Carburetor

## Idle Speed/Mixture (cont'd)

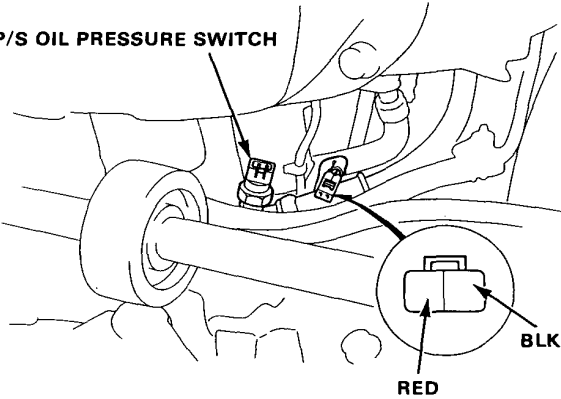
- If idle speed is as specified, go to step 15.
- If idle speed is not as specified, adjust by turning throttle stop screw, then repeat step 5.

15. Reinstall the mixture adjusting screw hole cap.

16. Disconnect the connector on the P/S oil pressure switch.

Except KX, KE with CATA; Connect a jumper wire between the RED terminal and the BLK terminal.

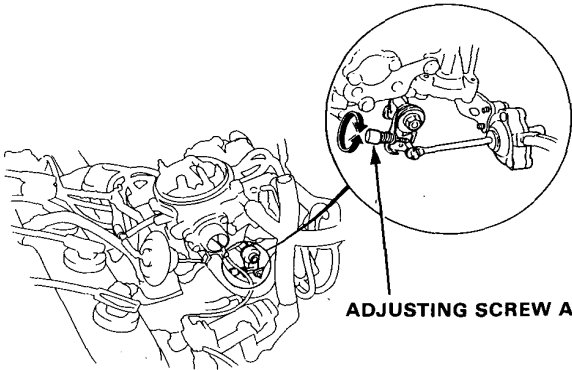
P/S OIL PRESSURE SWITCH



17. Check the idle speed.

Idle speed should be :

Manual	$950 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
Automatic	$820 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (in "D")

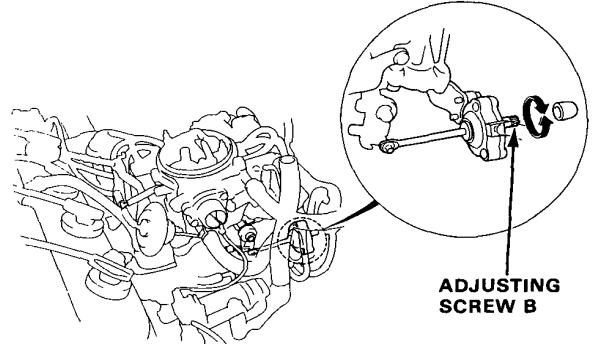


Adjust the idle speed, if necessary, by turning the adjusting screw A.

18. If equipped with air conditioner, check the idle speed with the A/C on.

Idle speed should be:

Manual	$800 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
Automatic	$750 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (in "D")



Adjust the idle speed, if necessary, by turning the adjusting screw B.



# Fuel Supply System

## Symptom-to-sub System Chart

**NOTE:**

- Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.
- Before starting inspection, check that other items that affect engine performance are within specification. Check the self-diagnosis indicator, 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 in this page.

PAGE		SYSTEM	FUEL FILTERS	FUEL PUMP	FUEL CUT-OFF RELAY	FUEL TANK	CONTAMINATED FUEL
SYMPTOM			---	---	---	---	*
ENGINE WON'T START			③	①	②		②
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING		①				①
	LOSS OF POWER		①				①

\* Fuel with dirt, water or a high percentage of alcohol is considered contaminated.

# Air Intake System



## Symptom-to-Sub System Chart

**NOTE:**

- Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.
- Before starting inspection, check that other items that affect engine performance are within specification. Check the self-diagnosis indicator, valve clearance, air cleaner, 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 in this page.

PAGE	SYSTEM	THROTTLE CABLE	AIR INTAKE CONTROL
SYMPTOM		—	—
LOSS OF POWER			①
AFTERBURN			①
HESITATION/SURGE			①

# Emission Control System

## Symptom-to-sub System Chart

**NOTE:**

- Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try next system ②, etc.
- Before starting inspection, check that other items that affect engine performance are within specification. Check the self-diagnosis indicator, 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 in this page.

PAGE		SYSTEM	FEEDBACK CONTROL	THROTTLE CONTROL	EGR	EVAPORATIVE CONTROL	AIR INJECTION
SYMPTOM			—	59	57	60	54
ENGINE WON'T START					②	①	
DIFFICULT TO START ENGINE	WHEN COLD	①	②	②	②	①	
	WHEN WARM	①	②	③	③	①	
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFICATION	①	②	②	②		
	WHEN WARM ENGINE SPEED TOO HIGH		①				
	WHEN WARM ENGINE SPEED TOO LOW	①			②		
	ROUGH IDLE/ FLUCTUATION	①			②		
FREQUENT STALLING	WHILE WARMING UP	①			②		
	AFTER WARMING UP	①			②		
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	②			①		
	LOSS OFF POWER	①				①	
	AFTERBURN	①		②			②
	HESITATION/SURGE	①			②		



## Tailpipe Emissions

### Inspection

**NOTE:** It is not possible to use a CO meter to adjust the idle mixture; the effect of the catalytic converter prevents accurate tracking of such small changes in air-fuel ratio.

**▲ WARNING** Do not smoke during this procedure. Keep any open flame away from your work area.

1. KS, KG:  
Check the idle speed/mixture using the propane enrichment method.
2. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
3. Start the engine and warm it up to normal operating temperature (the cooling fan comes on twice).
4. Turn the ignition switch OFF. Restart the engine and hold engine at idle for 2 minutes. And hold engine at 2,500–3,000 min<sup>-1</sup> (rpm) for 1 minute.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

### Specified CO %:

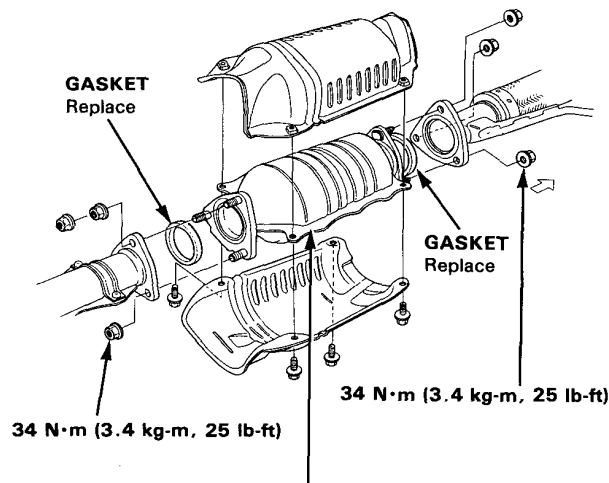
KX, KS, KG, KE with CATA: below 0.1%

Except KX, KS, KG, KE with CATA: 1.0 ± 1.0%

## Catalytic Converter

### Inspection

If excessive exhaust system back-pressure is suspected, remove the catalytic converter from the car and make a visual check for plugging, melting or cracking of the catalyst. Replace the catalytic converter if any of the visible area is damaged or plugged.



### CATALYTIC CONVERTER

Removal Installation, section 5  
Inspect housing for cracks or other damage.  
Inspect element for clogging by looking through the inside.

# Emission Control System

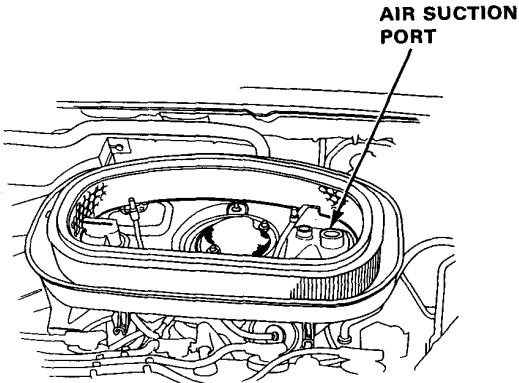
## Air Injection Control

### Testing

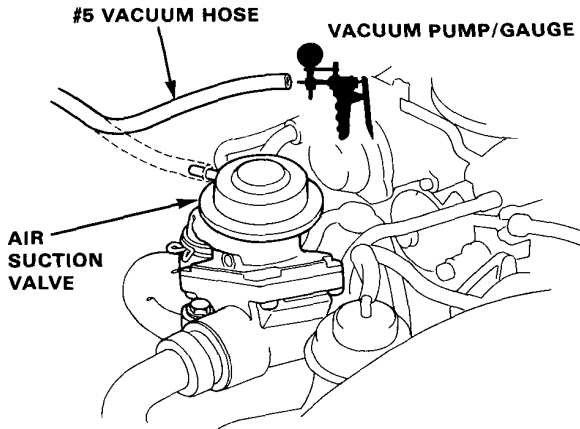
1. Start the engine.
2. Remove the air cleaner cover and filter.
3. Start the engine and check for a bubbling noise from the air suction port idle.

A bubbling noise should not be heard.

NOTE: Engine coolant temperature must be below 30°C (86°F)



- If a bubbling noise is heard, disconnect the #5 vacuum hose from the air suction valve and connect a vacuum pump. There should be no vacuum.



- If there is no vacuum, replace air suction valve and retest.
- If there is vacuum, go to troubleshooting (page 6-55).

4. Warm up to normal operating temperature.  
NOTE: Engine coolant temperature must be below 70°C (158°F).

A bubbling noise should be heard.

- If bubbling noise is not heard, disconnect the #5 vacuum hose from the air suction valve and connect a vacuum pump.

There should be vacuum.

- If there is vacuum, replace the air suction valve and retest.
- If there is no vacuum, check the #5 and #12 vacuum line for proper connection, cracks, blockage or disconnected hose. If OK, go to troubleshooting (page 6-55).





### Troubleshooting Flow Chart Air Suction Control Solenoid Valve

Inspection of Air Suction Control Solenoid Valve.

Open the control box lid.

Disconnect the lower vacuum hose of the solenoid valve from the joint and connect a vacuum pump.

Disconnect the #5 vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum gauge.

Start the engine.

Apply vacuum.

Does solenoid valve hold vacuum ?

NO

Turn the ignition switch OFF.

Disconnect the connector on the control box.

Warm up normal operating temperature.

NOTE: Engine coolant temperature must be below 70 °C (158 °F)

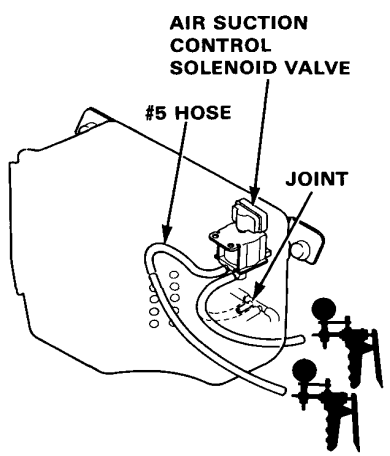
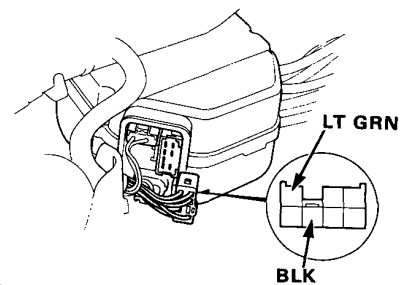
Start the engine.

Measure voltage between LT GRN (+) and BLK (-) terminals

Is there voltage ?

NO

Replace the solenoid valve.



NOTE: Engine coolant temperature must be below 30 °C (86 °F)

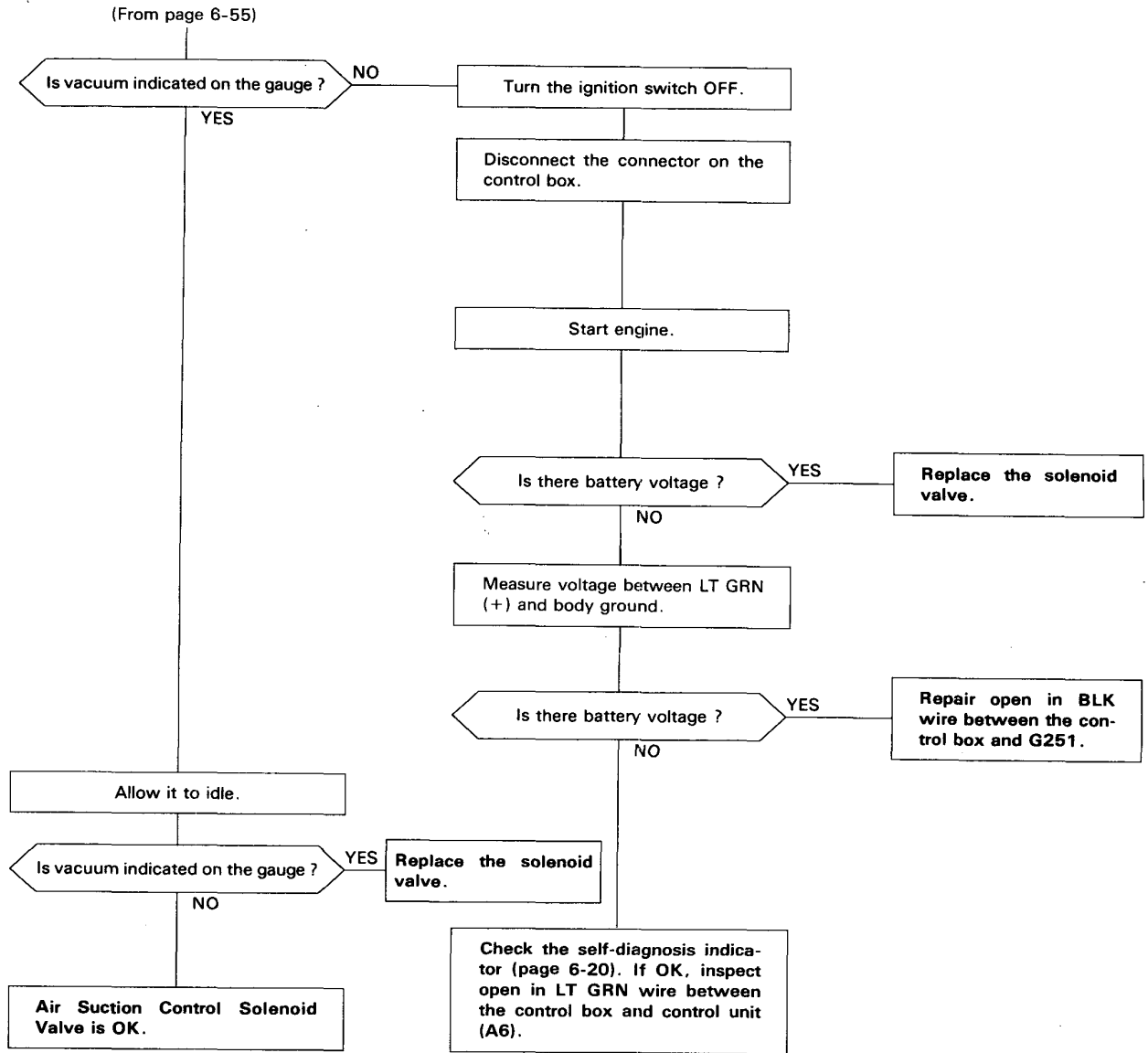
Check the self-diagnosis indicator (page 6-20). If OK, substitute a known-good control unit and retest. If symptom goes away, replace the original control unit.

(To page 6-56)

(cont'd)

# Emission Control System

## Air Injection Control (cont'd)



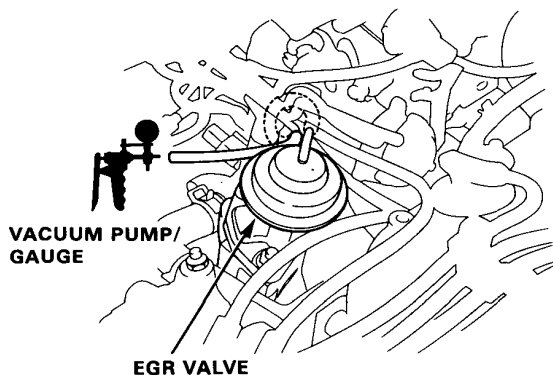


## EGR System

### Testing (COLD ENGINE)

NOTE: The engine coolant temperature must be below the thermostatic valve B set temperature (55°C, 131°F).

1. Disconnect the vacuum hose from the EGR valve and connect a vacuum gauge to the hose.



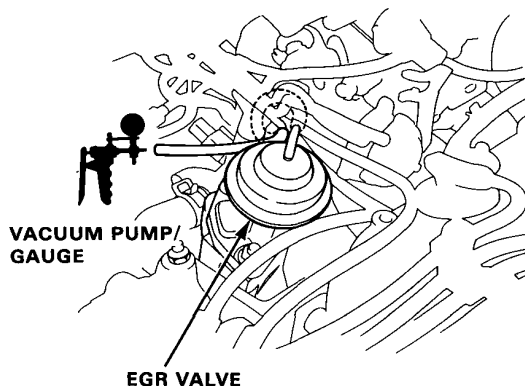
2. Start the engine and raise the engine speed to 3,000  $\text{min}^{-1}$  (rpm)

Vacuum should not be available.

- If vacuum is not available, go on to the hot engine inspection (right column).
- If vacuum is available, replace thermostatic valve B and retest.

