

GENERAL SERVICE INFORMATION

Protection of The Vehicle

Always be sure to cover fenders, seats, and floor areas before starting work.

CAUTION

The support rod must be inserted into the hole near the edge of the hood whenever you inspect the engine compartment to prevent the hood from falling and causing possible injury.

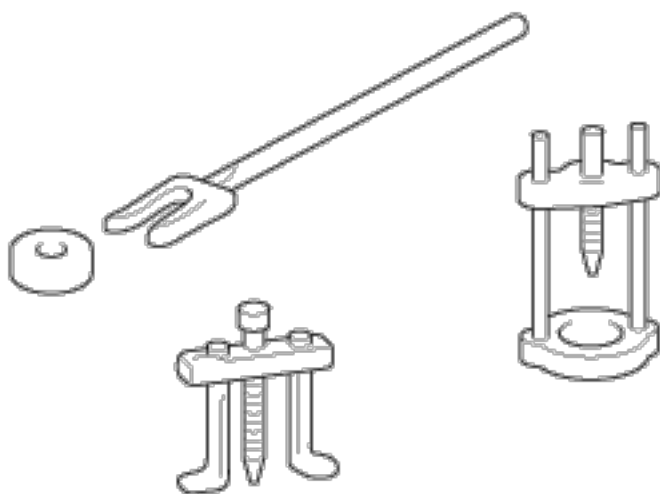
Make sure that the support rod has been released prior to closing the hood. Always check to be sure the hood is firmly latched before driving the vehicle.

Preparation of Tools and Measuring Equipment

Be sure that all necessary tools and measuring equipment are available starting work.

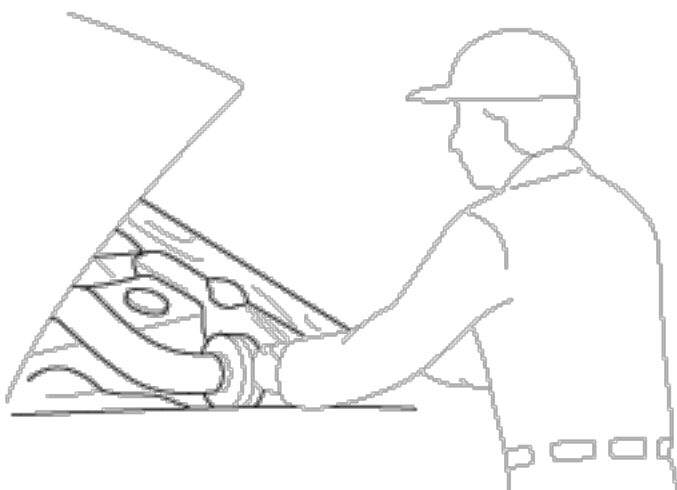
Special Tools

Use special tools when they are required.



Removal of Parts

First find the cause of the problem and then determine whether removal or disassembly before starting the job.



Disassembly

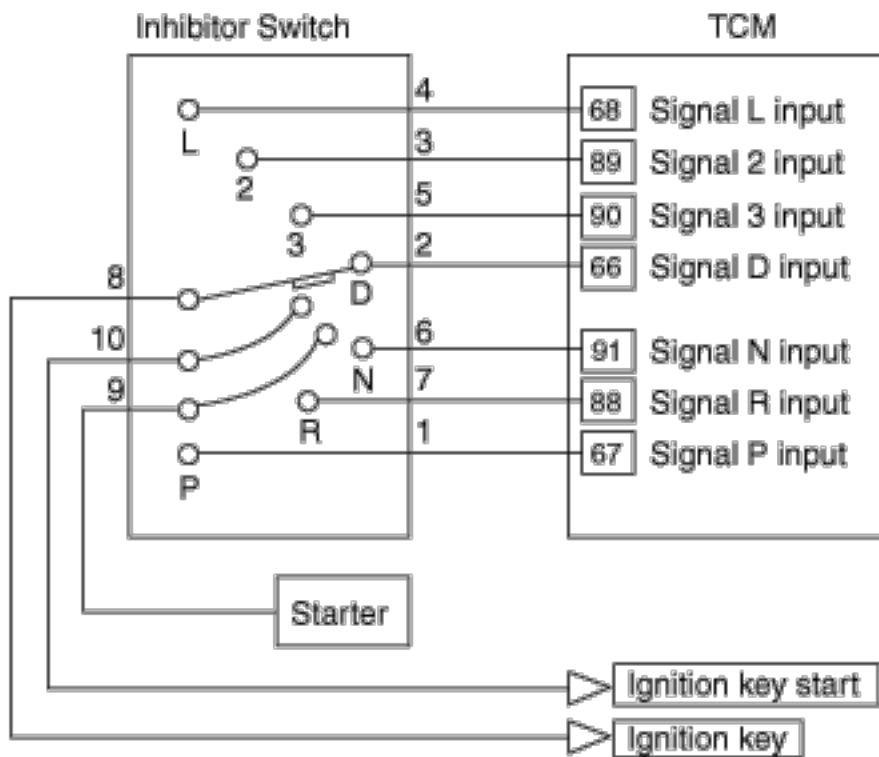
If the disassembly procedure is complex, requiring many parts to be disassembled, all parts should be disassembled in a way that will not affect their performance or external appearance.

1) Inspection of parts

Each part, when removed, should be carefully inspected for suspected malfunction, deformation, damage, and other problems.

CIRCUIT DIAGRAM

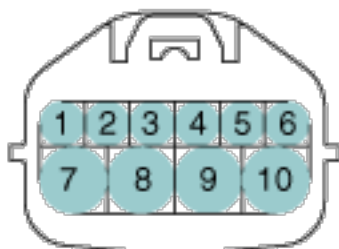
[Circuit Diagram]



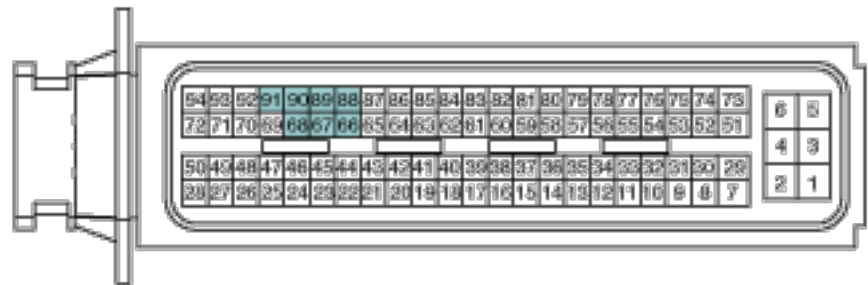
[Connection Information]

Terminal	Connected to	Function
1	TCM (67)	Signal P input
2	TCM (66)	Signal D input
3	TCM (89)	Signal 2 input
4	TCM (68)	Signal L input
5	TCM (90)	Signal 3 input
6	TCM (91)	Signal N input
7	TCM (88)	Signal R input
8	Ignition switch	Battery voltage after ignition key on
9	Ignition switch	Battery voltage after ignition key start
10	Starter	Supply the voltage to starter

