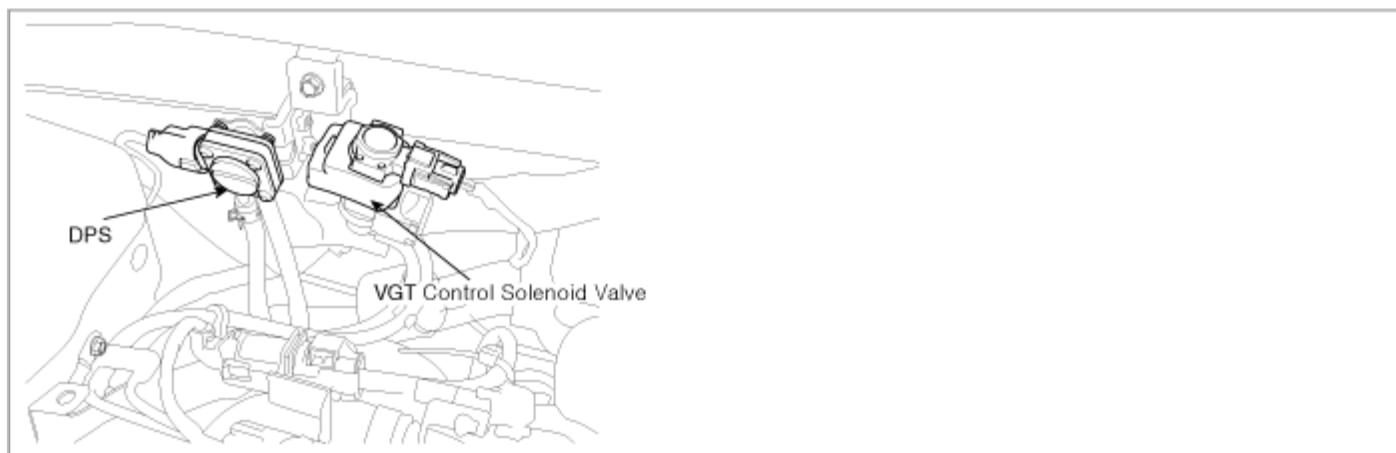


COMPONENT LOCATION



GENERAL DESCRIPTION

Heating combustion chamber, glow plug increases fuel ignitability and makes fuel in the foggy state easily when engine is cold. Thus, glow plug makes engine starting easily and decreases exhaust gas produced just after turning engine on when engine is cold. ECM controls operation and operating duration of glow plug relay which supplies power to glow plug with ECTS signal, battery voltage and IG KEY ON signal. Through glow lamp in cluster, ECM let drivers know if glow plug is ON.

DTC DESCRIPTION

P1326 is set when glow plug relay control circuit voltage does not drop and high voltage is detected for more than 1 sec. While glow plug relay is operated by ECM. This code is due to short to battery in glow plug relay control circuit.

DTC DETECTING CONDITION

Item	Detecting Condition			Possible Cause
DTC Strategy	• Voltage monitoring			• Glow relay control circuit • Glow relay component
Enable Conditions	• IG KEY "ON" (monitoring only performed within relay operating condition)			
Threshold Value	• Short to battery			
Diagnostic Time	• 1.0 sec.			
Fail Safe	Fuel cut	NO		
	EGR Off	NO		
	Fuel Limit	NO		
	Check Lamp	NO		