### Testing (HOT ENGINE)

1. Disconnect the vacuum hose from the EGR valve and connect a vacuum gauge to the hose.



2. Start the engine and wait for the cooling fan to come on.
3. Remove the control box and remove the control box cover.

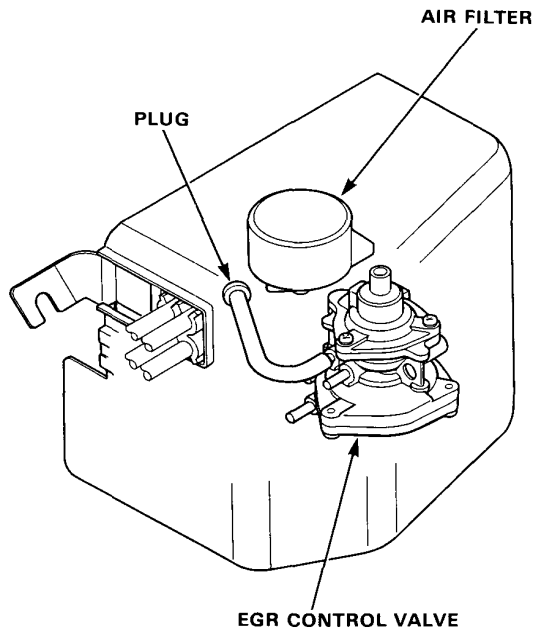
Vacuum should be as shown below:

Condition		Vacuum at EGR hose
1	Idle	No
2	3,000 $\text{min}^{-1}$ (rpm)	Yes, 50–152 mm
3	3,000 $\text{min}^{-1}$ (rpm) with blocked vacuum bleed (shown next column)	Less than 50 mm Hg
4	Rapid acceleration	Yes, 50–152 mm Hg
5	Deceleration	No

(cont'd)

# Emission Control System

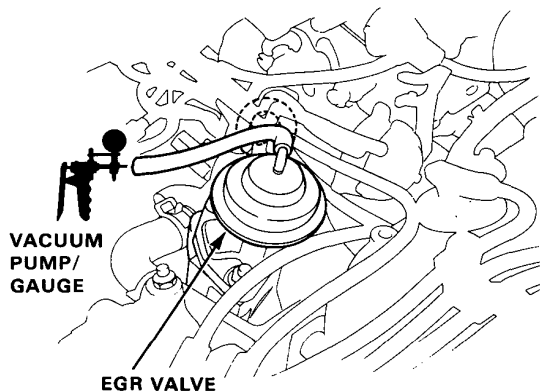
## EGR System (cont'd)



- If vacuum is available at idle (condition 1) check the vacuum hoses for proper routing and connections, then check for correct idle speed and idle mixture, and make adjustment as necessary.
- If there is no vacuum in conditions 2 and 4, check the #10, #11, #15 and #16 vacuum line for proper connection, cracks, blockage or disconnected hose. If OK, replace the thermostatic valve B and retest.
- If vacuum is more than 50 mm Hg in condition 3, replace the EGR control valve and check the vacuum hoses for proper routing and connections.

### EGR Valve

1. Start engine and allow to idle.
2. Disconnect vacuum hose from EGR Valve and connect a vacuum pump to EGR Valve



3. Apply 150 mm Hg (6 in. Hg) vacuum to EGR Valve. Vacuum should remain steady and engine should die.
  - If vacuum remains steady and engine dies, EGR valve is working properly, remove the vacuum pump and reconnect EGR vacuum hose ; test is complete.
  - If vacuum does not remain steady and engine does not die, replace EGR valve and retest.
  - If vacuum remains steady but engine does not die : Remove EGR valve ; check EGR valve and manifold for blockage, clean or replace as necessary and retest.

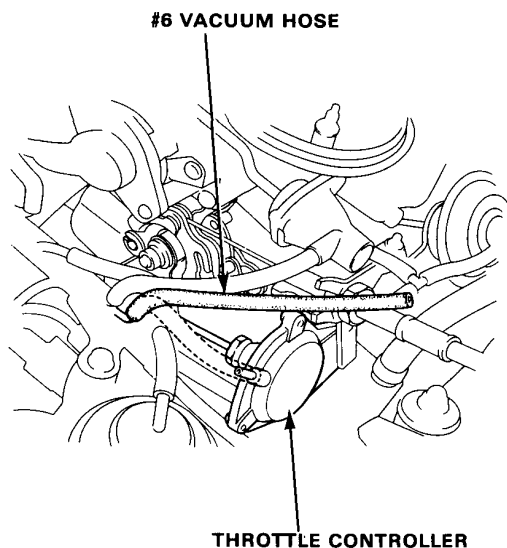


## Throttle Control System

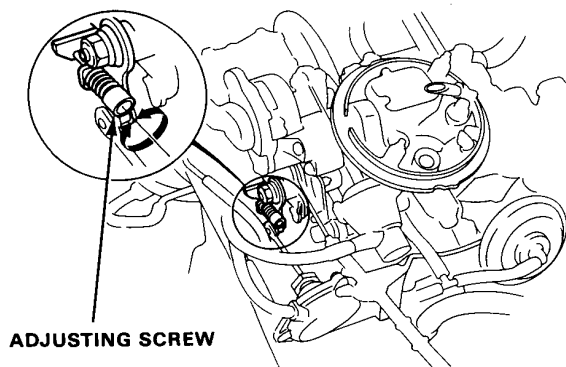
### Testing (HOT ENGINE)

1. Start the engine and warm up to normal operating temperature (the cooling fan comes on).
2. Disconnect the #6 vacuum hose from the throttle controller and check the engine speed.

Engine speed should be:  $1,800 \pm 300 \text{ min}^{-1} \text{ (rpm)}$

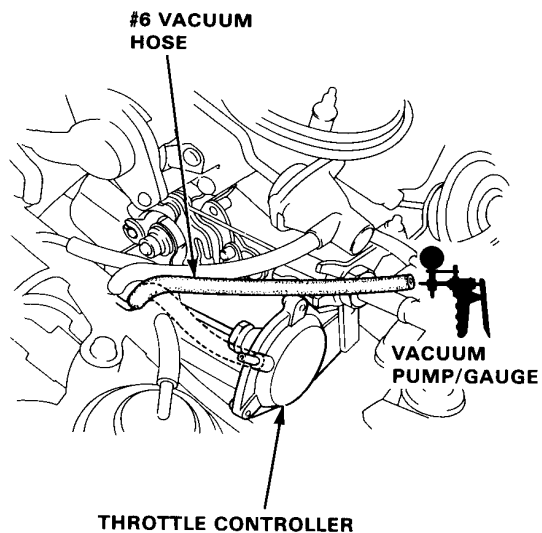


- If the engine speed is excessively high, adjust by turning the adjusting screw.



- If the engine speed does not change, connect a vacuum pump to the #6 vacuum hose and check vacuum.

There should be vacuum.



- If there is no vacuum, check the #6 vacuum hose for proper connection, cracks, brockage or disconnected hose.
- If there is vacuum, replace the throttle controller and retest.

3. Reconnect the #6 vacuum hose and check the idle speed. Idle speed should be within specification (page 6-43).

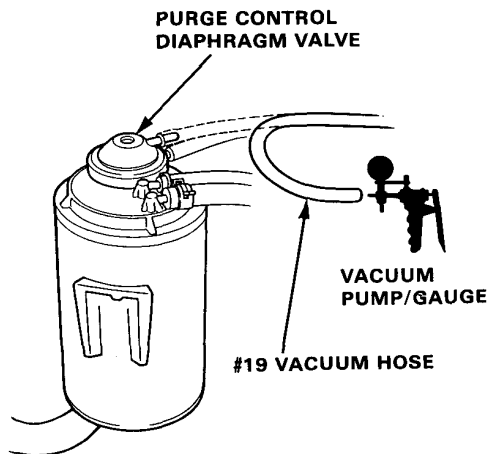
# Emission Control System

## Evaporative Emission Controls

### Testing (COLD ENGINE)

NOTE: Engine coolant temperature must be below 63 °C (145°F)

1. Disconnect the #19 vacuum hose at purge control diaphragm valve and connect vacuum pump/gauge to the hose.



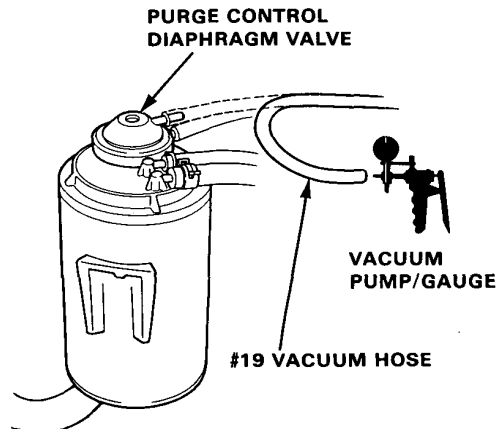
2. Start the engine and allow to idle.

There should be no vacuum.

- If there is no vacuum, go to hot engine test (next column).
- If there is vacuum, go to troubleshooting (page 6-62).

### Testing (HOT ENGINE)

1. Disconnect the #19 vacuum hose at the purge control diaphragm valve and connect a vacuum pump/gauge to the hose.



2. Start the engine and warm up to normal operating temperature (the cooling fan comes on). Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stands.

**⚠ WARNING** Block rear wheels before jacking up front of car.

Place the shift or selector lever in 2nd gear or "2" range and accelerate above 5 km/h, 2,000 min<sup>-1</sup> (rpm).

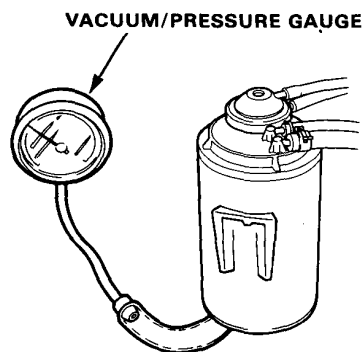
There should be vacuum.

- If there is vacuum, go to step 3.
- If there is no vacuum, check the #19 and #12 vacuum line for proper connection, cracks, blockage or disconnected hose. If OK, go to troubleshooting (page 6-62).

3. Disconnect a vacuum pump/gauge and reconnect hose.
4. Remove fuel filler cap.



- Remove the canister purge air hose from frame and connect hose to a vacuum gauge as shown.



- Place the shift or selector lever in 2nd gear or "2" range and raise the engine speed to 3,500  $\text{min}^{-1}$  (rpm). Vacuum should appear on the gauge within 1 minute.

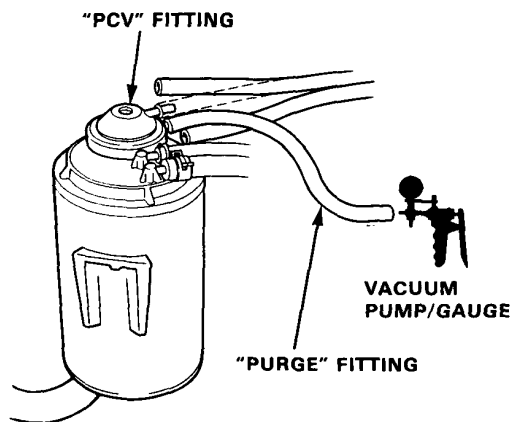
- If vacuum appears on the gauge in 1 minute, remove the gauge and go on to step 8.
- If no vacuum, disconnect the vacuum gauge and reinstall the fuel filler cap.

- Remove the charcoal canister and check for signs of damage.

- If damaged, replace the canister.
- If OK, go on to step 8.

- Stop the engine. Disconnect the hose from the canister PCV fitting. Connect a vacuum pump to the canister PURGE fitting as shown, and apply vacuum.

Vacuum should remain steady.



- If vacuum remains steady, go on to step 9.
- If vacuum drops, replace the canister and retest.

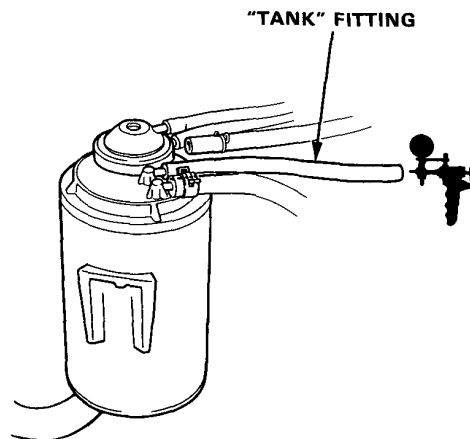
- Restart the engine. Reconnect the hose to the canister PCV fitting, and raise engine to 3,500  $\text{min}^{-1}$  (rpm) (in 2nd gear or "2" range).

PURGE side vacuum should drop to zero.

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

- Connect a vacuum pump to TANK fitting as shown, and apply vacuum.

If should not hold vacuum.



- If it does not hold vacuum, reinstall fuel filler cap and canister; test is complete.
- If it holds vacuum, replace canister and retest.

# Emission Control System

## Evaporative Emission Controls (cont'd)

### Troubleshooting Flowchart Purge Cut-off Solenoid Valve

Inspection of Purge Cut-off Solenoid valve.

Open the control box.

Disconnect the lower vacuum hose of the solenoid valve from the joint and connect a vacuum pump.

Disconnect #19 vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum gauge.

Start the engine.

Apply vacuum.

Is vacuum indicated on the gauge ?

YES

Turn the ignition switch OFF.

NO

Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stand.

Disconnect the connector on the control box.

Start the engine.

Place the shift or selector lever in second or "2" and accelerate above 5 km/h, 2,000 min<sup>-1</sup> (rpm).

Measure voltage between ORN (+) and BLK (-) terminals.

Is there battery voltage ?

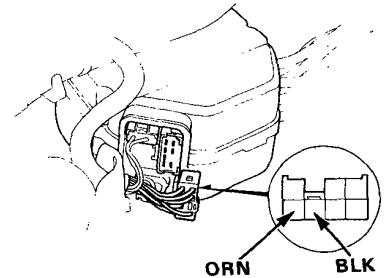
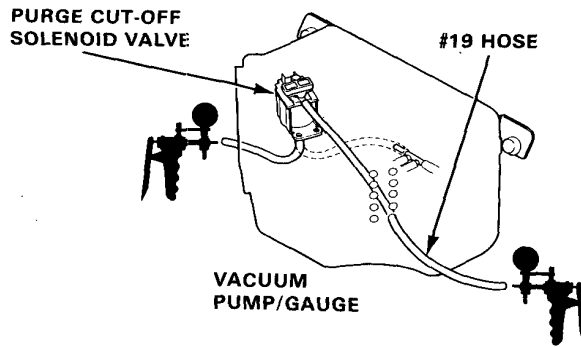
YES

Replace the solenoid valve.

NO

Measure voltage between ORN (+) and body ground.

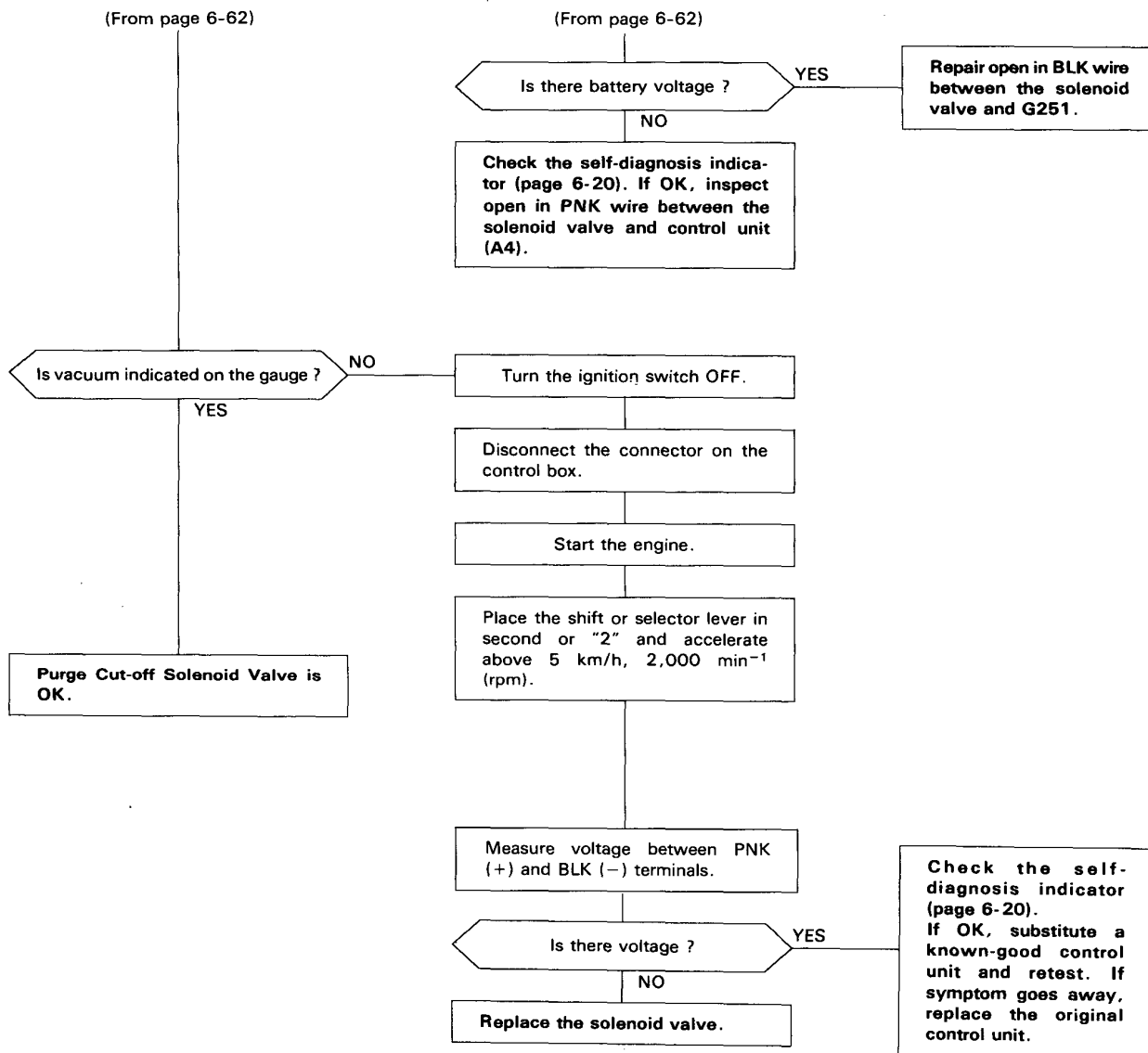
(To page 6-63)



**▲WARNING** Block rear wheels before jacking up front of car.

(To page 6-63)