[Harness Connector]



Inhibitor Switch Connector



TCM Connector

REPLACEMENT

⚠ CAUTION

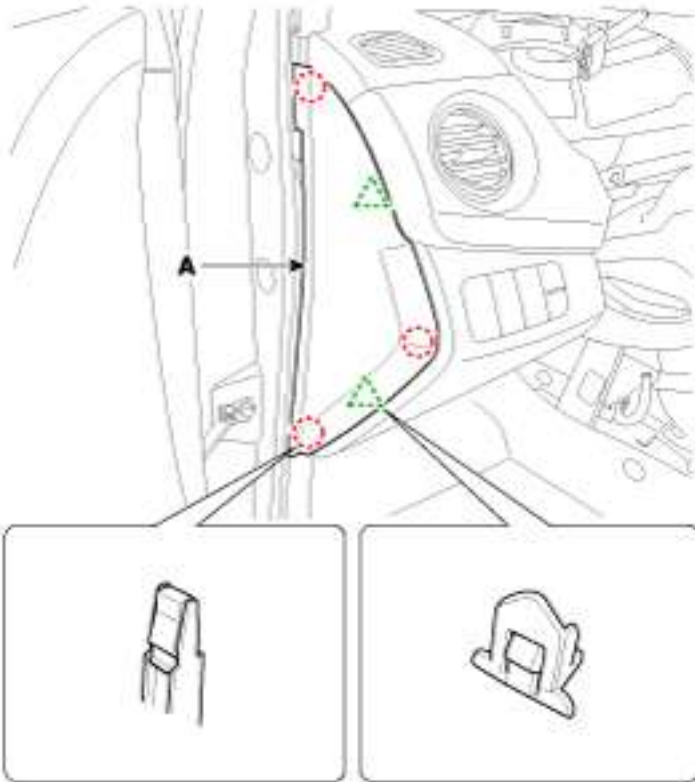
- Put on gloves to protect your hands.

NOTICE

- When prying with a flat-tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.
- Use a plastic panel removal tool to remove interior trim pieces to protect from marring the surface.
- Take care not to bend or scratch the trim and panels.

1. Using a screwdriver or remover, remove the crash pad side cover (A).

[LH]



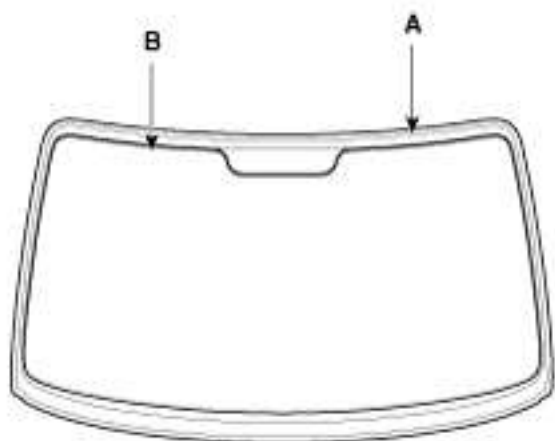
[RH]

7. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive (B) around the edge of the windshield glass (A) between the fastener and molding as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.

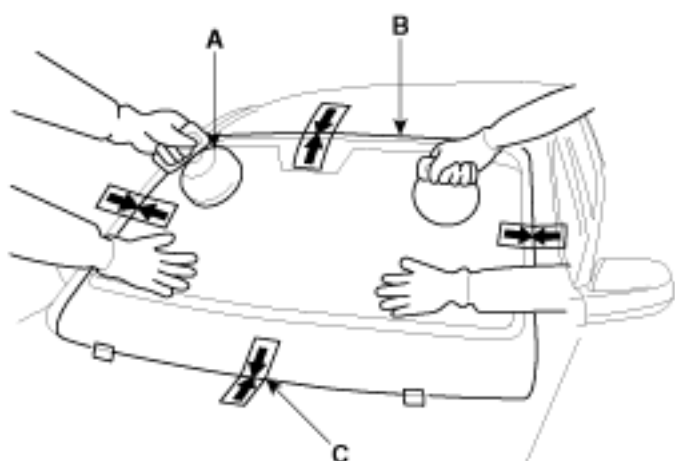
Sealant Bead width

Height : 12 mm (0.4724 in.)

Width : 8 mm (0.3150 in.)



8. Use suction cups (A) to hold the windshield glass (B) over the opening, align it with the alignment marks (C) made in step 15, and set it down on the adhesive. Lightly push on the windshield until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.



9. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the windshield, wipe with a soft shop towel dampened with alcohol.
10. Let the adhesive dry for at least one hour, then spray water over the roof and check for leaks. If a leak occurs, let it dry, then seal with sealant :

NOTICE

- Let the vehicle stand for at least four hours after windshield installation. If the vehicle must be driven within 4 hours, it must be driven slowly.
- Keep the windshield dry for the first hour after installation.

