OPTIMA(MS) > 2001 > G 2.4 DOHC > General Information

General Information > General Information > General Information

HOW TO USE THIS MANUAL

This manual is divided into 21 sections. This first page of each section is marked with a black tab at the edge of the page. You can quickly find the first page of each section without looking through a full table of contents.

Each section includes the essential removal, installation, adjustment and maintenance procedures for servicing all body styles. This information is current as of time of publication.

An INDEX is provided on the first page of each section to guide you to the item to be replaced.

TROUBLESHOOTING tables are included for each system to help you diagnose the system problem and find the cause. The repair for each possible cause is referenced in the remedy column to quickly lead you to the solution.

DEFINITION OF TERMS (Standard Value (Service standard))

Indicates the value used as the standard for judging the quality of a part or assembly on inspection or the value to which the part or assembly is corrected and adjusted. It is given by a tolerance.

Service Limit

Shows the standard for judging the quality of a part or assembly on inspection and means the maximum or minimum value within which the part or assembly must be kept functionally or in strength. It is a value established outside the range ofstandard value.

WARNING , CAUTION, NOTE, ABBREVIATION

WARNING

Information about an activity that could cause serious or severe personal injury or death to the driver, occupants or service technician.

CAUTION

Information about an activity that could cause damage to the vehicle, or cause some personal injury.

NOTE

A point of information.

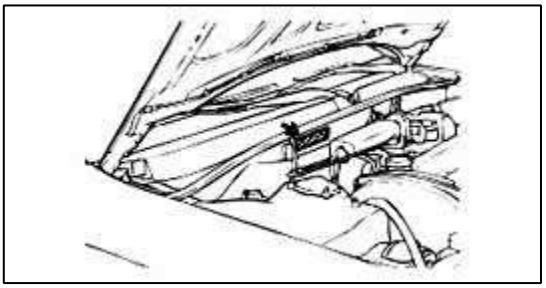
ABBREVIATIONS

DOHC : Double Over Head Camshaft

V-6 : V-typed 6 Cylinder

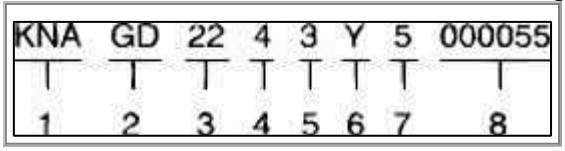
VEHICLE IDENTIFICATION NUMBER LOCATION

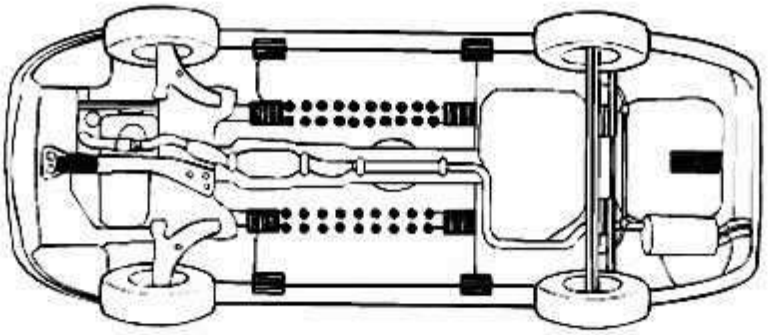
- The vehicle identification number (VIN) is on the top of the firewall and on the lower side of the left front door pillar.



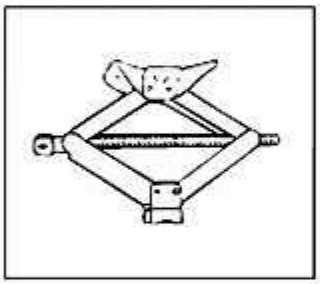
VEHICLE IDENTIFICATION NUMBER

Vehicle identification number consists of 17 digit.

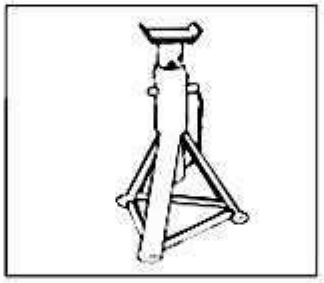




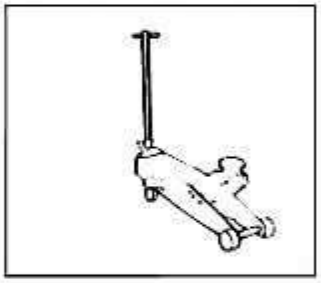
Jack provided with the vehicle
Rigid jack, single or double post lift
Garage jack
H bar lift



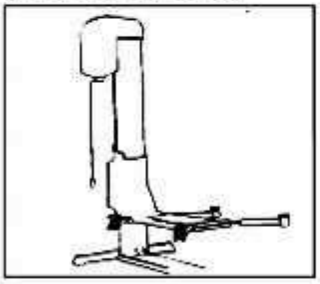
The jack provided with the vehicle (for reference)



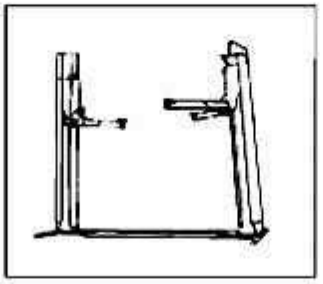
Rigid rack (Safety stand)



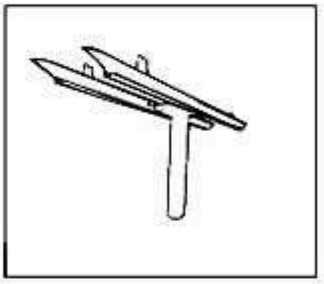
Garage jack (floor Jack)