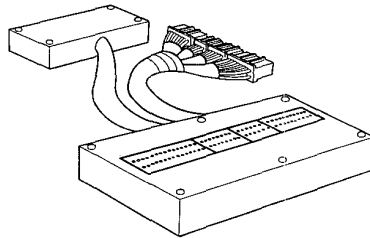
# Special Tools

## Special Tools

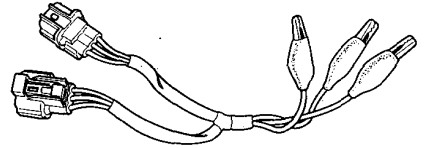
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07LAA-PT50100	O <sub>2</sub> Sensor Socket Wrench	1	
②	07LAJ-PT30100	ECU Test Harness	1	
③	07LAJ-PT30200	Test Harness	1	
④	07JAZ-SH20100	R.P.M. Connecting Adaptor	1	
⑤	07LAZ-PT30100	R.P.M. Connecting Adaptor	1	
⑤-1	07LAZ-PT30110	R.P.M. Connecting Adaptor (A)	(1)	Component Tools
⑤-2	07LAZ-PT30120	R.P.M. Connecting Adaptor (B)	(1)	
⑥	07406-0040001	Fuel Pressure Gauge Set	1	
⑥-1	07406-0040100	Pressure Gauge	(1)	Component Tools
⑥-2	07406-0040201	Hose Assembly	(1)	
⑦	07411-0020000	Digital Circuit Tester	1	



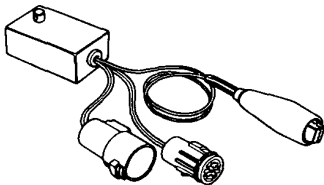
①



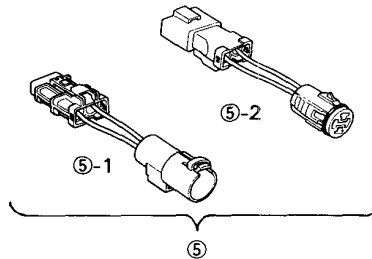
②



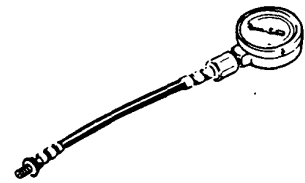
③



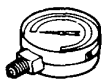
④



⑤



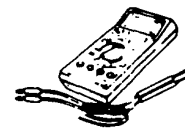
⑥



⑥-1



⑥-2



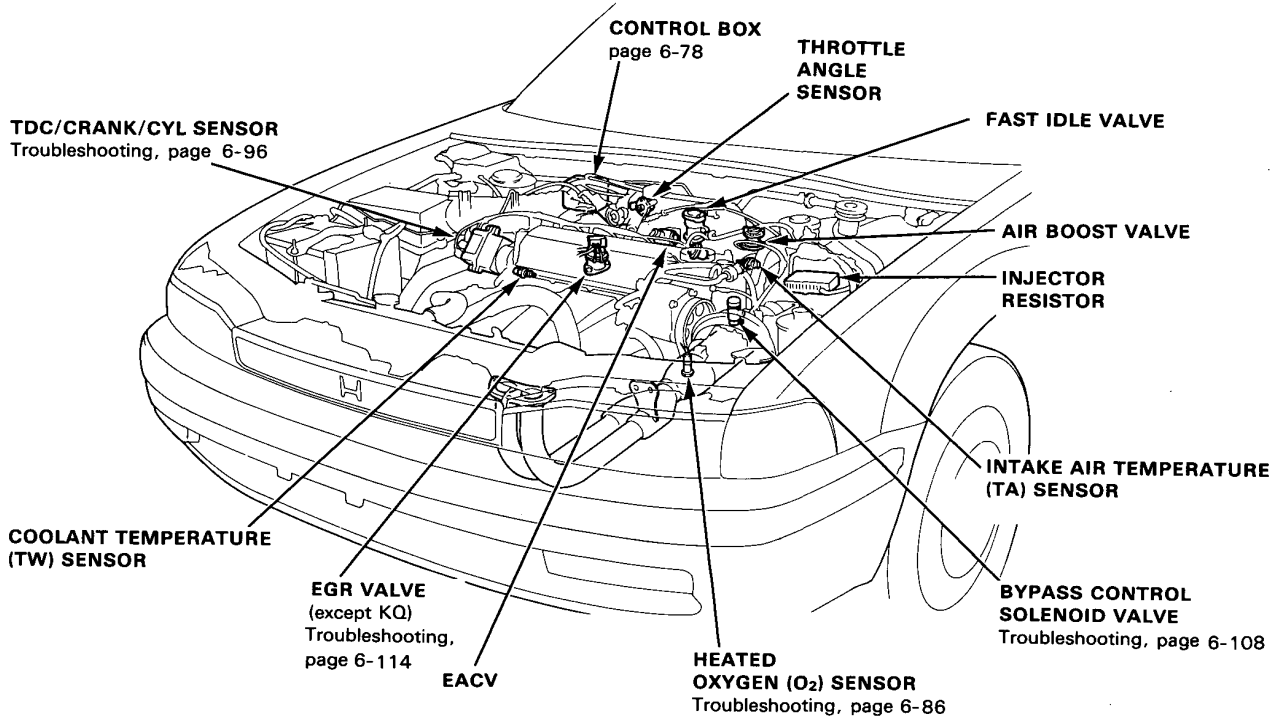
⑦

# Component Locations

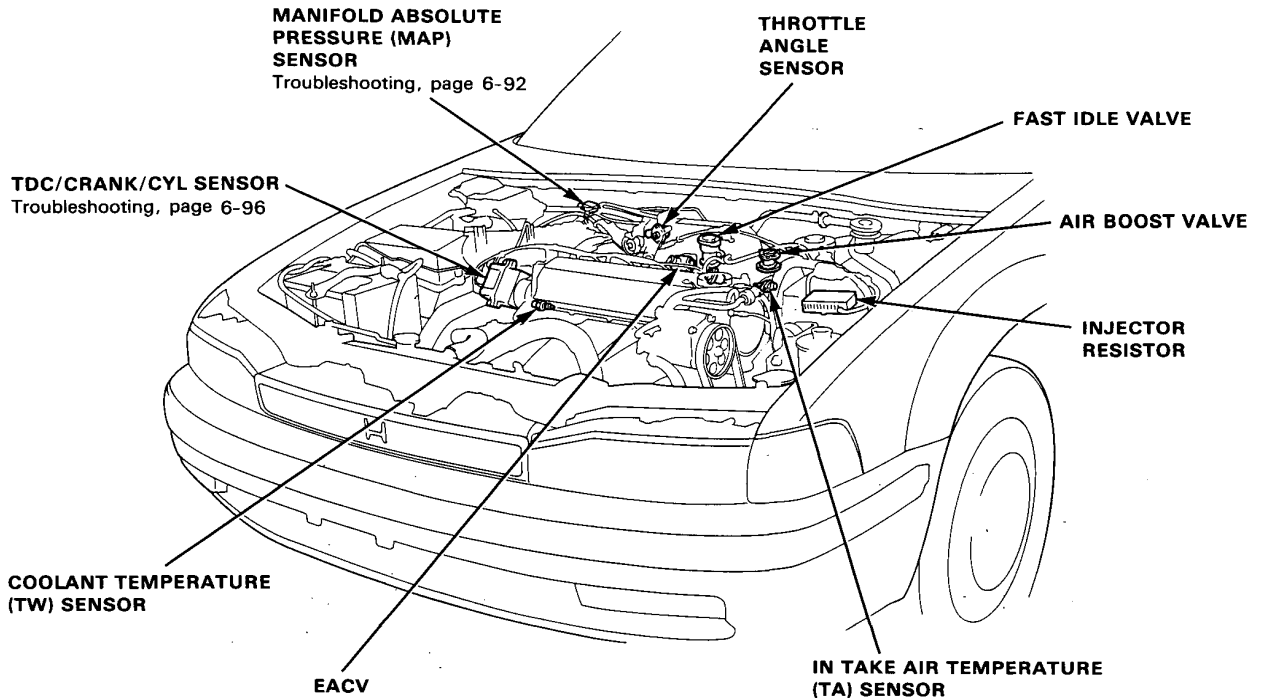


## Index

2.2 l except KY:



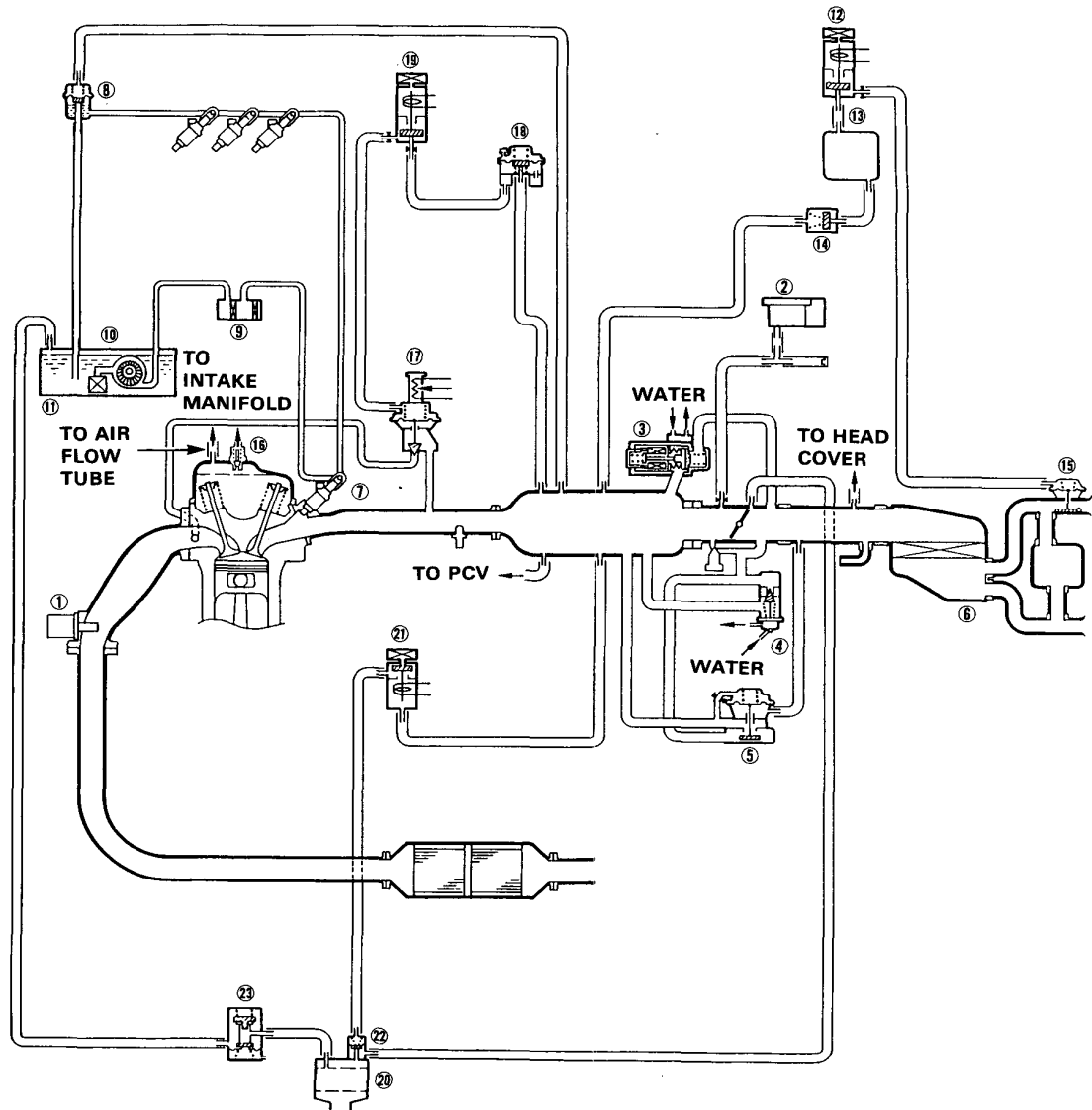
2.2 l KY:



# System Description

## Vacuum Connections

2.0 l with CATA:












- ① OXYGEN (O<sub>2</sub>) SENSOR
- ② MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
- ③ ELECTRONIC AIR CONTROL VALVE (EACV)
- ④ FAST IDLE VALVE
- ⑤ AIR BOOST VALVE
- ⑥ AIR CLEANER
- ⑦ FUEL INJECTOR
- ⑧ PRESSURE REGULATOR
- ⑨ FUEL FILTER
- ⑩ FUEL PUMP
- ⑪ FUEL TANK
- ⑫ INTAKE CONTROL SOLENOID VALVE

- ⑬ AIR CHAMBER
- ⑭ CHECK VALVE
- ⑮ INTAKE CONTROL DIAPHRAGM
- ⑯ PCV VALVE
- ⑰ EGR VALVE
- ⑱ CONSTANT VACUUM CONTROL (CVC) VALVE
- ⑲ EGR CONTROL SOLENOID VALVE
- ⑳ CHARCOAL CANISTER
- ㉑ PURGE CUT-OFF SOLENOID VALVE
- ㉒ PURGE CONTROL DIAPHRAGM VALVE
- ㉓ TWO-WAY VALVE

# Troubleshooting

## Troubleshooting Guide [With CATA]

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE	SYSTEM	PGM-FI							
		ECU	OXYGEN SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR	TDC/CRANK/CYL SENSOR	COOLANT TEMPERATURE SENSOR	THROTTLE ANGLE SENSOR	INTAKE AIR TEMPERATURE SENSOR	ATMOSPHERIC PRESSURE SENSOR
	SYMPTOM	—	86,90	92	96	—	—	—	—
	CHECK ENGINE WARNING LIGHT TURNS ON	 or 							
	CHECK ENGINE WARNING LIGHT BLINKS	① or ②	① or ②	③ or ④	④ or ⑤ or ⑥	⑧	⑦	⑩	⑬
	ENGINE WON'T START	③			③				
	DIFFICULT TO START ENGINE WHEN COLD	BU		③	③	①			③
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC	BU				③			
	ROUGH IDLE	BU		③					
	WHEN WARM IDLE SPEED TOO HIGH	BU							
	WHEN WARM IDLE SPEED TOO LOW	BU							
FREQUENT STALLING	WHILE WARMING UP	BU				③			
	AFTER WARMING UP	BU							③
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	BU			③				
	FAILS EMISSION TEST	BU	③	②					
	LOSS OF POWER	BU		③			②		

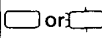








• if codes other than those listed above are indicated, count the number of blinks again. If the indicator is in fact blinking these codes, substitute a known-good ECU and recheck. If the indication goes away, replace the original ECU.

ⓑ: When the Check Engine warning light and the self-diagnosis indicator are on, the back-up system is in operation. Substitute a known-good ECU and recheck. If the indication goes away, replace the original ECU.

# Troubleshooting

## Troubleshooting Guide [Without CATA]

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE	SYSTEM	PGM-FI							
		ECU	MANIFOLD ABSOLUTE PRESSURE SENSOR	TDC/CRANK/CYL SENSOR	COOLANT TEMPERATURE SENSOR	THROTTLE ANGLE SENSOR	INTAKE AIR TEMPERATURE SENSOR	IMA SENSOR	ATMOSPHERIC PRESSURE SENSOR
	SYMPTOM	---	92	96	---	---	---	---	---
	CHECK ENGINE WARNING LIGHT TURNS ON	 or 							
	CHECK ENGINE WARNING LIGHT BLINKS	① or ③	③ or ⑤	④ or ⑧ or ⑨	⑥	⑦	⑩	⑪	⑬
	ENGINE WON'T START	③		③					
	DIFFICULT TO START ENGINE WHEN COLD	BU	③	③	①				③
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC	BU			③				
	ROUGH IDLE	BU	③						
	WHEN WARM IDLE SPEED TOO HIGH	BU							
	WHEN WARM IDLE SPEED TOO LOW	BU							
FREQUENT STALLING	WHILE WARMING UP	BU			③				
	AFTER WARMING UP	BU							③
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	BU		③					
	FAILS EMISSION TEST	BU	②						
	LOSS OF POWER	BU	③				②		

• if codes other than those listed above are indicated, count the number of blinks again. If the indicator is in fact blinking these codes, substitute a known-good ECU and recheck. If the indication goes away, replace the original ECU.

BU: When the Check Engine warning light and the self-diagnosis indicator are on, the back-up system is in operation. Substitute a known-good ECU and recheck. If the indication goes away, replace the original ECU.



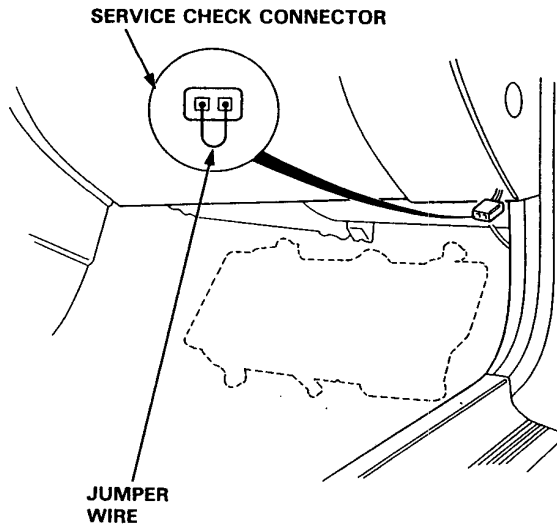
PGM-FI				IDLE CONTROL		FUEL SUPPLY	AIR INTAKE	EMISSION CONTROL
IGNITION OUTPUT SIGNAL	VEHICLE SPEED SENSOR	A/T FI Signal A	A/T FI Signal B	ELECTRONIC AIR CONTROL VALVE	OTHER IDLE CONTROLS			
—	—	—	—	—	—	103	107	112
①						②		
					②			
				①	②			
				①		②		
				①	②			
				①		②		
				①	②	③		
				③	①	②		
				③		①		
						③		①
						①	③	③

# Troubleshooting

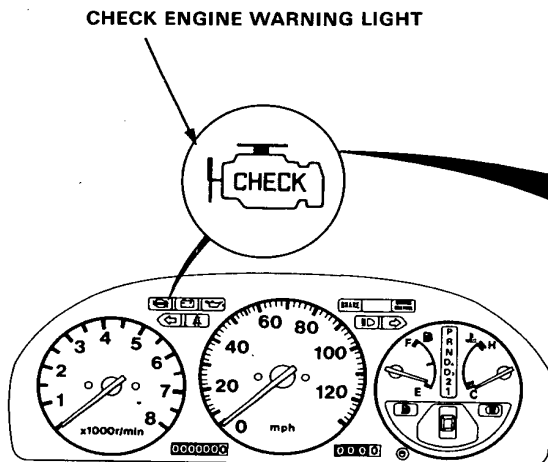
## Self-diagnostic Procedures

I. When the Check Engine warning light has been reported on, do the following:

1. Connect the Service Check Connector terminals with a jumper wire as shown (the Service Check Connector is located under the dash on the passenger side of the car).

