SECTION AT
AUTOMATIC TRANSMISSION

CONTENTS

INDEX FOR DTC

PFP:00024

Alphabetical Index

ECS0021I

NOTE:
If DTC U1000 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000. Refer to AT-79 .

Items (CONSULT-II screen terms)	DTC		Reference page
	OBD-II	Except OBD-II	
	CONSULT-II GST*1	CONSULT-II only “A/T”	
A/T 1ST E/BRAKING	—	P1731	AT-135
ATF PRES SW 1/CIRC	—	P1841	AT-172
ATF PRES SW 3/CIRC	—	P1843	AT-175
ATF PRES SW 5/CIRC	—	P1845	AT-178
ATF PRES SW 6/CIRC	—	P1846	AT-181
A/T INTERLOCK	P1730	P1730	AT-129
A/T TCC S/V FNCTN	P0744	P0744	AT-97
ATF TEMP SEN/CIRC	P1710	P1710	AT-118
CAN COMM CIRCUIT	U1000	U1000	AT-79
D/C SOLENOID/CIRC	P1762	P1762	AT-150
D/C SOLENOID FNCTN	P1764	P1764	AT-153
ENGINE SPEED SIG	—	P0725	AT-92
FR/B SOLENOID/CIRC	P1757	P1757	AT-144
FR/B SOLENOID FNCT	P1759	P1759	AT-147
HLR/C SOL/CIRC	P1767	P1767	AT-156
HLR/C SOL FNCTN	P1769	P1769	AT-159
I/C SOLENOID/CIRC	P1752	P1752	AT-138
I/C SOLENOID FNCTN	P1754	P1754	AT-141
L/PRESS SOL/CIRC	P0745	P0745	AT-101
LC/B SOLENOID/CIRC	P1772	P1772	AT-162
LC/B SOLENOID FNCT	P1774	P1774	AT-165
MANU MODE SW/CIR	—	P1815	AT-168
PNP SW/CIRC	P0705	P0705	AT-85
STARTER RELAY/CIRC	—	P0615	AT-82
TCC SOLENOID/CIRC	P0740	P0740	AT-94
TCM·EEPROM	—	P1704	AT-114
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TCM·RAM	—	P1702	AT-110
TCM·ROM	—	P1703	AT-112
TP SEN/CIRC A/T	—	P1705	AT-116
TURBINE REV S/CIRC	P1716	P1716	AT-123
VEH SPD SE/CIR·MTR	—	P1721	AT-127
VEH SPD SEN/CIR AT	P0720	P0720	AT-89

*1: These numbers are prescribed by SAE J2012.

DTC No. Index

ECS0021J

NOTE:
If DTC U1000 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000. Refer to AT-79 .

DTC		Items (CONSULT-II screen terms)	Reference page
OBD-II	Except OBD-II		
CONSULT-II GST*1	CONSULT-II only “A/T”		
—	P0615	STARTER RELAY/CIRC	AT-82
P0705	P0705	PNP SW/CIRC	AT-85
P0720	P0720	VEH SPD SEN/CIR AT	AT-89
—	P0725	ENGINE SPEED SIG	AT-92
P0740	P0740	TCC SOLENOID/CIRC	AT-94
P0744	P0744	A/T TCC S/V FNCTN	AT-97
P0745	P0745	L/PRESS SOL/CIRC	AT-101
—	P1701	TCM-POWER SUPPLY	AT-104
—	P1702	TCM·RAM	AT-110
—	P1703	TCM·ROM	AT-112
—	P1704	TCM·EEPROM	AT-114
—	P1705	TP SEN/CIRC A/T	AT-116
P1710	P1710	ATF TEMP SEN/CIRC	AT-118
P1716	P1716	TURBINE REV S/CIRC	AT-123
—	P1721	VEH SPD SE/CIR·MTR	AT-127
P1730	P1730	A/T INTERLOCK	AT-129
—	P1731	A/T 1ST E/BRAKING	AT-135
P1752	P1752	I/C SOLENOID/CIRC	AT-138
P1754	P1754	I/C SOLENOID FNCTN	AT-141
P1757	P1757	FR/B SOLENOID/CIRC	AT-144
P1759	P1759	FR/B SOLENOID FNCT	AT-147
P1762	P1762	D/C SOLENOID/CIRC	AT-150
P1764	P1764	D/C SOLENOID FNCTN	AT-153
P1767	P1767	HLR/C SOL/CIRC	AT-156
P1769	P1769	HLR/C SOL FNCTN	AT-159
P1772	P1772	LC/B SOLENOID/CIRC	AT-162
P1774	P1774	LC/B SOLENOID FNCT	AT-165
—	P1815	MANU MODE SW/CIRC	AT-168
—	P1841	ATF PRES SW 1/CIRC	AT-172
—	P1843	ATF PRES SW 3/CIRC	AT-175
—	P1845	ATF PRES SW 5/CIRC	AT-178
—	P1846	ATF PRES SW 6/CIRC	AT-181
U1000	U1000	CAN COMM CIRCUIT	AT-79

*1: These numbers are prescribed by SAE J2012.

PRECAUTIONS

PFP:00001

Precautions for Supplemental Restraint System (SRS) “AIR BAG” and “SEAT BELT PRE-TENSIONER”

ECS006MY

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

Precautions for On Board Diagnostic (OBD) System of A/T and Engine

ECS006MR

The ECM has an on board diagnostic system. It will light up the malfunction indicator lamp (MIL) to warn the driver of a malfunction causing emission deterioration.

CAUTION:

- **Be sure to turn the ignition switch “OFF” and disconnect the negative battery terminal before any repair or inspection work. The open/short circuit of related switches, sensors, solenoid valves, etc. will cause the MIL to light up.**
- **Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MIL to light up due to an open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **Be sure to route and secure the harnesses properly after work. Interference of the harness with a bracket, etc. may cause the MIL to light up due to a short circuit.**
- **Be sure to connect rubber tubes properly after work. A misconnected or disconnected rubber tube may cause the MIL to light up due to a malfunction of the EGR system or fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the TCM and ECM before returning the vehicle to the customer.**

Precautions for A/T Assembly Replacement

ECS006MS

CAUTION:

- **Check data (Unit ID) in TCM with data monitor of CONSULT-II before replacing A/T assembly.**
- **Check if new data (Unit ID) are entered correctly after replacing A/T assembly and erasing data in TCM.**
- When replacing A/T assembly or TCM, refer to the pattern table below and erase the EEPROM in the TCM if necessary.

EEPROM ERASING PATTERNS

A/T assembly	TCM	Erasing EEPROM in TCM	Remarks
Replaced	Replaced	Not required	Not required because the EEPROM in the TCM is in the default state.
Not replaced	Replaced	Not required	Not required because the EEPROM in the TCM is in the default state.
Replaced	Not replaced	Required	Required because data has been written in the EEPROM in the TCM and because the TCM cannot write data from the ROM assembly in the transmission.

METHOD FOR ERASING THE EEPROM IN THE TCM

1. Connect CONSULT-II to data link connector.
2. Turn ignition switch “ON” position. Confirm that CONSULT-II turn “ON”.
3. Move selector lever in “R” position.
4. Touch “START” on CONSULT-II.
5. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
6. Fully press the accelerator pedal (8/8 throttle), and hold it in the fully open position. (This will set the closed throttle position signal to “ON”.)
7. Touch “ERASE” on CONSULT-II, and then touch “YES”.
8. Wait 3 seconds and then release the accelerator pedal.
9. Turn ignition switch “OFF” position.

METHOD FOR WRITING DATA FROM THE ROM ASSEMBLY IN THE TRANSMISSION

In the following procedure, the TCM reads data from the ROM assembly and writes it to the EEPROM in the TCM.

1. With the EEPROM in the TCM erased.
2. Move selector lever in “P” position.
3. Turn ignition switch “ON” position.

CHECK METHOD

- Normal: About 2 seconds after the ignition switch “ON” position, the A/T CHECK indicator lamp lights up for 2 seconds.
- Abnormal: Even after the ignition switch “ON” position, the A/T CHECK indicator lamp does not light up after 2 seconds or illuminates immediately.

Cope for abnormal

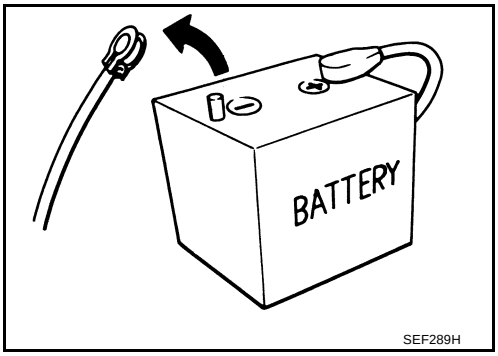
- Replace the A/T assembly.
- Replace the TCM.

Precautions

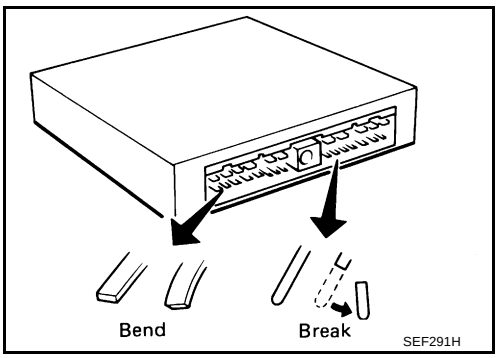
ECS006MT

NOTE:
If any problems occur in the RE5R05A model transmission, replace the entire transmission assembly.

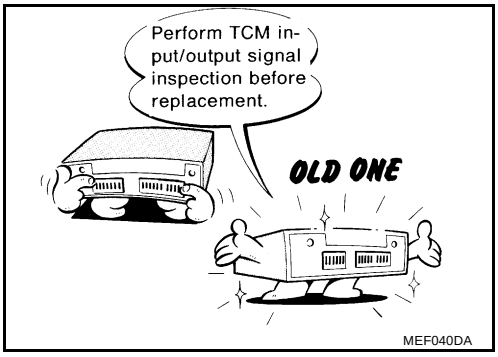
- **Before connecting or disconnecting the TCM harness connector, turn ignition switch “OFF” and disconnect negative battery terminal. Because battery voltage is applied to TCM even if ignition switch is turned “OFF”.**



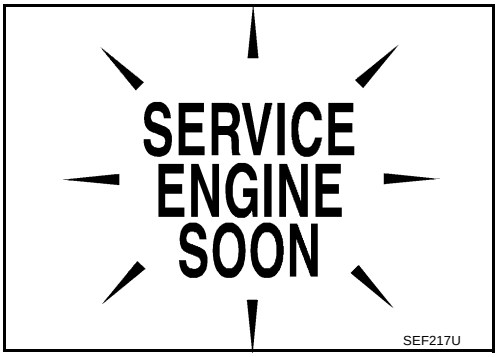
- **When connecting or disconnecting pin connectors into or from TCM, take care not to damage pin terminals (bend or break).**
  Make sure that there are not any bends or breaks on TCM pin terminal, when connecting pin connectors.



- **Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not.** **AT-64, "TCM INSPECTION TABLE"**.

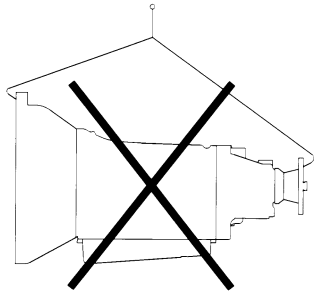


- **After performing each TROUBLE DIAGNOSIS, perform “DTC (Diagnostic Trouble Code) CONFIRMATION PROCEDURE”.**
  If the repair is completed **the DTC should not be displayed in the “DTC CONFIRMATION PROCEDURE”.**

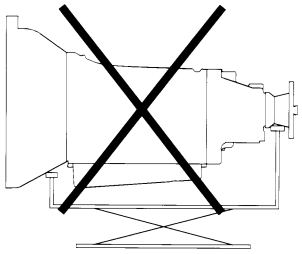


- Always use the specified brand of A/T fluid. Refer to MA-10, "Fluids and Lubricants" .
- Use paper rags not cloth rags during work.
- After replacing the A/T fluid, dispose of the waste oil using the methods prescribed by law, ordinance, etc.

- When removing the RE5R05A model transmission from a vehicle, do not use the companion flange section at the rear end of the transmission as a support point.



Do not hang at companion flange.



Do not support at companion flange.

SCIA0490E

Service Notice or Precautions

ECS006MU

OBD-II SELF-DIAGNOSIS

- A/T self-diagnosis is performed by the TCM in combination with the ECM. The results can be read through the blinking pattern of the A/T CHECK indicator or the malfunction indicator lamp (MIL). Refer to the table on AT-69, "Self-Diagnostic Result Test Mode" for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MIL are automatically stored in both the ECM and TCM memories.
  Always perform the procedure on AT-37, "HOW TO ERASE DTC" to complete the repair and avoid unnecessary blinking of the MIL.

*: For details of OBD-II, refer to EC-50, "ON BOARD DIAGNOSTIC (OBD) SYSTEM" .

- **Certain systems and components, especially those related to OBD, may use the new style slide-locking type harness connector. For description and how to disconnect, refer to** PG-65, "HARNESS CONNECTOR".

Wiring Diagrams and Trouble Diagnosis

ECS006MV

When you read wiring diagrams, refer to the following:

- GI-14, "How to Read Wiring Diagrams".
- PG-2, "POWER SUPPLY ROUTING" for power distribution circuit.

When you perform trouble diagnosis, refer to the following:

- GI-10, "How to Follow Trouble Diagnoses".
- GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident"

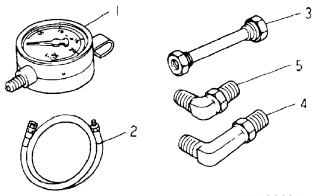
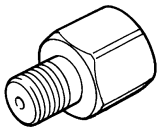
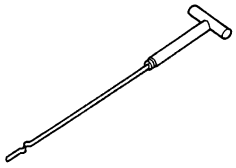
PREPARATION

PFP:00002

Special Service Tools

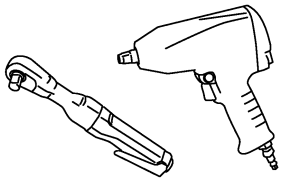
ECS002OX

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
ST2505S001 (J34301-C) Oil pressure gauge set 1 ST25051001 (—) Oil pressure gauge 2 ST25052000 (—) Hose 3 ST25053000 (—) Joint pipe 4 ST25054000 (—) Adapter 5 ST25055000 (—) Adapter  ZZA0600D	Measuring line pressure
KV31103600 (J45674) Joint pipe adapter (With ST25054000)  ZZA1227D	Measuring line pressure
(J45475) A/T fluid level gauge  SCIA1182E	Checking A/T fluid

Commercial Service Tools

ECS002OY

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

A/T FLUID

PFP:KLE40

Changing A/T Fluid

ECS002FM

NOTE:
Use only A/T fluid level gauge: Parts No.31086 AR211 (Special Service Tool No.J45475)

1. Stop engine.
2. Warm up A/T fluid.
3. Remove the tightening bolt for A/T fluid level gauge.
4. Drain A/T fluid from drain plug and refill with new A/T fluid. Always refill same volume with drained fluid.

- To replace the A/T fluid, pour in new oil at the charging pipe with the engine idling and at the same time drain the old oil from the radiator cooler hose return side.
- When the color of the oil coming out is about the same as the color of the new oil, the replacement is complete. The amount of new transmission fluid to use should be 30-50% of the stipulated amount.

A/T fluid	**:Nissan Matic Fluid J**
Fluid capacity liter (US pt, Imp pt.)	**:10.1 (10-5/8, 8-7/8)**

CAUTION:

- **Use only Nissan Genuine ATF Matic Fluid J. Do not mix with other fluid.**
- **Using automatic transmission fluid other than Nissan Genuine ATF Matic Fluid J will deteriorate in drive ability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the INFINITI new vehicle limited warranty.**

Drain plug : 29 - 39 N·m (3.0 - 4.0 kg-m, 22 - 29 ft-lb)

5. Run engine at idle speed for 5 minutes.
6. Check fluid level and condition. Refer to AT-12, "Checking A/T Fluid" . If fluid is still dirty, repeat step 2. through 5.

- Install the removed A/T fluid level gauge in the oil charging pipe.

: 4.4 - 5.8 N·m (0.45 - 0.59 kg-m, 39.1 - 51.2 in-lb)

Checking A/T Fluid

ECS000X7

NOTE:
Use only A/T fluid level gauge: Parts No.31086 AR211 (Special Service Tool No.J45475)

1. Warm up engine.
2. Remove the tightening bolt for A/T fluid level gauge.
3. Check for fluid leakage.
4. Before driving, fluid level can be checked at fluid temperatures of 30 to 50°C (86 to 122°F) using “COLD” range on A/T fluid level gauge.

a. Park vehicle on level surface and set parking brake.
b. Start engine and move selector lever through each gear position. Leave selector lever in “P” position.
c. Check fluid level with engine idling.
d. Remove A/T fluid level gauge and wipe clean with lint-free paper.
e. Re-insert A/T fluid level gauge into charging pipe as far as it will go.
f. Remove A/T fluid level gauge and note reading. If reading is at low side of range, add fluid to the charging pipe.
Do not overfill.

5. Drive vehicle for approximately 5 minutes in urban areas.
6. Re-check fluid level at fluid temperatures of 50 to 80°C (122 to 176°F) using “HOT” range on A/T fluid level gauge.
7. Check fluid condition.

- If fluid is very dark or smells burned, refer to AT section for checking operation of A/T. Flush cooling system after repair of A/T.

- If A/T fluid contains frictional material (clutches, bands, etc.), Replace radiator and flush cooler line using cleaning solvent and compressed air after repair of A/T. Refer to CO-11, "RADIATOR" .
- Install removed A/T fluid level gauge in the oil charging pipe.

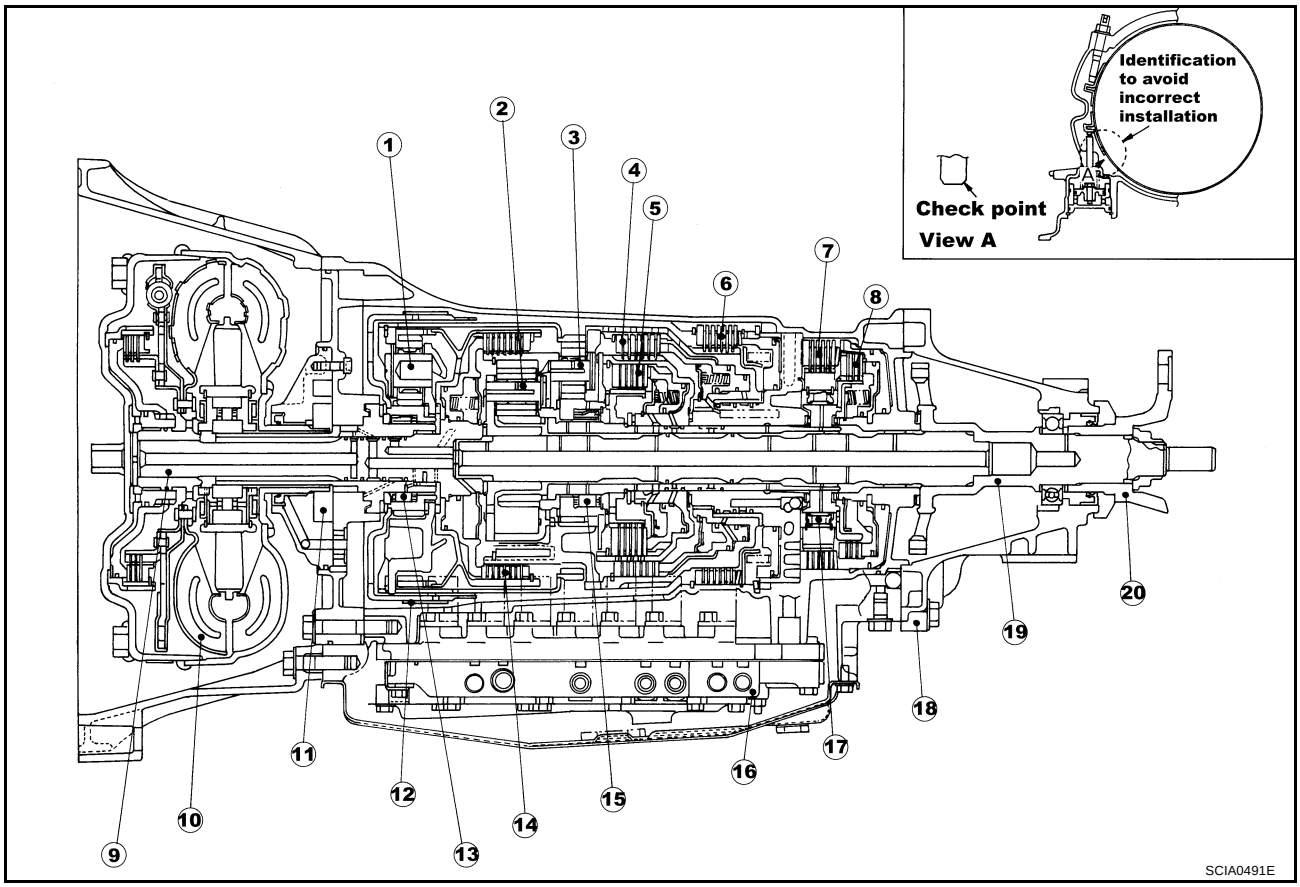
: **4.4 - 5.8 N·m (0.45 - 0.59 kg-m, 39.1 - 51.2 in-lb)**

