

# 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 MANUAL 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	S1 MODEL	REFERENCE SECTION
Engine	<p>Tightening torque changed</p> <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> <p>Changed</p> <ul style="list-style-type: none"> <li>Exhaust manifold (KQ model)</li> <li>Crank bore marking method</li> </ul>	○	6
Carburation	<p>Adapted</p> <ul style="list-style-type: none"> <li>KE with GATA model.</li> </ul> <p>Modified</p> <ul style="list-style-type: none"> <li>Vacuum connection</li> </ul>	○	6
PGM FI	<p>Adapted</p> <ul style="list-style-type: none"> <li>KE with GATA model (2.0 r.)</li> </ul> <p>Modified</p> <ul style="list-style-type: none"> <li>KQ model (2.2 r.)</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	<p>Modified</p> <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	<p>Changed</p> <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 : 2.0l, F20A4 with CATA (KG, KS)  
F20A4 without CATA (KF, KE)  
F20A5 (KB, KW)  
2.0l 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 : 2.2l, F22A3 with CATA (KF, KG, KX, KS, KE)  
EXi, F22A2 (KY)  
F22A9 with CATA (KO)

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: KO, 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  
KO

**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
- H2U6: 2.2 l Fuel-Injected, KO

**Serial Number**

**Automatic Transmission Number**

MPXA - 2000001

**Transmission Type**

**Serial Number**

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

F20A4 - 20 00001

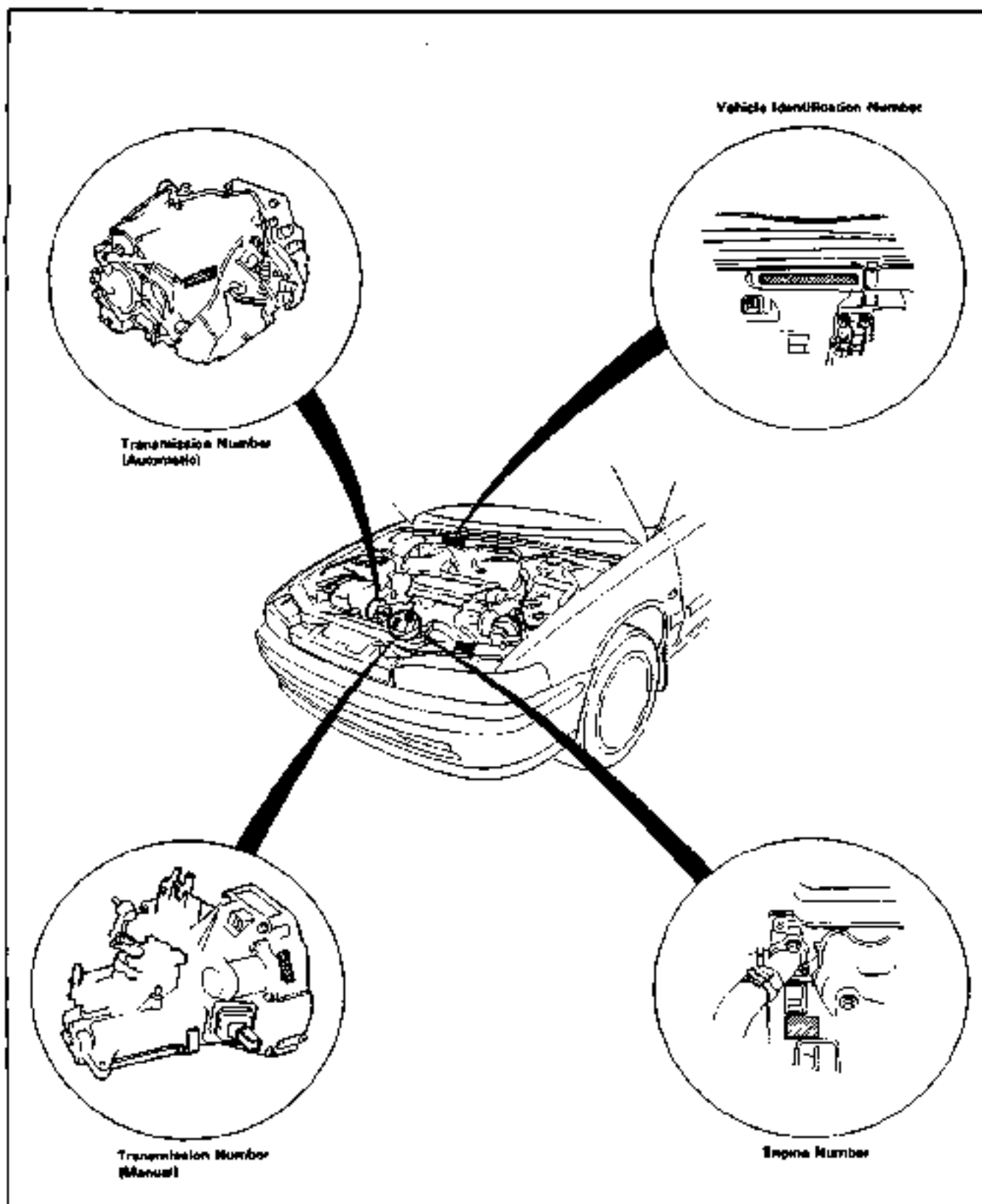
**Engine Type**

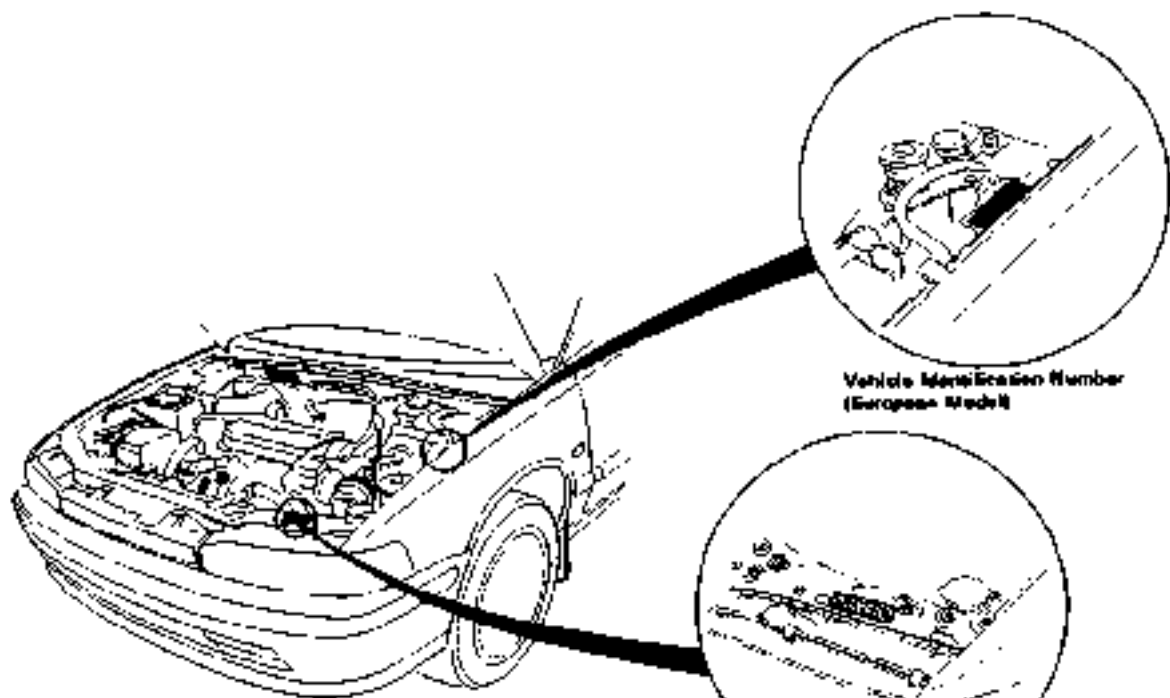
- F20A4: 2.0 l SOHC Fuel-Injected  
Unleaded gasoline with CATA  
KG, KX, KS, KE
- 2.0 l SOHC Fuel-Injected  
Unleaded gasoline without  
CATA: KF, KE
- F20A5: 2.0 l SOHC Fuel-Injected  
Leaded gasoline: KB, KW, KU

**Transmission Type**

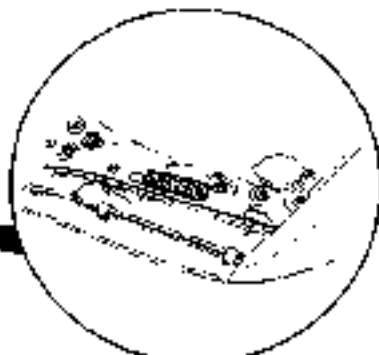
- 20: 5-speed manual
  - 25: 4-speed automatic
- Serial Number**

# Identification Number Locations





Vehicle Identification Number  
(European Model)

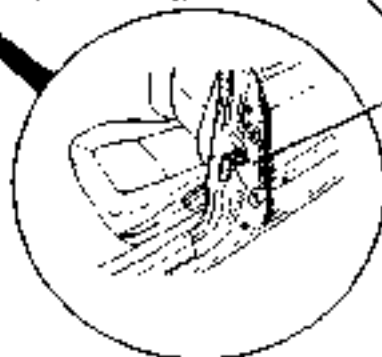
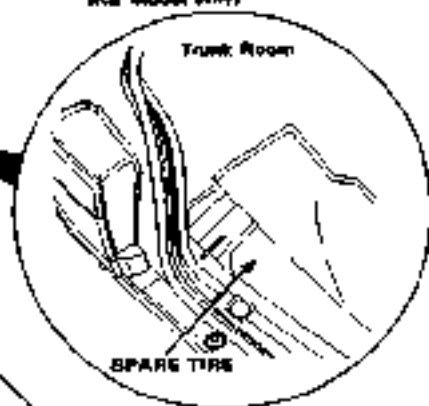


Vehicle Identification Number  
(KQ, KT Model)

Vehicle Identification Number  
(KJ Model only)

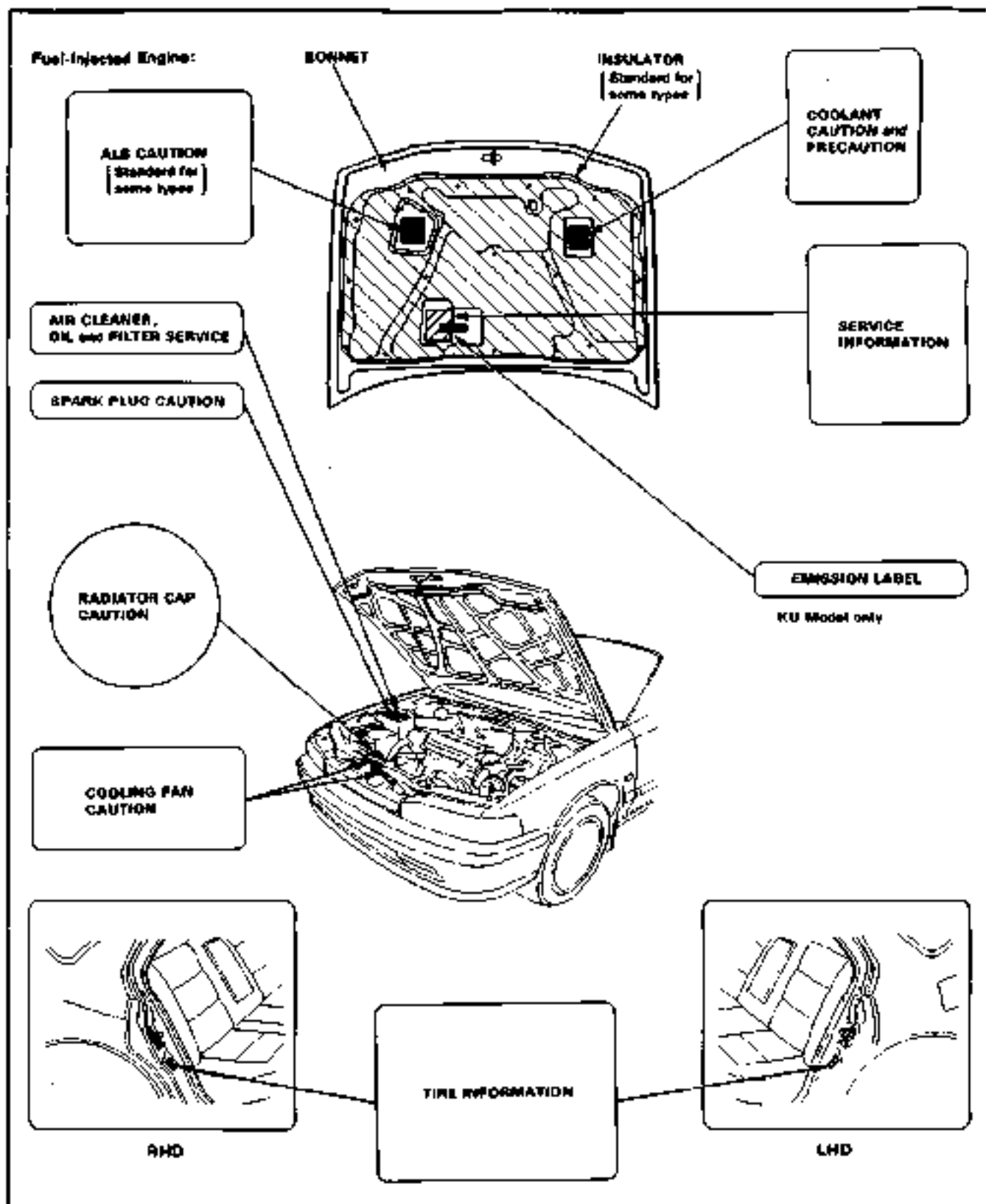


Vehicle Identification Number  
(KY Model only)



CENTER  
PILLAR

# Label Locations







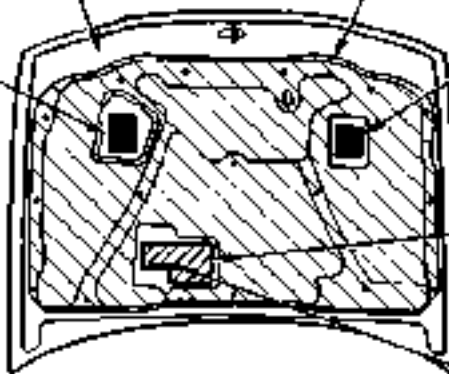
Carbureted Engine:

**ALB CAUTION**  
(Standard for  
some types)

**BONNET**

**INSULATOR**  
(Standard for  
some types)

**COOLANT  
CAUTION and  
PRECAUTION**



**SERVICE  
INFORMATION**

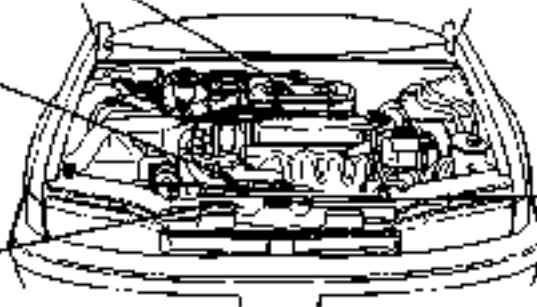
**AIR CLEANER,  
OIL and FILTER SERVICE**

**EMISSION LABEL**

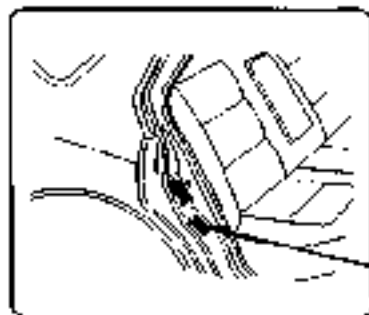
KU Model only

**RADIATOR CAP  
CAUTION**

**COOLING FAN  
CAUTION**

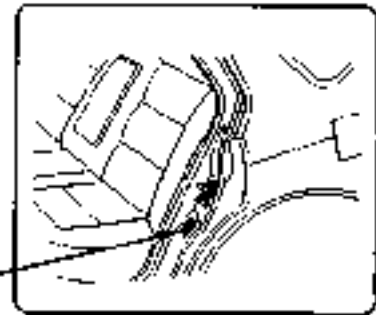


**COOLING FAN  
CAUTION**



**RHD**

**TIRE INFORMATION**



**LHD**

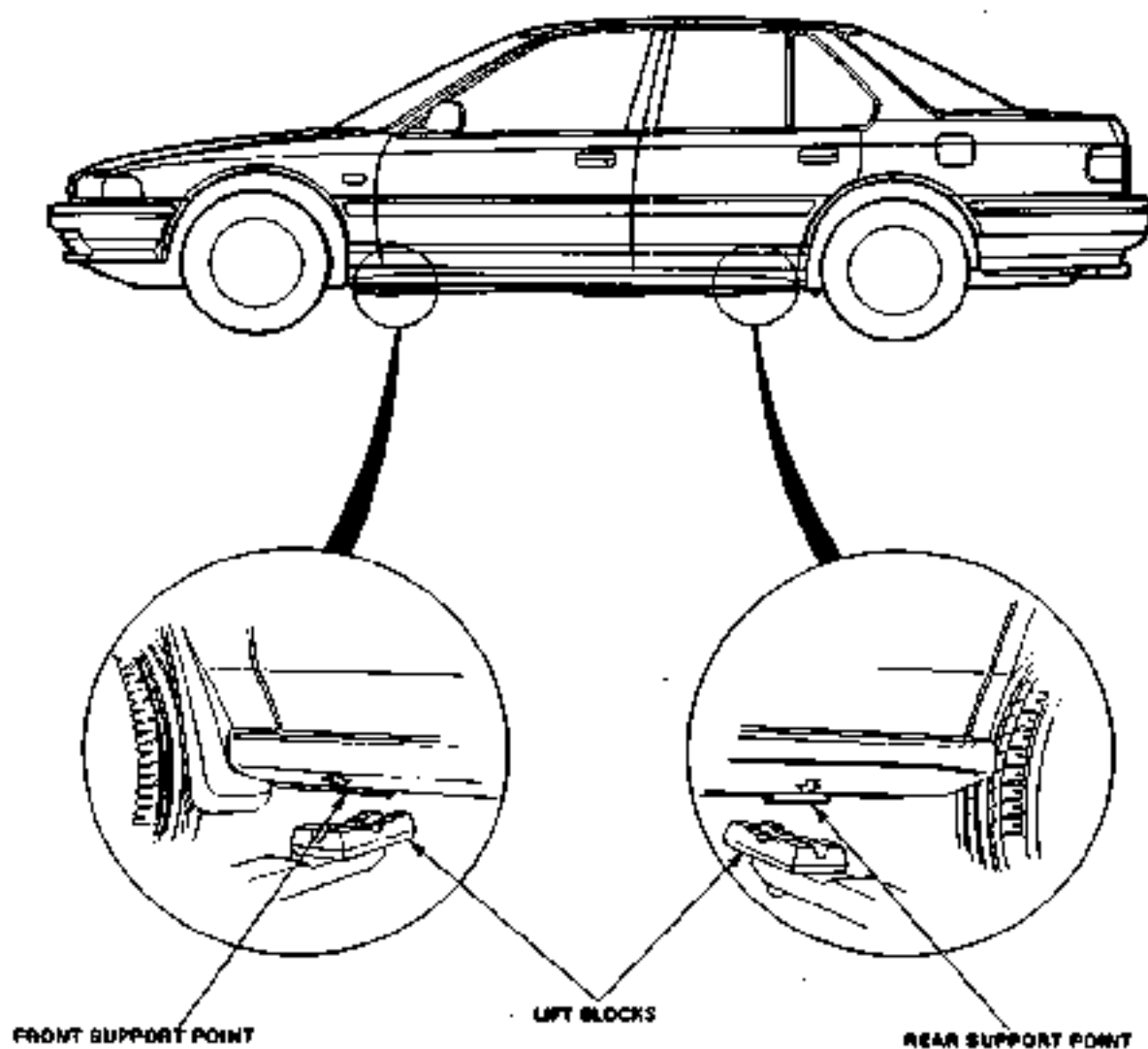
# Lift and Support Points

## 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.

**▲ CAUTION** 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.





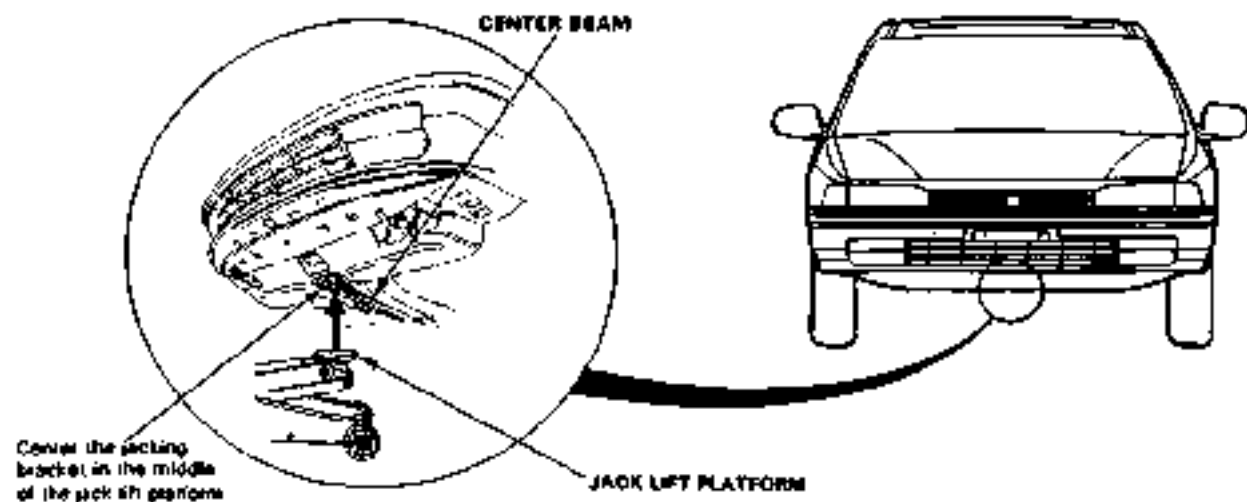
## Floor Jack

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.

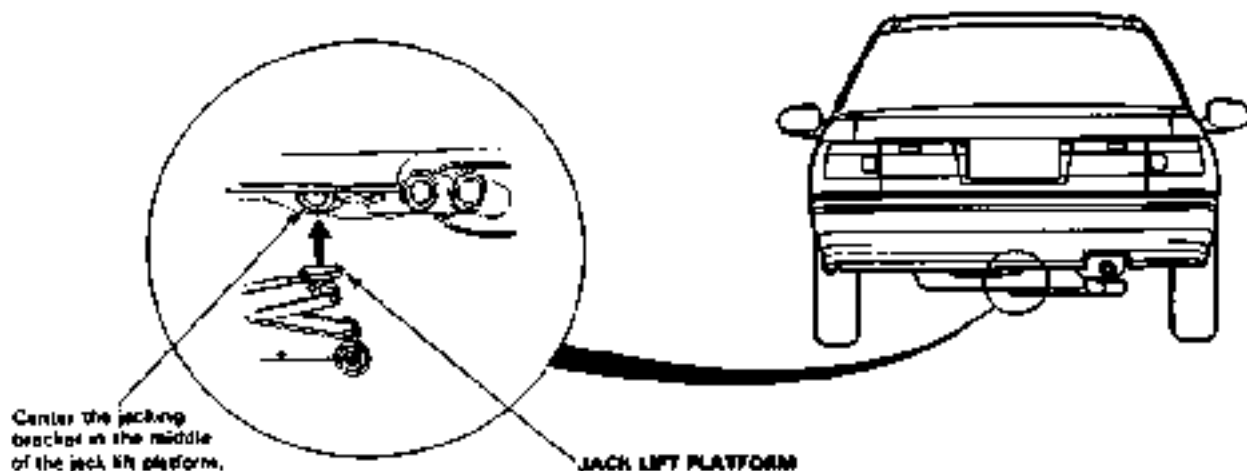
### \* CAUTION \*

- 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



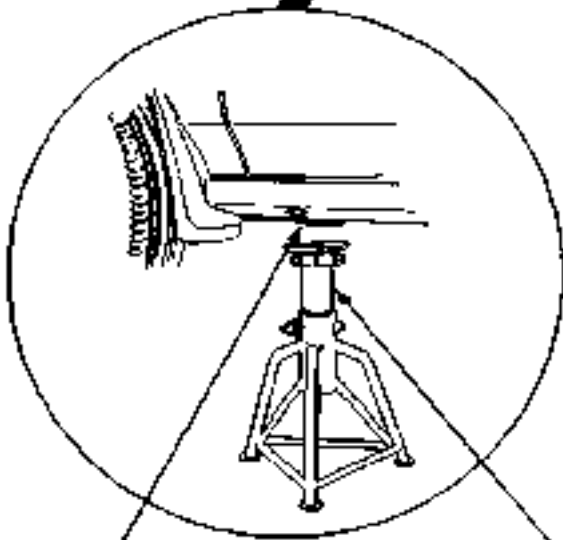
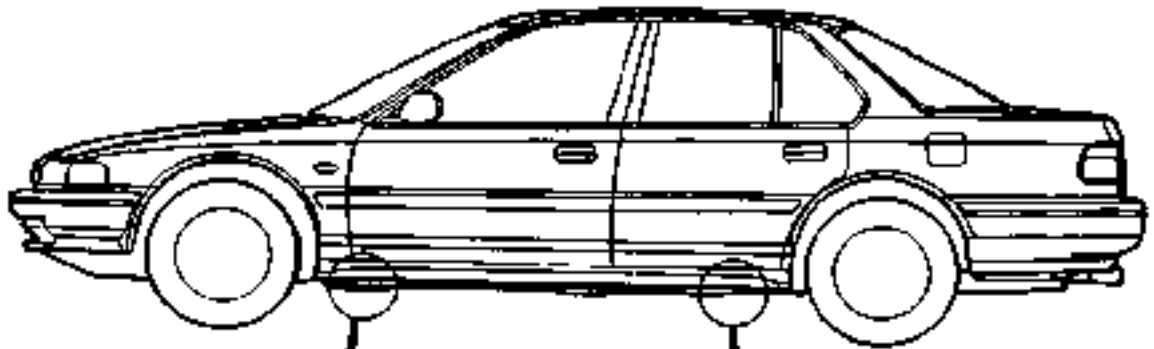
### Rear



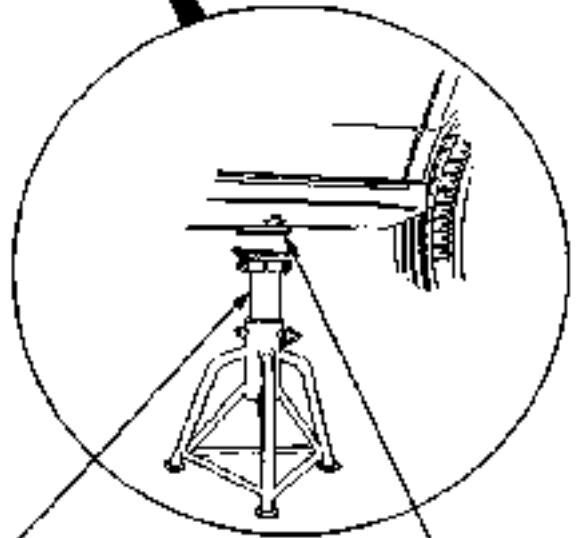
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## Lift and Support Points (cont'd)

### 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 the 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.

#### **CAUTION:**

**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 towing.

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.

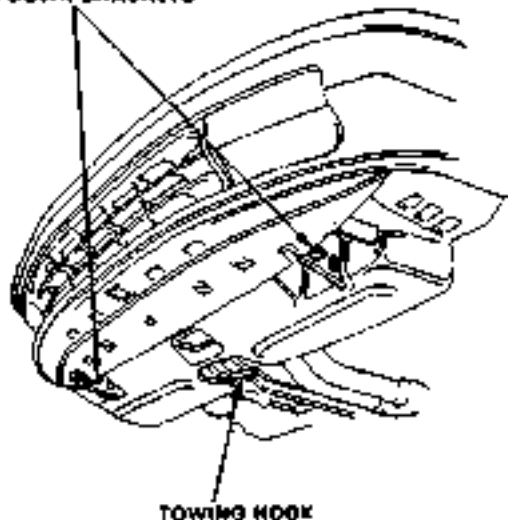
#### **Automatic Transmission**

First, check the automatic transmission fluid level. Start the engine and shift to D, 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**

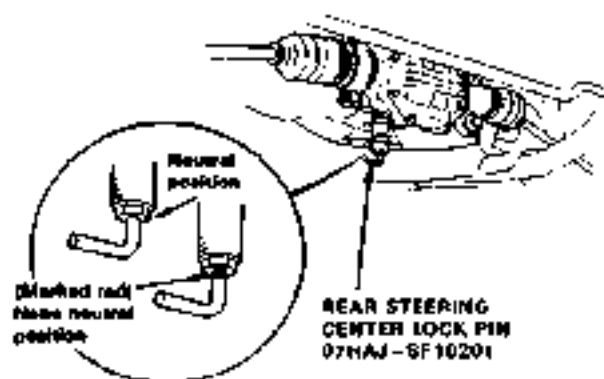


# Preparation of Work

## Special Caution Items For This Car

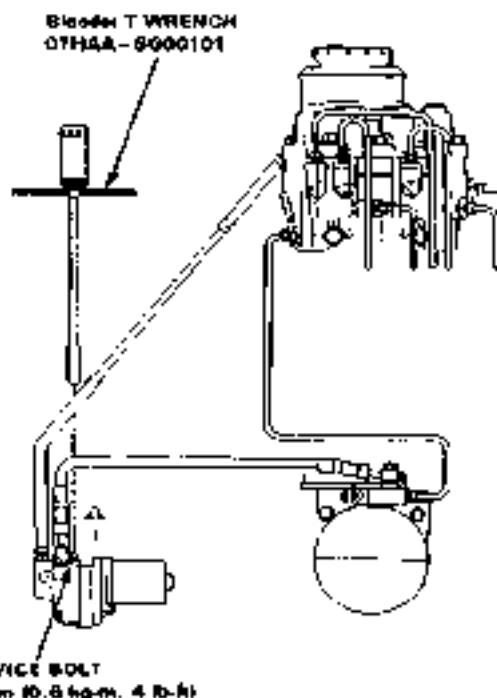
### 1. 4WS system servicing (with 4WS)

- 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.



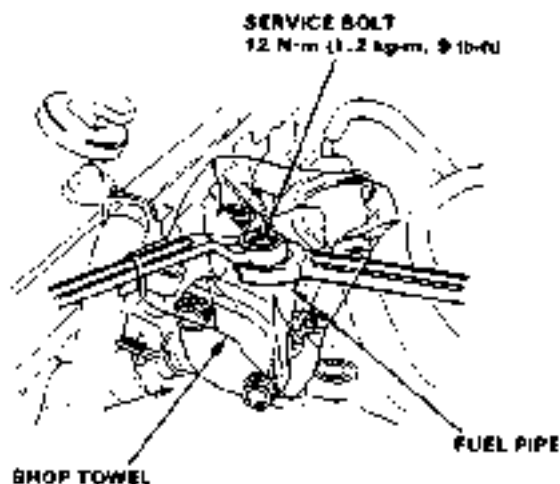
### 2. Anti-lock brake system piping system servicing

- Disassemble the anti-lock brake system piping system after relieve the high-pressure brake fluid.
- Otherwise, the high-pressure brake fluid will burst out and it is very dangerous.
- See section 13 of base manual (02SM400) how to relieve the high-pressure 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.

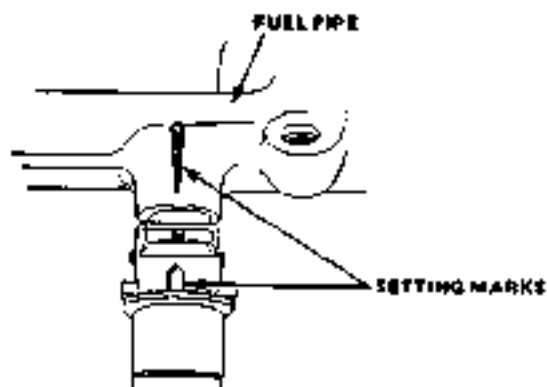




- Be sure to replace washers, O-rings, and rubber seals with new ones when servicing fuel line parts.
- Always apply oil to the surfaces of O-rings and seal rings before installation. Never use brake fluid, radiator fluid, vegetable oils or alcohol-based oils.



- 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.



**d. 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 leader 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).

**B. Apply liquid gasket to the transmission, oil pump cover, right side cover and water outlet. Use HONDA genuine liquid gasket part No. 0Y740-38986.**

- 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 30 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 locate the cause for which service is necessary. Observe all safety notes and precautions and follow the proper procedures as described in the manual.



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



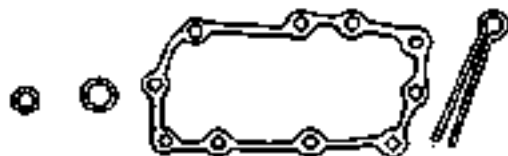
5. Use the special tools when use of such is specified.



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 opposite pattern in two or more steps.



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

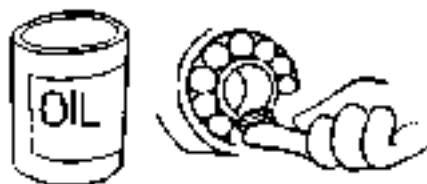


9. Use genuine HONDA parts and lubricants or those equivalent. When parts are to be reused, they must be inspected carefully to make sure they are not damaged or deteriorated and are in good usable condition.





10. Coat or fill parts with specified grease as specified (Page 4-7). 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 metal 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.

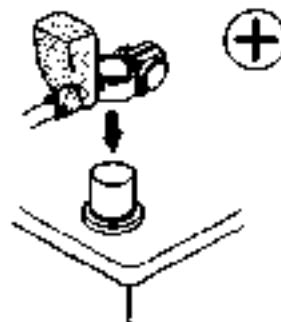


## Electrical

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



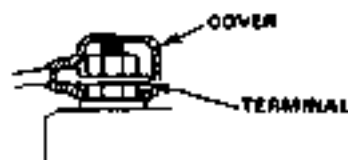
- After making repairs, check each wire or part for proper routing and installation. Also check to see that they are connected properly.
- Always connect the battery positive (+) cable first, then connect the negative (-) cable.



- 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.



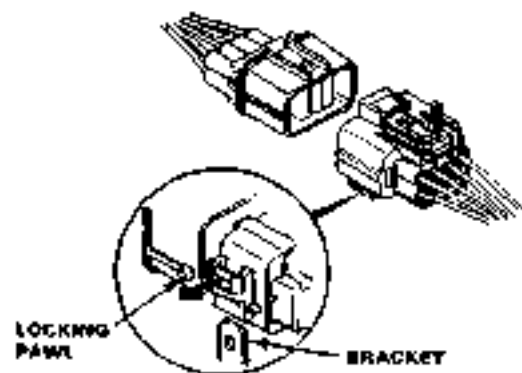
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# Preparation of Work

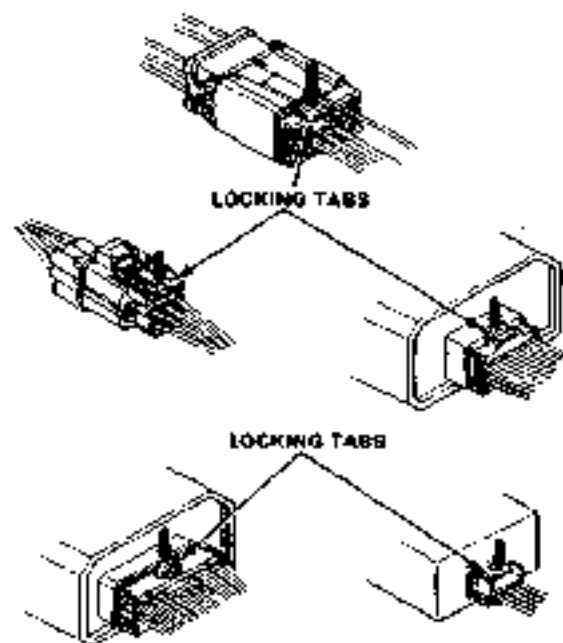
## Electrical (cont'd)

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

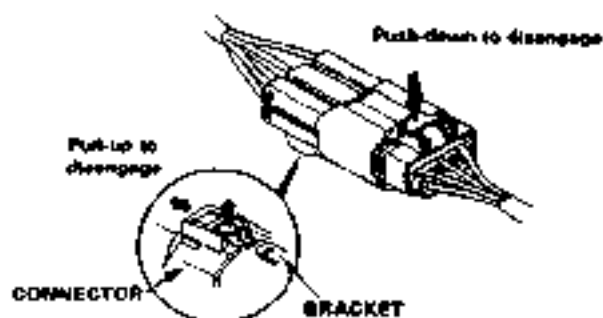
- Because all the connectors except terminal of 1-P are equipped with push-down type locks, unlock them first before disconnecting the connectors.
- On the connectors installed on the bracket a pull type lock is equipped between the bracket and the connector. Some connectors of this type can not be disconnected 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.



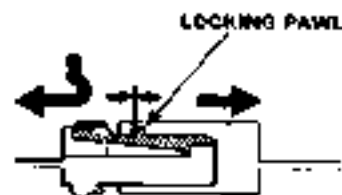
- Push the locking tab to disconnect.



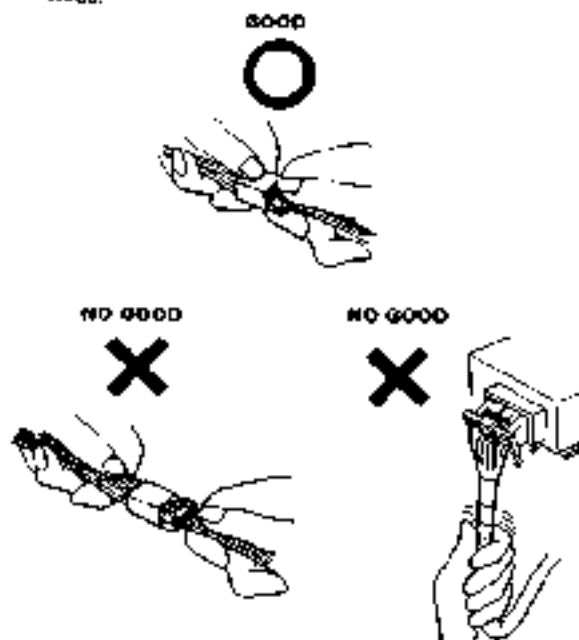
- Pull up the locking tab to remove the connector from the bracket



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

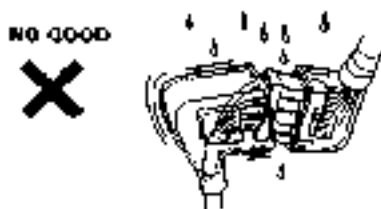


- When disconnecting a connector, pull it off from the mating coupler by holding in both connectors.
- Never try to disconnect connectors by pulling on their wires.

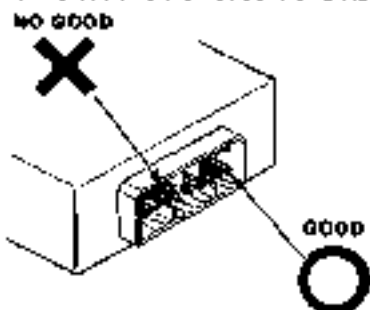




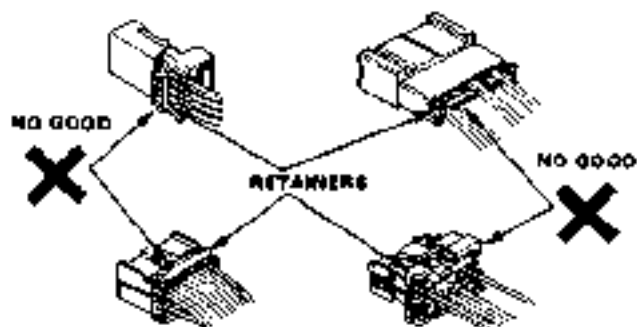
- Place the plastic cover over the mating connector after reconnecting. Also check that the cover is not distorted.



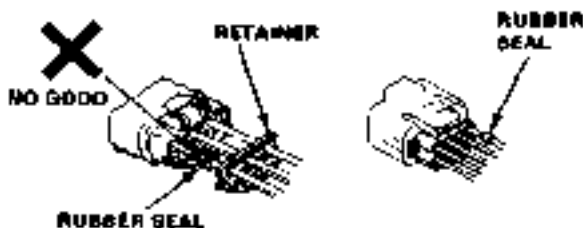
- Before connecting connectors, check to see that the terminals are in place and are not bent or distorted.



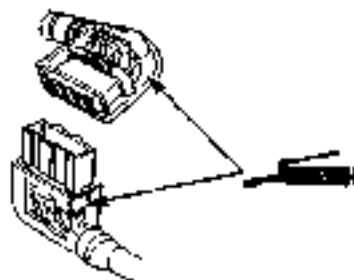
- Check for loose retainers and rubber seats. The illustration shows examples of terminal and seat abnormality.



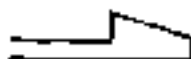
Examples of waterproof connector



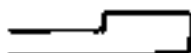
- For this connector which uses insulation grease, clean the connector then apply grease if the grease is insufficient or contaminated.



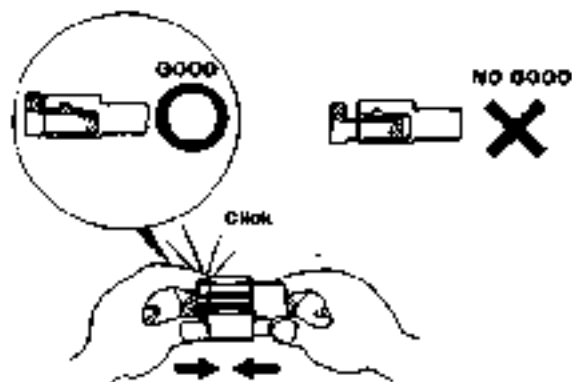
- Insert the connector tightly and make sure it is securely locked.
- Check all the wire harnesses are connected.
- There are two types of locking tab: one that you have to push and the other you should not touch when connecting the connector. Check the shape of the locking tab before connecting.
- The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

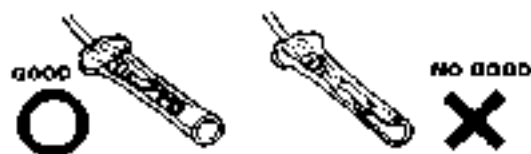


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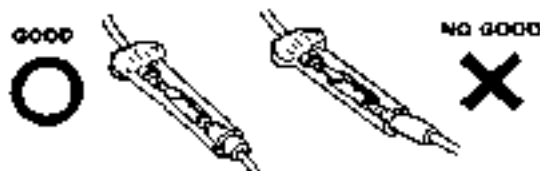
# Preparation of Work

## Electrical (cont'd)

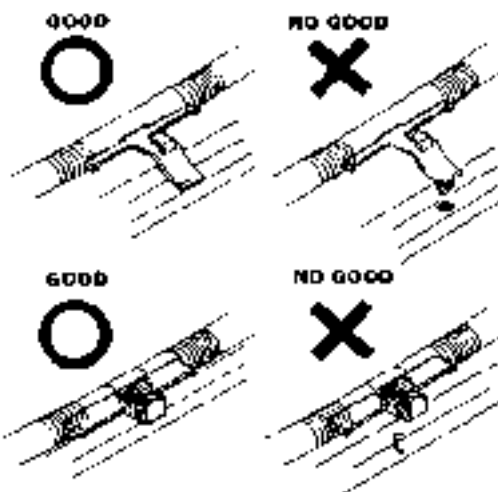
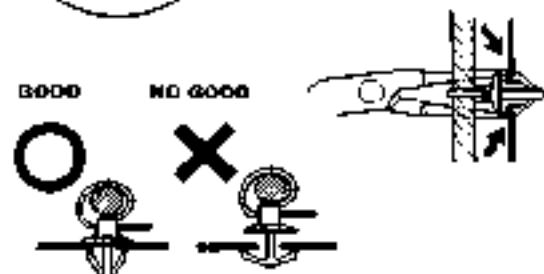
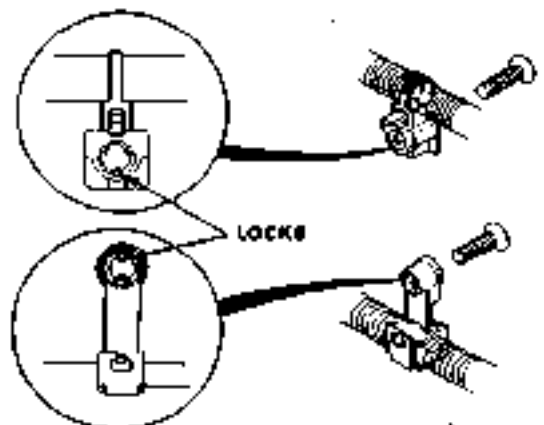
- Before connecting, check each connector cover for damage. Also make sure that the female connector is tight and not loosened from the previous use.



