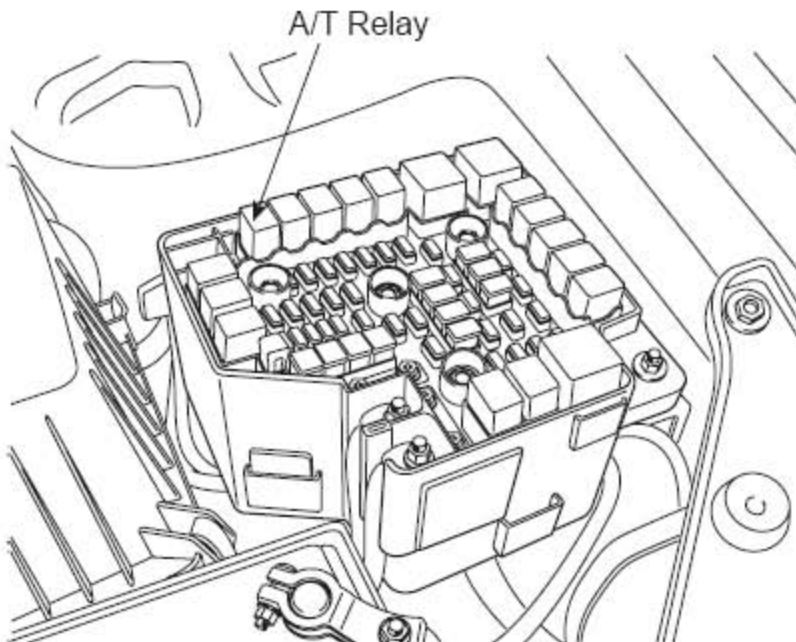


## P0890 AT RELAY - LOW CIRCUIT

### COMPONENT LOCATION



### GENERAL DESCRIPTION

The HIVEC Automatic Transmission supplies the power to the solenoid valves by way of a control relay. When the TCM sets the relay to ON, the relay operates and the battery power is supplied to all the solenoid valves. When the TCM sets the relay to OFF, all solenoid valve power is shut off and the transmission is held in the 3rd gear position. (Fail Safe Mode).

### DTC DESCRIPTION

The TCM checks the A/T control relay signal by monitoring the control signal. If, after the ignition key is turned on, an unexpected voltage value, which is quite a bit lower than battery voltage is detected, the TCM sets this code.

## DTC DETECTING CONDITION

Item	Detecting Condition	Possible cause
<b>DTC Strategy</b>	• Check voltage range	• Open or short in circuit
<b>Enable Conditions</b>	• 16V > Voltage Battery > 11V • Time after TCM turns on > 0.5sec	• Faulty A/T control relay • Faulty PCM/TCM
<b>Threshold value</b>	• Feedback Voltage ≤ 0.5V	
<b>Diagnostic Time</b>	• More than 1 second	
<b>Fail Safe</b>	• Locked in 3rd gear.(Control relay off)	

## MONITOR SCANTOOL DATA

- 1). Connect scantool to data link connector(DLC).
- 2). Ignition "ON" & Engine "OFF".
- 3). Monitor the "A/T CON. RELAY VOLT" parameter on the scantool.

**Specification :** Approx. B+

1.2 CURRENT DATA		24/27
× A/T CON. RELAY VOLT	14	V
BBRAKE SWITCH	ON	
SPORTS MODE SEL. SW.	OFF	
SPORTS MODE UP SW.	OFF	
SPORTS MODE DOWN SW.	OFF	
ENGINE TORQUE	17	%
DRIVING PATTERN	NORMAL	
DRIVING MODE	-	

FIG.1)

1.2 CURRENT DATA		24/27
× A/T CON. RELAY VOLT	0	V
HOLD SWITCH	STANDARD	
A/C SWITCH	OFF	
O/D SWITCH	OFF	
BBRAKE SWITCH	OFF	
SPORTS MODE SEL. SW.	OFF	
SPORTS MODE UP SW.	OFF	
SPORTS MODE DOWN SW.	OFF	

FIG.2)

FIG. 1) Normal status for "A/T RELAY"

FIG. 2) Open status for "A/T RELAY"

4). Is A/T RELAY VOLT within specifications?