A/T CONTROL SYSTEM

PFP:31036

Cross-Sectional View

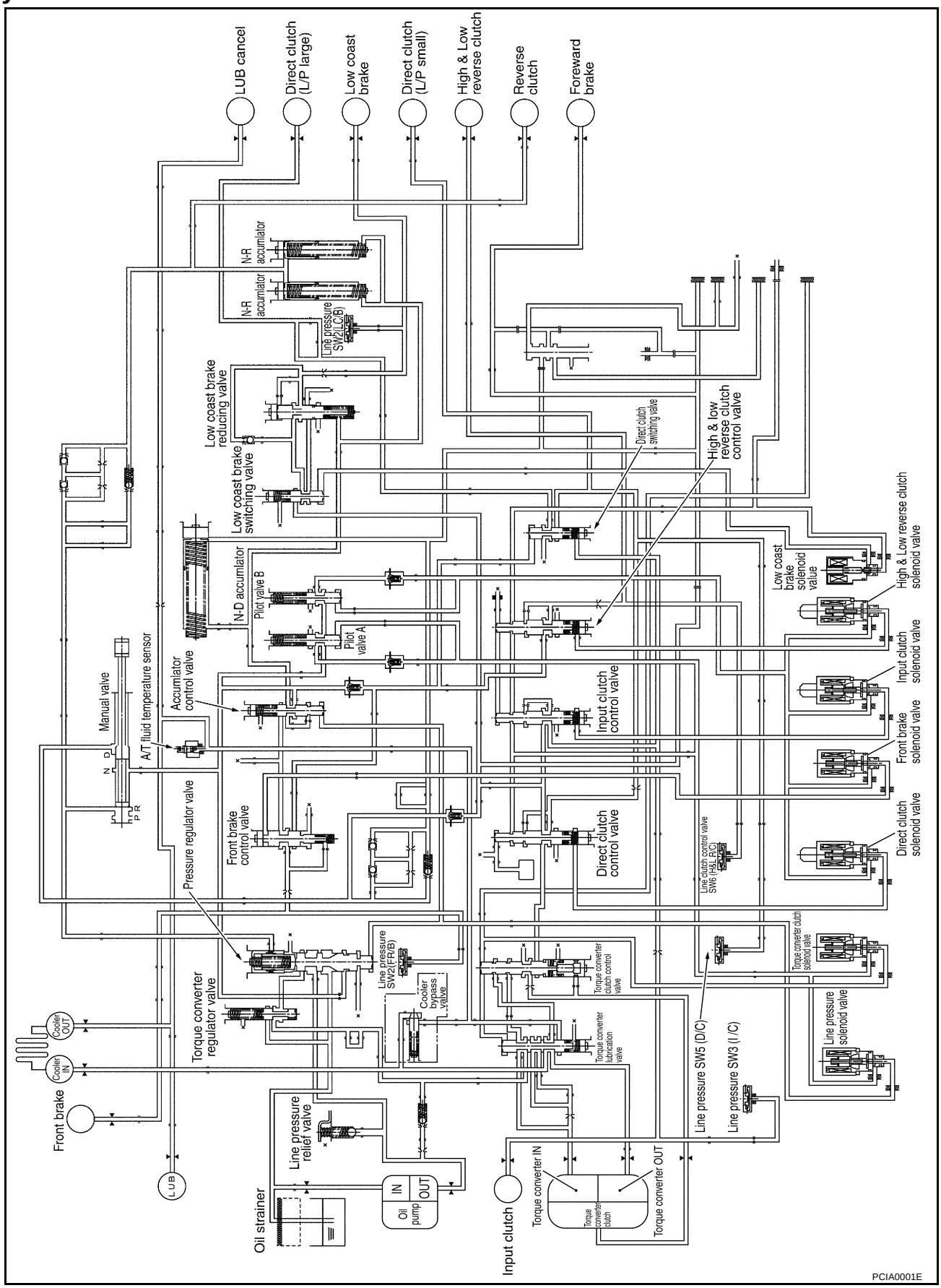
ECS002FO



1. Front planetary gear
2. Mid planetary gear
3. Rear planetary gear
4. Direct clutch
5. High & low reverse clutch
6. Reverse brake
7. Forward brake
8. Low coast brake
9. Input shaft
10. Torque converter
11. Oil pump
12. Front brake
13. 3rd one-way clutch
14. Input clutch
15. 1st one-way clutch
16. Control valve
17. Forward one-way clutch
18. Rear extension
19. Output shaft
20. Companion flange

Hydraulic Control Circuit

ECS002FP

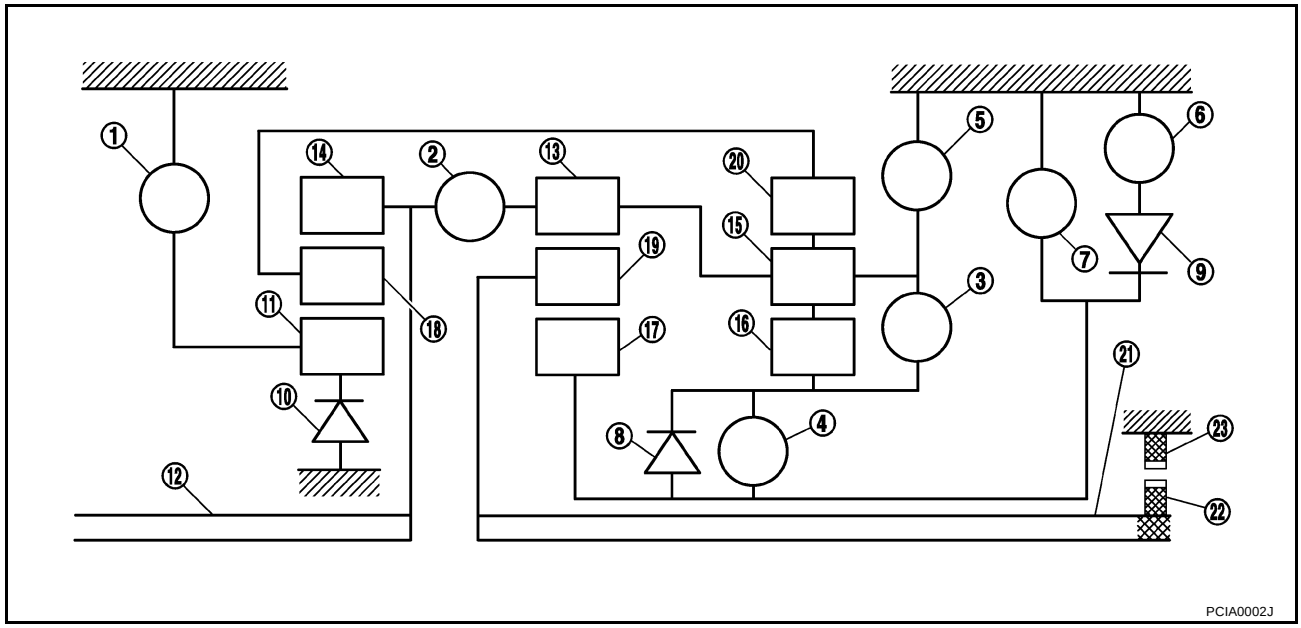


Shift Mechanism

ECS002FQ

The automatic transmission uses compact, dual planetary gear systems to improve power-transmission efficiency, simplify construction and reduce weight.
It also employs an optimum shift control and super wide gear ratios. They improve starting performance and acceleration during medium and high-speed operation.

CONSTRUCTION



1. Front brake
2. Input clutch
3. Direct clutch
4. High and low reverse clutch
5. Reverse brake
6. Forward brake
7. Low coast brake
8. 1st one-way clutch
9. Forward one-way clutch
10. 3rd one-way clutch
11. Front sun gear
12. Input shaft
13. Mid internal gear
14. Front internal gear
15. Rear carrier
16. Rear sun gear
17. Mid sun gear
18. Rear sun gear
19. Mid carrier
20. Rear internal gear
21. Output shaft
22. Parking gear
23. Parking pole

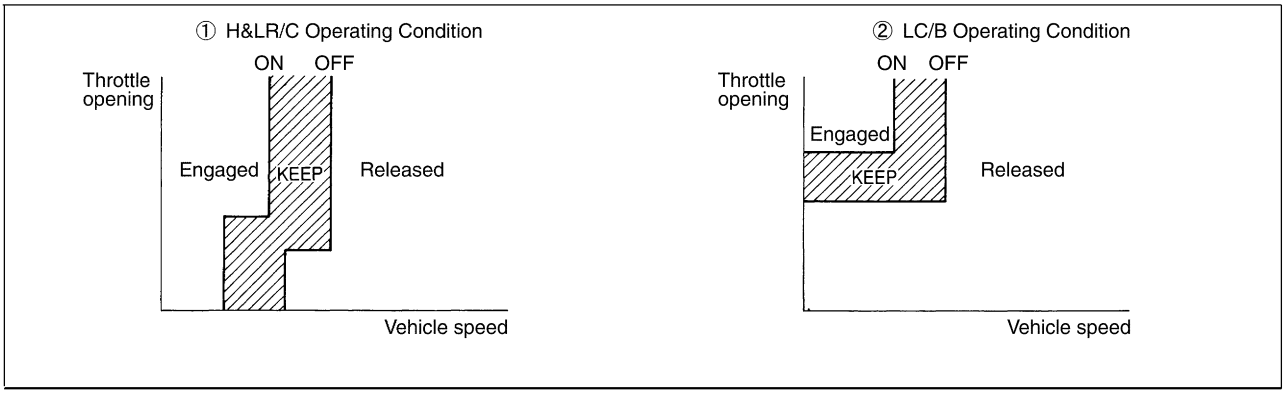
FUNCTION OF CLUTCH AND BRAKE

Name of the Part	Abbreviation	Function
Front brake (1)	Fr/B	Fastens the front sun gear (11)
Input clutch (2)	I/C	Connects the input shaft (12), the mid internal gear (13), and the front internal gear (14).
Direct clutch (3)	D/C	Connects the rear carrier (15) and the rear sun gear (16).
High and low reverse clutch (4)	H&LR/C	Connects the mid sun gear (17) and the rear sun gear (16)
Reverse brake (5)	R/B	Fastens the rear carrier (15).
Forward brake (6)	F/B	Fastens the mid sun gear (17).
Low coast brake (7)	LC/B	Fastens the mid sun gear (17).
1st one-way clutch (8)	1st/O.C	Allows the rear sun gear (16) to turn freely forward relative to the mid sun gear (17) but fastens it for reverse rotation.
Forward one-way clutch (9)	F/O.C	Allows the mid sun gear (17) to turn freely in the forward direction but fastens it for reverse rotation
3rd one-way clutch (10)	3rd/O.C	Allows the front sun gear (11) to turn freely in the forward direction but fastens it for reverse rotation

CLUTCH AND BAND CHART

Shift position		I/C	H&LR/C	D/C	R/B	Fr/B	LC/B	Fwd/B	1st OWC	Fwd OWC	3rd OWC	Remarks
P			△			△						PARK POSITION
R			○		○	○			◎		◎	REVERSE POSITION
N			△			△						NEUTRAL POSITION
D	1st		△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2↔3↔4↔5
	2nd			○		△		○		◎	◎	
	3rd		○	○		○		△	◇		◎	
	4th	○	○	○				△	◇			
	5th	○	○			○		△	◇		◇	
M5	1st		△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2↔3↔4↔5
	2nd			○		△		○		◎	◎	
	3rd		○	○		○		△	◇		◎	
	4th	○	○	○				△	◇			
	5th	○	○			○		△	◇		◇	
M4	1st		△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2↔3↔4
	2nd			○		△		○		◎	◎	
	3rd		○	○		○		△	◇		◎	
	4th	○	○	○				△	◇			
M3	1st		△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2↔3
	2nd			○		△		○		◎	◎	
	3rd		○	○		○		△	◇		◎	
M2	1st		△ *			△	△ **	○	◎	◎	◎	Automatic shift 1↔2
	2nd			○		○	○	○		◎	◎	
M1	1st		○			○	○	○	◎	◎	◎	Locks (held stationary) in 1st speed

○ — Operates
◎ — Operates during "progressive" acceleration.
◇ — Operates and affect power transmission while coasting.
△ — Line pressure is applied but does not affect power transmission.
△ * — Operates under conditions shown in illustration ①.
△ ** — Operates under conditions shown in illustration ②. Delay control is applied during D (4,3,2,1) → N shift.



SCIA0492E

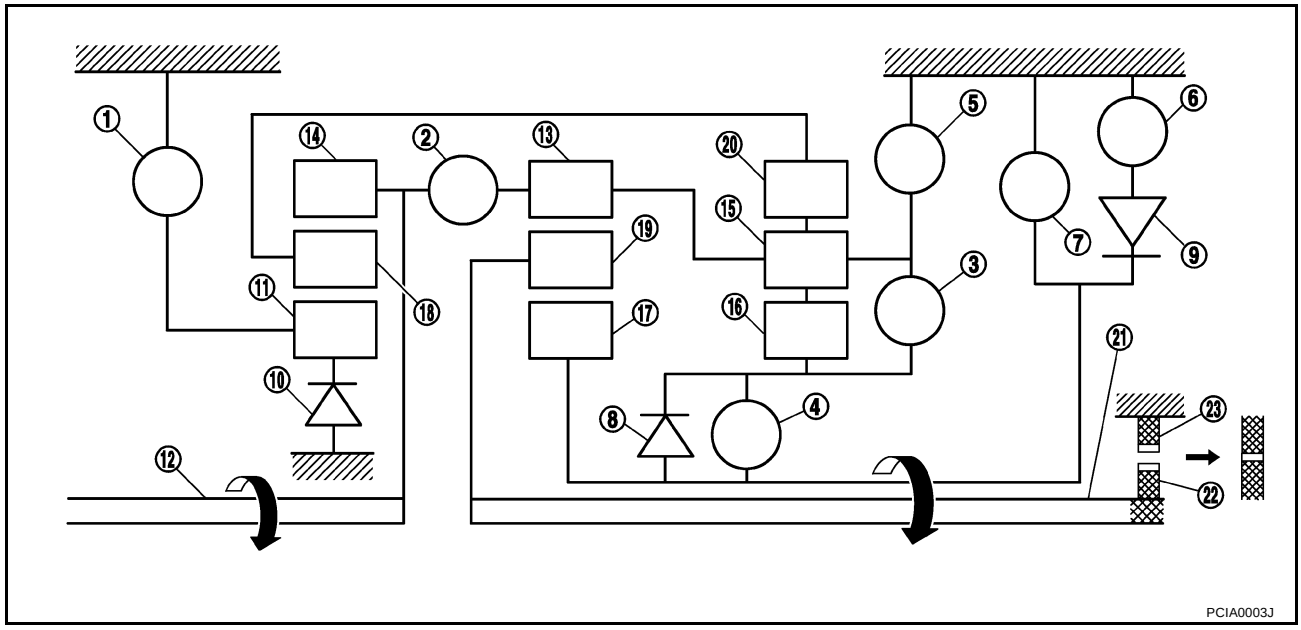
POWER TRANSMISSION

"N" Position

Since both the forward brake and the reverse brake are released, torque from the input shaft drive is not transmitted to the output shaft.

"P" Position

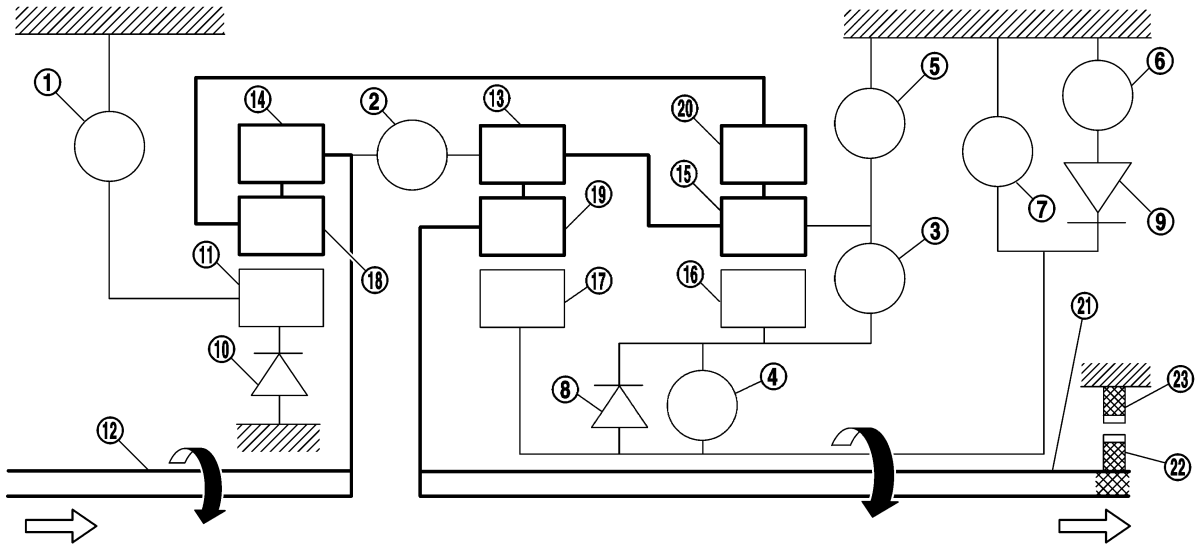
- The same as for the "N" position, both the forward brake and the reverse brake are released, so torque from the input shaft drive is not transmitted to the output shaft.
- The parking pole linked with the select lever meshes with the parking gear and fastens the output shaft mechanically.



"D", "M2", "M3", "M4", "M5" POSITIONS 1ST SPEED

- The front brake is fastened
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The first one-way clutch regulates reverse rotation of the rear sun gear.
- The third one-way clutch regulates reverse rotation of the front sun gear.

- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and the engine brake is not activated.



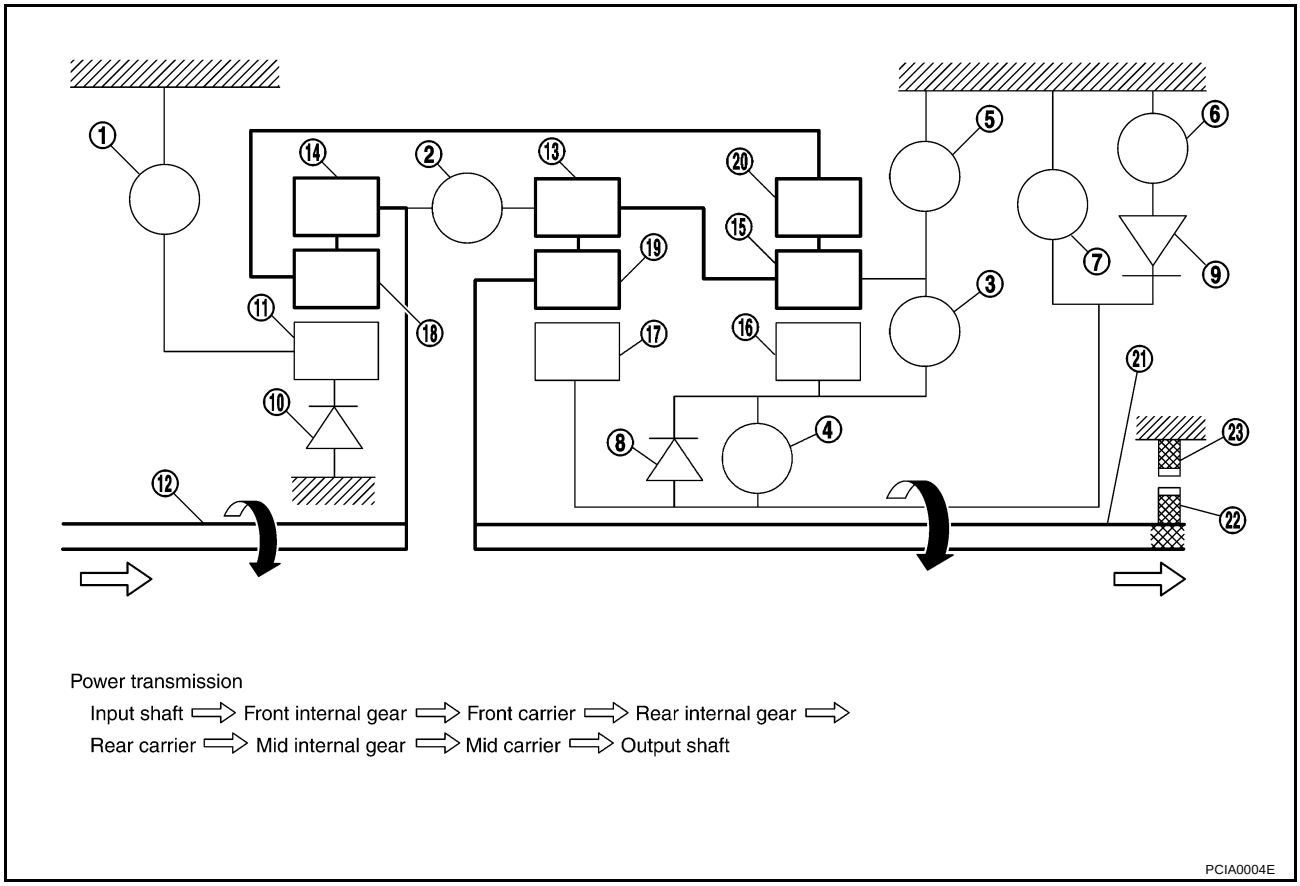
Power transmission

Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Mid internal gear ⇨ Mid carrier ⇨ Output shaft

PCIA0004E

“M1” POSITION 1ST SPEED

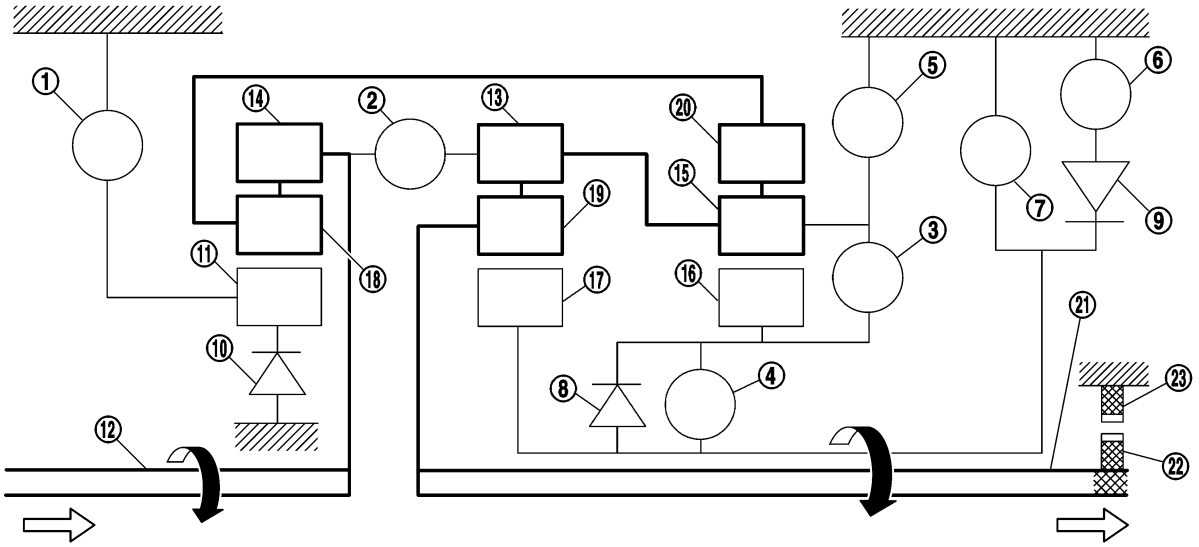
- The front brake is applied.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The first one-way clutch regulates reverse rotation of the rear sun gear.
- The third one-way clutch regulates reverse rotation of the front sun gear.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and the engine brake is not activated.
- The low coast brake fastens the mid sun gear.
- * During deceleration, the low coast brake regulates forward rotation of the mid sun gear and the engine brake functions.



“D”, “M3”, “M4”, “M5” POSITIONS 2ND SPEED

- The front brake is applied.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The third one-way clutch regulates reverse rotation of the front sun gear.

- The direct clutch is coupled and the rear carrier and rear sun gear are connected.