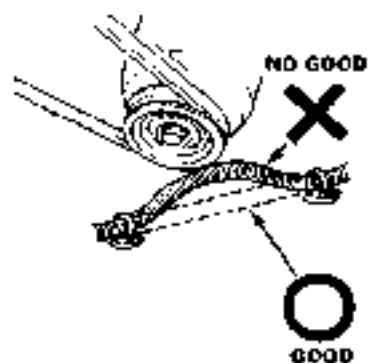
- Insert male connectors into the female connectors fully until they will no longer go.
- Be sure that plastic cover is placed over the connection.
- Position the wires so that the open of the cover is not facing upward.



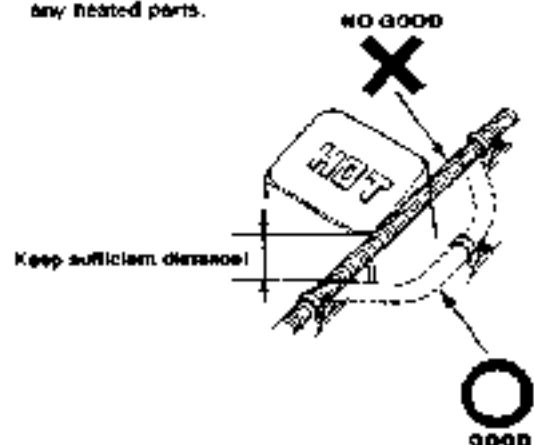
- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Position the wiring in the bands so that only the insulated surfaces contact the wires or wire harnesses.
- Remove with care not to damage the lock.



- 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.

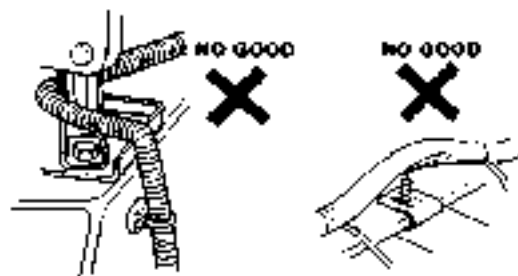


- Always keep a safe distance between wire harnesses and any heated parts.

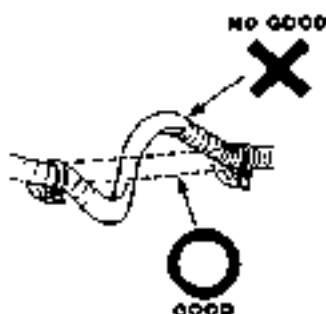




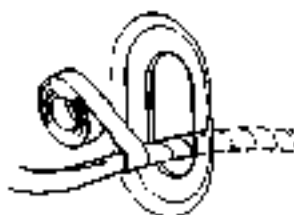
- Do not bring wire harnesses in direct contact with sharp edges or corners.
- Also avoid contact with the projected ends of bolts, screws and other fasteners.



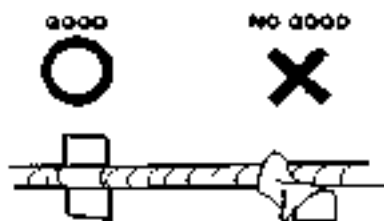
- Route harnesses so they are not pulled taut or slackened excessively.



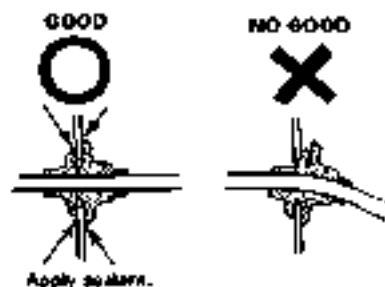
- Protect wires and harnesses with a tape or a tube if they are in contact with a sharp edge or corner.



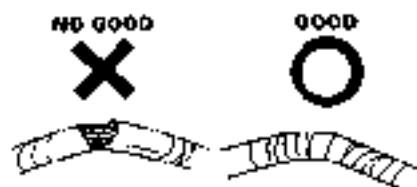
- Clean the attaching surface thoroughly if an adhesive is used. First, wipe with solvent or alcohol if necessary.



- Seal 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.



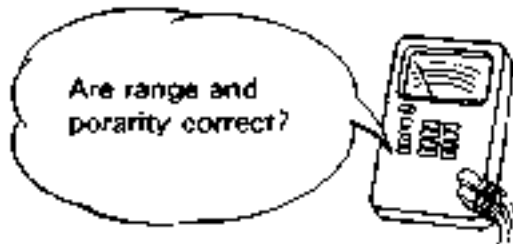
- After routing, check that the wire harnesses are not twisted or linked.
- Wire harnesses should be routed so that they are not pulled taut, slackened excessively, pinched or interfering with adjacent or surrounding parts in all steering positions.

(cont'd)

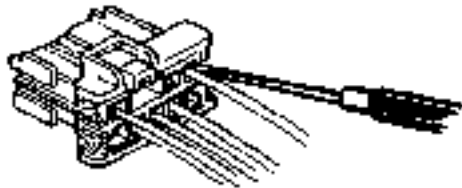
# Preparation of Work

## Electrical (cont'd)

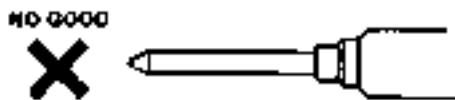
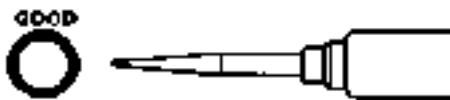
- When using the Service Tester, follow the manufacturer's instructions and those described in the Shop Manual.



- 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.

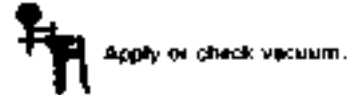


- Do not drop parts.



# Symbol Marks

The following symbols stand for



# Abbreviation



2WS	Front Wheel Steering	Ⓟ	Parking
4WS	Four Wheel Steering	Ⓡ	Reverse
A/C	Air Conditioner	Ⓝ	Neutral
A/T	Automatic Transmission	Ⓛ	Drive Position (1st-4th)
ATF	Automatic Transmission Fluid	Ⓜ	Drive Position (1st-3rd)
B or BAT	Battery	Ⓜ	Fixed 2nd speed
CATA	Catalytic Converter	Ⓛ	Fixed 1st speed
EACV	Electronic Air Control Valve	Ⓢ	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	Pist. Collar	1	
②	07HAD-PJ70200	Valve Guide Seal Installer	1	
③	07HAF-PL20102	Piston Base Head	1	
④	07HAK-PJ70100	Valve Guide Reamer 5.5mm	1	
⑤	07JAB-0010000	Crank Pulley Holder Set	1	
⑥-1	07JAA-0010200	Socket Wrench 19 mm	(1)	
⑥-2	07JAB-0010200	Handle	(1)	
⑦	07JAB-0010400	Pulley Holder Attachment MEX b0 mm	1	
⑧	07JAZ-SH20100	R.P.M. Connecting Adaptor	1	
⑨	07JGG-0010100	Belt Tension Gauge	1	
⑩	07KAK-SJ40100	Engine Tilt Hanger Set	1	
⑪	07LAF-PT20100	Bearing Replacement Tool Set	1	
⑫	07LAG-PT20100	Balancer Shafts Lock Pin	1	
⑬	07LA7-PT30100	R.P.M. Connecting Adaptor	1	
⑭	07LAZ-PT30110	R.P.M. Connecting Adaptor (A)	1	Component Tools
⑮	07LAZ-PT30120	R.P.M. Connecting Adaptor (B)	1	
⑯	07A06-0030000	Oil Pressure Gauge Adaptor	1	
⑰	07746-0010300	Driver Attachment 42 x 47 mm	1	for Crankshaft
⑱	07746-0010400	Driver Attachment 52 x 55 mm	1	for Balancer Shaft
⑲	07749-0010000	Driver	1	
⑳	07757-0010000	Valve Spring Compressor	1	
㉑	07912-8110001	Oil Filter Socket	1	
㉒	07924-PO20003 or 07924-PD20002	Ring Gear Holder	1	
㉓	07942-0010100	Valve Guide Remover 5.5 mm	1	
㉔	07942-9920000	Valve Guide Driver 5.5 mm	1	
㉕	07948-S800101	Driver Attachment	1	
㉖	07973-PE00310	Piston Pin Driver Shaft	1	
㉗	07973-PE00320	Piston Pin Driver Head	1	
㉘	07973-PE00400	Piston Pin Base Insert	1	
㉙	07973-8570500	Piston Base	1	
㉚	07973-0570600	Piston Base Spring	1	





## 6. Fuel and Emissions

Number	Tool Number	Description	Qty	Remarks	
①	07JAZ-SH20100	R.P.M. Connecting Adaptor	1	Component Tools	
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	07IAZ-PT30100	R.P.M. Connecting Adaptor	1		
⑤-1	07LA2-PT30110	R.P.M. Connecting Adaptor (A)	(1)		
⑤-2	07LA2-PT30120	R.P.M. Connecting Adaptor (B)	(1)		
⑥	07406-0040001	Fuel Pressure Gauge Set	1		Component Tools
⑥-1	07406-0040100	Pressure Gauge	(1)		
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	Qty	Remarks
①	07JAF-PM7011A	Clutch Alignment Disc	1	
②	07LAF-PT03110	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	Qty	Remarks
①	07GAJ-PG20102	Mainshaft Inspection Tool Set	1	Component Tools
①-1	07GAJ-PG20110	Mainshaft Holder	(1)	
①-2	07GAJ-PG20130	Mainshaft Base	(1)	
②	07HAJ-PK40201	Preload Inspection Tool	1	Component Tools
③	07JAC-PH80000	Adjusting Bearing Remover Set	1	
③-1	07JAC-PH80100	Bearing Remover Attachment	(1)	
③-2	07JAC-PH80200	Bearing Remover Handle	(1)	
③-3	07741-0010201	Bearing Remover Weight	(1)	
④	07JAD-PH80400	Ripe Driver 28 mm	1	
⑤	07JAD-SH30100	Oil Seal Driver	1	07944-6110100 may also be used
⑥	07744-0010400	Pin Driver 5.0 mm	1	
⑦	07746-0010300	Attachment 42 x 47 mm	1	
⑧	07746-0010400	Attachment 52 x 55 mm	1	
⑨	07746-0010500	Attachment 52 x 58 mm	1	
⑩	07746-0010800	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-SAC0000	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	Qty	Remarks
①	07GAB-PF50100	Mainshaft Holder	1	
②	07GAD-PG20100	Pin Driver 5.0 mm	1	
③	07GAE-PG40200	Clutch Spring Compressor Set	1	
④-1	07HAE-PL80100	Clutch Spring Compressor Attachment	(1)	Component Tools
④-2	07GAE-PG40200	Clutch Spring Compressor Bolt Assembly	(1)	
④-3	07960-B120101	Clutch Spring Compressor Attachment	(1)	
⑤	07GAJ-PG20200	Preload Inspection Tool	1	
⑥	07HAC-PK40101	Floung puller	1	
⑥-1	07HAC-PK40110	Puller Base, Replacement	(1)	May also be used when combined with 07HAC-PK40100
⑦	07JAC-PH80000	Adjusting Bearing Remover Set	1	
⑧-1	07JAC-PH80100	Bearing Remover Attachment	(1)	Component Tools
⑧-2	07JAC-PH80200	Bearing Handle Assembly	(1)	
⑧-3	07741-0010201	Remover Weight	(1)	
⑨	07JAB-PH80101	Driver Attachment	1	
⑩	07JAB-PH80400	Pilot Driver 28 x 30 mm	1	
⑪	07JAB-PH80100	Driver Attachment	1	
⑫	07LAF-PX40100	Clutch Spring Compressor Attachment	1	
⑬	07LAJ-FT30100	ECU Test Harness	1	
⑭	07406-0020003	Oil Pressure Gauge	1	
⑮	07406-0020201	Oil Pressure Gauge Hose	1	
⑯	07406-0070000	Low Pressure Gauge	1	
⑰	07746-0010400	Attachment 52 x 55 mm	1	
⑱	07746-0010500	Attachment 62 x 68 mm	1	
⑲	07746-0010600	Attachment 72 x 78 mm	1	
⑳	07746-0030100	Driver 40 mm I.D.	1	
㉑	07749-0010000	Driver	1	
㉒	07947-6340500	Driver Attachment E	1	

## 10. Driveshafts

Number	Tool Number	Description	Qty	Remarks
①	07GAD-PG40100	Seal Driver Attachment	1	
②	07QAF-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	07966-SD90100	Support Base	1	



## 11. Steering

Number	Tool Number	Description	Q'ty	Remarks
①	07GAG-SM40300	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	07JGQ-0010100	Ball 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	
⑧-1	07406-0010300	Pressure Control Valve	1	
⑧-2	07406-0010400	Pressure Gauge	1	
⑨	07406-0010101	Bypass Tube Joint (included with 07406-0010001)	1	
⑩	07725-0030000	Universal Holder	1	
⑪	07746-0010300	Attachment 42 x 47 mm	1	
⑫	07748-8910000	Driver	1	
⑬	07916-S450001	Locknut Wrench 40 mm	1	
⑭	07941-S920003	Ball Joint Remover	1	
⑮	07947-S740300	Driver Attachment	1	
⑯	07974-S450600	Pinion Seal Guide	1	

## 11. Steering (4WS only)

Number	Tool Number	Description	Q'ty	Remarks
①	07HAG-SF10000	4WS Tool Kit	1	
②-1	07HAG-SF10400	Pinion Seal Ring Sizing Tool	1	
②-2	07HAG-SF10500	Driven Seal Ring Guide	1	
③	07HAJ-SF10100	Rack Adjuster Gauge Holder Set	1	
④	07HAJ-SF10201	Rear Steering Centre Lock Pin	1	
⑤	07HAJ-SF10300	Stroke Rod Holder Set	1	
⑥	07HAJ-SF10400	Inspection Adaptor	1	
⑦	07LAA-SM40100	Locknut Wrench, 43 mm	1	
⑧	07LAA-SM40200	Locknut Socket 38 x 43 mm	1	
⑨	07LAG-SM40000	4WS Tool Kit	1	
⑩-1	07LAG-SM40100	Piston Seal Ring Guide	1	
⑩-2	07LAG-SM40200	Piston Seal Ring Sizing Tool	1	
⑪-3	07LAG-SM40300	Cylinder End Seal Slider	1	
⑪-4	07LAG-SM40400	Cylinder End Seal Guide	1	
⑫-5	07LAG-SM40500	Tool Box	1	
⑬	07703-0010101	TORX® 81L T40	1	

## Special Tools

### 12. Suspension

Number	Tool Number	Description	Qty	Remarks
①	07GAE—SE00101	Spring Compressor	1	
②	07GAF—SD40100	Hub Assembly Pin	1	
③	07BAF—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	
⑦-1	07HAF—SF10110	Ball Joint Remover Base	1	
⑦-2	07HAF—SF10120	Ball Joint Installer Base	1	
⑦-3	07HAF—SF10130	Ball Joint Remover/Installer	1	
⑧	07HAJ—SF10201	Rear Steering Center Lock Pin	1	
⑨	07HGJ—0010000	Toe Inspection Gauge Set	1	4WS Only
⑩	07HGK—0010200	Wheel Alignment Gauge Attachment	1	
⑪	07703—0010100	TORX® BIT T40	1	4WS Only
⑫	07749—0010000	Driver	1	
⑬	07941—6920003	Ball Joint Remover	1	
⑭	07947—SB00100	Oil Seal Driver	1	4WS Only
⑮	07965—B340301	Hub Dis/assembly Base	2	
⑯	07965—B920201	Hub Dis/Assembly Base	1	

### 13. Brakes

Number	Tool Number	Description	Qty	Remarks
①	07GAG—SE00100	Pushrod Adjustment Gauge	1	
②	07HAE—SQ00100	Brake Spring Compressor	1	
③	07HAK—SG00110	Pressure Gauge Joint Pipe	1	
④	071AF—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 Adapter	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	Qty	Remarks
①	07HAA—SG00101	Bleeder T-Wrench	1	
②	07HAJ—SG00601	ALB Checker	1	
	or			
	07508—SB00000	ALB Checker	1	
	—07HAJ—SG00400	Adapter	1	



#### 14. Body

Number	Tool Number	Description	Qty	Remarks
①	07GAZ-SE30100	Torsion Bar Assembly Tool	1	

#### 15. Heater and Air Conditioner

Number	Tool Number	Description	Qty	Remarks
①	07JGG-0010100	Belt Tension Gauge	1	
②	07LAD-SK70100	A/C Clutch Holder	1	
③	07LAJ-P130100	ECU Test Harness	1	

#### 16. Electrical

Number	Tool Number	Description	Qty	Remarks
③	07GAC-SE00200	Fuel Sender Wrench	1	
④	07JGG-0010100	Belt Tension Gauge	1	

# Standards and Service Limits

## 5. Engine/Cylinder Head, Valve Train

		MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT				
Compression	250 min. Inlet and side cover Inlet	1.8 r	Nominal Minimum Maximum variation	1.177 MPa (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 r 2.2 r	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		mm 39.95-100.00 (1.925-3.937)	0.05 (0.002)				
Cams/cam	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	mm	1. F18A2	38.085 (1.4990)	—			
			2. F20A2	38.526 (1.5187)	—			
			3. F20A3	38.528 (1.5187)	—			
			4. F20A4	38.741 (1.5252)	—			
			5. F20A5	38.741 (1.5252)	—			
			6. F20A6	38.528 (1.5187)	—			
			7. F22A2	38.741 (1.5252)	—			
			8. F22A3	39.187 (1.5429) MT 38.741 (1.5252) AT	—			
			9. F22A9	38.741 (1.5252)	—			
EX	mm	1. F18A2	37.800 (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	38.386 (1.5104) MT 38.972 (1.5343) AT	—				
		9. F22A9	38.972 (1.5343)	—				
Valve	Valve clearance	mm IN EX	0.24-0.38 (0.0094-0.0150) 0.28-0.32 (0.0110-0.1269)	—				
	Valve stem O.D.	IN +1 +2 EX	5.485-5.496 (0.2159-0.2183) 5.480-5.490 (0.2157-0.2181) 5.450-5.460 (0.2145-0.2169)	5.455 (0.2147) 5.480 (0.2165) 5.420 (0.2133)				
	Stem-to-guide clearance	IN +1 +2 EX	0.020-0.040 (0.0007-0.0015) 0.025-0.050 (0.0009-0.0019) 0.035-0.050 (0.0014-0.0019)	0.075 (0.0029) 0.080 (0.0031) 0.12 (0.0047)				
	Valve stem	IN and EX mm EX	1.25-1.55 (0.049-0.0610) 45.245-48.715 (1.8194-1.9179) 50.315-50.785 (1.9809-1.9924)	2.00 (0.0787)				
Valve spring	Free length	mm (IN)	1. F18A2	55.28 (2.1767)	—			
			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]	mm (IN)	mm (IN)	1. F18A2	56.20 (2.2129)	—
						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 r CARB 6. F20A6 2.0 r CARB with CATS NH NIHOW MATSUJO  
 2. F20A2 2.0 r CARB with CATS 7. F22A2 2.2 r PGM-FI CH. CHUNO MATSUJO  
 3. F20A3 2.0 r CARB 8. F22A3 2.2 r PGM-FI with CATS  
 4. F20A4 2.0 r PGM-FI with CATS 9. F22A9 2.2 r PGM-FI with CATS for K2  
 5. F20A6 2.0 r PGM-FI

+1. CARB, 7. F22A2 and 8. F22A9  
 +2. PGM-FI except 7. F22A2 and 9. F22A9

### 5. Engine/Cylinder Head, Valve Train

MEASUREMENT		STANDARD (MM)		SERVICE LIMIT				
Valve spring	Free length	EX (mm)	1. F1CA2	58.89 (2.3178)	---			
			2. F2CA2	59.89 (2.3578)	---			
			3. F2CA3	59.89 (2.3578)	---			
			4. F2CA4	55.78 (2.1960)	---			
			5. F2CA5	55.78 (2.1960)	---			
			6. F2CA6	59.89 (2.3578)	---			
			7. F2CA2	55.78 (2.1960)	---			
			8. F2CA3	55.78 (2.1960)	---			
			9. F2CA5	55.78 (2.1960)	---			
		ICI (mm)	1. F1BA2	69.86 (2.7504)	---			
			2. F2CA2	59.86 (2.3574)	---			
			3. F2CA3	59.89 (2.3574)	---			
			4. F2CA4	55.60 (2.1888)	---			
			5. F2CA5	55.60 (2.1888)	---			
Valve guide	IQ	IN and EX	1. F1CA2	8.012-8.530 (0.3154-0.3361)	5.50 (0.2177)			
			2. F2CA2	23.78-24.25 (0.9365-0.9547)	---			
			3. F2CA3	15.05-15.55 (0.5925-0.6122)	---			
			4. F2CA4	---	---			
			5. F2CA5	---	---			
			6. F2CA6	---	---			
			7. F2CA2	---	---			
			8. F2CA3	---	---			
			9. F2CA5	---	---			
			Valve guide	Valve guide installed height	IN and EX	1. F1CA2	---	---
						2. F2CA2	---	---
						3. F2CA3	---	---
						4. F2CA4	---	---
						5. F2CA5	---	---
6. F2CA6	---	---						
7. F2CA2	---	---						
8. F2CA3	---	---						
9. F2CA5	---	---						
Rocker arm	Arm-to-shaft clearance	IN and EX				1. F1CA2	0.012-0.050 (0.0007-0.0020)	0.060 (0.0031)
						2. F2CA2	0.012-0.050 (0.0007-0.0020)	0.060 (0.0031)
						3. F2CA3	---	---
						4. F2CA4	---	---
						5. F2CA5	---	---
			6. F2CA6	---	---			
			7. F2CA2	---	---			
			8. F2CA3	---	---			
			9. F2CA5	---	---			

### 5. Engine/Engine Block

MEASUREMENT		STANDARD (MM)		SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.07 (0.003) max.		0.10 (0.004)	
		Bore diameter		85.00-85.02 (3.3464-3.3473)	
		Bore taper		---	
Piston	Skirt O.D. (at 21 mm (0.83 in.) from bottom of skirt)	A	84.86-84.99 (3.3416-3.3465)	84.97 (3.3482)	
			B	84.87-84.98 (3.3452-3.3458)	84.86 (3.3448)
				0.02-0.04 (0.0008-0.0016)	0.06 (0.0024)
Piston ring	Piston-to-ring clearance	Top	0.025-0.060 (0.0010-0.0024)	0.130 (0.0051)	
		Second	0.020-0.055 (0.0010-0.0022)	0.130 (0.0051)	
		Ring end gap	Top	0.20-0.35 (0.0079-0.0138)	0.60 (0.0236)
Connecting rod	Piston-to-rod interference	Top	0.40-0.46 (0.0157-0.0217)	0.70 (0.0276)	
			Second	0.20-0.70 (0.0079-0.0276)	0.80 (0.0315)
			Oil	---	---
Crankshaft	Main journal diameter	1 8 1, 2 0 r	21.948-21.961 (0.8654-0.8664)	---	
			2 2 r	Nominal 48 (1.850)	---
				Nominal 31 (0.008)	0.16-0.30 (0.006-0.012)
Crankshaft	Main journal diameter	No. 1, 2 Journals	49.976-50.000 (1.9670-1.9685)	---	
			No. 3 Journal	49.972-49.995 (1.9674-1.9683)	---
				No. 4, 5 Journals	49.968-50.000 (1.9665-1.9688)
Crankshaft	Rod journal diameter	1 8 1, 2 0 r	44.976-45.000 (1.7710-1.7717)	0.010 (0.0004)	
			2 2 r	47.976-48.000 (1.8888-1.8888)	---
				0.005 (0.0002) max.	0.010 (0.0004)
Crankshaft	Rod journal diameter	No. 1, 2 Journals	0.005 (0.0002) max.	0.010 (0.0004)	
			No. 3 Journal	0.10-0.36 (0.004-0.014)	0.46 (0.018)
				No. 4, 5 Journals	0.015 max (0.0006)
Crankshaft	End play	No. 1, 2 Journals	0.021-0.045 (0.0008-0.0018)	0.05 (0.002)	
			No. 3 Journal	0.026-0.049 (0.0011-0.0019)	0.054 (0.0021)
				No. 4, 5 Journals	0.015-0.037 (0.0006-0.0015)
Crankshaft	Runout	2 2 r	0.021-0.045 (0.0008-0.0018)	0.06 (0.002)	
			Others	0.015-0.043 (0.0006-0.0017)	0.05 (0.002)
				---	---

- 1. F1CA2 1.8 l CARB
- 2. F2CA2 2.0 l CARB with CATA
- 3. F2CA3 2.0 l CARB
- 4. F2CA4 2.0 l PGM-FI with CATA
- 5. F2CA5 2.0 l PGM-FI
- 6. F2CA6 2.0 l CARB with CATA
- 7. F22A2 2.2 l PGM-FI
- 8. F22A3 2.2 l PGM-FI with CATA
- 9. F22AB 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)	42.722—42.758 (1.6820—1.6874)	—	
		No. 2 journal (Rear)	20.838—20.850 (0.8243—0.8248)	—	
		No. 3 journal	38.712—38.724 (1.5241—1.5246)	—	
	Journal taper	(Front)	0.006 (0.0002)	—	
		(Rear)	0.100—0.350 (0.0040—0.0138)	—	
	Randou Oil Clearance	No. 1 journal (Rear)	0.050—0.075 (0.0020—0.0030)	—	
	No. 2, 3 journal	0.068—0.118 (0.0028—0.0046)	—		
Balancer Shaft Bearing	I.D.	No. 1 journal (Front)	42.800—42.820 (1.6850—1.6858)	—	
		No. 2 journal (Rear)	21.000—21.013 (0.8268—0.8273)	—	
		No. 2 journal	38.800—38.820 (1.5276—1.5280)	—	
		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., lmo., qt.)	4.8 (5.2, 4.3) After engine disassembly 3.8 (4.0, 3.3) After oil change, including oil filter 3.8 (3.7, 3.1) After oil change, without oil filter	
Oil pump	Displacement	42.97 (11.9 US. gal., 9.7 Imp. gal. @ 1000 rpm) 1 rpm	
	Inner-to-outer rotor radial clearance	0.02—0.18 (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 @ 20°C (178°F)	1.0 MPa (10.7 kg/cm <sup>2</sup> , 150 psi)	
		3.000 rpm (1 ppm)	343.1 kPa (3.5 kg/cm <sup>2</sup> , 50 psi)



### 5. Engine/Cooling

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Thermostat	Stays to open Full open Valve lift at 1/4 open	78°C ± 2 (172°F ± 3) 90°C (194°F) # 10.311 mm	86-90°C (187-194°F)
Water Pump	Displacement	160 J 442.2 US gal, 35.2 imp gal, 6,000 min <sup>-1</sup> (rpm)	
Radiator	Capacity (incl. hoses) ( US qt., imp qt.) evacuates reservoir tank 2-6 (0-63, 0-63) after overhaul           in change           pressure cap opening pressure	MT 6.6 (8.97, 8.81) AT 5.6 (6.87, 6.72) 7.2 (7.64, 6.94) 7.1 (7.50, 6.23) 7.2 (7.64, 6.94) 7.1 (7.50, 6.23) 7.2 (7.64, 6.94) 7.1 (7.50, 6.23) 7.2 (7.64, 6.94) 7.1 (7.50, 6.23) 7.2 (7.64, 6.94) 7.1 (7.50, 6.23) 6.6 (6.97, 5.91) 7.1 (7.50, 6.23) 7.2 (7.64, 6.94) 7.1 (7.50, 6.23) 6.6 (8.97, 5.81) 7.1 (7.50, 6.23) MT 3.0 (3.17, 2.64) AT 2.9 (3.08, 2.55) 3.6 (3.80, 3.17) 3.6 (3.70, 3.08) 3.6 (3.80, 3.17) 3.6 (3.70, 3.08) 3.6 (3.80, 3.17) 3.6 (3.70, 3.08) 3.6 (3.80, 3.17) 3.6 (3.70, 3.08) 3.6 (3.80, 3.17) 3.6 (3.70, 3.08) 3.0 (3.17, 2.64) 3.0 (3.17, 2.64) 3.6 (3.80, 3.17) 3.6 (3.80, 3.17) 3.0 (3.17, 2.64) 3.5 (3.70, 3.08)	
Cooling fan	'OFF' temperature 'OFF' temperature 'ON' temperature (fan stop) 'ON' temperature (fan start)	87° 83°C (180° 186°F) 80° 84°C (176° 196°F) 106° 111°C (223° 231°F) 96° 109°C (204° 228°F)	

- 1. F18A2: 1.8l CARB
- 2. F20A2: 2.0l CARB with CAT
- 3. F20A3: 2.0l CARB
- 4. F20A4: 2.0l PGM-FI with CAT
- 5. F20A6: 2.0l PGM-FI
- 6. F20A8: 2.0l CARB with CAT
- 7. F22A2: 2.2l PGM-FI
- 8. F22A3: 2.2l PGM-FI with CAT
- 9. F22A9: 2.2l PGM-FI with CAT

# Standards and Service Limits

## 6. Fuel and Emissions

MEASUREMENT		STANDARD (new)
Fuel Pump (PGM-FI)	Delivery pressure Displacement (average in 10 seconds) Fuel valve opening pressure	240-278 Pa (2.45-2.85 kg/cm <sup>2</sup> 35-41 lb-in) 230 cc (7.6 US oz., 8.1 Imp. oz.) 4.41-5.28 kPa (0.6-0.8 kg/cm <sup>2</sup> 0.8-1.1 psi)
Fuel Pump (LAMB)	Delivery pressure Displacement (average in 1 minute at 12V)	0-14 kPa (0.03-0.14 kg/cm <sup>2</sup> , 1.3-2.0 psi) 750 cc (25.7 US oz., 29.8 Imp. oz.)
Pressure Regulator (PGM-FI)	Pressure with regulator vacuum hose disconnected	310-379 kPa (2.45-2.85 kg/cm <sup>2</sup> , 35-41 psi)
Fuel Tank	Capacity	2WS 4WS 65 ± 1.7 US gal., 14.3 Imp. gal. 60 ± 1.5 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)	M1 with carbureted engine: M7 with PGM-FI engine: AT with carbureted engine: AT with PGM-FI engine: 800 ± 50 min <sup>-1</sup> (rpm) 770 ± 60 min <sup>-1</sup> (rpm) 750 ± 50 min <sup>-1</sup> (rpm) at [D] position 770 ± 50 min <sup>-1</sup> (rpm) at [D] or [R] positions
	Idle CO	With CAT: 0.1% maximum Without CAT: 1.0 ± 0.5%

## 7. Clutch

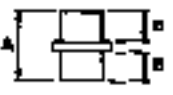
MEASUREMENT		STANDARD (new)	SERVICE LIMIT
Clutch pedal	Pedal height	210-18.8 (to floor)	—
	Stroke	142-0 (5.8)	—
	Pedal play	0-15 (0.4-0.6)	—
	Disengagement height	90 (3.5) min. to floor 60 (2.4) min. to carpet	—
Flange	Clutch surface runout	0.05 (0.002) max	0.15 (0.008)
Clutch disc	Rives head depth	1.3 (0.05) min	0.2 (0.008)
	Surface runout	0.3 (0.03) max.	1.0 (0.04)
	Thickness	8.3-9.2 (0.33-0.36)	0.1 (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 7 (U.S. qt., Imp. qt.)	1.9 (2.0, 1.7) at assembly 2.0 (2.1, 1.8) at oil change	—
	End play	0.10-0.16 (0.0039-0.0063)	Adjust with adjuster
	Diameter of ball bearing contact area	27.977-27.990 (1.1015-1.1076)	29.93 (1.1783)
	Diameter of third gear contact area	37.884-38.000 (1.4914-1.4961)	37.830 (1.4933)
	Diameter of ball bearing contact area Runout	27.987-28.000 (1.1018-1.1074) 0.02 (0.0008) 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 (0.042)
	Thickness 3rd gear 4th gear	32.42-32.47 (1.278-1.278) 30.92-30.97 (1.217-1.219)	32.3 (1.27) 30.8 (1.21)
Mainshaft 1st gear Counterhaft	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 (0.042)
	Thickness	30.42-30.47 (1.198-1.200)	30.3 (1.193)
	End play	0.05-0.21 (0.0019-0.0083)	0.50 (0.02)
	Diameter of needle bearing contact area Diameter of ball bearing needle bearing contact area Diameter of low gear contact area Runout	33.000-33.018 (1.2992-1.2998) 24.987-25.000 (0.9837-0.9845) 38.884-40.000 (1.5242-1.5748) 0.02 (0.0008) max.	32.95 (1.297) 24.94 (0.982) 39.93 (1.572) 0.05 (0.002)

## 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 (1.9899-1.9995) 0.04-0.10 (0.002-0.004) 33.92-33.97 (1.335-1.337)	50.08 (1.972) Adjust with a collar 32.9 (1.2913)
Spacer collar (Countershaft second gear)	I.D. O.D. Length	36.48-36.49 (1.4362-1.4368) 43.989-44.000 (1.7318-1.7323) 29.03-29.05 (1.1428-1.1437) 28.98-29.00 (1.1409-1.1417)	36.50 (1.437) 43.94 (1.7308) —
Spacer collar (Mainshaft fourth and fifth gears)	I.D. O.D. Length	31.002-31.012 (1.2205-1.2209) 37.889-38.000 (1.4914-1.4961) 56.45-56.55 (2.222-2.226) 28.03-28.05 (1.1028-1.1030)	31.06 (1.223) 37.94 (1.489) — 28.04 (1.099)
Reverse idler gear	I.D. Gear-to-reverse gear shaft distance	20.018-20.049 (0.7894-0.7894) 0.038-0.044 (0.0014-0.0031)	20.09 (0.7899) 0.160 (0.0066)
Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.89-1.10 (0.035-0.043)	0.40 (0.016)
Shift fork	Synchronizer sleeve groove width Fork-to-synchronizer sleeve clearance	6.75-6.85 (0.266-0.270) 0.39-0.65 (0.015-0.026)	— 1.0 (0.039)
Reverse shift fork	Pinion groove width Fork-to-reverse idler gear clearance Groove width Fork-to fifth reverse shaft Shaft clearance	13.0-13.2 (0.51-0.52) 0.5-1.1 (0.02-0.43) 7.05-7.26 (0.276-0.286) 7.4-7.7 (0.29-0.30) 0.03-0.39 (0.002-0.014) 0.4-0.8 (0.02-0.03)	1.6 (0.07) — — 0.6 (0.02) 1.0 (0.04)
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 (0.6290-0.6299) 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	Fit line of contact area Shift lever diameter Shift lever cone clearance	7.9-8.0 (0.311-0.314) 15.41-16.69 (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)	— —
Input shaft	Bore diameter Shift gear lever clearance	16.00-16.06 (0.630-0.632) 0.032-0.109 (0.0013-0.0043)	— —
Ring gear	Bore dia.	0.095-0.142 (0.0037-0.0056)	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 (0.0007-0.0018) 28.005-28.025 (1.1026-1.1033) 0.020-0.062 (0.0008-0.0024) 0.055-0.081 (0.0022-0.0031)	— 0.100 (0.0039) — 0.130 0.150
Differential crown gear	Backlash Pinion shaft bore diameter Pinion gear-to-pinion shaft clearance	0.05-0.15 (0.002-0.008) 18.042-18.068 (0.7103-0.7124) 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, I.D. 1.9 (0.75))	Selection with 20 types of shims



# Standards and Service Limits

## 9. Automatic Transmission

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity 7.115 lit. imp. qt.		7.4 (2.5, 2.1) at oil change 6.0 (4.4, 5.2) at assembly	
Hydraulic pressure	Line pressure at 2,000 min <sup>-1</sup> (rpm)	Carburator	700 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 (7.25 kg/cm <sup>2</sup> , 103 psi) Throttle valve more than 2/8 open
		PGM-FI	780 kPa (8.0 kg/cm <sup>2</sup> , 113 psi) Throttle valve full-closed 833 kPa (8.5 kg/cm <sup>2</sup> , 120 psi) Throttle valve more than 2/8 open	730 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)	Carburator	411 kPa (4.2 kg/cm <sup>2</sup> , 58 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	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	480 kPa (4.7 kg/cm <sup>2</sup> , 68 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)	Carburator	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	392 kPa (3.9 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 (5.10 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)	Carburator	382 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	460 kPa (4.6 kg/cm <sup>2</sup> , 66 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)	Carburator	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	780-833 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 137.6 mph (60 km/h)	Carburetor with C.A.T.A.	225-236 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 C.A.T.A.	166-176 kPa (1.70-1.80 kg/cm <sup>2</sup> , 24-26 psi)	162 kPa (1.65 kg/cm <sup>2</sup> , 23 psi)
	Throttle pressure A	Carburetor with C.A.T.A.	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 C.A.T.A.	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 780-808 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 784-813 kPa (8.0-8.5 kg/cm <sup>2</sup> , 113-120 psi)	716 kPa (7.5 kg/cm <sup>2</sup> , 106 psi)	
Shift speed	Check with car on level ground	Carburetor (1.6 l)	2.450-2.750 mm <sup>2</sup> (inpsi)	
		Diaphragm	2.350-3.650 mm <sup>2</sup> (inpsi)	
Clutch	Clutch install clearance	1st. 1st	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. 53.8 (1.934) 2nd. 30.3 (1.192) 3rd. 32.1 (1.262) 4th. 32.1 (1.262)	31.8 (1.248) 28.3 (1.114) 30.1 (1.185) 30.3 (1.188)
		PGM-FI	1st. 2nd. 3rd. 4th. 33.5 (1.318)	31.5 (1.240)
	Clutch disc thickness		1.85-2.0 (0.073-0.079)	Undergrooves worn out
	Clutch plate thickness	Carburetor	1st. 3rd. 4th. 1.95-2.05 (0.0767-0.0807)	Discoloration
			2nd. 2.85-2.95 (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	2.05-2.10 (0.081-0.83)	Discoloration	
	Mark 2	2.16-2.20 (0.085-0.087)		
	Mark 3	2.25-2.30 (0.089-0.091)		
	Mark 4	2.35-2.40 (0.093-0.095)		
	Mark 5	2.45-2.50 (0.096-0.098)		
	Mark 6	2.55-2.60 (0.100-0.102)		
	Mark 7	2.65-2.70 (0.104-0.106)		
	Mark 8	2.75-2.80 (0.108-0.110)		
	Mark 9	2.85-2.90 (0.112-0.114)		
	* Mark 10	2.95-3.00 (0.116-0.118)		

\* Calculated engine only.

# Standards and Service Limits

## 9. Automatic Transmission (cont'd)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Valve body	Super camshaft needle bearing contact area I. D. (torque converter side)	27.000-27.011 (1.0430-1.0638)	Wear or damage
	Super camshaft needle bearing contact area I. D. (oil pump side)	29.000-29.013 (1.1417-1.1427)	Wear or damage
Regulator valve body	Oil pump drive gear I. D.	14.018-14.034 (0.5518-0.5525)	Wear or damage
	Oil pump shaft O. D.	13.990-13.990 (0.5408-0.5408)	Wear or damage
	Oil pump gear side clearance	0.09-0.06 (0.0012-0.0020)	0.07 (0.0028)
	Oil pump gear to body clearance	0.21-0.205 (0.0082-0.0104)	—
	Drive	0.07-0.125 (0.0027-0.0049)	—
	Driven	—	—
Regulator valve body	Sealing ring contact area diameter	35.000-35.025 (1.3780-1.3789)	35.050 (1.3798)
Accumulator body	Sealing ring contact area diameter	32.000-32.025 (1.2598-1.2606)	32.05 (1.2618)
Stator camshaft	Sealing ring contact area diameter	29.000-29.018 (1.1417-1.1423)	29.05 (1.1426)
Shifting device and parking brake control	Reverse shift fork thickness	5.40-5.40 (0.2127-0.2127)	5.40 (0.2131)
	Parking brake machinist pin	—	Wear or other defect
	Parking gear throw-in cam stopper	Carburized PGM-FI 18.5-18.6 (0.7283-0.7322) 17.0-17.1 (0.6692-0.6732)	—
Slave body	Shift fork Shift I. D.	A 14.000-14.008 (0.5512-0.5514) B 14.006-14.010 (0.5514-0.5516) C 14.011-14.016 (0.5516-0.5518)	—
	Shift fork shaft valve bore I. D.	37.000-37.039 (1.4567-1.4662)	37.045 (1.4585)
	Transmission	Diameter of needle bearing contact area On mainshaft and spacer shaft On mainshaft 4th gear collar On mainshaft 3rd gear collar On counter shaft 1st gear collar On counter shaft 4th gear collar On counter shaft reverse gear collar On counter shaft parking gear On secondary shaft 1st gear On secondary shaft 2nd gear Reverse side shaft holes I. D. Mainshaft 3rd gear I. D. 4th gear I. D.	Carburized PGM-FI 22.990-23.000 (0.9047-0.9055) 31.984-32.000 (1.2582-1.2598) 41.984-42.000 (1.6529-1.6535) 45.984-46.000 (1.8103-1.8107) 40.984-42.000 (1.6136-1.6535) 35.990-35.996 (1.4165-1.4171) 35.984-36.000 (1.4168-1.4173) 39.984-40.000 (1.5741-1.5748) 31.978-31.991 (1.2588-1.2594) 35.984-36.000 (1.4168-1.4173) 14.418-14.424 (0.5675-0.5682) 52.000-52.019 (2.0472-2.0479) 36.000-36.016 (1.4169-1.4180)

Unit of length: mm (in.)

## 9. Automatic Transmission

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Counter shaft 1st gear I.D.	47.000-47.018 (1.8504-1.8510)	Wear or damage
	4th gear I.D.	42.000-42.018 (1.6535-1.6541)	
	reverse gear I.D.	42.000-42.018 (1.6535-1.6541)	
	5th gear I.D.	48.000-48.018 (1.8897-1.8903)	
	Secondary shaft 1st gear I.D.	37.000-37.018 (1.4566-1.4573)	
	2nd gear I.D.	42.010-42.028 (1.6539-1.6545)	
	Intermediate 3rd gear collar length	20.000-20.050 (0.7874-0.7893)	
	4th gear collar length	47.500-47.580 (1.8700-1.8720)	
	Counter shaft 1st gear collar length	27.500-27.550 (1.0826-1.0846)	
	3rd gear collar length	73.08-73.08 (2.8769-2.8769)	
	reverse gear collar length	15.00-15.05 (0.5906-0.5925)	
	Secondary shaft disengagement collar length	4.95-5.00 (0.1948-0.1968)	
	Counter shaft 1st gear thickness	1.45-1.50 (0.0570-0.0590)	
	Counter shaft parking gear length	25.030-25.048 (0.9854-0.9861)	

# Standards and Service Limits

Unit of length: mm (in.)

