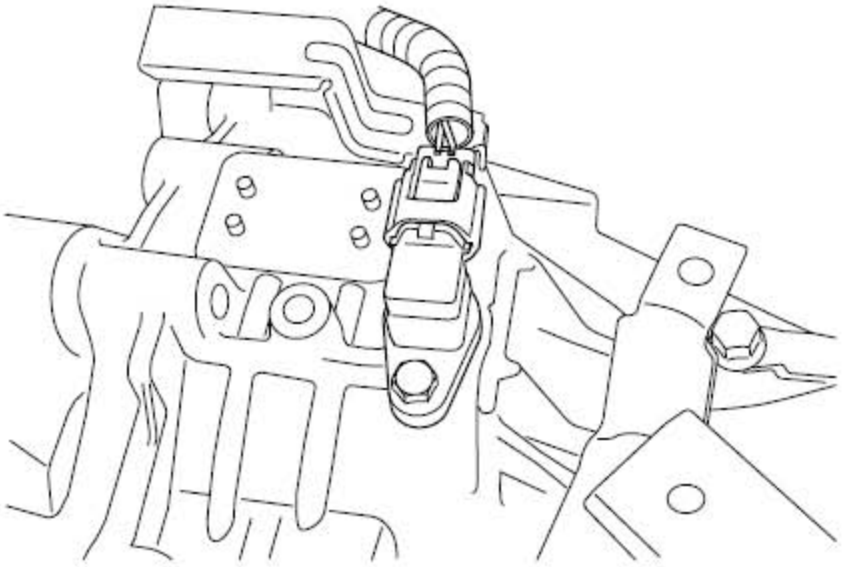
P0722 OUTPUT SPEED SENSOR CIRCUIT - NO SIGNAL

COMPONENT LOCATION



GENERAL DESCRIPTION

The Output Speed Sensor outputs pulse-signals according to the revolutions of the output shaft of the transmission. The Output Speed Sensor is installed in front of the Transfer Drive Gear to determine the Transfer Drive Gear rpms by counting the frequency of the pulses. This value, together with the throttle position data, is mainly used to decide the optimum gear position.

DTC DESCRIPTION

The TCM sets this code if the calculated value of the pulse-signal is noticeably different from the value calculated, using the Vehicle Speed Sensor output, when the vehicle is running faster than 30 km/h. The TCM will initiate the fail safe function if this code is detected.

DTC DETECTING CONDITION

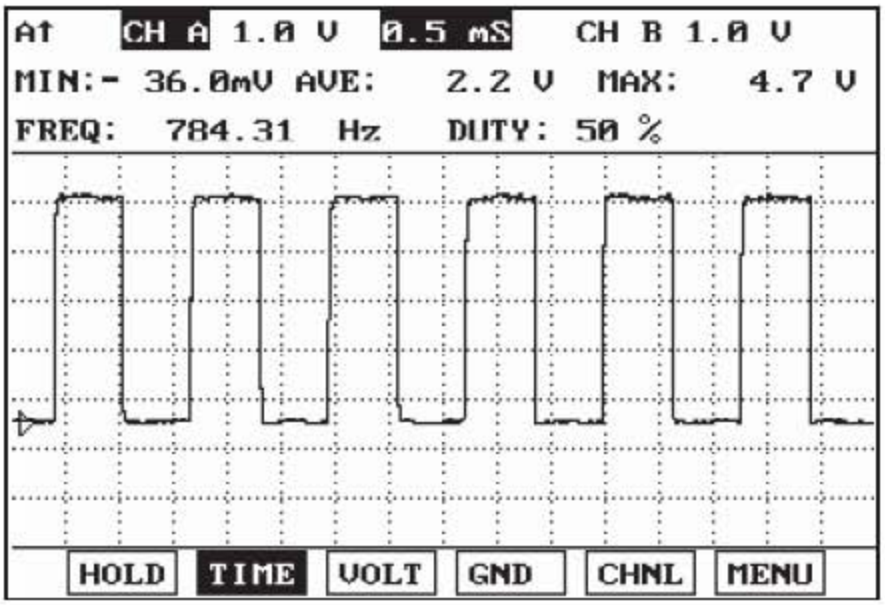
Item	Detecting Condition	Possible cause
DTC Strategy	• Speed rationality check	• Signal circuit is open or short. • Sensor power circuit is open • Sensor ground circuit is open • Faulty INPUT SPEED SENSOR • Faulty PCM/TCM
Enable Conditions	• Vehicle speed is over 19 Mile/h(30 Km/h) and Ne≥ 1000rpm in D,3,2,L(A/T range switch) and SP(SPORTS MODE) • 11V ≤ Battery Voltage ≤ 16V • TM oil temperature ≥ -23 C(-9.4 F)	
Threshold value	• Vehicle speed calculated from output speed ≤ 10%(the vehicle speed from vehicle speed sensor)	
Diagnostic Time	• More than 1sec	
Fail Safe	• Locked into 3rd or 2nd gear. • Apply an electric current to solenoid valve • Manual shifting is possible(2 nd → 3 rd, 3 rd → 2 nd)	