11. Install the inside rear view mirror assembly.

12. Install the cowl top cover.

13. Install the front pillar trim.

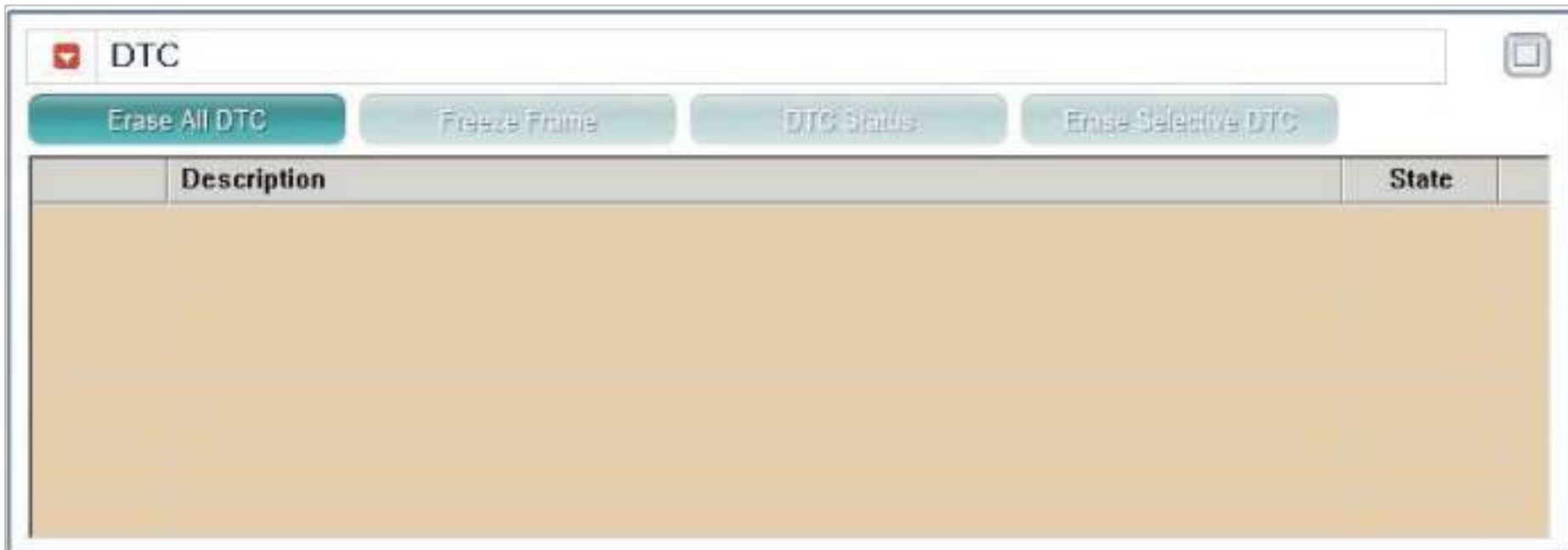


5. You can see the situation of each switch on scanner after connecting the "current data" process.

Display	Description
FL Toggle switch	ON : Push button is ON in the driver door handle.
FR Toggle switch	ON : Push button is ON in the assist door handle.
Trunk switch	ON : Trunk button is ON.
Gear P Position	ON : Shift lever is P position.
IGN 1	ON : IGN switch is IG position.
ACC	ON : IGN switch is ACC position.
Push Knob switch	ON : Push knob switch is ON.
External Buzzer	ON : Buzzer is ON.

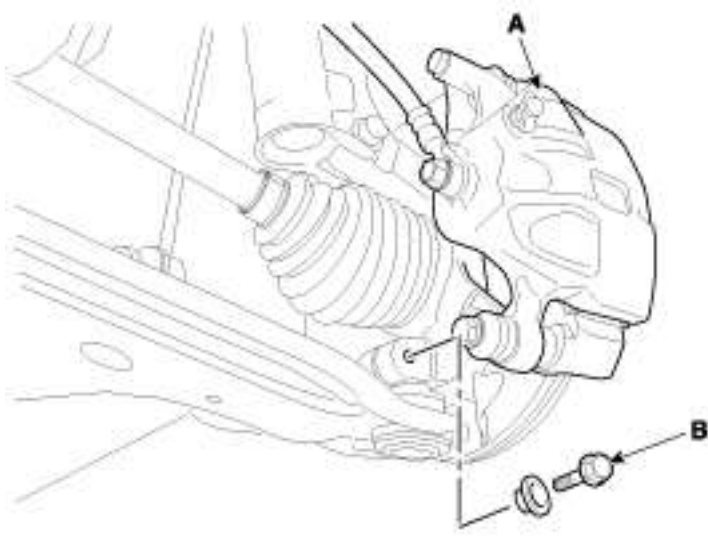
Communication Diagnosis With GDS (Self Diagnosis)

1. Communication diagnosis checks that the each linked components operates normal.
2. Connect the cable of GDS to the data link connector in driver side crash pad lower panel.
3. After IG ON, select the "DTC".



Antenna Actuation Diagnosis

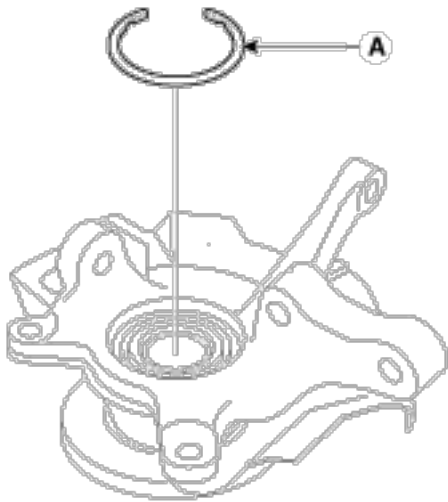
1. Connect the cable of GDS to the data link connector in driver side crash pad lower panel.
2. After IG ON, select the "ACTUATION TEST".



8. Installation is the reverse of the removal.

DISASSEMBLY

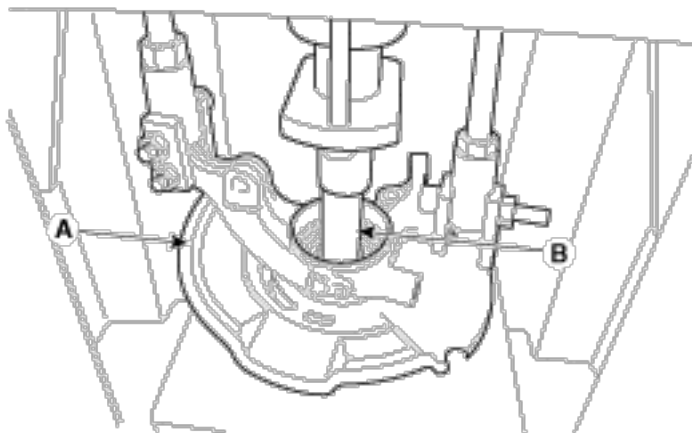
1. Remove the snap ring (A).



2. Remove the hub assembly from the knuckle assembly.

(1) Install the front knuckle assembly (A) on press.

(2) Lay a suitable adapter (B) upon the hub assembly shaft.



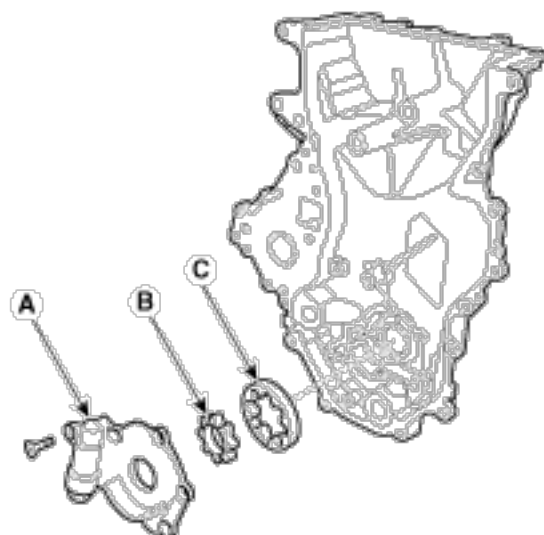
(3) Remove the hub assembly (B) from the knuckle assembly (A) by using press.

REMOVAL AND INSTALLATION

1. Remove the timing chain cover.
(Refer to Timing system - "Timing Chain Cover")
2. Remove the oil level gauge guide.
(Refer to Lubrication System - "Oil Level Gauge & Pipe")
3. Remove the oil pump cover (A), the inner rotor (B) and the outer rotor (C).