## 9. Automatic Transmission (cont'd)

	MEASUREMENT	STANDARD (NEW)				
		WIRE DIA.	O. D.	FREE LENGTH	No. of COILS	
Spring (Continued)	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 (0.0709)	14.7 (0.5787)	35.1 (1.3799)	18.6	
	Regulator valve spring B	1.80 (0.0709)	9.8 (0.3779)	44.0 (1.7323)	7.5	
	Sensor check spring	5.50 (0.2165)	37.4 (1.4724)	30.3 (1.1929)	2.1	
	Throttle modulation spring	1.20 (0.0472)	9.4 (0.3700)	27.2 (1.0708)	8.0	
		with CAT	1.20 (0.0472)	9.4 (0.3700)	26.3 (1.0354)	5.0
		without CAT	1.10 (0.0433)	8.4 (0.3307)	26.0 (1.0236)	12.0
	Torque converter check valve spring	1.00 (0.0394)	8.4 (0.3307)	39.1 (1.5393)	15.1	
	Release valve spring	1.10 (0.0433)	8.4 (0.3307)	40.8 (1.6055)	17.0	
	Cooler check valve spring	1.0 (0.0394)	10.8 (0.4252)	44.3 (1.7440)	4.0	
	Clawing spring A	with CAT	1.0 (0.0394)	10.8 (0.4252)	44.3 (1.7440)	4.0
		without CAT	1.0 (0.0394)	10.8 (0.4252)	44.3 (1.7440)	4.0
	Governor spring B	with CAT	0.8 (0.0315)	11.8 (0.4645)	18.4 (0.7244)	8.2
		without CAT	0.8 (0.0315)	11.8 (0.4645)	21.4 (0.8425)	8.2
	Second clutch control spring	0.7 (0.0276)	6.0 (0.2362)	53.3 (2.0981)	20.5	
	Servo valve spring	0.9 (0.0354)	7.1 (0.2795)	61.2 (2.4094)	28.2	
	Throttle spring A	1.0 (0.0394)	8.5 (0.3346)	21.0 (0.8267)	5.8	
	Throttle adjust spring A	0.8 (0.0315)	6.2 (0.2440)	30.0 (1.1811)	8.0	
	Throttle spring B	1.6 (0.0630)	8.5 (0.3346)	41.4 (1.6280)	11.7	
	1-2 shift spring	with CAT	0.5 (0.0196)	4.8 (0.1811)	42.3 (1.6653)	25.0
		without CAT	0.5 (0.0196)	4.1 (0.1614)	42.2 (1.6608)	31.1
	1-2 shift ball spring	with CAT	0.4 (0.0157)	4.5 (0.1771)	13.0 (0.5118)	8.7
		without CAT	0.4 (0.0157)	4.3 (0.1771)	12.6 (0.4960)	8.7
	2-3 shift spring	with CAT	0.9 (0.0354)	7.6 (0.2992)	30.0 (1.1811)	26.7
		without CAT	0.8 (0.0315)	7.0 (0.2756)	68.9 (2.7138)	15.8
	2-3 shift ball spring	with CAT	0.5 (0.0196)	4.5 (0.1771)	11.7 (0.4608)	10.5
		without CAT	0.5 (0.0196)	4.5 (0.1771)	14.1 (0.5551)	10.5
	3-4 shift spring	with CAT	0.8 (0.0315)	5.8 (0.2283)	36.4 (1.4309)	10.3
		without CAT	0.9 (0.0354)	5.8 (0.2283)	27.7 (1.0905)	10.3
	3-4 shift ball spring	with CAT	0.5 (0.0196)	4.5 (0.1771)	11.5 (0.4527)	7.4
		without CAT	0.5 (0.0196)	4.5 (0.1771)	11.3 (0.4448)	7.4
	1st hold accumulator spring	3.0 (0.1181)	21.5 (0.8464)	71.7 (2.8228)	3.0	
	1st accumulator spring	2.1 (0.0826)	16.3 (0.6417)	66.0 (2.5795)	17.1	
	2nd accumulator spring	2.0 (0.0787)	16.0 (0.6299)	64.6 (2.5407)	14.3	
	2nd accumulator spring	3.2 (0.1260)	20.7 (0.8149)	80.7 (3.1791)	10.8	
	3rd accumulator spring	2.6 (0.1023)	17.8 (0.6989)	78.8 (3.0944)	11.0	
	L/C shift spring	0.9 (0.0354)	7.5 (0.2952)	73.7 (2.9015)	32.0	
	L/C timing spring B	with CAT	1.0 (0.0394)	6.6 (0.2598)	64.0 (2.5200)	42.4
		without CAT	1.0 (0.0394)	6.6 (0.2598)	79.1 (3.1141)	42.4
	L/C timing spring A	with CAT	0.9 (0.0354)	6.6 (0.2598)	65.8 (2.5907)	27.3
		without CAT	0.8 (0.0315)	6.6 (0.2598)	60.0 (2.3622)	27.3
	Governor ball spring	0.8 (0.0315)	7.8 (0.3071)	44.5 (1.7519)	17.0	
	L/C control spring	0.7 (0.0276)	5.8 (0.2283)	42.9 (1.6890)	14.1	
	CPC valve spring	1.4 (0.0551)	9.4 (0.3700)	31.2 (1.2283)	10.8	
	2nd lock down spring	0.8 (0.0315)	7.8 (0.3071)	62.7 (2.4694)	27.8	
Reverse control spring	0.7 (0.0276)	7.1 (0.2795)	40.0 (1.5748)	20.8		
L/C cut spring	0.7 (0.0276)	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 lock down spring	1.2 (0.0472)	7.1 (0.2795)	48.9 (1.9248)	20.6		
Servo control spring	0.8 (0.0315)	8.4 (0.3307)	32.5 (1.2783)	17.5		
2-1 timing spring	0.7 (0.0276)	6.6 (0.2598)	33.0 (1.2992)	21.7		
4th exhaust spring	0.8 (0.0315)	8.1 (0.3189)	61.1 (2.4055)	26.6		



## 9. Automatic Transmission

	MEASUREMENT	STANDARD (NEW)			
		WIRE DIA.	O.D.	FREE LENGTH	No. of COILS
Spring (PGM-FI)	Regulator valve Spring	1.8 (0.0709)	11.7 (0.4587)	89.5 (3.4955)	16.5
	A	1.8 (0.0709)	6.0 (0.2361)	44.0 (1.7323)	12.7
	B	8.4 (0.3307)	27.4 (1.0764)	30.3 (1.1929)	7.1
	Slack reduction spring	1.1 (0.0433)	8.4 (0.3307)	33.8 (1.3307)	12.5
	Torque converter check valve spring	1.0 (0.0394)	8.4 (0.3307)	39.1 (1.5393)	15.7
	Reval valve spring	1.1 (0.0433)	8.4 (0.3307)	46.8 (1.8425)	17.0
	Cooler check valve spring	0.8 (0.0315)	6.6 (0.2598)	82.2 (3.2367)	21.0
	2nd oilags spring	0.8 (0.0315)	6.6 (0.2598)	52.2 (2.0551)	33.0
	Service valve spring	0.9 (0.0354)	7.1 (0.2796)	60.8 (2.3936)	26.9
	4th oilag spring	1.0 (0.0394)	8.8 (0.3464)	41.3 (1.6258)	18.6
	1-2 shift spring	0.8 (0.0315)	7.6 (0.2992)	67.0 (2.640)	28.6
	2-3 shift spring	2.1 (0.0826)	18.2 (0.7173)	98.0 (3.8583)	17.1
	1st accumulator spring	2.3 (0.0913)	22.0 (0.8661)	88.5 (3.4827)	10.8
	4th accumulator spring	2.2 (0.0860)	20.7 (0.8149)	80.2 (3.1571)	10.8
	2nd accumulator spring	2.8 (0.1102)	17.5 (0.6889)	94.2 (3.7088)	16.1
	L/C shift spring	0.8 (0.0315)	7.6 (0.2992)	73.7 (2.9018)	32.0
	L/C spring spring	0.8 (0.0315)	6.6 (0.2598)	64.0 (2.5196)	40.1
	O-ring spring	1.0 (0.0394)	8.1 (0.3189)	52.6 (2.0708)	22.4
	3rd kick-down spring	1.1 (0.0433)	7.6 (0.2992)	48.3 (1.9018)	23.3
	2nd kick-down spring	1.2 (0.0472)	7.1 (0.2796)	46.9 (1.8464)	20.6
Throttle squat spring	0.8 (0.0315)	6.2 (0.2440)	30.0 (1.1811)	8.0	
Throttle @ spring	1.8 (0.0709)	9.5 (0.3740)	41.6 (1.6338)	11.2	
1st shift spring	4.0 (0.1574)	25.0 (0.9842)	84.7 (3.3325)	7.3	
L/C modulated valve spring	1.4 (0.0551)	9.4 (0.3700)	33.0 (1.2992)	10.6	
L/C control spring	0.8 (0.0315)	6.6 (0.2598)	41.0 (1.6141)	26.0	

# Standards and Service Limits

## 9. Automatic Transmission (cont'd)

	MEASUREMENT	STANDARD (INCH)	SERVICE LIMIT
High gear	Backlash	0.085-0.142 (0.003-0.006)	0.200 (0.008)
Differential cover	Pinion shaft bore diameter	18.000-18.018 (0.7087-0.7094)	0.100 (0.004)
	Crown-to-pinion shaft clearance	0.017-0.047 (0.001-0.002)	---
	Pinion shaft bore diameter	28.001-28.025 (1.1028-1.1033)	0.120 (0.005)
Differential pinion gear	Backlash	0.08-0.15 (0.003-0.006)	Adjust with a washer
	Pinion gear bore diameter	18.043-18.065 (0.7100-0.7117)	---
Differential input shaft bearing preload	Pinion gear to pinion shaft clearance	0.059-0.095 (0.002-0.004)	0.150 (0.006)
	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 (28-40 kg-cm, 2.0-2.9 lb-ft)	Adjust with a washer

## 11. Steering

	MEASUREMENT	STANDARD (NEW)
Steering wheel	Play	10 (0.29) maximum
Gearbox	Pinion steering torque Angle of rack guide screw loosened from locked position	Below 1.0 N-m (10 kg-cm, 0.72 lb-ft) 35° ± 2
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> , 1,138-1,260 psi) at idle
Power steering fluid	Capacity	Reservoir As change (approx.) 0.57 (0.53 US qt., 0.44 imp qt.) 1.87 (1.80 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 12.5-16.0 (0.50-0.63) 8.0-11.0 (0.31-0.43)
	Belt tension between pulleys (measure with tension gauge)	For used belt For new belt 343-490 N (35-50 kg, 77-110 lbs) 486-662 N (50-68 kg, 110-145 lbs)

## 12. Suspension

	MEASUREMENT	STANDARD (INCH)	SERVICE LIMIT	
Wheel alignment	Total toe	Front	0 ± 2 (0 ± 0.08)	---
		Rear	2WS 4WS -1 ± 2 (0.08 ± 0.08) -1 ± 2 (0.17 ± 0.08)	---
	Camber	Front	0° 00' ± 1'	---
		Rear	2WS 4WS -0° 30' ± 1' -0° 20' ± 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 l 2 engine: 29° 30' 1.8 l engine: 31° 10' 4WS: 29° 30'	---	
Rear wheel turning angle (4WS only)	Inward wheel Outward wheel (reference)	5° 50' ± 1' 0° 10' ± 1'	---	
Wheel	Rim runout	Steel wheel Axial Radial	Below 1.0 (0.04)	2.0 (0.08)
		Aluminum wheel Axial Radial	Below 1.0 (0.04) Below 0.7 (0.03) Below 0.7 (0.03)	1.5 (0.06) 2.0 (0.08) 1.5 (0.06)
Wheel bearing	End play	Front Rear	0-0.06 (0.0001) 0-0.06 (0.002)	---

### 13. Brakes

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Parking brake level	Play in stroke 200 N (20 kg, 44 lbs)		To be locked when pulled 4-B notch	—
Foot brake pedal	Pedal height (from floor)	Alt Alt	180 (7.1) 196 (7.7)	— —
Master cylinder	Piston-to-pull rod clearance		0-0.4 (0-0.016)	—
Brake drum	I.D.		220 (8.69)	221 (8.70)
Lining	Thickness		4.0 (0.16)	2.0 (0.08)
Disc brake	Disc thickness	Front	23.0 (0.91)	21.0 (0.83)
		Rear	16.0 (0.39)	8.0 (0.32)
	Disc warpage	Front	—	0.10 (0.004)
		Rear	—	0.15 (0.006)
Disc parallelism	Front and rear		—	0.015 (0.0006)
Pad thickness	Front		12.5 (0.49)	1.8 (0.08)
	Rear		2 g ± 0.02 (0.17)	1.8 (0.08)
Brake booster	Characteristics at 20 kg (44 lbs) pedal pressure		(Use pressure Unit: kPa (kg/cm <sup>2</sup> /psi))	
	Vacuum		Conventional type	with anti lock brake system
	Brakes			
	0 mm (0 in) Hg	0.22 (0.4/1.84) minimum	0.13 (0.3/1.31) minimum	
	300 mm (11.8 in) Hg	5.494 (10.7/96) minimum	6.078 (9.2/962) minimum	
	600 mm (19.7 in) Hg	8.506 (17.1/1.737) minimum	8.134 (13.1/1.180) minimum	

### 15. Air Conditioner

	MEASUREMENT		STANDARD (NEW)
Air conditioner system	Lubricant capacity	Condenser Evaporator Orifice Receiver	10 cc (0.3 US oz., 0.4 imp oz.) 28 cc (1.0 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 Static oil resistance at 20°C (68°F) Pull-up pressure (plate clearance)		8m-950 g (31.7-33.8 oz.) 3.4-3.8 g 0.38-0.68 (0.018-0.036)
Compressor belt	Deflection between pulleys with 88N (10 kg, 22 lbs) force	For used belt For new belt	10-12 (0.4-0.6) 8.5-11 (0.3-0.4)
	Belt tension between pulleys (measured with tension gauge)	For used belt For new belt	441-588 N (100-132 lbs) 921-1,127 N (208-254 lbs)

# Standards and Service Limits

Unit of length: mm (in.)

16. Electrical		MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Ignition coil	Rated voltage			12 Volts
	Winding resistance	Primary		0.6-0.8 Ω 0.5-0.7 Ω
		Secondary		12.8-19.3 kΩ (14.4-21.6 kΩ)
Ignition wire	Resistance			25 Ω maximum
Spark plug	Type	standard	ZFR6F-11 (NGK) or KJ20CR-L11 (ND) KP, KT, ZFR6F-11 (NGK) or KJ16CR-L11 (ND)	
	Manufacturer	Option T: Excludes 2.2 l engines other than KQ, KY types	T: ZFR6F-11 (NGK) or KJ16CR-L11 (ND) KP, KT only, ZFR6F-11 (NGK) or KJ20CR-L11 (ND) (except KP, KT ZFR7F-11 (NGK) or KJ22CR-L11 (ND))	
	Gap			1.0-1.40 (0.39-0.043)
Ignition switch	Ac-circuit			15 ± 2 BTDC 10 ± 2 BTDC 10 ± 2 BTDC
		KF, KB, KE, KW, KU, KY, KP (AT), KY (AT/MT)		
Battery	Lighting capacity (20-ampere ratio)			65Ah 47Ah
	Starting capacity (voltage after 5 sec)			8.4 V minimum/100 ampere draw at -15°C (5°F)
Alternator	Output	Carburated engine (except KS, KW, KY)		60A <70A
	Brush coil resistance		7.8-10 Ω 14.4 (0.67) 10 Ω (0.41) 300-350 g (10.6-12.7 oz)	14.0 (0.55) 5.5 (0.22)
Alternator belt	Deflection at midpoint between pulleys with 40 N (10 lb, 22 lb) force			10-12 (0.39-0.47) for used belt 8.5-11.0 (0.33-0.43) for new belt
	Belt tension between pulleys (impressive with tension gauge)			224-441 N (45-45 lb, 77-33 lb) for used belt 441-837 N (45-85 kg, 99-143 lb) for new belt
Starting motor	Output	European Except European		MT: 1.4 kw (2.2 cv, 1.6 kw) AT: 1.6 kw AT: 1.4 kw
	Manufacturer	Mica depth	0.4-0.5 (0.016-0.02)	0.15 (0.006)
	Manufacturer	Commutator symbol	0-0.02 (0-0.001)	0.05 (0.002)
	Manufacturer	Commutator O.D.	28.0-28.1 (1.10-1.11)	27.5 (1.08)
	Manufacturer	Brush length	15.0-15.2 (0.62-0.64)	10.0 (0.39)
	Manufacturer	Brush spring tension	15-18N (1.6-1.8 kg, 3.5-4.0 lb)	
	Manufacturer	Mica depth	0.5-0.8 (0.02-0.03)	0.2 (0.01)
	Manufacturer	Commutator symbol	0-0.02 (0-0.001)	0.05 (0.002)
	Manufacturer	Commutator O.D.	29.9-30.0 (1.18-1.18)	29.0 (1.14)
	Manufacturer	Brush length	15.0-15.5 (0.59-0.61)	10.0 (0.39)
	Manufacturer	Brush spring tension	19-24N (1.9-2.4 kg, 4.2-5.3 lb)	

	ITEM	METRIC	ENGLISH	NOTES				
DIMENSIONS	Overall length	4,865 mm	194.4 in	KY KQ KW (Finish)  KY KQ  KY  KW 2WS				
		4,860 mm	194.3 in					
	Overall width	4,896 mm	194.3 in					
		4,700 mm	185.0 in					
	Overall height	1,695 mm	66.7 in					
		1,720 mm	67.7 in					
	Wheelbase	1,228 mm	48.3 in					
		1,390 mm	54.7 in					
	Track	1,440 mm	55.1 in					
		1,270 mm	50.1 in					
Ground clearance	1,438 mm	56.1 in						
	1,490 mm	59.3 in						
Turning capacity	160 mm	6.3 in						
	170 mm	6.7 in						
Turning circle diameter (at top corner)	4.9 m	16.1 ft						
	5.4 m	17.7 ft						
WEIGHT	Curb weight	See page 3-19						
	Max. permissible weight (for European) 1.8/2.0 t without anti-lock brake system 1.8/2.0 t with anti-lock brake system 2.2 t	1,740 kg 1,740 kg 1,840 kg	3,836 lb 3,836 lb 4,056 lb					
ENGINE	Type	Water-cooled, 4-stroke DMC						
	Cylinder arrangement	In-line, 4 cylinders						
	Bore and stroke	85 x 81.5 mm	3.35 x 3.21 in	1.8 l				
		85 x 88 mm	3.34 x 3.46 in	2.0 l				
	Displacement	85 x 85 mm	3.35 x 3.74 in	3.2 l				
1,848 cm <sup>3</sup>		113.9 cu. in.	1.8 l					
Compression ratio	1,897 cm <sup>3</sup>	121.8 cu. in.	2.0 l					
	2,156 cm <sup>3</sup>	131.9 cu. in.	2.2 l					
Valve train	Carburetor	4 11 : 8.9 : 1		1. > VAN catalytic converter				
	2.0 t fuel-injected	9.8 : 1 (9.5 : 1)						
Lubrication system	2.2 t European	8.8 : 1						
	2.2 t KY	8.8 : 1						
SWARTER	Type	Gear reduction						
	Normal output	European	AT 1.6 kW					
Normal voltage	European	AT 1.4 kW	AT 1.4 kW					
	12 V	30 seconds						
Direction of rotation	WD	Clockwise as viewed from gear end						
	Nissan 1.8 liter	4.75 kg	10.5 lb					
TRANSMISSION	Clutch	AT	3.7 kg	8.2 lb				
	Clutch lining area	AT	3.5 kg	7.7 lb				
Transmission	MT	Single plate dry, torsion spring						
	AT	Torque converter with lock-up clutch						
Primary reduction ratio	MT	217 cm <sup>2</sup>   33.6 sq in						
	AT	Synchronized 5-speed forward, 1 reverse						
Gear ratio	4-speed forward automatic, 1 reverse	Electronically controlled dual range						
	4-speed forward automatic, 1 reverse	1 : 1.4 Direct						
Gear ratio	Gear	AT				AT		
		①	②	③	④	⑤	⑥	⑦
①: Carburetor	1st	3.307	3.307	3.307	3.307	2.706	1.706	2.706
	2nd	1.857	1.809	1.809	1.809	1.484	1.386	1.484
②: 2.0 t PGM-FI	3rd	1.268	1.230	1.230	1.230	1.028	1.028	1.028
	4th	0.968	0.933	0.933	0.933	0.731	0.731	0.674
③: Carburetor	5th	0.787	0.757	0.757	0.757	—	—	—
	Reverse	3.000	3.000	3.000	3.000	2.047	2.047	2.047
④: 2.0 t PGM-FI (2.2 t except KY, KQ, KY)	Final	4.268	4.268	4.268	4.082	4.285	4.285	4.285
	⑤: 2.2 t KQ							

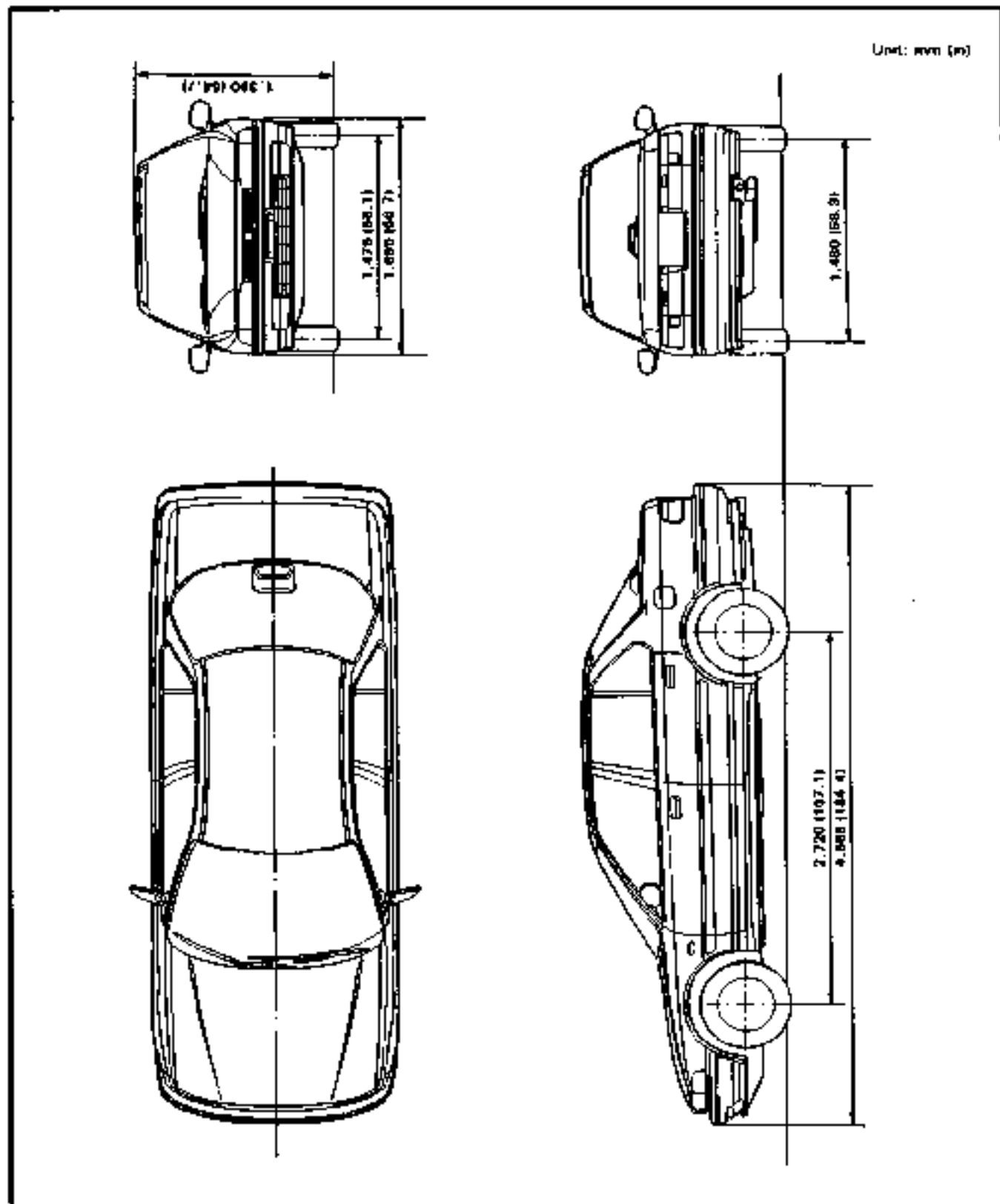
# Design Specifications

	ITEMS	METRIC	ENGLISH	NOTES
AIR CONDITIONER	Cooling capacity	4.850 kcal/h	17.268 Btu/h	
	Condition			
	Compressor speed	1,800 min <sup>-1</sup> (rpm)		
	Condensate air temperature	27°C	81°F	
	Condensate air humidity	50%		
Compressor air temperature	35°C		88°F	
Condensate air velocity	4.5 m/sec.		14.8 ft/sec	
Blower capacity	440 m <sup>3</sup>		15.542 cu ft/h	
Compressor	Type		Sweeps-plate	
No. of cylinders			10	
Capacity		178 cc/rev.	±0.9 cc/rev.	
Maximum speed		8,300 min <sup>-1</sup> (rpm)		
Lubricant capacity		90-120 cc	3.0-4.0 US oz. 3.3-4.2 imp oz	
Condenser			Corrugated fin type	
Evaporator			Corrugated fin type	
Blower	Type		Swirl fan	
Motor input			210 W (12 V)	
Speed control			6-speed	
Blow-off capacity		500 m <sup>3</sup> /h	17.562 cu ft/h	
Temperature control			Air-mix type	
Clutch	Type		Dr. single-stage	
Power consumption			40W (12V) maximum	
Refrigerant	Type		R-12	
Quantity		3.90-0.92 kg	2.0-2.1 lb	
STEERING SYSTEM	Type		Rack and pinion	
Overall ratio			16.1:1 (13.6:1)	
Turns, lock-to-lock			3.13 (2.5)	
Steering wheel diameter		375 mm 14.8 in	14.8 in 1.9 US qt. 1.8 imp qt.	> 4WS > 4WS
Power steering fluid capacity				
Power steering fluid			Getacine Power Steering Fluid P/N 00208-99901	
SUSPENSION	Type	Front	Independent double wishbone, coil spring	
		Rear	Independent double wishbone, coil spring	
Shock absorber	Front and rear		Telescopic, hydraulic Nitrogen gas-Nitro	∴ F: exceed KP, KT
WHEEL ALIGNMENT	Total toe	Front	0±3 mm	0±0.12 in
		Rear	W 2±2 mm	0.06±0.08 in
			W 3±2 mm	0.12±0.08 in
Camber	Front		0° 0' ± 1'	
	Rear		-0° 30' ± 1'	
			-0° 20' ± 1'	
			±0°	
CASTER	Front		Ventilated disc	
BRAKE SYSTEM	Type	Front		
		Rear	Drum	
Pad and lining swept area (mrad)			2.2 r (4-corr) (V) or 4.0 r or 4WS Solid disc	
	Front	16 in	475 cm <sup>2</sup>	84 sq. in
	Rear	14 in	311 cm <sup>2</sup>	48 sq. in
	Disc	14 in	242 cm <sup>2</sup>	39 sq. in
	Disc		281 cm <sup>2</sup>	44 sq. in
TIRES	Size		185/70R14 65H 185/65R16 67H 190/60R15 67V 185/90R16 67H 185/70 D14 185/90 D16	
ELECTRICAL	Fuses	In the anti-lock brake system fuse box In the fuse box In the relay box	15A, 40A 7.5A, 10A, 15A, 30A 7.5A, 10A, 15A, 20A, 30A, 40A, 50A, 60A	
Headlights	High/Low		12V-65/55W	
Turn signal lights	Front		12V-21W	
	Rear		12V-21W	
Position lights			12V-5W	
License plate sign			12V-5W	
Back-up lights			12V-21W	
Stop lights			12V-21W	
High mount brake light			12V-16CP	
Tail light			12V-5W	
Rear fog light			12V-21W	
Door 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-0.81/0.91/1.12/1.4W	
Warning lights			12V-1.4/3.4W	
Door lock light			12V-3.4W	
Illumination and pilot lights			12V-1.4/1.2W LED; 0.91W, 0.64W	
Rear illumination lights			12V-1.2/1.4W	

**WEIGHT SPECIFICATIONS**

ENGINE	TYPE	GRADE	Manual Transmission		Automatic Transmission	
			CURB WEIGHT	WEIGHT DISTRIBUTION (FR:RR)	CURB WEIGHT	WEIGHT DISTRIBUTION (FR:RR)
1.8i Carburated	KB	LX	1,200 (2,646)	730/470 (1,609/1,036)	—	—
		EX	1,215 (2,679)	720/480 (1,620/1,058)	—	—
2.0i Carburated	KG	DX, EX	1,220 (2,690)	740/480 (1,631/1,058)	1,245 (2,745)	765/480 (1,687/1,058)
		KH	1,220 (2,690)	740/480 (1,631/1,058)	1,245 (2,745)	765/480 (1,687/1,058)
	KB	DX	1,225 (2,701)	745/480 (1,642/1,058)	1,250 (2,750)	770/480 (1,688/1,058)
		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)
		KH	1,215 (2,678)	740/475 (1,631/1,047)	1,240 (2,734)	765/478 (1,687/1,047)
	KH	EX	1,225 (2,701)	740/485 (1,631/1,069)	1,250 (2,750)	765/485 (1,687/1,069)
		KW	DX, LX	1,225 (2,701)	745/480 (1,642/1,058)	1,250 (2,750)
	KP, KT	LX	1,215 (2,678)	735/480 (1,620/1,053)	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 (2,750)
	KY	LX	1,245 (2,745)	760/485 (1,675/1,069)	1,275 (2,811)	790/485 (1,742/1,069)
		KY	EX	1,260 (2,756)	765/485 (1,687/1,069)	1,290 (2,822)
2.0i PGM-FI	KG	2.0	1,240 (2,734)	750/480 (1,653/1,060)	1,270 (2,800)	780/480 (1,720/1,060)
		EX	1,265 (2,789)	770/495 (1,688/1,091)	1,295 (2,850)	800/495 (1,764/1,091)
	KS	2.0	1,260 (2,756)	760/490 (1,675/1,080)	1,280 (2,822)	790/490 (1,742/1,080)
		KF, KB, KW	2.0	1,245 (2,745)	755/490 (1,666/1,090)	1,275 (2,811)
	KF	2.0	1,265 (2,767)	760/495 (1,675/1,091)	1,285 (2,833)	790/495 (1,742/1,091)
		KU, KP, KT	EX	1,240 (2,734)	750/490 (1,653/1,060)	1,275 (2,811)
2.2i PGM-FI	KG	2.2i-2WS	1,305 (2,877)	780/510 (1,753/1,121)	1,335 (2,943)	815/510 (1,819/1,121)
		EX	1,320 (2,902)	795/525 (1,753/1,179)	1,360 (2,990)	825/525 (1,819/1,179)
	KH, KS	2.2i-2WS	1,310 (2,886)	800/510 (1,764/1,134)	1,340 (2,954)	830/510 (1,830/1,124)
		EX	1,335 (2,941)	800/525 (1,764/1,179)	1,365 (3,009)	830/535 (1,830/1,179)
	KF	2.2i-2WS	1,290 (2,844)	785/505 (1,731/1,134)	1,320 (2,910)	815/505 (1,787/1,134)
		EX	1,315 (2,899)	795/510 (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 (2,922)	810/510 (1,808/1,124)
		EX	1,325 (2,921)	790/525 (1,742/1,179)	1,355 (2,987)	820/525 (1,808/1,179)
	KO	EX	1,340 (2,934)	795/525 (1,802/1,190)	1,370 (2,990)	825/525 (1,808/1,190)
		KY	EX	1,320 (2,910)	790/530 (1,742/1,168)	1,350 (2,970)

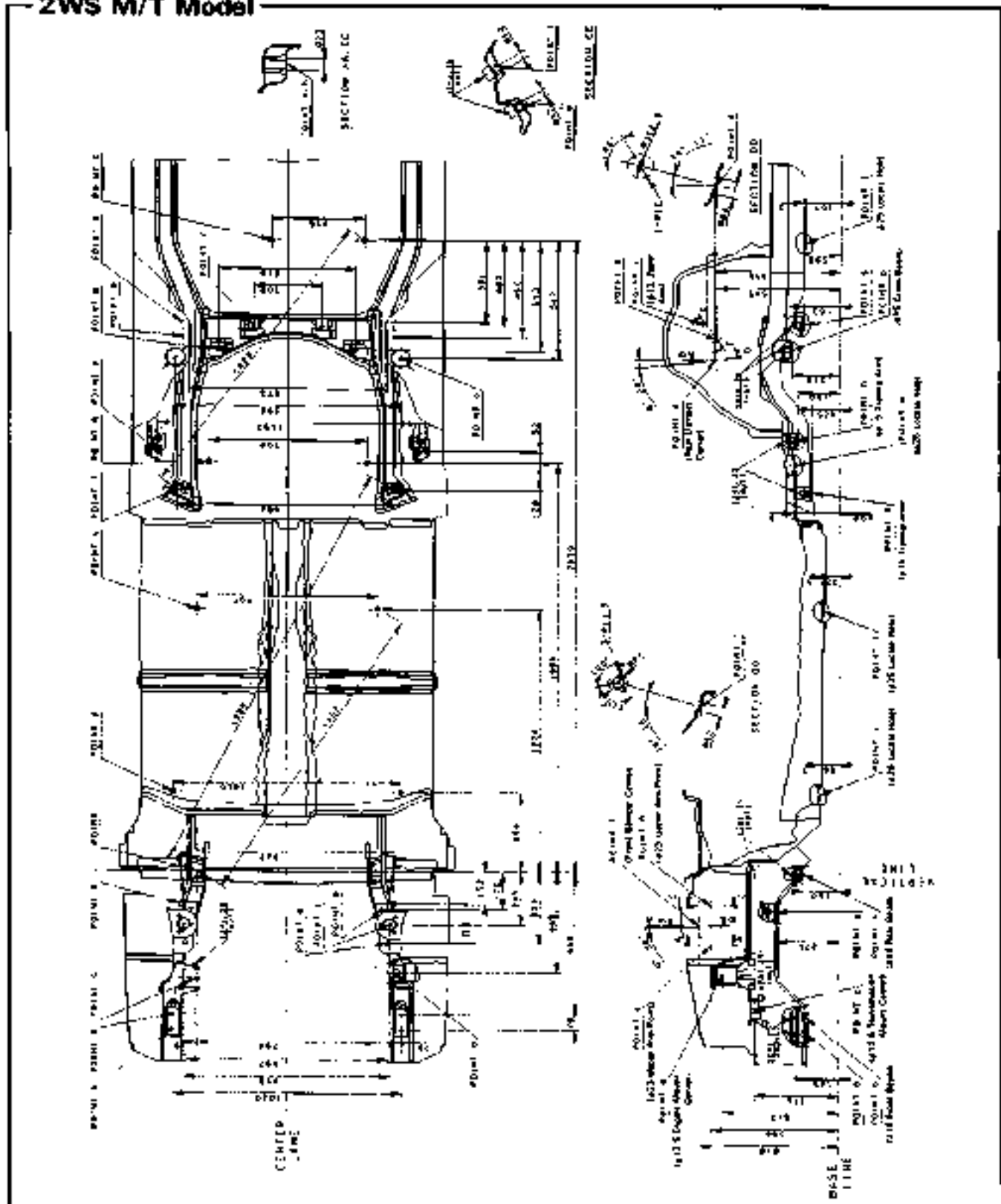
## Body Specifications





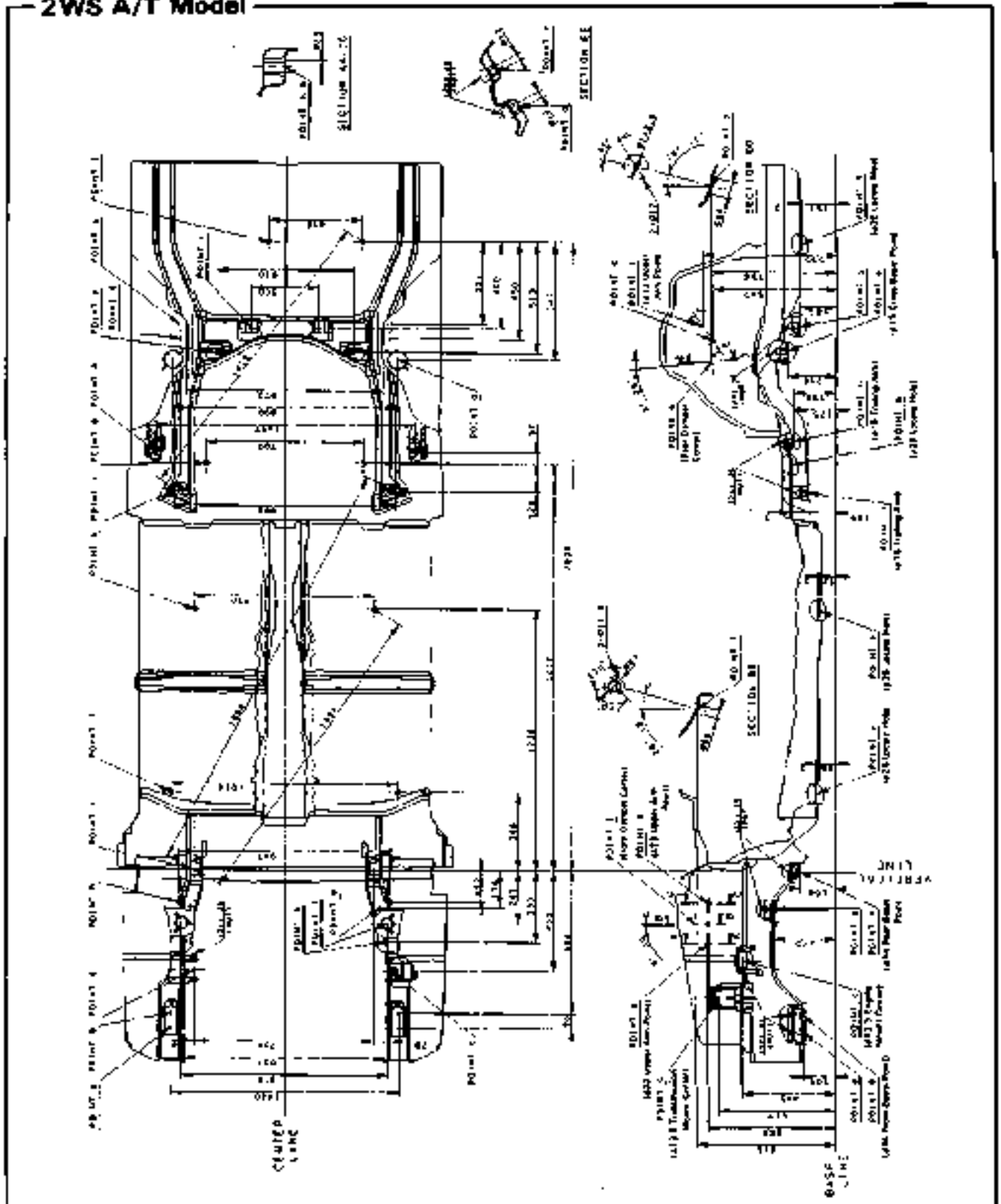
# Frame Repair Chart

2WS M/T Model



# Frame Repair Chart

— 2WS A/T Model —







## **Maintenance**

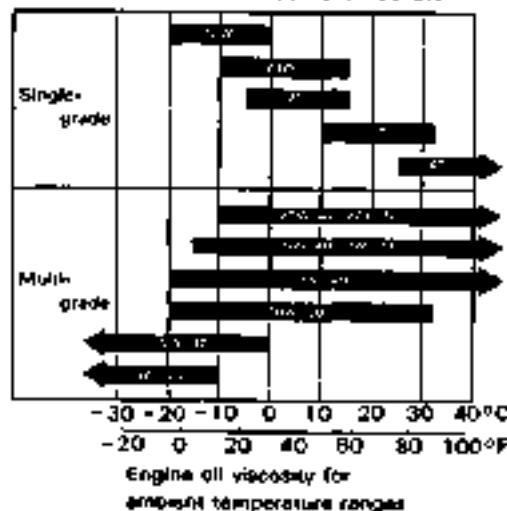
Lubrication Points.....	4-2
Maintenance Schedule .....	4-4



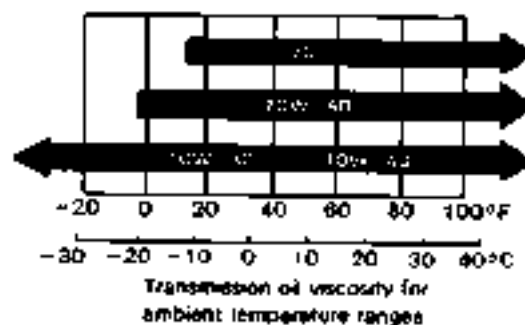
# Lubrication Points

No.	LUBRICATION POINTS	LUBRICANT
1	Engine	API Service Grade: SF or SG 10W-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 08733-80706
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) Fuel 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 Tail lever Rear brake shoe linkage	Multi-purpose grease
23	Caliper Pinion seal Dust seal Caliper pin Piston	Silicone grease
24	Power steering system	Power steering fluid P/N 08208-99961

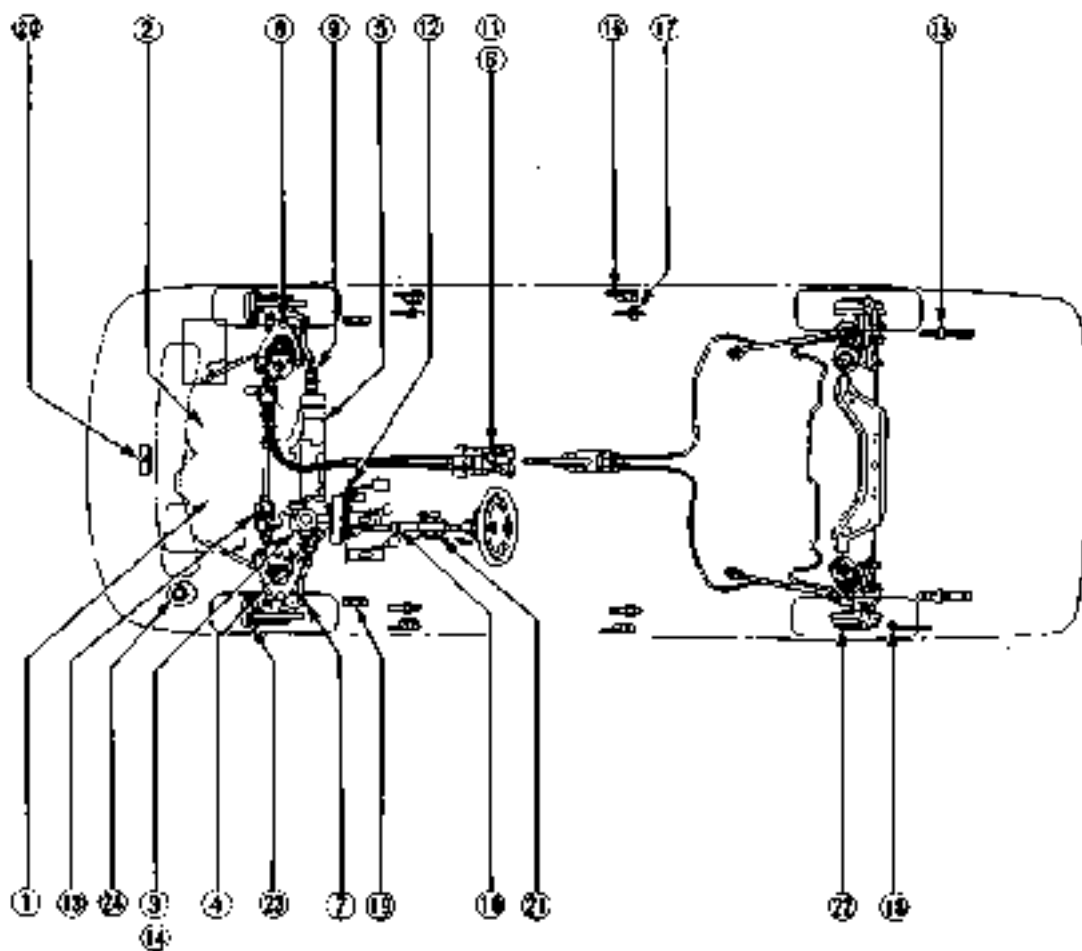
Recommended Engine Oil  
15F or SG Grade 10W-30 Oil



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.	A—Replace C—Clean		I—Inspect. After inspection, clean, adjust, repair or replace if necessary				
	< 1,000 km < 1,000 miles months	20 12	40 24	60 36	80 48	100 60	80 60
Idle speed and idle CO*2		I	I	I	I	I	I
Idle speed and idle CO**							I
Valve clearance		I	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**		
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 air 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*3, *5							I
Choke mechanism*4 (except KS models)			I		I		
Choke mechanism*4 (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
Slow-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 2.0i 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	
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 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.	A—Replace C—Clean		I—Inspect. After inspection, clean, adjust, repair or replace if necessary				
	< 1,000 km < 1,000 miles months	20 12	40 24	60 36	80 48	100 60	80 60
Idle speed and idle CO*2		I	I	I	I	I	I
Idle speed and idle CO**							I
Valve clearance		I	I	I	I	I	I
Alternator drive belt			I		I		
Timing belt and timing balance 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**		
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 air 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*3, *5							I
Choke mechanism*4 (except KS models)			I		I		
Choke mechanism*4 (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**							I
Ignition wiring*3			I		I		
Ignition wiring**							I
Positive crankcase ventilation valve*3			I		I		
Positive crankcase ventilation valve**							I
Slow-by filter*3			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 l 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	
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 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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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.