Single post lift



Double post lift

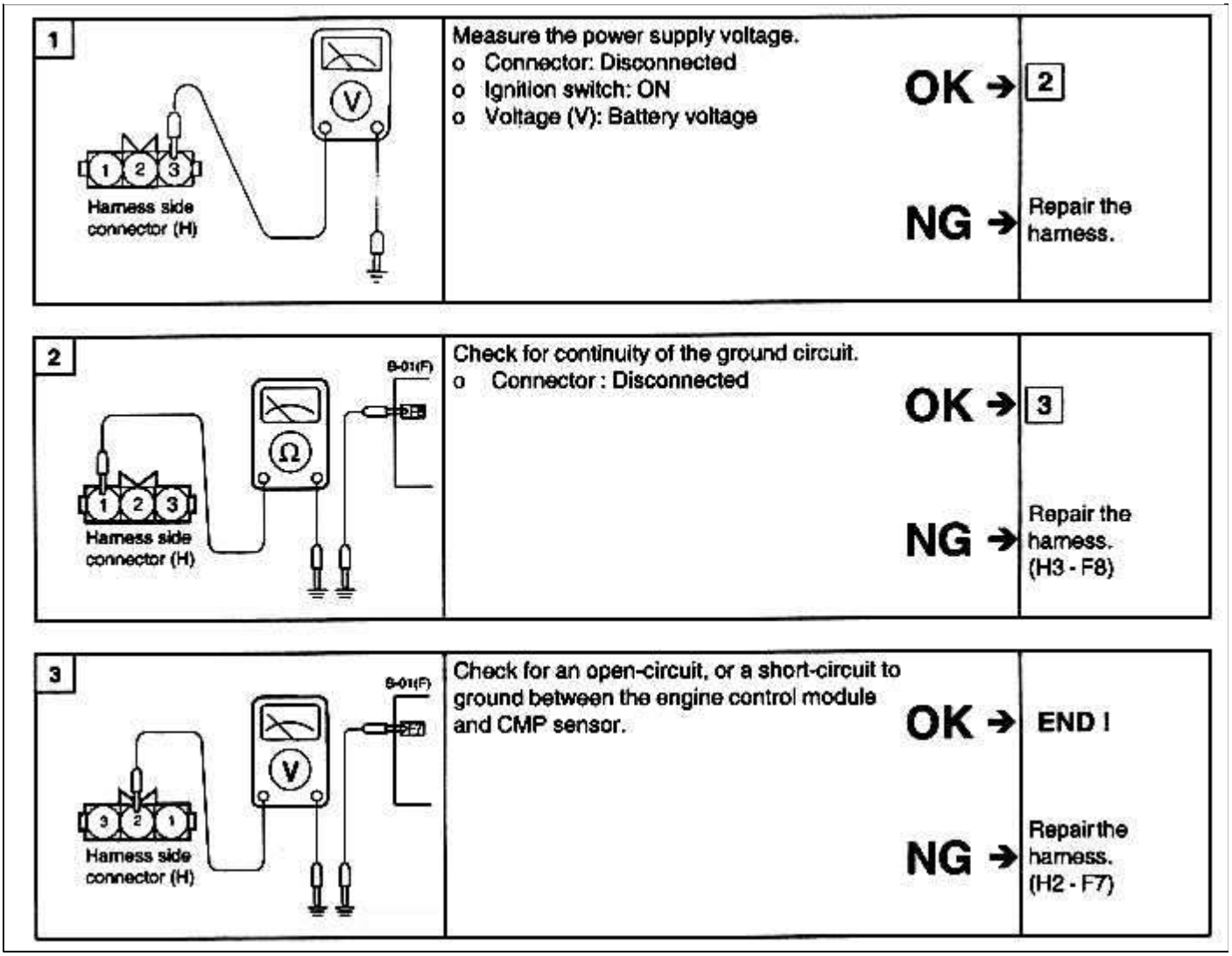


Free wheel type auto lift (H bar lift)

CAUTION

1) Never use a jack at the lateral rod or rear suspension assembly.
2) In order to prevent scarring the centermember, place a piece of cloth on the jack's contact surface (to prevent corrosion caused by damage to the coating).
3) Never attempt to position a floor jack on any part of the vehicle underbody.
4) Do not attempt to raise one entire side of the vehicle by placing a jack midway between the front and rear wheels. To do so could result in permanent damage to the body.

STANDARD PARTS TIGHTENING TORQUE TABLE



TROUBLESHOOTING HINTS

If the camshaft position sensor does not operate correctly, correct sequential injection is not made so that the enginemay stall or run irregularly at idle or fail to accelerate normally.

Fuel System > Engine Control System > Barometric Pressure (BARO) Sensor > Troubleshooting

MANIFOLE ABSOLUTE PRESSURE SENSOR (MAP) SENSOR

The manifold differential pressure (MAP) sensor converts intake manifold pressure into a voltage signal. The engine control module (ECM) uses this signal to determine the condition of the exhaust gas recirculation (EGR).