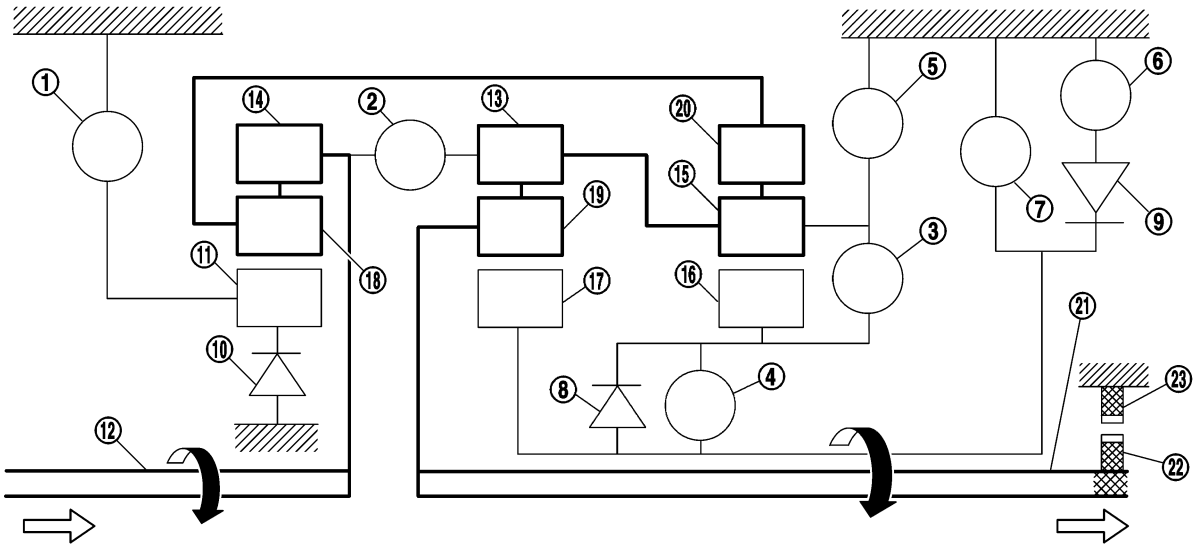
Power transmission

Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Mid internal gear ⇨ Mid carrier ⇨ Output shaft

PCIA0004E

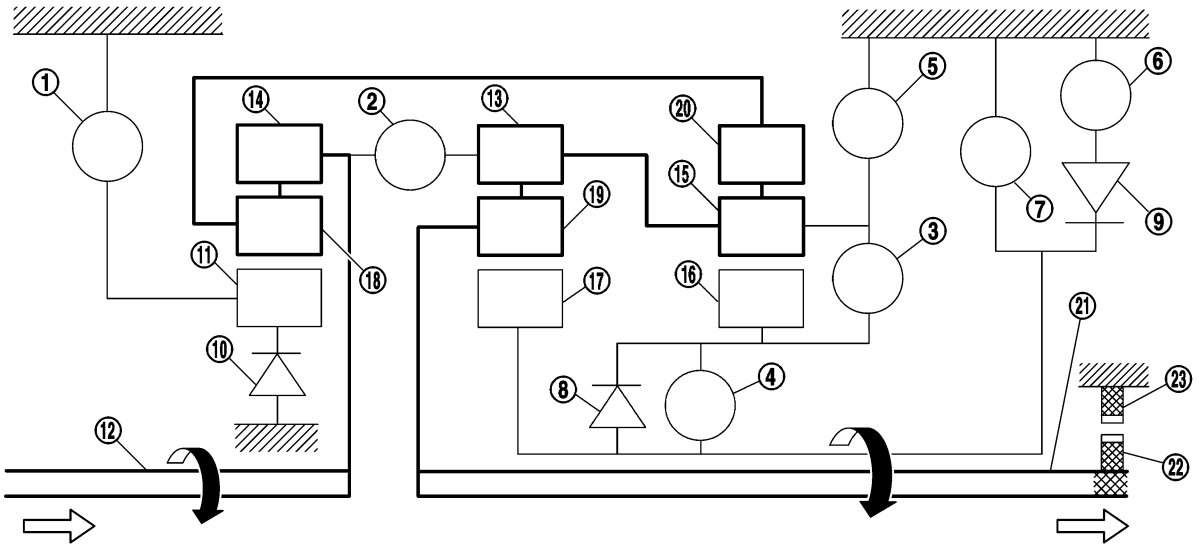
“M2” POSITION 2ND SPEED

- The front brake is applied.
- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The third one-way clutch regulates reverse rotation of the front sun gear.
- The direct clutch is coupled, and the rear carrier and rear sun gear are connected.
- The low coast brake functions.
- Engine brake function



“D”, “M3”, “M4”, “M5” POSITIONS 3RD SPEED

- The front brake is applied.
- The third one-way clutch regulates reverse rotation of the front sun gear.
- The high and low reverse clutch is coupled and the mid sun gear and rear sun gear are connected.



Power transmission

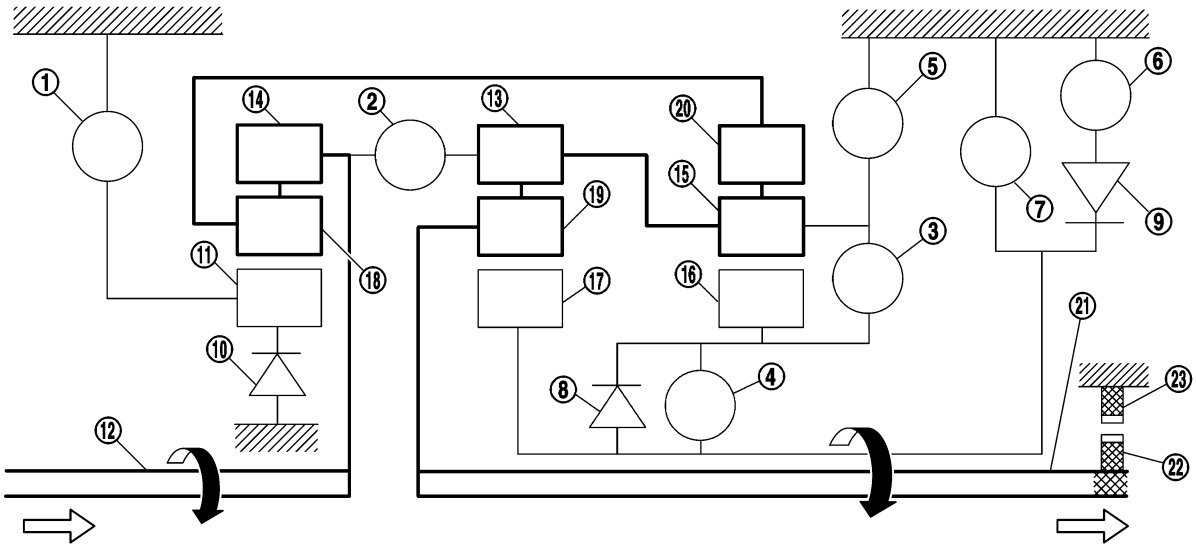
Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Mid internal gear ⇨ Mid carrier ⇨ Output shaft

PCIA0004E

“D”, “M4”, “M5” POSITIONS 4TH SPEED

- The front brake is released and the sun gears rotate forward.
- The input clutch is coupled and the front internal gear and mid internal gear are connected.

- The drive power is conveyed to the front internal gear, mid internal gear, and rear carrier and the three planetary gears rotate as one unit.



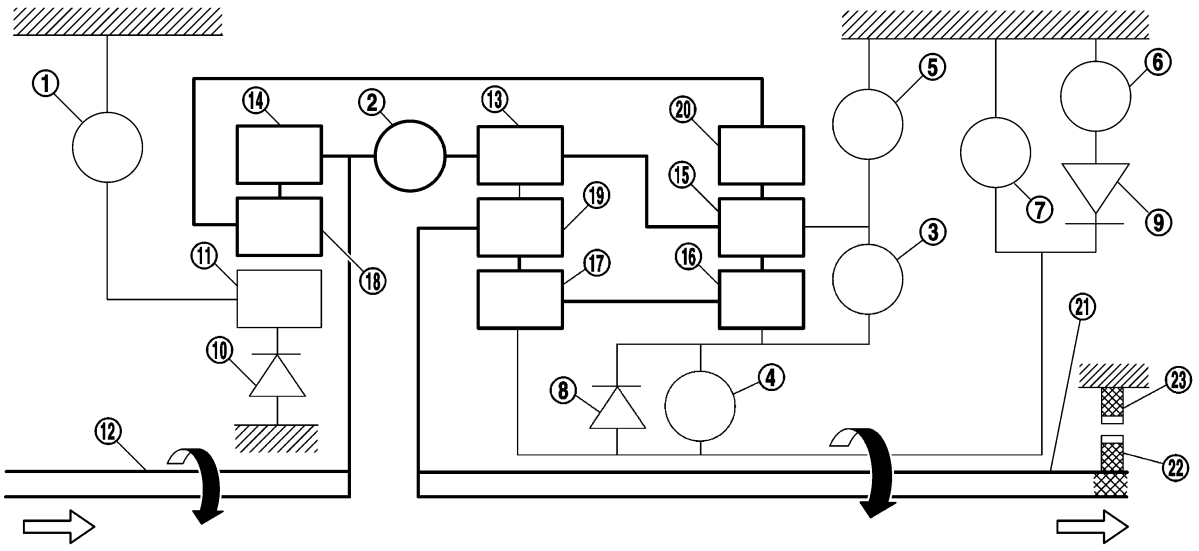
Power transmission

Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Mid internal gear ⇨ Mid carrier ⇨ Output shaft

PCIA0004E

“D”, “M5” POSITIONS 5TH SPEED

- The front brake fastens the front sun gear.
- The direct clutch is released and the connection between the rear carrier and the rear sun gear is released.



Power transmission

Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear

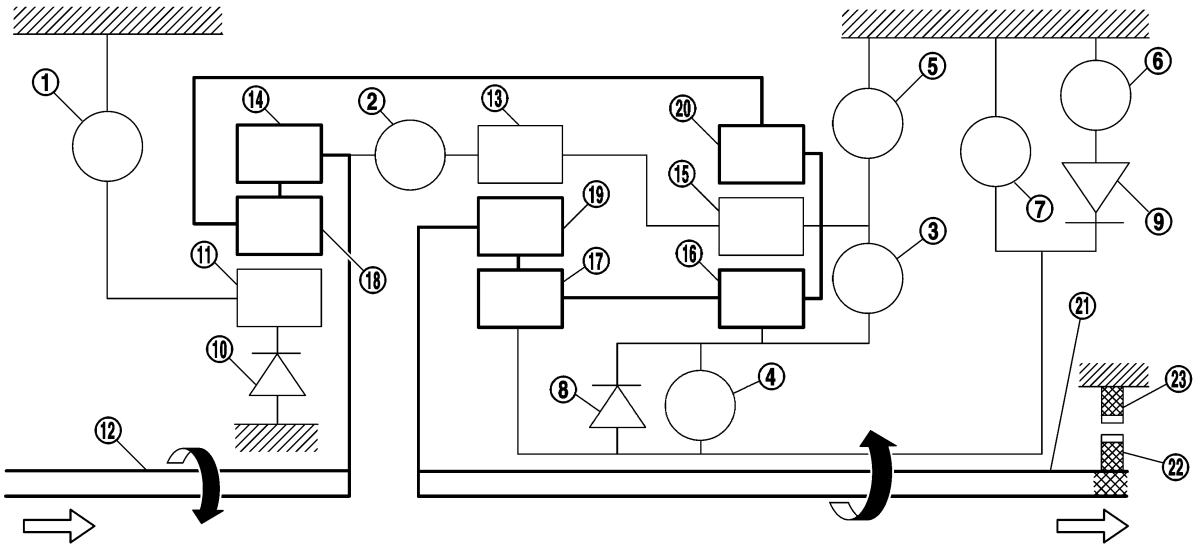
Input shaft ⇨ Mid internal gear ⇨ Rear carrier ⇨ Rear sun gear ⇨

Mid sun gear ⇨ Mid carrier ⇨ Output shaft

PCIA0005E

“R” POSITION

- The front brake fastens the front sun gear.
- The high and low reverse clutch is coupled and the mid sun gear and rear sun gear are connected.
- The reverse brake fastens the rear carrier.



Power transmission

Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal ⇨
Rear sun gear ⇨ Mid sun gear ⇨ Mid carrier ⇨ Output shaft

PCIA0006E

TCM Function

ECS002MA

The function of the TCM is to:

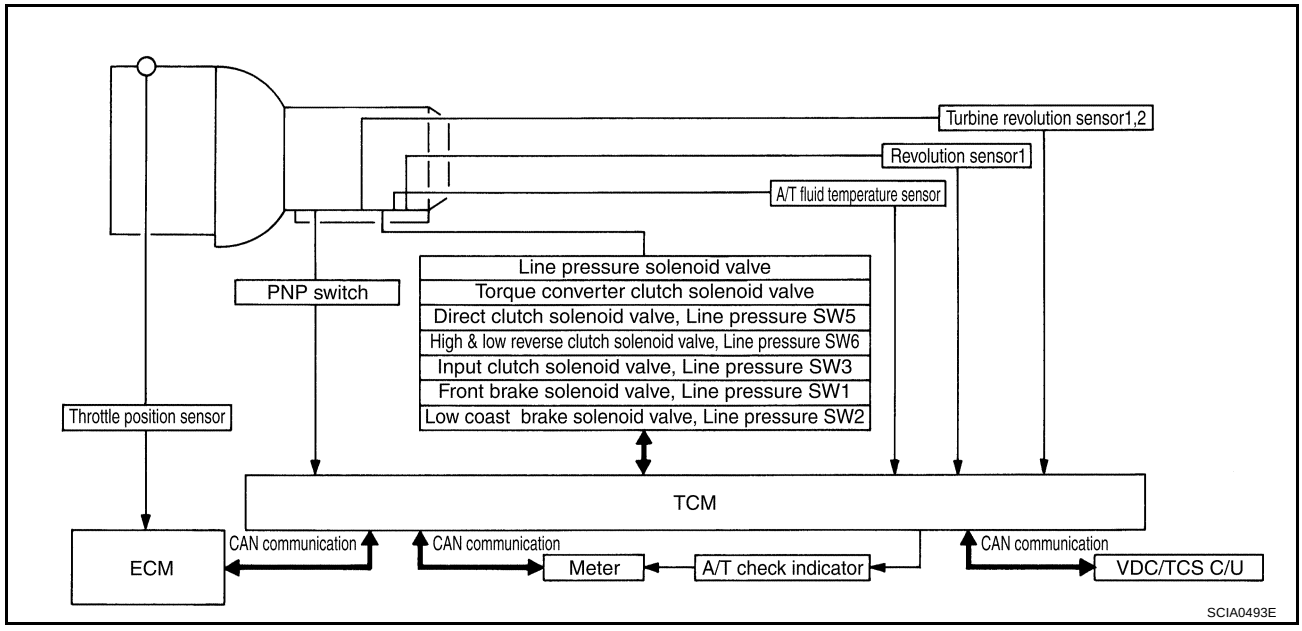
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids and sensors.

CONTROL SYSTEM OUTLINE

The automatic transmission senses vehicle operating conditions through various sensors. It always controls the optimum shift position and reduces shifting and lock-up shocks.

SENSORS		TCM		ACTUATORS
PNP switch Throttle position sensor Closed throttle position switch Wide open throttle position switch Engine speed signal A/T fluid temperature sensor Revolution sensor Vehicle speed sensor Manual mode switch ASCD control unit Stop lamp switch Turbine revolution sensor	⇒	Shift control Line pressure control Lock-up control Engine brake control Timing control Fail-safe control Self-diagnosis CONSULT-II communication line Duet-EA control CAN system	⇒	Input clutch solenoid valve Direct clutch solenoid valve Front brake solenoid valve High & low reverse clutch solenoid valve Low cost brake solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve A/T CHECK indicator lamp

CONTROL SYSTEM DIAGRAM



CAN Communication

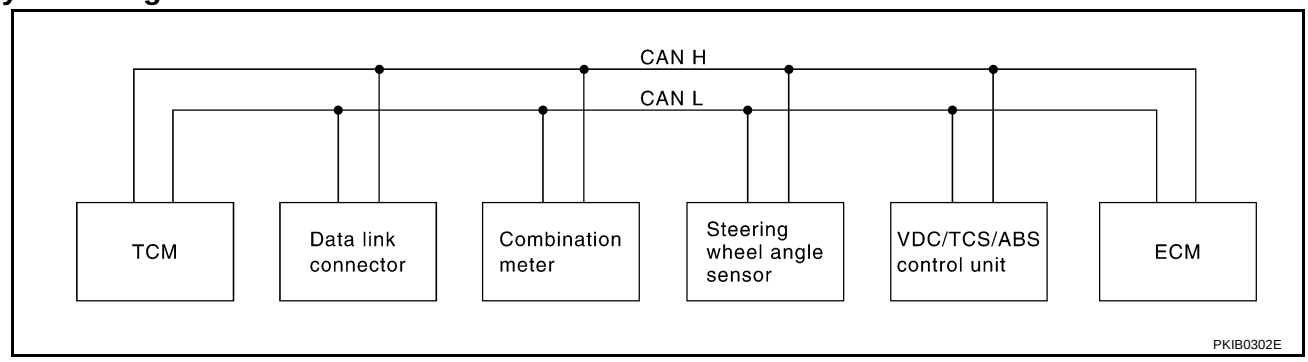
ECS002MC

SYSTEM DESCRIPTION

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line). These allow a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

FOR VDC MODELS

System diagram



Input/output signal chart

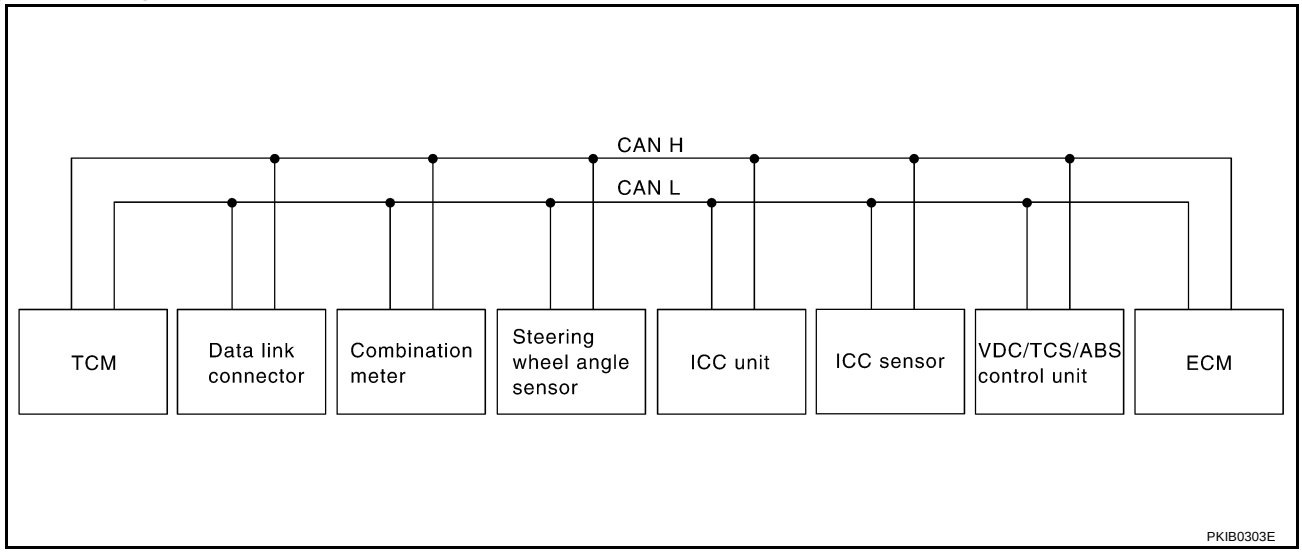
T: Transmit R: Receive

Signals	TCM	Combination meter	Steering wheel angle sensor	VDC / TCS / ABS control unit	ECM
Engine speed signal	R	R		R	T
Engine coolant temperature signal	R	R			T
Accelerator pedal position signal	R			R	T
Engine torque signal	R			R	T
Battery voltage signal	R				T
Closed throttle position signal	R				T
Wide open throttle position signal	R				T
Lock-up prohibition signal	R				T
Torque-down permission signal	R				T
Fuel consumption monitor signal		R			T
Lock-up signal	T				R
Hard deceleration signal	T				R
Torque-down signal	T				R
Power mode indicator signal	T				R
A/T fluid temperature warning lamp signal	T	R			R
Current gear position signal	T	R		R	R
	R	T			
Next gear position signal	T			R	R
Shift change signal	T			R	R
Shift pattern signal	T				R
VDC system control signal				T	R
VDC operation signal				T	R
Stop lamp switch signal	R			T	
Steering wheel angle sensor signal	R		T	R	R

Signals	TCM	Combination meter	Steering wheel angle sensor	VDC / TCS / ABS control unit	ECM
Air conditioner switch signal		T			R
Headlamp switch signal		T			R
Rear window defogger switch signal		T			R
OD cancel switch signal	R	T		R	
Brake switch signal	R	T			
Power mode switch signal	R	T			
Vehicle speed signal	R	R		T	
	R	T			R
	T				R

FOR ICC MODELS

System diagram



Input/output signal chart

T: Transmit R: Receive

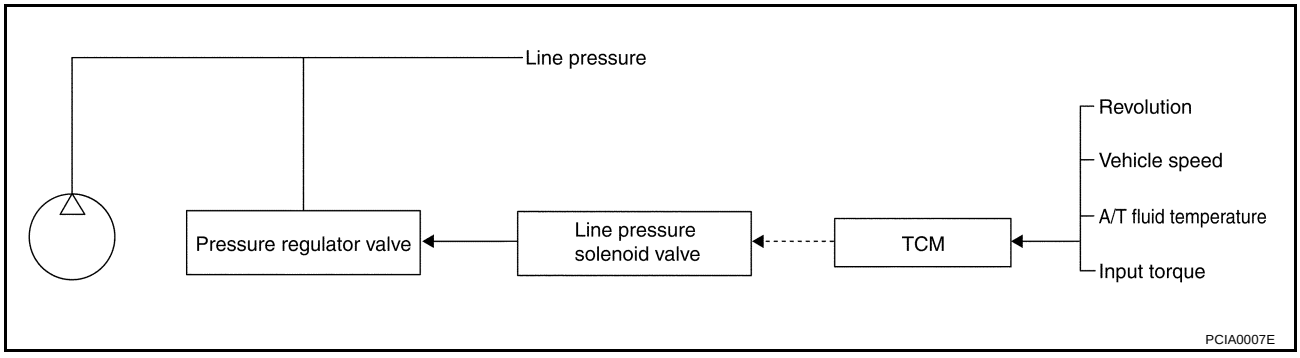
Signals	TCM	Combination meter	Steering wheel angle sensor	ICC unit	ICC sensor	VDC / TCS / ABS control unit	ECM
ICC system display signal		R		T			
ICC sensor signal				R	T		
Engine speed signal	R	R		R		R	T
Engine coolant temperature signal	R	R					T
Accelerator pedal position signal	R					R	T
Engine torque signal	R					R	T
Battery voltage signal	R						T
Closed throttle position signal	R			R			T
Lock-up prohibition signal	R						T
Torque-down permission signal	R						T
Fuel consumption monitor signal		R					T
Lock-up signal	T						R
Hard deceleration signal	T						R
Torque-down signal	T						R

Signals	TCM	Combination meter	Steering wheel angle sensor	ICC unit	ICC sensor	VDC / TCS / ABS control unit	ECM
Power mode indicator signal	T						R
A/T fluid temperature warning lamp signal	T	R					R
Current gear position signal	T	R				R	R
	R	T					
Next gear position signal	T					R	R
Shift change signal	T					R	R
Shift pattern signal	T			R			R
VDC system control signal						T	R
VDC operation signal				R		T	R
Stop lamp switch signal	R					T	
Steering wheel angle sensor signal	R		T			R	R
Air conditioner switch signal		T					R
Headlamp switch signal		T					R
Rear window defogger switch signal		T					R
OD cancel switch signal	R	T				R	
Brake switch signal	R	T					
Power mode switch signal	R	T					
Vehicle speed signal	R	R		R		T	
	R	T					R
	T			R			R

Line Pressure Control

ECS002FR

- When an input torque signal equivalent to the engine drive force is sent from the ECM to the TCM, the TCM controls the line pressure solenoid.
- This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the oil pump to the line pressure most appropriate to the driving state.