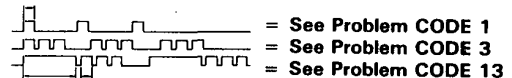


2. Note the CODE: the Check Engine warning light indicates a failure code by blinking frequency. The Check Engine warning light can indicate any number of simultaneous component problems by blinking separate codes, one after another. Problem codes 1 through 9 are indicated by a individual short blinks. Problem codes 10 through 43 are indicated by a series of long and short blinks. The number of long blinks equals the first digit, the number of short blinks equals the second digit.



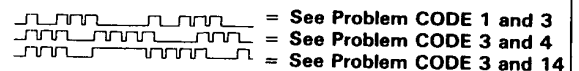
### Separate Problems:

#### Short



#### Long short

### Simultaneous Problems:



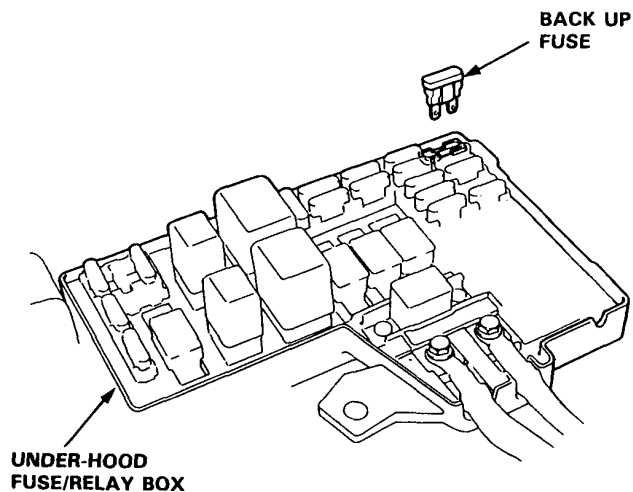




## II. ECU Reset Procedure

1. Turn the ignition switch off.
2. Remove the Back Up fuse (7.5 A) from the under-hood fuse/relay box for 10 seconds to reset ECU.

**NOTE:** Disconnecting the Back Up fuse also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you reset them.



## III. Final Procedure (this procedure must be done after any troubleshooting)

1. Remove the Jumper Wire.

**NOTE:** If the Service Check Connector is jumped the Check Engine warning light will stay on.

2. Do the ECU Reset Procedure.
3. Set the radio preset stations and the clock setting.

# PGM-FI Control System

## Troubleshooting Flowchart — Oxygen Sensor



Self-diagnosis Check Engine warning light indicates code 1: A problem in the Heated Oxygen (O<sub>2</sub>) Sensor circuit.



—Check Engine warning light has been reported on, with service check connector jumped (page 6-84) CODE 1 is indicated.

Turn the ignition switch OFF.

Remove BACK UP fuse in the under-hood relay box for 10 seconds to reset ECU.

Inspect fuel pressure (page 6-104).

Is it normal ?

NO

Go to page 6-103 Fuel Supply System.

YES

Warm up engine to normal operating temperature (cooling fan comes on).

Run engine for 10 seconds.

Road test with the Transmission in 2nd gear, accelerate using wide open throttle for at least 5 seconds. Then decelerate for at least 5 seconds with the throttle completely closed.

Is Check Engine warning light on and does it indicate CODE 1 ?

NO

Intermittent failure, system is OK at this time. Check for poor connections or loose wires.

YES

(To page 6-87)



(From page 6-86)

Turn the ignition switch OFF.

Disconnect the O<sub>2</sub> sensor connector and connect A (-) terminal to B (+) terminal with a battery.

After two minutes, measure voltage between C (-) terminal and D (+) terminal.

Start the engine.

Is the voltage above 0.6 V at wide open throttle to 4,500 min<sup>-1</sup>(rpm) and below 0.4 V when the throttle is quickly released from 4,500 min<sup>-1</sup>(rpm) ?

NO

Replace O<sub>2</sub> sensor.

YES

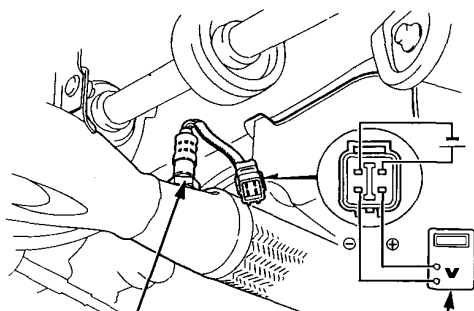
Stop engine.

Connect the O<sub>2</sub> sensor connector to engine wire harness.

Connect the ECU test harness between the ECU and connector

(To page 6-88)

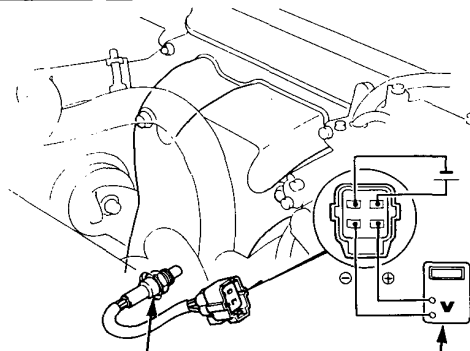
2.2 l :



O<sub>2</sub> SENSOR  
45 N·m (4.5 kg·m, 33 lb-ft)

DIGITAL MULTIMETER  
07411-0020000

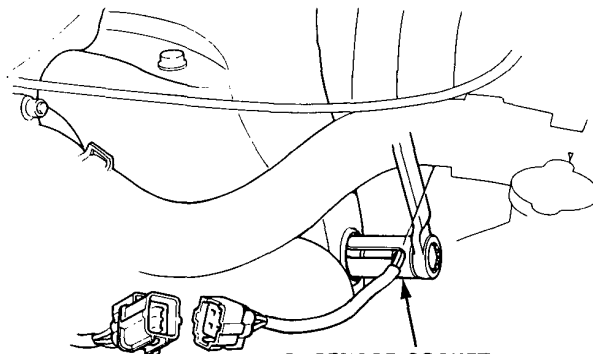
2.0 l :



O<sub>2</sub> SENSOR

DIGITAL MULTIMETER

2.0 l :



O<sub>2</sub> SENSOR SOCKET  
WRENCH  
07LAA-PT50100  
45 N·m (4.5 kg·m, 33 lb-ft)

(cont'd)

# PGM-FI Control System

## Troubleshooting Flowchart — Oxygen Sensor (cont'd)

(From page 6-87)

Restart and warm up engine to normal operating temperature (cooling fan comes on).

Measure voltage between D14 (+) and A26 (-) terminal.

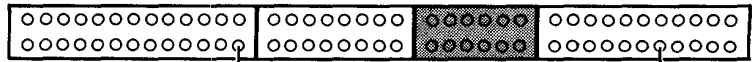
Is the voltage above 0.6 V at wide open throttle to 4,500  $\text{min}^{-1}$ (rpm) and 0.4 V when the throttle is quickly released from 4,500  $\text{min}^{-1}$ (rpm) ?

NO

Repair short or open in WHT wire between ECU (D14) and O<sub>2</sub> sensor.

YES

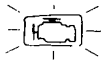
Substitute a known-good ECU and recheck. If symptom/indication goes away, replace the original ECU.



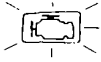
Above 0.6 V at wide open throttle to 4,500  $\text{min}^{-1}$ (rpm).  
Below 0.4 V when the throttle is quickly released from 4,500  $\text{min}^{-1}$ (rpm).

# PGM-FI Control System

## Troubleshooting Flowchart — Oxygen Sensor Heater



Self-diagnosis Check Engine warning light indicates code 41: A problem in the Oxygen (O<sub>2</sub>) Sensor Heater circuit.



2.2 l :

—Engine is running.  
—Check Engine warning light has been reported on, with service check connector jumped (page 6-84), CODE 41 is indicated.

Turn the ignition switch OFF.

Remove BACK UP fuse in the under-hood relay box for 10 seconds to reset ECU.

Start engine.

Is Check Engine warning light on and does it indicate CODE 41 ?

NO

Intermittent failure, system is OK at this time (test driving may be necessary). Check for poor connections or loose wires at O<sub>2</sub> sensor connector.

YES

Stop engine.

Disconnect the 4P connector from the O<sub>2</sub> sensor.

Measure resistance between terminals A and B on the O<sub>2</sub> sensor.

Is there 10–40 Ω ?

NO

Replace O<sub>2</sub> sensor.

YES

Check for continuity to body ground on each terminal on the O<sub>2</sub> sensor.

Does continuity exist ?

YES

Replace O<sub>2</sub> sensor.

NO

Check for continuity between terminal A and terminals C and D individually.

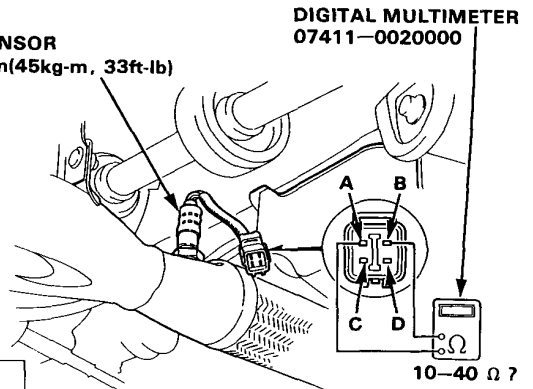
Does continuity exist ?

YES

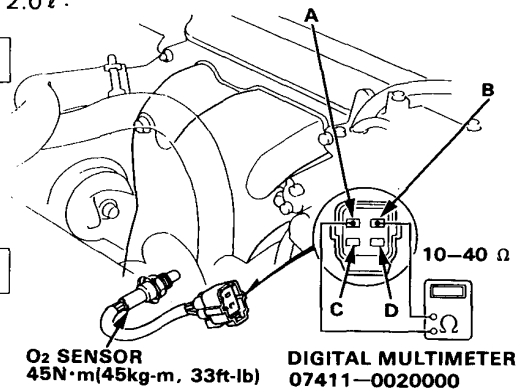
Replace O<sub>2</sub> sensor.

NO

(To page 6-91)

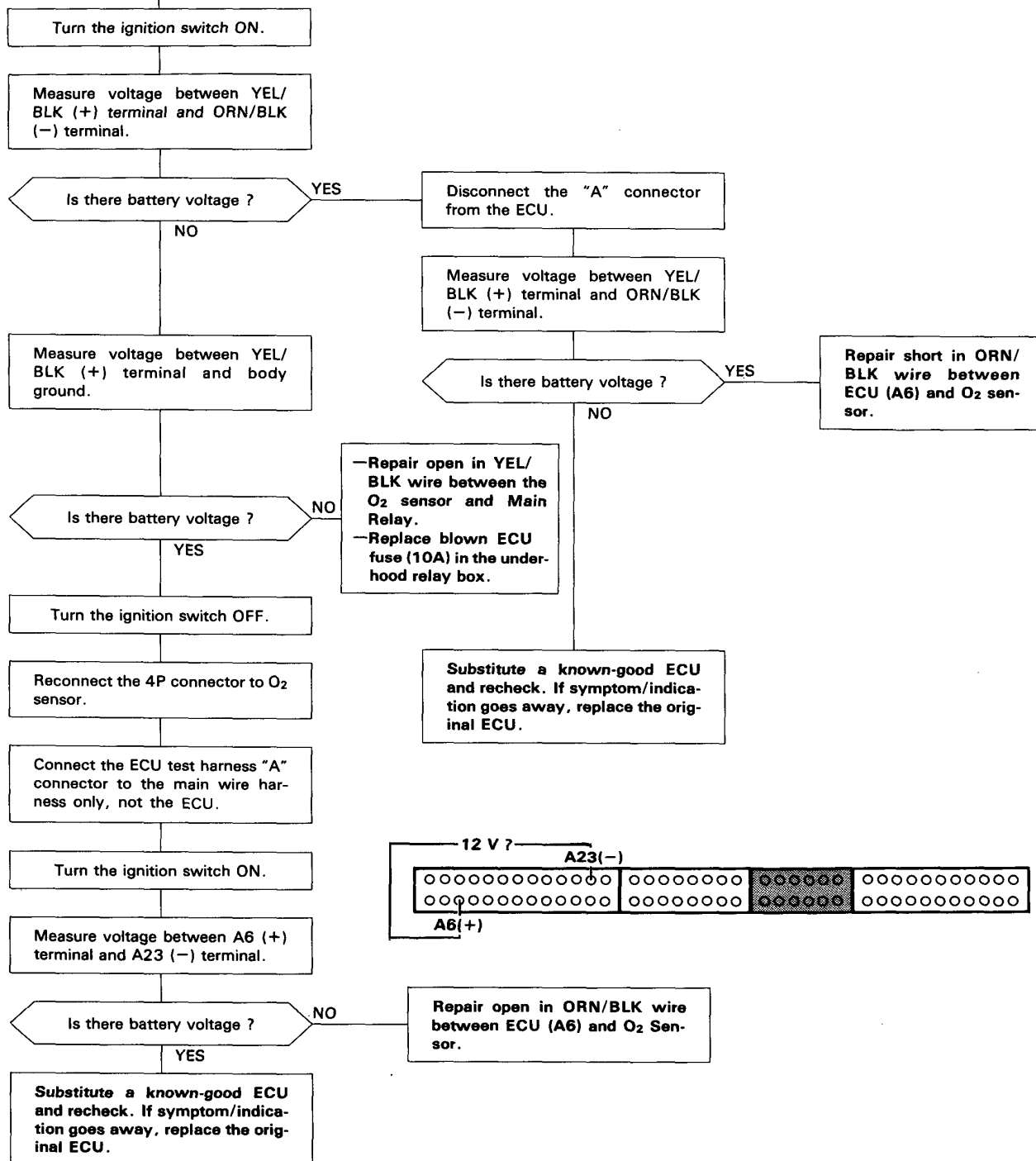


2.0 l :





(From page 6-90)



# PGM-FI Control System

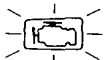
## Troubleshooting Flowchart — MAP Sensor



Self-diagnosis Check Engine warning light indicates code 3: Most likely an electrical problem in the Manifold Absolute Pressure (MAP) Sensor system.



Self-diagnosis Check Engine warning light indicates code 5: Most likely a mechanical problem (broken hose) in the Manifold Absolute Pressure (MAP) Sensor system.



—Engine is warm and running.  
—Check Engine warning light has been reported on, with service check connector jumped (page 6-84), CODE 3 is indicated.

Turn the ignition switch OFF.

Remove BACK UP fuse in the under-hood relay box for 10 seconds to reset ECU.

Warm up engine to normal operating temperature (cooling fan comes on).

Is Check Engine warning light on and does it indicate CODE 3?

NO

YES

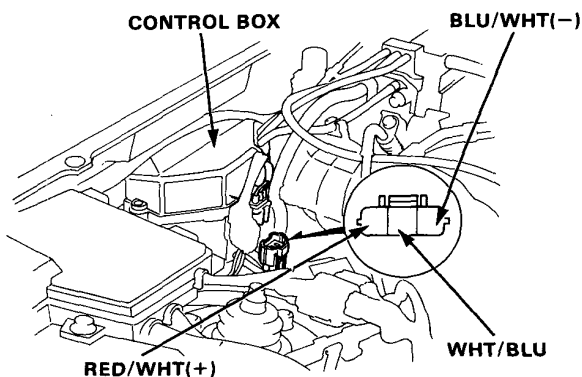
Turn the ignition switch OFF.

Disconnect the 3P connector from the MAP sensor.

Turn the ignition switch ON.

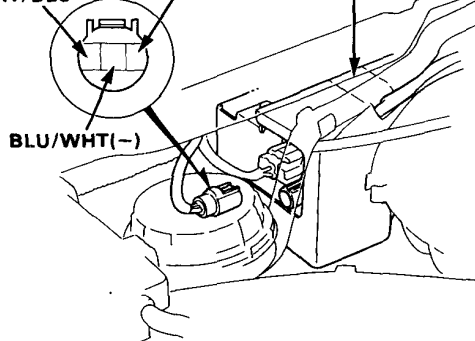
(To page 6-93)

2.0 l WITH CATA AND  
2.2 l EXCEPT KE, KQ, KY :



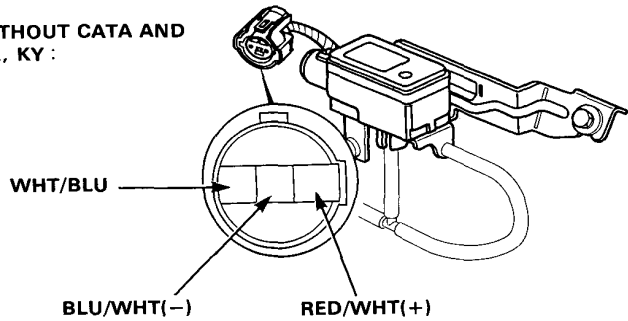
Intermittent failure, system is OK at this time (test drive may be necessary).  
Check for poor connection or loose wires at MAP sensor connector and ECU.

2.2 l KE :  
RED/WHT(+) CONTROL BOX  
WHT/BLU





2.0L WITHOUT CATA AND  
2.2L KQ, KY:



(From page 6-92)

Measure voltage between RED/  
WHT (+) terminal and body  
ground.