Tightening torque :

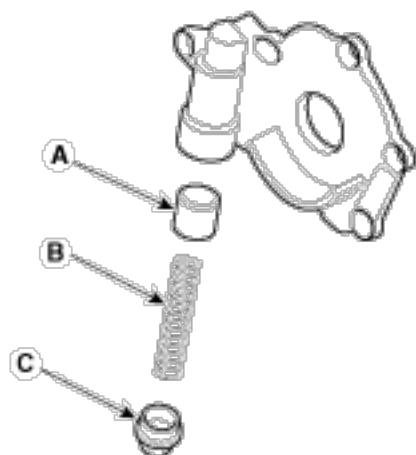
5.9 ~ 8.8N.m (0.6 ~ 0.9kgf.m, 4.3 ~ 6.5lb-ft)



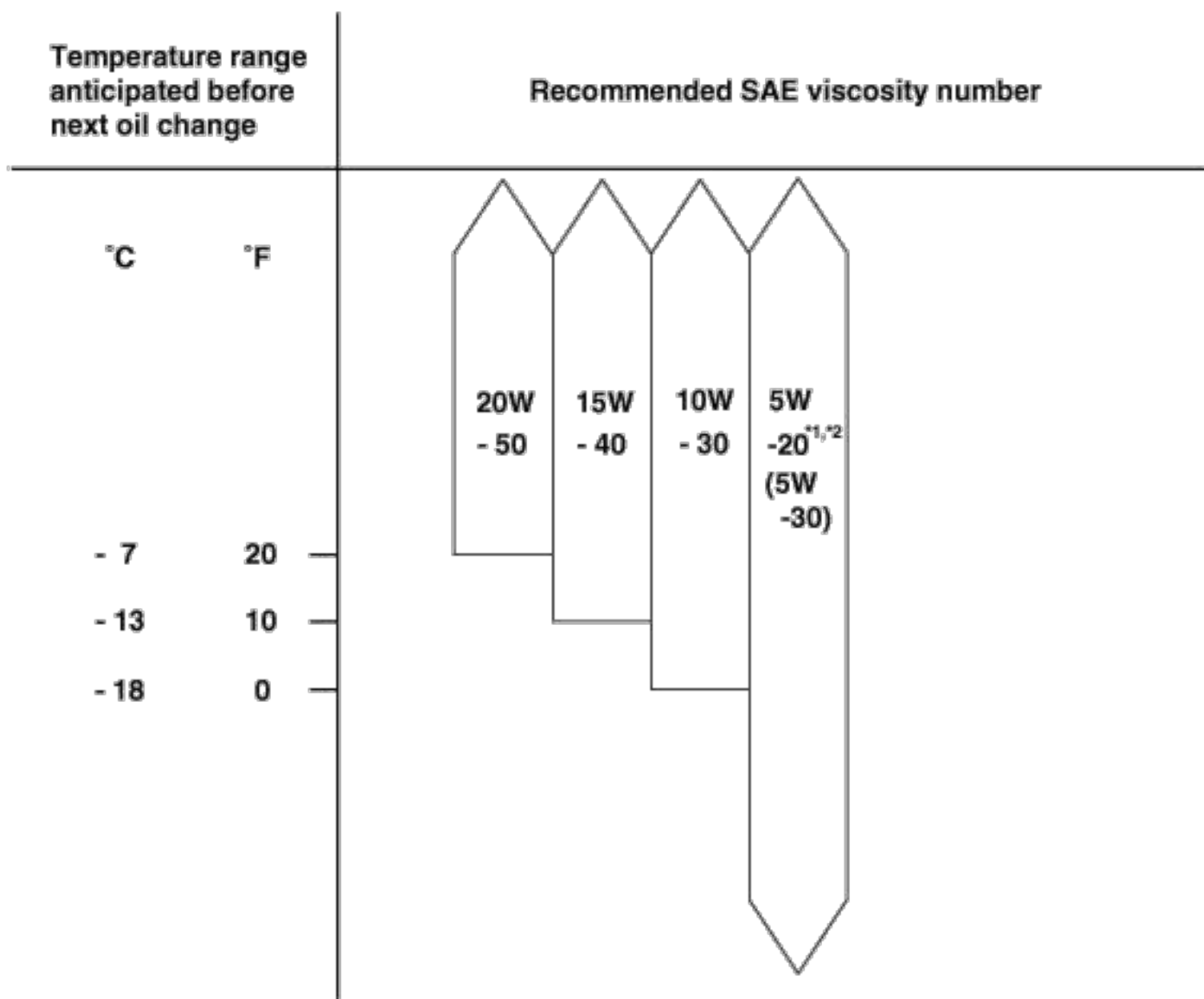
4. Installation is the reverse order of removal.
5. Refill the engine oil.

INSPECTION

1. Remove the relief plunger.
Remove the plug (A), spring (B) and relief plunger (C).



2. Inspect the relief plunger.
Coat the plunger with engine oil and check that it falls smoothly into the plunger hole by its own weight.
If necessary, replace timing chain cover.
3. Inspect the rotor side clearance.
Using a feeler gauge and precision straight edge, measure the clearance between the inner rotors and precision straight edge.



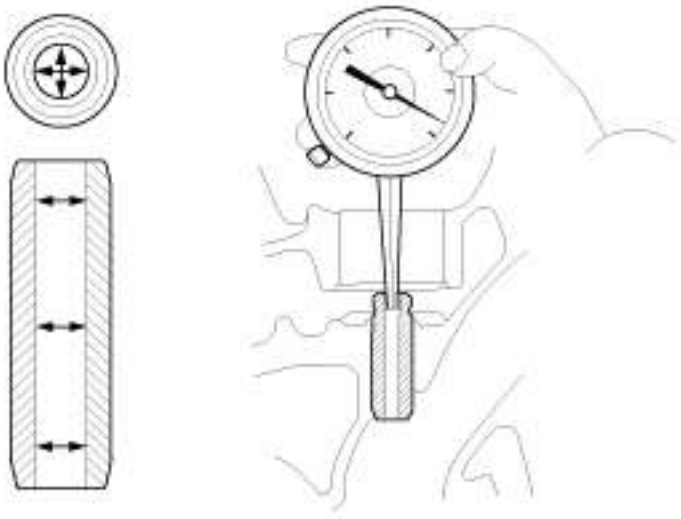
***1 If 5W-20 / GF4 engine oil is not available, 5W-30 or secondary recommended engine oil for corresponding temperature range can be used.**

***2 In Middle East, do not use the engine oil of viscosity grade SAE 5W-20.**

NOTICE

For best performance and maximum protection of all types of operation, select only those lubricants which :

- 1) Satisfy the requirement of the API or ILSAC classification.
- 2) Have proper SAE grade number for expected ambient temperature range.
- 3) Lubricants that do not have both an SAE grade number and API or ILSAC service classification on the container should not be used.