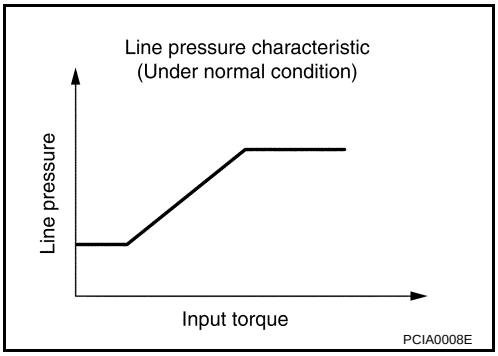


LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

- The TCM has stored in memory a number of patterns for the optimum line pressure characteristic for the driving state.
- In order to obtain the line pressure characteristic that the TCM has selected as being the most appropriate characteristic in the current driving state, the TCM controls the line pressure solenoid current value and thus controls the line pressure.

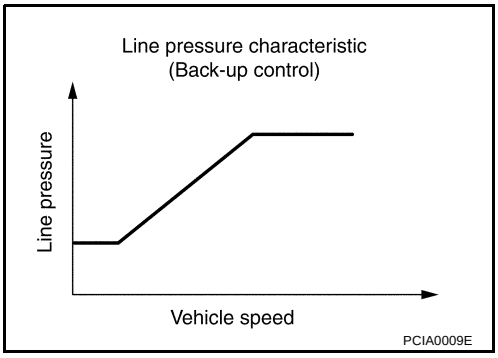
Normal Control

Each clutch is adjusted to the necessary pressure to match the engine drive force.



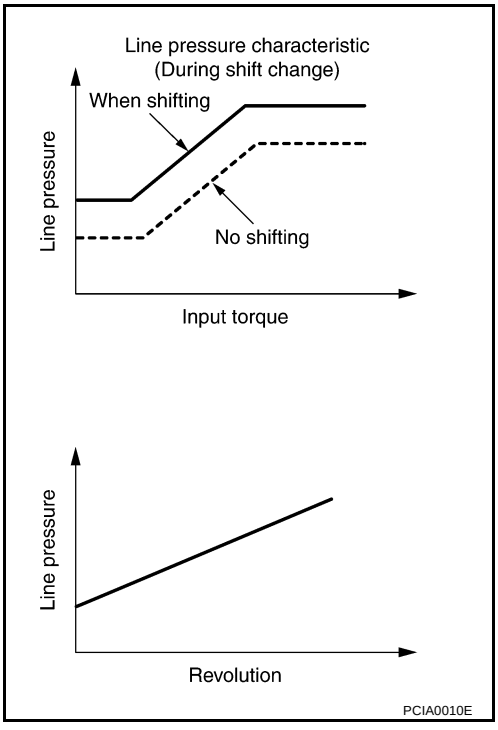
Back-up Control (Engine brake)

When the select operation is executed during driving and the transmission is shifted down, the line pressure is set according to the vehicle speed.



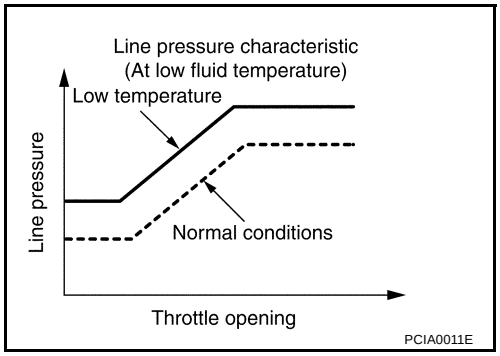
During Shift Change

The necessary and adequate line pressure for speed change is set. Therefore, the line pressure characteristic is set according to the input torque and speed change type.



At Low Fluid Temperature

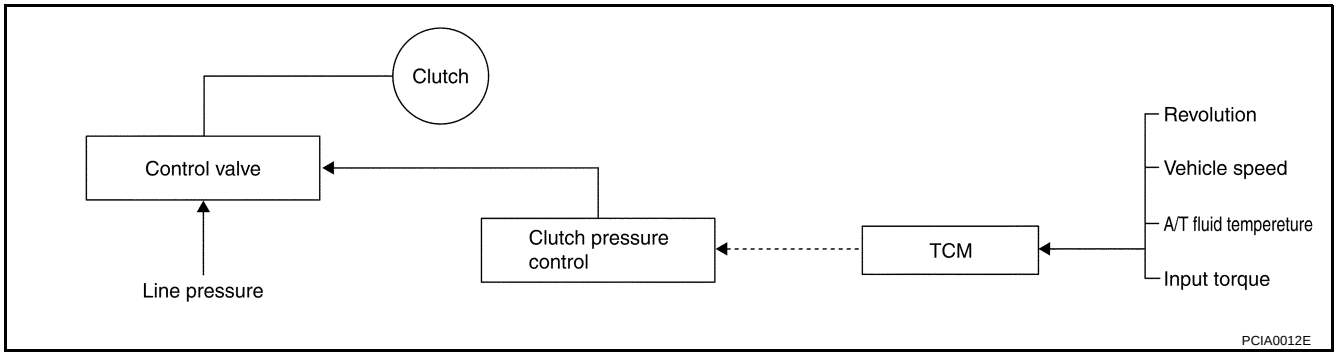
When the A/T fluid temperature drops below the prescribed temperature, in order to speed up the action of each friction element, the line pressure is set higher than the normal line pressure characteristic.



Shift Control

ECS002FS

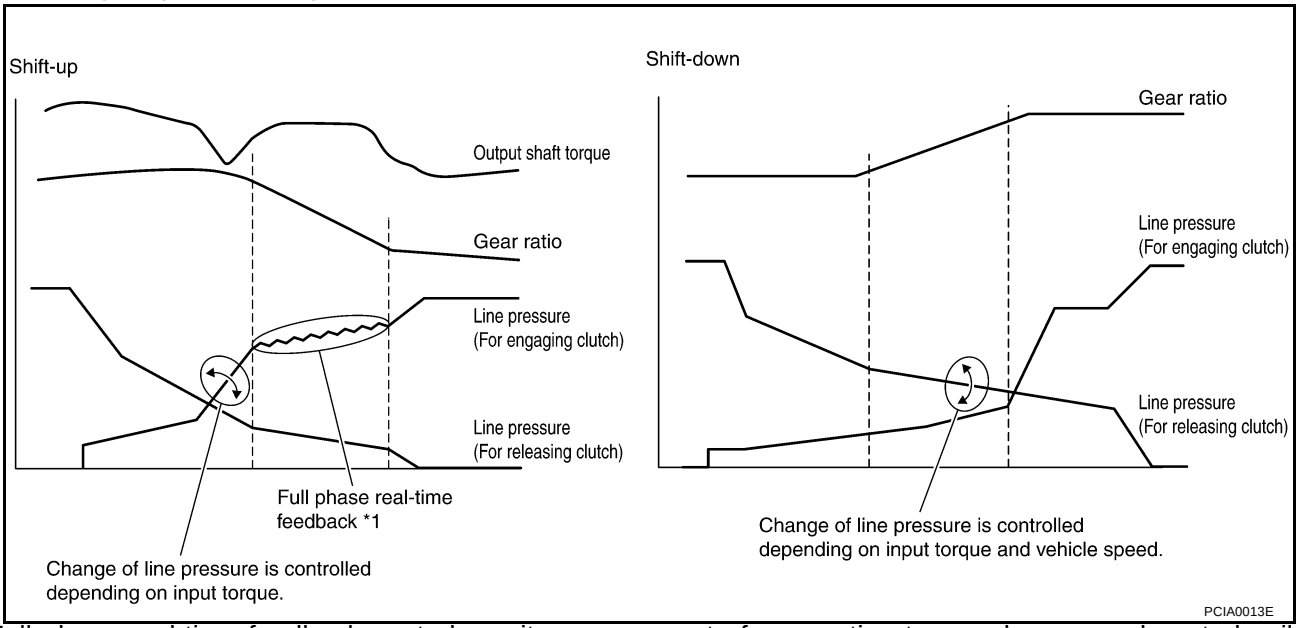
The clutch pressure control solenoid is driven by the signals from the switches and sensors. Thus, as the clutch pressure is adjusted to be appropriate to the engine load state and vehicle driving state. It becomes possible to finely control the clutch hydraulic pressure with high precision and a smoother speed change characteristic is attained.



SHIFT CHANGE

The clutch is controlled with the optimum timing and oil pressure for the engine speed, engine torque information, etc.

Shift Change System Diagram



*1: Full phase real-time feedback control monitors movement of gear ratio at gear change, and controls oil pressure at real-time to achieve the best gear ratio.

Lock-Up Control

ECS002FT

Lock-up control means that torque converter sliding is eliminated and coupling the lock-up piston in the torque converter raises the power transmission efficiency.
The lock-up solenoid is controlled by a signal from the TCM, the lock-up control valve operation is controlled, and the torque converter lock-up piston is coupled or released.

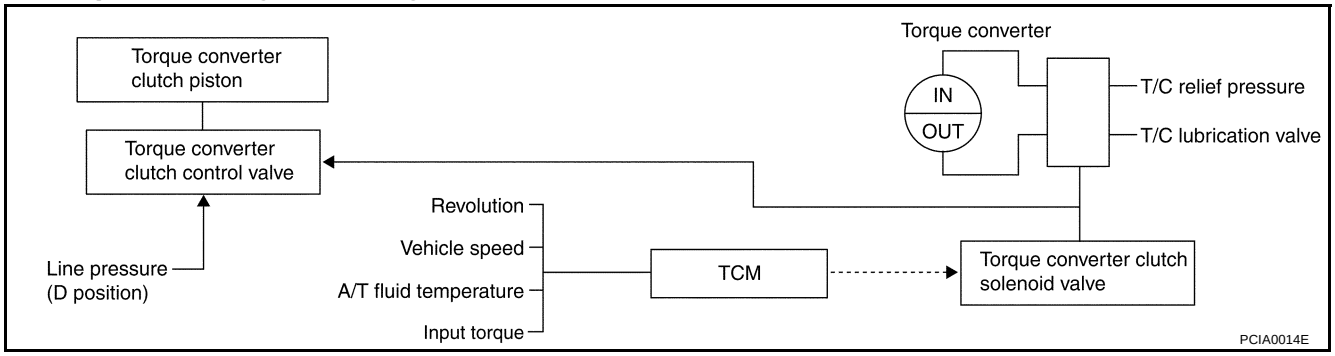
Lock-up Operation Condition Table

Select lever	D position		M position
Gear position	5	4	4
Lock-up	×	-	×
Slip lock-up	×	×	-

TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

- The circuit that supplies operating oil pressure to the lock-up piston chamber is connected to the lock-up control valve. This valve is switched by the lock-up solenoid with signals from the TCM.
- In this way, the circuit that supplies operating oil pressure to the lock-up piston chamber is controlled to the released side or the coupled side.

Lock-Up Control System Diagram



Lock-Up Released

- In the lock-up released state, the lock-up control valve is set into the un-locked state by the lock-up solenoid and the lock-up apply pressure is drained.
  In this way, the lock-up piston is not coupled.

Lock-Up Applied

- In the lock-up coupled state, the lock-up control valve is set into the locked state by the lock-up solenoid and lock-up apply pressure is generated.
  In this way, the lock-up piston is pressed and coupled.

SMOOTH LOCK-UP CONTROL

When shifting from the lock-up release state to the lock-up coupled state, the current output to the lock-up solenoid is controlled with the TCM. In this way, when shifting to the lock-up coupled state, the lock-up clutch is temporarily set to the half-clutched state to reduce the shock.

Half Clutched State

- The current output from the TCM to the lock-up solenoid is varied to steadily increase the lock-up solenoid pressure.
  In this way, the lock-up apply pressure steadily rises and while the lock-up piston is put into half-clutched status, the force pressing on the lock-up piston is increased and the coupling is completed smoothly.

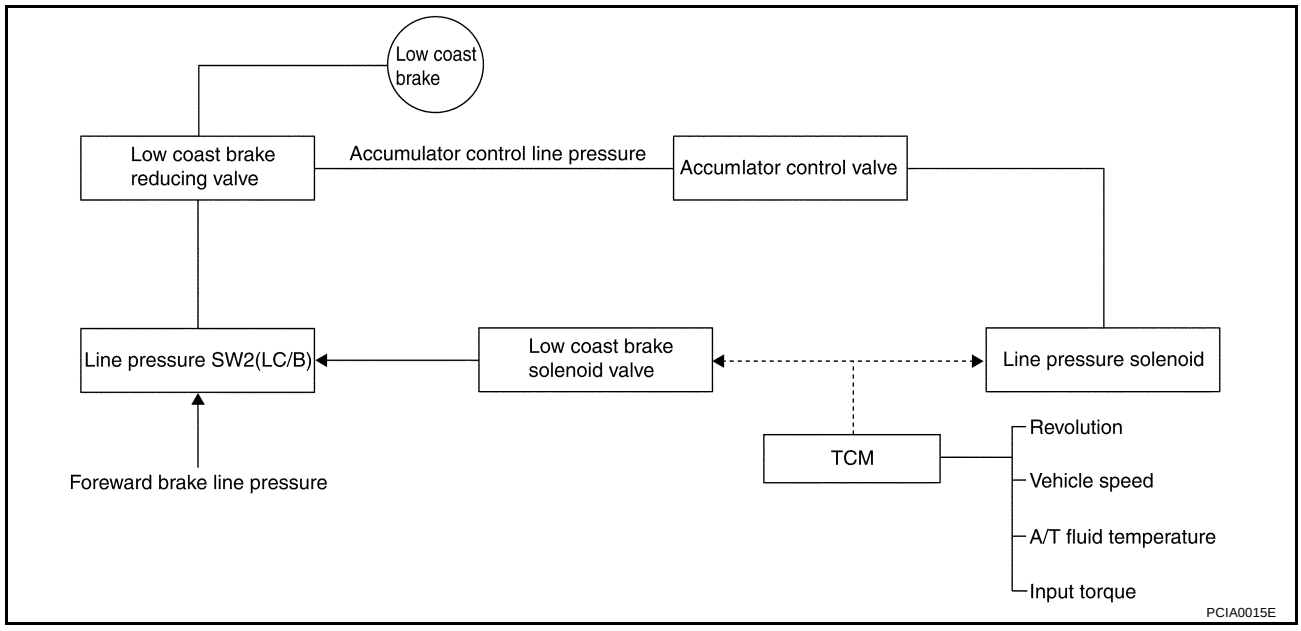
Slip Lock-up Control

- In the slip region, the lock-up solenoid current is controlled with the TCM to put it into the half-clutched state. This absorbs the engine torque fluctuation and lock-up operates from low speed.
  This raises the fuel efficiency for 3rd, 4th, and 5th speed at both low speed and when the accelerator has a low degree of opening.

Engine Brake Control

ECS002FU

- The forward one-way clutch transmits the drive force from the engine to the rear wheels. But the reverse drive from the rear wheels is not transmitted to the engine because the one-way clutch is idling.
  Therefore, the low coast brake solenoid is operated to prevent the forward one-way clutch from idling and the engine brake is operated in the same manner as conventionally.



- The operation of the low coast brake solenoid switches the low coast brake switch valve and controls the coupling and releasing of the low coast brake.
  The low coast brake reducing valve controls the low coast brake coupling force.

Control Valve

ECS002FV

FUNCTION OF CONTROL VALVE

Name	Function
Torque converter regulator valve	In order to prevent the pressure supplied to the torque converter from being excessive, the line pressure is adjusted to the optimum pressure (torque converter operating pressure).
Pressure regulator valve Pressure regulator plug Pressure regulator sleeve	Adjusts the oil discharged from the oil pump to the optimum pressure (line pressure) for the driving state.
Front brake control valve	When the front brake is coupled, adjusts the line pressure to the optimum pressure (front brake pressure) and supplies it to the front brake.
Accumulator control valve	Adjusts the pressure (accumulator control pressure) acting on the accumulator piston and low coast reducing valve to the pressure appropriate to the driving state (adjusts the clutch pressure for 1st, 2nd, 3rd, and 5th speeds).
Pilot valve A	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for line pressure control, speed change control, and lock-up control.
Pilot valve B	Adjusts the line pressure and produces the constant pressure (pilot pressure) required for speed change control.
Low coast brake switching valve	During engine braking, supplies the line pressure to the low coast brake reducing valve.
Low coast brake reducing valve	When the low coast brake is coupled, adjusts the line pressure to the optimum pressure (low coast brake pressure) and supplies it to the low coast brake.
N-R accumulator	Produces the stabilizing pressure for when N-R is selected.
Direct clutch piston switching valve	Operates in 4th speed and switches the direct clutch coupling capacity.
High and low reverse clutch control valve	When the high and low reverse clutch is coupled, adjusts the line pressure to the optimum pressure (high and low reverse clutch pressure) and supplies it to the high and low reverse clutch. (In 1st, 2nd, 3rd, and 5th speeds, adjusts the clutch pressure.)

Name	Function
Input clutch control valve	When the input clutch is coupled, adjusts the line pressure to the optimum pressure (input clutch pressure) and supplies it to the input clutch. (In 4th and 5th speeds, adjusts the clutch pressure.)
Direct clutch control valve	When the direct clutch is coupled, adjusts the line pressure to the optimum pressure (direct clutch pressure) and supplies it to the direct clutch. (In 2nd, 3rd, and 4th speeds, adjusts the clutch pressure.)
TCC control valve TCC control plug TCC control sleeve	Switches the lock-up to operating or released. Also, by executing the lock-up operation transiently, lock-up smoothly.
Torque converter lubrication valve	Operated during lock-up to switch the torque converter, cooling, and lubrication system oil path.
Cool bypass valve	Set for securing oil lubrication flow at low temperatures.
Line pressure relief valve	Set for securing line pressure.
N-D accumulator	Produces the stabilizing pressure for when N-D is selected.
Manual valve	Sends line pressure to each circuit according to the select position. The circuits to which the line pressure is not sent drain.

FUNCTION OF PRESSURE SWITCH

Name	Function
Pressure switch 1 (FR/B)	Detects any abnormality in the front brake hydraulic pressure. When it detects any abnormality, it puts the system into fail-safe mode.
Pressure switch 2 (LC/B)	Detects any abnormality in the low coast brake hydraulic pressure. When it detects any abnormality, it puts the system into fail-safe mode.
Pressure switch 3 (I/C)	Detects any abnormality in the input clutch hydraulic pressure. When it detects any abnormality, it puts the system into fail-safe mode.
Pressure switch 5 (D/C)	Detects any abnormality in the direct clutch hydraulic pressure. When it detects any abnormality, it puts the system into fail-safe mode.
Pressure switch 6 (H&LR/C)	Detects any abnormality in the high & low reverse clutch hydraulic pressure. When it detects any abnormality, it puts the system into fail-safe mode.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

ECS000XL

The A/T system has two self-diagnostic systems.
The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.
The second is the TCM original self-diagnosis indicated by the A/T CHECK indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For detail, refer to AT-69, "Self-Diagnostic Result Test Mode" .

OBD-II Function for A/T System

ECS000XM

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system. One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.
The MIL automatically illuminates in One or Two Trip Detection Logic when a malfunction is sensed in relation to A/T system parts.

One or Two Trip Detection Logic of OBD-II

ECS000XN

ONE TRIP DETECTION LOGIC

If a malfunction is sensed during the first test drive, the MIL will illuminate and the malfunction will be stored in the ECM memory as a DTC. The TCM is not provided with such a memory function.

TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — First Trip
If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — Second Trip
The “trip” in the “One or Two Trip Detection Logic” means a driving mode in which self-diagnosis is performed during vehicle operation.

OBD-II Diagnostic Trouble Code (DTC)

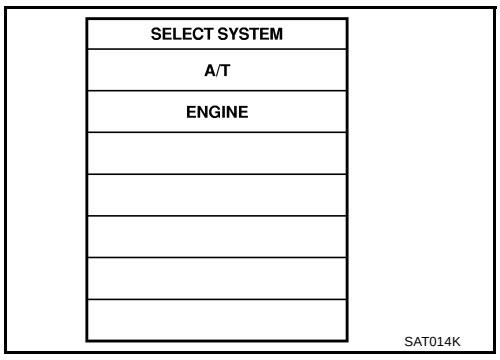
ECS000XO

HOW TO READ DTC AND 1ST TRIP DTC

DTC and 1st trip DTC can be read by the following methods.
(with CONSULT-II or GST GST) CONSULT-II or GST (Generic Scan Tool) Examples: P0705, P0720 etc. These DTC are prescribed by SAE J2012.
(CONSULT-II also displays the malfunctioning component or system.)

- **1st trip DTC No. Is the same as DTC No.**
- **Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST, they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal.**
  CONSULT-II can identify them as shown below, therefore, CONSULT-II (if available) is recommended.

A sample of CONSULT-II display for DTC and 1st trip DTC is shown on the next page. DTC or 1st trip DTC of a malfunction is displayed in SELF-DIAGNOSTIC RESULTS mode for “ENGINE” with CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.



If the DTC is being detected currently, the time data will be “0”.

SELF-DIAG RESULTS	
DTC RESULTS	TIME
PNP SW/CIRC [P0705]	0

SAT015K

If a 1st trip DTC is stored in the ECM, the time data will be “1t”.

SELF-DIAG RESULTS	
DTC RESULTS	TIME
PNP SW/CIRC [P0705]	1 t

SAT016K

Freeze Frame Data and 1st Trip Freeze Frame Data

The ECM has a memory function, which stores the driving condition such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed and vehicle speed at the moment the ECM detects a malfunction.
Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For detail, refer to EC-118, "CONSULT-II Function" .
Only one set of freeze frame data (either 1st trip freeze frame data of freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MIL on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM. The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0306 Fuel Injection System Function — DTC: P0171, P0172, P0174, P0175
2		Except the above items (Includes A/T related items)
3	1st trip freeze frame data	

Both 1st trip freeze frame data and freeze frame data (along with the DTC) are cleared when the ECM memory is erased.

HOW TO ERASE DTC

The diagnostic trouble code can be erased by CONSULT-II, GST or ECM DIAGNOSTIC TEST MODE as described following.