# Special Tools

## Special Tools

Ref. No.	Tool Number	Description	Qty	Remark
①	07411-0020000	Digital Circuit Tester	1	
②	07814-0050100	Fuel Line Clamp	1	
③	07JAZ-SM20100	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)	--- Companion Tools
⑥-2	07LAZ-PT30120	R.P.M. Connecting Adaptor (B)	(1)	
⑦	07LAA-PT60100	O <sub>2</sub> Sensor Socket Wrench	1	



①



②



③



④



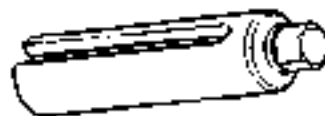
⑤



⑥⑥-1



⑥⑥-2



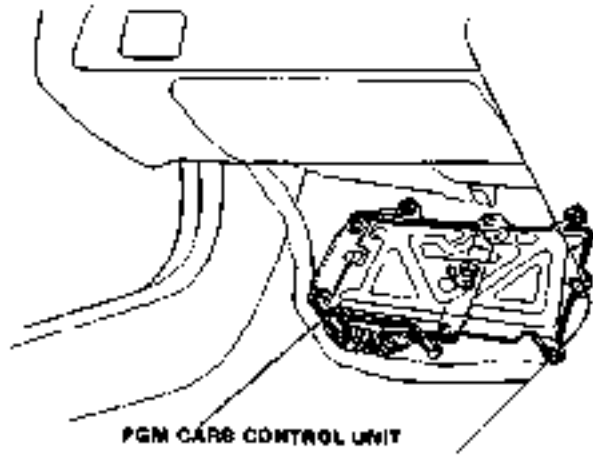
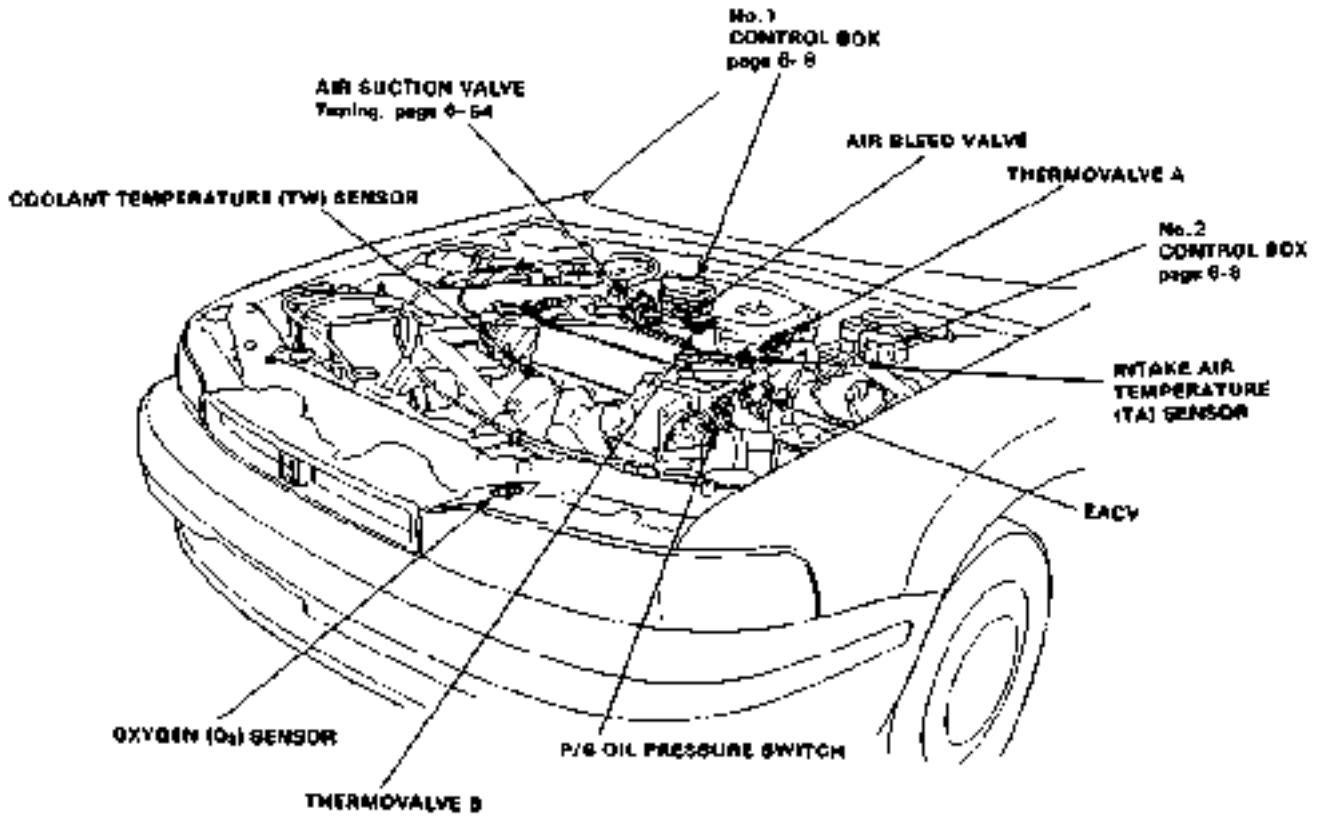
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# Component Locations

## Index

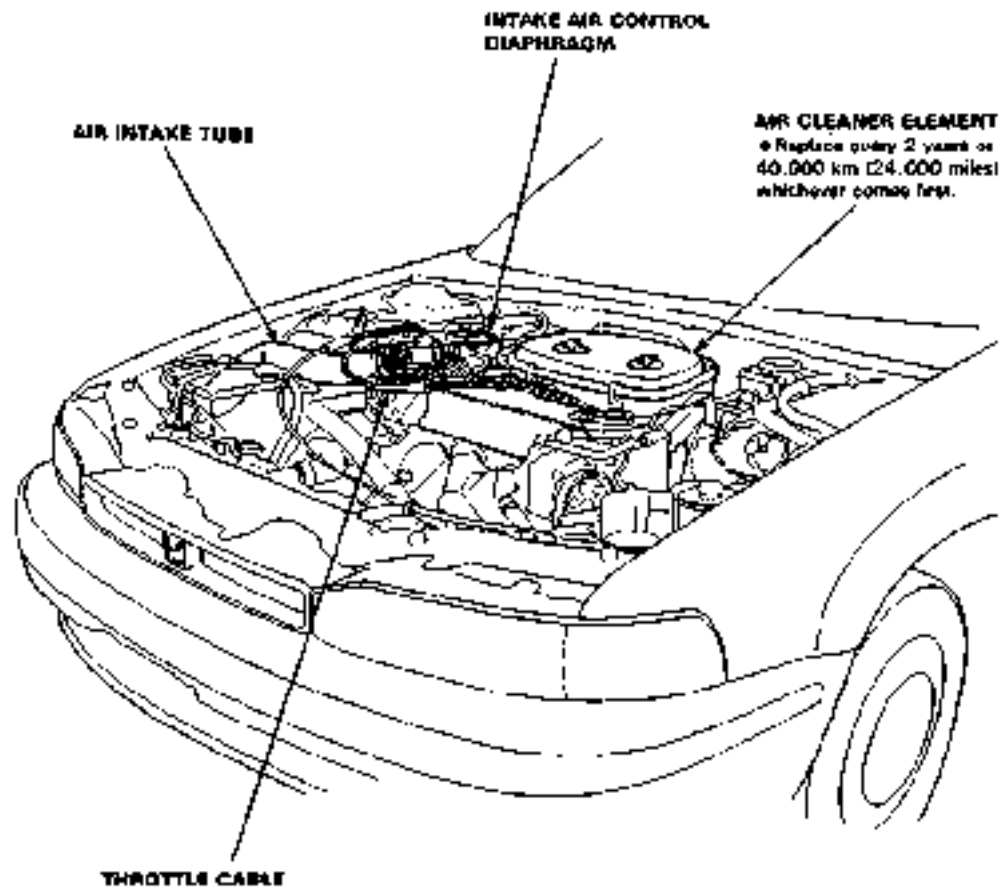
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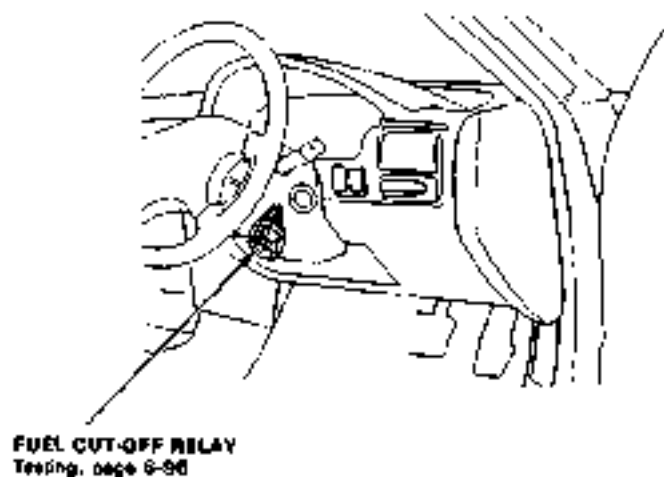
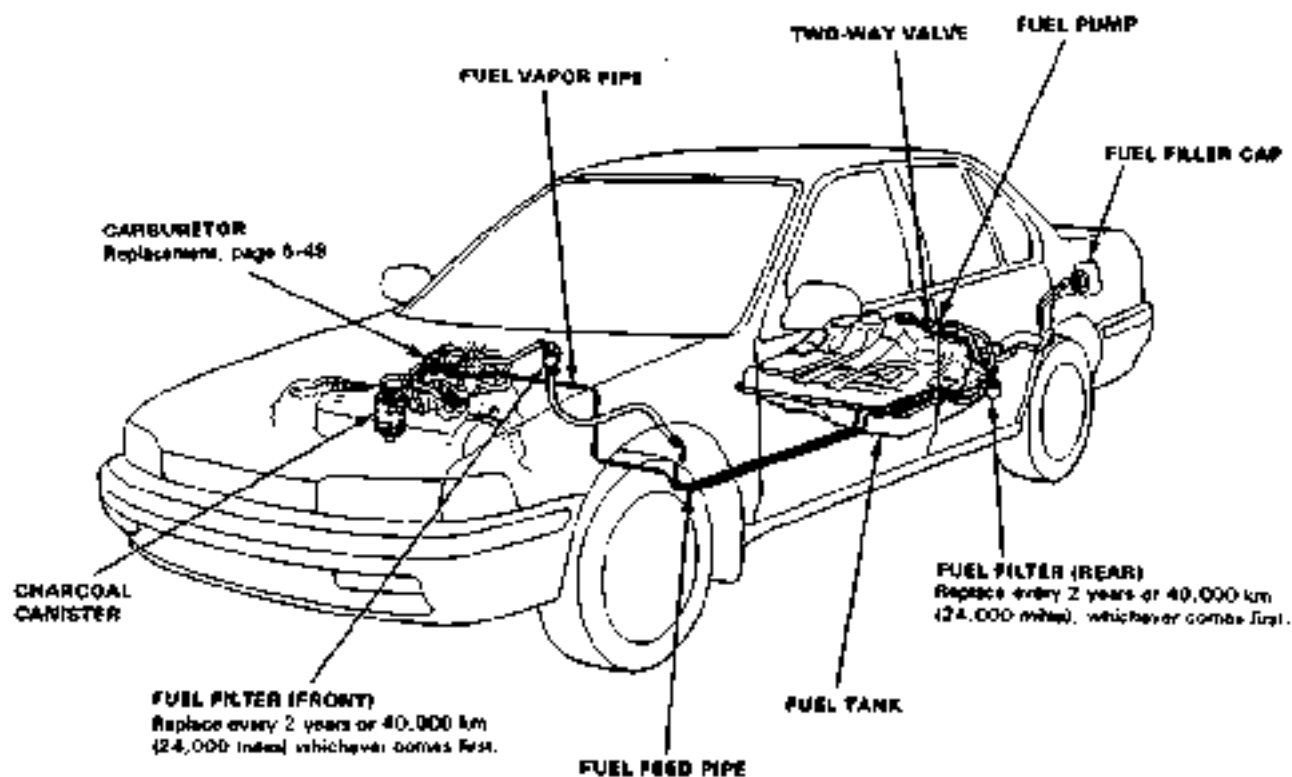


# Component Locations

Index

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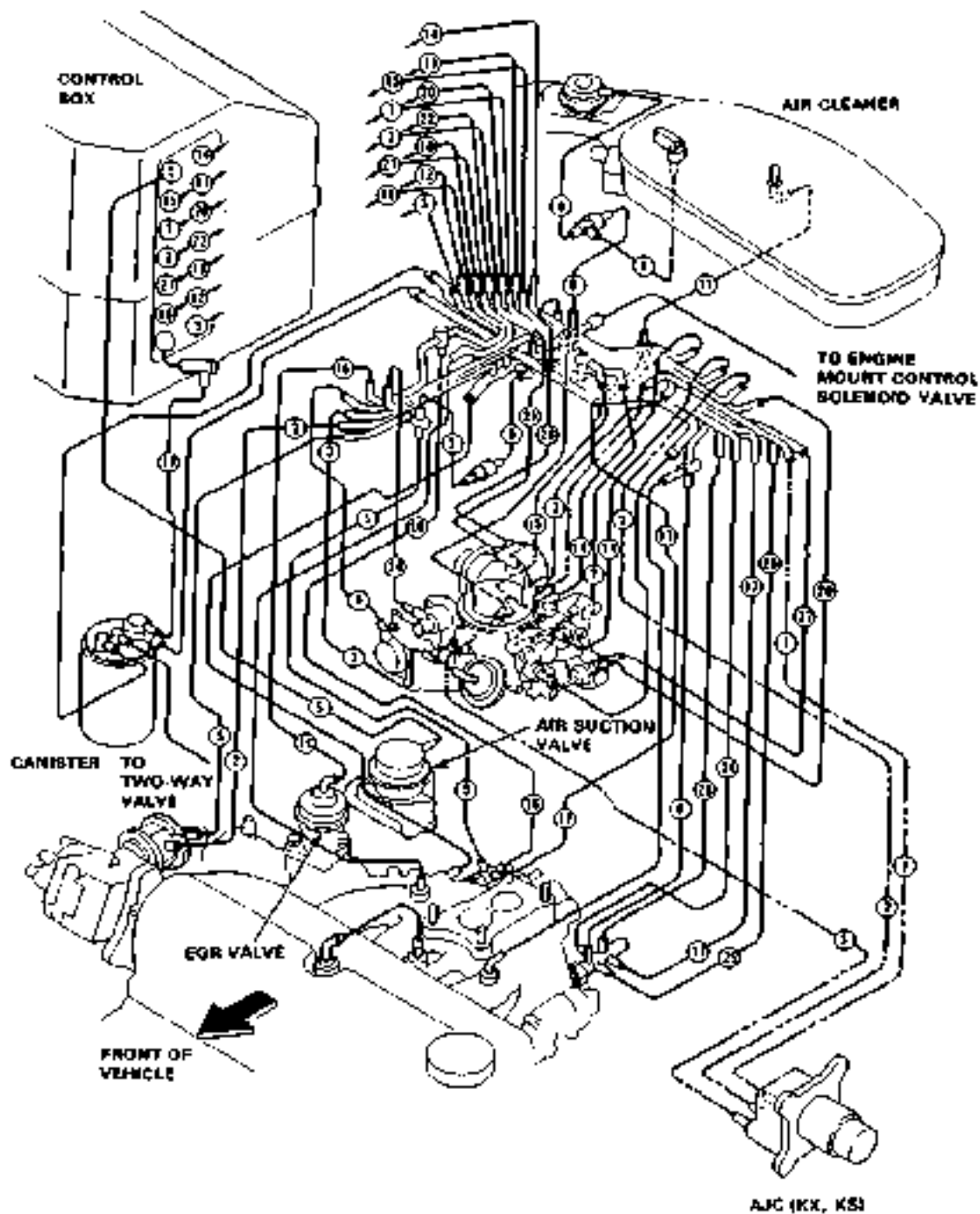




# System Description

## Vacuum Connections

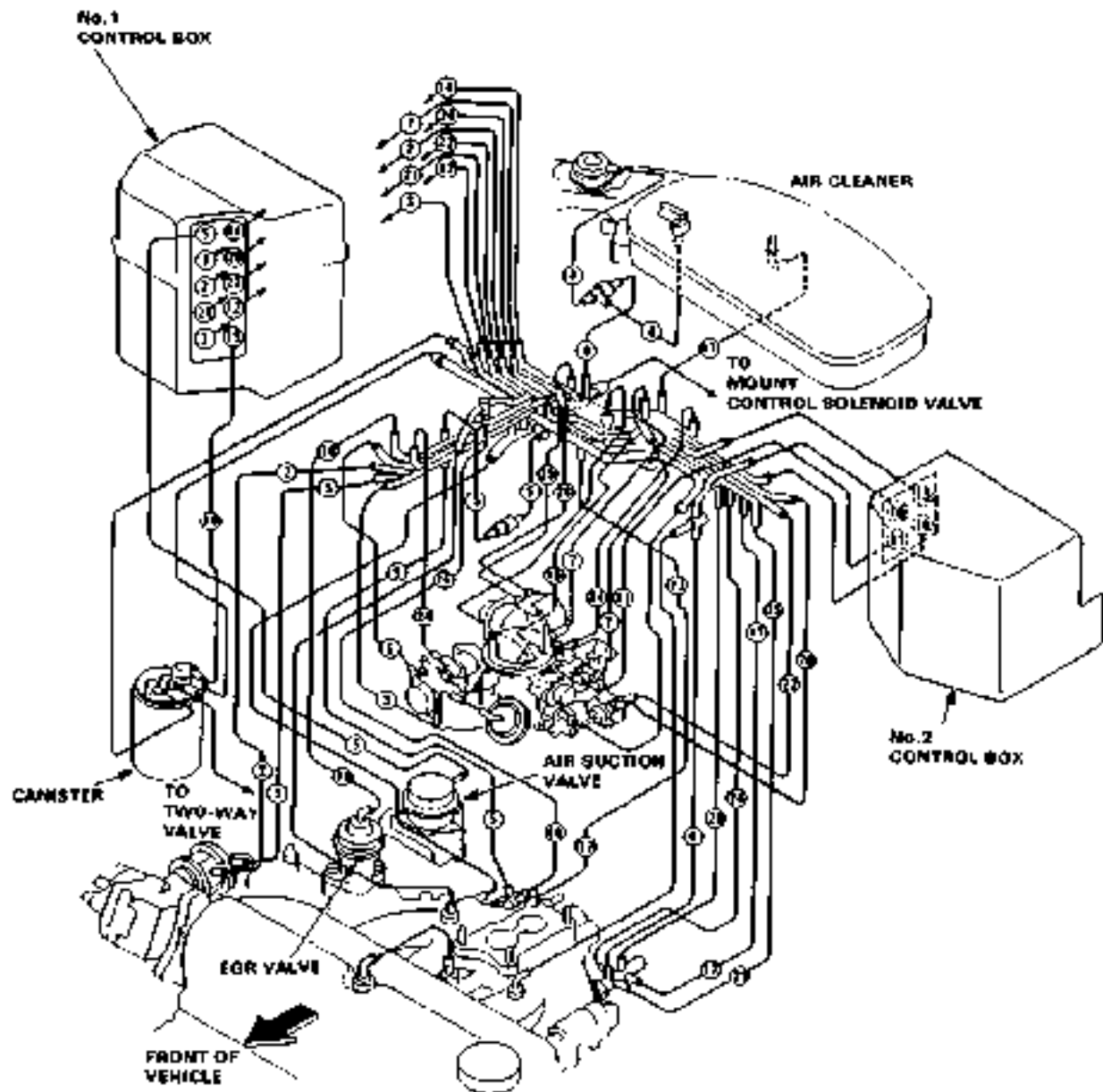
(KX, KS, KG)







(KE with CATA)

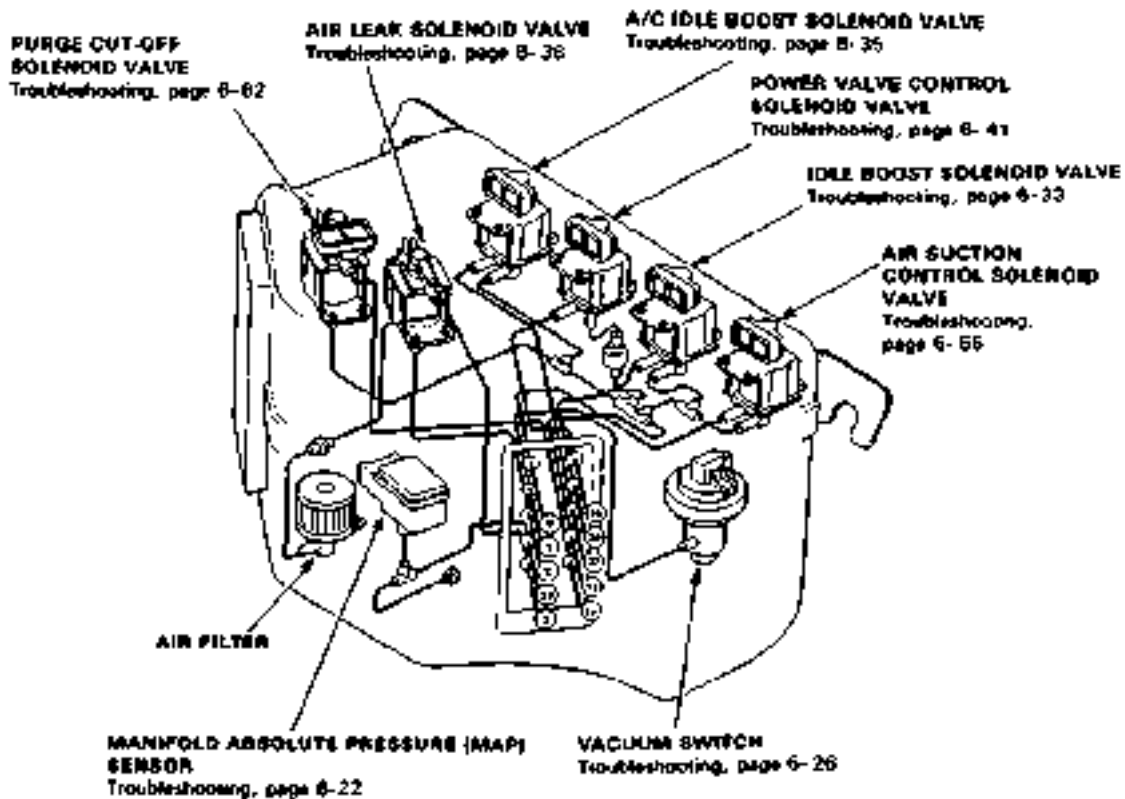


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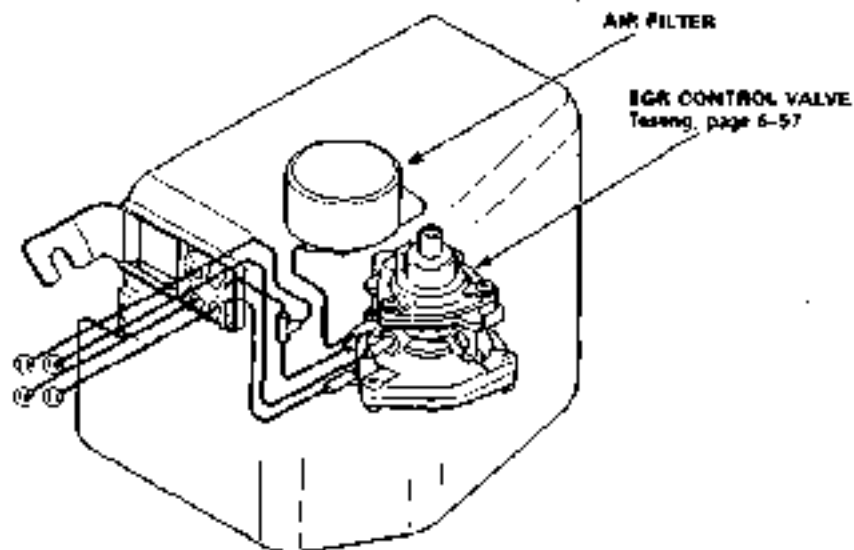
## Vacuum Connections

(KE with CAT)

No. 1 Control Box

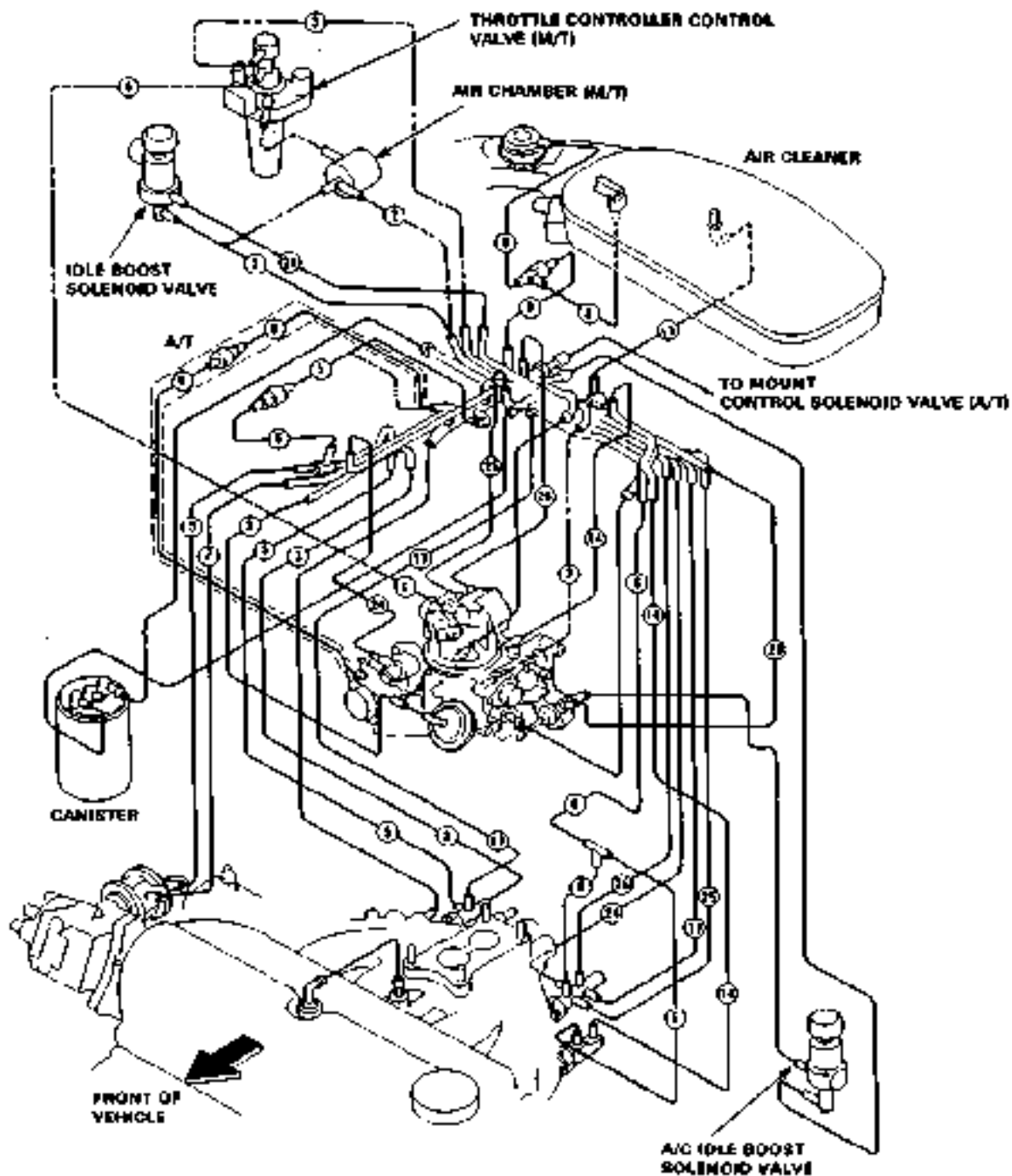


No. 2 Control Box





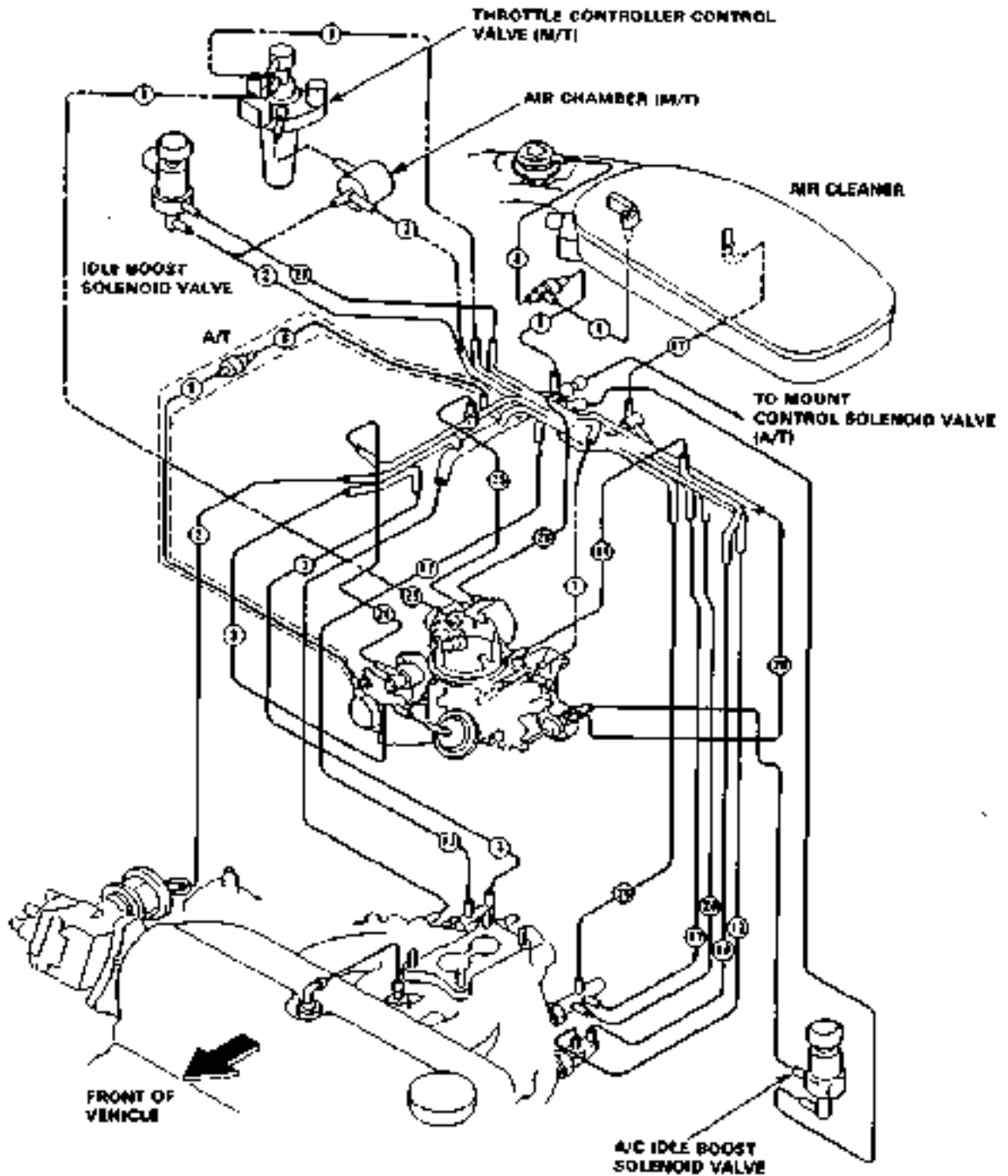
[KF, KB, KW, KE, KU]



# System Descriptions

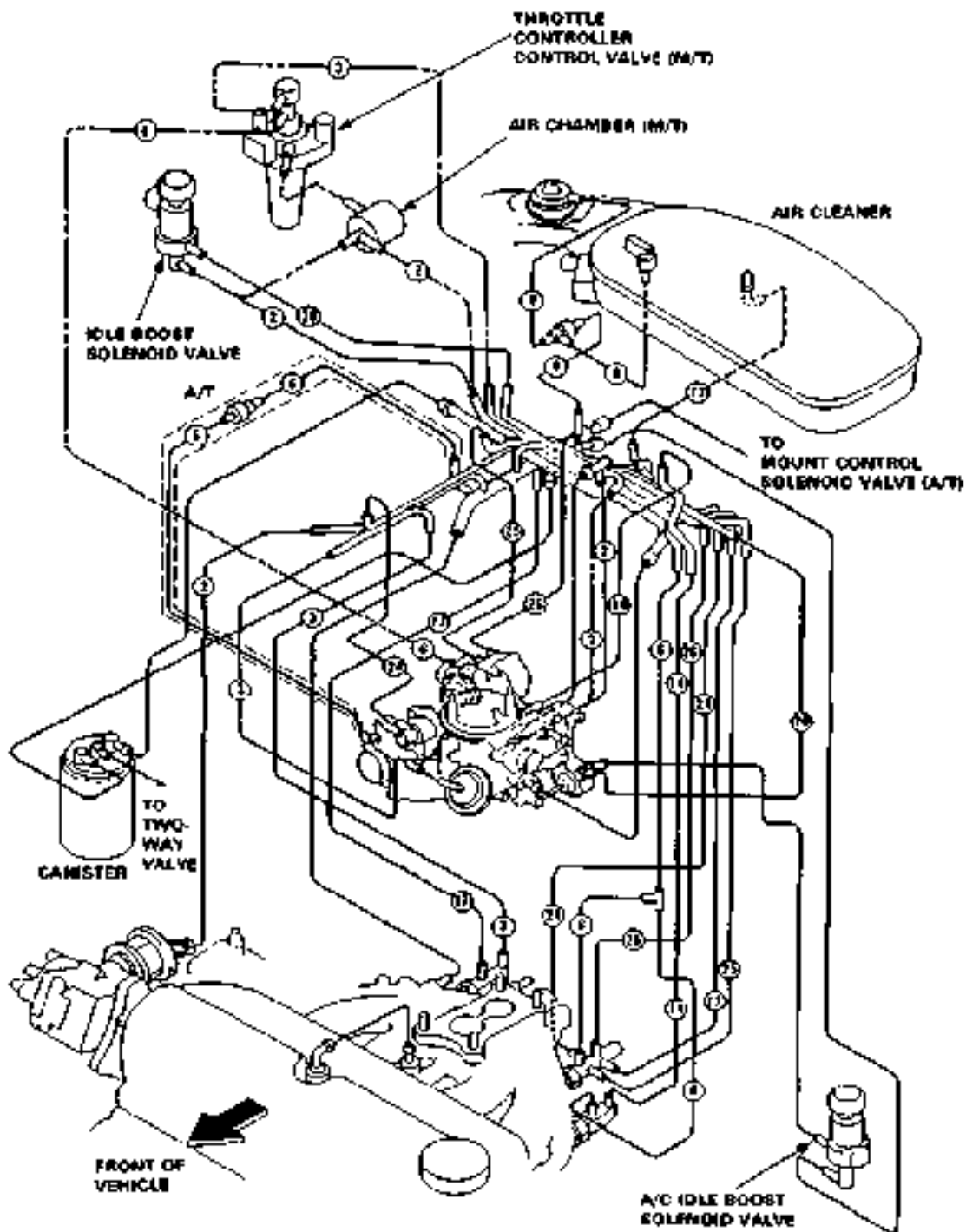
## Vacuum Connections

IMP. KTJ





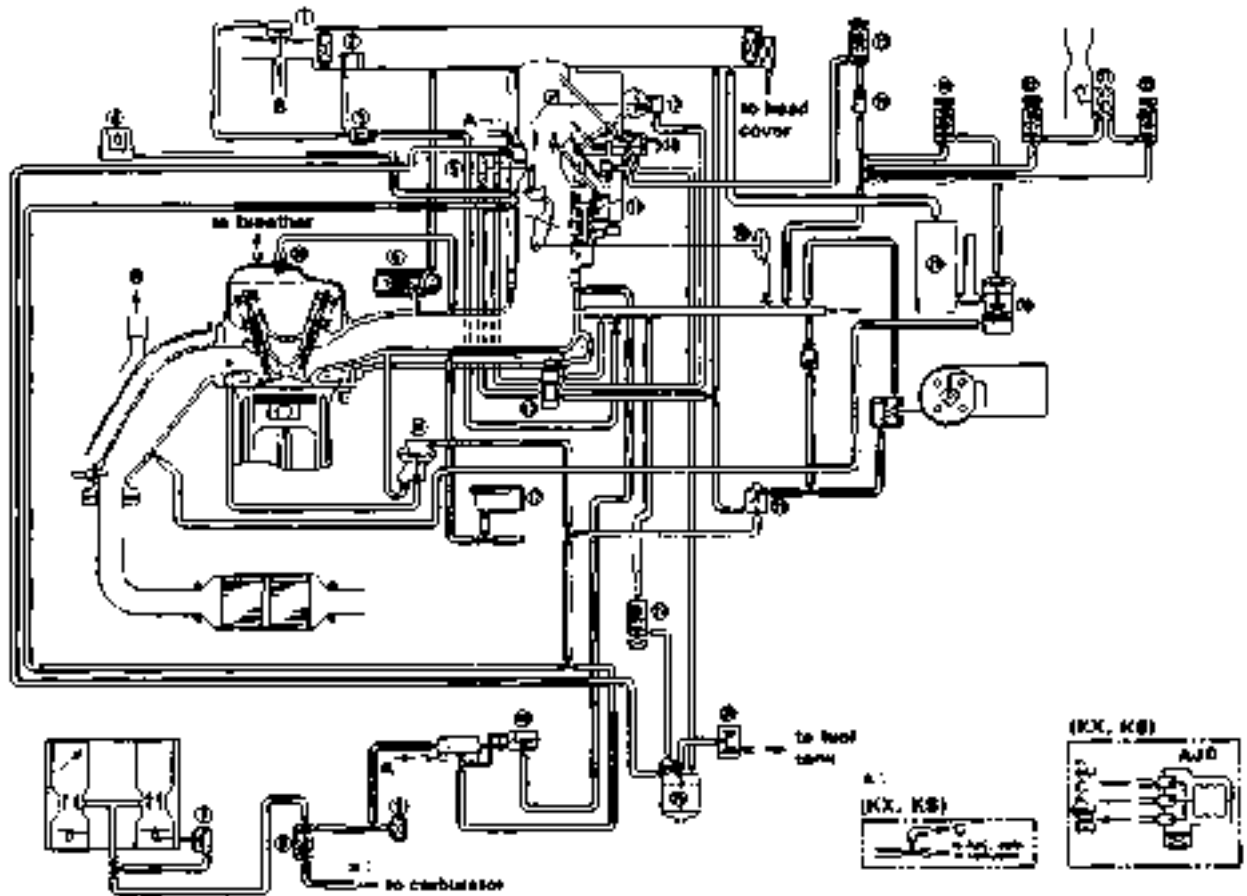
[KY]



# System Descriptions

## Vacuum Connections

(KX, KS, KU, KE with CATB)

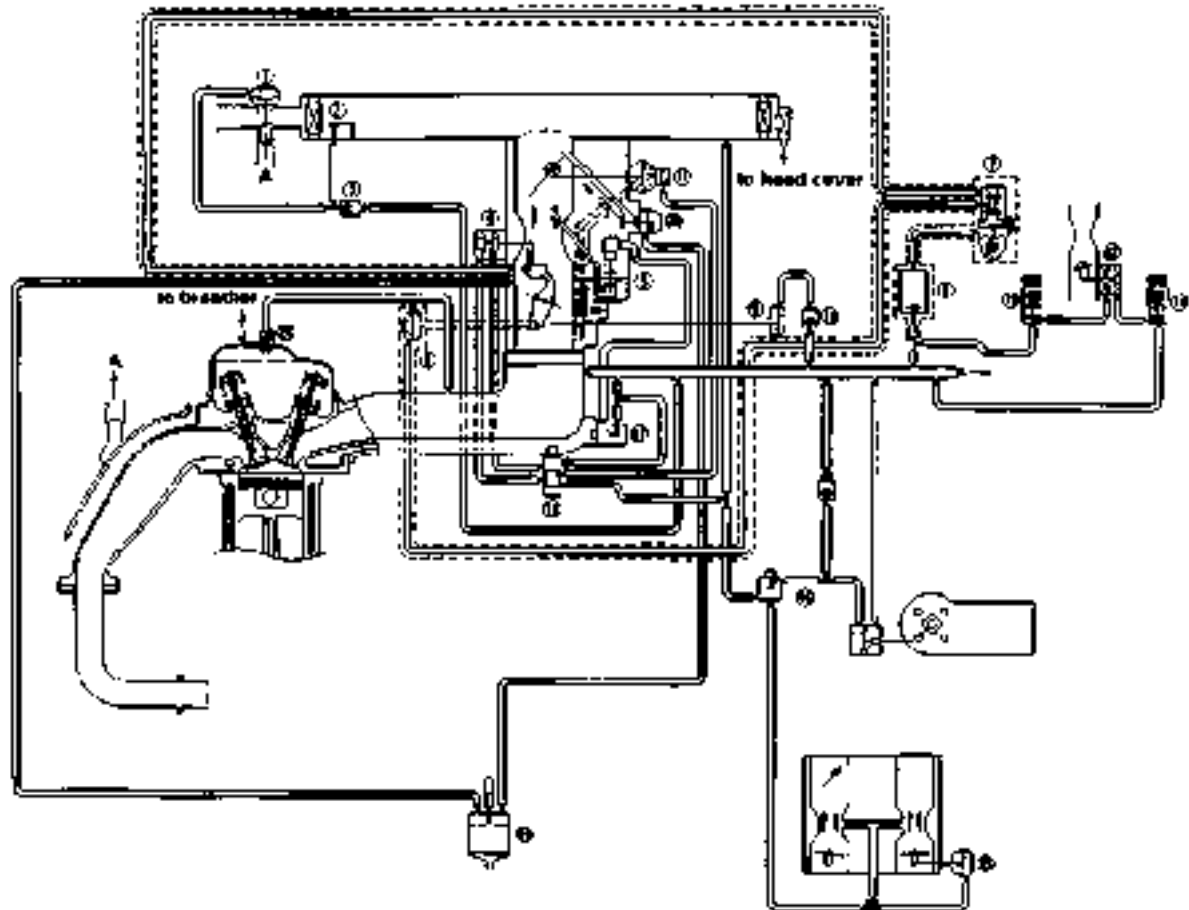


- ① AIR CONTROL DIAPHRAGM
- ② AIR BLEED VALVE
- ③ CHECK VALVE
- ④ VACUUM SWITCH
- ⑤ FAST IDLE UNLOADER
- ⑥ EACV
- ⑦ SECONDARY DIAPHRAGM
- ⑧ AIR LEAK SOLENOID VALVE
- ⑨ AIR FILTER
- ⑩ EGR CONTROL VALVE
- ⑪ EGR VALVE
- ⑫ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
- ⑬ THERMOVALVE A
- ⑭ POWER VALVE
- ⑮ POWER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