**YES**

- ▶ Fault is intermittent caused by poor contact in the sensor's and/or TCM(PCM)'s connector or was repaired and TCM(PCM) memory was not cleared. Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration or damage. Repair or replace as necessary and go to "Verification of vehicle repair" procedure.

**NO**

- ▶ Go to "Terminal & connector inspection " procedure.

## **TERMINAL & CONNECTOR INSPECTION**

- 1). Many malfunctions in the electrical system are caused by poor harness and terminals. Faults can also be caused by interference from other electrical systems, and mechanical or chemical damage.
- 2). Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage.
- 3). Has a problem been found?

**YES**

- ▶ Repair as necessary and then go to "Verification of vehicle repair" procedure.

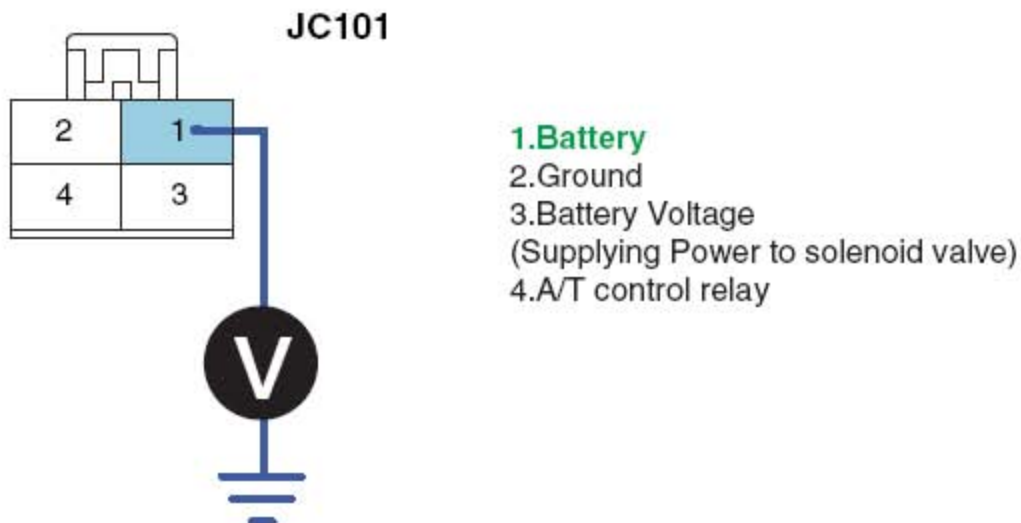
**NO**

- ▶ Go to "Power supply circuit inspection" procedure.

## **POWER SUPPLY CIRCUIT INSPECTION**

- 1). Ignition "ON" & Engine "OFF".
- 2). Disconnect "A/T CONTROL RELAY" connector.
- 3). Measure the voltage between terminal "1" of the "A/T CONTROL RELAY" harness(JC101) connector and chassis ground.

<b>Specification:</b> Approx. B+
----------------------------------



4). Is voltage within specifications?

**YES**

▶ Go to "Signal circuit inspection" procedure.

**NO**

▶ Check that A/T-20A fuse in engine room junction is installed or not blown.

▶ Check for open in harness. Repair as necessary and go to "Verification of vehicle repair" procedure.