- **If the battery terminal is disconnected, the diagnostic trouble code will be lost within 24 hours.**
- **When you erase the DTC, using CONSULT-II or GST is easier and quicker than switching the mode selector on the ECM.**

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD-II. For details, refer to EC-51, "Emission-related Diagnostic Information" .

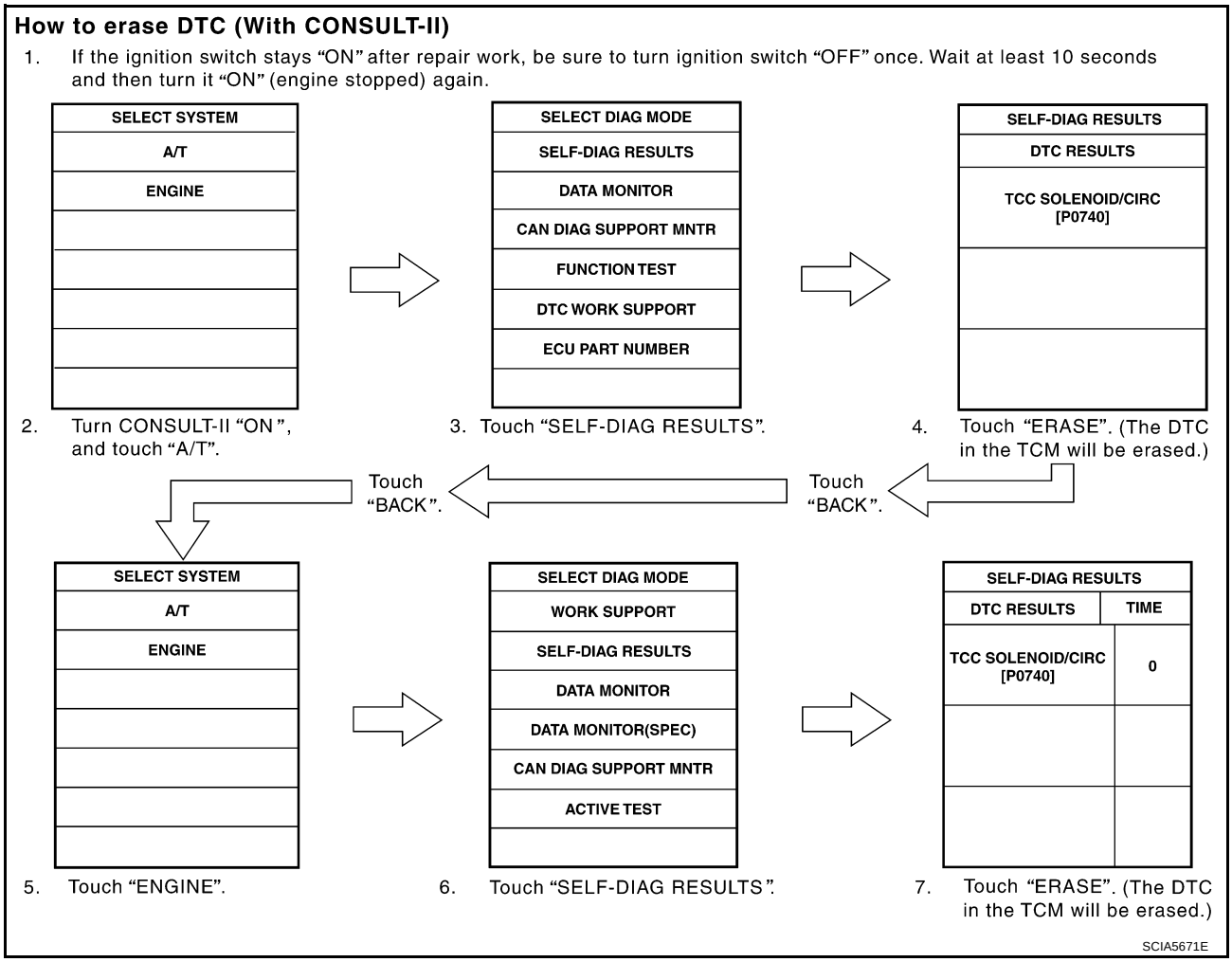
- **Diagnostic trouble codes (DTC)**
- **1st trip diagnostic trouble codes (1st trip DTC)**
- **Freeze frame data**

- **1st trip freeze frame data**
- **System readiness test (SRT) codes**
- **Test values**

HOW TO ERASE DTC (WITH CONSULT-II)

- **If a DTC is displayed for both ECM and TCM, it is necessary to be erased for both ECM and TCM.**

1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait at least 10 seconds and then turn it “ON” (engine stopped) again.
2. Turn CONSULT-II “ON” and touch “A/T”.
3. Touch “SELF-DIAG RESULTS”.
4. Touch “ERASE”. (The DTC in the TCM will be erased.) Then touch “BACK” twice.
5. Touch “ENGINE”.
6. Touch “SELF-DIAG RESULTS”.
7. Touch “ERASE”. (The DTC in the ECM will be erased.)



HOW TO ERASE DTC (WITH GST)

1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait at least 10 seconds and then turn it “ON” (engine stopped) again.
2. Perform “OBD-II SELF-DIAGNOSTIC PROCEDURE (No Tools)”. Refer to AT-76, "OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Select Mode 4 with Generic Scan Tool (GST). For details, refer to EC-130, "Generic Scan Tool (GST) Function" .

HOW TO ERASE DTC (NO TOOLS)

The A/T CHECK indicator lamp is located on the instrument panel.

1. If the ignition switch stays “ON” after repair work, be sure to turn ignition switch “OFF” once. Wait at least 10 seconds and then turn it “ON” (engine stopped) again.
2. Perform “TCM SELF-DIAGNOSTIC PROCEDURE (No Tools)”. Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)

Malfunction Indicator Lamp (MIL)

ECS002KY

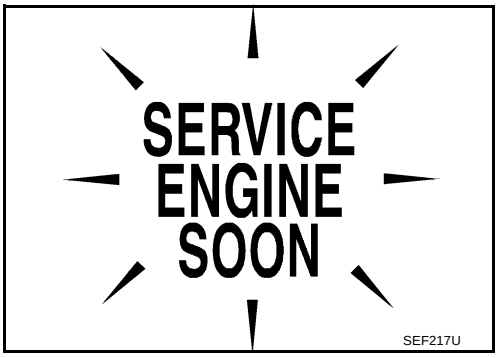
DESCRIPTION

The MIL is located on the instrument panel.

1. The MIL will light up when the ignition switch is turned “ON” without the engine running. This is a bulb check.

- If the MIL does not light up, refer to DI-27, "WARNING LAMPS" , or see AT-39, "Malfunction Indicator Lamp (MIL)" .

2. When the engine is started, the MIL should go off.
   If the MIL remains on, the on board diagnostic system has detected an engine system malfunction.



SEF217U

TROUBLE DIAGNOSIS

PFP:00004

DTC Inspection Priority Chart

ECS002LO

If some DTC are displayed at the same time, perform inspections one by one based on the following priority chart.

NOTE:
If DTC U1000 is displayed with other DTC, first perform the trouble diagnosis for DTC U1000. Refer to AT-79 .

Priority	Detected items (DTC)
1	U1000 CAN communication line
2	Except above

Fail-Safe

ECS002LP

The TCM has an electrical fail safe mode. This mode makes it possible to operate even if there is a breakdown in a main electronic control input/output signal path.
In fail safe mode, even if the select lever is “D” or “M” mode, the transmission is fixed in 2nd or 4th (depending on the breakdown position), so the customer should feel “slipping” or “poor acceleration”. When fail-safe mode is triggered, when the ignition switch is switched “ON”, the A/T malfunction CHECK indicator lamp flashes for about 8 seconds.(Refer toAT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)").
Even when the electronic circuits are normal, under special conditions (for example, when slamming on the brake with the wheels spinning drastically and stopping the tire rotation), the transmission can go into fail safe mode. If this happens, switch “OFF” the ignition switch for 10 seconds, then switch it “ON” again to return to the normal shift pattern. Also, the A/T CHECK indicator lamp flashes for about 8 seconds once, then is cleared. Therefore, the customer's vehicle has returned to normal, so handle according to the “diagnostics flow” (Refer to AT-43).

FAIL-SAFE FUNCTION

If any abnormality occurs in a sensor or solenoid, this function controls the A/T without interfering with drivability.

Fail-Safe Chart

Control item			Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function (*3)	Self- diagnostics function
Input	Throttle position sensor		X	X	X	X	X	X	X
	Vehicle speed sensor A/T (revolution sensor)		X	X	X	X		X	X
	Vehicle speed sensor MTR(*1)		X	X	X	X			X
	Closed throttle position switch		(*2) X	(*2) X					(*4) X
	Wide open throttle position switch		(*2) X	(*2) X					(*4) X
	Turbine revolution sensor 1		X	X				X	X
	Turbine evolution sensor 2 (for 4th speed only)		X	X				X	X
	Engine speed signals					X			X
	PNP switch		X	X	X	X	X	X	(*4) X
	Brake switch			X			X		(*4) X
	Fluid temperature sensors 1, 2		X	X		X	X	X	X
	ASCD	Cruise signal		X	X	X	X		
		Overdrive release signal		X		X	X		
	TCM power supply voltage signal		X	X	X	X	X	X	X

Control item		Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function (*3)	Self- diagnostics function
Output	Direct clutch solenoid (oil pressure switch 5)	X	X	X	X		X	X
	Input clutch solenoid (oil pressure switch 3)	X	X	X	X		X	X
	High & low reverse clutch solenoid (oil pressure switch 6)	X	X	X	X		X	X
	Front brake solenoid (oil pressure switch 1)	X	X	X	X		X	X
	Low coast brake solenoid (oil pressure switch 2)	X	X	X	X	X	X	X
	Line pressure solenoid	X	X	X	X	X	X	X
	TCC solenoid				X		X	X
	Self-diagnostics table							X

*1: Spare for vehicle speed sensor·A/T (revolution sensor)
*2: Spare for throttle position sensor
*3: If these input and output signals are different, the TCM triggers the fail-safe function.
*4: Used as a condition for starting self-diagnostics; if self-diagnostics are not started, it is judged that there is some kind of error.

VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)

- Signals are input from two systems - from vehicle speed sensor A/T (revolution sensor) installed on the transmission and from VDC/TCS/ABS C/U so normal driving is possible even if there is an error in one of the systems.

ACCELERATOR SENSOR

- If an error occurs in the accelerator sensor signal, the accelerator degree of opening is detected from the full switch signal (input by CAN communications) and the idle signal transmitted from the ECM and the line pressure is controlled according to the table below to make driving possible.

Closed throttle position switch	Wide open throttle position switch	Line pressure	Remarks
OFF	ON	Maximum hydraulic pressure	Accelerator degree of opening 4/8
OFF	OFF		Accelerator degree of opening 2/8
ON	OFF	Minimum hydraulic pressure	Accelerator degree of opening 0/8

PNP SWITCH

- In the unlikely event that an error signal enters the TCM, the position indicator is switched “OFF”, the PNP relay is switched “OFF” (starter starting disabled), and the position is fixed to the “D” speed to make driving possible.

PNP RELAY

- The PNP relay is switched “OFF”. (Starter starting is disabled.)

A/T INTERLOCK

- If there is an A/T interlock judgment malfunction, the transmission is fixed in 2nd gear to make driving possible.

  NOTE:
  When the vehicle is driven fixed in 2nd gear, a turbine revolution sensor malfunction is displayed, but this is not a turbine revolution sensor malfunction.

- When the coupling pattern below is detected, the fail-safe action corresponding to the pattern is performed.

A/T interlock coupling pattern table

●: NG, X:OK

Gear position		Hydraulic pressure switch output					Fail-safe function	Clutch pressure output pattern after fail-safe function					
		SW3 (I/C)	SW6 (H&LR/C)	SW5 (D/C)	SW1 (Fr/B)	SW2 (LC/B)		I/C	H&LR/C	D/C	Fr/B	LC/B	L/U
A/T interlock coupling pattern	3rd		X	X		●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
	4th		X	X		●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
	5th	X	X		X	●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF

A/T 1ST ENGINE BRAKING

- When there is an A/T first speed engine brake judgment error, the low coast brake solenoid is switched “OFF” to avoid switching on the engine brake.

LINE PRESSURE SOLENOID

- The solenoid is switched “OFF” and the line pressure is set to the maximum hydraulic pressure to make driving possible.

TORQUE CONVERTER CLUTCH SOLENOID

- The solenoid is switched “OFF” to release the lockup.

LOW COAST BRAKE SOLENOID

- When an (electrical or functional) error occurs, in order to make driving possible, if the solenoid is “ON”, the transmission is held in 2nd speed; if the solenoid is “OFF”, the transmission is held in 4th speed.

INPUT CLUTCH SOLENOID

- If an (electrical or functional) error occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th speed to make driving possible.

DIRECT CLUTCH SOLENOID

- If an (electrical or functional) error occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th speed to make driving possible.

FRONT BRAKE CLUTCH SOLENOID

- If an electrical error occurs with the solenoid “ON”, in order to make driving possible, the A/T is held in 5th speed; if the solenoid is OFF, 4th speed.
- If a functional error occurs with the solenoid “ON”, in order to make driving possible, the A/T is held in 2nd speed; if the solenoid is OFF, 4th speed.

HIGH & LOW REVERSE CLUTCH SOLENOID

- If an (electrical or functional) error occurs with the solenoid either “ON” or “OFF”, the transmission is held in 4th speed to make driving possible.

TURBINE REVOLUTION SENSORS 1, 2

- The control is the same as if there were no turbine revolution sensors and control is from vehicle speed sensor·A/T.

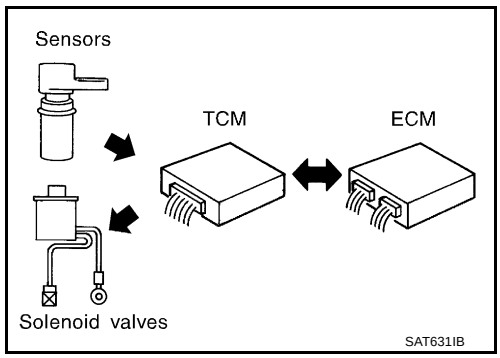
How To Perform Trouble Diagnosis For Quick and Accurate Repair

ECS002LQ

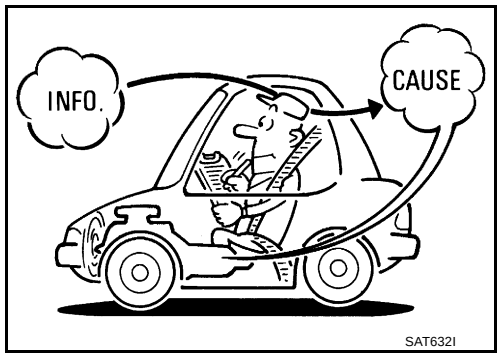
INTRODUCTION

The TCM receives a signal from the vehicle speed sensor, throttle position sensor or PNP switch and provides shift control or lock-up control via A/T solenoid valves.

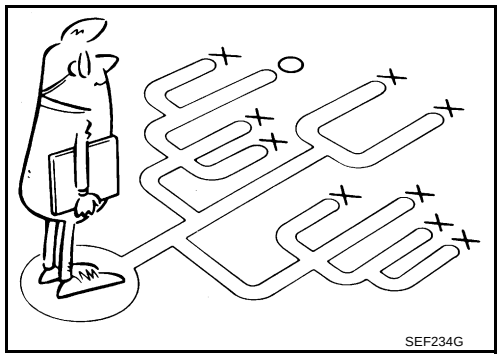
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.
Input and output signals must always be correct and stable in the operation of the A/T system. The A/T system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.



It is much more difficult to diagnose a problem that occurs intermittently rather than continuously. Most intermittent problems are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.
A visual check only may not find the cause of the problems. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the AT-43, "WORK FLOW" .



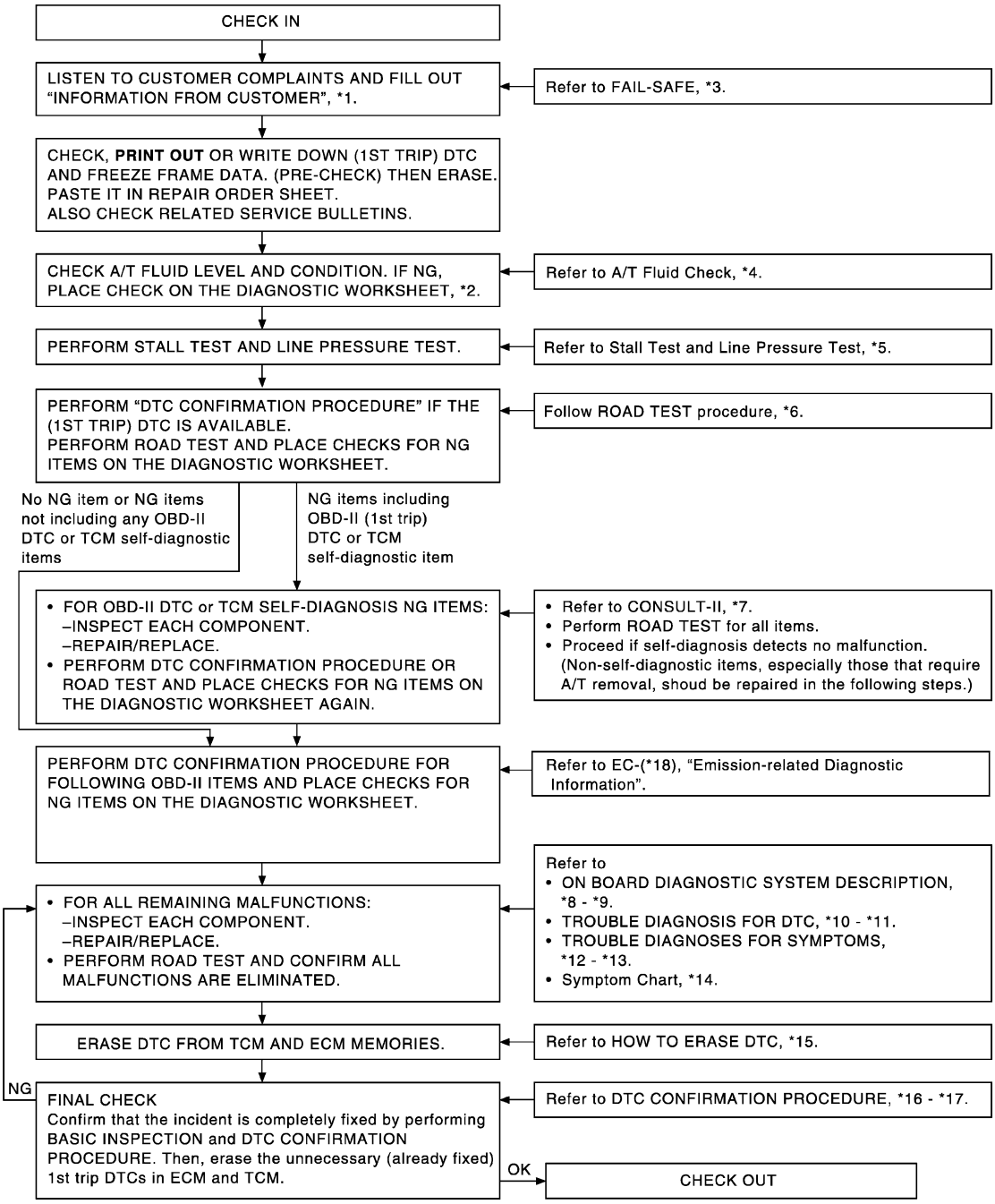
Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a drive ability complaint. The customer can supply good information about such problems, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A “Diagnostic Worksheet” as shown on the example (Refer to AT-45) should be used.
Start your diagnosis by looking for “conventional” problems first. This will help troubleshoot drive ability problems on an electronically controlled engine vehicle.
Also check related Service bulletins.



WORK FLOW

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate.
In general, each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.
Make good use of the two sheets provided, “Information From Customer” (Refer to AT-45) and “Diagnostic Worksheet” (Refer to AT-45), to perform the best troubleshooting possible.