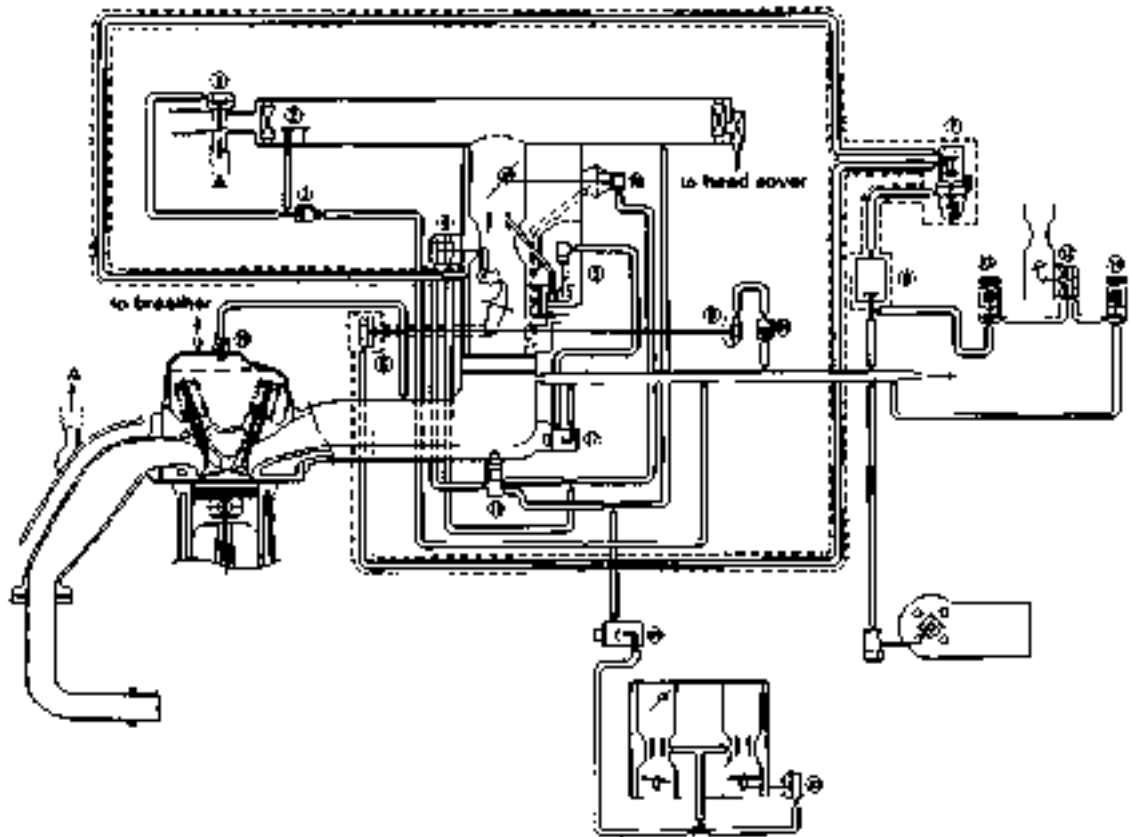
- ①AIR CONTROL DIAPHRAGM
- ②AIR BLEED VALVE
- ③CHECK VALVE
- ④FAST IDLE UNLOADER
- ⑤POWER VALVE
- ⑥THROTTLE CONTROLLER (M/T)
- ⑦THROTTLE CONTROLLER CONTROL VALVE (M/T)
- ⑧AIR CHAMBER (M/T)
- ⑨THROTTLE CONTROLLER (A/T)
- ⑩CHECK VALVE (A/T)

- 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, NT)



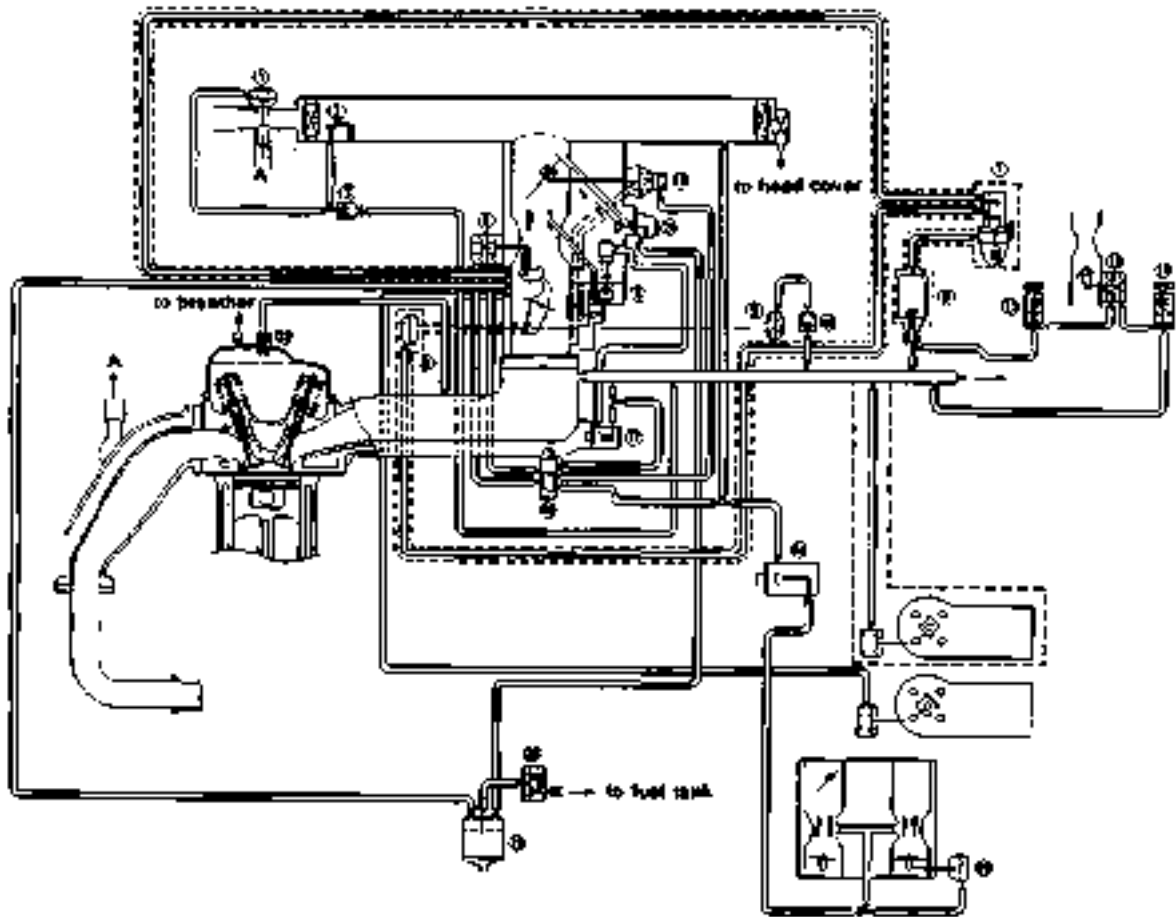
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- ② AIR BLEED VALVE
- ③ CHECK VALVE
- ④ FAST IDLE UNLOADER
- ⑤ POWER VALVE
- ⑥ THROTTLE CONTROLLER (M/T)
- ⑦ THROTTLE CONTROLLER CONTROL VALVE (M/T)
- ⑧ AIR CHAMBER (M/T)
- ⑨ THROTTLE CONTROLLER (A/T)
- ⑩ CHECK VALVE (A/T)

- ⑪ CHOKE OPENER
- ⑫ IDLE BOOST THROTTLE CONTROLLER
- ⑬ IDLE BOOST SOLENOID VALVE
- ⑭ A/C IDLE BOOST SOLENOID VALVE
- ⑮ SECONDARY DIAPHRAGM
- ⑯ THERMOVALVE D
- ⑰ THERMOVALVE C
- ⑱ THERMOVALVE A
- ⑲ PCV VALVE





(KCY)



- ① AIR CONTROL DIAPHRAGM
- ② AIR BLEED VALVE
- ③ CHECK VALVE
- ④ FAST IDLE UNLOADER
- ⑤ POWER VALVE
- ⑥ THROTTLE CONTROLLER (M/T)
- ⑦ THROTTLE CONTROLLER VALVE (M/T)
- ⑧ AIR CHAMBER (M/T)
- ⑨ THROTTLE CONTROLLER (A/T)
- ⑩ CHECK VALVE (A/T)
- ⑪ CHOKE OPENER

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





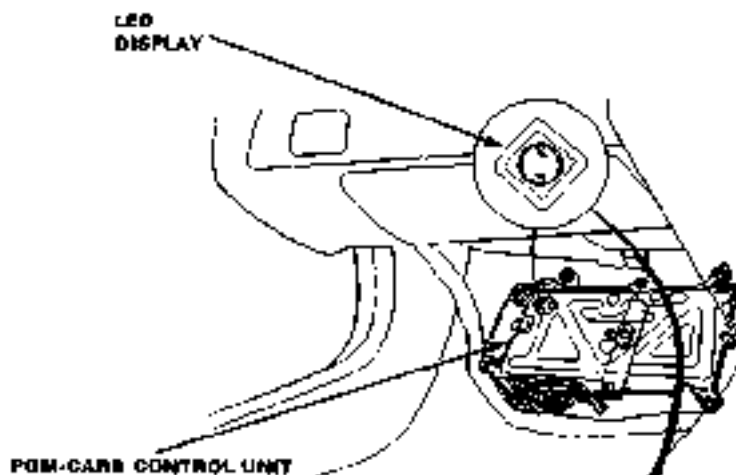
# Troubleshooting



## 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
	SYMPTOM	—	—	—	23, 24	26	—
	SELF-DIAGNOSIS INDICATOR (LED) BLINKS	⑧ or ⑨	①	②	③ or ⑤	④	⑥
	ENGINE WON'T START						
	DIFFICULT TO START ENGINE WHEN COLD	Ⓢ					
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFIC	Ⓢ					
	ROUGH IDLE	Ⓢ	③		②		
	WHEN WARM ENGINE SPEED TOO HIGH	Ⓢ					
	WHEN WARM ENGINE SPEED TOO LOW	Ⓢ					
FREQUENT STALLING	WHILE WARMING UP	Ⓢ			②	③	
	AFTER WARMING UP	Ⓢ			②		
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	Ⓢ	③	④	②		
	FAILS EMISSION TEST	Ⓢ	②		①		
	LOSS OF POWER	Ⓢ			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.

Ⓢ: 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	①
					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

— Engine is warm and running.  
— LED indicates CODE 3.

Turn the ignition switch OFF.

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

Start the engine and allow to idle.

Does LED indicate CODE 3?

NO

Intermittent failure (test drive may be necessary).

YES

Turn the ignition switch OFF.

Connect the test harness between the MAP sensor and wire harness.

Turn the ignition switch ON.

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

Is there approx. 5 V?

NO

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

YES

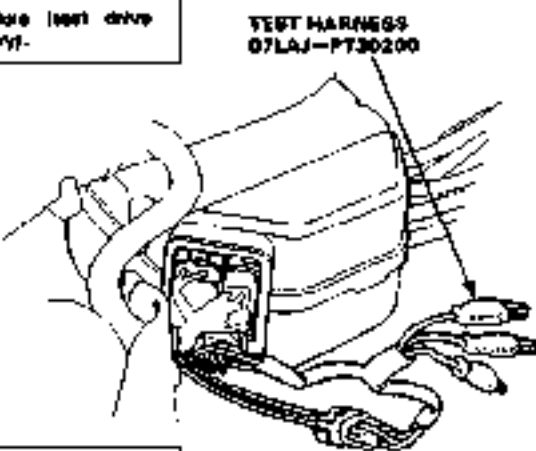
Measure voltage between WHT (+) terminal and GRN (-) terminal.

(To page 6-23)

Is there approx. 6 V?

YES

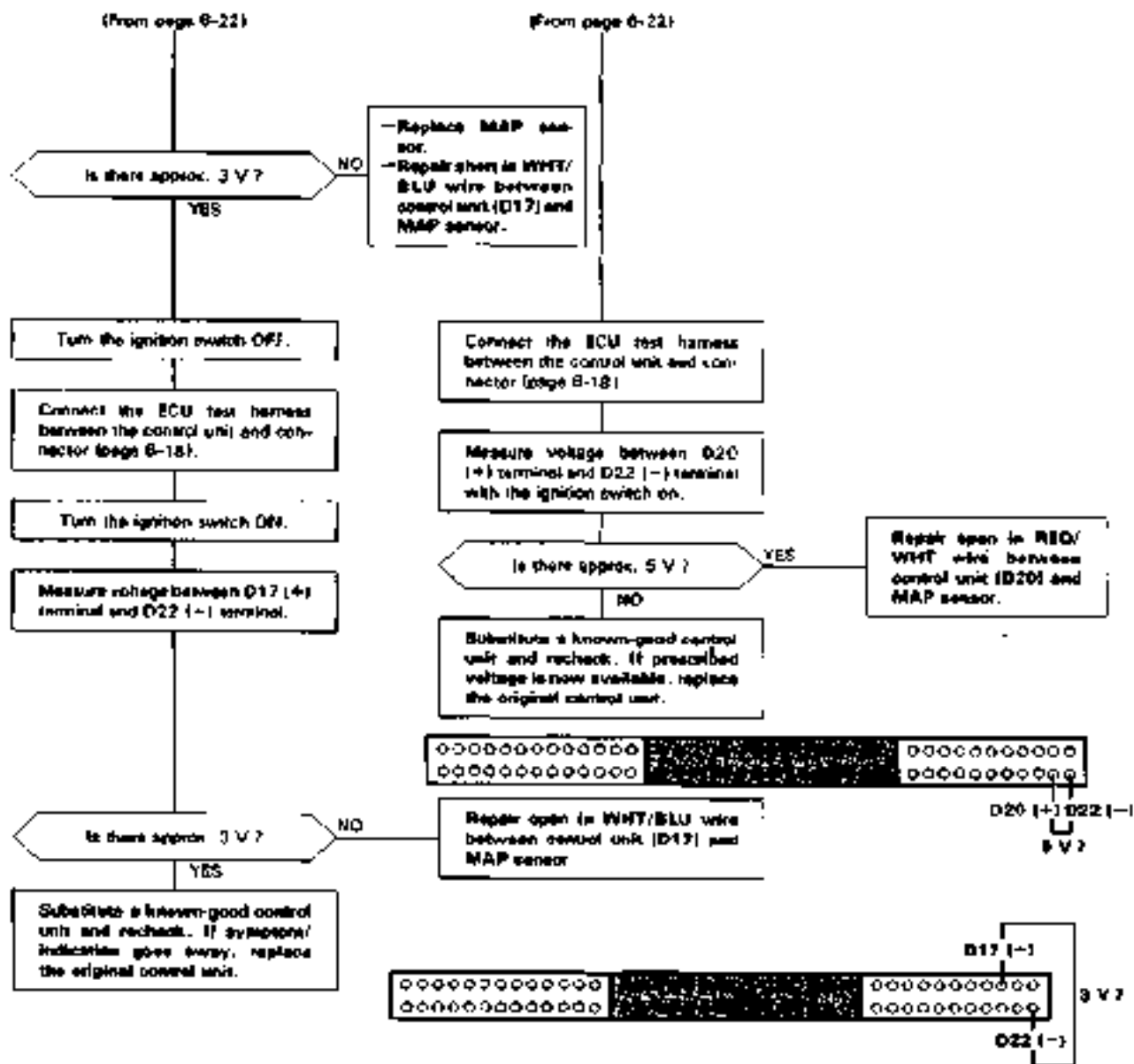
Repair open in BLU/WHT wire between control unit (D22) and MAP sensor.



Turn the ignition switch OFF.

(To page 6-23)





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.

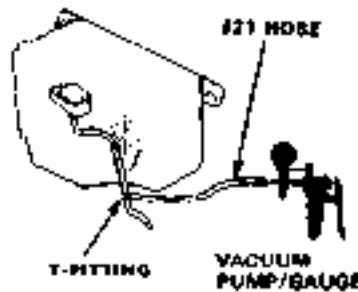
Does it hold vacuum?

NO

Replace #21 hose.

YES

(To page 6-25)





(From page 6-24)

Stop engine.

Connect the test harness between the MAP sensor and wire harness.

Turn the ignition switch ON.

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

Is there approx. 3 V ?

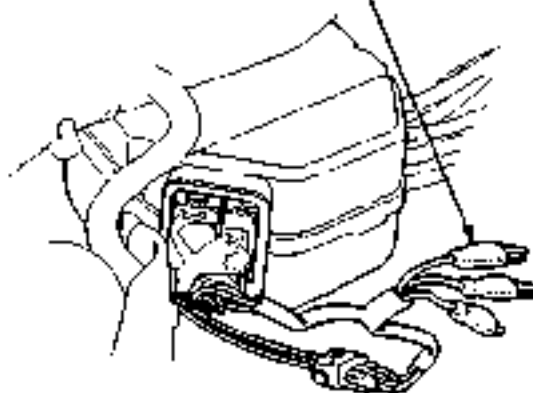
NO

Replace MAP sensor.

YES

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

TEST HARNESS  
07L&J-PT30200



# 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.

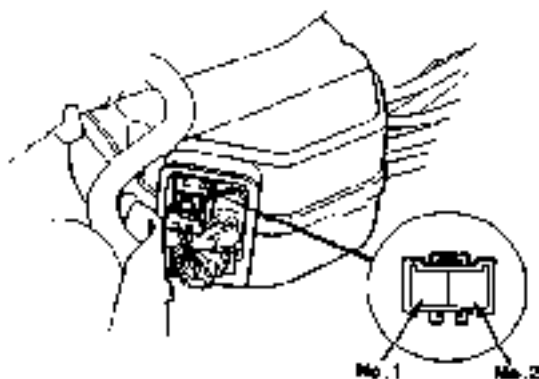
Turn the ignition switch OFF.

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)

Does continuity exist? YES NO

Remove #7 hose from the vacuum hose manifold and connect a T-fitting from a vacuum gauge between the vacuum hose manifold and the vacuum switch.

Turn the ignition switch ON.

Measure voltage between BLK/YEL terminal and body ground on the wire harness.

Is there more than 30 mmHg of vacuum? YES NO

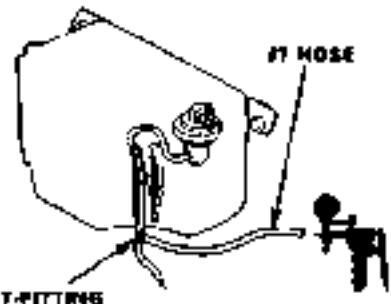
- Replace vacuum switch.
- Repair open BLK/YEL or WHT wire in the control box.

Check routing of #7 hose.

Is there battery voltage? YES NO

Repair open in BLK/YEL wire between connector and No.2 fuse.

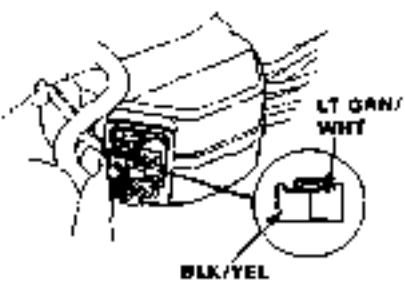
Turn the ignition switch OFF.



Reconnect the connector to the control box.

Connect the ECU test harness between the control unit and connector (page 6-18).

Turn the ignition switch ON.



Remove #7 hose from the vacuum hose manifold and connect a vacuum pump.

Apply vacuum.

Measure voltage between D7 (+) terminal and D21 (-) terminal.

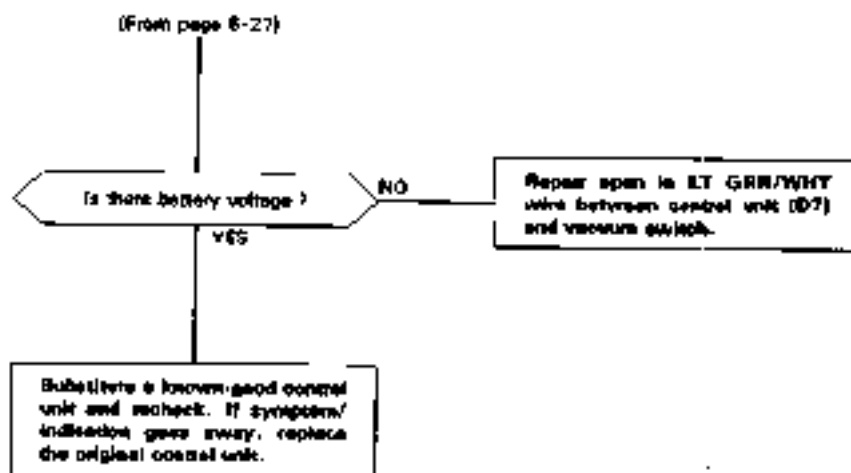


(To page 6-28)

(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-diagnose 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 these 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
		46	32	—	FLOAT LEVEL
SYMPTOM					
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 OF 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	①		
②	②			
		①		
		①		
		①	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.

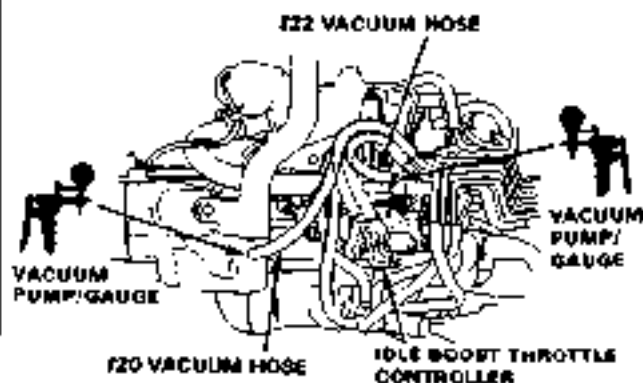
Idle speed should be:

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

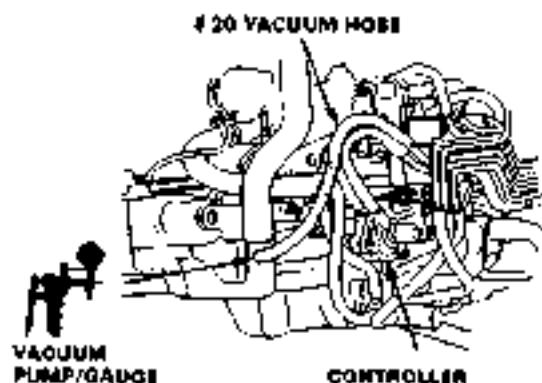
4. Disconnect the connector on the P/S oil pressure switch, and check the idle speed.

Idle speed should be:

Manual	$950 \pm 50 \text{ min}^{-1}$ (rpm)
Automatic	$820 \pm 50 \text{ min}^{-1}$ (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	$800 \pm 50 \text{ min}^{-1}$ (rpm)
Automatic	$750 \pm 50 \text{ min}^{-1}$ (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 I20 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?

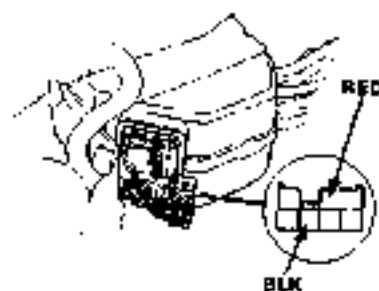
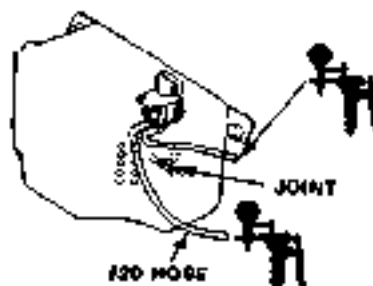
YES

NO

Turn steering wheel slowly.

Apply vacuum.

(To page 6-34)



Turn the ignition switch OFF.

Disconnect the connector on the control box.

Start the engine.

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

Is there voltage?

YES

NO

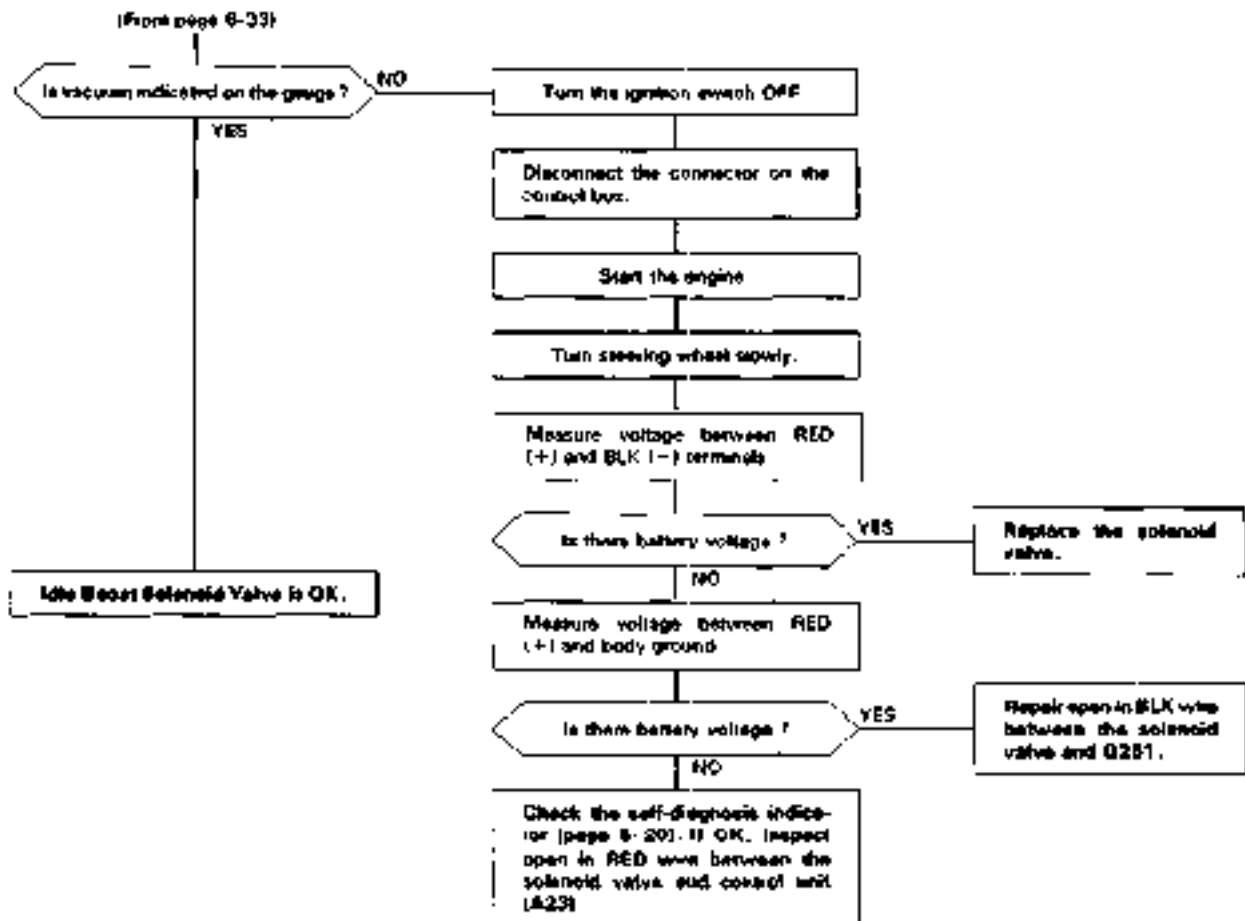
Replace the solenoid valve.

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

(cont'd)

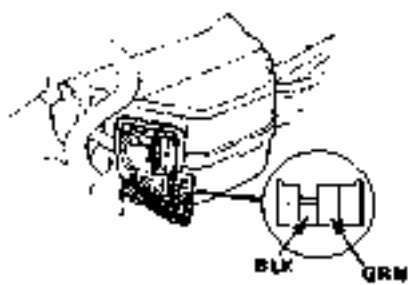
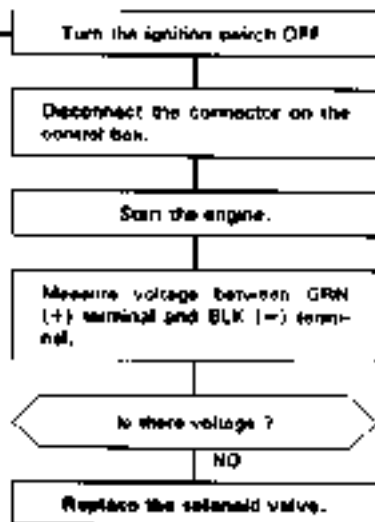
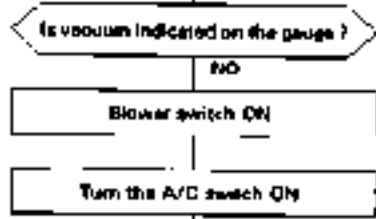
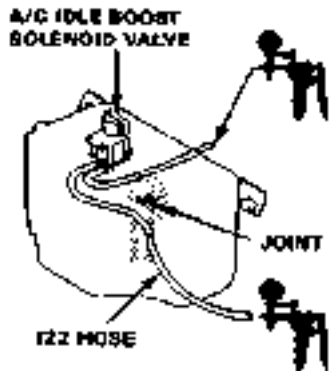
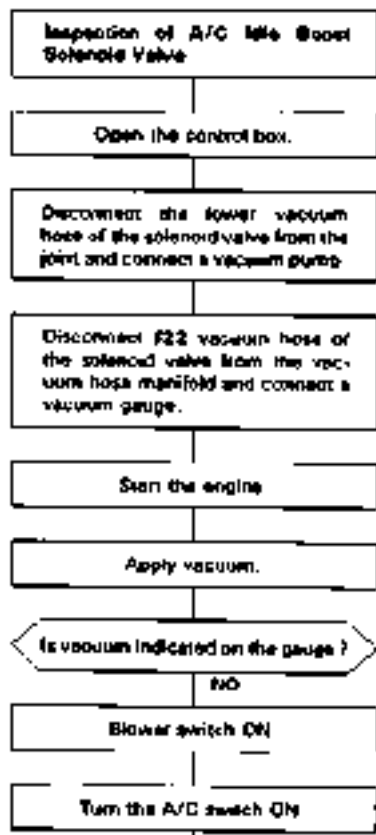
# Carburetor

## Idle Control System (cont'd)





Troubleshooting Flowchart A/C Idle Boost Solenoid Valve



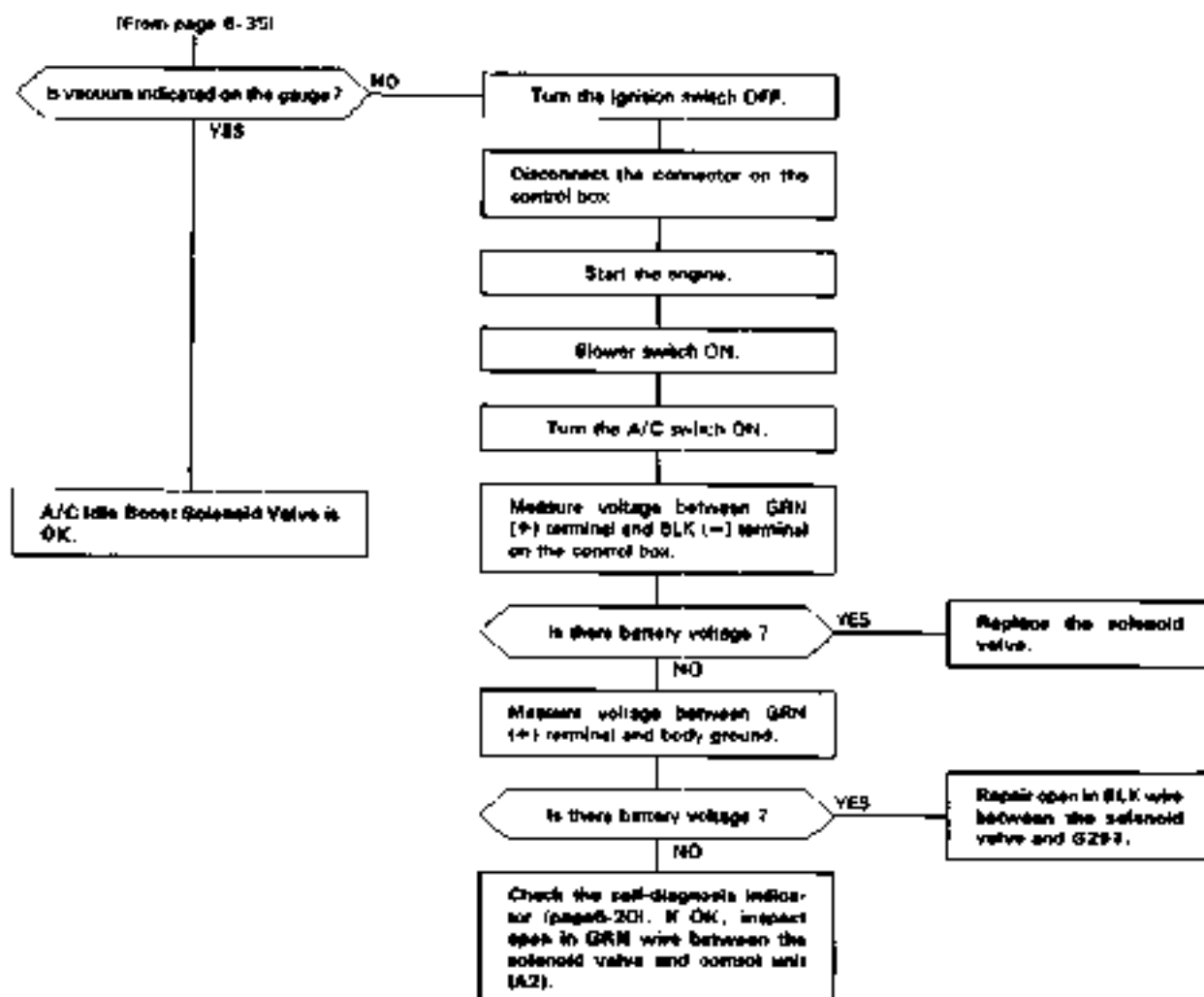
Check the self diagnosis indicator (page 6-20).  
If OK, check the input troubleshooting (page 6-20).

[To page 6-38]

[cont'd]

# Carburetor

## Idle Control System (cont'd)

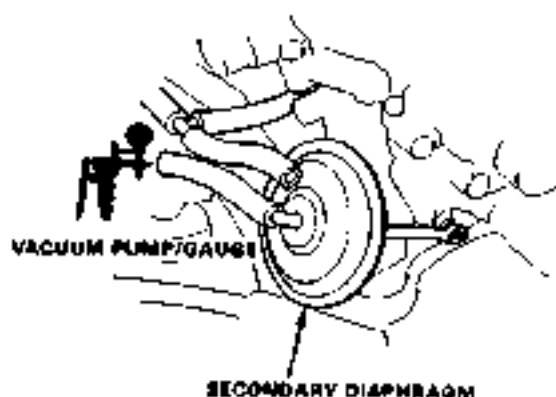




## Vacuum Controlled Secondary

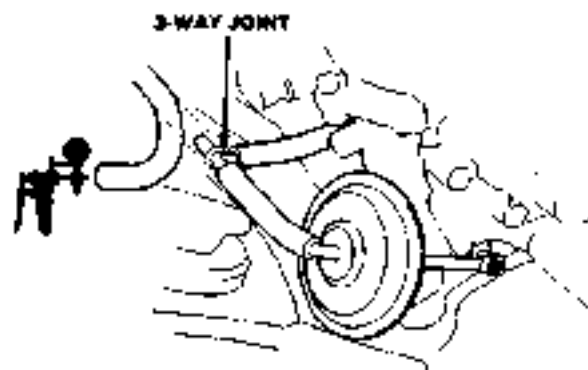
### Testing

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.

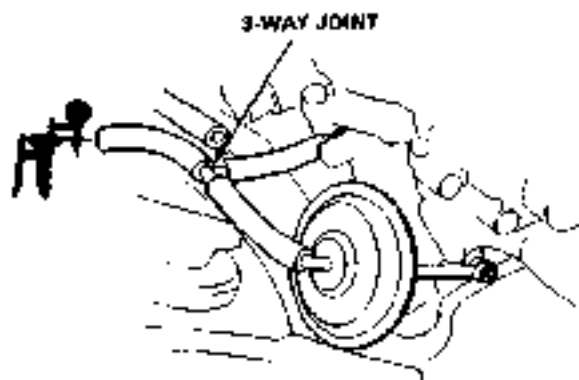


- ◆ If the vacuum does not hold or the rod does not move, first check the hose for proper connection and condition, then replace the diaphragm and recheck.

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  $\text{min}^{-1}$  (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  $\text{min}^{-1}$  (rpm). Then close the throttle suddenly.

[To page 6-39]

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 G291.

NO

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



# 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  $\text{min}^{-1}$  (rpm). Then close the throttle suddenly.

[To page 6-39]

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.

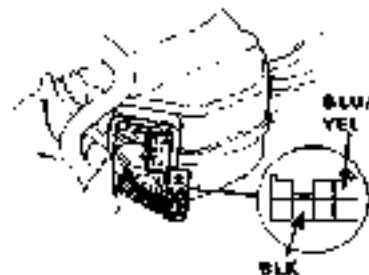
Is there battery voltage?

YES

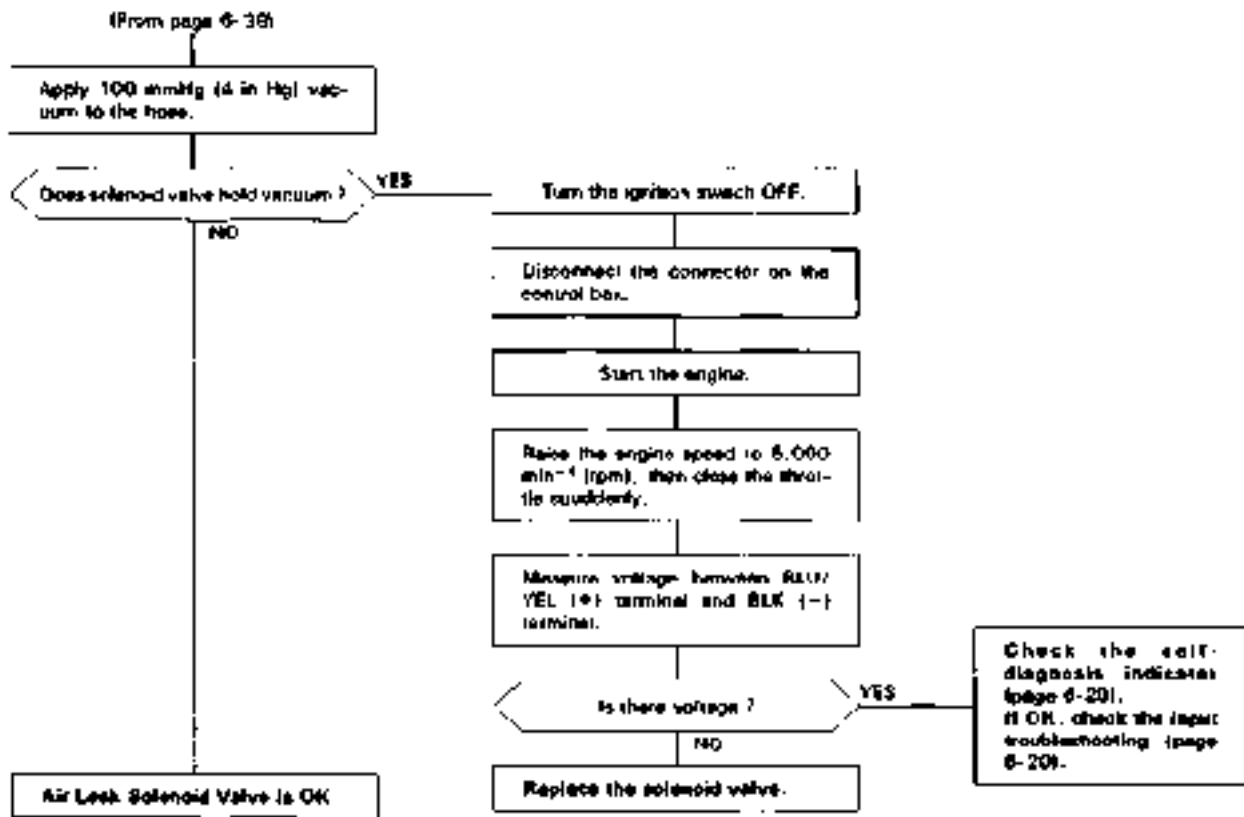
Repair open in BLK wire between the solenoid valve and G291.

NO

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







# 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 reset.

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 10 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

Inspection of Power Valve control Solenoid Valve.

Open the control box.

Disconnect the lower vacuum line of the antiroid valve from the joint and connect a vacuum pump.

Disconnect #14 vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum gauge.

Start engine.

Apply vacuum for about 3 seconds after the engine is started.

Is vacuum indicated on the gauge?

YES

NO

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

Turn the ignition switch OFF.

Disconnect the connector on the control box.

Start the engine.

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

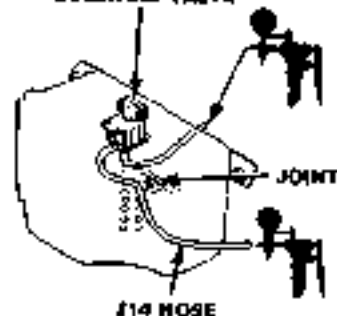
Is there voltage?

YES

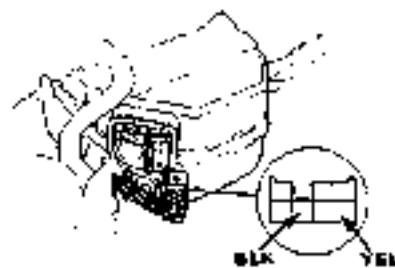
NO

Replace the solenoid valve.

POWER VALVE CONTROL SOLENOID VALVE



NOTE: The engine coolant temperature must be below 30°C (85°F).