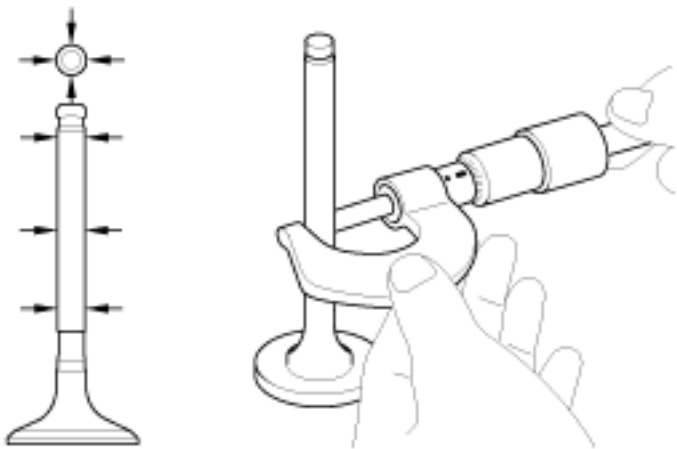


- (2) Using a micrometer, measure the diameter of the valve stem.

Valve stem O.D.

Intake : 5.465 ~ 5.480 mm (0.2151 ~ 0.2157 in)

Exhaust : 5.448 ~ 5.460 mm (0.2144 ~ 0.2149 in)



- (3) Subtract the valve stem diameter measurement from the valve guide inside diameter measurement.

Valve stem-to-guide clearance

Intake : 0.020 ~ 0.047 mm (0.00078 ~ 0.00185 in)

Exhaust : 0.040 ~ 0.064 mm (0.00157 ~ 0.00251 in)

2. Inspect valves.

- (1) Check the valve is ground to the correct valve face angle.

Valve face angle

Intake/Exhaust : 45.25° ~ 45.75°

- (2) Check that the surface of the valve for wear. If the valve face is worn, replace the valve.

- (3) Check the valve head margin thickness. If the margin thickness is less than minimum, replace the valve.

Margin

Intake : 1.5 mm (0.0590 in)

Exhaust : 1.75 mm (0.0688 in)

REMOVAL AND INSTALLATION

1. Disconnect the oil pressure switch connector (A) and then remove the oil pressure switch (B).

Tightening torque :

9.8 ~ 11.8 N.m (1.0 ~ 1.2 kgf.m, 7.2 ~ 8.7 lb-ft)



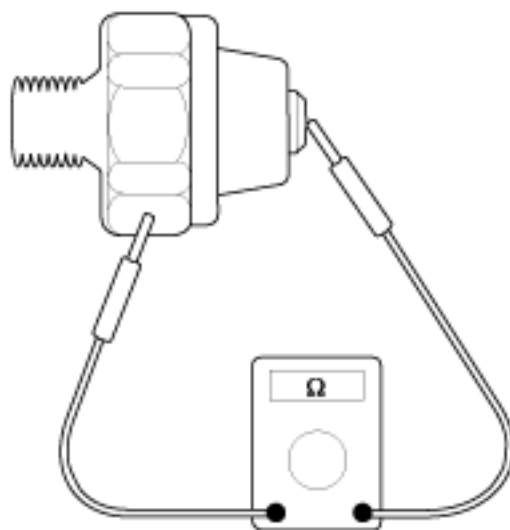
2. Install in the reverse order of removal.

NOTICE

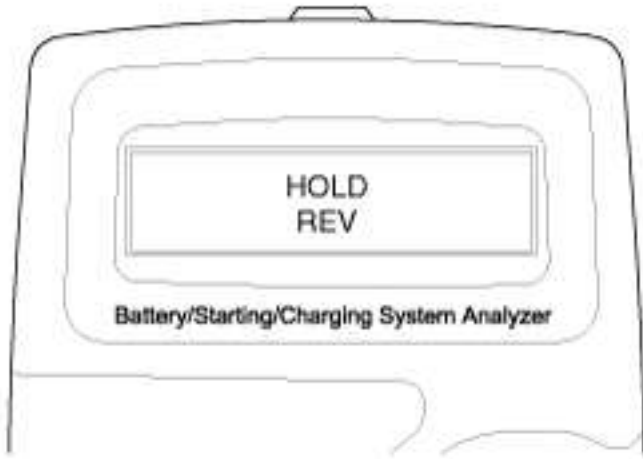
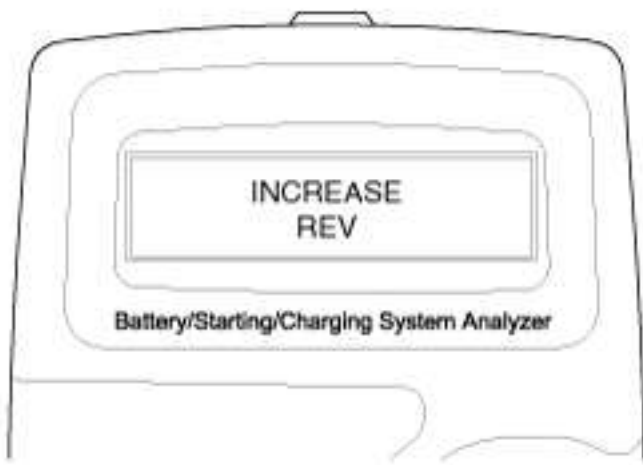
When installing the oil pressure switch, apply seal lock to the thread.

INSPECTION

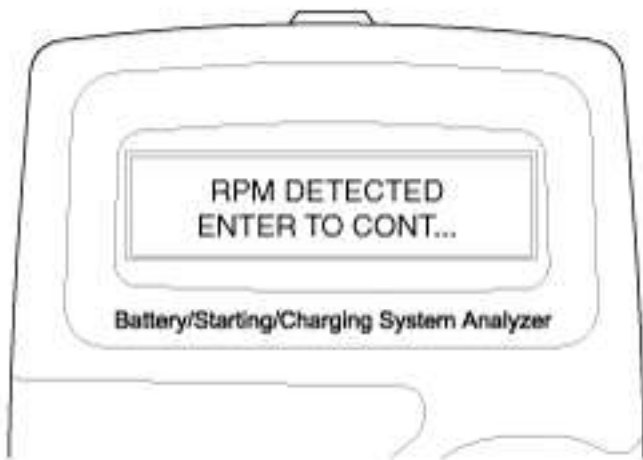
1. Check the continuity between the terminal and the body with an ohmmeter.
If there is no continuity, replace the oil pressure switch.



2. Check the continuity between the terminal and the body when the fine wire is pushed. If there is continuity even when the fine wire is pushed, replace the switch.
3. If there is no continuity when a 50kPa (0.50kgf/cm², 7.25psi) is applied through the oil hole, the switch is operating properly.
Check for air leakage. If air leaks, the diaphragm is broken. Replace it.