Work Flow Chart



SCIA0501E

*1 AT-45 *2 AT-45 *3 AT-40
*4 AT-50 *5 AT-50, AT-52 *6 AT-54
*7 AT-67 *8 AT-36 *9 AT-76
*10 AT-79 *11 AT-184 *12 AT-186
*13 AT-206 *14 AT-60 *15 AT-37
*16 AT-79 *17 AT-181 *18 EC-51

DIAGNOSTIC WORKSHEET

Information From Customer

KEY POINTS

- **WHAT**..... Vehicle & A/T model
- **WHEN**..... Date, Frequencies
- **WHERE**..... Road conditions
- **HOW**..... Operating conditions, Symptoms

Customer name MR/MS	Model & Year	VIN
Trans. Model	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	❑ Continuous ❑ Intermittent (times a day)	
Symptoms	❑ Vehicle does not move. (❑ Any position ❑ Particular position)	
	❑ No up-shift (❑ 1st → 2nd ❑ 2nd → 3rd ❑ 3rd → 4th ❑ 4th → 5th)	
	❑ No down-shift (❑ 5th → 4th ❑ 4th → 3rd ❑ 3rd → 2nd ❑ 2nd → 1st)	
	❑ Lock-up malfunction	
	❑ Shift point too high or too low.	
	❑ Shift shock or slip (❑ N → D ❑ Lock-up ❑ Any drive position)	
	❑ Noise or vibration	
	❑ No kick down	
	❑ No pattern select	
	❑ Others ( )	
A/T CHECK indicator lamp	Blinks for about 8 seconds.	
	❑ Continuously lit	❑ Not lit
Malfunction indicator lamp (MIL)	❑ Continuously lit	❑ Not lit

Diagnostic Worksheet Chart

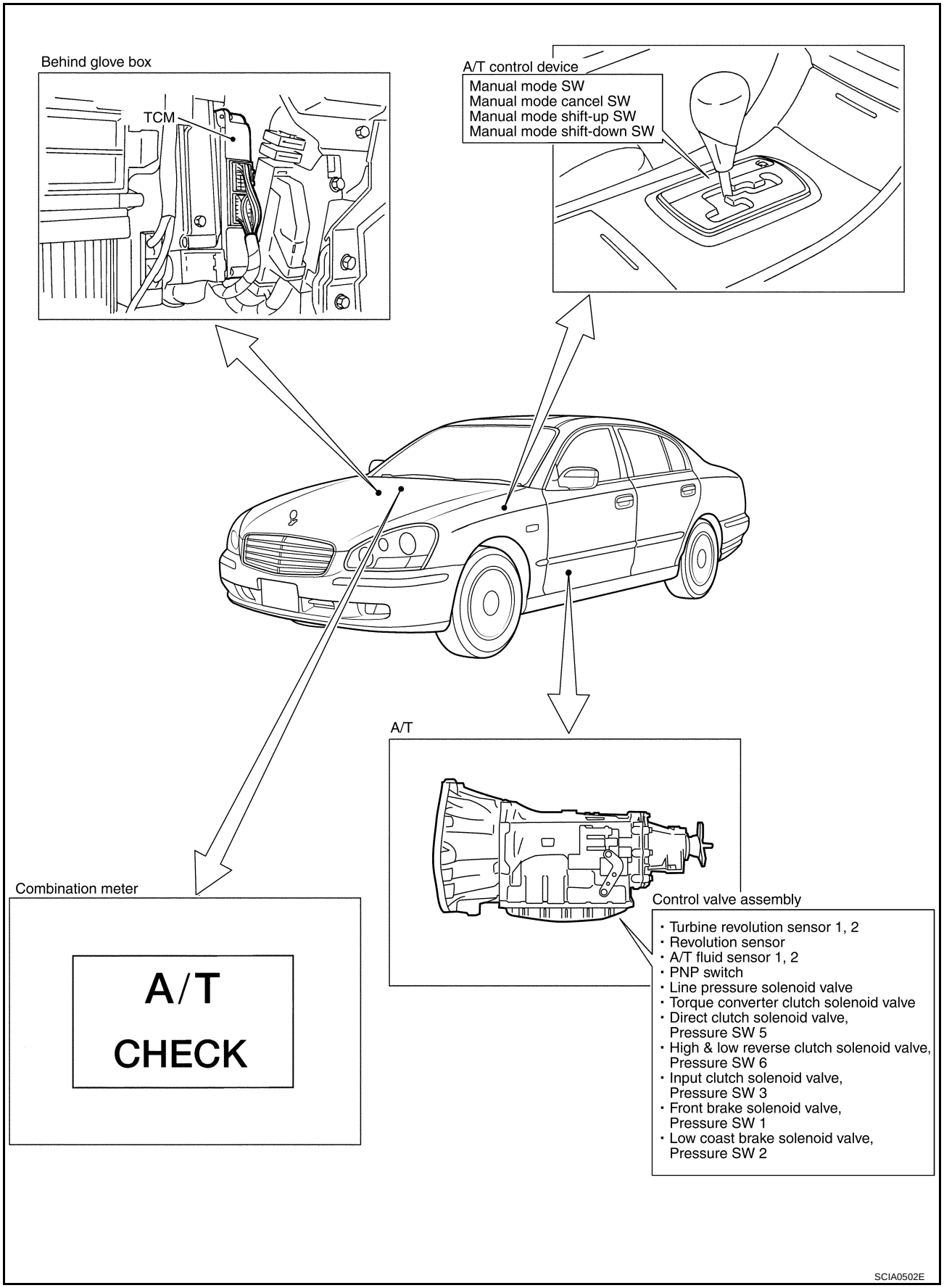
1	❑ Read the item on “cautions concerning fail-safe and understand the customer's complaint.			AT-40
2	❑ A/T fluid inspection			AT-50
		❑ Leak (Repair leak location.) ❑ State ❑ Amount		
3	❑ Stall test and line pressure test			AT-50, AT-52
		❑ Stall test		
			❑ Torque converter one-way clutch ❑ Input clutch ❑ Front brake ❑ Direct clutch ❑ High & low reverse clutch ❑ Low coast brake ❑ Forward brake ❑ Forward one-way clutch	❑ 1st one-way clutch ❑ 3rd one-way clutch ❑ Engine ❑ Line pressure low ❑ Except for input clutch and front brake, clutches and brakes OK
		❑ Line pressure inspection - Suspected part:		

4	❑ Execute all road tests and enter checks in required inspection items.			AT-54
	4-1.	Check before engine is started		AT-54
		❑ Execute self-diagnostics Enter checks for detected items.		
			❑ Vehicle speed sensor·A/T. AT-89 . ❑ Vehicle speed sensor·MTR. AT-127 . ❑ Direct clutch solenoid valve. AT-150 . ❑ TCC solenoid valve. AT-94 . ❑ Line pressure solenoid valve.AT-101 . ❑ Input clutch solenoid valve. AT-138 . ❑ Front brake solenoid valve. AT-144 . ❑ Low coast brake solenoid valve. AT-162 . ❑ High & low reverse clutch solenoid valve. AT-156 . ❑ PNP switch. AT-85 . ❑ A/T Fluid temperature sensors 1, 2. AT-118 . ❑ Turbine revolution sensors 1, 2. AT-123 . ❑ A/T interlock. AT-129 . ❑ A/T 1st engine braking. AT-135 . ❑ Start signal. AT-82 . ❑ Throttle position sensor. AT-116 . ❑ Engine speed signal. AT-92 . ❑ CAN communication. AT-79 . ❑ TCM power supply. AT-104 . ❑ Battery ❑ Other	
	4-2.	Idle inspection		AT-54
		❑ The A/T CHECK Indicator Lamp does come on. AT-187 ❑ Engine Cannot Be Started in “P” and “N” Position. AT-189 . ❑ In “ P” Position, Vehicle Moves When Pushed. AT-189 . ❑ In “N” Position Vehicle Moves. AT-191 . ❑ Large Shock “N” to “D” Position. AT-191 . ❑ Vehicle Does Not Creep Backward In “R” Position. AT-192 . ❑ Vehicle does Not Creep Forward In “D” Position. AT-194 .		
	4-3.	Driving tests		AT-56
		Part 1		
		❑ Vehicle Cannot Be Started From D1. AT-195 . ❑ A/T Does Not Shift: D1 → D2 Or Does Not Kick Down D4 → D2. AT-196 . ❑ A/T Does Not Shift: D2 → D3. AT-197 . ❑ A/T Does Not Shift: D3 → D4. AT-198 . ❑ A/T Does Not Shift: D4 → D5. AT-199 . ❑ Lock-up Is Not Released. AT-201 . ❑ Engine Speed Does Not Return To Idle. AT-202 .		

		Part 2		
		❑ Vehicle Cannot Be Started From D1. AT-195 . ❑ A/T Does Not Shift: D1 → D2 Or Does Not Kick Down D4 → D2. AT-196 . ❑ A/T Does Not Shift:D2 → D3. AT-197 . ❑ A/T Does Not Shift: D3 → D4. AT-198 . ❑ A/T Does Not Shift:D4 → D5. AT-199 .		AT-58
		Part 3		
		❑ Engine rotation does not drop to idle rotation. AT-202 . ❑ A/T Does Not Shift:D5 → D4.AT-203 . ❑ A/T Does Not Shift:D4 → D3. AT-204 . ❑ A/T Does Not Shift:D3 → D2. AT-205 . ❑ A/T Does Not Shift:D2 →D1. AT-205 . ❑ Vehicle Does Not Decelerate By Engine Brake. AT-206 . ❑ Execute self-diagnostics Enter checks for detected items.		AT-59
4	4-3		❑ Vehicle speed sensor·A/T. AT-89 . ❑ Vehicle speed sensor·MTR. AT-127 . ❑ Direct clutch solenoid valve.AT-150 . ❑ TCC solenoid valve. AT-94 . ❑ Line pressure solenoid valve.AT-101 . ❑ Input clutch solenoid valve. AT-138 . ❑ Front brake solenoid valve. AT-144 . ❑ Low coast brake solenoid valve. AT-162 . ❑ High & low reverse clutch solenoid valve. AT-156 ❑ PNP switch. AT-85 . ❑ A/T fluid temperature sensors 1, 2. AT-118 . ❑ Turbine revolution sensors 1, 2. AT-123 . ❑ A/T interlock. AT-129 . ❑ A/T 1st engine braking. AT-135 . ❑ Start signal.AT-82 . ❑ Throttle position sensor. AT-116 . ❑ Engine sped signal. AT-92 . ❑ CAN communication. AT-79 . ❑ TCM power supply. AT-104 . ❑ Battery ❑ Other	
5	❑ Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunction parts.			
6	❑ Execute all road tests and enter the checks again for the required items.			AT-54
7	❑ For any remaining NG items, execute the “diagnostics procedure” and repair or replace the malfunction parts. See the chart for breakdown diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)			AT-60
8	❑ Erase the results of the self-diagnostics from the TCM.			AT-67, AT-76

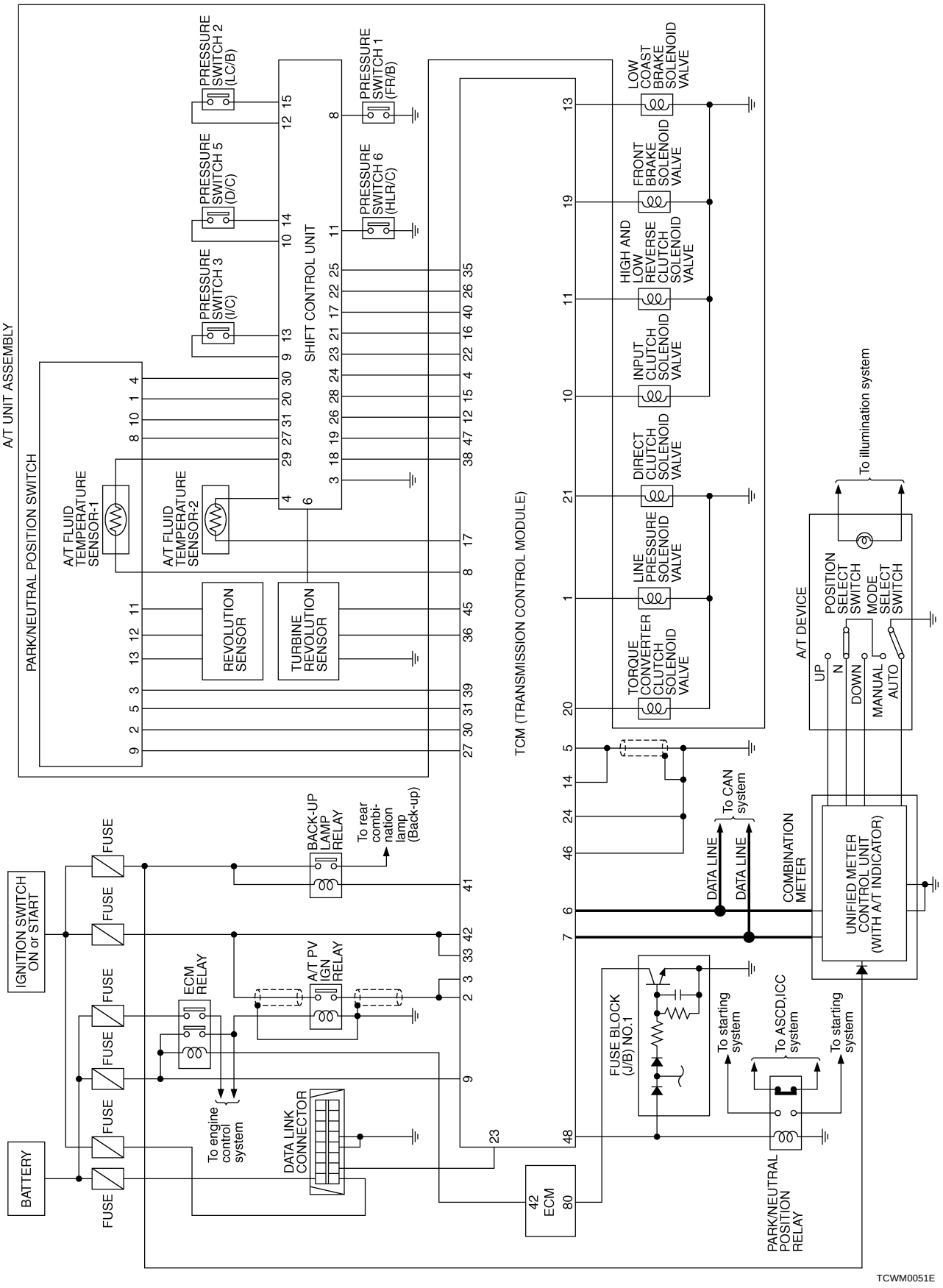
A/T Electrical Parts Location

ECS002LR



Circuit Diagram

ECS002LS



Inspections Before Trouble Diagnosis

ECS002LT

A/T FLUID CHECK

Fluid Leakage and Fluid Level Check

NOTE:
Use only A/T fluid level gauge: Parts No.31086 AR211 (Special Service Tool No.J45475)

- Inspect for fluid leakage and check the fluid level. Refer to AT-12, "Checking A/T Fluid" .

Inspect the amount of A/T fluid under the hot conditions 50 to 80°C (122 to 176°F) according to the instructions below.

1. After engine warm up is complete, drive around the city for about 10 minutes. The automatic fluid temperature rises to 50 to 80°C (122 to 176°F) during 10 minutes of driving.
2. Place the vehicle on a level location.
3. Brake securely with the parking brake.
4. Put the engine in idle and while pressing the brake pedal, shift the selector lever from “P” to “D” position.
5. Check that when the selector lever is in the “P” or “N” position, then the amount of transmission fluid is in the position of the oil level gauge (hot side).

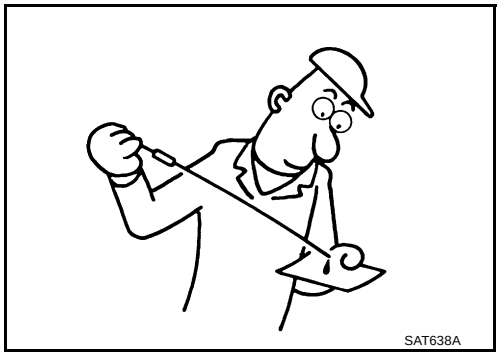
CAUTION:

- **If it is necessary to check the amount of A/T fluid with the A/T fluid at low temperature 30 to 50°C (86 to 122°F), after adjusting within the cold level of the level gauge, then always check the amount of A/T fluid under the above hot condition.**
- **When wiping away the oil level gauge, always use a paper rag, not a cloth one.**
- **Always secure the oil level gauge in the charging pipe with the stopper.**

Fluid Condition Check

Inspect the fluid status.

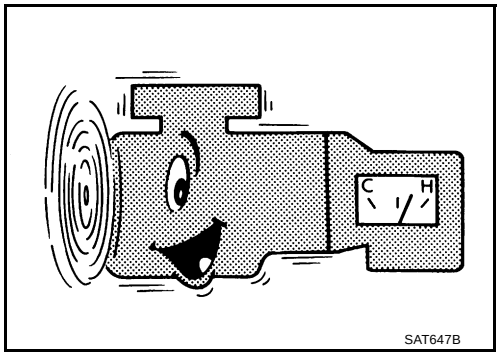
Fluid status	Conceivable Cause	Required Operation
Varnished (viscous varnish state)	Clutch, parking brake scorched	Replace the A/T fluid and check the A/T main unit and the vehicle for problems (wire harnesses, cooler pipes, etc.)
Milky white or cloudy	Water in the fluid	Replace the A/T fluid and check for places where water is getting in.
Large amount of metal powder mixed in	Abnormal wear of sliding parts within A/T	Replace the A/T fluid and check for improper operation of the A/T.


SAT638A

STALL TEST

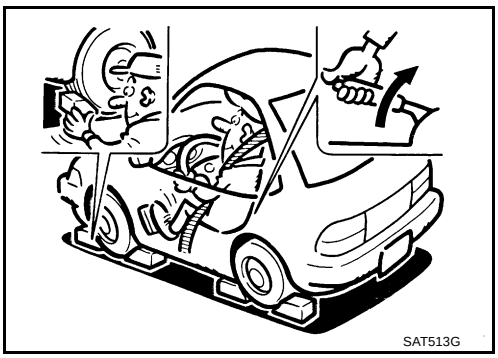
Stall Test Procedure

1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Inspect the amount of A/T fluid. Replenish if necessary.



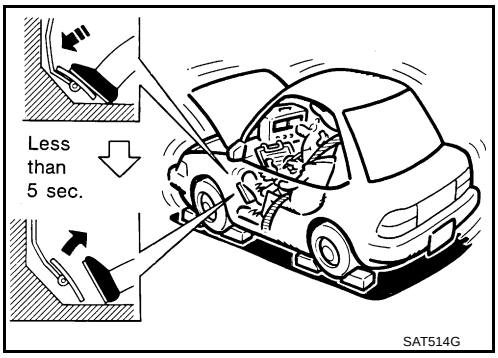
SAT647B

3. Securely engage the parking brake so that the tires do not turn.



4. Engine start, apply foot brake, and place selector lever in “P” position.
5. While holding down the foot brake, gradually press down the accelerator pedal.
6. Quickly read off the stall speed, then quickly remove your foot from the accelerator pedal.

CAUTION:
Do not hold down the accelerator pedal for more than 5 seconds during this test.



7. Move the selector lever to the “N” position.
8. Cool down the A/T fluid.

CAUTION:
Run the engine at idle for at least one minute.

Stall revolution: 2,200 - 2,500 rpm

Judgement Stall Test

	Selector lever position		Expected problem location
	D, M	R	
Stall rotation	H	O	● Forward brake ● Forward one-way clutch ● 1st one-way clutch ● 3rd one-way clutch
	O	H	● Front brake ● Reverse clutch ● 1st one-way clutch
	L	L	● Engine and torque converter one-way clutch
	H	H	● Line pressure low
	O	O	● One-way clutch in torque converter stuck or check with individual item tests

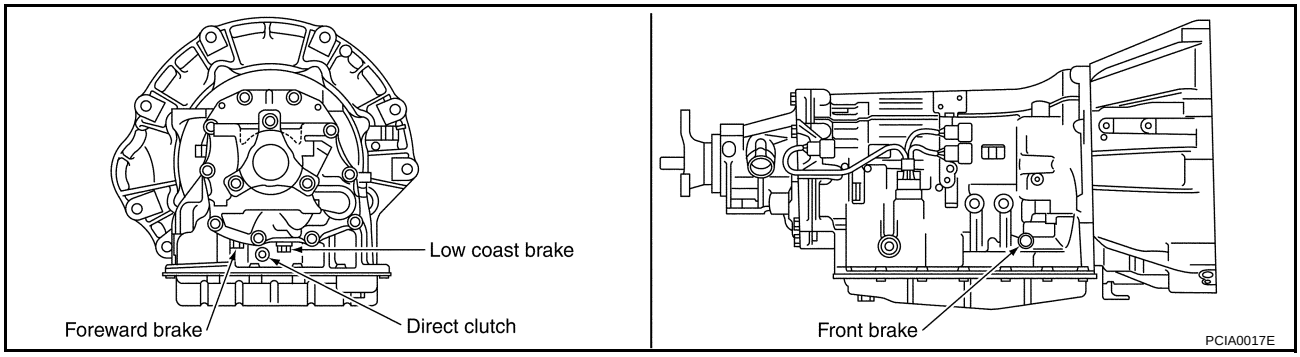
O: Stall speed within standard value position
H: Stall speed higher than standard value
L: Stall speed lower than standard value

Stall test standard value position

Does not shift up D, M position 1 → 2	Slipping in 2nd, 3rd, 4th speeds	Direct clutch slippage
Does not shift up D, M position 2 → 3	Slipping in 3rd, 4th, 5th speeds	High & low reverse clutch slippage
Does not shift up D, M position 3 → 4	Slipping in 4th, 5th speeds	Input clutch slippage
Does not shift up D, M position 4 → 5	Slipping in 5th speeds	Front brake slippage

LINE PRESSURE TEST

Line Pressure Test Port

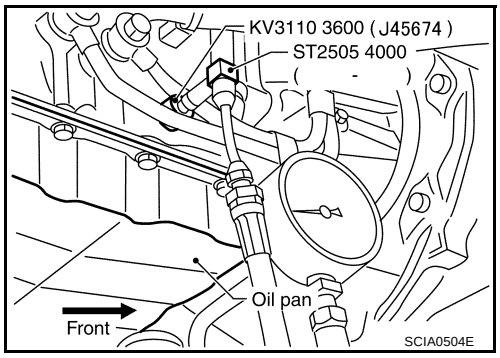


Line Pressure Test Procedure

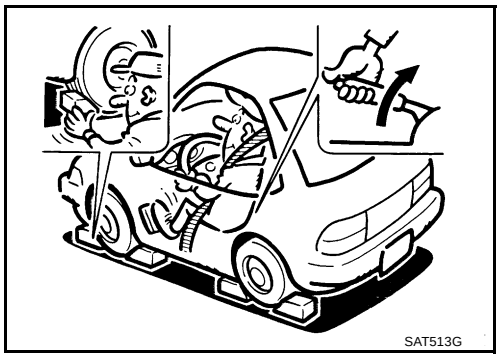
1. Inspect the amount of engine oil and replenish if necessary.
2. Drive the car for about 10 minutes to warm it up so that the A/T fluid reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of A/T fluid and replenish if necessary.

   NOTE:
   The automatic fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.
3. After warming up your A/T, remove the oil pressure detection plug and install the oil pressure gauge.

   CAUTION:
   When using the oil pressure gauge, be sure to use the O-ring attached to the oil pressure detection plug.



4. Securely engage the parking brake so that the tires do not turn.



5. Start the engine, then measure the line pressure at both idle and the stall speed.

CAUTION:

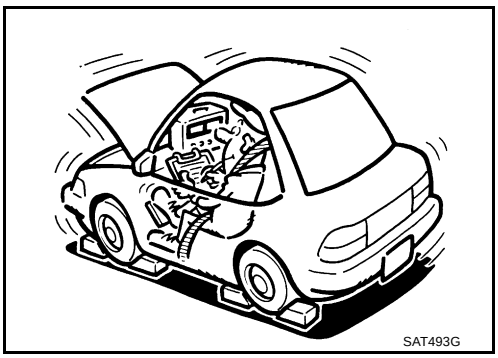
- **Keep the brake pedal pressed all the way down during measurement.**
- **When measuring the line pressure at the stall speed, refer to AT-50, "STALL TEST" .**

6. After the measurements are complete, install the oil pressure detection plug and tighten to the regulation torque below.

:4.8 - 9.8 N·m (0.45 - 0.99 kg-m, 39 - 86 in-lb)

CAUTION:

Do not reuse the O-ring.



Line Pressure

Engine speed rpm	Line Pressure [(kPa (kg/cm^2)]	
	R position	D, M positions
Idling Revolution	392 - 441 (4.0 - 4.5)	373 - 422 (3.8 - 4.3)
Stall Revolution	1,310 - 1,500 (13.4 - 15.3)	

Judgement of Line Pressure Test

Judgement		Possible cause
Idle speed	Low for all positions (P, R, N, D, M)	Possible causes include problems in the pressure supply system and low oil pump output. For example ● Oil pump wear ● Pressure regulator valve or plug sticking or spring fatigue ● Oil strainer ⇒ oil pump ⇒ pressure regulator valve path oil leak ● Engine idle speed too low
	Only low for a specific position	Possible causes include an oil pressure leak in a path or device related to the position after the pressure is distributed by the manual valve.
	High	Possible causes include a sensor problem or problem in the pressure adjustment function. For example ● Accelerator sensor malfunction ● ATF temperature sensor breakdown ● Line pressure solenoid malfunction (sticking in “OFF” state, filter clog, cut line) ● Pressure regulator valve or plug sticking
Stall speed	Oil pressure does not rise higher than the oil pressure for idle.	Possible causes include a sensor problem or problem in the pressure adjustment function. For example ● Accelerator sensor malfunction ● TCM breakdown ● Line pressure solenoid malfunction (shorting, sticking in“ ON” state) ● Pressure regulator valve or plug sticking ● Pilot valve sticking or pilot filter clogged
	The pressure rises, but does not enter the standard position.	Possible causes include problems in the pressure supply system and problems in the pressure adjustment function. For example ● Accelerator pedal position sensor malfunction ● Line pressure solenoid malfunction (sticking, filter clog) ● Pressure regulator valve or plug sticking ● Pilot valve sticking or pilot filter clogged
	Only low for a specific position	Possible causes include an oil pressure leak in a path or device related to the position after the pressure is distributed by the manual valve.