SPECIFICATION

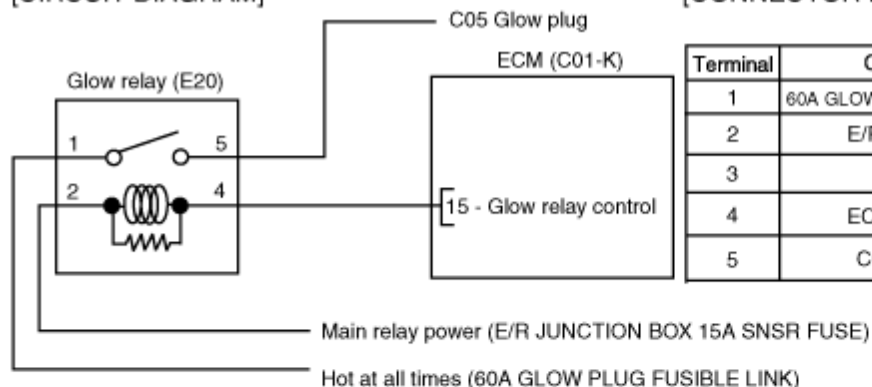
※ Relay operating time

	- 20°C	-10°C	10°C	50°C

10V	16sec	10sec	4sec	2.0sec
14.9V	16sec	10sec	4sec	2.0sec

SCHEMATIC DIAGRAM

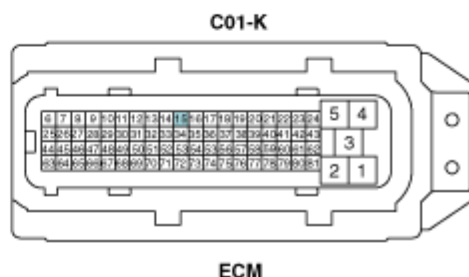
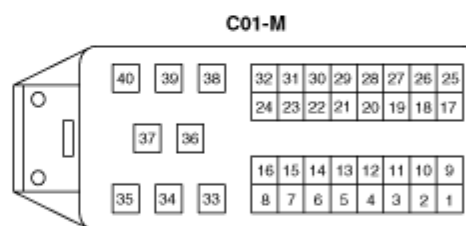
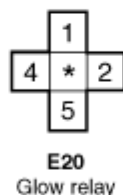
[CIRCUIT DIAGRAM]



[CONNECTOR INFORMATION]

Terminal	Connected to	Function
1	60A GLOW PLUG FUSIBLE LINK	Glow plug power(INPUT)
2	E/R-D terminal 6	Glow relay coil power
3	-	-
4	ECM C01-K (15)	Glow relay control
5	C05 terminal 1	Glow plug power(OUTPUT)

[HARNESS CONNECTOR]



MONITOR SCANTOOL DATA

1. Connect Scantool to Data Link Connector (DLC).
2. Warm engine up to normal operating temperature.
3. Turn "OFF" electrical devices and A/C.
4. Monitor "GLOW RELAY" parameter on the Scantool.

Specification : After operating according to engine coolant temperature and battery voltage, Glow relay turns "OFF".
at IG KEY "ON". (Refer to Specification)

1.2 CURRENT DATA		31/54
✖ BATTERY VOLTAGE	13.8 V	▲
✖ FUEL PRESSURE MEASURED	29.4 MPa	
✖ RAIL PRESS. REGULATOR1	17.9 %	
✖ AIR MASS PERCYLINDER	424.8mg/st	
✖ WATER TEMP.SENSOR	88.0 °C	■
✖ GLOW RELAY	ON	
✖ GLOW CONTROL LAMP	OFF	
✖ ENGINE SPEED SENSOR	794 rpm	▼
FIX	FULL	GRPH BCRD

Fig.1

1.5 ACTUATION TEST		08/15
GLOW RELAY		
DURATION	UNTIL STOP KEY	
METHOD	ACTIVATION	
CONDITION	IG.KEY ON ENGINE OFF	
PRESS [STRT], IF YOU ARE READY !		
STRT	STOP	

Fig.2

Fig 1) Operating state of Glow relay is shown. However, it is difficult to check operating state because Glow relay turns OFF 2~3 sec. after operation at normal temp.

Fig.2) Checking glow relay operation and power supply to glow plug using "ACTUATION TEST" on Scantool is convenient.