Is there approx. 5 V ?

NO

Repair open in RED/WHT wire  
between ECU (D19) and MAP  
sensor.  
If wire is OK, substitute a  
known-good ECU and recheck. If  
prescribed voltage is now avail-  
able, replace the original ECU.

YES

Measure voltage between RED/  
WHT (+) terminal and BLU/WHT  
(-) terminal.

Is there approx. 5 V ?

NO

Repair open in BLU/  
WHT wire between  
ECU (D21) and MAP  
sensor.  
If wire is OK, substi-  
tute a known-gttd ECU  
and recheck. If pre-  
scribed voltage is now  
available, replace the  
original ECU.

YES

Measure voltage between WHT/  
BLU (+) terminal and BLU/WHT  
(-) terminal.

Is there approx. 5 V ?

NO

Repair open or short in  
WHT/BLU wire  
between ECU (D17)  
and MAP sensor.  
If wire is OK, substi-  
tute a known-good  
ECU and recheck. If  
prescribed voltage is  
now available, replace  
the original ECU.

YES

Turn the ignition switch OFF.

Reconnect the 3P connector to  
the MAP sensor.

Connect the ECU test harness  
between the ECU and connector.

Turn the ignition switch ON.

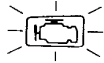
(To page 6-94)

(cont'd)



# PGM-FI Control System

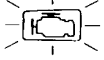
## Troubleshooting Flowchart — TDC/CRANK/CYL Sensors



Self-diagnosis Check Engine warning light indicates code 4: A problem in the circuit of the CRANK Sensor.



Self-diagnosis Check Engine warning light indicates code 8: A problem in the circuit of the TDC Sensor.



Self-diagnosis Check Engine warning light indicates code 9: A problem in the circuit of the CYL Sensor.



—Check Engine warning light has been reported on, with service check connector jumped (page 6-84), CODE 4 is indicated.

Turn the ignition switch OFF.

Remove BACK UP fuse in the under-hood relay box for 10 seconds to reset ECU.

Start engine.

Is Check Engine warning light on and does it indicate CODE 4 ?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).  
Check for poor connections or loose wires at distributor connector.

YES

Stop engine.

Disconnect the 8P connector from the TDC/CRANK/CYL sensor.

Measure resistance between B terminal and F terminal.

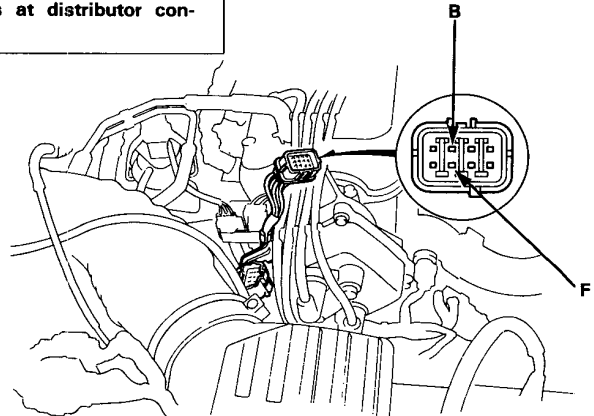
Is there 260–500  $\Omega$  ?

NO

Replace the distributor assembly (section 16).

YES

(To page 6-97)





(From page 6-96)

Check for continuity to body ground on B terminal and F terminal individually.

Does continuity exist ?

YES

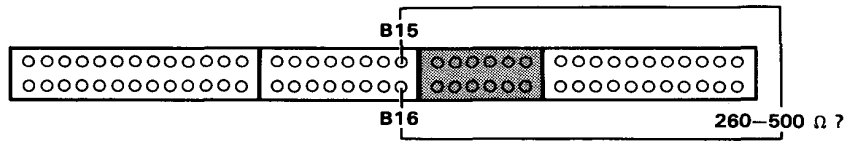
Replace the distributor assembly (section 16).

NO

Reconnect the connector.

Connect the ECU test harness only to the main wire harness, not to the ECU .

Measure resistance between B15 terminal and B16 terminal.



Is there 260-500 Ω ?

NO

Repair open in BLU/GRN and/or BLU/YEL wires.

YES

Check for continuity to body ground on B15 terminal.

Does continuity exist ?

YES

Repair short in BLU/GRN wire between ECU (B15) and distributor connector.

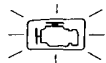
NO

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

(Cont'd)

# PGM-FI Control System

## Troubleshooting Flowchart — TDC/CRANK/CYL Sensors (cont'd)



—Check Engine warning light has been reported on, with service check connector jumped (page 6-84), CODE 8 is indicated.

Turn the ignition switch OFF.

Remove BACK UP fuse in the under-hood relay box for 10 seconds to reset ECU.

Start engine.

Is Check Engine warning light on and does it indicate CODE 8 ?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).  
Check for poor connections or loose wires at distributor connector.

YES

Stop engine.

Disconnect the 8P connector from the TDC/CRANK/CYL sensor.

Measure resistance between C terminal and G terminal.

Is there 260–500  $\Omega$  ?

NO

Replace the distributor assembly (section 16).

YES

Check for continuity to body ground on C terminal and G terminal individually.

Does continuity exist ?

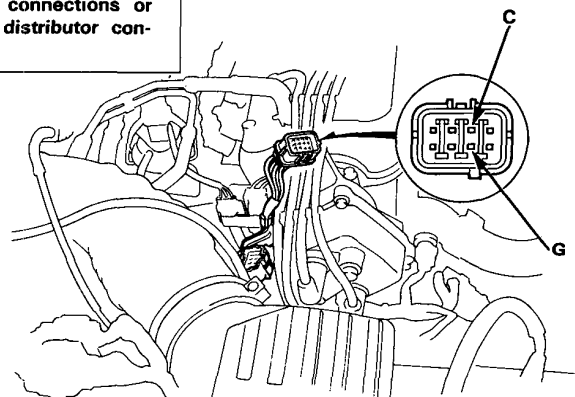
YES

Replace the distributor assembly (section 16).

NO

Reconnect the connector.

(To page 6-99)

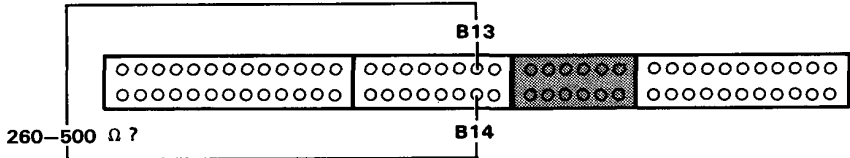




(From page 6-98)

Connect the ECU test harness only to the main wire harness, not to the ECU.

Measure resistance between B13 terminal and B14 terminal.



Is there 260-500 Ω ?

NO

Repair open in ORN/BLU and/or WHT/BLU wires.

YES

Check for continuity to body ground on B13 terminal.

Does continuity exist ?

YES

Repair short in ORN/BLU wire between ECU (B13) and distributor connector.

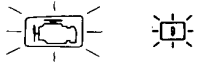
NO

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

(Cont'd)

# PGM-FI Control System

## Troubleshooting Flowchart — TDC/CRANK/CYL Sensors (cont'd)



—Check Engine warning light has been reported on, with service check connector jumped (page 6-84), CODE 9 is indicated.

Turn the ignition switch OFF.

Remove BACK UP fuse in the under-hood relay box for 10 seconds to reset ECU.

Start engine.

Is Check Engine warning light on and does it indicate CODE 9 ?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).  
Check for poor connections or loose wires at the distributor connector.

YES

Stop engine.

Disconnect the 8P connector from the TDC/CRANK/CYL sensor.

Measure resistance between D terminal and H terminal.

Is there 260—500  $\Omega$  ?

NO

Replace the distributor assembly (section 16).

YES

Check for continuity to body ground on D terminal and H terminal individually.

Does continuity exist ?

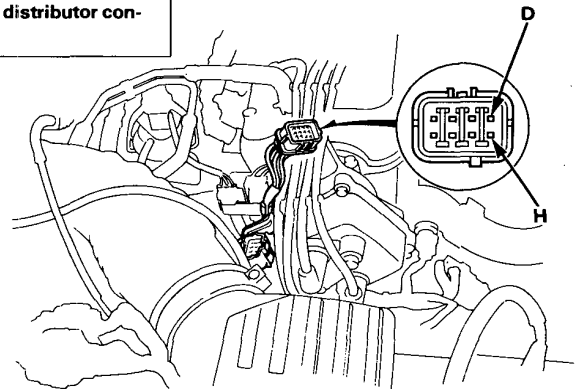
YES

Replace the distributor assembly (section 16).

NO

Reconnect the connector.

(To page 6-101)

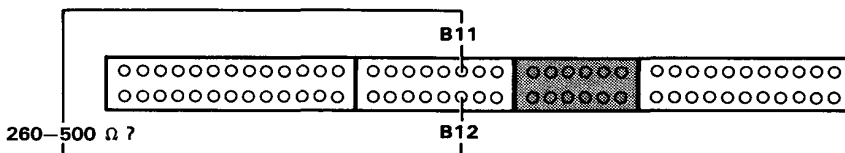




(From page 6-100)

Connect the ECU test harness only to the main wire harness, not to the ECU.

Measure resistance between B11 terminal and B12 terminal.



Is there 260-500 Ω ?

NO

Repair open in ORN and/or WHT wires.

YES

Check for continuity to body ground on B11 terminal.

Does continuity exist ?

YES

Repair short in ORN wire between ECU (B11) and distributor connector.

NO

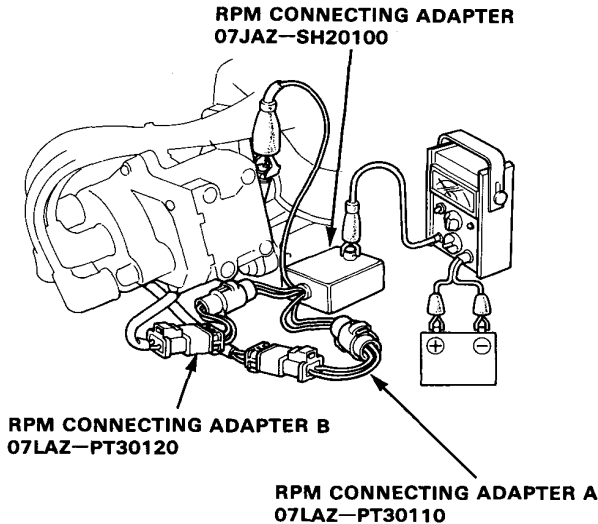
Substitute a known-good ECU and recheck. If symptom/indication goes away, replace the original ECU.

# Idle Control System

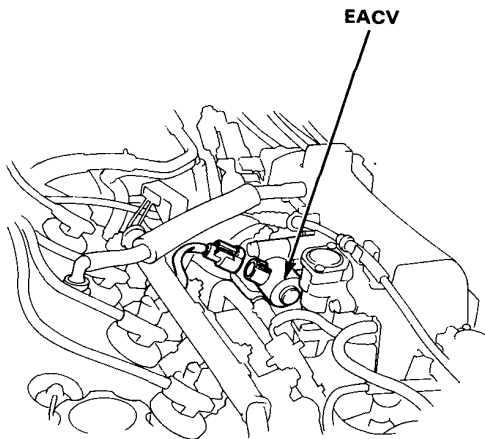
## Idle Speed Setting

### Inspection/Adjustment

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



3. Disconnect the 2P connector from the EACV.

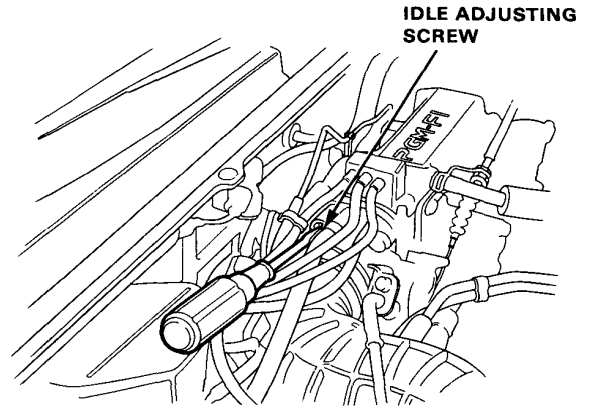


4. Check idling in no-load conditions in which the headlights, blower fan, rear defogger, cooling fan, and air conditioner are not operating.

### Idle speed should be:

Manual	$620 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
Automatic	$620 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (N) or (P)

Adjust the idle speed, if necessary, by turning the idle adjusting screw.



5. Turn the ignition switch OFF.
6. Reconnect the 2P connector on the EACV, then remove BACK UP fuse in the under-hood relay box for 10 seconds to reset ECU.
7. Restart an idle the engine with no-load conditions in which the headlights, blower fan, rear defogger, cooling fan, and air conditioner are not operating for one minute, then check the idle speed.

### Idle speed should be:

Manual	$770 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
Automatic	$770 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (N) or (P)

8. Idle the engine for one minute with headlights (Hi) and rear defogger ON and check the idle speed.

### Idle speed should be:

Manual	$770 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
Automatic	$770 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (N) or (P)

9. Idle the engine for one minute with heater fan switch at HI and air conditioner on, then check the idle speed.

### Idle speed should be:

Manual	$770 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
Automatic	$770 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (N) or (P)

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

# Fuel Supply System

## Symptom Troubleshooting Guide



NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE		SUB SYSTEM	FUEL INJECTOR	INJECTOR RESISTOR	PRESSURE REGULATOR	FUEL FILTER	FUEL PUMP	MAIN RELAY	CONTAMINATED FUEL
SYMPTOM			—	—	105	106	—	—	*
ENGINE WON'T START			③	③		③	①	②	③
DIFFICULT TO START ENGINE WHEN COLD OR HOT									①
ROUGH IDLE			①	②					③
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING		①	②	③				③
	FAILS EMISSION TEST		②	③	①				
	LOSS OF POWER		③	③		①	③		②

\* Fuel with dirt, water or a high percentage of alcohol is considered contaminated.



# Fuel Supply System

## Fuel Pressure

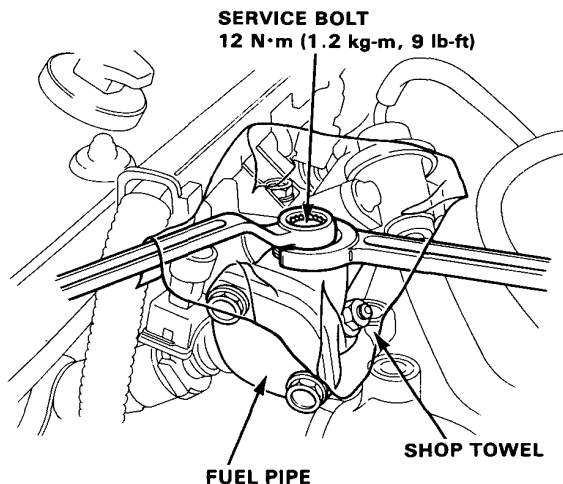
### Relieving

#### **⚠ WARNING**

- Do not smoke while working on the fuel system. Keep open flames or sparks away from the work area.
- Be sure to relieve fuel pressure while the engine is off.

NOTE: Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the 6 mm service bolt at the fuel pipe.

1. Remove fuel filter cap.
2. Disconnect the battery negative cable from the battery negative terminal.
3. Use a box end wrench on the 6 mm service bolt at the fuel pipe, while holding the special banjo bolt with another wrench.
4. Place a rag or shop towel over the 6 mm service bolt.
5. Slowly loosen the 6 mm service bolt one complete turn.



#### NOTE:

- A fuel pressure gauge can be attached at the 6 mm service bolt hole.
- Always replace the washer between the service bolt and the special banjo bolt, whenever the service bolt is loosened to relieve fuel pressure.
- Replace all washers whenever the bolts are removed to disassemble parts.

### Inspection

1. Relieve fuel pressure.
2. Remove the service bolt on the fuel pipe while holding the banjo bolt with another wrench and attach the fuel pressure gauge.
3. Start the engine. Measure the fuel pressure with the engine idling and vacuum hose of the pressure regulator disconnected.

#### Pressure should be:

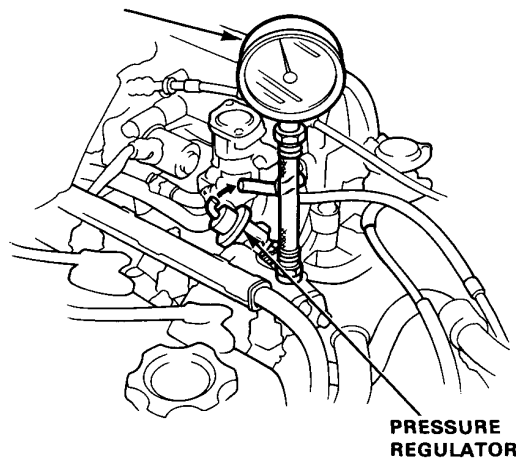
(2.2 ℓ : KS, KX, KG, KE, KF, KY, 2.0 ℓ)  
235–284 kPa (2.4–2.9 kg/cm<sup>2</sup>, 34–41 psi)  
(KQ)  
265–314 kPa (2.7–3.2 kg/cm<sup>2</sup>, 38–46 psi)

4. Reconnect vacuum hose to the pressure regulator.

#### Pressure should be:

(2.2 ℓ : KS, KX, KG, KE, KF, KY)  
176–225 kPa (1.8–2.3 kg/cm<sup>2</sup>, 26–33 psi)  
(KQ, 2.0 ℓ)  
196–245 kPa (2.1–2.6 kg/cm<sup>2</sup>, 28–36 psi)

#### FUEL PRESSURE GAUGE 07406–0040001



- If the fuel pressure is not as specified, first check the fuel pump. If the pump is OK, check the following:
  - If the pressure is higher than specified, inspect for:
    - Pinched or clogged fuel return hose or piping.
    - Faulty pressure regulator (page 6-105).
  - If the pressure is lower than specified, inspect for:
    - Clogged fuel filter.
    - Pressure regulator failure (page 6-105).
    - Leakage in the fuel line.