ROAD TEST

Description

- The road test inspects overall performance of the A/T and analyzes possible breakdown causes.
- The road test is carried out in the following three stages.

1. Check before engine is started. Refer to AT-54 .
2. Check at idle. Refer to AT-54 .
3. Cruise test
   - Inspect all the items from Part 1 to Part 3. Refer to AT-56 .

- Before beginning the road test, check the test procedure and inspection items.
- Test all inspection items until the symptom is uncovered. Diagnose NG items when all road tests are complete.

Check Before Engine is Started

ECS002LU

1. A/T CHECK INDICATOR LAMP

1. Park vehicle on level surface.
2. Move selector lever to “P” position.
3. Turn ignition switch to “OFF” position and wait at least 10 seconds.
4. Turn ignition switch to “ON” position. (Do not start engine.)

Does A/T CHECK indicator lamp light up for about 2 seconds?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-187 .

2. A/T CHECK INDICATOR LAMP

Does A/T CHECK indicator lamp flash for about 8 seconds?

YES >> Carry out the self-diagnostics and record all NG items on the diagnostics sheet. Refer to AT-54
NO >> 1. Turn ignition switch to “OFF” position.
2. Carry out the self-diagnostics and record all NG items on the diagnostics sheet. Refer to AT-76
3. Refer to AT-54 .

Check at Idle

ECS002LV

1. STARTING THE ENGINE

1. Park vehicle on level surface.
2. Move selector lever to “P” position.
3. Turn ignition switch to “OFF” position.
4. Switch the ignition switch to “START”.

Does the engine start?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-189 .

2. STARTING THE ENGINE

1. Turn ignition switch to “ACC” position.
2. Move selector lever in “D” or “R” position.
3. Turn ignition switch to “START” position.

Does the engine start in either position?

YES >> Stop the road test and go toAT-189 .
NO >> GO TO 3.

3. "P" POSITION FUNCTIONS

1. Move selector lever to "P" position.
2. Turn ignition switch to "OFF" position.
3. Disengage the parking brake.
4. Push the vehicle forward or backward.
5. Engage the parking brake.

When you push the vehicle, does it move?

YES >> Enter a check mark at "Vehicle moves when pushed in "P" position" on the diagnostics sheet, then continue the road test.
NO >> go to 4. Refer to AT-189 .

4. "N" POSITION FUNCTIONS

1. Start the engine.
2. Move selector lever to "N" position.
3. Disengage the parking brake.

Does the vehicle move?

YES >> Enter a check mark at "Vehicle moves in "N" position" on the diagnostics sheet, then continue the road test. Refer to AT-191 .
NO >> GO TO 5.

5. SHIFT SHOCK

1. Engage the brake.
2. Move selector lever to "D" position.

When the transmission is shifted from "N" to "D", is there an excessive shock?

YES >> Enter a check mark at "Large shock when shifted from N to D" on the diagnostics sheet, then continue the road test. Refer to AT-191 .
NO >> GO TO 6.

6. "R" POSITION FUNCTIONS

Disengage the brake for 4 to 5 seconds.

Does the vehicle creep backward?

YES >> GO TO 7.
NO >> Enter a check mark at "Vehicle does not creep backward in R position" on the diagnostics sheet, then continue the road test. Refer to AT-192 .

7. D, M POSITION FUNCTIONS

Inspect whether the vehicle moves forward when the transmission is put into the "D" or "M" position.

Does the vehicle move forward in the "D" and "M" positions?

YES >> See "Cruise test - Part 1" (Refer to AT-56), "Cruise test - Part 2" (Refer to AT-58), and Cruise test - Part 3" (Refer to AT-59).
NO >> Enter a check mark at "Vehicle does not move forward in D, M positions" on the diagnostics sheet, then continue the road test. Refer to AT-194 .

Cruise Test - Part 1

ECS002LW

Cruise test Part 1

1. STARTING OUT FROM D1

1. Drive the car for about 10 minutes to warm up the engine oil and A/T fluid. Appropriate temperature for the A/T fluid: (50 - 80°F)
2. Park the vehicle on a level surface.
3. Move selector lever to “P” position.
4. Engage the engine.
5. Move selector lever to “D” position.
6. Press the accelerator pedal about half way down to accelerate the vehicle.

With CONSULT-II

Read off the gear positions.

Starts from D1?

YES >> GO TO 2.

NO >> Enter a check mark at “Vehicle can not be started from D1” on the diagnostics sheet, then continue the road test. Refer to AT-195 .

2. SHIFT UP D1 → D2

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D1 → D2) at the appropriate speed.

- See AT-59 .

With CONSULT-II

Read the gear position, throttle degree of opening, and vehicle speed.

Does the A/t shift up D1 → D2 at the correct speed?

YES >> GO TO 3.

NO >> Enter a check mark at “A/T does not shift D1 → D2 or does not kick down D4 → D2” on the diagnostics sheet, then continue the road test. Refer to AT-196 .

3. SHIFT UP D2 → D3

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D2 → D3) at the appropriate speed.

- See AT-59 .

With CONSULT-II

Read the gear position, throttle degree of opening, and vehicle speed.

Does the A/t shift up D2 → D3 at the correct speed?

YES >> GO TO 4.

NO >> Enter a check mark at “A/T does not shift D2 → D3” on the diagnostics sheet, then continue the road test. Refer toAT-197 .

4. SHIFT UP D3 → D4

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D3 → D4) at the appropriate speed.

- See AT-59 .

With CONSULT-II

Read the gear position, throttle degree of opening, and vehicle speed.

Does the A/t shift up D3 → D4 at the correct speed?

YES >> GO TO 5.

NO >> Enter a check mark at “A/T does not shift D3 → D4” on the diagnostics sheet, then continue the road test. Refer to AT-198 .

5. SHIFT UP D4 → D5

Press down the accelerator pedal about half way and inspect if the vehicle shifts up (D4 → D5) at the appropriate speed.

- See AT-59 .

With CONSULT-II
Read the gear position, throttle degree of opening, and vehicle speed.

Does the A/T shift up D4 → D5 at the correct speed?

YES >> GO TO 6.
NO >> Enter a check mark at “A/T does not shift D4 → D5” on the diagnostics sheet, then continue the road test. Refer to AT-199 .

6. LOCK-UP

Press down the accelerator pedal about half way and inspect if the vehicle lock-up (D5 → L/U) at the appropriate speed.

- See AT-59 .

With CONSULT-II
Select “TCC SOL 0.00A” with the “MAIN SIGNAL” mode for A/T.

Does the A/T lock-up at the correct speed?

YES >> GO TO 7.
NO >> Enter a check mark at “A/T does not perform lock-up” on the diagnostics sheet, then continue the road test. Refer to AT-200 .

7. LOCK-UP HOLD

Is the lock-up held for at least 30 seconds?

YES >> GO TO 8.
NO >> Enter a check mark at “A/T hold does not lock-up condition” on the diagnostics sheet, then continue the road test. Refer to AT-201 .

8. LOCK-UP RELEASE

Release the accelerator pedal.

When you release the accelerator pedal, is the lock-up released?

YES >> GO TO 9.
NO >> Enter a check mark at “Lock-up is not released” on the diagnostics sheet, then continue the road test. Refer to AT-201 .

9. SHIFT DOWN D5 → D4

.Decelerate by pressing lightly on the brake pedal.

With CONSULT-II
Read the gear position and engine speed.

When the A/T shift down D5 → D4, does the engine speed drop smoothly back to idle?

YES >> 1. Stop the car.
2. GO TO Cruise test - Part 2 (Refer to AT-58).
NO >> Enter a check mark at “A/T does not shift down” on the diagnostics sheet, then continue the road test. Refer to AT-203 .

Cruise Test - Part 2

ECS002LX

Cruise test Part 2

1. STARTING FROM D1

1. Move selector lever the “D” position.
2. Accelerate at half throttle.

With CONSULT-II
Read the gear position.

Does it start from D1?

YES >> GO TO 2.
NO >> Enter a check mark at “Vehicle can not be started from D1” on the diagnostics sheet, then continue the road test. Refer to AT-195 .

2. SHIFT UP D3 → D4 AND SHIFT DOWN D4 → D3

1. Accelerate to 80 km/h (50 MPH).
2. Release the accelerator pedal once, then quickly press it down again all the way.

With CONSULT-II.
Read the gear position and throttle position.

When you press the accelerator pedal, does the transmission immediately shift down D4 → D2?

YES >> GO TO 3.
NO >> Enter a check mark at “Vehicle does not shift D1 → D2 or does not kick down D4 → D2” on the diagnostics sheet, then continue the road test. Refer to AT-196 .

3. SHIFT UP D2 → D3

Press the accelerator pedal down all the way and inspect whether or not the transmission shifts up (D2 → D3) at the correct speed.

- SeeAT-59 .

With CONSULT-II
Read the gear position, throttle position and vehicle speed.

Does the A/T shift up D2 → D3 at the correct speed?

YES >> GO TO 4.
NO >> Enter a check mark at “Vehicle does not shift D2 → D3” on the diagnostics sheet, then continue the road test. Refer to AT-197 .

4. SHIFT UP D3 → D4 AND ENGINE BRAKE

When the transmission changes speed D2 → D3, return the accelerator pedal.

Does the A/T shift up D3 → D4 and apply the engine brake?

YES >> 1. Stop the vehicle.
2. See AT-59 .
NO >> Enter a check mark at “Vehicle does not shift D3 → D4” on the diagnostics sheet, then continue the road test. Refer to AT-198 .

Cruise Test - Part 3

ECS002LY

Cruise test Part 3

1. SHIFT DOWN

Shift down one while driving in each position.

With CONSULT-II

Read the gear position.

Shift down?

YES >> GO TO 2.

NO >> Enter a check mark at “Vehicle does not shift” at the corresponding position (D5→ D4, D4 → D3, D3 → D2, D2 → D1) on the diagnostics sheet, then continue the road test. Refer to AT-203 .

2. ENGINE BRAKE

Does the engine brake work to decelerate the vehicle?

YES >> 1. Stop the vehicle.
2. Carry out the self-diagnostics. Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

NO >> Enter a check mark at “Vehicle does not decelerate by engine brake” on the diagnostics sheet, then continue the road test. Refer to AT-206 .

Vehicle Speed When Shifting Gears Throttle Position

ECS002LZ

Throttle position	Vehicle Speed km/h (MPH)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
Full throttle	73 - 77 (45 - 48)	109 - 117 (68 - 73)	170 - 180 (106 - 112)	252 - 262 (157 - 163)	248 - 258 (154 - 160)	160 - 170 (99 - 106)	99 - 107 (62 - 66)	43 - 47 (27 - 29)
Half throttle	36 - 40 (22 - 25)	69 - 75 (43 - 47)	116 - 124 (72 - 77)	162 - 170 (101 - 106)	125 - 133 (78 - 83)	73 - 81 (45 - 50)	46 - 52 (29 - 32)	9 - 13 (6 - 8)

- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed When Performing and Releasing Complete Lock-up

ECS002M0

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up “ON”	Lock-up “OFF”
Closed throttle	76 - 84 (47 - 52)	61 - 69 (38 - 43)
Half throttle	208 - 216 (130 - 134)	157 - 165 (98 - 103)

- At closed throttle, the accelerator opening is less than 1/8.
- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed When Performing and Releasing Slip Lock-up

ECS002M1

Throttle position	Gear position	Vehicle speed km/h (MPH)	
		Slip lock-up “ON”	Slip lock-up “OFF”
Closed throttle	4th	38 - 46 (24 - 29)	35 - 43 (22 - 27)
	5th	48 - 56 (30 - 35)	44 - 52 (27 - 32)

- At closed throttle, the accelerator opening is less than 1/8.

Symptom Chart

ECS002M2

The diagnostics item numbers show the sequence for inspection. Inspect in order from Item 1.

CAUTION:

- **If a problem occurs in the RE5R05A transmission, replace the transmission assembly.**
- **Condition for “on vehicle” only**

Symptom	Diagnostic Item	Reference page
Engine does not start in “N”, “P” position.	1. Ignition switch and starter	PG-2, SC-20
	2. Control cable adjustment	AT-208
	3. PNP switch	AT-85
Engine starts in positions other than “N” or “P”.	1. Control cable adjustment	AT-208
	2. PNP switch	AT-85
Strange noise in “P” or“ N” position	1. Fluid level	AT-12
	2. Line pressure inspection	AT-52
	3. Accelerator pedal position sensor	EC-186
	4. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	5. Engine speed signal	AT-92
Vehicle not parked when transmission in“ P” position or vehicle is parked even when transmission put into position other than P	1. Control cable adjustment	AT-208
	2. PNP switch	AT-85
Vehicle runs with transmission in “ P” position	1. Control cable adjustment	AT-208
	2. PNP switch	AT-85
Vehicle runs with transmission in “N” position	1. Control cable adjustment	AT-208
	2. PNP switch	AT-85
Vehicle cannot run in “R” position	1. Control cable adjustment	AT-208
	2. Line pressure inspection	AT-52
	3. Line pressure solenoid valve	AT-101
	4. PNP switch	AT-85
Large shock (“N” →“ D” position)	1. Engine idle speed	EC-34
	2. Accelerator pedal position sensor	EC-186
	3. Throttle position sensor adjustment	EC-178
	4. Line pressure test	AT-52
	5. ATF temperature sensor	AT-118
	6. ATF pressure switch 1 and front brake solenoid	AT-172, AT-144
	7. Engine speed signal	AT-92
	8. Line pressure solenoid valve	AT-101
Vehicle cannot run in“ D” position. Clutch slips Extreme acceleration malfunction	1. Fluid level and state	AT-12
	2. Line pressure test	AT-52
	3. Line pressure solenoid valve	AT-101
	4. PNP switch	AT-85
When vehicle starts out, clutch and brake slip	1. Fluid level and state	AT-50
	2. Control cable adjustment	AT-208
	3. Accelerator pedal position sensor	EC-186
	4. Line pressure test	AT-52
	5. Line pressure solenoid valve	AT-101
Extremely large creep	Engine idle speed	EC-35

Symptom	Diagnostic Item	Reference page
No creep at all	1. Fluid level and state	AT-50
	2. Line pressure test	AT-52
	3. Engine speed signal	AT-92
	4. ATF pressure switch 5 and direct clutch solenoid	AT-178,AT-150
1 → 2 vehicle speed change malfunction	1. PNP switch	AT-209
	2. Control cable adjustment	AT-208
	3. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-79
	4. ATF pressure switch 5 and direct clutch solenoid	AT-178, AT-150
2 → 3 vehicle speed change malfunction	1. PNP switch adjustment	AT-209
	2. Control cable adjustment	AT-208
	3. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	4. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-181, AT-156
3 → 4 vehicle speed change malfunction	1. PNP switch adjustment	AT-209
	2. Control cable adjustment	AT-208
	3. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	4. ATF pressure switch 3 and input clutch solenoid	AT-175, AT-138
4 → 5 vehicle speed change malfunction	1. PNP switch adjustment	AT-209
	2. Control cable adjustment	AT-208
	3. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	4. ATF pressure switch 1 and front brake solenoid	AT-172, AT-144
“D” position vehicle speed change point is too high	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	2. Accelerator pedal position sensor	EC-186
	3. ATF temperature sensor	AT-118
“D” position vehicle speed change point is too low	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	2. Accelerator sensor adjustment	EC-186
Shock is too large when changing 1 → 2.	1. Accelerator pedal position sensor	EC-186
	2. Line pressure test	AT-52
	3. ATF pressure switch 5 and direct clutch solenoid	AT-178, AT-150
Shock is too large when changing 2 → 3.	1. Accelerator pedal position sensor	EC-186
	2. Line pressure test	AT-52
	3. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-181, AT-156
Shock is too large when changing 3 → 4.	1. Accelerator pedal position sensor	EC-186
	2. Line pressure test	AT-52
	3. ATF pressure switch 3 and input clutch solenoid	AT-178, AT-138
Shock is too large when changing 4 → 5.	1. Accelerator pedal position sensor	EC-186
	2. Line pressure test	AT-52
	3. ATF pressure switch 1 and front brake solenoid	AT-172, AT-144
Shock is too large for downshift when brake pedal is pressed.	1. Fluid level and state	AT-50
	2. Accelerator pedal position sensor	EC-186
	3. Line pressure test	AT-52
	4. Engine speed	AT-92
	5. Turbine revolution sensor	AT-123

Symptom	Diagnostic Item	Reference page
Shock is too large for upshift when brake pedal is released.	1. Fluid level and state	AT-50
	2. Accelerator pedal position sensor	EC-186
	3. Line pressure test	AT-52
	4. Engine speed	AT-92
	5. Turbine revolution sensor	AT-123
Shock is too large for lock-up.	1. Fluid level and state	AT-50
	2. Accelerator sensor adjustment	EC-186
	3. Line pressure test	AT-52
	4. Engine speed	AT-92
	5. Turbine revolution sensor	AT-123
	6. Lockup solenoid	AT-97
Shock is too large when engine brake is selected.	1. Fluid level and state	AT-50
	2. Accelerator pedal position sensor	EC-186
	3. Line pressure inspection	AT-52
No shock at all or the clutch slips when vehicle changes speed 1 → 2.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	3. ATF pressure switch 5 and direct clutch solenoid	AT-178, AT-150
No shock at all or the clutch slips when vehicle changes speed 2 → 3.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-79
	3. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-181, AT-162
No shock at all or the clutch slips when vehicle changes speed 3 → 4.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	3. ATF pressure switch 3 and input clutch solenoid	AT-178, AT-138
No shock at all or the clutch slips when vehicle changes speed 4 → 5.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	3. ATF pressure switch 1 and front brake solenoid	AT-172, AT-144
Maximum speed low	1. Fluid level and state	AT-50
	2. Line pressure test	AT-52
	3. Accelerator pedal position sensor	EC-186
	4. ATF pressure switch 5 and direct clutch solenoid	AT-178, AT-150
Does not change 5 → 4.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	3. ATF pressure switch 3 and input clutch solenoid	AT-175, AT-138
Does not change 5, 4 → 3.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	3. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-178, AT-156
Does not change 5, 4, 3 → 2.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	3. ATF pressure switch 5 and direct clutch solenoid	AT-178, AT-150
Does not change 4, 3, 2 → 1.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89,AT-79
When you press the accelerator pedal and shift speed 5 → 4, the engine idles or the transmission slips.	1. Fluid level and state	AT-50
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-89, AT-127
	3. ATF pressure switch 3 and input clutch solenoid	AT-175, AT-138

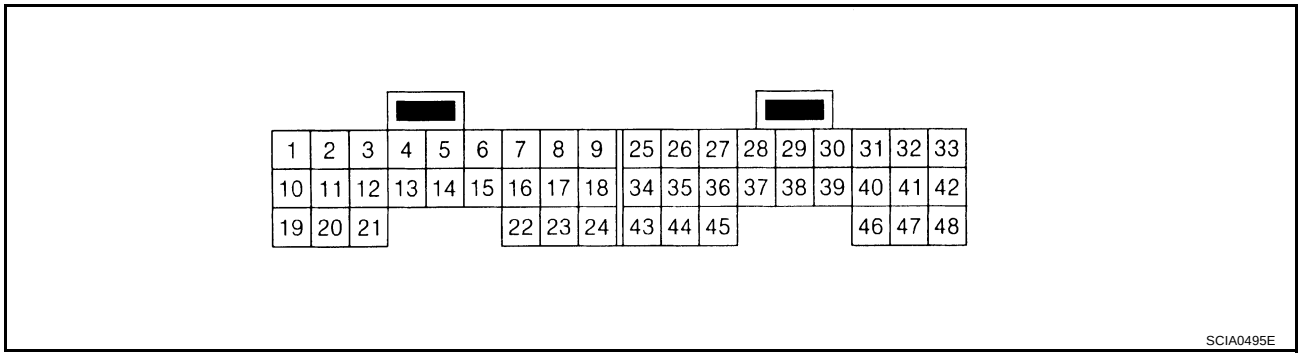
Symptom	Diagnostic Item	Reference page
When you press the accelerator pedal and shift speed 5, 4 → 3, the engine idles or the transmission slips.	1. Fluid level and state	AT-50
	2. PNP switch	AT-85
	3. Control cable adjustment	AT-208
	4. Manual mode switch	AT-168
	5. ATF pressure switch 3 and input clutch solenoid	AT-178, AT-144
	6. ATF pressure switch 1 and front brake solenoid	AT-172, AT-144
When you press the accelerator pedal and shift speed 5, 4, 3 → 2, the engine idles or the transmission slips.	1. Fluid level and state	AT-50
	2. Control cable adjustment	AT-208
	3. PNP switch	AT-85
	4. Manual mode switch	AT-168
	5. ATF pressure switch 3 and input clutch solenoid	AT-178,AT-138
	6. ATF pressure switch 1 and front brake solenoid	AT-172,AT-144
When you press the accelerator pedal and shift speed 4, 3, 2 → 1, the engine idles or the transmission slips.	1. Fluid level and state	AT-50
	2. Control cable adjustment	AT-208
	3. PNP switch	AT-85
	4. Manual mode switch	AT-168
	5. ATF pressure switch 3 and input clutch solenoid	AT-178, AT-138
	6. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-181, AT-156
Vehicle runs in all positions.	1. Fluid level and state	AT-50
	2. Control cable adjustment	AT-208
	3. Line pressure test	AT-52
	4. PNP switch	AT-85
Loud, strange noise in “D”, “R” position	1. Fluid level and state	AT-50
Engine brake does not work 5 → 4.	1. PNP switch	AT-209
	2. Fluid level and state	AT-12
	3. Control cable adjustment	AT-208
	4. Manual mode switch	AT-168
Engine brake does not work 5, 4 → 3.	1. PNP switch	AT-209
	2. Fluid level and state	AT-12
	3. Control cable adjustment	AT-208
	4. Manual mode switch	AT-168
	5. ATF pressure switch 3 and input clutch solenoid	AT-178,AT-138
	6. ATF pressure switch 1 and front brake solenoid	AT-172,AT-144
Engine brake does not work 5, 4, 3 → 2.	1. PNP switch	AT-209
	2. Fluid level and state	AT-12
	3. Control cable adjustment	AT-208
	4. Manual mode switch	AT-168
	5. ATF pressure switch 3 and input clutch solenoid	AT-178, AT-138
	6. ATF pressure switch 1 and front brake solenoid	AT-172, AT-144

Symptom	Diagnostic Item	Reference page
Engine brake does not work 4, 3, 2 → 1.	1. PNP switch	AT-209
	2. Fluid level and state	AT-12
	3. Control cable adjustment	AT-208
	4. Manual mode switch	AT-168
	5. ATF pressure switch 3 and input clutch solenoid	AT-178, AT-156
	6. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-181, AT-156
Engine stalls when select lever shifted “N” → “D”, “R”	1. Fluid level and state	AT-50
	2. Engine speed signal	AT-92
	3. TCC solenoid valve	AT-97
	4. Turbine revolution sensor	AT-123

TCM Input/Output Signal Reference Values

ECS002M3

TCM TERMINAL CONNECTOR LAYOUT



TCM INSPECTION TABLE

Data are reference value.