19. The message that engine RPM is detected will be displayed on the screen. Press ENTER to continue.



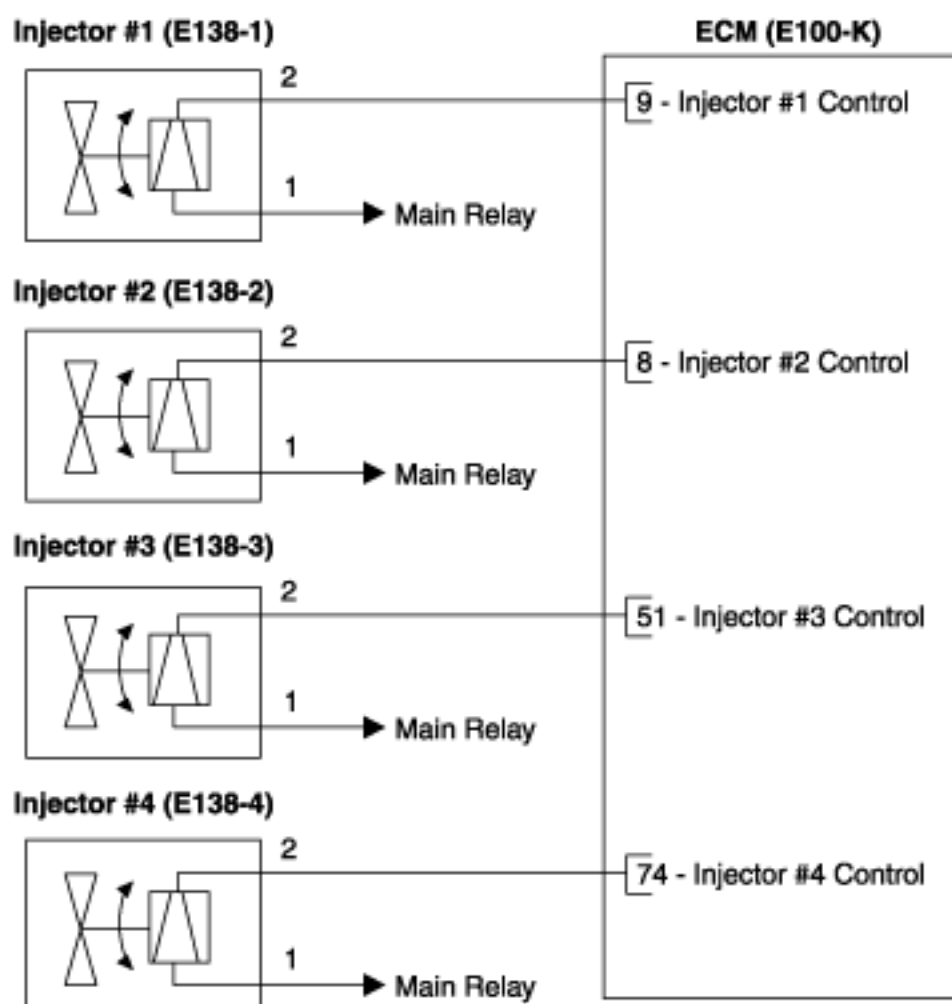
20. If the engine RPM is not detected, press ENTER after revving engine.



21. Turn off electrical loads (air conditioner, lamps, audio and etc). Turn the engine off.

CIRCUIT DIAGRAM

[Circuit Diagram]



[Connection Information]

Injector #1 (E138-1)

Terminal	Connected to	Function
1	Main Relay	Battery Power (B+)
2	ECM E100-K (9)	Injector #1 Control

Injector #2 (E138-2)

Terminal	Connected to	Function
1	Main Relay	Battery Power (B+)
2	ECM E100-K (8)	Injector #2 Control

Injector #3 (E138-3)

Terminal	Connected to	Function
1	Main Relay	Battery Power (B+)
2	ECM E100-K (51)	Injector #3 Control

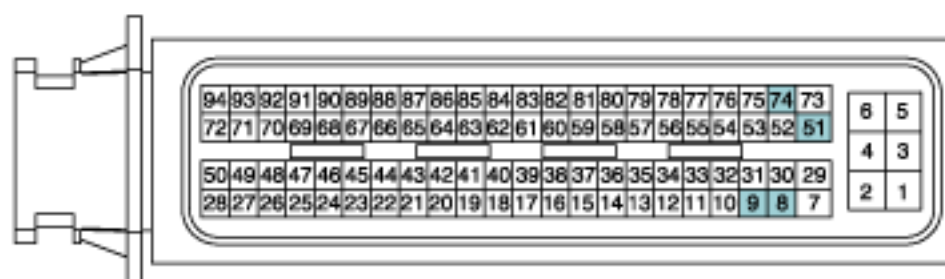
Injector #4 (E138-4)

Terminal	Connected to	Function
1	Main Relay	Battery Power (B+)
2	ECM E100-K (74)	Injector #4 Control

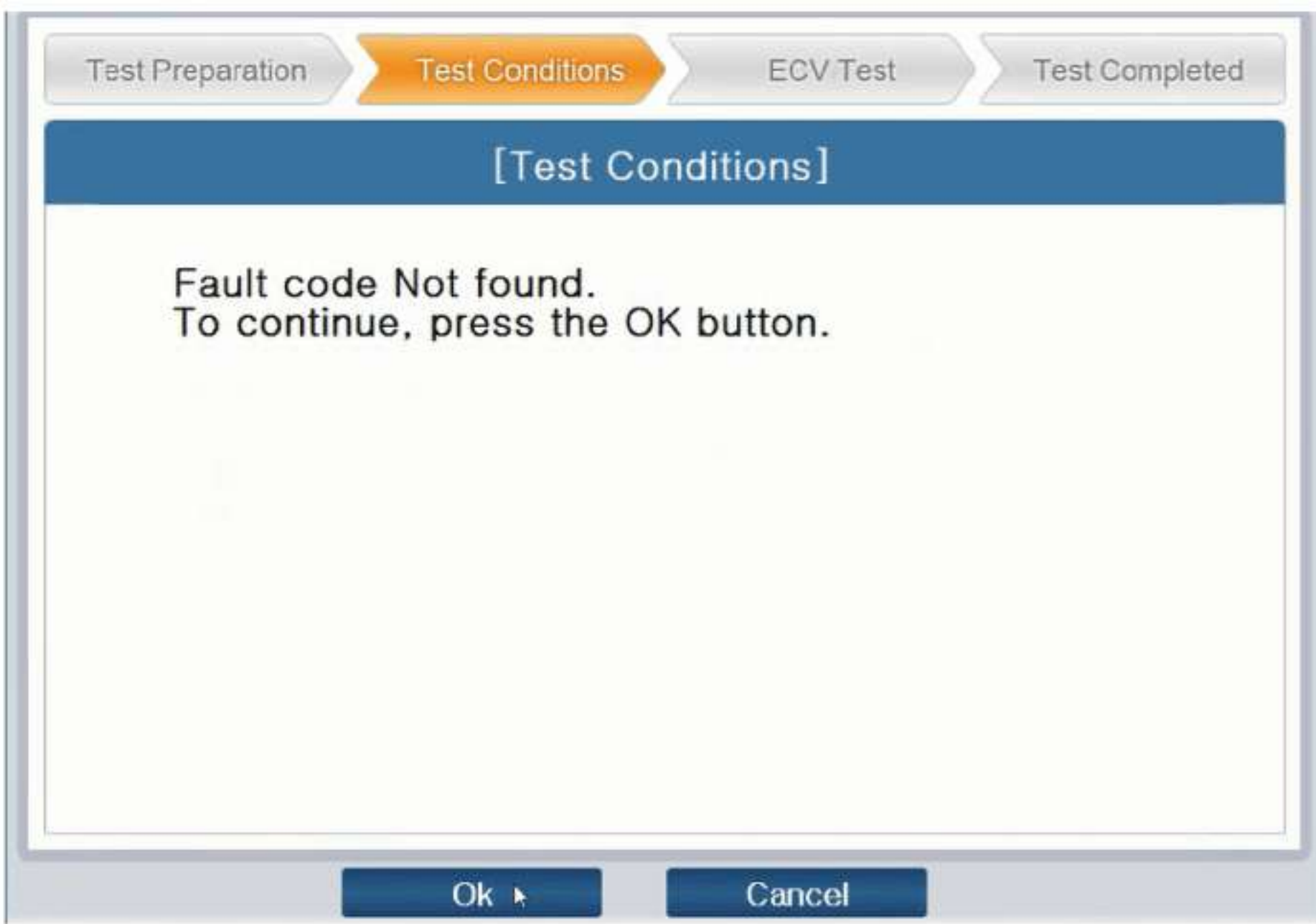
[Harness Connector]