## SIGNAL CIRCUIT INSPECTION

1). CHECK A/T control relay harness

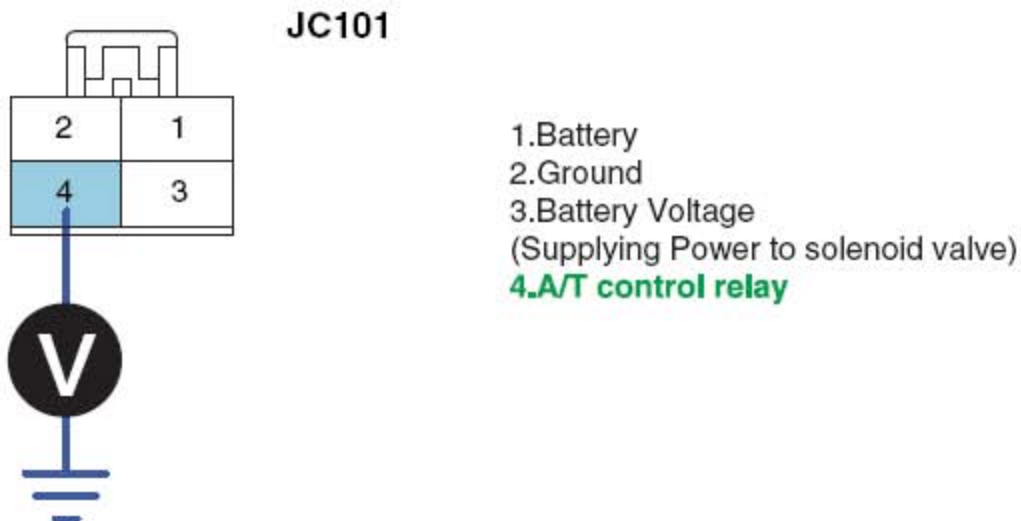
A) Ignition "OFF".

B) Disconnect the "A/T CONTROL RELAY" connector.

C) Measure the voltage between terminal "4" of the "A/T CONTROL RELAY" harness connector and chassis ground.

D) Engine OFF → ON.

**Specification:** 12V is measured only for approx. 0.5sec



E) Is voltage within specifications?

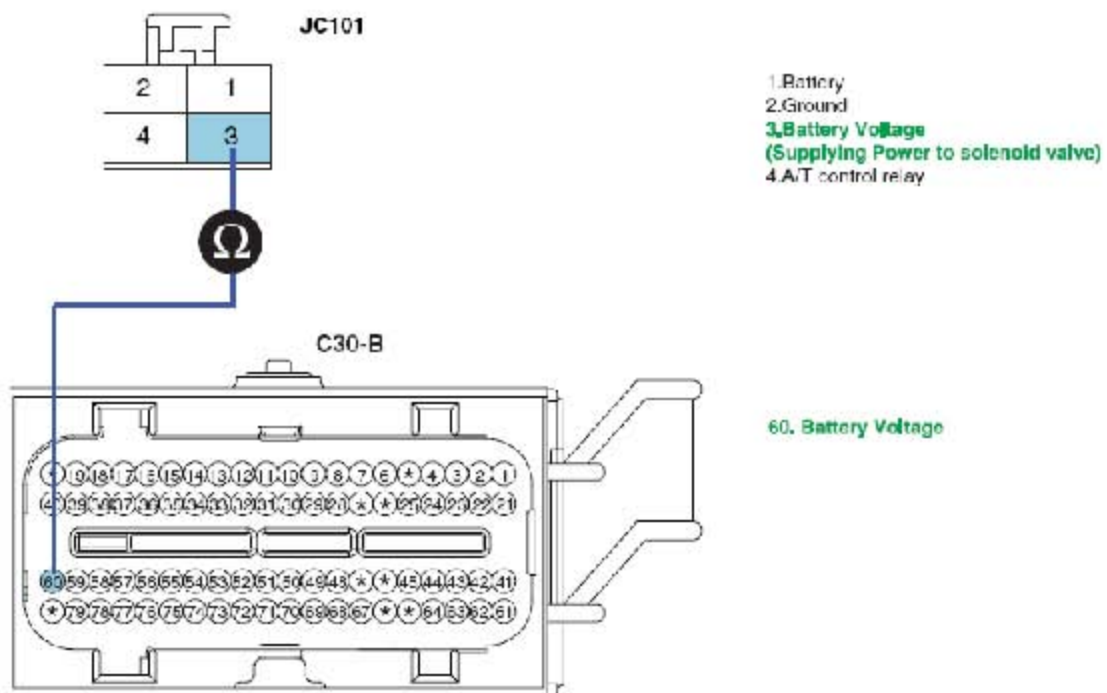
**YES**

- ▶ Go to "Check Supplying Power to solenoid valve" procedure.