Circuit Diagram (2.4 DOHC)

USING VOLTMETER

OPTIMA(MS) > 2001 > G 2.5 DOHC > Engine Mechanical System

Engine Mechanical System > General Information > General Information

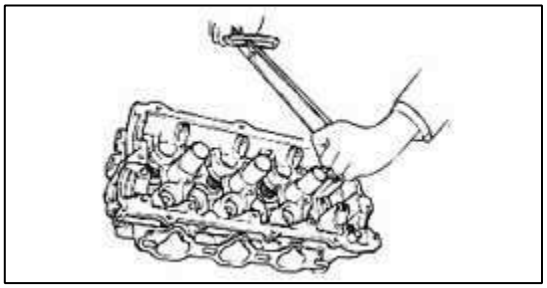
ADJUSTING VALVE CLEARANCE

As the intake and exhaust valves are equipped with auto-lash adjustment mechanisms, there is no need to adjust the valveclearance.The proper function of the auto-lash mechanism may be determined by checking for tappet noise. When there is tappet noise or any unusual noise, first check the engine oil pressure. If the engine oil pressure is okay, check the auto-lash by removing and bleeding or replacing it.

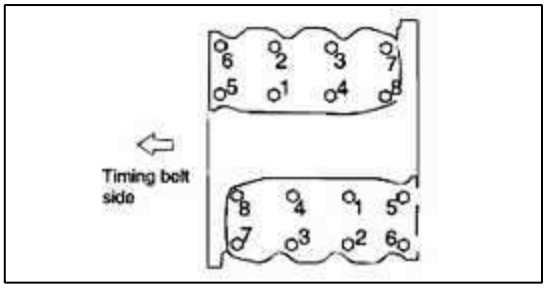
TIGHTENING CYLINDER HEAD BOLTS

1. First loosen slightly and then tighten to the specified torque

Tightening torque
Cylinder head bolts
Cold [Engine temperature approximately20°C(68°F)] : 25 Nm (250 kg.cm, 18 lb.ft)+(58°~62°)+(43°~47°)



2. Be sure to follow the specific torque sequence as shown in the illustration.

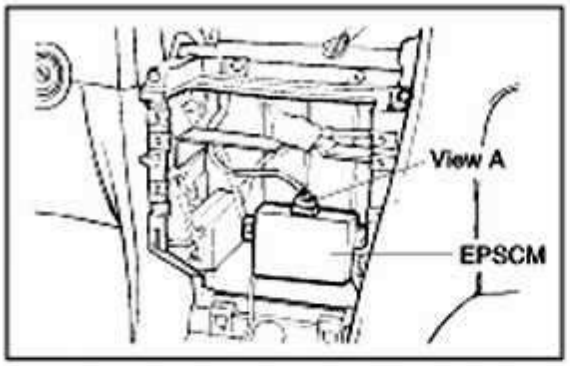


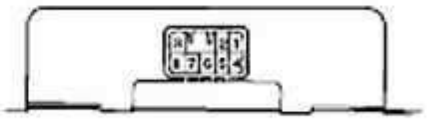
NOTE

Run the engine to normal operating temperature make it cool, and then re-torque the bolts to specifications.

CHECKING COMPRESSION PRESSURE

1. Before checking compression, check the engine oil level and that the starter motor and battery are all in normal operating condition
2. Start the engine and wait until engine coolant temperature reaches 80°C~95°C (176°F~205°F).
3. Stop the engine and disconnect the spark plug cables.
4. Remove the spark plugs.
5. Crank the engine to remove any foreign material in the cylinders.
6. Attach the compression gauge to the spark plug hole.
7. Depress the accelerator pedal to fully open the throttle.





<VIEW "A">

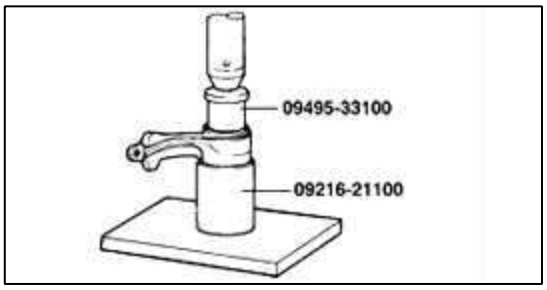
PIN LAYOUT

PIN NO.	DESCRIPTION
1	Solenoid (-)
2	Solenoid (+)
3	-
4	-
5	Data link connector
6	Sensor signal from vehicle speed sensor
7	IG2
8	Ground

EPS SLENOID(Solenoid valve)

A solenoid valve is provided in the gear box to control the flow of power steering oil. The solenoid valve is composed of a releasing spring, a piston and a plunger. The input current is varying from 0A to 1A according to the vehicle speed and is controlled by EPS control module. When the ignition switch is turned on, current is sent to the solenoid valve to push up the plunger and accordingly the piston contacting the plunger is pushed up while overcoming the spring force. As the vehicle speed increasing the current flow to the solenoid decreased pulling down the piston bottom by the releasing spring force. When the piston is pushed up, it closes the oil passing hole, therefore the power steering oilpressure is delivered into the cylinder without any interruption. But when the hole is opened as the piston is pulling down, some of the oil coming from the rotary valve is drained into reservoir via the hole inside the rotary valve.

2. Using the special tool, press out the center bearing from the outside to the inside direction of the center bearing bracket as shown in the illustration.