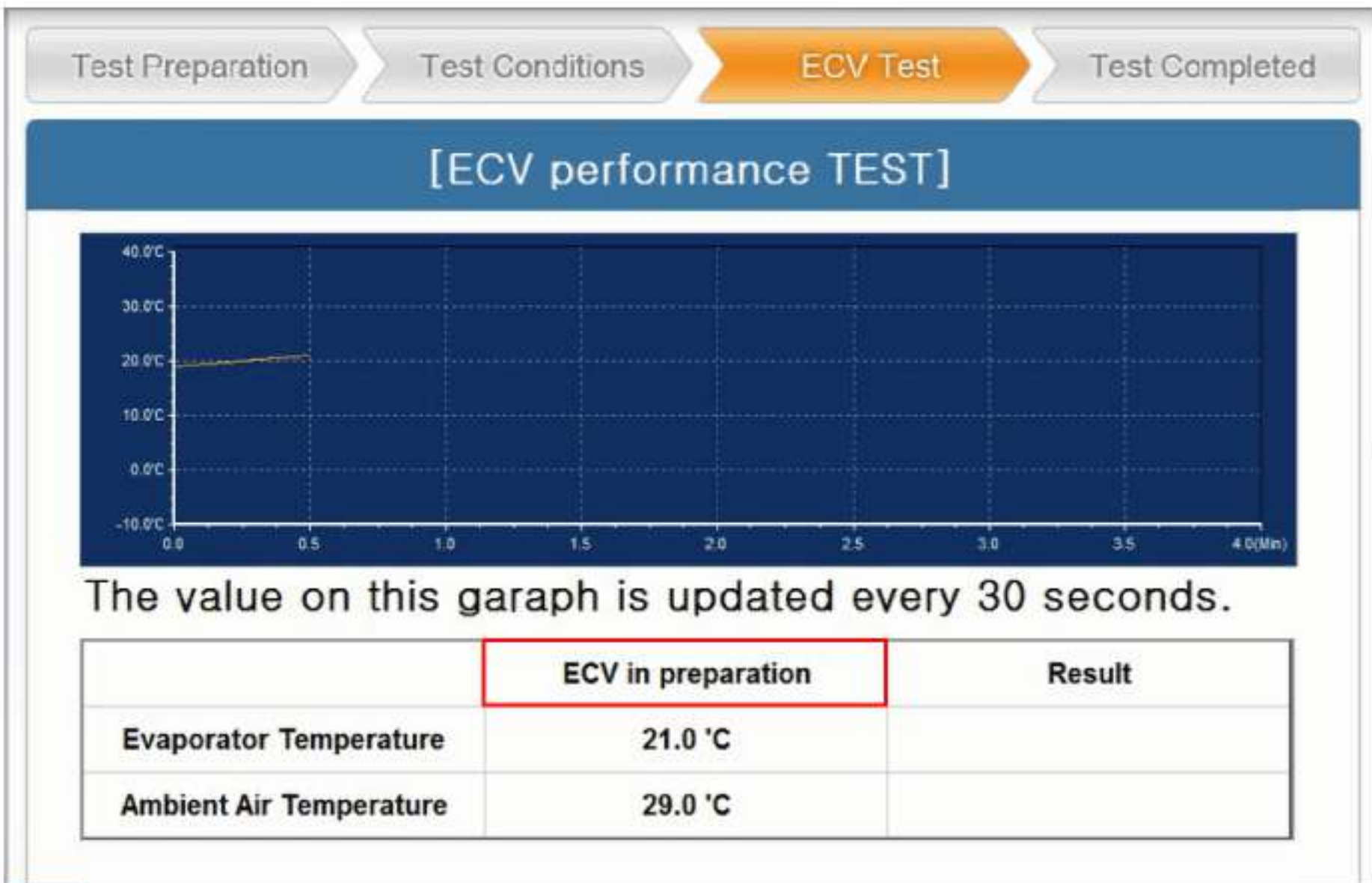
E138-1,2,3,4
Injector #1,2,3,4



E100-K
ECM



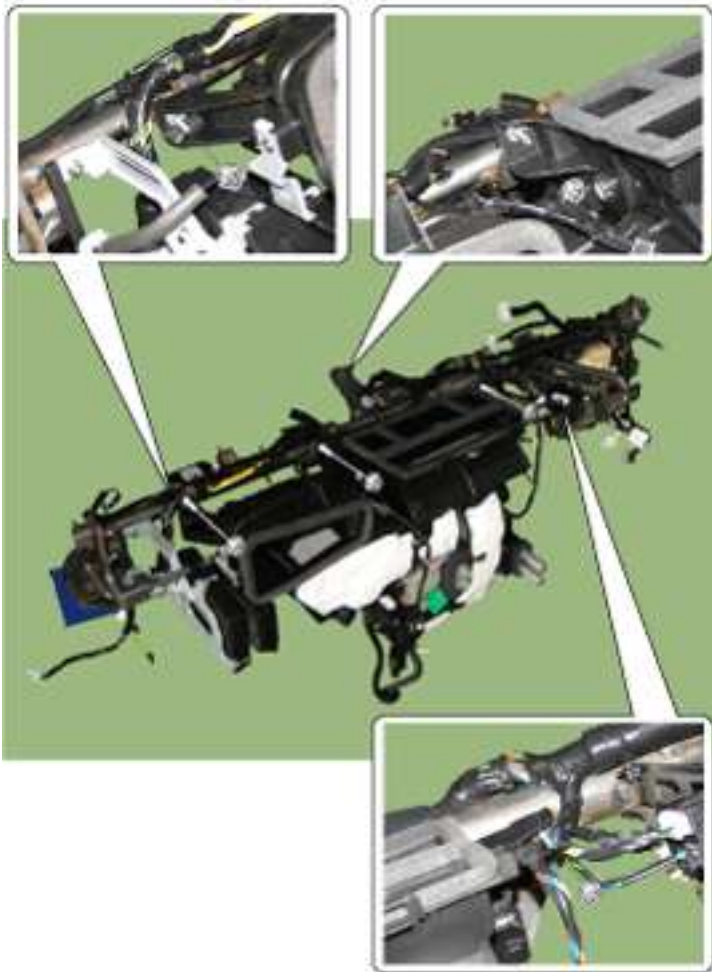
4. Start inspection.
[ECV5]