SPECIFICATION

Input shaft & Output shaft speed sensor

Type : Hall sensor Current consumption : 22mA(MAX) Sensor body and sensor connector have been unified as one.

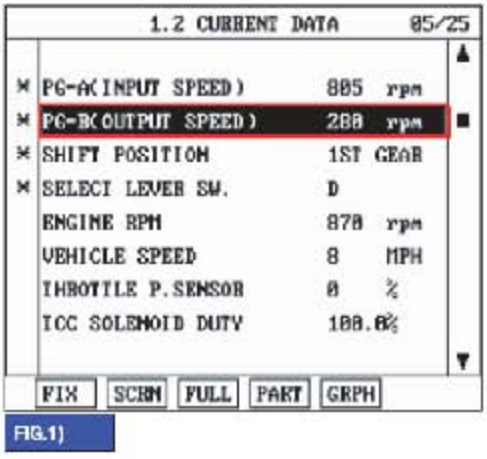
SIGNAL WAVEFORM



MONITOR SCANTOOL DATA

1). Connect scan tool to data link connector(DLC).
2). Engine "ON".
3). Monitor the "INPUT SPEED SENSOR" parameter on the scantool.
4). Driving at speed of over 19 Mile/h(30 Km/h).

Specification : Increasing Gradually



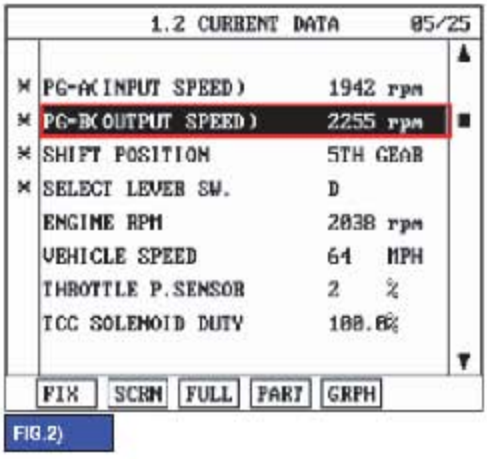


FIG.1) Idling
FIG.2) Accelerating

5). Does "Input speed sensor" follow the reference data?

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 may be caused from poor harness and terminals. These faults can 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 go to "Verification of vehicle repair" procedure.

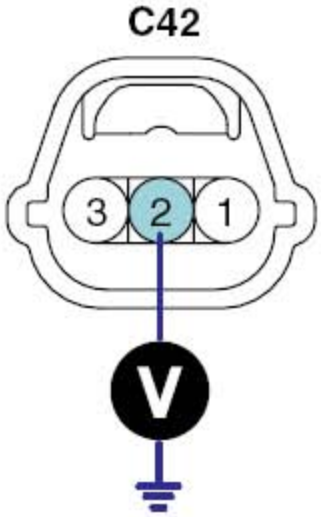
NO

- Go to "Signal circuit inspection" procedure.

SIGNAL CIRCUIT INSPECTION

1). Ignition "ON" & Engine "OFF".
2). Disconnect the "INPUT SPEED SENSOR" connector.
3). Measure voltage between terminal "2" of the INPUT SPEED SENSOR harness connector and chassis ground.

Specification : approx. 5V



1. Sensor ground
2. Input speed sensor
3. Power supply IG1

4). Is voltage within specification?

YES

▶ Go to "Power circuit Inspection" procedure.

NO

- ▶ Check for open or short in harness. Repair as necessary and Go to "Verification of Vehicle Repair" procedure.
- ▶ If signal circuit in harness is OK, Go to "Check PCM/TCM" of the "Component Inspection" procedure.