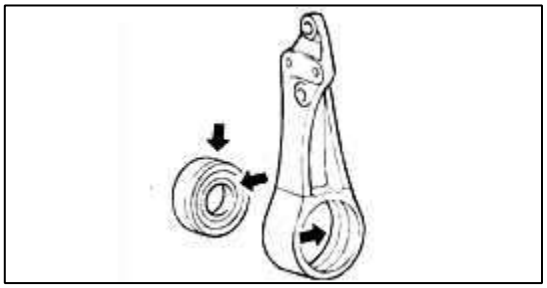


INSPECTION

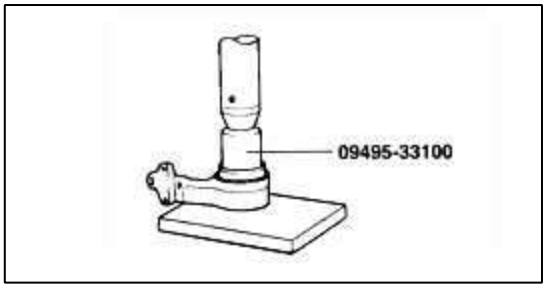
1. Check the inner shaft for damage, bending or rust.
2. Check the inner shaft splines for wear or damage.
3. Check the center bearing for scoring, discoloration and roughness of the roller joumal's moving surfaces.

REASSEMBLY

1. Apply multipurpose grease to the center bearing and inside the center bearing bracket.

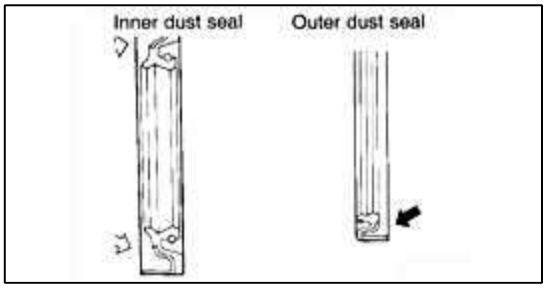


2. Using the special tools, press the center bearing into the center beairng bracket.



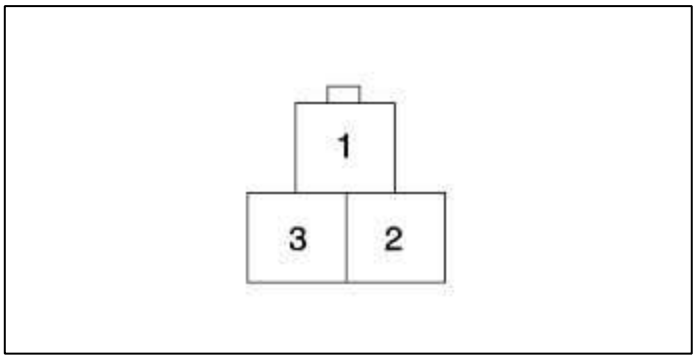
3. Apply multipurpose grease to the rear surface of all dust seals.

Recommended grease : LIG-2 or Sunlight No.2
Inner dust seal : 7-10 g (0.25-0.35 oz)
Outer dust seal : 4-6 g (0.14-0.21 oz)



3. If there is an abnormality, replace the limit switch.

Terminal NO. / Switch position	1	2	3
Frontward	○	—	○
Backward		○	○



Height motor limit switch

The height motor limit switch builts in the height motor.

1. Check that the motor stop after about 1/2 turns counterclockwise.
2. Check that the motor stop after about 1/2 turns clockwise.
3. If operation is not as specified, replace the motor.

Body (Interior and Exterior) > Seat & Power Seat > front seat > Description and Operation

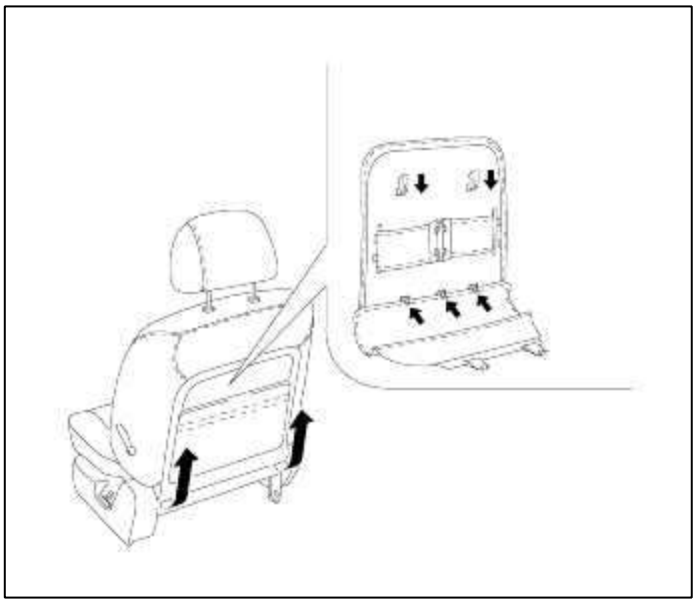
DESCRIPTION AND OPERATION

Front seat consists of a seat back and a cushion. Both items are replaceable or serviceable. Both seats can be reclined or adjusted front-to-rear by two levers, adjusting lever and reclining lever. Head restraint can also be adjusted or removed. Seat adjuster lever is under right or left front corner of either front seat. Pulling on this lever unlocks seat, allowing it to slide forward or backward on a track attached to vehicle floor. Track assembly and seat adjuster lock are replaceable items. Reclining lever arm is placed on door side of either seat. If this lever is pulled up and pressure is placed on seatback, seatback will recline. If no pressure is applied, seat will spring forward past vertical driving position. If pressure is applied to seatback, it will recline to vertical driving position and then lock. Reclining adjuster is a replaceable item. Driver´s seat is also equipped with a lifter lever. This is controlled by a lever on left side of driver´s side seat cushion. Lifter control lever is a replaceable item.