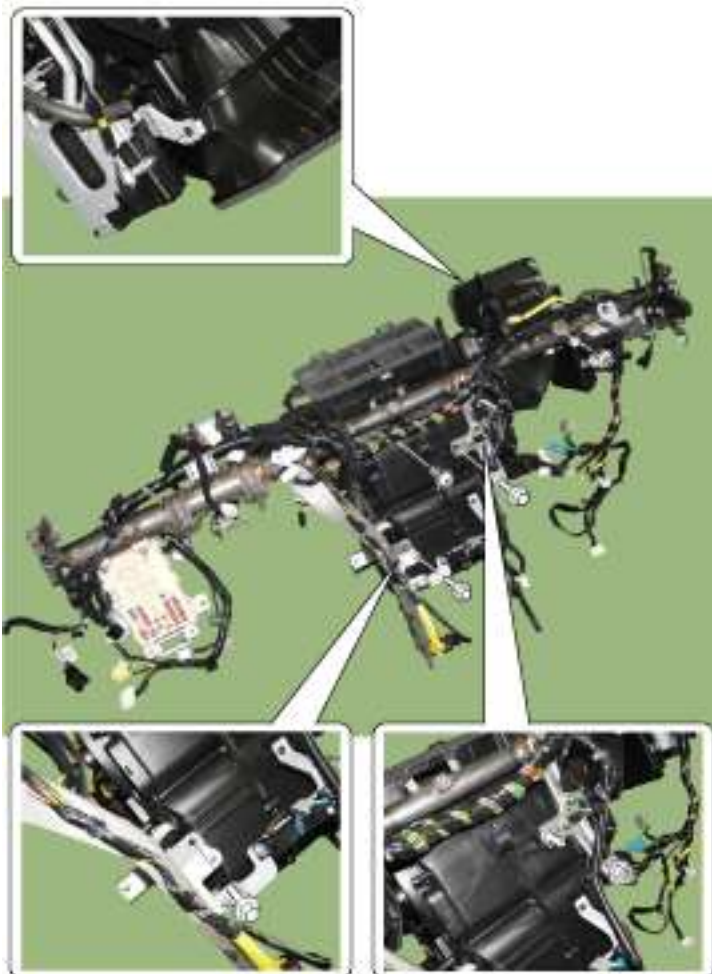
[ECV6]

16. Remove the heater & A/C control unit.
(Refer to Controller - " Heater & A/C Control Unit ")

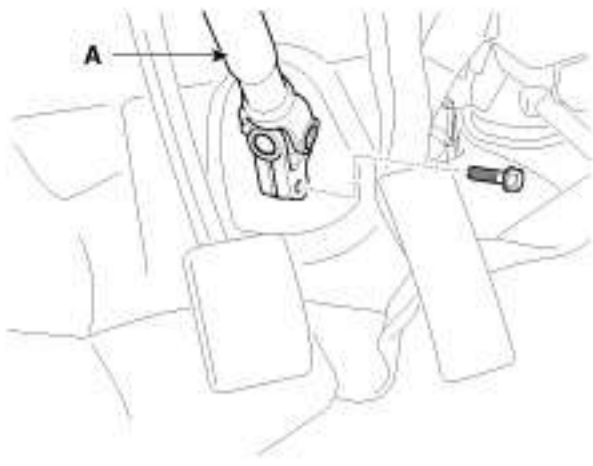
17. Loosen the nuts.



18. Loosen the bolts, a screw and a fastener.



19. Remove the heater core cover (A) after loosening the mounting screws.



NOTICE

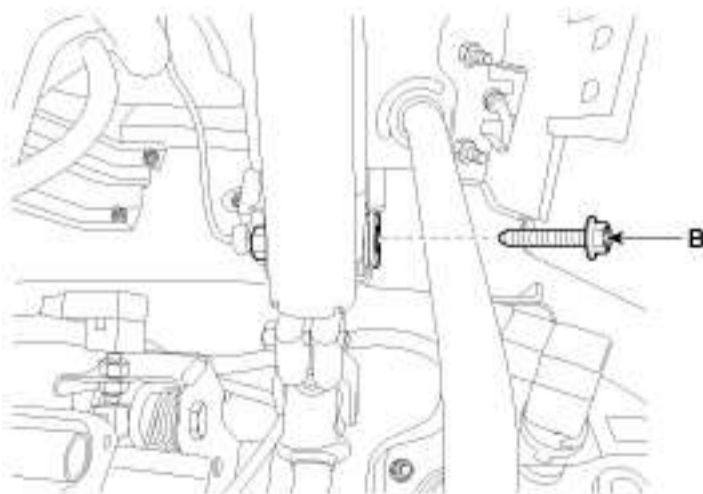
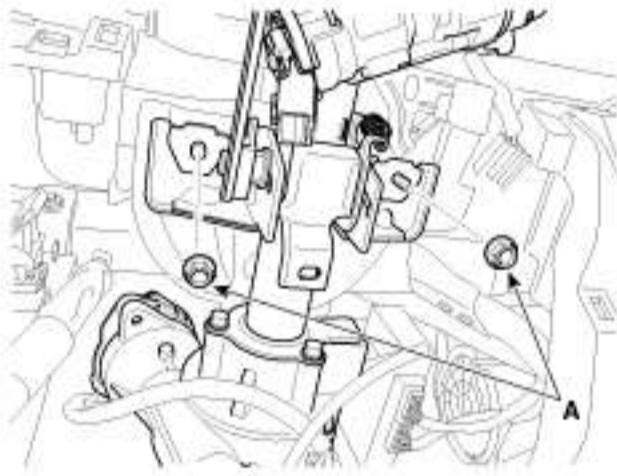
Lock the steering wheel in the straight ahead position to prevent the damage of the clock spring inner cable when you handle the steering wheel.

11. Disconnect all connectors connected the steering column & EPS unit assembly.
12. Remove the steering column & EPS control module by loosening the mounting bolt (B) and nuts (A).

Tightening torque :

Nut : 12.7 ~ 17.7 N.m(1.3 ~ 1.8 kgf.m, 9.4 ~ 13.0 lb-ft)

Bolt : 44.1 ~ 49.0 N.m(4.5 ~ 5.0 kgf.m, 32.5 ~ 36.2 lb-ft)



DISASSEMBLY

Key lock assembly

1. Make a groove on the head of special bolts (A) by a punch.