TERMINAL AND CONNECTOR INSPECTION

- Electrical systems consist of a lot of harness and connectors, poor connection of terminals can cause various problems and damage of component.
- Perform checking procedure as follows.
 - Check damage of harness and terminals : Check terminals for contact resistance, corrosion and deformation.
 - Check connecting condition of ECM and component connector : Check terminal separation, damage of locking device and connecting condition between terminal and wiring.

Disconnect the pin which requires checking at male connector and insert it to the terminal at female connector for checking connecting condition. (after checking, reconnect the pin at correct position.)

- Is the problem found?

YES

- ▶ Repair the trouble causing part and go to "Verification of Vehicle Repair".

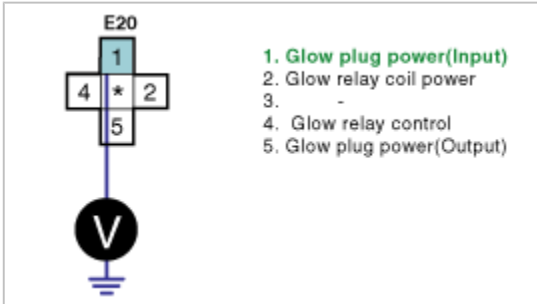
NO

- ▶ Go to "Power Circuit Inspection".

POWER CIRCUIT INSPECTION

- Check HOT AT ALL TIMES power circuit voltage
 - IG KEY "OFF", ENGINE "OFF".
 - Disconnect glow relay.
 - Measure the voltage of glow relay connector terminal 1.

Specification : 11.5V~13.0V



(4) Is the measured voltage within the specification?

YES

► Go to "2. Check IG KEY "ON" power circuit voltage" as follows.

NO

► Repair E/R FUSIBLE LINK BOX 60A GLOW PLUG FUSIBLE LINK and related circuit and go to "Verification of Vehicle Repair".

2. Check IG KEY "ON" power circuit voltage

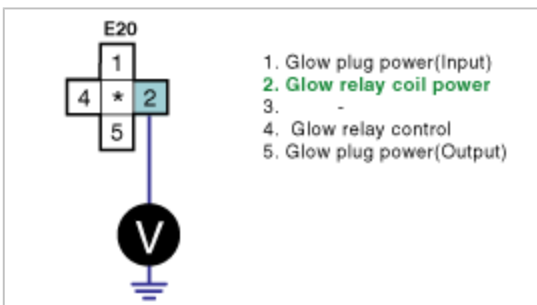
(1) IG KEY "OFF", ENGINE "OFF".

(2) Disconnect glow relay.

(3) IG KEY "ON".

(4) Measure the voltage of glow relay connector terminal 2.

Specification : 11.5V~13.0V



(5) Is the measured voltage within the specification?

YES

► Go to "Control Circuit Inspection".

NO

► Repair E/R JUNCTION BOX 15A EUN SEN fuse and related circuit and go to "Verification of Vehicle Repair".

CONTROL CIRCUIT INSPECTION

1. Check control circuit monitoring voltage

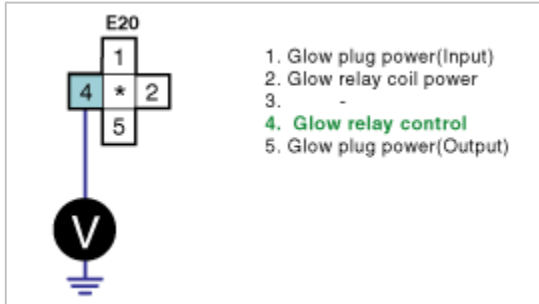
(1) IG KEY "OFF", ENGINE "OFF".

(2) Disconnect glow relay.

(3) IG KEY "ON".

(4) Measure the voltage of glow relay connector terminal 4.

Specification : 3.2V~3.7V



(5) Is the measured voltage within the specification?

YES

► Go to "Component Inspection".

NO

► When no value is detected : Go to "2. Check open in control circuit".

► When high voltage is detected : Repair short to battery in signal circuit and go to "Verification of Vehicle Repair".