Body (Interior and Exterior) > Seat & Power Seat > front seat > Components and Components Location

Component

2. Remove back plate.

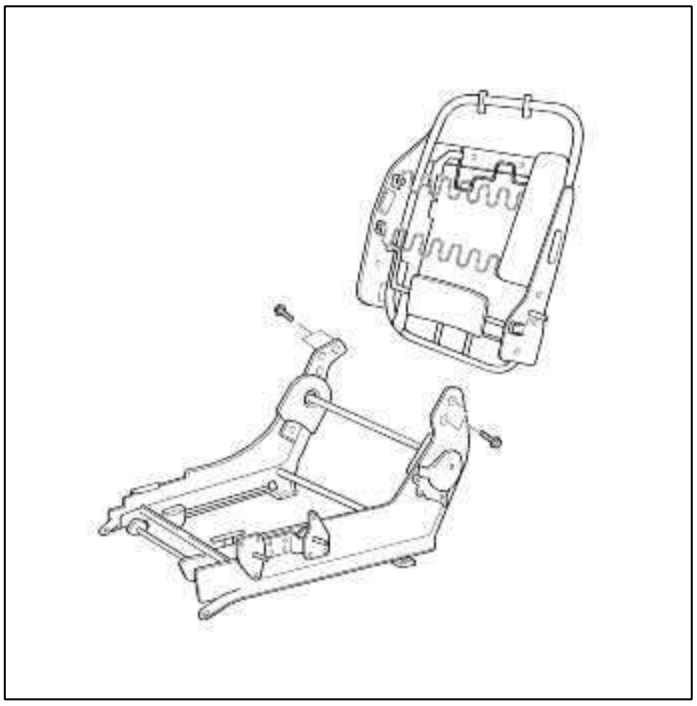


(1) Remove two clips from bottom of seat cushion.

(2) Pull out lower side of back plate.

(3) Remove back plate carefully, pulling down with hands.

3. Remove two mounting bolts from left side of seatback.



4. Repeat right side.

4. Avoid prolonged engine compression measurement. Engine compression tests must be made as rapidly as possible.
5. Do not run engine when fuel tank is nearly empty. This may cause the engine to misfire and create an extra load on the converter.
6. Avoid coasting with ignition turned off and prolonged braking.
7. Do not dispose of used catalyst along with parts contaminated with gasoline or oil.

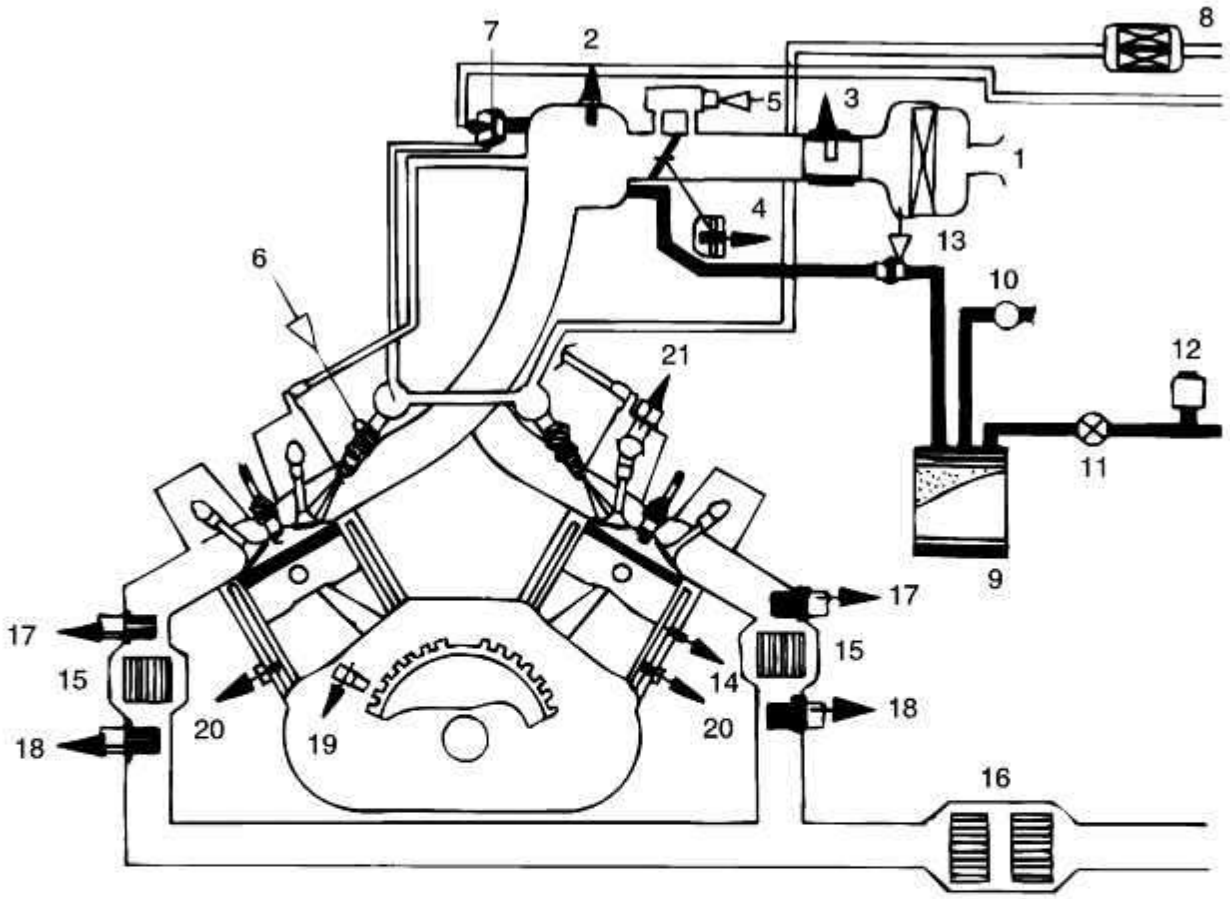
SRS SYSTEM COMPONENTS INFORMATION

WARNING

Failure to carry out service operations in the correct sequence could cause the airbag system to unexpectedly deploy during servicing, possibly leading to a serious injury or death. Further, if a mistake is made in servicing the airbag system, it is possible the airbag may fail to operate when required. Before performing servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedure described in the repair manual.