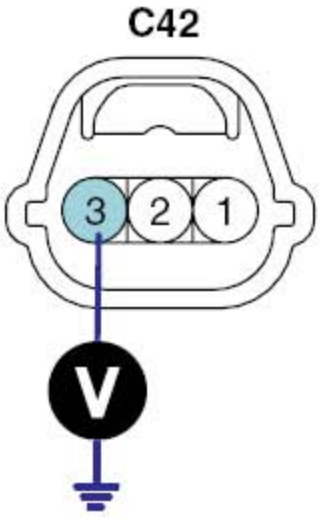
POWER SUPPLY CIRCUIT INSPECTION

1). Ignition "ON" & Engine "OFF".

2). Disconnect the "INPUT SPEED SENSOR" connector.

3). Measure voltage between terminal "3" of the INPUT SPEED SENSOR harness connector and chassis ground.

Specification : approx. B+



1. Sensor ground
2. Input speed sensor
3. **Power supply IG1**

4). Is voltage within specification?

YES

- Go to "Ground circuit inspection" procedure.

NO

- Check for open in harness. Repair as necessary and Go to "Verification of Vehicle Repair" procedure.

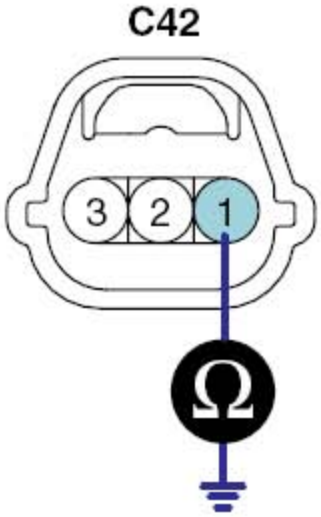
GROUND CIRCUIT INSPECTION

1). Ignition "ON" & Engine "OFF".

2). Disconnect the "INPUT SPEED SENSOR" connector.

3). Measure resistance between terminal "1" of the INPUT SPEED SENSOR harness connector and chassis ground.

Specification : approx. 0 Ω



1. **Sensor ground**
2. Input speed sensor
3. Power supply IG1

4). Is resistance within specification ?

YES

- Go to "Component Inspection" procedure.

NO

- Check for open in harness. Repair as necessary and Go to "Verification of Vehicle Repair" procedure.
- If ground circuit in harness is OK, Go to "Check PCM/TCM" of the "Component Inspection" procedure.

COMPONENT INSPECTION

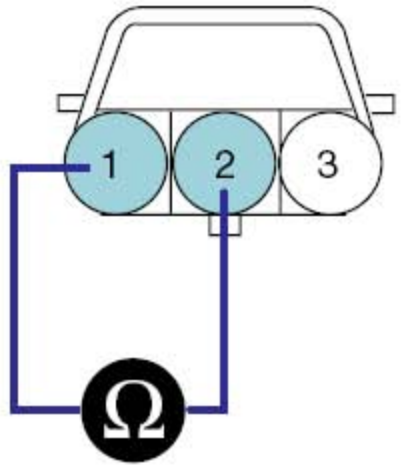
1). Check "INPUT SPEED SENSOR"

A). Ignition "OFF".

B). Disconnect the "INPUT SPEED SENSOR" connector.

C). Measure resistance between terminal "1","2" and "2","3" and "1","3" of the "INPUT SPEED SENSOR" connector.

Specification : Refer to "Reference data"



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Component side

1. Sensor ground
2. Input speed sensor
3. Power supply IG1

D). Is resistance within specifications?

[REFERENCE DATA]

Data	Reference Data	
Current	22 mA	
Air Gap	Input sensor	1.3 mm
	Output sensor	0.85 mm
Resistance	Input sensor	Above 4 MΩ
	Output sensor	Above 4 MΩ
Voltage	High	4.8~5.2V
	Low	Below 0.8V

YES

- Go to "CHECK PCM" as below.

NO

- Replace "INPUT SPEED SENSOR" as necessary and Go to "Verification of Vehicle Repair" procedure.

2). CHECK PCM/TCM

A). Ignition "ON" & Engine "OFF".

B). Connect "INPUT SPEED SENSOR" connector.

C). Install scantool and select a SIMU-SCAN.

D). Simulate frequency to INPUT SPEED SENSOR signal circuit.