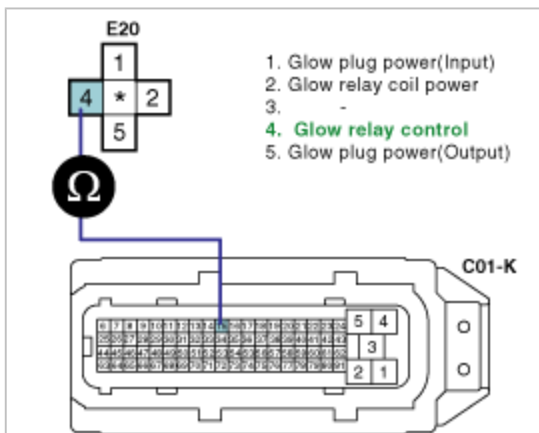
2. Check open in control circuit

(1) IG KEY "OFF", ENGINE "OFF".

(2) Disconnect glow relay and ECM connector.

(3) Check continuity between glow relay connector terminal 4 and ECM connector terminal 15.

Specification : Continuity (below 1.0Ω)



(4) Is the measured resistance within the specification?

YES

► Repair short to ground and go to "Verification of Vehicle Repair".

NO

► Repair open in control circuit and go to "Verification of Vehicle Repair".

COMPONENT INSPECTION

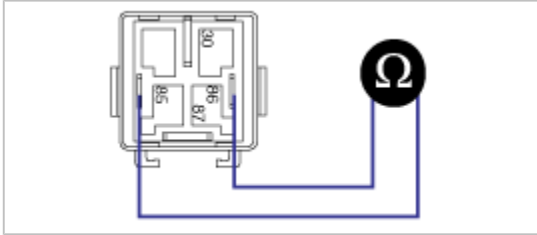
1. Check glow relay component coil resistance

(1) IG KEY "OFF", ENGINE "OFF".

(2) Disconnect glow relay.

(3) Measure the resistance of glow relay component coil.

Specification : 55±5 Ω (20°C)



(4) Is the measured resistance within the specification?

YES

► Go to "2. Check glow relay component operation" as follows.

NO

► Replace glow relay and go to "Verification of Vehicle Repair".

2. Check glow relay component operation

(1) IG KEY "OFF", ENGINE "OFF".

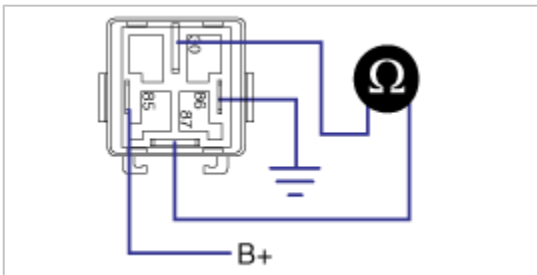
(2) Disconnect glow relay.

(3) Supplies random B+ and ground to coil sides of glow relay (terminal 85, terminal 86).

(4) Check continuity between glow relay terminal 30 and terminal 87.

Specification : When power is supplied : Continuity (below 1.0Ω)

When power is not supplied : Discontinuity (Infinite Ω)



(5) Is the measured resistance within the specification?

YES

► Go to "Verification of Vehicle Repair".

NO

► Replace glow relay and go to "Verification of Vehicle Repair".

※ Repeat this process 2~3 times.

VERIFICATION OF VEHICLE REPAIR

After a repair, it is essential to verify that the fault is corrected.

1. After connecting Scantool select "DIAGNOSTIC TROUBLE CODES(DTCs)" mode.

2. Clear recorded DTC using Scantool.

3. Drive the vehicle within DTC "Enable conditions" in "General information".

4. After selecting "DIAGNOSTIC TROUBLE CODES(DTCs)" mode and check if DTC is recorded again.

5. Are any DTCs recorded ?

YES

► Go to the DTC guide of recorded NO. in Scantool.

NO

► System operates within specification.