1. Malfunction symptoms of the airbag system are difficult to confirm, so the diagnostic codes become the most important source of information when troubleshooting. When troubleshooting the airbag system, always inspect the diagnostic codes before disconnecting the battery. 2.
2. Work must be started 30 seconds or longer from the time the ignition switch is turned to the LOCK position and the negative (-) terminal cable is disconnected from the battery. (The airbag system is equipped with a back-up power source so that work is started immediately after disconnecting the negative (-) terminal cable of the battery, the airbag may be deployed.) When the negative (-) terminal cable is disconnected from the battery, memory of the clock and audio systems will be cancelled. So before starting work, make a record of the contents memorized by the audio memory system. Then when work is finished, reset the audio system as before and adjust the clock.
3. Never use airbag parts from another vehicle. When replacing parts, replace them with new parts.
4. Never attempt to disassemble and repair the airbag modules, SRSCM, Clock spring and Air-bag wiring harness in order to reuse it.
5. If the SRSCM or air-bag module have been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace them with new ones.
6. After work on the airbag system is completed, perform the SRS SRI check.

VEHICLE LIFT AND SUPPORT LOCATIONS



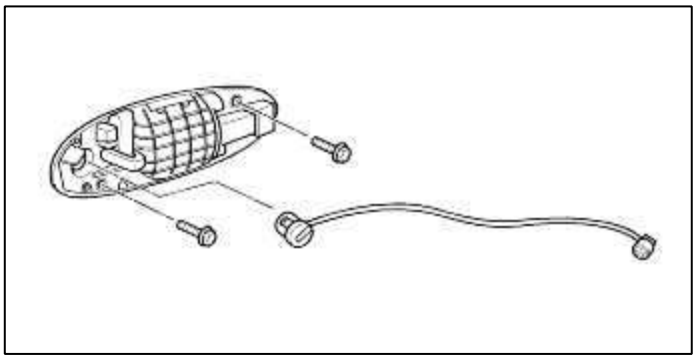
No	Part Name	No	Part Name	No	Part Name
1	Air Cleaner	8	Fuel Filter	15	Catalyst, Warm-up (2EA)
2	Intake Air Temperature Sensor	9	Canister	16	Catalytic Converter
3	Mass Air Flow Sensor	10	ORVR valve	17	O2 Sensor, upstream (2EA)
4	Throttle Position Sensor	11	2 Way Check Valve	18	O2 Sensor, downstream (2EA)
5	Idle Speed Control Actuator	12	Fuel Tank Pressure Sensor	19	Crankshaft Position Sensor
6	Fuel Injector	13	Purge Control Valve	20	Knock Sensor (2EA)
7	Pressure Regulator	14	Coolant Temp. Sensor	21	Camshaft Position Sensor

Fuel System > Engine Control System > Troubleshooting

INSPECTION CHART FOR DIAGNOSTIC TROUBLE CODE (FOR V6 DOHC)

DTC	Diagnostic items	Trouble area	MIL
P0101	Mass or Volume Air Flow	• Dirty air cleaner	O

8. Install outside door handle assembly.



(1) Position outside door handle assembly as originally positioned through access hole.

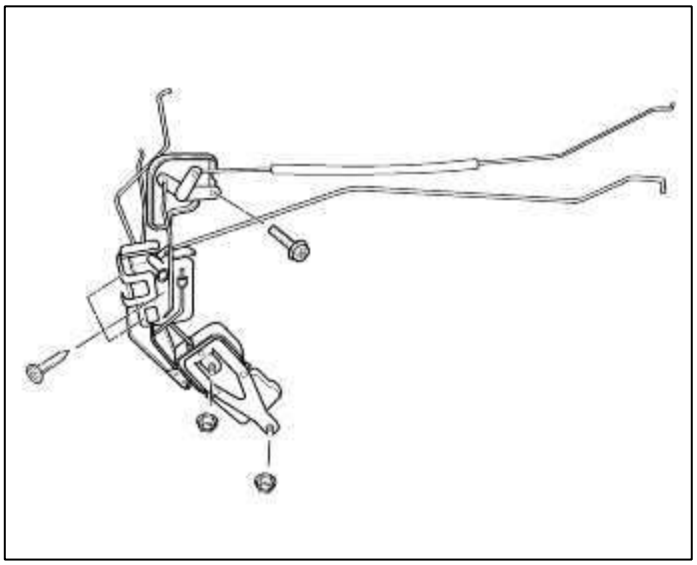
(2) Install door lock cylinder on outside handle assembly .

(3) Install two mounting bolts.

Tighten mounting bolts to
7~11 N.m (70~110 kg-cm, 61~95 Ib-in)

(4) Connect door lock cylinder connector.

9. Install door lock assembly.



(1) Position it as originally positioned through access hole.

(2) Install three mounting screws.