# Pressure Regulator

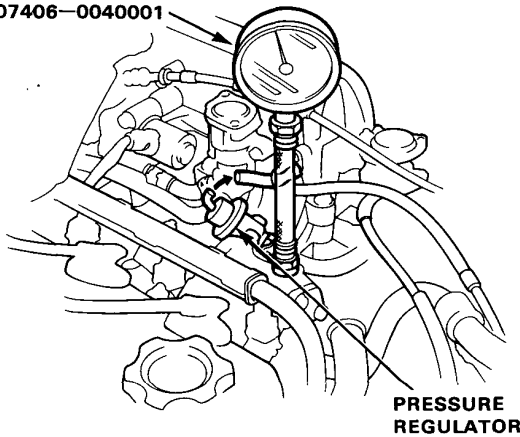
## Testing

**▲ WARNING** Do not smoke during the test, Keep open flames away from your work area.

1. Attach a pressure gauge to the service port of the fuel pipe (page 6-104).

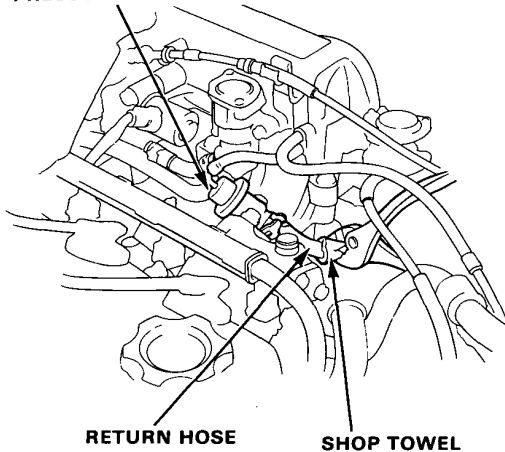
**Pressure should be:**  
 (2.2 l :KS, KX, KG, KE, KF, KY, 2.0 l )  
 235–284 kPa (2.4–2.9 kg/cm<sup>2</sup>, 34–41 psi)  
 (KQ)  
 265–314 kPa (2.7–3.2 kg/cm<sup>2</sup>, 38–46 psi)  
 (with the regulator vacuum hose disconnected)

**FUEL PRESSURE GAUGE**  
 07406–0040001



2. Reconnect the vacuum hose to the pressure regulator.
3. Check that the fuel pressure rises when the vacuum hose from the regulator is disconnected again.
  - If the fuel pressure did not rise, check to see if it rise with the fuel return hose lightly pinched.
  - If the fuel pressure still does not rise, replace the pressure regulator.

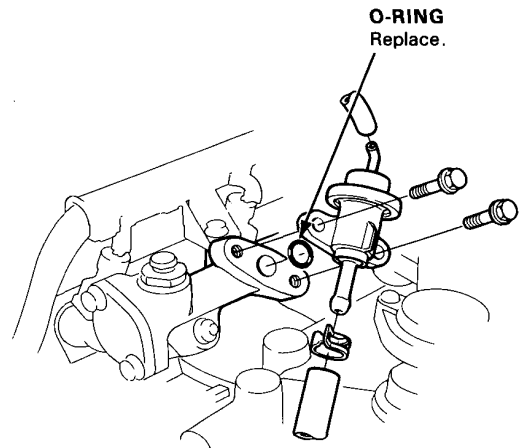
**PRESSURE REGULATOR**



## Replacement

**▲ WARNING** Do not smoke while working on fuel system. Keep open flame way from work area.

1. Place a shop towel under pressure regulator, then relieve fuel pressure (page 6-104).
2. Disconnect the vacuum hose and fuel return hose.
3. Remove the two 6 mm retainer bolts.



### NOTE:

- Replace the O-ring.
- When assembling the regulator, apply clean engine oil to the O-ring and assemble it into its proper position, taking care not to damage the O-ring.

# Fuel Supply System

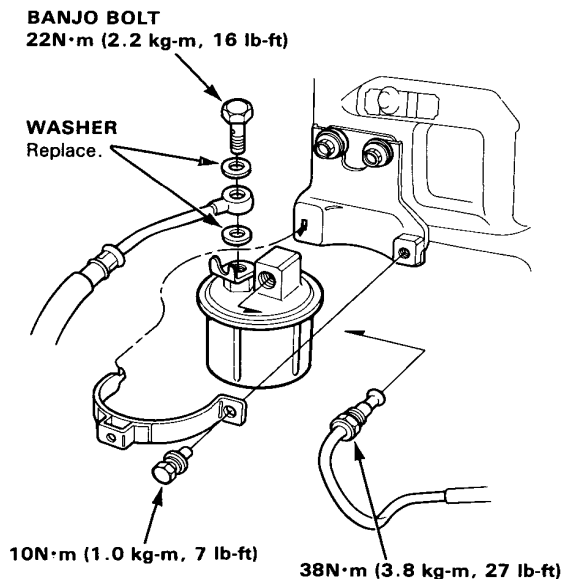
## Fuel Filter

### Replacement

**⚠ WARNING** Do not smoke while working on fuel system. Keep open flame away from work area.

The filter should be replaced : every 2 years or 40,000 km, (24,000 miles), whichever comes first or whenever the fuel pressure drops below the specified value 235–284 kPa, 2.4–2.9 kg/cm<sup>2</sup>, 34–41 psi (Except KQ) [KQ:265–314 kPa (2.7–3.2 kg/cm<sup>2</sup>, 38–46 psi)] with the pressure regulator vacuum hose disconnected after making sure that the fuel pump and the pressure regulator are OK.

1. Place a shop towel under and around the fuel filter.
2. Relieve fuel pressure (page 6-104).
3. Remove the 12 mm banjo bolt and the fuel feed pipe from the filter.
4. Remove the fuel filter clamp and fuel filter.
5. When assembling, use new washers, as shown.



**CAUTION:** Clean the flared joint of high pressure hoses thoroughly before reconnecting them.

# Air Intake System

## System Troubleshooting Guide



NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

### 2.0 l and KY :

PAGE	SUB SYSTEM	THROTTLE CABLE	THROTTLE BODY	INTAKE CONTROL SYSTEM
		---	---	---
SYMPTOM				
WHEN WARM RPM TOO HIGH		②	①	
LOSS OF POWER			①	②

### 2.2 l except KY :

PAGE	SUB SYSTEM	THROTTLE CABLE	THROTTLE BODY	INTAKE CONTROL SYSTEM	BYPASS CONTROL
		---	---	---	108
SYMPTOM					
WHEN WARM RPM TOO HIGH		②	①		
LOSS OF POWER			①	③	②

# Air Intake System

## Bypass Control System (2.2 l Except KY)

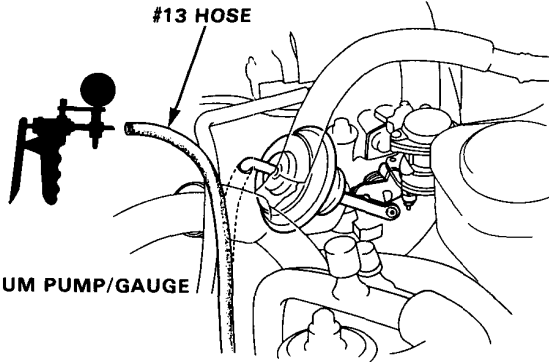
### Troubleshooting Flowchart

Inspection of Bypass Control System

Start engine and allow to idle.

Remove #13 vacuum hose from the bypass control diaphragm and connect vacuum gauge to the hose.

VACUUM PUMP/GAUGE



Is there vacuum ?

NO

Remove #12 vacuum hose from the vacuum tank, then check for vacuum at the tank.

Is there vacuum ?

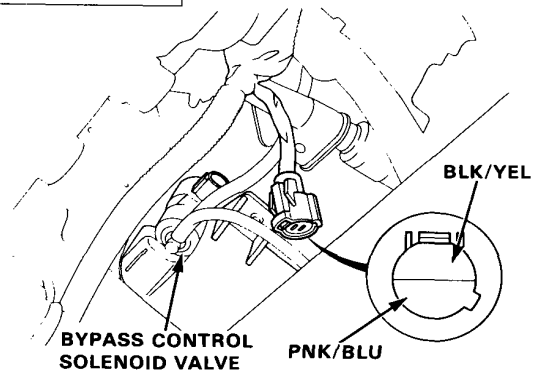
NO

Repair the blockage or vacuum leak between the vacuum tank and the intake manifold.

YES

Disconnect the 2P connector from the Bypass Control Solenoid Valve.

Measure voltage between BLK/YEL (+) terminal and PNK/BLU (-) terminal.



Is there battery voltage ?

YES

Replace the bypass control solenoid valve.

NO

Measure voltage between BLK/YEL (+) terminal and body ground.

(To page 6-109)

(To page 6-109)



(From page 6-108)

Raise engine speed to 5,000 min<sup>-1</sup> (rpm).

Check for vacuum at #13 vacuum hose.

Is there vacuum ?

NO

Bypass control system is OK.

(From page 6-108)

Is there battery voltage ?

NO

Repair open in BLK/YEL wire between the 2P connector and No. 2 (10 A) fuse.

YES

Turn the ignition switch OFF.

Connect the ECU test harness between the ECU and connector.

Check for continuity of PNK/BLU wire between ECU (A17) and the 2P connector.

Does continuity exist ?

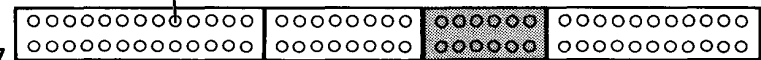
NO

Repair open in PNK/BLU wire between ECU (A17) and the 2P connector.

YES

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

A17



Disconnect the 2P connector from the bypass control solenoid valve.

Is there vacuum ?

YES

Replace bypass control solenoid valve.

NO

Turn the ignition switch OFF.

Disconnect "A" connector from ECU.

Check for continuity to ground on the PNK/BLU wire.

Is there continuity to ground ?

YES

Repair short to ground at PNK/BLU wire between ECU (A17) and the 2P connector.

NO

Substitute a known-good ECU and recheck. If symptom goes away, replace the original ECU.

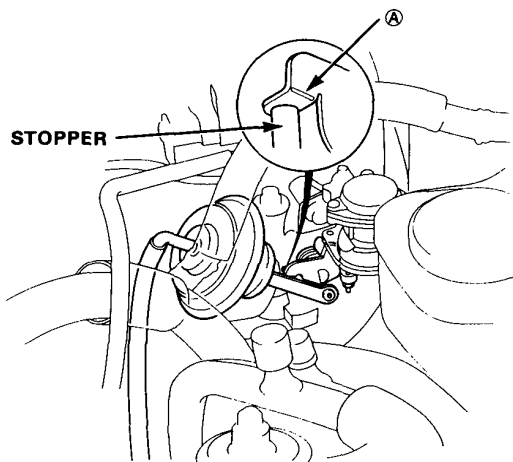
# Air Intake System

## Bypass Valve (2.2 l Except KY)

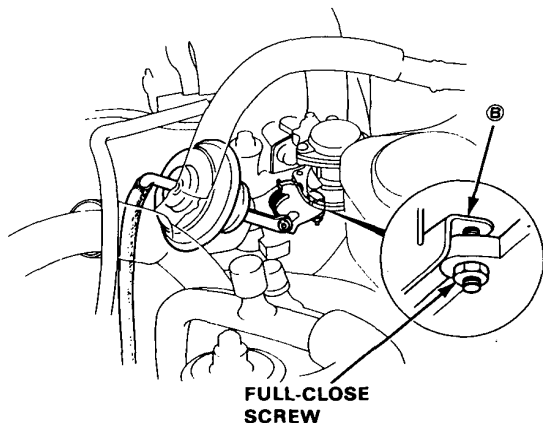
### Testing

**CAUTION:** Do not adjust the bypass valve full-close screw. It was preset at the factory.

1. Check the bypass valve shaft for binding or sticking.
2. Check the bypass valve for smooth movement.
3. Check that Ⓐ of the bypass valve is in close contact with the stopper when the bypass valve is fully open.



4. Check that Ⓑ of the bypass valve is in close contact with the full-close screw when the valve is fully closed.



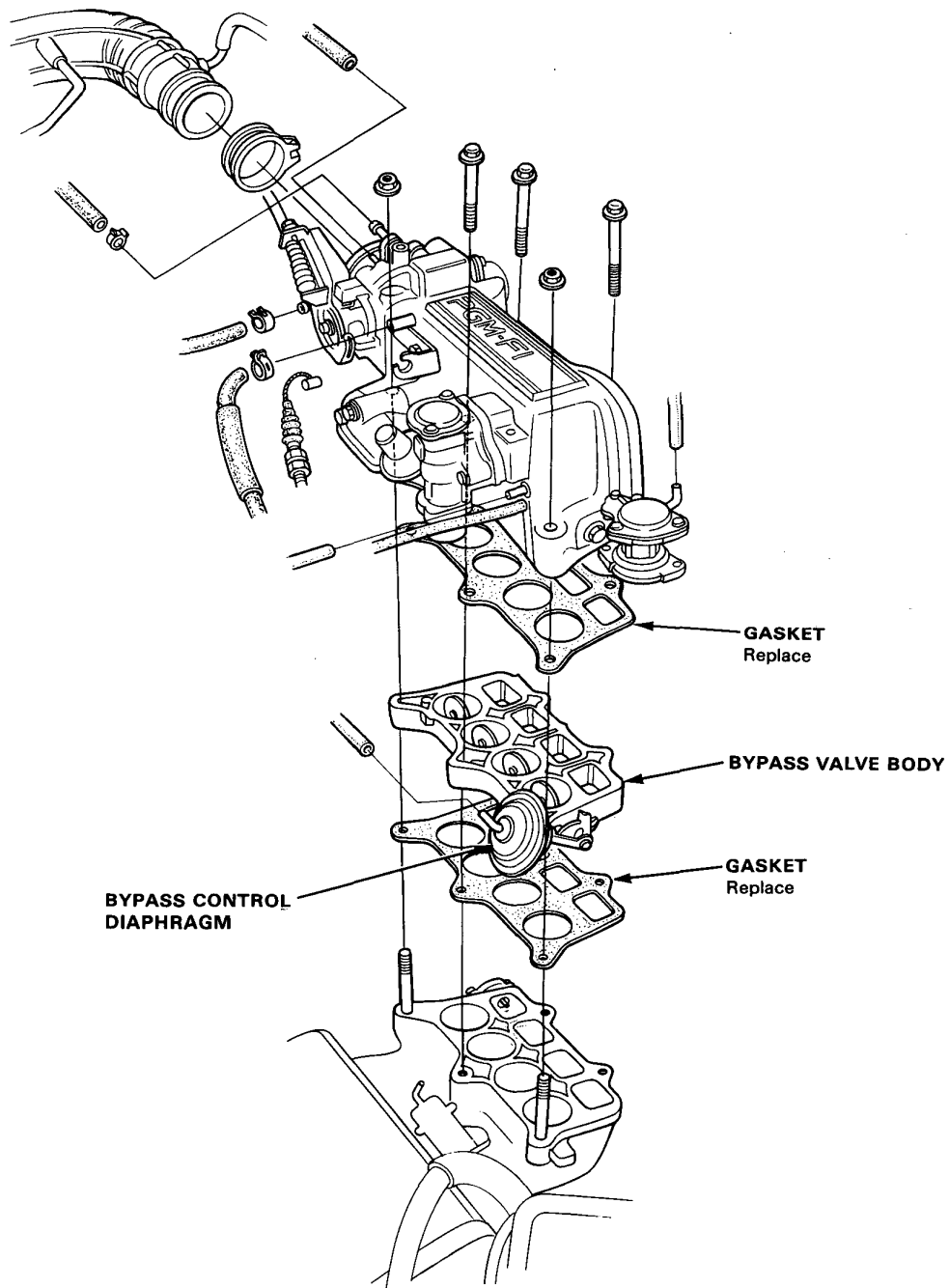
- If any fault is found, clean the linkage and shafts with carburetor cleaner.
- If the problem still exists after cleaning, disassemble the intake manifold and check the bypass valve (page 6-111).

(cont'd)



# Bypass Valve (2.2 l Except KY) (cont'd)

Disassembly





# Emission Control System

## System Troubleshooting Guide

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

### With CATA:

PAGE	SUB SYSTEM	CATALYTIC CONVERTER	EGR SYSTEM (except KQ)	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS
SYMPTOM		---	114	---	---
ROUGH IDLE			①	②	
FREQUENT (AFTER STALLING (WARMING UP))			①		
POOR PERFORMANCE	FAILS EMISSION TEST	①			②
	LOSS OF POWER	①			

### Without CATA :

PAGE	SUB SYSTEM	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS (KY)
SYMPTOM		---	---
ROUGH IDLE		①	
POOR PERFORMANCE (FAILS EMISSION TEST)			①

# Emission Control System

## System Troubleshooting Guide

---

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

### With CATA:

PAGE	SUB SYSTEM	CATALYTIC CONVERTER	EGR SYSTEM (except KQ)	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS
		---	114	---	---
			①	②	
			①		
	FAILS EMISSION TEST	①			②
	LOSS OF POWER	①			

### Without CATA :

PAGE	SUB SYSTEM	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS (KY)
		---	---
		①	
	POOR PERFORMANCE (FAILS EMISSION TEST)		①



## Tailpipe Emission

### Inspectin

**⚠ WARNING** Do not smoke during this procedure. Keep any open flame away from your work area.

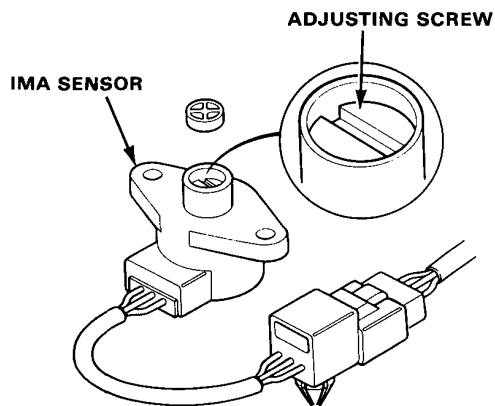
1. Start the engine and warm up to normal operating temperature (cooling fan comes on).
2. Connect tachometer.
3. Check idle speed and adjust the idle speed, if necessary (page 6-102)
4. Warm up and calibrate the CO meter according to the meter manufacture's instructions.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

### Specified CO%:

With CATA: 0.1 % maximum

Without CATA:  $1.0 \pm 1.0$  %

- If unable to obtain this reading :  
On With CATA, see ECU troubleshooting guide (page 6-80).  
On other models, adjust by turning the adjusting screw of the IMA sensor.