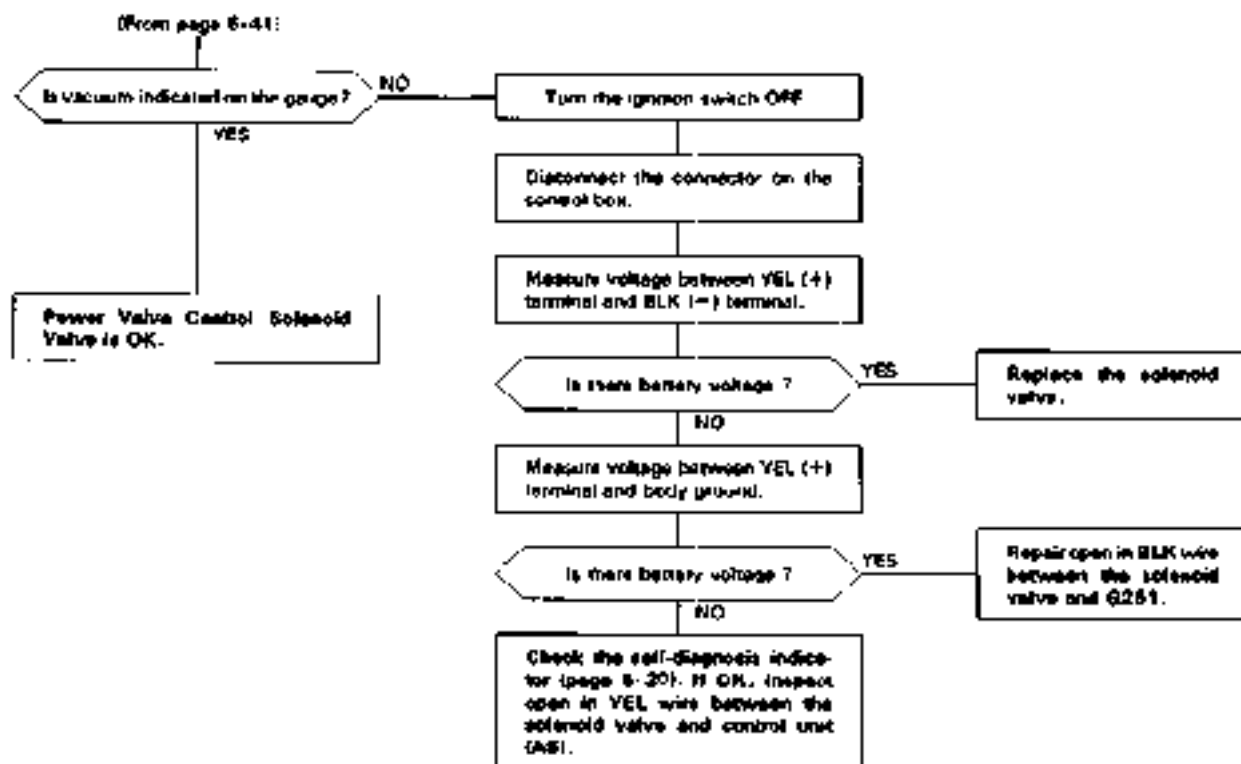
Check the self-diagnosis indicator (page 6-20). If OK, substitute a known-good control unit and retest. If symptom goes away, replace the original control unit.

(To page 6-42)

(cont'd)

# Carburetor

## Power Valve (cont'd)





## Idle Speed/Mixture

(K6, K6i)

Inspection/Adjustment

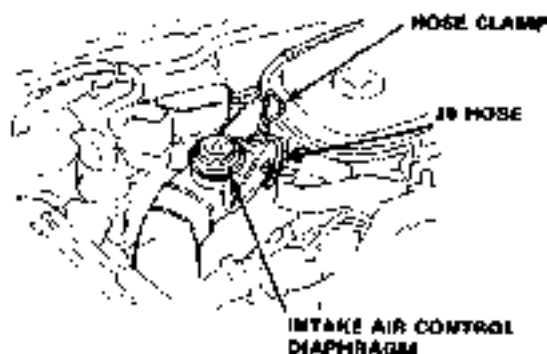
### Propane Enrichment Method

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

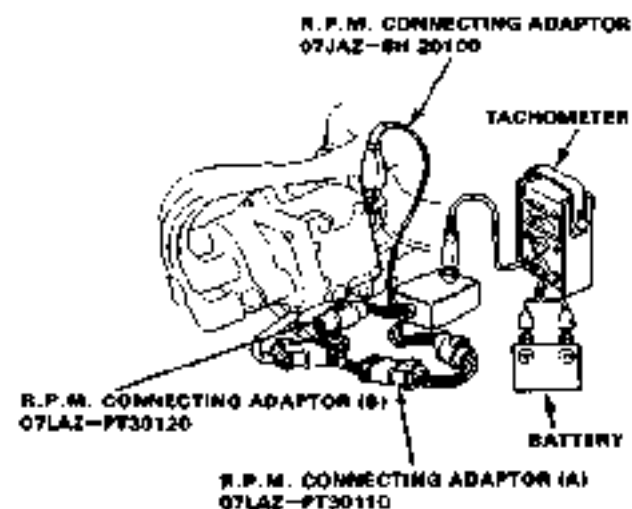
#### NOTE:

- This procedure requires a propane enrichment kit.
- Check that the self-diagnose 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.

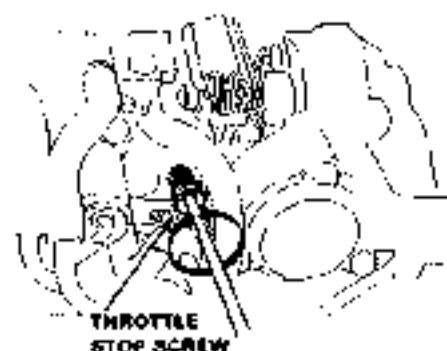


3. Connect a tachometer.



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:

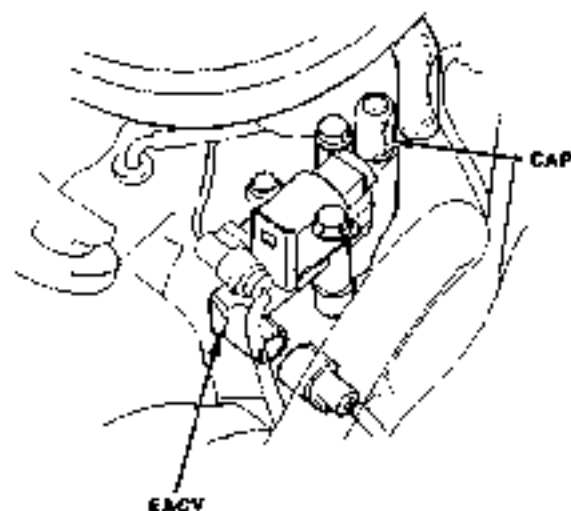
Manual	800 $\pm$ 50 $\text{min}^{-1}$ (rpm)
Automatic	750 $\pm$ 50 $\text{min}^{-1}$ (rpm) (w/ "D")



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 6-53).

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

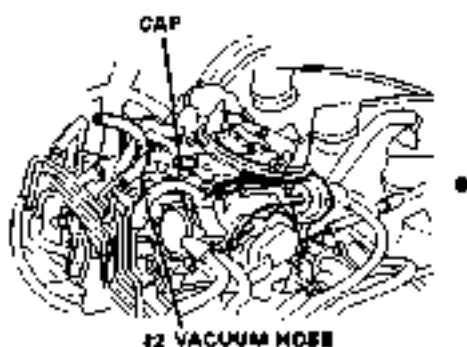


(cont'd)

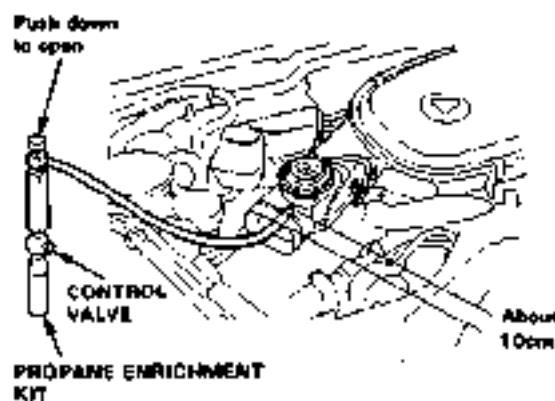
# Carburetor

## Idle Speed/Mixture (cont'd)

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

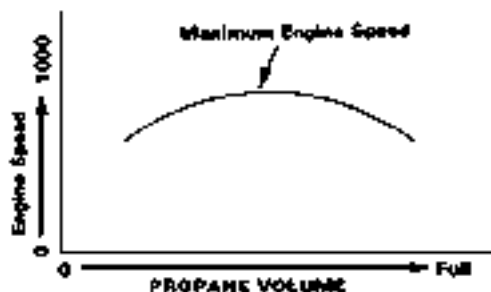


7. Disconnect air cleaner intake tube from air intake duct.
8. Insert the hose of the propane enrichment kit into the intake tube about 10 cm.  
NOTE: Check that propane bottle has adequate gas before beginning test.



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.

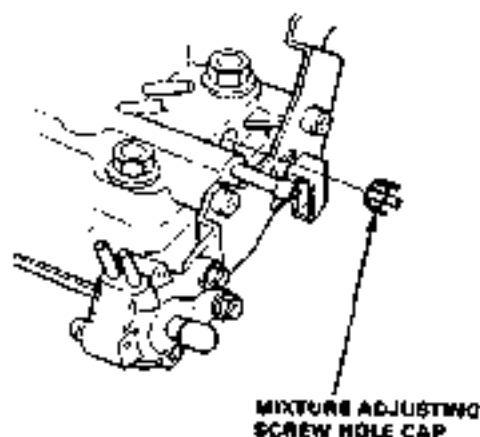
NOTE: Open the propane control valve slowly. a sudden burst of propane may stall the engine.



Engine speed increase should be:

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

- ◆ 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.





- Start engine and warm up to normal operating temperature, the cooling fan will come on.
- 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.

- 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:

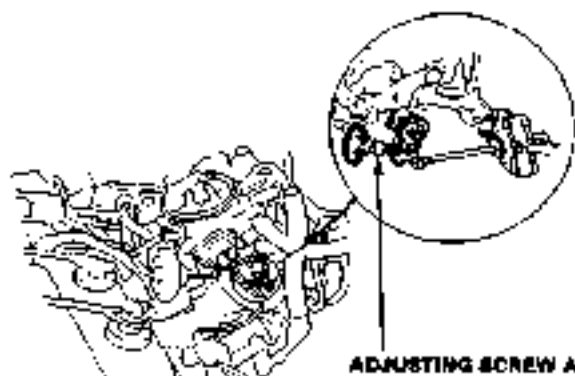
Manual	$800 \pm 50 \text{ min}^{-1}$ (rpm)
Automatic	$760 \pm 50 \text{ min}^{-1}$ (rpm) (in "D")

- 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.

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

Idle speed should be:

Manual	$650 \pm 50 \text{ min}^{-1}$ (rpm)
Automatic	$620 \pm 50 \text{ min}^{-1}$ (rpm) (in "D")

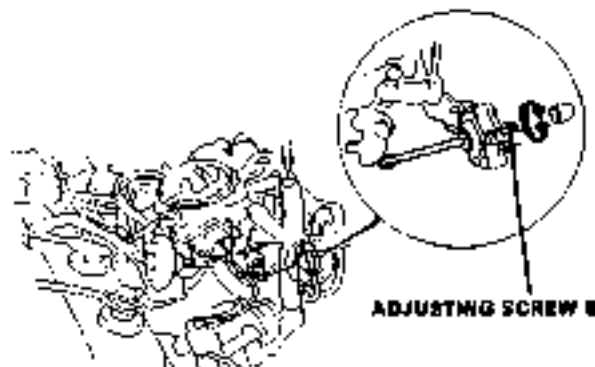


ADJUSTING SCREW A

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

- 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	$760 \pm 50 \text{ min}^{-1}$ (rpm) (in "D")



ADJUSTING SCREW B

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

(cont'd)

# Carburetor

## Idle Speed / Mixture (cont'd)

(Except K8, K6, K0)

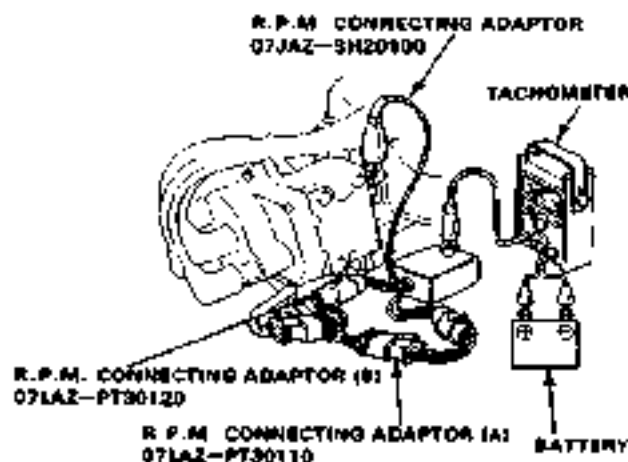
### CO Meter Method

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

#### NOTE:

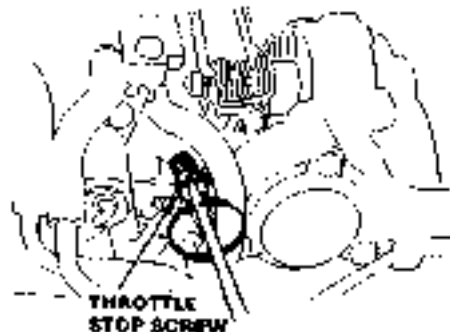
• Check that the self-diagnosis indicator (KX, KE with CATA) before making idle speed and mixture inspections.

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 2,500-3,000min<sup>-1</sup> (rpm) for 1 minute. Check idle speed with the headlight, heater blower, rear window defogger, cooling fan and air conditioner off (with DAY LIGHT headlights on). Idle speed should be:

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

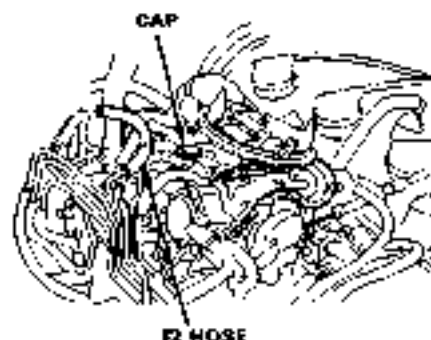
Except KX, KE with CATA: 1±1%

• If idle CO is as specified, go to step 14.

• If not, go to step 6 through 13.

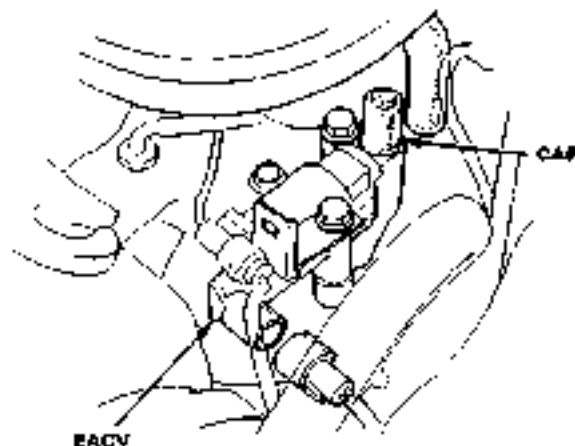
#### B KX

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<sub>2</sub> sensor.



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



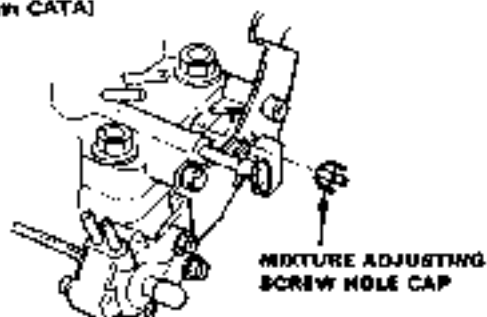
10. **KX:**  
Turn the ignition switch OFF. Restart the engine and hold engine at idle for 2 minutes. And hold engine at 2,500–3,000 min<sup>-1</sup> (rpm) for 1 minute. Check specification for idle CO.

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

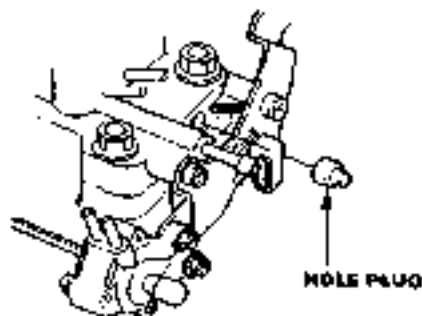
◀ If not, specification, go to step 11.

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%: 0.7%

- 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	600 ± 50 min <sup>-1</sup> (rpm)
Automatic	750 ± 50 min <sup>-1</sup> (nom) (in "D")

16997/01

# Carburetor

## Idle Speed/Mixture (cont'd)

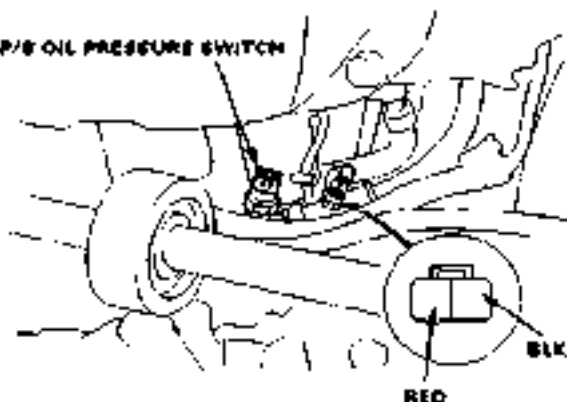
- If idle speed is as specified, go to step 15
- If idle speed is not as specified, adjust by turning throttle stop screw, then repeat step 5.

15. Reinstall the mixture adjusting screw hole cap.

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

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

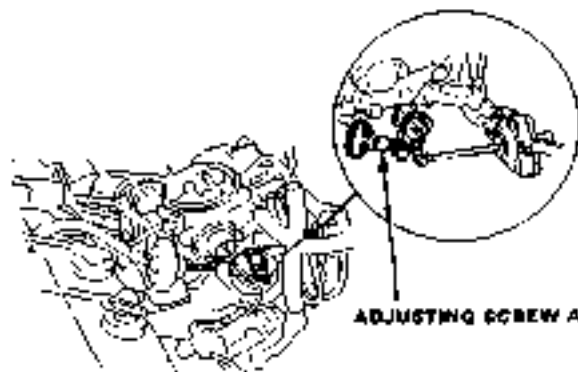
P/S OIL PRESSURE SWITCH



17. Check the idle speed.

Idle speed should be :

Manual	$860 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
Automatic	$920 \pm 50 \text{ min}^{-1} \text{ (rpm) (in "D")}$

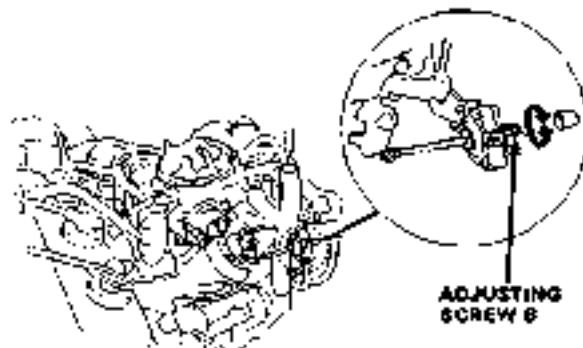


Adjust the idle speed, if necessary, by turning the adjusting screw A.

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 these 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	①		
	WHEN WARM	①	②	①	①		
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFICATION	①	①	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 OF 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.

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

1. **K5, K6.**  
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  $\text{min}^{-1}$  (rpm) for 1 minute.
5. Check with CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

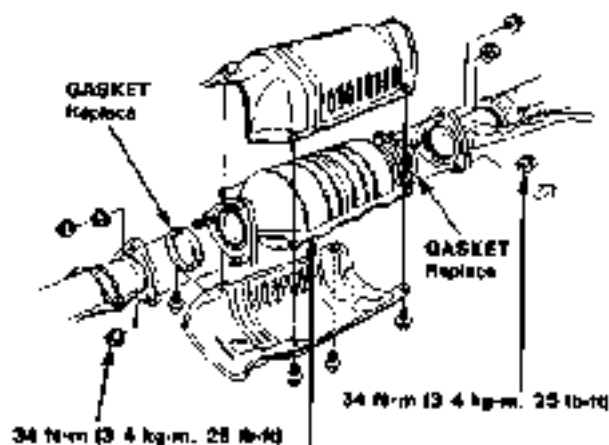
#### Specified CO %:

**KX, K6, K6, KE with CATA:** below 0.1%  
**Except KX, K5, K6, K6 with CATA:**  $1.0 \pm 1.0\%$

## 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 areas is damaged or plugged.



#### CATALYTIC CONVERTER

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

# Emission Control System

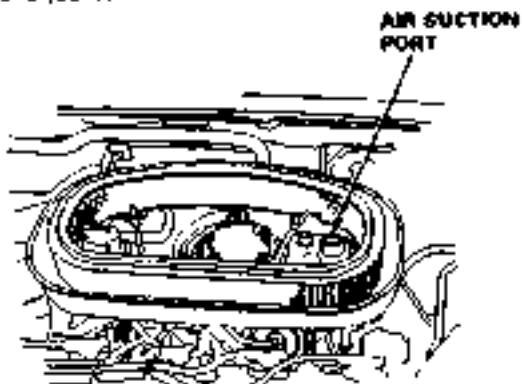
## Air Injection Control

### Testing

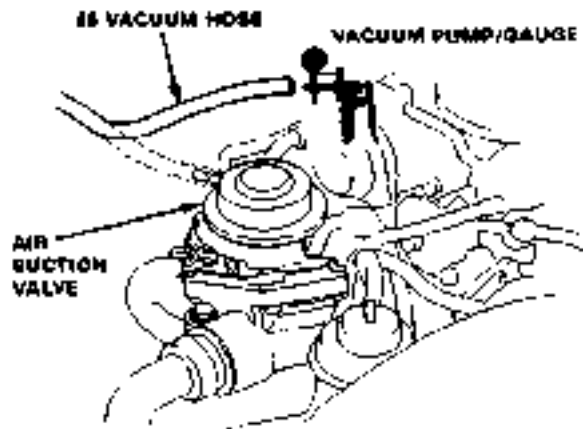
1. Start the engine.
2. Remove the air cleaner cover and filter.
3. Start the engine and check for a bubbling noise from the air suction port idle.

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 PS 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.

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

Start the engine.

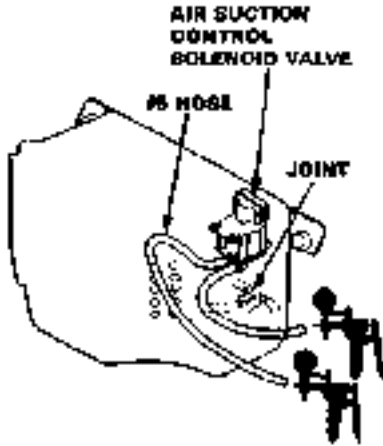
Measure voltage between LT GRN (+) and BLK (-) terminals.

Is there voltage?

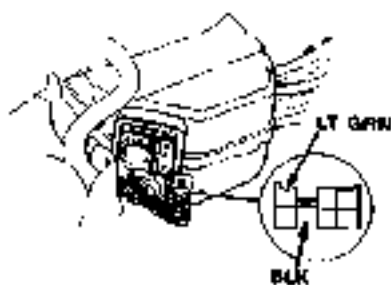
YES

Replace the solenoid valve.

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



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

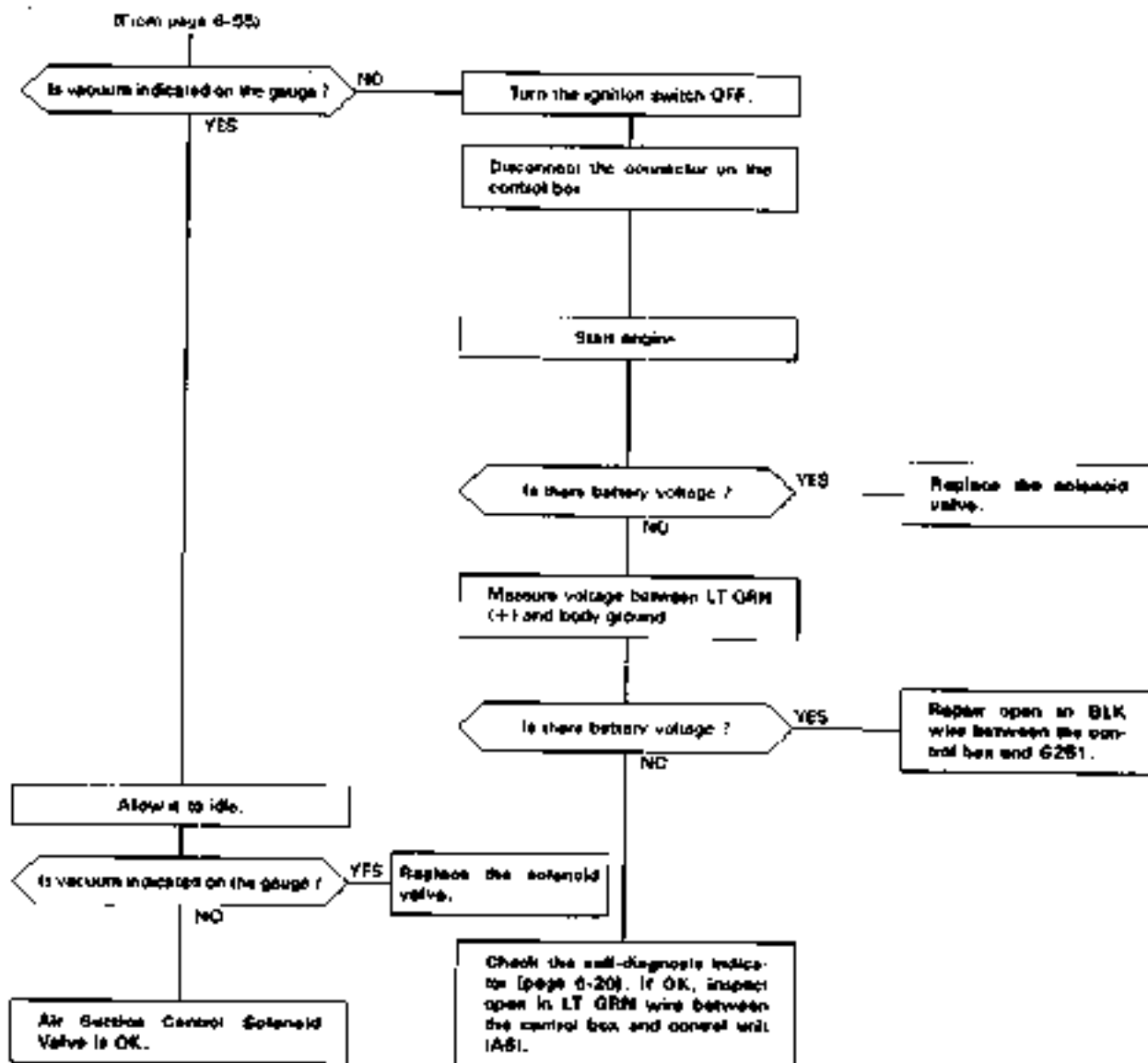


(To page 6-86)

(cont)

# Emission Control System

## Air Injection Control (cont'd)



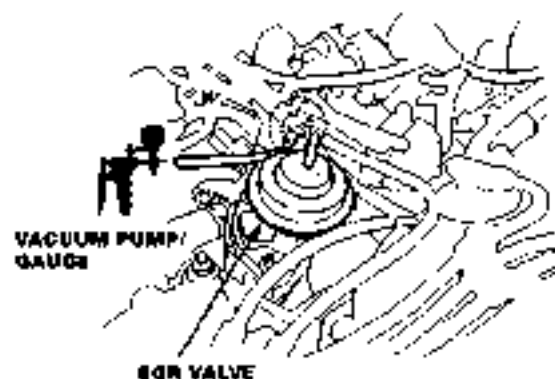


## EGR System

### Testing (COLD ENGINE)

**NOTE:** The engine coolant temperature must be below the thermovalve B set temperature (56°C, 131°F).

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



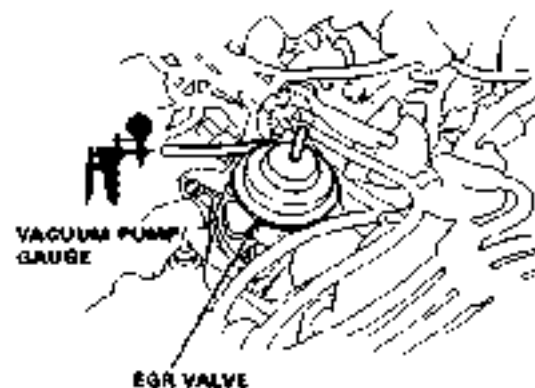
2. Start the engine and raise the engine speed to 3,000  $\text{min}^{-1}$  (rpm).

Vacuum should not be available.

- If vacuum is not available, go on to the hot engine inspection (right column).
- If vacuum is available, replace thermovalve 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.

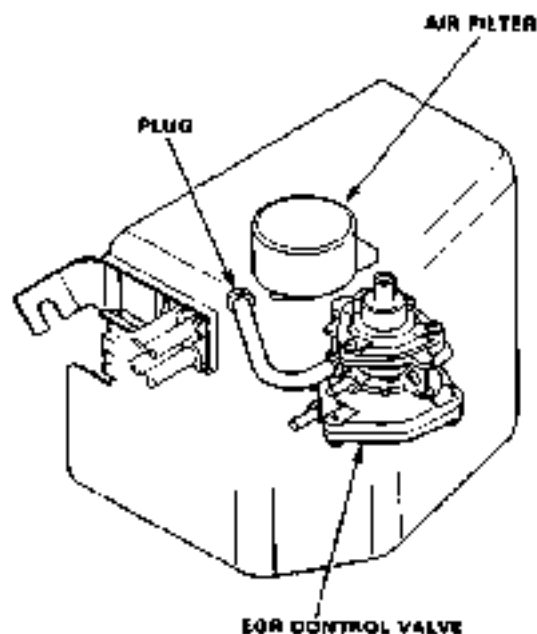
Vacuum should be as shown below:

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

16001/d1

# Emission Control System

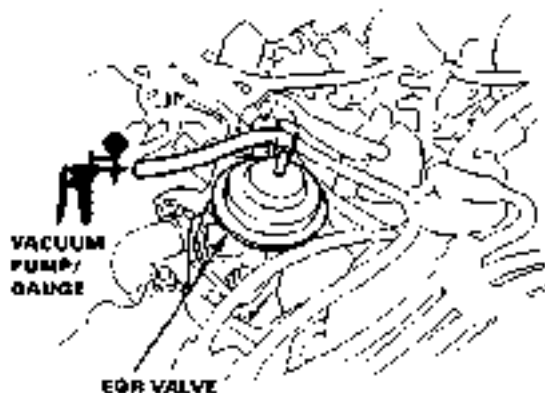
## EGR System (cont'd)



- 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 thermovalve 6 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 (5 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.

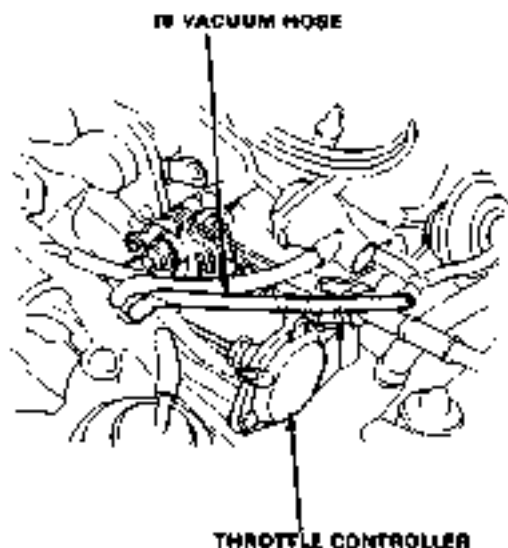


## Throttle Control System

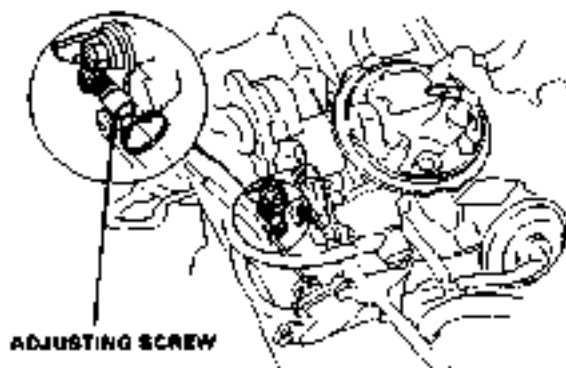
### Testing (HOT ENGINE)

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

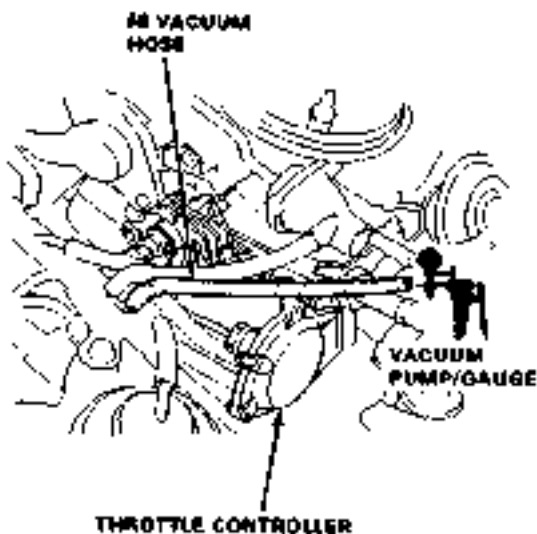


- If the engine speed is excessively high, adjust by turning the adjusting screw.



- 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, blockage 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 specifications (page 6-43)

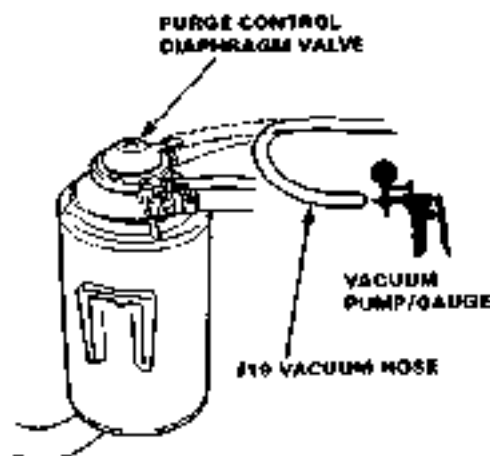
# Emission Control System

## Evaporative Emission Controls

### Testing (COLD ENGINE)

NOTE: Engine coolant temperature must be below 53 °C (125°F)

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



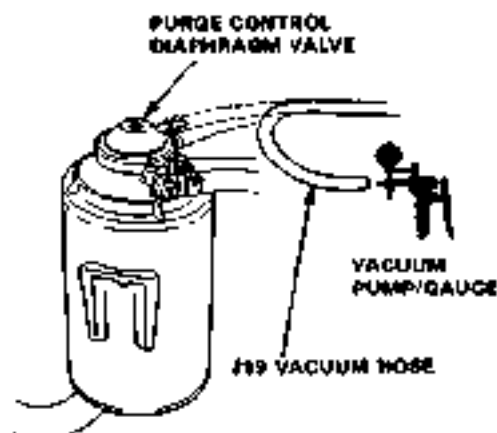
2. Start the engine and allow to idle.

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.

**CAUTION** 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).

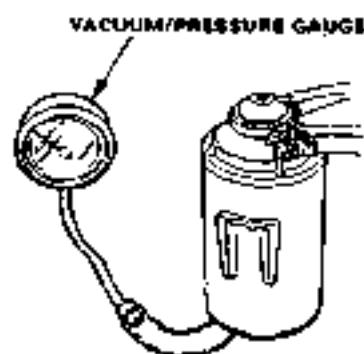
There should be vacuum.

- 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.

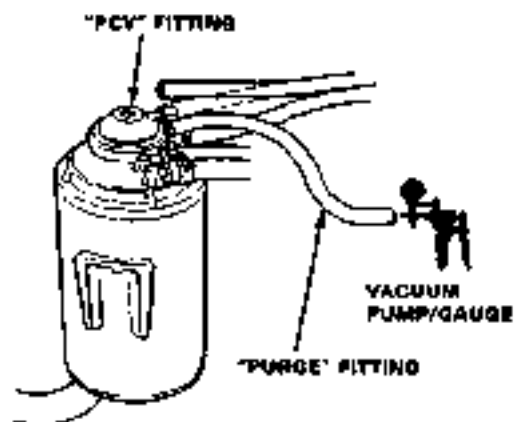
- If vacuum appears on the gauge in 1 minute, remove the gauge and go on to step 5.
- If no vacuum, disconnect the vacuum gauge and reinstall the fuel filter cap.

- 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.

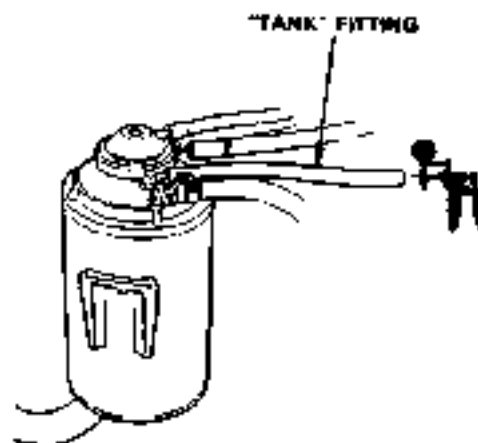
- Restart the engine. Reconnect the hose to the canister PCV fitting, and raise engine to 3,500  $\text{min}^{-1}$  (rpm) in 2nd gear or "2" range.

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 filter can 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 the IS 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.

Disconnect the connector on the control box

Start the engine

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

Is there battery voltage?

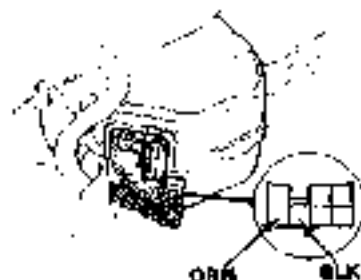
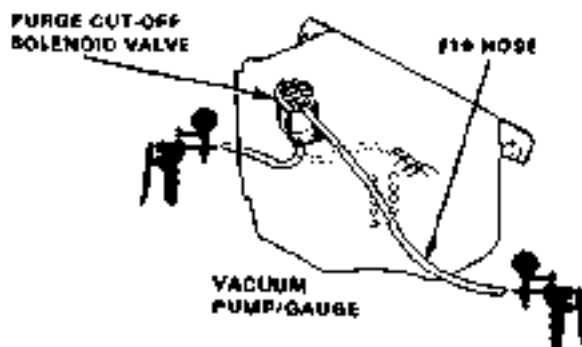
YES

Replace the solenoid valve.

NO

Measure voltage between ORN (+) and body ground.

(To page 6-63)



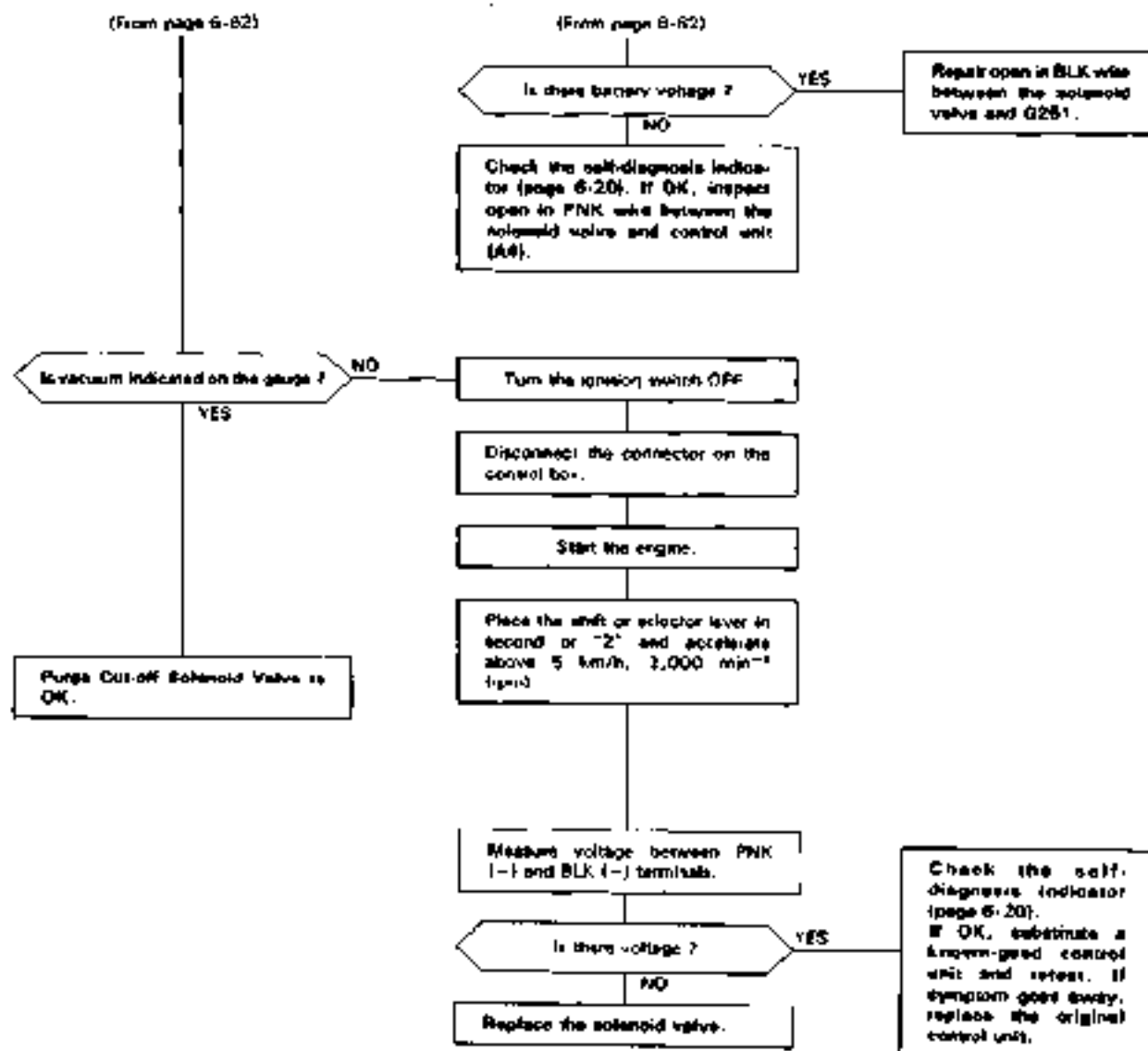
Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stand

Place the shift or selector lever in second or "2" and accelerate above 6 km/h, 2,000 min<sup>-1</sup> (rpm)

(To page 6-63)

 Block rear wheels before jacking up front of car.