Tighten mounting screws to
8~11 N.m (80~110 kg-cm, 69~95 Ib-in)

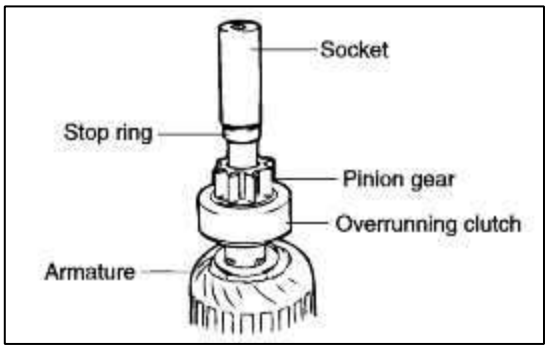
(3) Install one screw on rod cover of inside handle.

(4) Install two mounting nuts on door lock actuator.

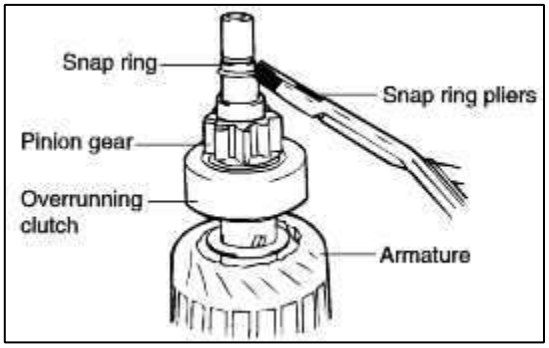
(5) Connect two remote control rods on outside handle.

(6) Connect door lock actuator connector.

1. Press the stop ring to the snap ring side using a socket wrench, to the snap ring side.

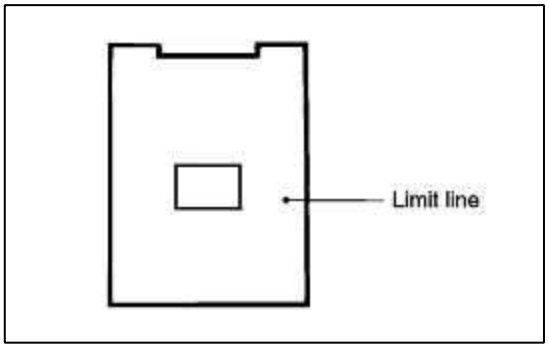


2. After removing the snap ring (using snap-ring pliers), remove the stop ring and the overrunning clutch.

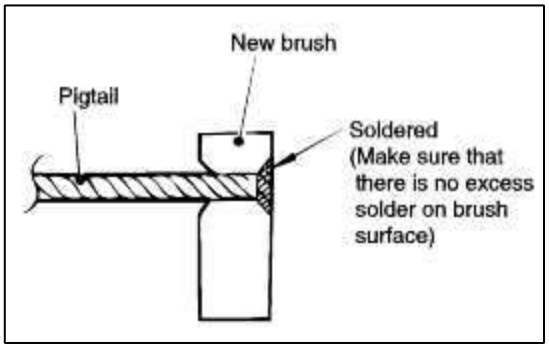


REPLACEMENT (BRUSHES AND SPRINGS)

1. Brushes that are worn beyond wear limit line, or oil-soaked, should be replaced.
2. When replacing field coil brushes, crush worn brush with pliers, taking care not to damage pigtail.



3. Sand pigtail end with sandpaper to ensure good soldering.
4. Insert pigtail into hole provided in new brush and solder it. Make sure that pigtail and excess solder do not come out onto brush surface.
5. When replacing ground brush, slide the brush from brush holder by prying retaining spring back.

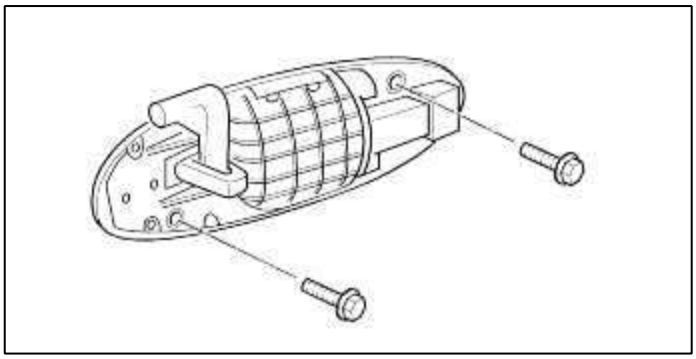


INSTALLATION OF THE STOP RING AND SNAP RING

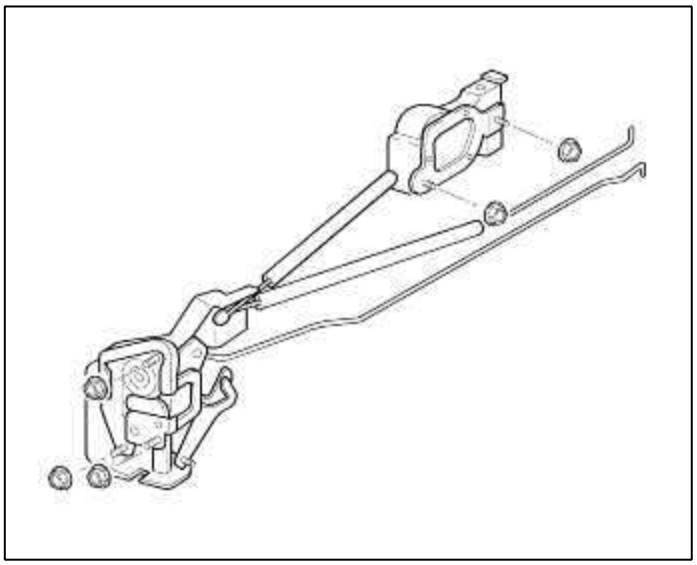
Using a suitable pulling tool, pull overrunning clutch stop ring over snap ring

6. Install outside door handle assembly.
   (1) Position outside door handle assembly as originally positioned through access hole.
   (2) Install two mounting bolts.