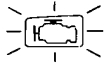


- If unable to obtain a CO reading of specified % by this procedure, check the engine tune-up condition.

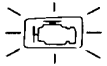
# Emission Control System

## Exhaust Gas Recirculation System

### Troubleshooting Flowchart



Self-diagnosis Check Engine warning light indicates code 12: Most likely a problem in the Exhaust Gas Recirculation (EGR) system.



—Check Engine warning light has been reported on, with service check connector jumped (page 6-84), CODE 12 is indicated.

Turn the ignition switch OFF.

Remove the BACK UP fuse in the under-hood relay box for 10 seconds to reset ECU.

Road test necessary: Warm up the engine to normal operating temperature (cooling fan comes on). Drive the car on the road for approx. 10 minutes. Try to keep the engine speed in the 1700—2500 range.

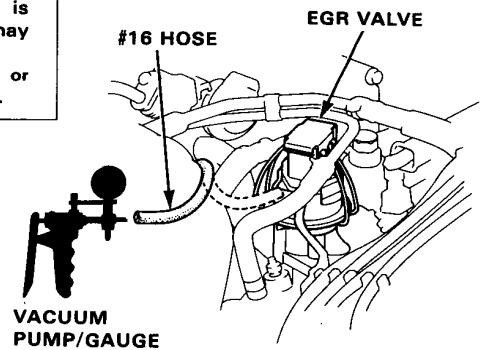
Is Check Engine warning light on and does it indicated CODE 12 ?

NO

Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires at EGR and ECU.

YES

With the engine at idle, disconnect the #16 hose from the EGR valve and connect a vacuum pump/gauge to the hose.



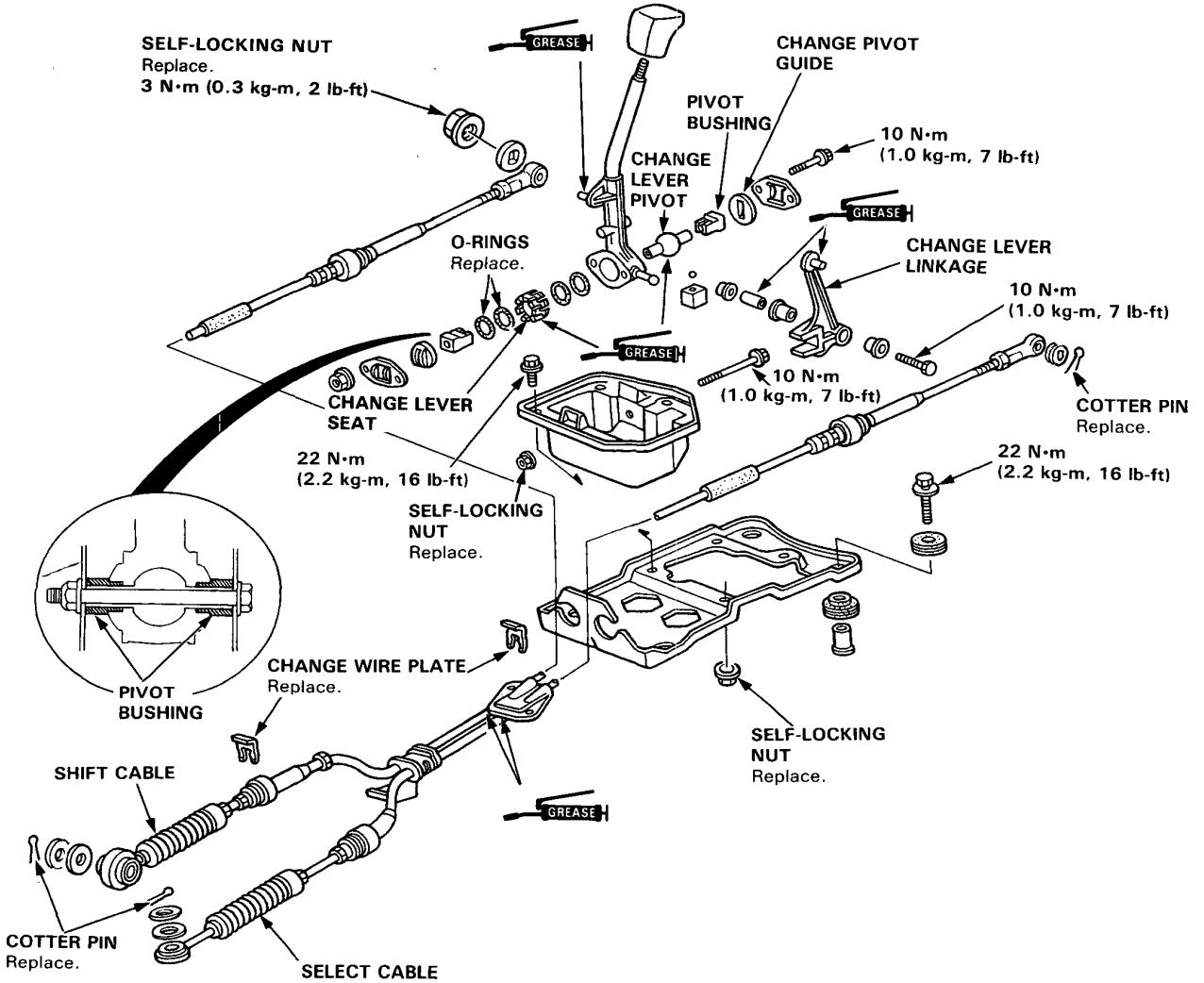
(To page 6-115)

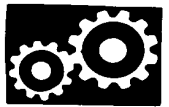
# Gearshift Mechanism

## Overhaul

### NOTE:

- Inspect rubber parts for wear or damage when disassembling.
- Check that new cotter pin is seated firmly.

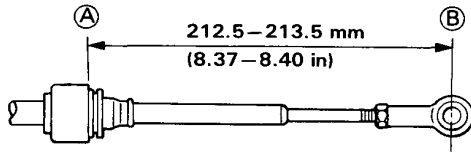




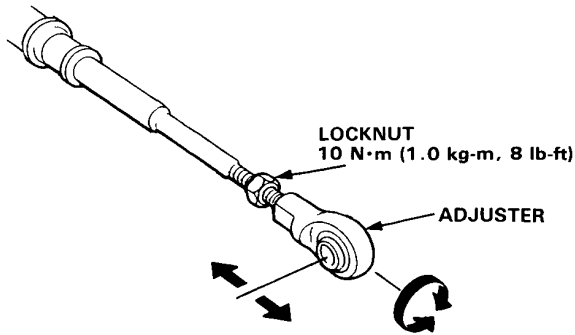
## Cable Adjustment

### Select Cable:

1. With the transmission in neutral, measure the clearance between (A) and (B).



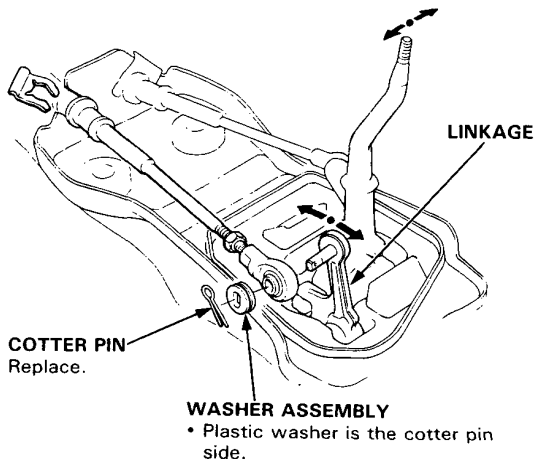
2. If there is no clearance between (A) and (B), loosen the locknut and turn the adjuster as necessary.



3. Tighten the locknut and install the select cable to the linkage.

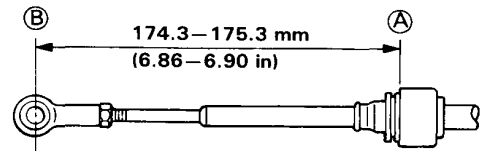
### NOTE:

- Check that new cotter pin is seated firmly.
- After adjustment, check operation of the gear-shift lever.

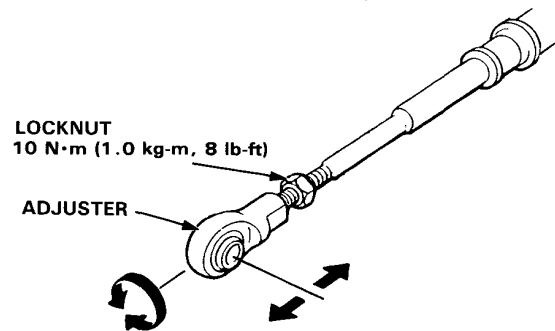


### Shift Cable:

1. With the transmission in neutral, measure the clearance between (A) and (B).

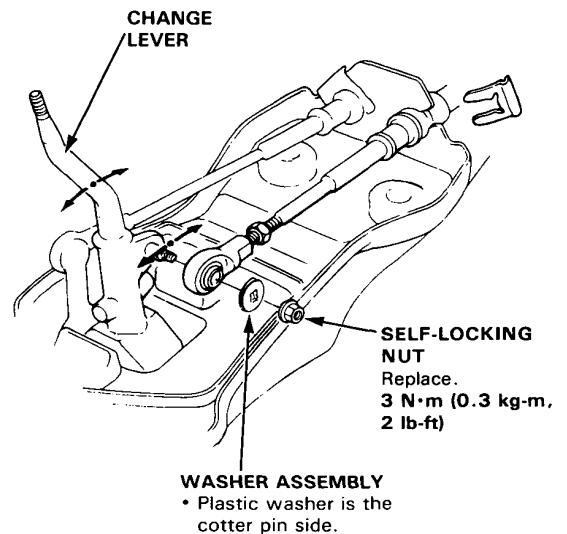


2. If there is no clearance between (A) and (B), loosen the locknut and turn the adjuster as necessary.



3. Tighten the locknut and install the shift cable to the change lever.

NOTE: After adjustment, check operation of the gear-shift lever.



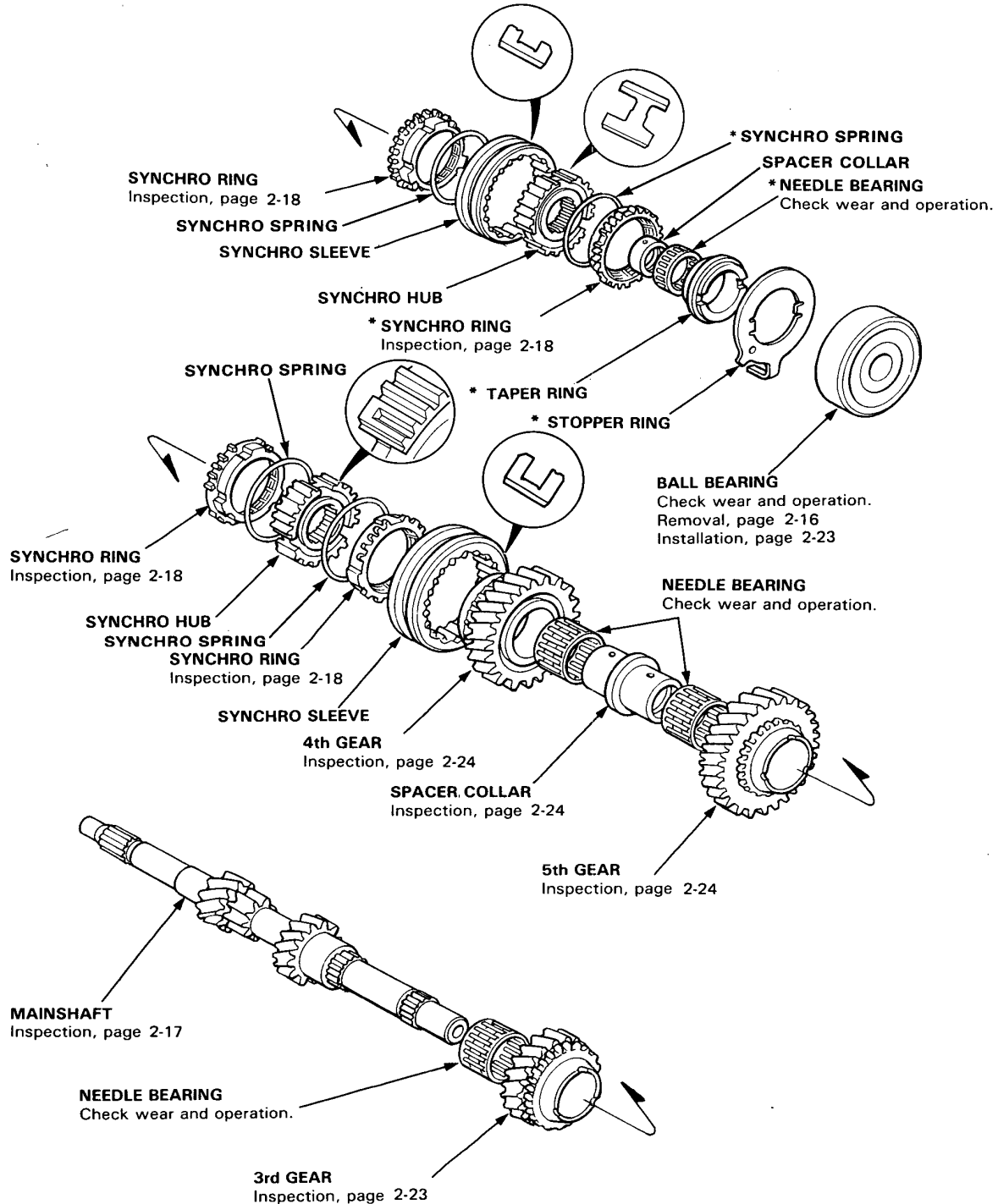
# Mainshaft

## Index



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

\* Mark parts: H2U5, H2C4 only.



# Countershaft

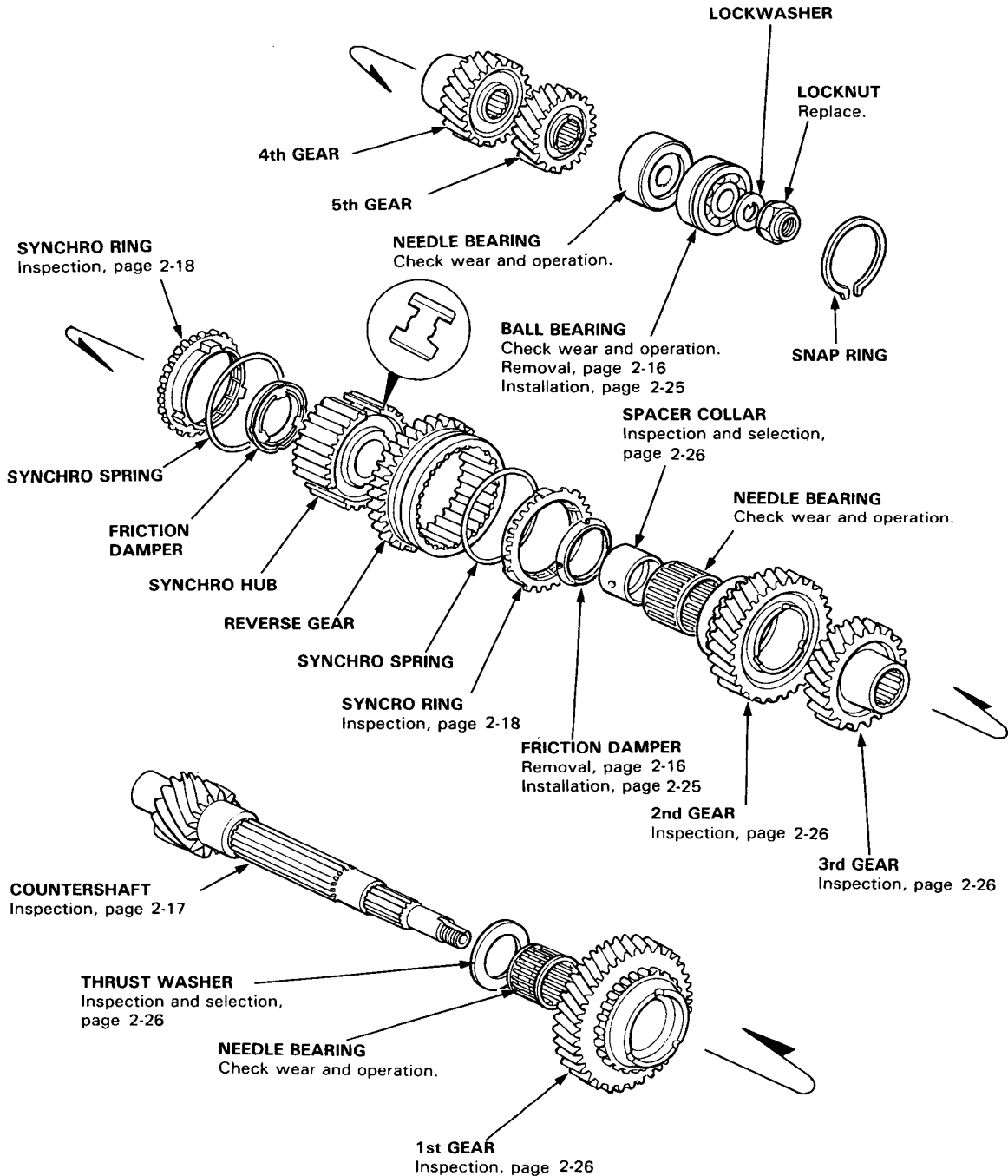


## Index

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.