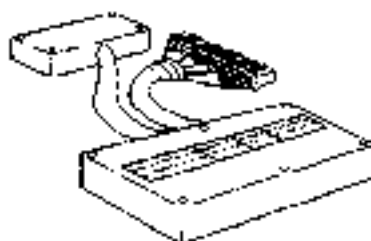
# Special Tools

## Special Tools

Ref. No.	Tool Number	Description	Qty	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	7	
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	07406-0040001	Fuel Pressure Gauge Set	1	
⑧-1	07406-0040100	Pressure Gauge	(1)	Component Tools
⑧-2	07406-0040201	Hose Assembly	(1)	
⑨	07411-0026000	Digital Circuit Tester	1	



①



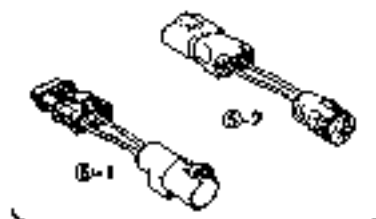
②



③



④



⑤



⑥



⑧-1



⑧-2



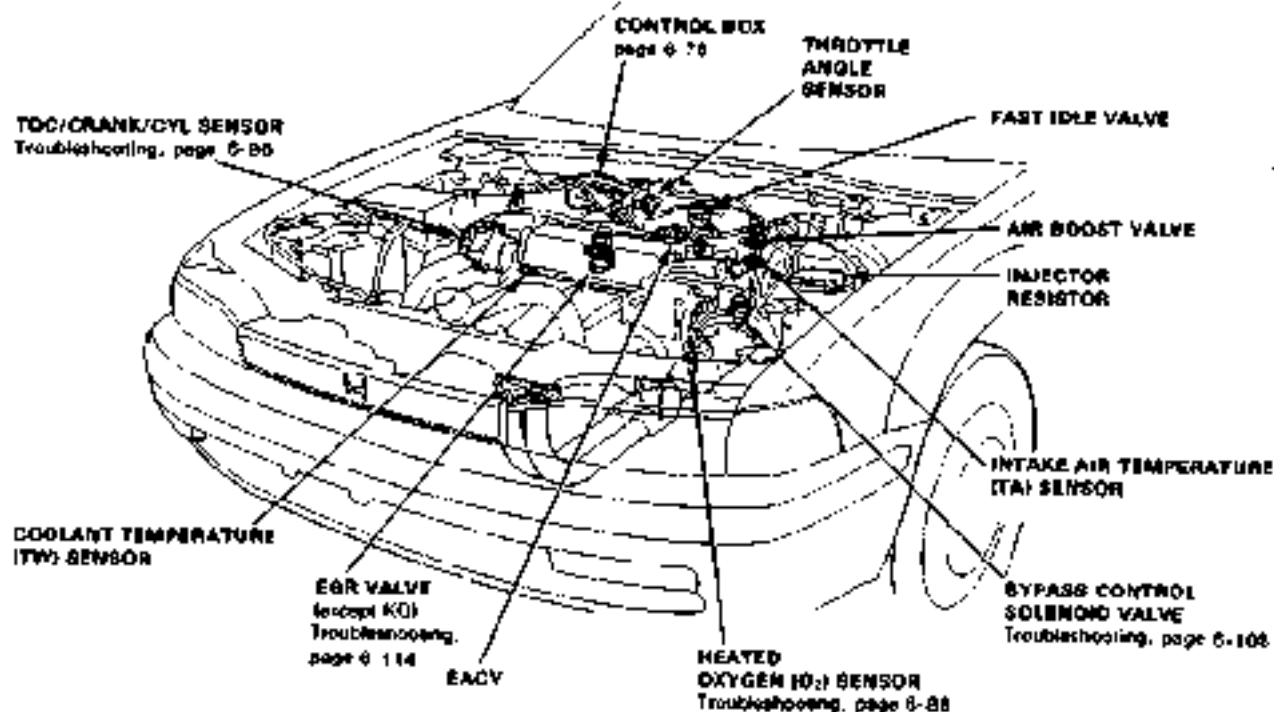
⑨

# Component Locations

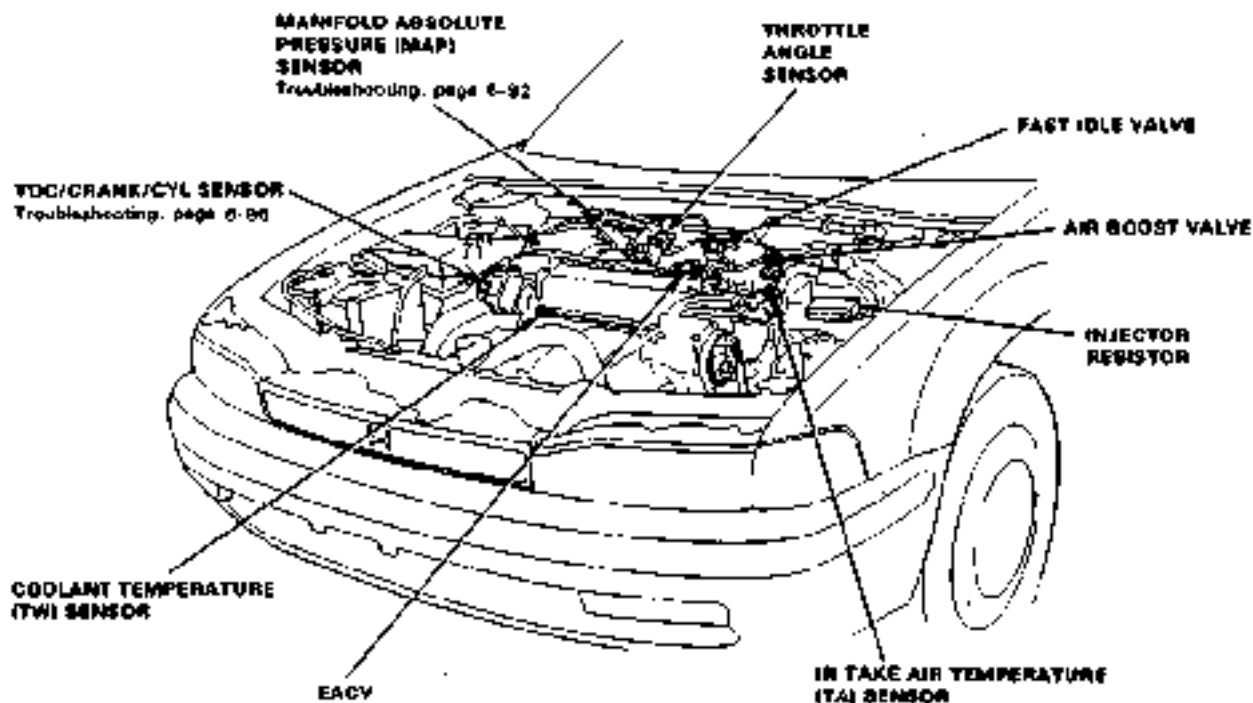


## Index

2.2 F except KY:



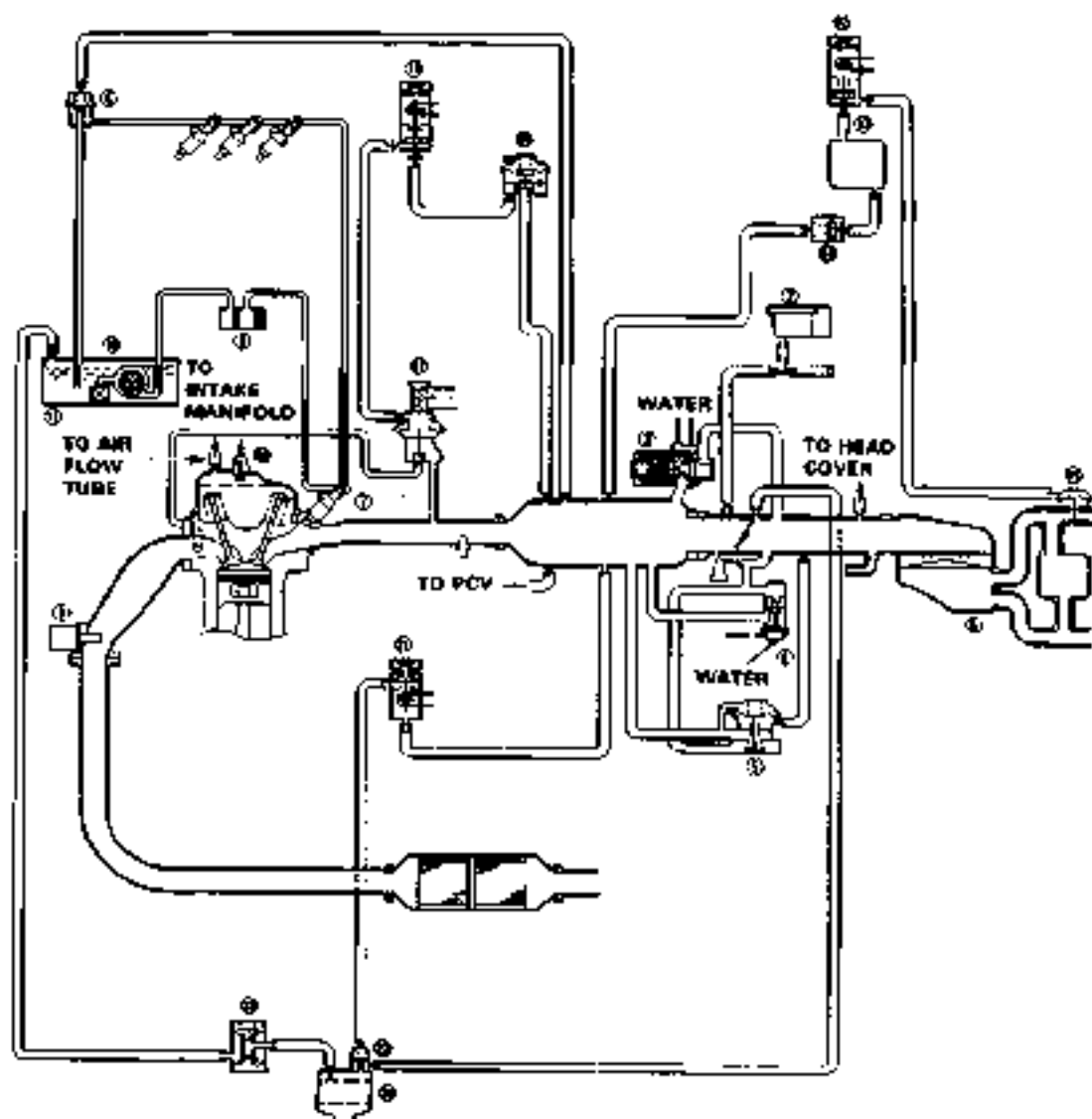
2.2 F KY:



# System Description

## Vacuum Connections

2.0l with CATS:



- 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 as 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
	SYMPTOM	—	B8, 90	B2	B6	—	—	—
	CHECK ENGINE WARNING LIGHT TURNS ON							
	CHECK ENGINE WARNING LIGHT BLINKS	① or ②	① or ②	① or ②	① or ②	①	①	①
	ENGINE WON'T START	③			①			
	DIFFICULT TO START ENGINE WHEN COLD	⑧U		③	②	①		③
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC	⑧U				③		
	ROUGH IDLE	⑧U		③				
	WHEN WARM IDLE SPEED TOO HIGH	⑧V						
	WHEN WARM IDLE SPEED TOO LOW	⑧V						
FREQUENT STALLING	WHILE WARMING UP	⑧V				③		
	AFTER WARMING UP	⑧V						③
POOR PERFORMANCE	BACKFIRE OR ROUGH RUNNING	⑧V			③			
	FAILS EMISSION TEST	⑧U	③	②				
	LOSS OF POWER	⑧U		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.

⑧U 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	A/MO. SPHERIC PRESSURE SENSOR
	SYMPTOM		42	86					
	CHECK ENGINE WARNING LIGHT TURNS ON	□ or □							
	CHECK ENGINE WARNING LIGHT BLINKS	② or ③	③ or ④	④ or ⑤ or ⑥	⑥	⑦	⑧	⑨	⑩
	ENGINE WON'T START	③		③					
	DIFFICULT TO START ENGINE WHEN COLD	⑧L	③	③	①				③
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC	⑧L			③				
	ROUGH IDLE	⑧L	③						
	WHEN WARM IDLE SPEED TOO HIGH	⑧L							
	WHEN WARM IDLE SPEED TOO LOW	⑧L							
FREQUENT STALLING	WHILE WARMING UP	⑧L			③				
	AFTER WARMING UP	⑧L							③
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	⑧L		③					
	FAILS EMISSION TEST	⑧L	②						
	LOSS OF POWER	⑧L	③			②			

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

⑧L: 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.



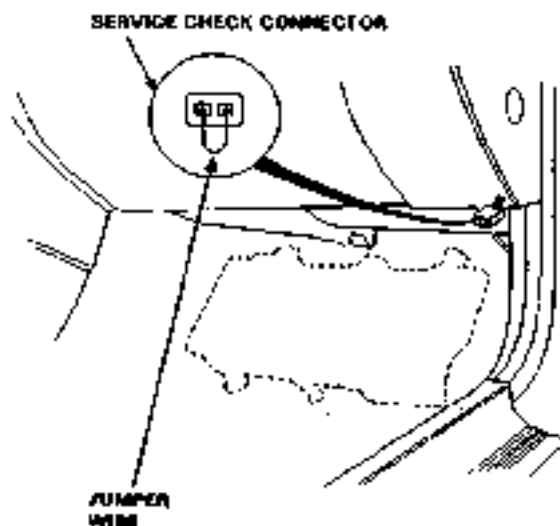
PGM-FI				IDLE CONTROL		FUEL SUPPLY	AIR INTAKE	EMISSION CONTROL
IGNITION OUTPUT SIGNAL	VEHICLE SPEED SENSOR	A/T F1 Signal A	A/T F1 Signal B	ELECTRONIC AIR CONTROL VALVE	OTHER IDLE CONTROLS			
—	—	—	—	—	—	103	107	112
①						②		
					②			
				①	②			
				①		②		
				①	②			
				①		②		
				①	②	③		
				③	①	②		
				③		①		
						③		①
						①	③	④

# Troubleshooting

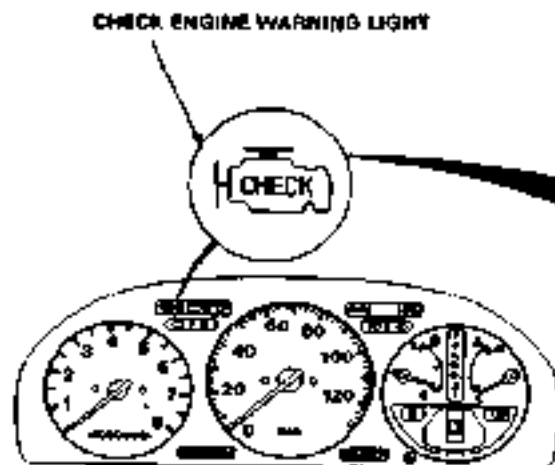
## Self-diagnostic Procedures

1. 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 49 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

- See Problem CODE 1
- See Problem CODE 3
- See Problem CODE 13

#### Long short

### Simultaneous Problems:

- See Problem CODE 1 and 3
- See Problem CODE 3 and 4
- See Problem CODE 3 and 14

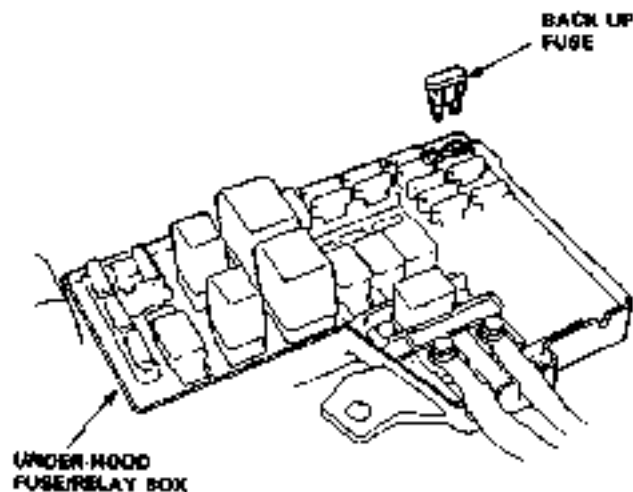




### II. ECU Reset Procedure

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.

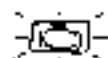
2. Do the ECU Reset Procedure.
3. Set the radio preset stations and the clock setting.

# PGM-FI Control System

## Troubleshooting Flowchart — Oxygen Sensor



Self-diagnose 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.

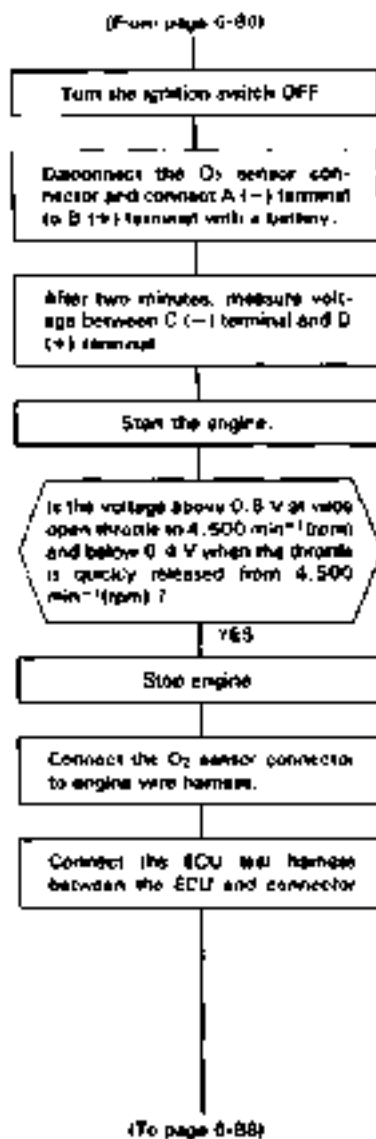
Is Check Engine warning light on and does it indicate CODE 1?

NO

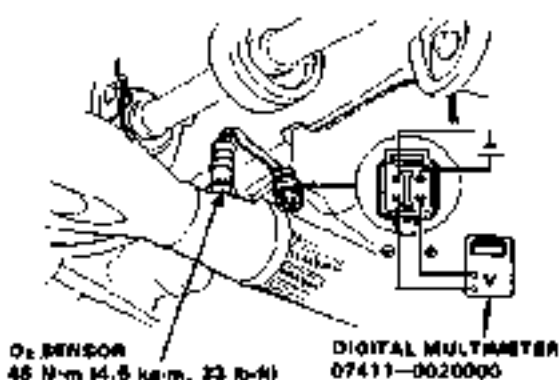
Intermittent failure, system is OK at this time. Check for poor connections or loose wires.

YES

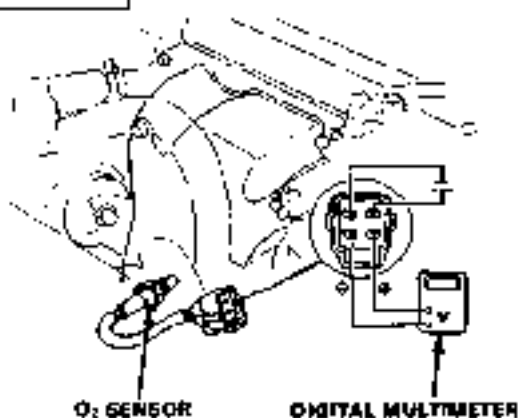
(To page 6-87)



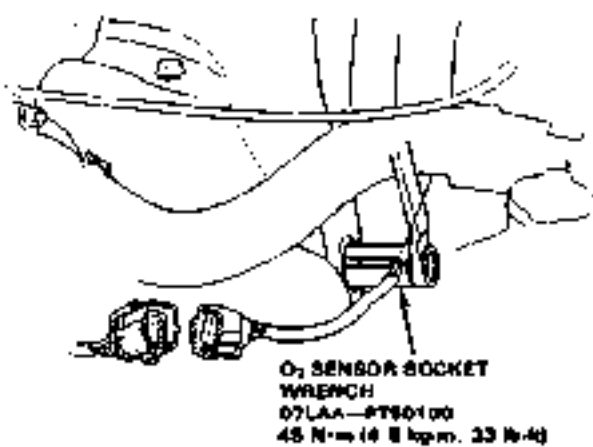
2.21:



2.07:



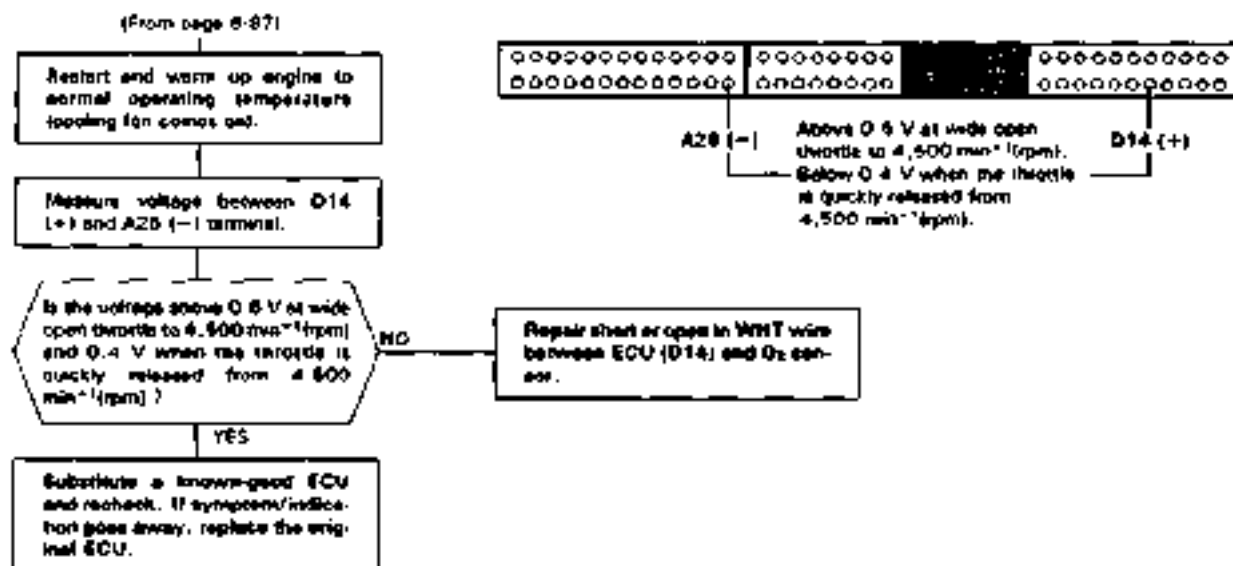
2.04:



(cont'd)

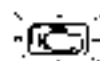
# PGM-FI Control System

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



# PGM-FI Control System

## Troubleshooting Flowchart — Oxygen Sensor Heater



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



2.24 :

— Engine is running.  
— Check Engine warning light has been repositioned on, with service check connector jumped (page 6-94), 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.

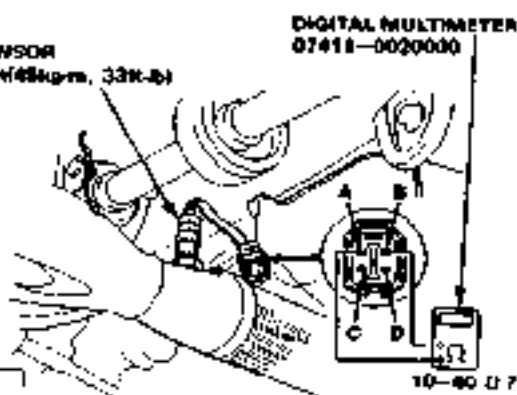
Does continuity exist ?

YES

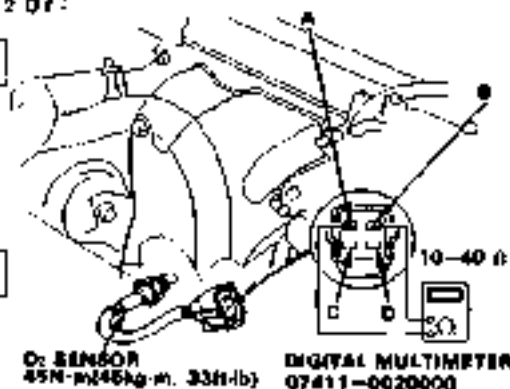
Replace O<sub>2</sub> sensor

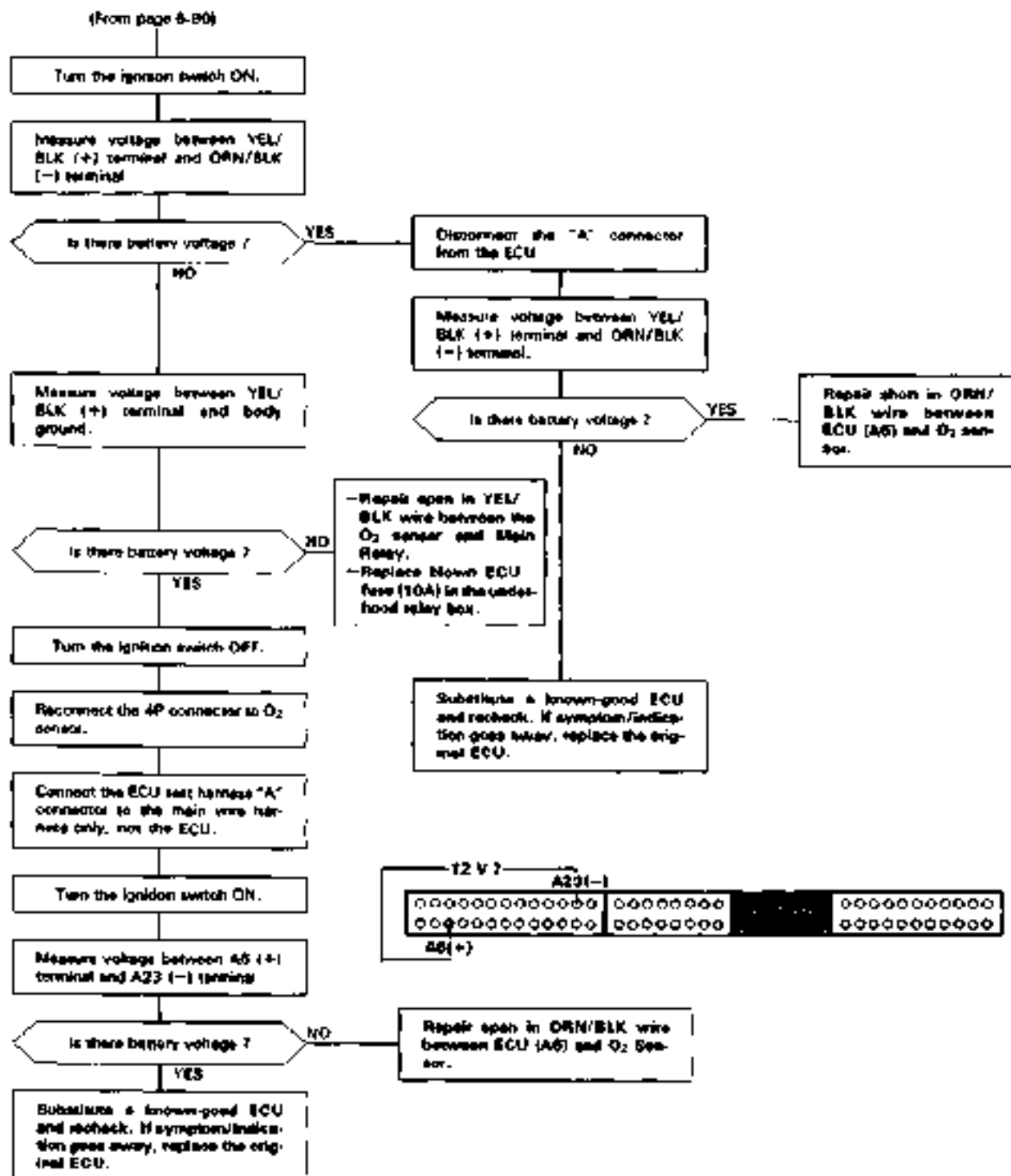
NO

(To page 6-91)



2 Or :



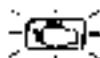


# PGM-FI Control System

## 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 6-24). 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?

YES

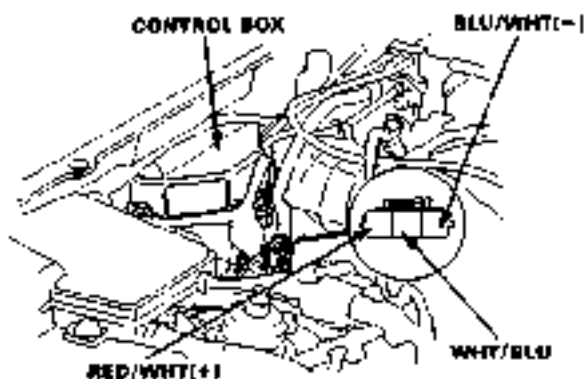
Turn the ignition switch OFF.

Disconnect the 3P connector from the MAP sensor.

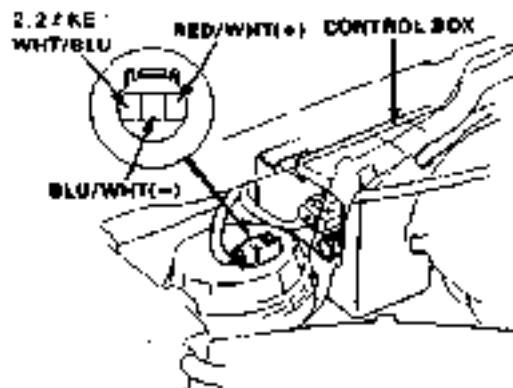
Turn the ignition switch ON

(To page 6-93)

2 0: WITH CATA AND  
2 2: EXCEPT KE, KO, KY:

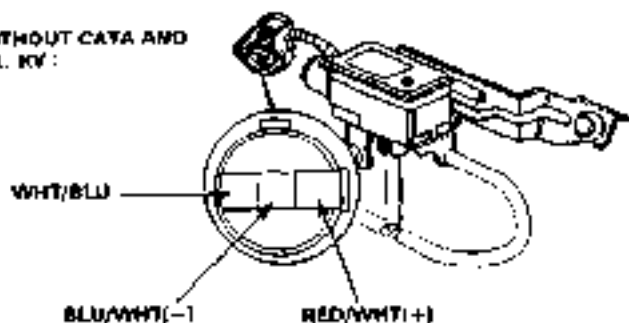


(Insufficient failure, system is OK at this time (test drive may be necessary). Check for poor connection or loose wires at MAP sensor connector and ECU.





2.0 l WITHOUT CATS AND  
2.2 l K0. KV :



(From page 6-92)

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

Is there approx. 5 V ?

YES

Repair open in RED/WHT wire  
between ECU (D18) 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.

NO

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-good 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 OFF.

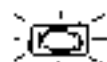
(To page 6-94)

(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 6-34). 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.

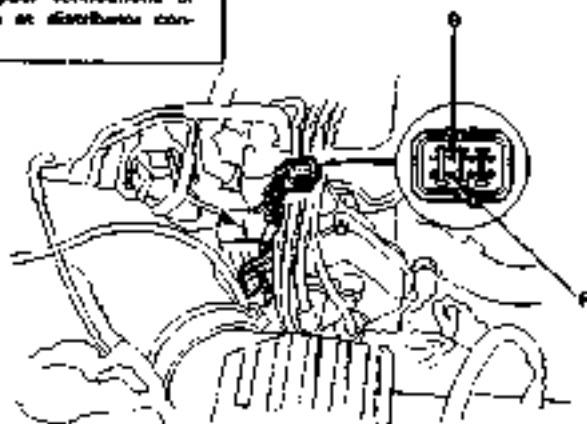
Is there 260-500  $\Omega$ ?

NO

Replace the distributor assembly (section 14).

YES

(To page 6-97)





[From page 6-98]

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

Does continuity exist?

YES

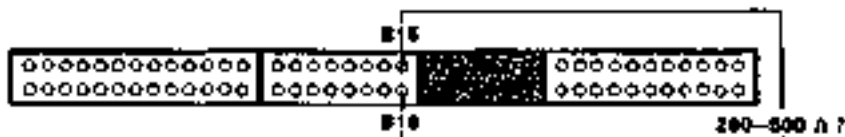
Replace the distributor assembly (section 16)

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 200-500  $\Omega$ ?

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 (B16) and distributor connector.

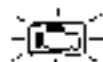
NO

Substitute a known good ECU and recheck. If symptoms/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 B 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 B?

YES

Stop engine.

Disconnect the BP connector from the TDC/CRANK/CYL sensor.

Measure resistance between C terminal and G terminal.

Is there 200–500 Ω?

YES

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

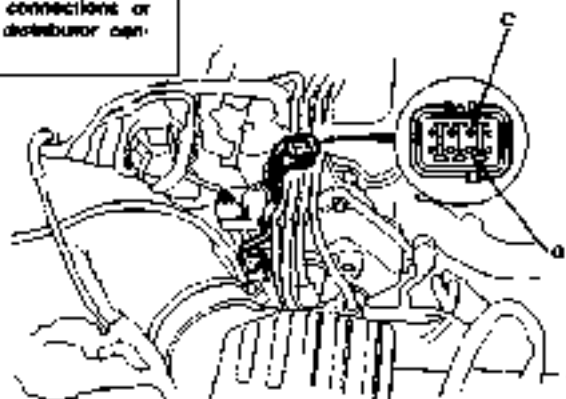
Does continuity exist?

NO

Reconnect the connector.

(To page 6-89)

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



Replace the distributor assembly (section 16).

Replace the distributor assembly (section 16).



(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  $\Omega$  ?

NO

YES

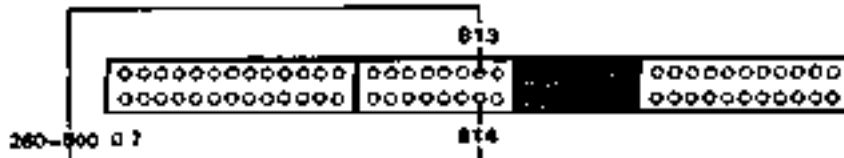
Check for continuity to body ground on B13 terminal.

Does continuity exist ?

YES

NO

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



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

Repair short in ORN/BLU wire between ECU (6-10) and distributor connector.

(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 280-500  $\Omega$  ?

NO

Replace the distributor assembly (section 10).

YES

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

Does continuity exist ?

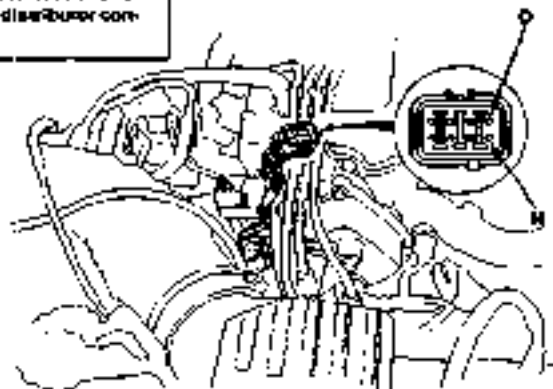
YES

Replace the distributor assembly (section 10).

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 200-500  $\Omega$ ?

NO

YES

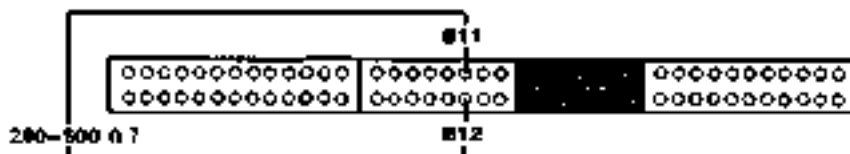
Check for continuity to body ground on B11 terminal

Does continuity exist?

YES

NO

Substitute a known-good ECU and recheck. If symptoms/indicators now go away, replace the original ECU.



Repair open in ORN and/or WHT wires.

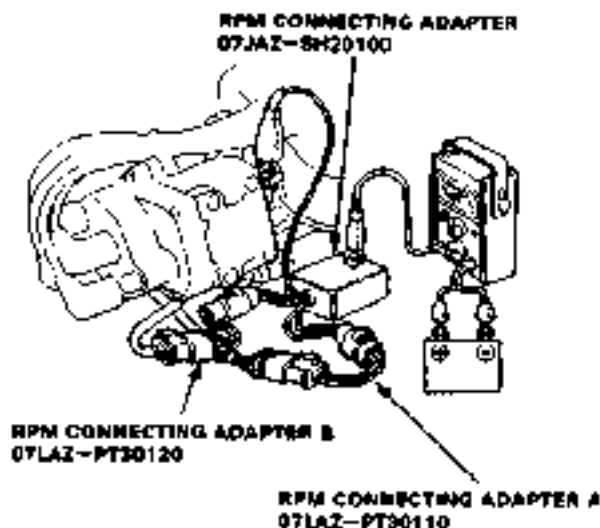
Repair short in ORN wire between ECU B11 and distributor connector.

# Idle Control System

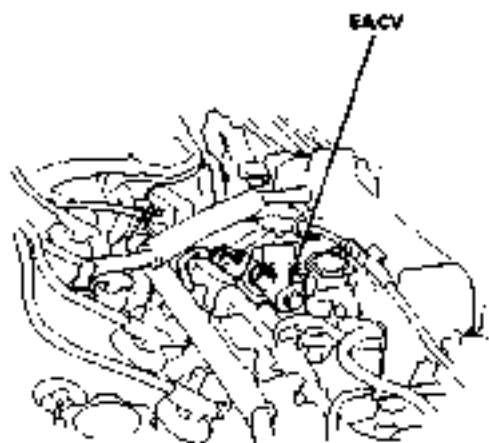
## Idle Speed Setting

### 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.

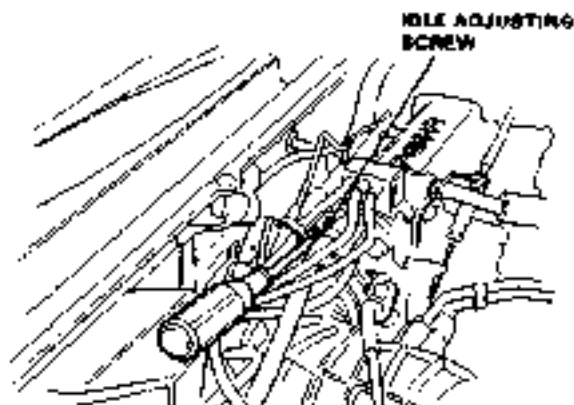


4. Check idling in no-load conditions in which the headlights, blower fan, rear defogger, cooling fan, and air conditioner are not operating.

Idle speed should be:

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

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	$770 \pm 50 \text{ min}^{-1}$ (rpm)
Automatic	$770 \pm 50 \text{ min}^{-1}$ (rpm) (H) or (L)

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

Idle speed should be:

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

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	$770 \pm 50 \text{ min}^{-1}$ (rpm)
Automatic	$770 \pm 50 \text{ min}^{-1}$ (rpm) (H) or (L)

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
					105	108			*
SYMP TOM									
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		①	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

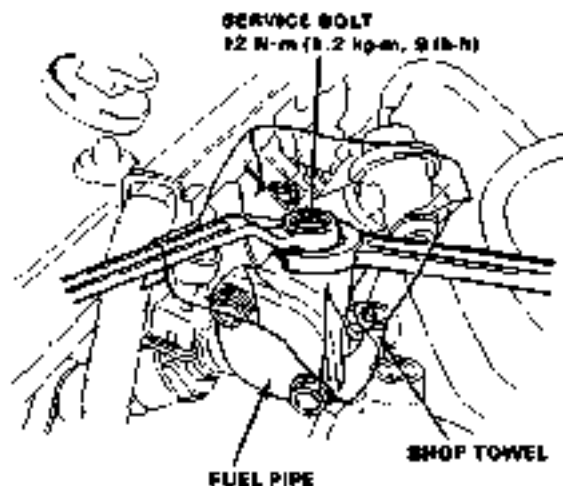
## Fuel Pressure

### Relieving

- 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.

- Remove fuel filter cap.
- Disconnect the battery negative cable from the battery negative terminal.
- Use a box end wrench on the 6 mm service bolt at the fuel pipe, while holding the special banjo bolt with another wrench.
- Place a rag or shop towel over the 6 mm service bolt.
- 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

- Relieve fuel pressure.
- Remove the service bolt on the fuel pipe while holding the banjo bolt with another wrench and attach the fuel pressure gauge.
- 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)

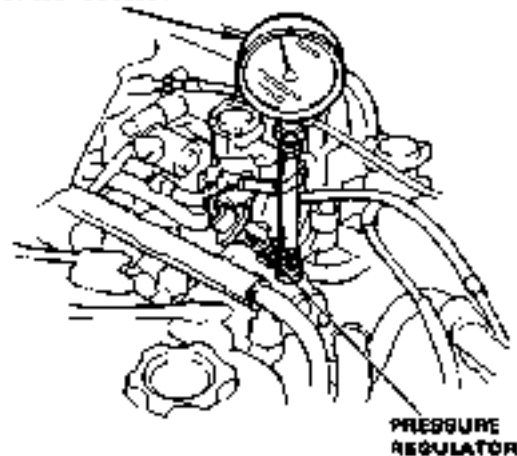
- Reconnect vacuum hose to the pressure regulator.

#### 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)

190–245 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

**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).

Pressures should be:

(2.2 l : KS, KL, KG, KE, KF, KY, 2.0 l)

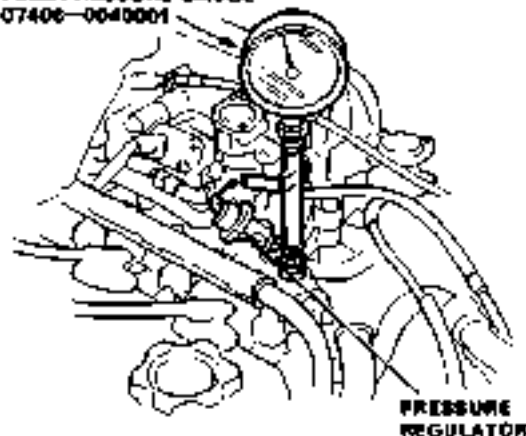
236–284 kPa (2.4–2.9 kg/cm<sup>2</sup>, 34–41 psi)

(KQ)

285–314 kPa (2.7–3.2 kg/cm<sup>2</sup>, 39–46 psi)

(with the regulator vacuum hose disconnected)

FUEL PRESSURE GAUGE  
07406-0040001

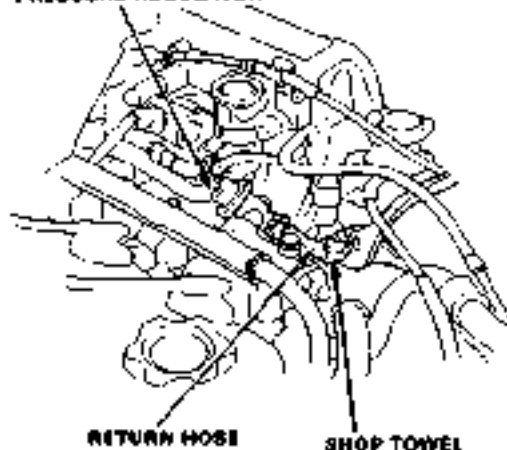


2. Reconnect the vacuum hose to the pressure regulator.
3. Check that the fuel pressure rises when the vacuum hose from the regulator is disconnected again.

● If the fuel pressure did not rise, check to see if it rises with the fuel return hose lightly pinched.

● If the fuel pressure still does not rise, replace the pressure regulator.

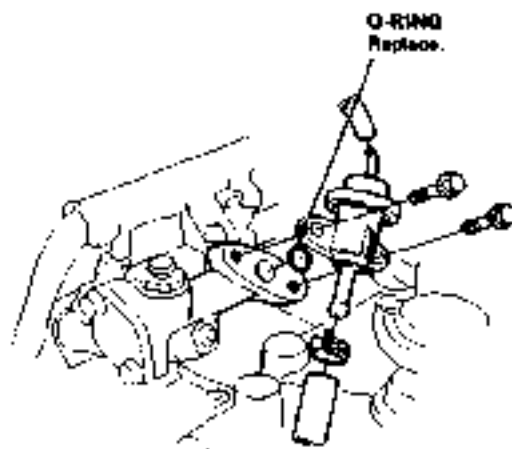
PRESSURE REGULATOR



### Replacement

**Do not smoke while working on fuel system. Keep open flame away 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 torx 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

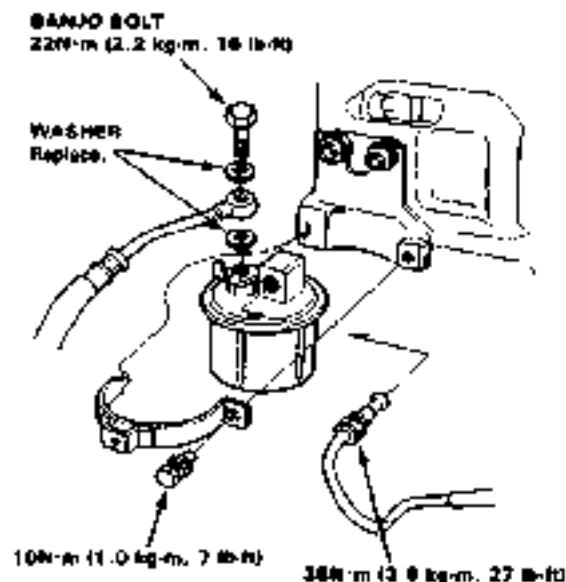
## Fuel Filter

### Replacement

**CAUTION:** 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, 2.4-2.8 kg/cm<sup>2</sup>, 34-41 psi (Except KO) (KO:266-314 kPa (2.7-3.2 kg/cm<sup>2</sup>, 38-45 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.