**NO**

- ▶ Check for open in harness. Repair as necessary and go to "Verification of vehicle repair" procedure.
  - ▶ If signal circuit is OK, Substitute with a known-good PCM/TCM and check for proper operation. If the problem is corrected, replace PCM/TCM and then go to "Verification of Vehicle Repair" procedure.
- 2). Check signal circuit short inspection
- A) Ignition "OFF".
  - B) Disconnect "A/T CONTROL RELAY" connector and "PCM/TCM" connector.
  - C) Measure the resistance between terminal "3" of the "A/T CONTROL RELAY" harness connector and terminal "60" of the PCM/TCM harness connector.

<b>Specification:</b> Approx. 0 $\Omega$
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D) Is resistance within specifications?

**YES**

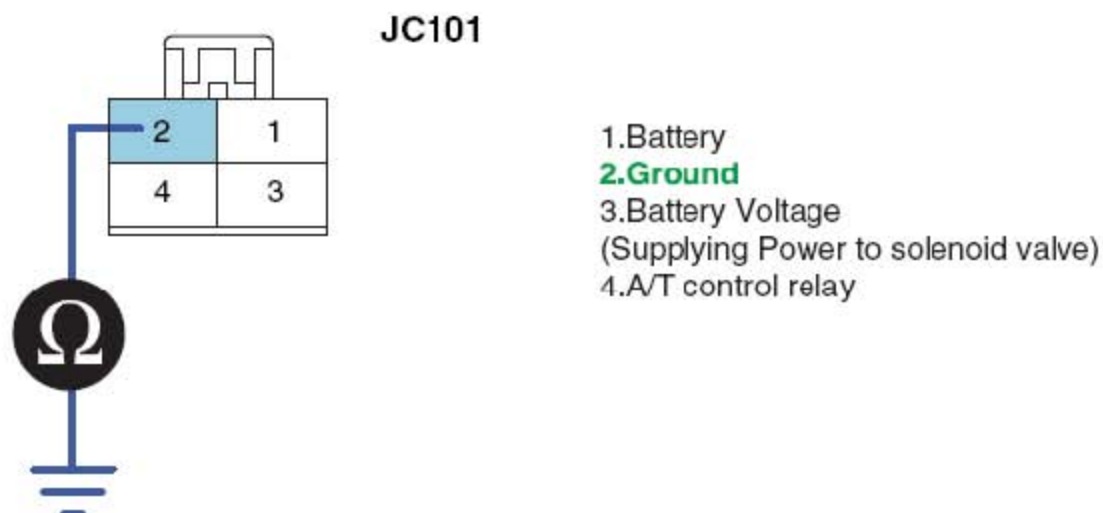
- ▶ Go to "Ground circuit inspection" procedure.

**NO**

- ▶ Check that A/T-15A Fuse in engine room junction is installed or not blown.
- ▶ Check for open in harness. Repair as necessary and Go to "Verification of Vehicle Repair" procedure.

## GROUND CIRCUIT INSPECTION

- 1). Ignition "OFF".
- 2). Connect the "A/T CONTROL RELAY" connector.
- 3). Measure the resistance between terminal "2" of the "A/T CONTROL RELAY" harness connector and chassis ground.



4). Is resistance within specifications?

**YES**

- ▶ Thoroughly check connectors for looseness, poor connection, bending, corrosion, contamination, deterioration, or damage. Repair or replace as necessary and then go to "Verification of Vehicle Repair" procedure.

**NO**

- ▶ Replace FRONT AREA MODULE and then go to "Verification of Vehicle Repair" procedure.

## VERIFICATION OF VEHICLE REPAIR

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

- 1). Connect scan tool and select "Diagnostic Trouble Codes(DTCs)" mode.
- 2). Using a scantool, Clear DTC.
- 3). Operate the vehicle within DTC Enable conditions in general information.
- 4). Are any DTCs present ?

**YES**

- ▶ Go to the applicable troubleshooting procedure.

**NO**

- ▶ System performing to specification at this time.