# Service Tips

**▲ WARNING** When handling refrigerant (R-12) :

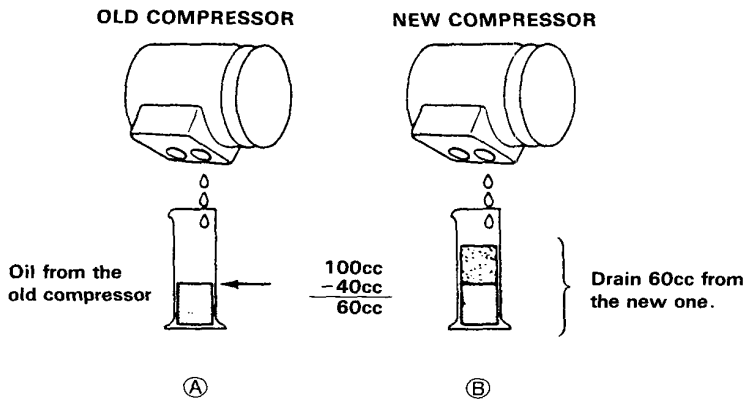
- Always wear eye protection.
- Do not let refrigerant get on your skin or in your eyes; if it does:
  - Do not rub your eyes or skin.
  - Splash large quantities of cool water in your eyes or on your skin.
  - Rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- Keep refrigerant containers (cans of R-12) stored below 40°C (100 °F).
- Do not handle or discharge refrigerant in an enclosed area near an open flame ; it may ignite and produce a poisonous gas.
- The ozone is a fragile layer surrounding the earth which acts as a shield against the sun's ultra-violet radiation. Chlorine from chemicals called chlorofluorocarbons (CFCs) destroy the ozone in the stratosphere. Automotive air conditioning systems currently use chlorofluorocarbons as the refrigerant.

Auto air conditioning service equipment has been developed to minimize the release of CFCs to the atmosphere. All service procedures should be performed using this equipment according to the manufacturer's instructions.

**CAUTION:**

1. Always disconnect the negative cable from the battery whenever replacing air conditioner parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When discharging the system, use a refrigerant recovery system, Don't release refrigerant into the atmosphere.
6. Add refrigerant oil after replacing the following parts;

Condenser .....	10 cc (1/3 fl oz)
Evaporator .....	25 cc (5/6 fl oz)
Line or hose .....	10 cc (1/3 fl oz)
Receiver .....	10 cc (1/3 fl oz)
Compressor .....	On compressor replacement, subtract the volume of oil drained from the removed compressor from 100 cc (3 1/3 fl oz), and drain the calculated volume of oil from the new compressor:
	100 cc (3 1/3 fl oz) - Volume of removed compressor = Draining volume.



# Discharge Procedure

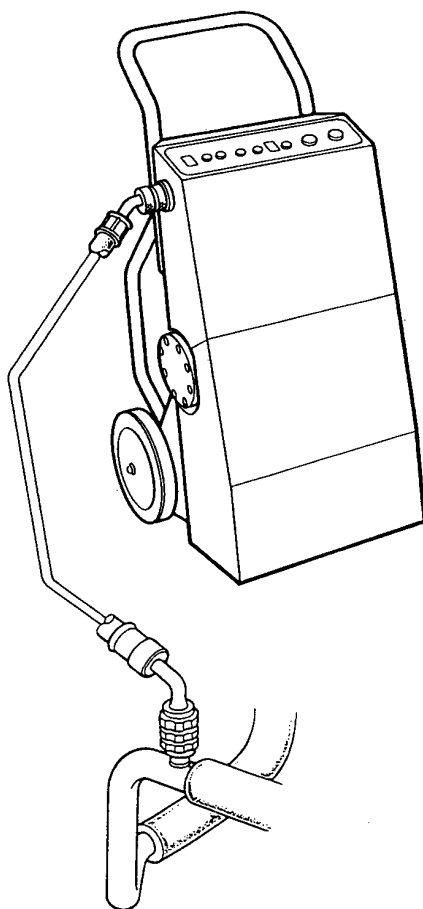


## Discharge

### ⚠ WARNING

- Keep away from open flames. The refrigerant, although nonflammable, will produce a poisonous gas if burned.
  - Work in a well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small enclosed area.
1. Connect a Refrigerant Recovery System to the A/C system.
  2. Operate the Refrigerant Recovery System according to the manufacturer's instructions.
- IMPORTANT:** Do not vent refrigerant to the atmosphere. The chlorofluorocarbons (CFCs) used in conventional refrigerant (R-12) may damage the earth's ozone layer. Always use UL-listed, refrigerant recovery/recycling equipment to extract the refrigerant before you open an A/C system to make repairs. Follow the equipment manufacturer's instructions.

Refrigerant Recovery/Recycling System.



# System Charging

## System Evacuation

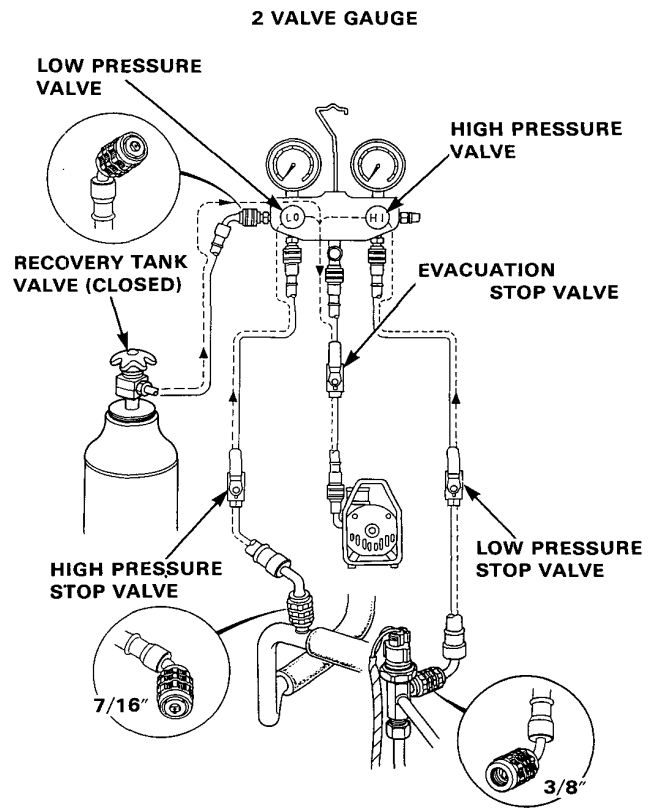
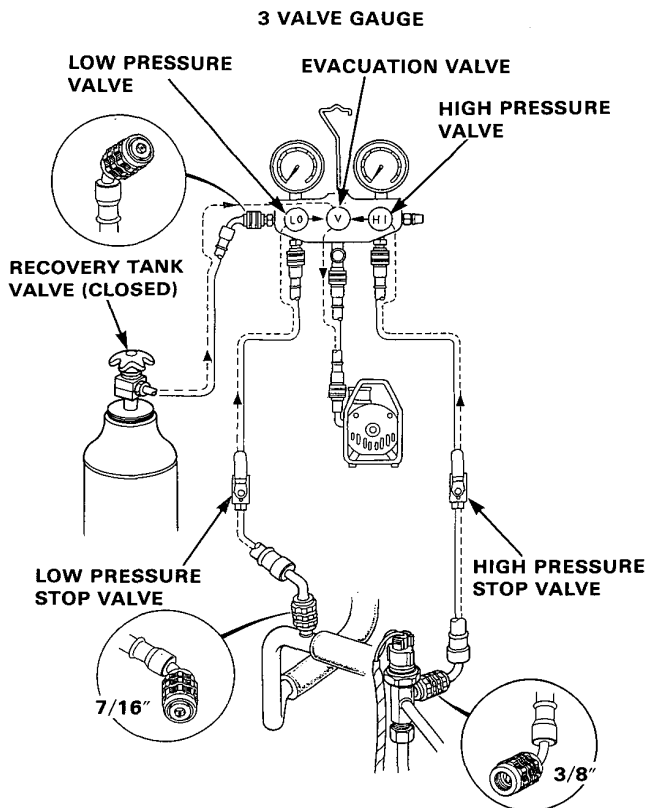
The following are the procedures to be adhered to when servicing air conditioners to reduce the amount of Freon R-12 into the atmosphere.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a vacuum pump. (If the system has been open for several days, the receiver/dryer should be replaced).
2. Connect a gauge, pump and refrigerant containers (recovery tank of R12) as shown.  
NOTE: Do not open the recovery tank.
3. Start the pump, then open the both pressure valves, both pressure stop valves and evacuation valve (2 valve gauge: evacuation stop valve). Run the pump for about 15 minutes. Close the both pressure valves and

evacuation valve (2 valve gauge: evacuation stop valve) and stop the pump. The low gauge should indicate above 700mmHg. (27 in-Hg) and remain steady with the valves closed.

NOTE: If low pressure does not reach more than 700 mmHg (27 in-Hg) in 15 minutes, there is probably a leak in the system. Check for leaks, and repair (see Leak Test).

4. If there are no leaks open the valves and continue pumping for at least another 15 minutes, then close both valves, stop the pump.





# System Charging

## Charging Procedures

The following are the procedures to be adhered to when servicing air conditioners to reduce the amount of R-12 into the atmosphere.


**⚠ WARNING** When handling refrigerant (R-12):

- Always wear eye protection.
- Do not let refrigerant get on your skin or in your eyes. If it does:
  - Do not rub your eyes or skin.
  - Splash large quantities of cool water in your eyes or on your skin.
  - Rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- Keep refrigerant containers (recovery tank of R-12) stored below 40°C (100°F).
- Keep away from open flame. Refrigerant, although non-flammable, will produce poisonous gas if burned.
- Work in well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small, enclosed area.

**CAUTION:** Do not overcharge the system; the compressor will be damaged.

1. After leak test, check that the high pressure valve is closed and start the engine.
 

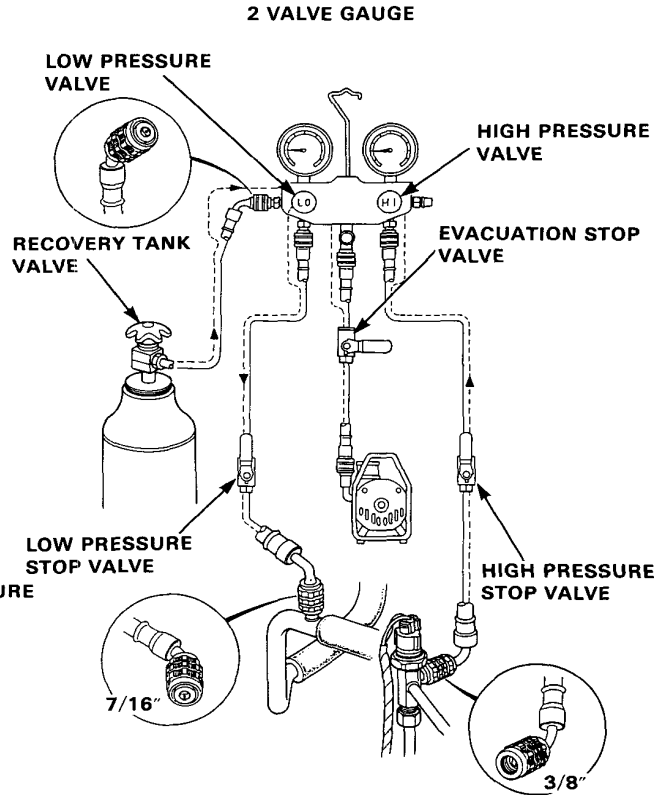
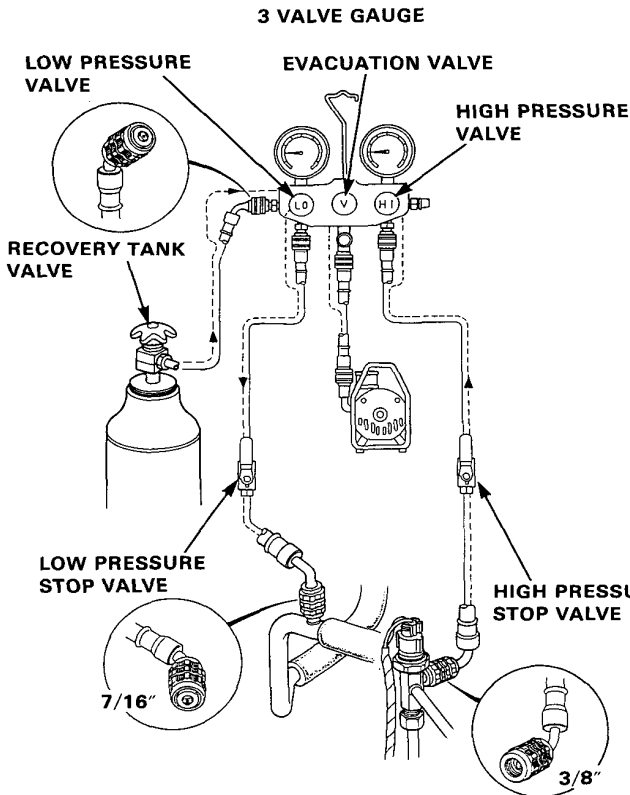
**NOTE:** Run the engine below 1500 rpm.

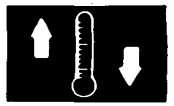
2. Open the front door.
  - Turn the A/C switch on.
  - Turn the air mix dial (lever) to COOL.
  - Turn function control switch (lever) on .
  - Turn the heater fan switch on "E" (MAX).
3. Open the low pressure valve and charge with refrigerant.

**⚠ WARNING**

- Do not open the high gauge valve.
  - Do not turn the cans upside down.
4. Charge the system with refrigerant capacity. Refrigerant capacity: 900–950 g (32–34 oz)
    - ★ Measure the charged refrigerant capacity using a weighing instrument.
  5. When fully charged, close the low pressure valve and the refrigerant cans. Check the system.
  6. Close the high pressure stop valve.
  7. Open the low pressure valve and gradually open the high pressure valve. When both pressure gauge are the same, close the low pressure stop valve and stop the engine.
  8. Disconnect the charge hose quickly.
  9. Check the system for leaks using a leak detector.
 

**NOTE:** Particularly check for leaks around the compressor, condenser, and receiver-dryer.





The following are the procedures to be adhered to when servicing air conditioners to reduce the amount of R-12 into the atmosphere.

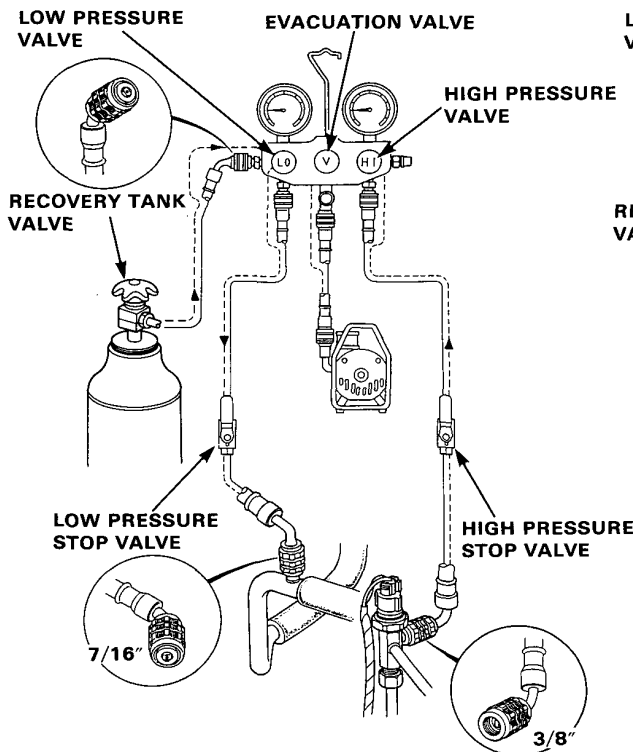
**⚠ WARNING** When handling refrigerant (R-12):

- Always wear eye protection.
- Do not let refrigerant get on your skin or in your eyes. If it does:
  - Do not rub your eyes or skin.
  - Splash large quantities of cool water in your eyes or on your skin.
  - Rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- Keep refrigerant containers (recovery tank of R-12) stored below 40°C (100°F)
- Keep away from open flame. Refrigerant, although non-flammable, will produce poisonous gas if burned.
- Work in well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small, enclosed area.

**CAUTION:** Do not overcharge the system; the compressor will be damaged.

1. Connect the gauge as shown, close both pressure stop valves. Purge air from the charge hose A, then loosen the stop valve connector.
2. Attach a pump and refrigerant containers (can: 250 g x 2) as shown.  
NOTE: Do not open cans.
3. Open both pressure valves and evacuation valve (2 valve gauge: evacuation stop valve), start the pump. The low gauge should indicate above 700 mmHg (27 in-Hg), then run the pump about 1 minute.

**3 VALVE GAUGE**



4. Close both pressure valves and evacuation valve (2 valve gauge: evacuation stop valve). Open both pressure stop valve.
5. Start the engine and turn on A/C switch.
6. Stop the engine and check for leaks using a leak detector.

NOTE: Particularly check for leaks around the compressor, condenser, and receiver-dryer.

7. Test the system using the pressure test and inspection data.

Test condition:

- Start the engine.
- Turn the air mix dial (lever) to COOL.
- Turn the function control switch (lever) on.
- Turn the recirculation control switch on.
- Turn the heater fan switch on "E" (MAX).

If there is insufficient refrigerant in system, continue to charge system.

8. Open one or two cans, open the low pressure gauge. Charge the system until there are no bubbles in the sight glass.

**⚠ WARNING**

- Do not open the high gauge valve.
  - Do not turn the cans upside down.
9. After adding supplemental refrigerant, close the high pressure stop valve. Open the low pressure valve and gradually open the high pressure valve. When pressure gauges read same, close the low pressure stop valve and stop the engine.
  10. Disconnect the charge hose quickly.
  11. Check the system for leaks using a leak detector.

**2 VALVE GAUGE**