### 2.07 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

### 2.24 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	①	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

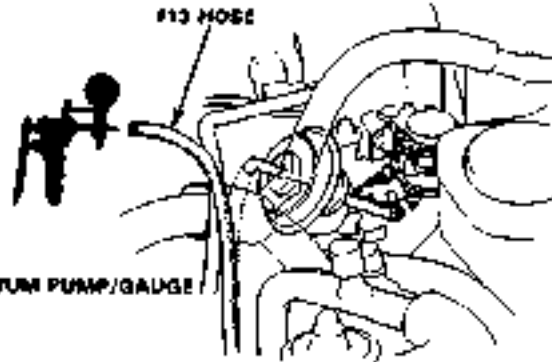
Remove #13 vacuum hose from the bypass control diaphragm and connect vacuum gauge to this hose

Is there vacuum?

YES

(To page 6-109)

VACUUM PUMP/GAUGE



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

Is there vacuum?

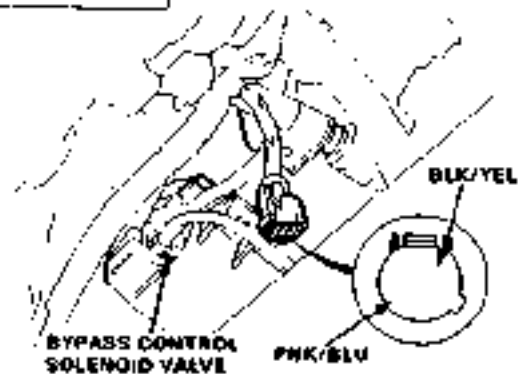
NO

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

YES

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

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



Is there battery voltage?

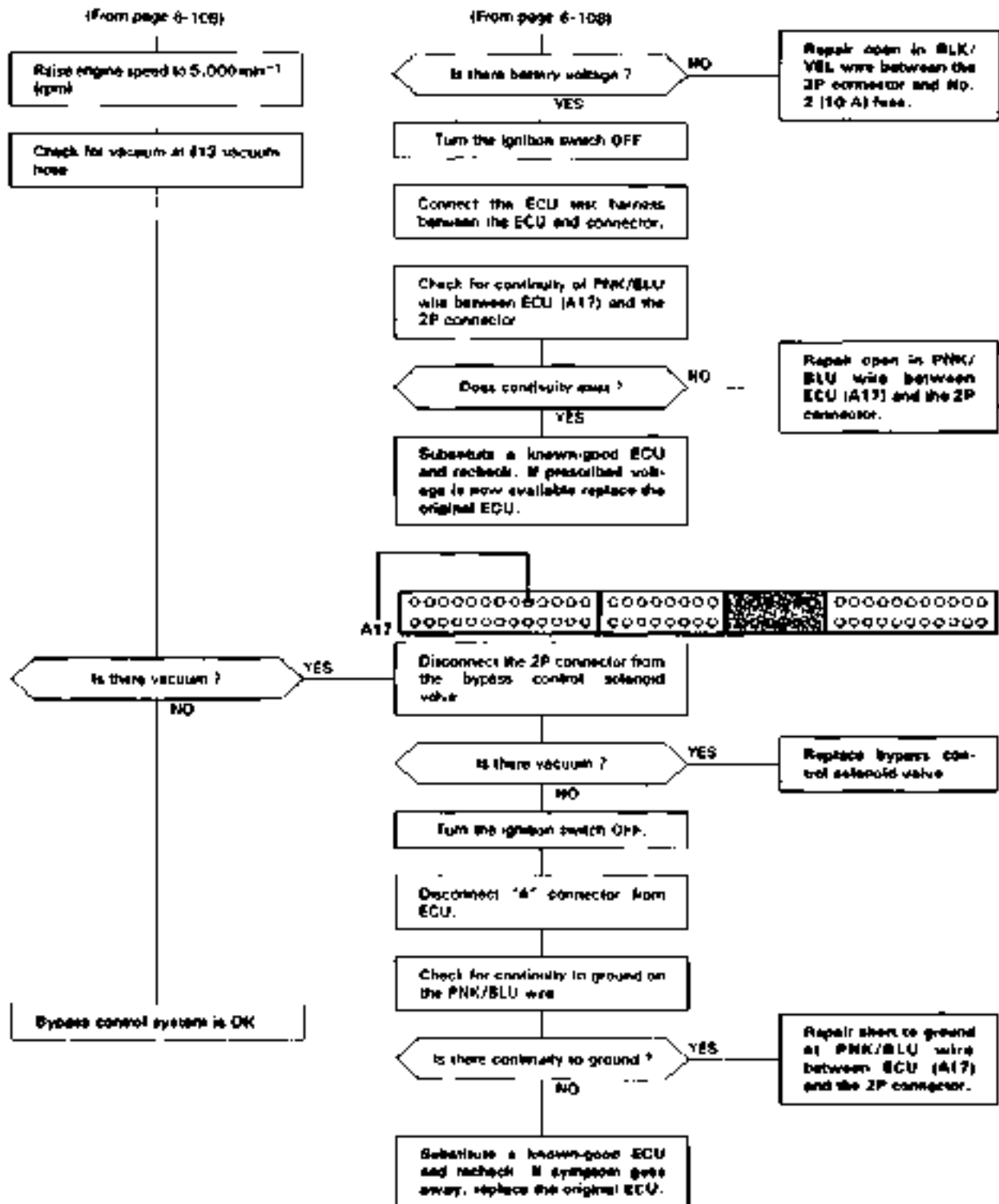
YES

Replace the bypass control solenoid valve.

NO

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

(To page 6-109)



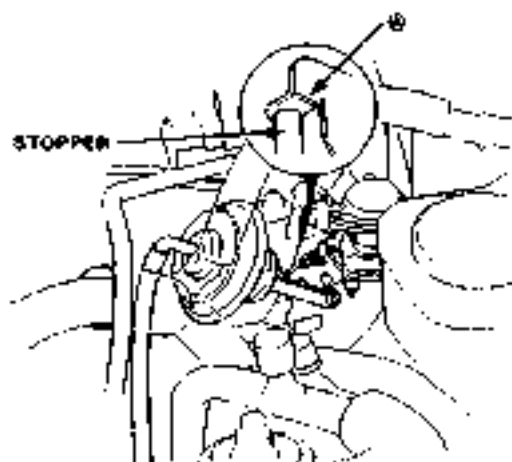
# Air Intake System

## Bypass Valve (2.2 l Except KY)

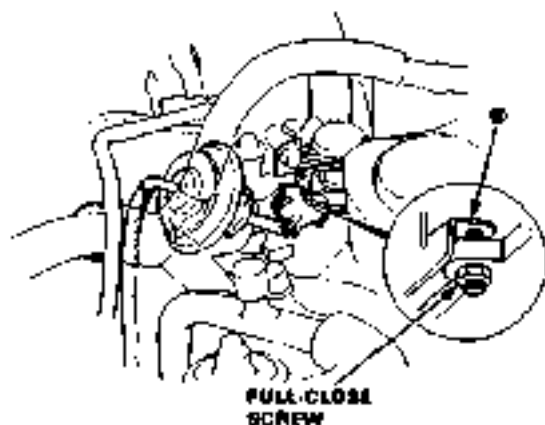
### Testing

**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 (A) of the bypass valve is in close contact with the stopper when the bypass valve is fully open.



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



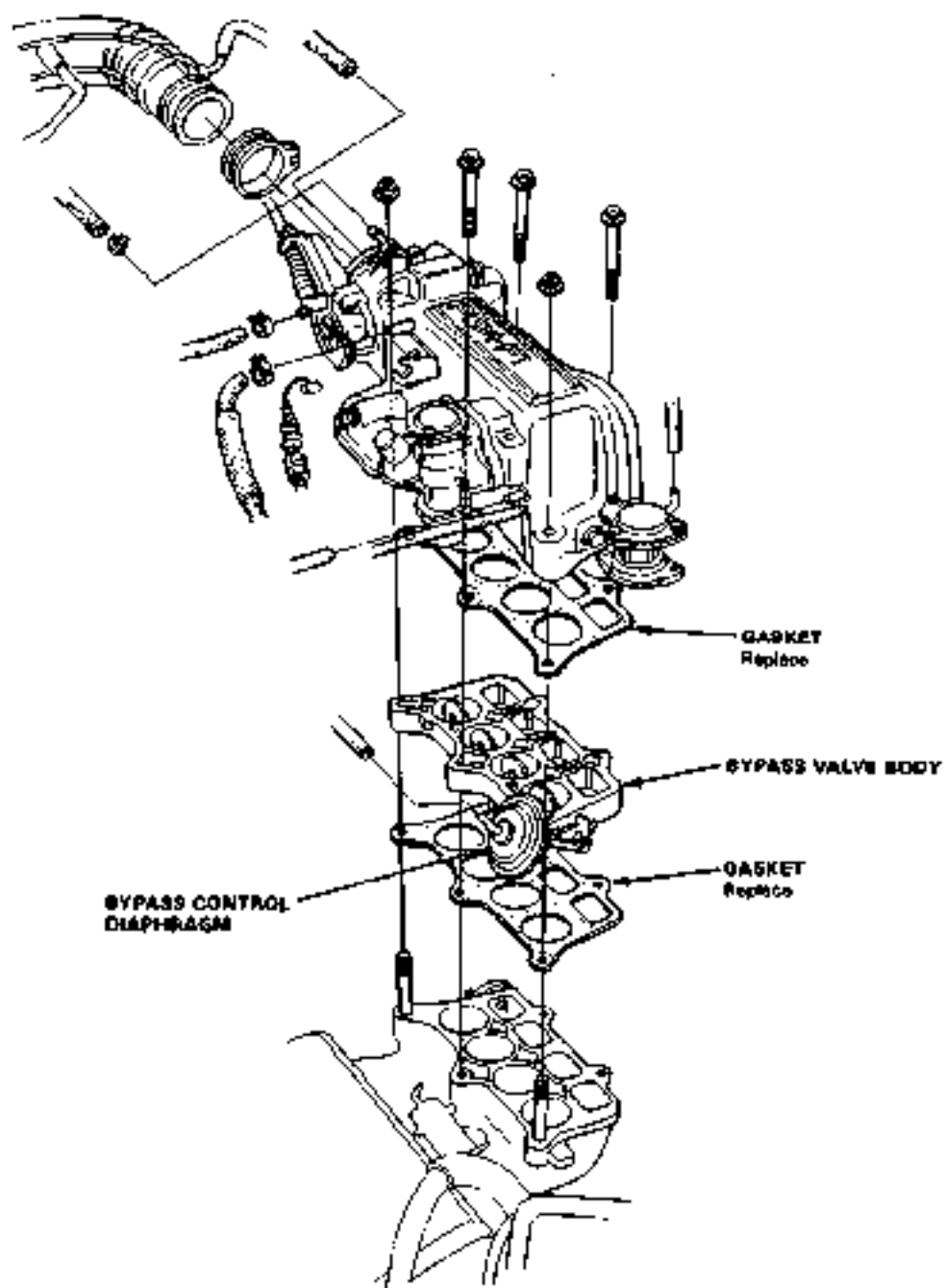
- ◆ If any leak is found, clean the linkage and shafts with carburetor cleaner.
- If the problem still exists after cleaning, disassemble the intake manifold and check the bypass valve (page 6-111)

(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
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



## Tailpipe Emission

### Inspection

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

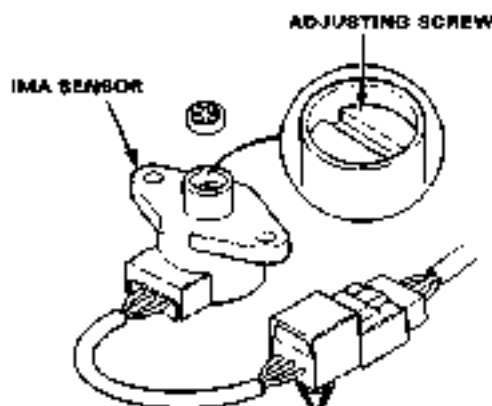
1. Start the engine and warm up to normal operating temperature (cooling fan comes on).
2. Connect tachometer.
3. Check idle speed and adjust the idle speed. If necessary (page 8-102).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

#### Specified CO%:

With CATA: 0.1 % maximum

Without CATA: 1.0±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.

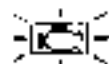


- If unable to obtain a CO reading of specified % by this procedure, check the engine tune-up condition.

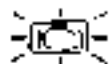
# Emission Control System

## Exhaust Gas Recirculation System

### Troubleshooting Flowchart



Self-diagnose. 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 6-94). 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

If 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.

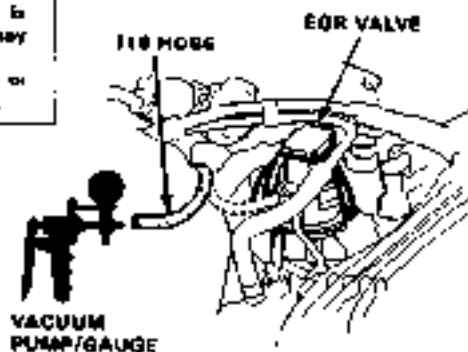
Is Check Engine warning light on and does it indicate CODE 12?

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 #1B hose from the EGR valve and connect a vacuum pump/gauge to the hose



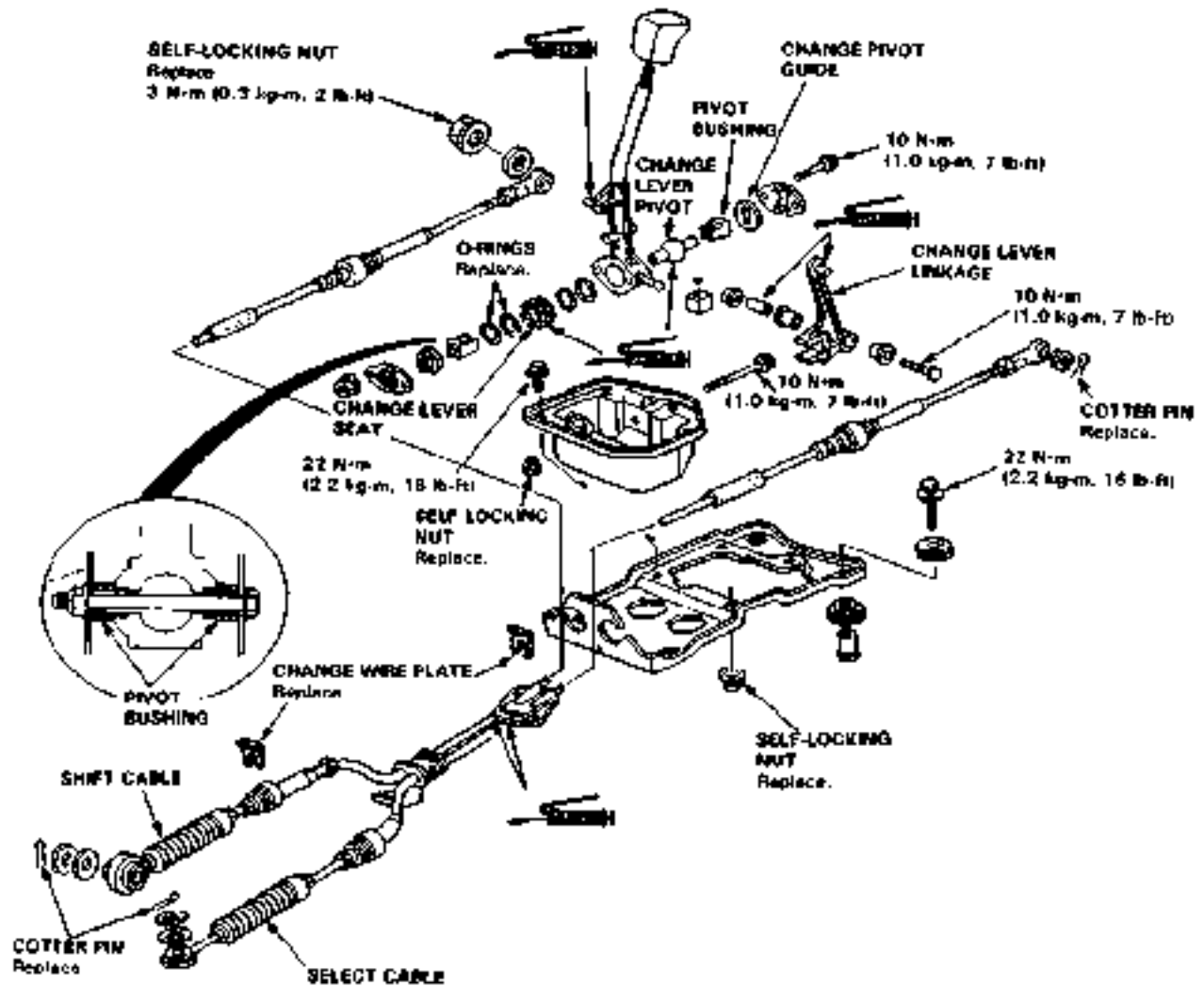
(To page 6-115)

# Gearshift Mechanism

## Overhaul

### NOTE:

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

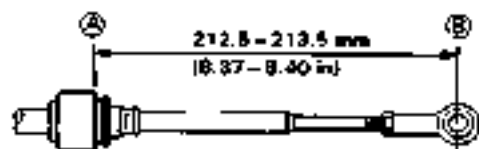




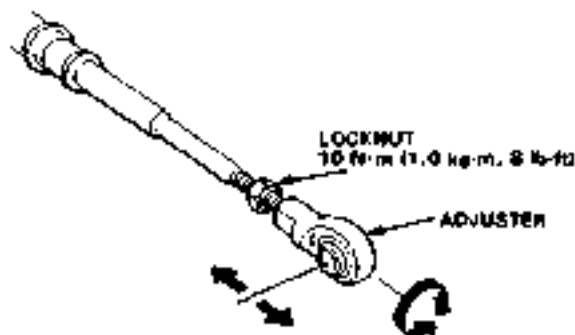
## Cable Adjustment

### Select Cable:

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



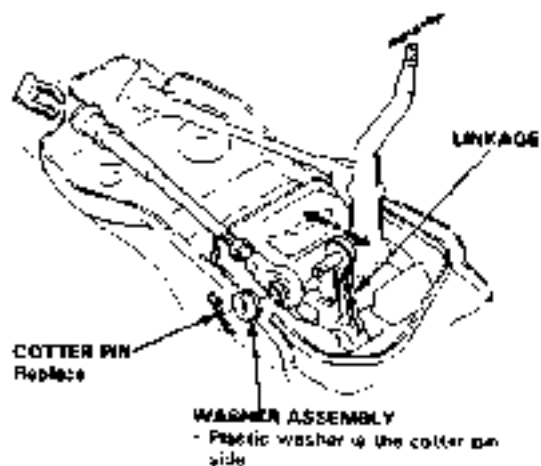
2. If there is no clearance between (A) and (B), loosen the locknut and turn the adjuster as necessary.



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

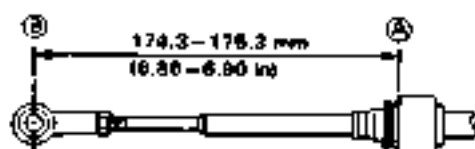
### NOTE:

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

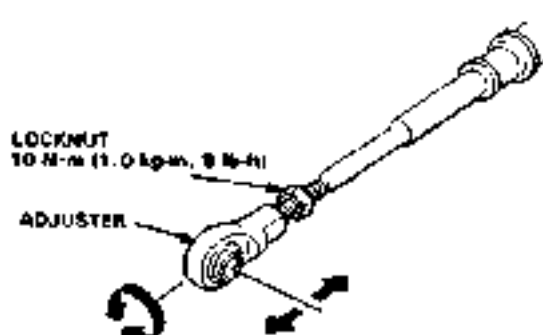


### Shift Cable:

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

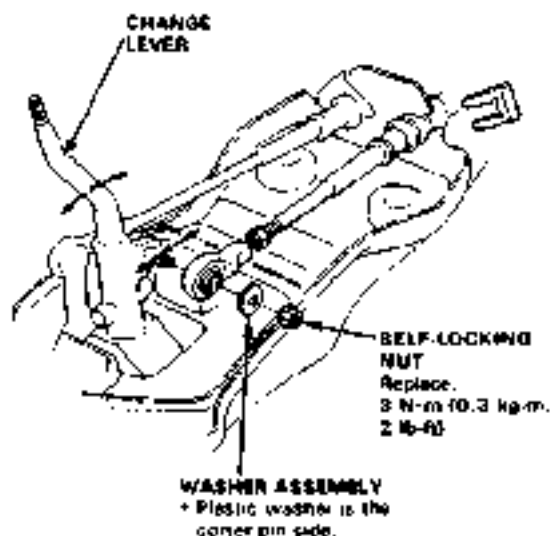


2. If there is no clearance between (A) and (B), loosen the locknut and turn the adjuster as necessary.



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

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

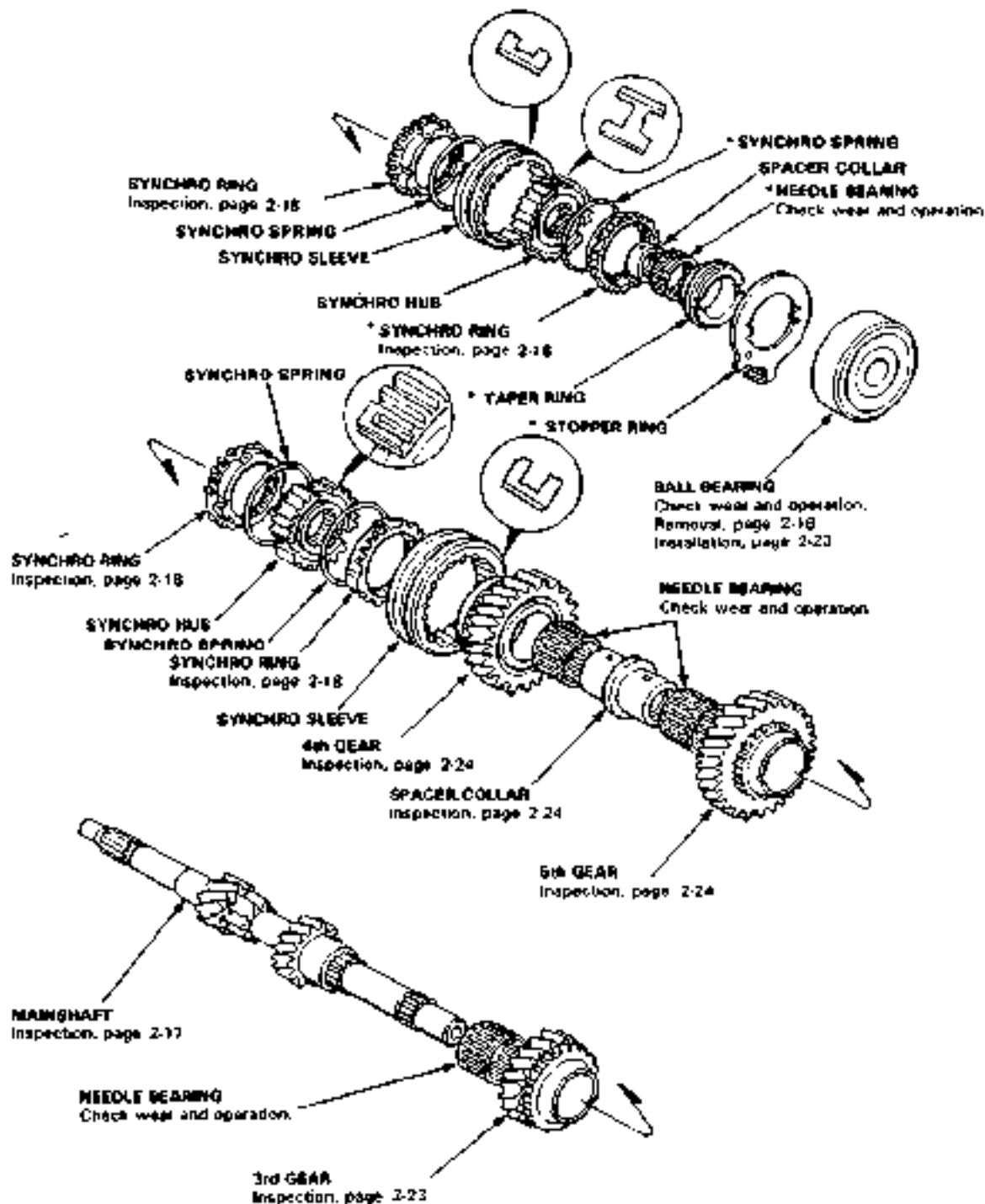


# Mainshaft

## Index

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

\* Mark parts: H2U5, H2C4 only.




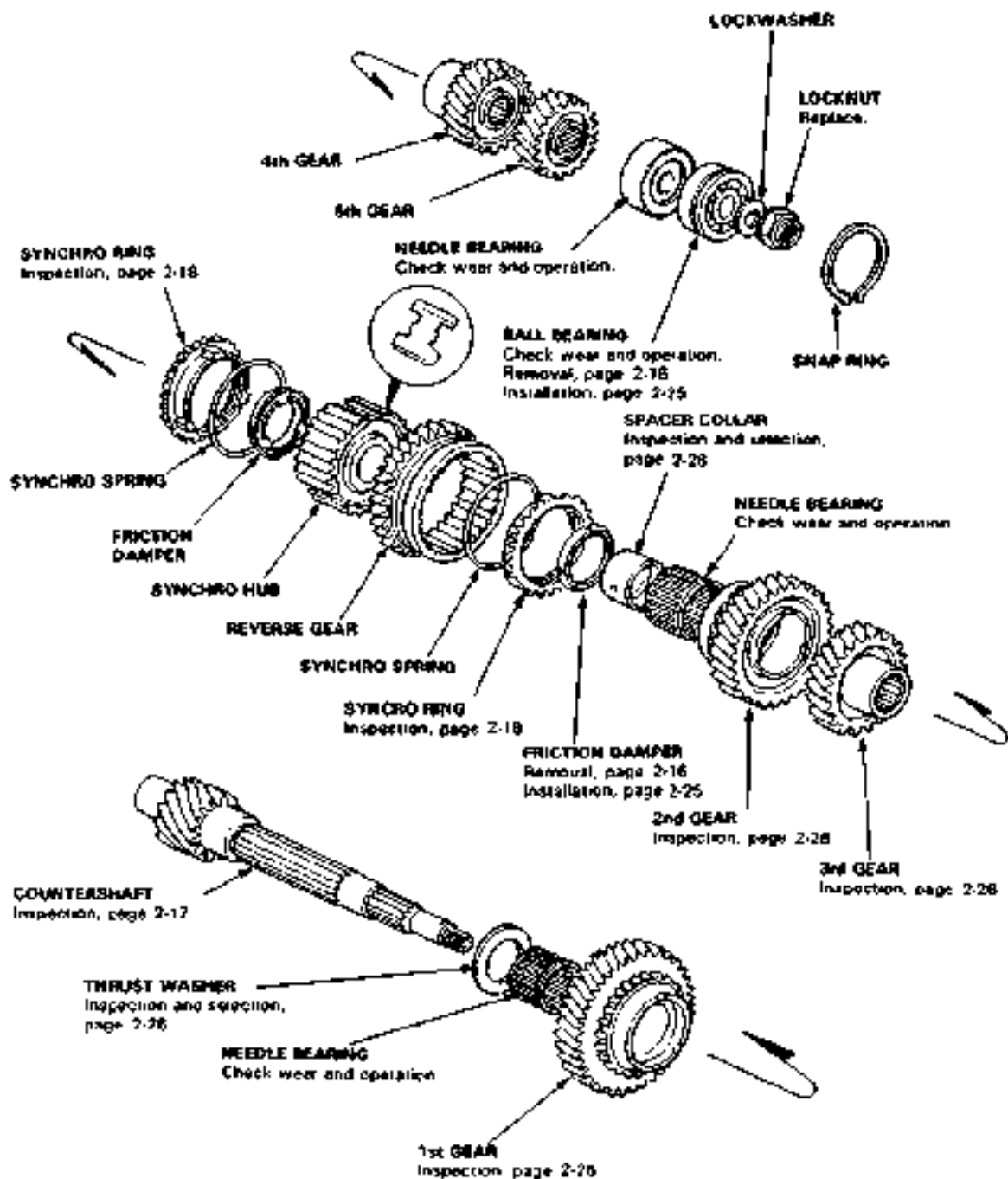
# Countershaft

## 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

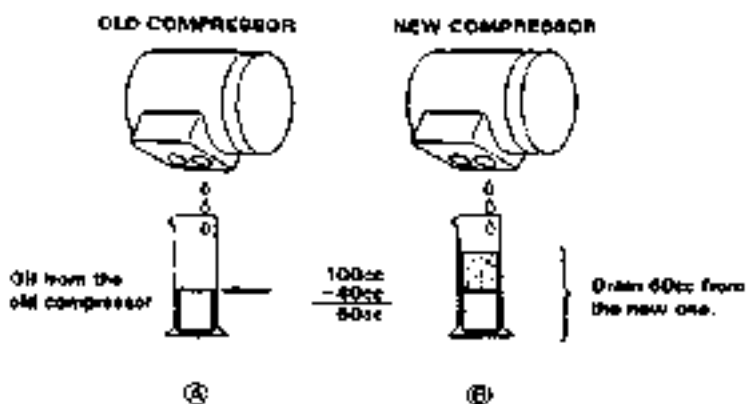
### WARNING When handling refrigerant (R-12):

- 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 (5/8 fl oz)
Lines 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:
	$100 \text{ cc (3 } 1/3 \text{ fl oz) - Volume of removed compressor = Draining volume.}$



# Discharge Procedure

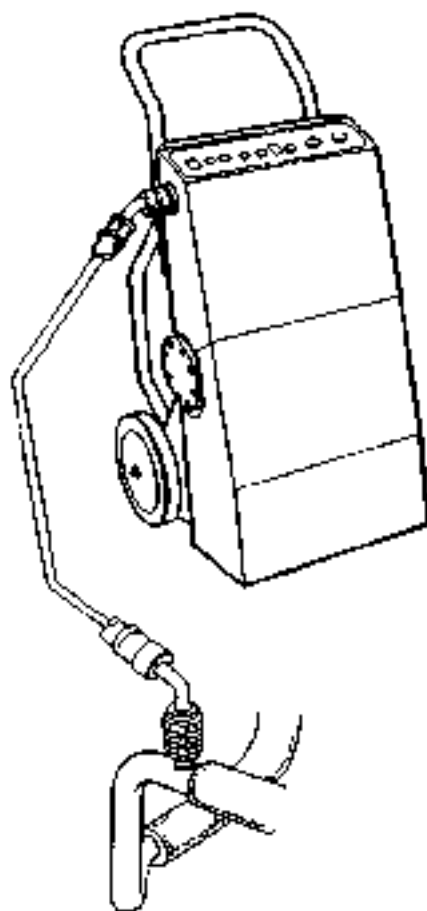


## Discharge

### 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

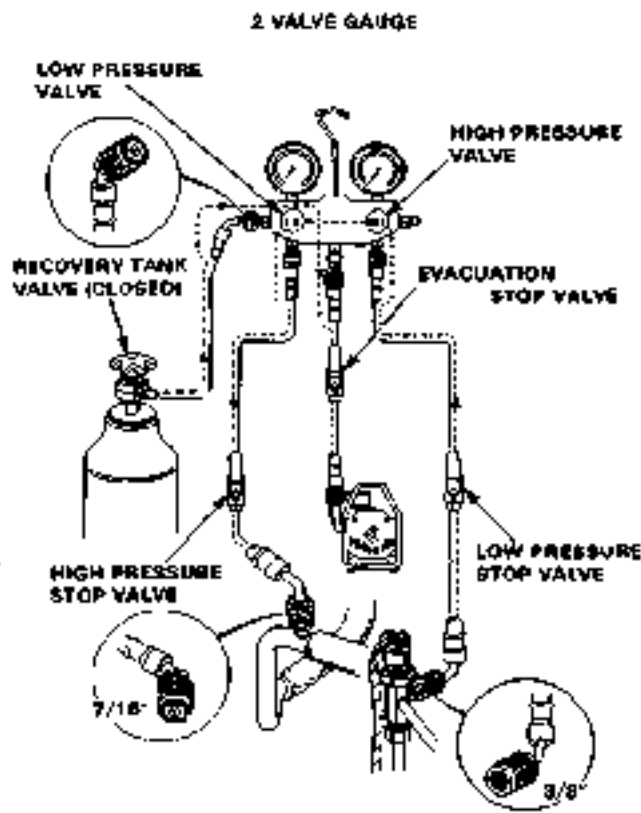
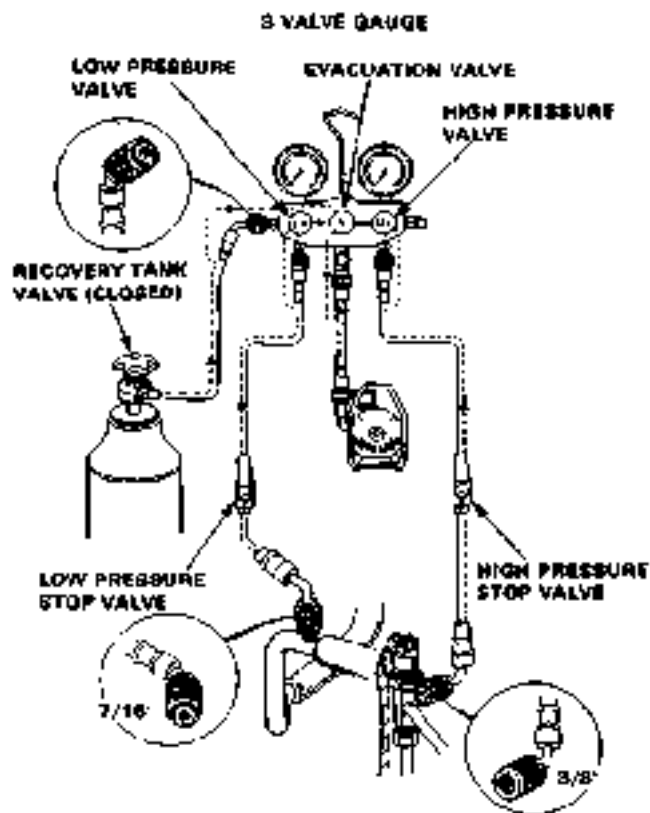
The following are the procedures to be achieved to when servicing air conditioners to reduce the amount of Freon R-12 into the atmosphere.

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 container (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





## Leak Test

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

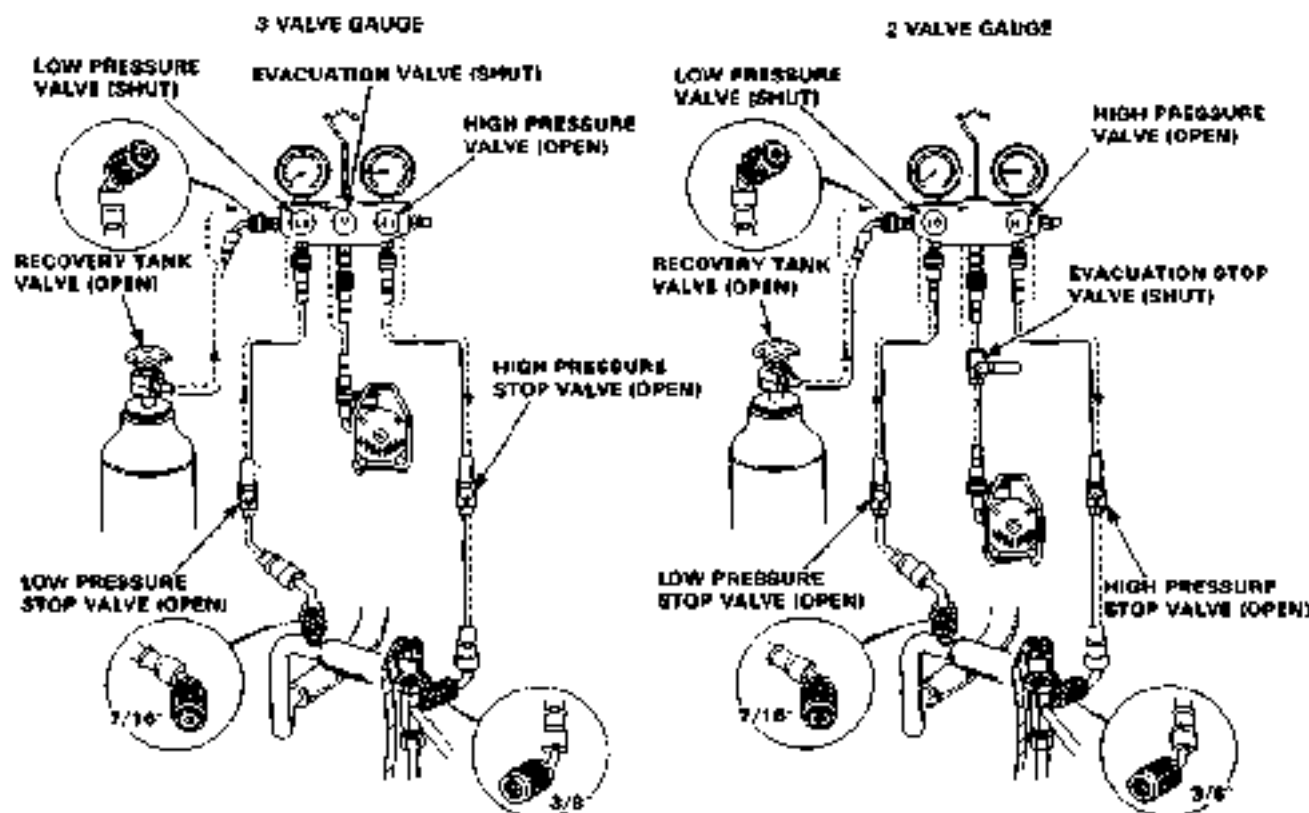
### When handling refrigerant (R-12):

- 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.

NOTE: Check for leaks after evacuation.

1. Close the evacuation valve (2 valve gauge; evacuation stop valve).

2. Open the recovery tank.
3. Open high pressure valve to charge the system to about 100 kPa (14 psi), then close the supply valve. NOTE: Close the low pressure valve.
4. Check the system for leaks using a leak detector. NOTE: Particularly check for leaks around the compressor, condenser, and receiver-dryer.
5. If you find any leaks, tighten the joint nuts and bolts to the specified torque.
6. Recheck the system for leaks using a leak detector.
7. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), release any charge in the system according to the Discharge Procedure on page.
8. After checking and repairing leaks, the system must be evacuated (see System Evacuation on page).



# System Charging

## Charging Procedures

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

**CAUTION:** 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.

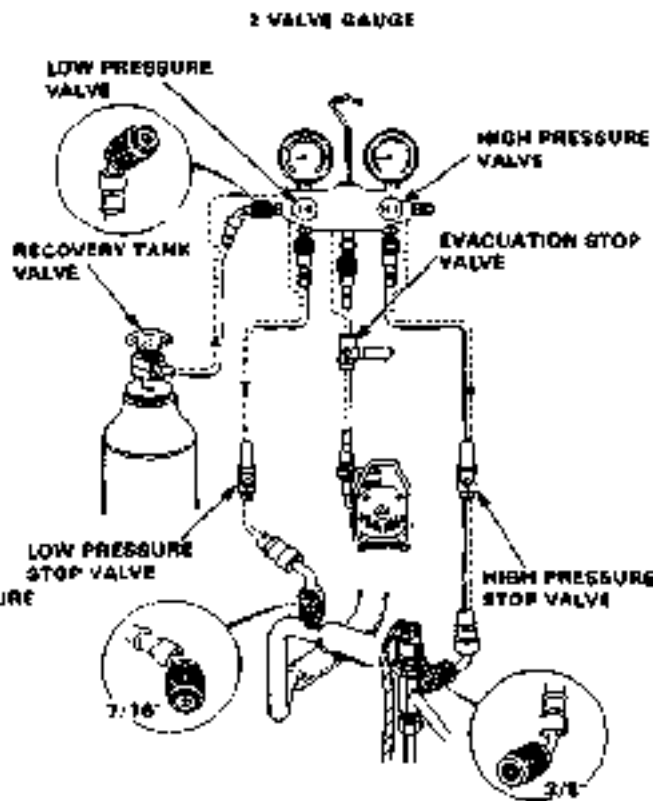
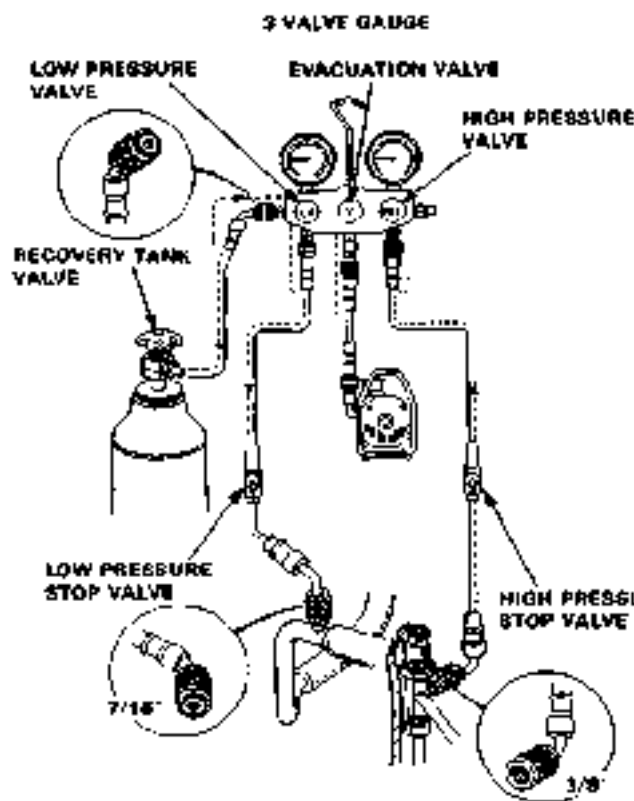
1. After leak test, check that the high pressure valve is closed and start the engine.

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

2. Open the front door.  
Turn the A/C switch on.  
Turn the air mode 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.

**CAUTION:**

- 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 Freon R-12 into the atmosphere.

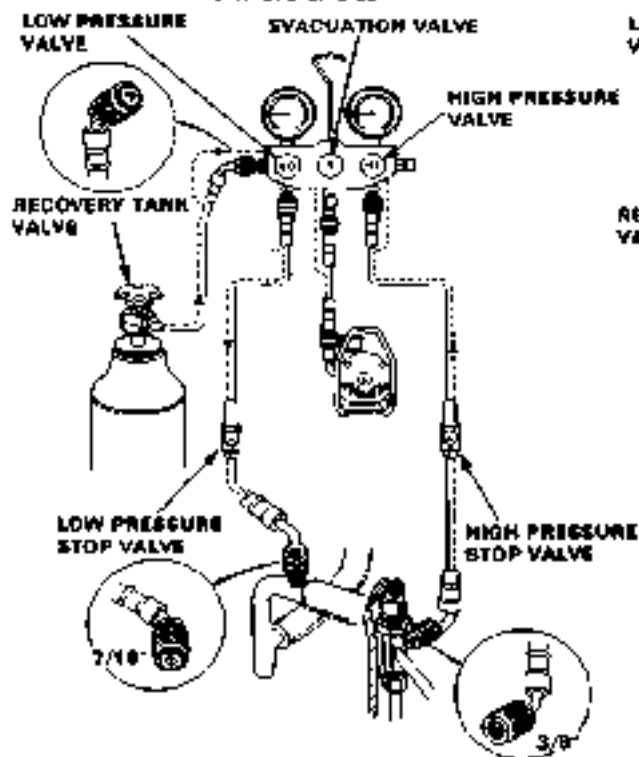
### Precautions When handling refrigerant (R-12):

- 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.
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 mode dial (lever) to COOL.
- Turn the function control switch (lever) on  $\frac{1}{2}$ .
- Turn the recirculation control switch on  $\frac{1}{2}$ .
- 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.

### Precautions

- 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