Tighten mounting nuts to
7~11 N.m (70~110 kg-cm, 61~95 Ib-in)



7. Install door lock assembly.



   (1) Position it as originally positioned through access hole.
   (2) Install three mounting screws.

Tighten screws to
8~11 N.m (80~110 kg-cm, 69~95 lb-in)

   (3) Connect door lock actuator connector.
   (4) Install two mounting nuts on door lock actuator.
   (5) Connect one remote control rod on outside door handle assembly.

(2) Connect the dummy (0957A-38200) and dummy adapter (0957A-38300) to the PAB harness side connector.

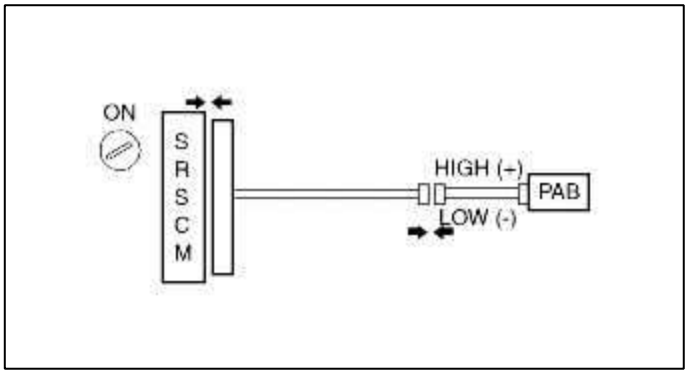
[CHECK]
Measure the resistance between the PAB high (+) and low (-) terminals.

1.7 Ω ≤ R ≤ 2.3 Ω

NG → Repair or replace the harness or the connector between the SRSCM and the PAB.

OK ↓
Go to step "3".

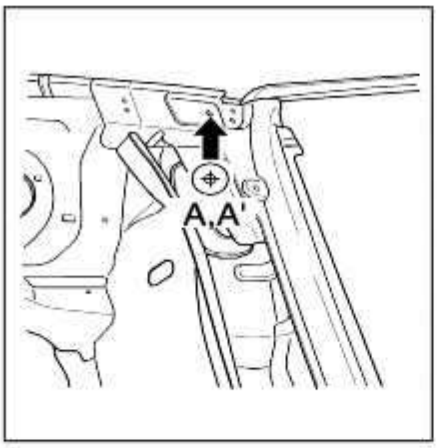
3. Check the PAB squib.
[PREPARATION]
(1) Turn the ignition switch to LOCK.
(2) Disconnect the negative (-) terminal cable from the battery, and wait for 30 seconds.
(3) Connect the SRSCM connector and the PAB connector.
(4) Connect the negative (-) terminal cable to the battery, and wait for 30 seconds.

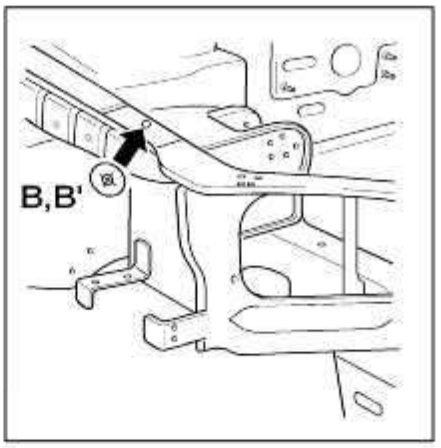


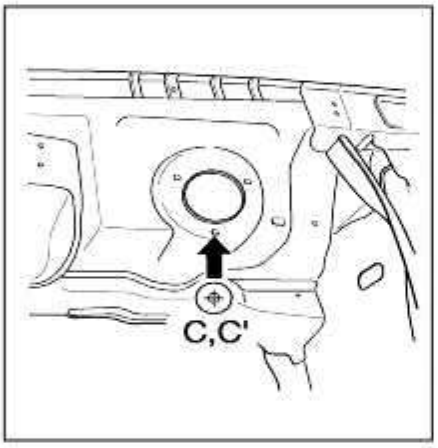
[CHECK]
(1) Turn the ignition switch to ON, and wait for at least 30 seconds.
(2) Clear the malfunction code stored in the memory of the Hi-Scan Pro.
(3) Turn the ignition switch to LOCK, and wait for 30 seconds.
(4) Turn the ignition switch to ON, and wait for 30 seconds.
(5) Using Hi-Scan Pro, check for DTCs.

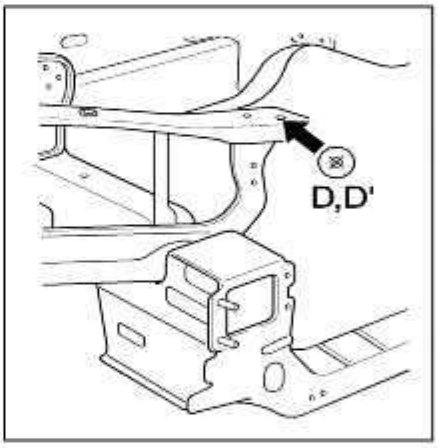
There is no DTC.

[HINT]
Codes other than these may be output at this time, but they are not relevant to this procedure.


A,A'


B,B'


C,C'


D,D'