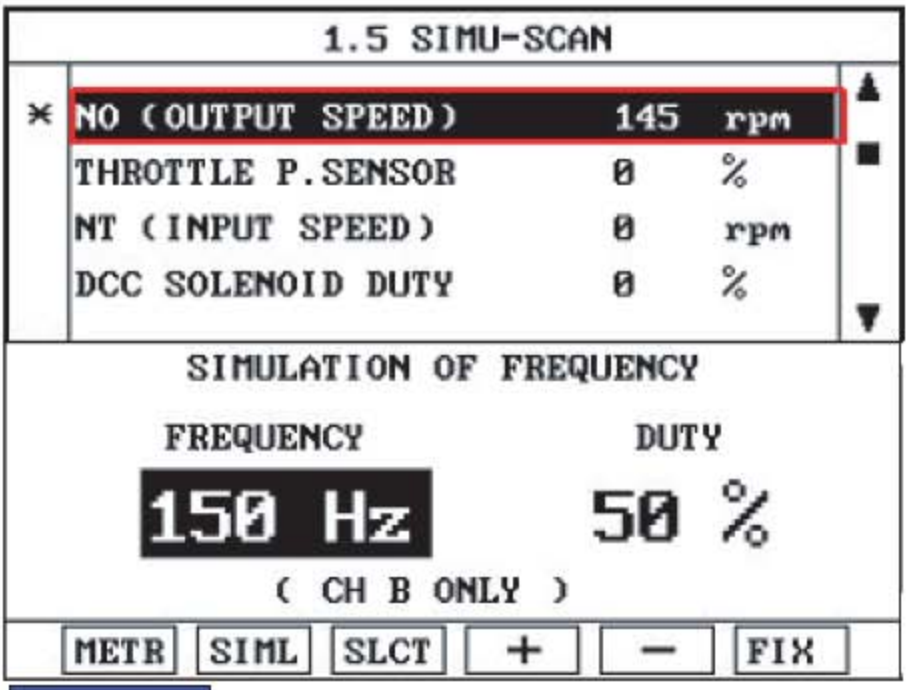

FIG.1)

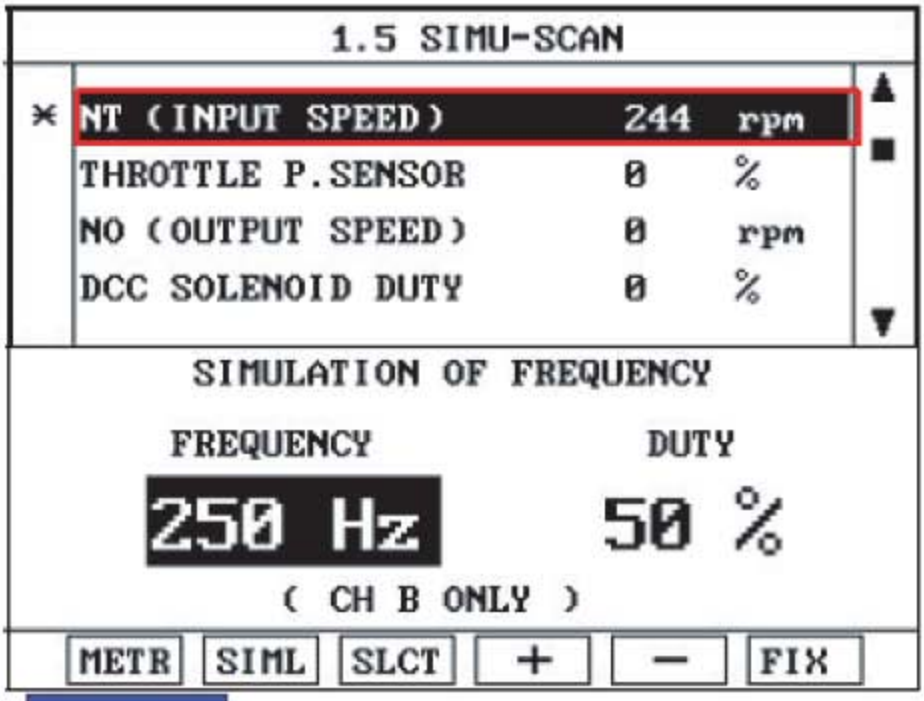

FIG.2)

FIG.1) INPUT 150Hz → 145 rpm
FIG.2) INPUT 250Hz → 244 rpm

E). Is "OUTPUT SPEED SENSOR" signal value changed according to simulation frequency?

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

- Substitute with a known-good PCM/TCM and check for proper operation. If the problem is corrected, replace PCM/TCM as necessary 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 scan tool, Clear DTC.
3). Operate the vehicle within DTC Enable conditions in General information.
4). Is resistance within specification ?

YES

- Go to the applicable troubleshooting procedure.

NO

- System performing to specification at this time.