Terminal No.	Wire color	Item	Condition		Data (Approx.)
1	B/Y	Line pressure solenoid valve		After warming up the engine, release your foot from the accelerator pedal.	2V
				After warming up the engine, press the accelerator pedal all the way down.	0.7V
2	W	Power supply (A/T PV IGN relay)		–	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
3	W	Power supply (A/T PV IGN relay)		–	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
4	P/L	SEL3 (pressure switches 2, 3, 5)	–	–	–
5	B	Ground	–	–	–
6	LG/B	CAN-H	–	–	–
7	P/B	CAN-L	–	–	–

Terminal No.	Wire color	Item	Condition		Data (Approx.)
8	B/R	Fluid temperature sensor 1		When ATF temperature 0°C (32°F)	3.3V
				When ATF temperature 20°C (68°F)	2.7V
				When ATF temperature 80°C (176°)	0.9V
9	W/B	Power supply (Memory back-up)		–	Battery voltage
10	R/W	Input clutch solenoid valve	When vehicle starts	When the solenoid valve operating (in 1st speed, 2nd speed, or 3rd speed)	More than 2V
				When the solenoid valve is not operating (4th speed or 5th speed)	0V
11	R/L	High & low reverse clutch solenoid valve		When the solenoid valve operating [6 km/h (4MPH) or faster in 1st speed or 2nd speed]	More than 2V
				When the solenoid valve is not operating [6 km/h (4MPH)or slower in 1st speed or 3rd, 4th, or 5th speed]	0V
12	Y/R	Power supply (out)		–	Battery voltage
				–	0V
13	W/L	Low coast brake solenoid valve	When vehicle starts	When the solenoid valve is operating (when running in M1-1 speed or M2-2 speed)	Battery voltage
				When the solenoid valve is not operating (when running in “D”)	0V
14	B	Groound	–	–	–
15	B/W	SEL4	–	–	–
16	W/G	SEL1 (pressure switches 2, 3, 5)	–	–	–
17	Y/B	Fluid temperature sensor 2		When ATF temperature about 0°C (32°F)	3.3V
				When ATF temperature about 20°C (68°F)	2.5V
				When ATF temperature about 80°C (176°F)	0.7V
19	R	Front brake solenoid valve	When vehicle starts	When the solenoid valve is operating (other than 4th speed)	More than 2V
				When the solenoid valve is not operating (4th speed)	0V
20	Y	TCC solenoid valve		When lock-up	More than 2V
				When not lock-up	0V
21	G	Direct clutch solenoid valve		When the solenoid valve is operating (1st speed or 5th speed)	More than 2V
				When the solenoid valve is not operating (2nd speed, 3rd speed, or 4th speed)	0V
22	P/B	SEL2	–	–	–
23	PU/W	K-line (CONSULT-II signal)	The terminal is connected to the Data link connector for CONSULT-II		
24	B	Ground	–	–	–

Terminal No.	Wire color	Item	Condition		Data (Approx.)
26	G/Y	PSC2 (pressure switch 6)	When vehicle starts	When high & low reverse clutch solenoid valve “ON”.	0V
				When high & low reverse clutch solenoid valve “OFF”.	Battery voltage
27	Y/B	Vehicle speed sensor A/T (revolution sensor)		When moving at 20 km/h(12MPH), use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	149 (Hz)
30	R/W	PNP switch 1		Selector lever in “P” position.	Battery voltage
				Selector lever in “N” position.	Less than 2.5V
31	OR	PNP switch 2		Selector lever in “P” position.	Battery voltage
				Selector lever in “D” position.	Less than 2.5V
33	G/R	Power supply		–	Battery voltage
				–	0V
35	B/Y	PSB2 (pressure switch 1)	When vehicle starts	When front brake solenoid valve “OFF”.	Battery voltage
				When front brake solenoid valve“ ON”.	0V
36	L/Y	Turbine revolution sensor 1		When moving at 20 km/h(12MPH) in 1st speed with the closed throttle position switch “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	1.1 (kHz)
38	SB	PNP switch 3		Selector lever in “D” position.	Battery voltage
				Selector lever in “R” position.	Less than 2.5V
39	BR	PNP switch 4		Selector lever in “D” position.	More than 2.5V
				Selector lever in “R” position.	Less than 2.5V
40	Y/G	DATA BIT1	–	–	–
41	R	Back-up lamp relay		Selector lever in “R” position.	Battery voltage
				Selector lever in other position.	Less than 2V
42	G/R	Power supply		–	Battery voltage
				–	0V
45	PU	Turbine revolution sensor 2	When vehicle starts	When running at 50 km/h(31MPH) in 4th speed with the closed throttle position switch “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	1.1 (kHz)
46	B	Ground	–	–	–

Terminal No.	Wire color	Item	Condition		Data (Approx.)
47	G/W	PNP switch 3 (monitor)		Selector lever in “D” position.	Battery voltage
				Selector lever in “R” position.	Less than 2.5V
48	B/W	PNP relay		Selector lever in “N”,“ P” position.	Battery voltage
				Selector lever in other position.	0V

CONSULT-II

ECS002M4

After performing “SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)” (Refer to AT-68), place check marks for results on the AT-45, "DIAGNOSTIC WORKSHEET" . Reference pages are provided following the items.

NOTICE:

1. The CONSULT-II electrically displays shift timing and lock-up timing (that is, operation timing of each solenoid).
   Check for time difference between actual shift timing and the CONSULT-II display. If the difference is noticeable, mechanical parts (except solenoids, sensors, etc.) May be malfunctioning. Check mechanical parts using applicable diagnostic procedures.
2. Shift schedule (which implies gear position) displayed on CONSULT-II and that indicated in Service Manual may differ slightly. This occurs because of the following reasons:

- Actual shift schedule has more or less tolerance or allowance,
- Shift schedule indicated in Service Manual refers to the point where shifts start, and
- Gear position displayed on CONSULT-II indicates the point where shifts are completed.

3. Display of solenoid valves on CONSULT-II changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).
4. Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II unit.

FUNCTION

Diagnostic test mode	Function	Reference page
Self-diagnostic results	Self-diagnostic results can be read and erased quickly.	AT-69
Data monitor	Input/Output data in the ECU can be read.	AT-70
CAN diagnostic support monitor	The results of transmit/receive diagnosis of CAN communication can be read.	—
Function test	Conducted by CONSULT-II instead of a technician to determine whether each system is “OK” or “NG”.	—
DTC work support	Select the operating condition to confirm Diagnosis Trouble Codes.	AT-73
ECU part number	ECU part number can be read.	—

CONSULT-II REFERENCE VALUE

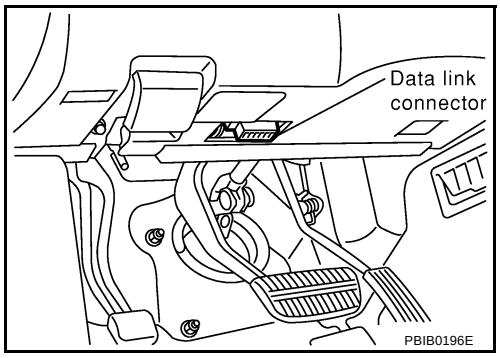
Item name	Condition	Display value (Approx.)
ATF TEMP SE 1	0°C (32° F) - 20°C (68°F) - 80°C (176°F)	3.3 - 2.7 - 0.9 V
ATF TEMP SE 2		3.3 - 2.5 - 0.7 V
TCC SOLENOID	When perform slip lock-up	0.2 - 0.4 A
	When perform lock-up	0.4 - 0.6 A

SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

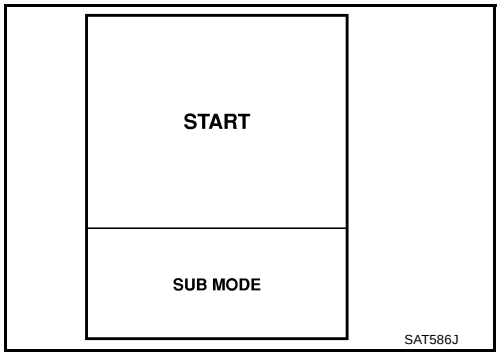
CONSULT-II SETTING PROCEDURE

- For details, refer to the separate “CONSULT-II Operations Manual”.

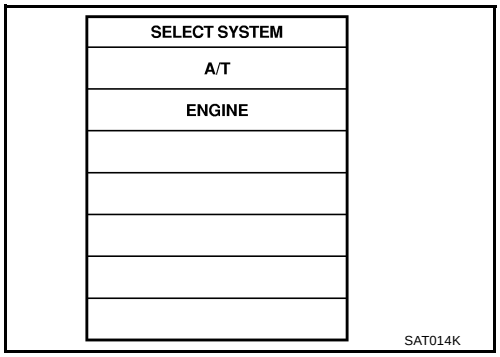
1. Turn ignition switch “OFF” position.
2. Connect CONSULT-II to data link connector, which is located in instrument lower panel on driver side.



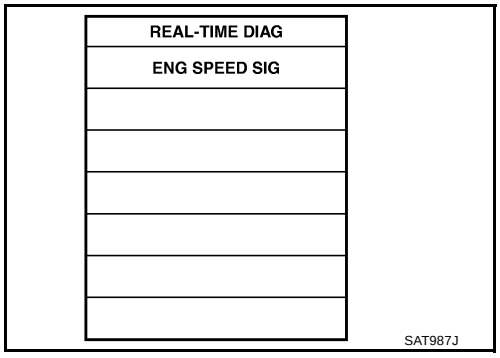
3. Turn ignition switch “ON” position.
4. Touch “START”.



5. Touch “A/T” and on the CONSULT-II screen in that order.
6. Turn on CONSULT-II and touch “ENGINE” for OBD-II detected items or touch “A/T” for TCM self-diagnosis.
   If A/T is not displayed, check TCM power supply and ground circuit. Refer to AT-64, "TCM Input/Output Signal Reference Values" . If result is NG, refer to PG-2, "POWER SUPPLY ROUTING" .



7. Touch “SELF-DIAG RESULTS”.
   Display shows malfunction experienced since the last erasing operation.
   CONSULT-II performs REAL-TIME SELF-DIAGNOSIS.
   Also, any malfunction detected while in this mode will be displayed at real time.



Self-Diagnostic Result Test Mode

X: Applicable, —: Not applicable

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp	"A/T" with CONSULT-II	MIL indicator lamp*1, "ENGINE" with CONSULT-II or GST
CAN COMM CIRCUIT	● When an abnormality is detected in CAN communications	X	U1000	U1000
STARTER RELAY/CIRC (PNP relay)	● If this signal is ON other than in P or N position, this is judged to be an abnormality. (And if it is OFF in P or N position, this too is judged to be an abnormality.)	X	P0615	—
PNP SW/CIRC	● PNP switch 1-4 signals input with impossible pattern ● PNP switch 3 monitor terminal cut line ● P position is detected from 3 position or N position without any other position being detected in between	X	P0705	P0705
VEH SPD SEN/CIR AT (Revolution sensor)	● Signal from vehicle sensor 1 not input due to cut line or the like ● Abnormal signal input during running ● After ignition switch is turned ON, abnormal signal input from vehicle sensor MTR before the vehicle starts moving	X	P0720	P0720
ENGINE SPEED SIG	● TCM does not receive the proper voltage signal from the ECM.	X	P0725	—
TCC SOLENOID/CIRC	● Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P0740	P0740
A/T TCC S/V FNCTN	● A/T cannot perform lock-up even if electrical circuit is good.	X	P0744*1	P0744*2
L/PRESS SOL/CIRC	● Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P0745	P0745
TCM-POWER SUPPLY	● When the power supply to the TCM is cut "OFF", for example because the battery is removed, and the self-diagnostics memory function stops ● This is not a malfunction message (Whenever shutting "OFF" a power supply to the TCM, this message appears on the screen.)	—	P1701	—
TCM·ROM	● TCM memory (ROM) is malfunctioning.	—	P1702	—
TCM·ROM	● TCM memory (ROM) is malfunctioning.	—	P1702	—
TCM·EEPROM	● TCM memory (EEP ROM) is malfunctioning.	—	P1704	—
TP SEN/CIRC A/T	● Voltage for accelerator sensor signal abnormally high ● Voltage for accelerator sensor signal abnormally low when idle signal OFF or full switch signal ON	X	P1705	—
ATF TEMP SEN/CIRC	● During running, the ATF temperature sensor signal voltage is abnormally high or low	X	P1710	P0710
TURBINE REV S/CIRC	● TCM does not receive the proper voltage signal from the sensor.	X	P1716	P1716
VEH SPD SE/CIR·MTR	● Signal from vehicle sensor MTR not input due to cut line or the like ● Abnormal signal input during running	—	P1721	—
A/T INTERLOCK	● Except during speed change, the gear position and hydraulic switch states are monitored and comparative judgement made.	X	P1730	P1730

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp	"A/T" with CONSULT-II	MIL indicator lamp*1, "ENGINE" with CONSULT-II or GST
A/T 1ST E/BRAKING	Each hydraulic switch and solenoid current is monitored and if a pattern is detected having engine braking other than in the 1 position, this is judged to be an abnormality.	X	P1731	—
I/C SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1752	P1752
I/C SOLENOID FNCTN	Normal voltage not applied to solenoid and pressure switch due to functional problem, cut line, short, or the like	X	P1754	P1754*2
FR/B SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1757	P1757
FR/B SOLENOID FNCT	Normal voltage not applied to solenoid and pressure switch due to functional problem, cut line, short, or the like	X	P1759	P1759*2
D/C SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1762	P1762
D/C SOLENOID FNCTN	Normal voltage not applied to solenoid and pressure switch due to functional problem, cut line, short, or the like	X	P1764	P1764*2
HLR/C SOL/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1767	P1767
HLR/C SOL FNCTN	Normal voltage not applied to solenoid and pressure switch due to functional problem, cut line, short, or the like	X	P1769	P1769*2
LC/B SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1772	P1772
LC/B SOLENOID FNCT	Normal voltage not applied to solenoid and pressure switch due to functional problem, cut line, short, or the like	X	P1774	P1774*2
MANU MODE SW/CIRC	When an impossible pattern of switch signals is detected, this is judged to be an abnormality.	—	P1815	—
ATF PRES SW 1/CIRC	When there is a difference found in the comparison between a pressure switch state and the electrical current monitor value, (Other than during speed change)	—	P1841	—
ATF PRES SW 3/CIRC		—	P1843	—
ATF PRES SW 5/CIRC		—	P1845	—
ATF PRES SW 6/CIRC		—	P1846	—
NO DTC IS DETECTED FURTHER TESTING MAY BE REQUIRED	No NG item has been detected.	—	X	X

*1: Refer to AT-39, "Malfunction Indicator Lamp (MIL)" .
*2:These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.

Data Monitor Mode (A/T)

X:Standard, —: Not applicable

Monitored item (Unit)	Monitor Item Selection			Remarks
	TCM INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/S SE·A/T (km/h)	X	X	X	Revolution sensor
VHCL/S SE·MTR (km/h)	X	—	X	

Monitored item (Unit)	Monitor Item Selection			Remarks
	TCM INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
ACCELE POSI (0.0/8)	X	—	X	Accelerator sensor signal
THROTTLE POSI (0.0/8)	X	X	X	Degree of opening for accelerator recognized by the TCM For fail-safe operation, the specific value used for control is displayed.
BATTERY BOLT (V)	X	—	X	
ENGINE SPEED (wpm)	X	X	X	
TURBINE REV (wpm)	X	—	X	
ATF TEMP 1 (°C)	—	X	X	
ATF TEMP 2 (°C)	—	X	X	
OUTPUT REV (wpm)	X	X	X	
ATF TEMP SE 1 (V)	X	—	X	
ATF TEMP SE 2 (V)	X	—	X	
ATF PRES SW 1 (ON-OFF display)	X	X	X	(for FR/B solenoid)
ATF PRES SW 2 (ON-OFF display)	X	X	X	(for LC/B solenoid)
ATF PRES SW 3 (ON-OFF display)	X	X	X	(for I/C solenoid)
ATF PRES SW 5 (ON-OFF display)	X	X	X	(for D/C solenoid)
ATF PRES SW 6 (ON-OFF display)	X	X	X	(for HLR/C solenoid)
PNP SW 1 (ON-OFF display)	X	—	X	
PNP SW 2 (ON-OFF display)	X	—	X	
PNP SW 3 (ON-OFF display)	X	—	X	
PNP SW 4 (ON-OFF display)	X	—	X	
1 POSITION SW (ON-OFF display)	X	—	X	
ASCD·CRUISE (ON-OFF display)	X	—	X	Not mounted but displayed.
ASCD·OD CUT (ON-OFF display)	X	—	X	
OD CONT SW (ON-OFF display)	X	—	X	
MANU MODE SW (ON-OFF display)	X	—	X	
NON M-MODE SW (ON-OFF display)	X	—	X	
UP SW LEVER (ON-OFF display)	X	—	X	
DOWN SE LEVER (ON-OFF display)	X	—	X	
POWER SHIFT SW (ON-OFF display)	X	—	X	A/T mode switch: Power switch
CLSO THL POS (ON-OFF display)	X	—	X	Signal input with CAN communications
W/O THL POS (ON-OFF display)	X	—	X	Signal input with CAN communications
TCC SOLENOID (A)	—	X	X	
LINE PRES SOL (A)	—	X	X	
I/C SOLENOID (A)	—	X	X	
FR/B SOLENOID (A)	—	X	X	
D/C SOLENOID (A)	—	X	X	
HLR/C SOL (A)	—	X	X	
HOLD SW (ON-OFF display)	X	—	X	
BRAKE SW (ON-OFF display)	X	—	X	Stop lamp switch
GEAR	—	X	X	Gear position recognized by the TCM updated after gear-shifting

Monitored item (Unit)	Monitor Item Selection			Remarks
	TCM INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
GEAR RATIO	—	X	X	
SLCTLVR POSI	—	X	X	Selector lever position is recognized by the TCM. For fail safe operation, the specific value used for control is displayed.
VEHICLE SPEED (km/h)	—	X	X	Vehicle speed recognized by the TCM.
TC SLIP SPEED (rpm)	—	X	X	Difference between engine speed and torque converter input shaft speed
Voltage (V)	—	—	X	Displays the value measured by the voltage probe.
F SUN GW REV (rpm)	—	—	X	
F CARR GR REV (rpm)	—	—	X	
SFT UP ST SW	—	—	X	Not mounted but displayed
SFT DWN ST SW	—	—	X	
ABS SIGNAL	—	—	X	
ACC OD CUT	—	—	X	
ACC SIGNAL	—	—	X	
TCS GR/P KEEP	—	—	X	
TCS SIGNAL 2	—	—	X	
TCS SIGNAL 1	—	—	X	
ON OFF SOL (ON-OFF display)	—	—	X	LC/B solenoid
TCC SOL MON	—	—	X	
L/P SOL MON	—	—	X	
I/C SL MON	—	—	X	
FR/B SOL MON	—	—	X	
D/C SOL MON	—	—	X	
HLR/C SOL MON	—	—	X	
ONOFF SOL MON	—	—	X	LC/B solenoid
P POSI IND	—	—	X	
R POSI IND	—	—	X	
N POSI IND	—	—	X	
D POSI IND	—	—	X	
4TH POSI IND	—	—	X	
3RD POSI IND	—	—	X	
2ND POSI IND	—	—	X	
1ST POSI IND	—	—	X	
M MODE IND	—	—	X	
POWER M LAMP	—	—	X	
F-SAFE IND/L	—	—	X	
ATF WARN LAMP	—	—	X	
BACK-UP LAMP	—	—	X	
STARTER RELAY	—	—	X	PNP relay
TRGT GR RATIO	—	—	X	
ENGINE TORQUE	—	—	X	

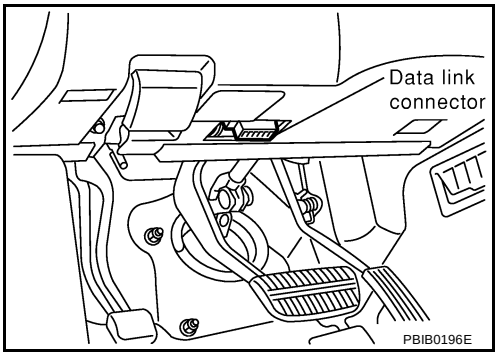
Monitored item (Unit)	Monitor Item Selection			Remarks
	TCM INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
ENG TORQUE D	—	—	X	
INPUT TRQ S	—	—	X	
INPUT TRQ L/P	—	—	X	
TRG PRE TCC	—	—	X	
TRG PRE L/P	—	—	X	
TRG PRE I/C	—	—	X	
TRG PRE FR/B	—	—	X	
TRG PRE D/C	—	—	X	
TRG PRE HLR/C	—	—	X	
DRV CST JUDGE	—	—	X	
START RLY MON	—	—	X	PNP relay
Next gear	—	—	X	
SHIFT MODE	—	—	X	
MANU GR POSI	—	—	X	
Frequency (Hz)	—	—	X	The value measured by the pulse probe is displayed.
DUTY·HI (high) (%)	—	—	X	
DUTY·LOW (low) (%)	—	—	X	
PLS WIDTH·HI (ms)	—	—	X	
PLS WIDTH·LOW (ms)	—	—	X	

DTC WORK SUPPORT MODE WITH CONSULT-II

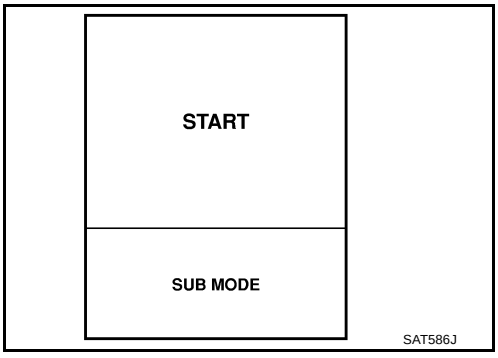
CONSULT-II Setting Procedure

- For details, refer to the separate “CONSULT-II Operations Manual”.

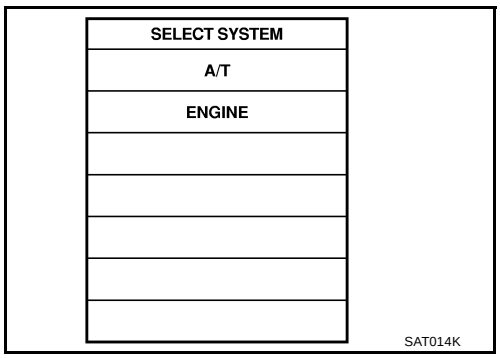
1. Turn ignition switch “OFF”.
2. Connect CONSULT-II to data link connector, which is located in instrument lower panel on driver side.



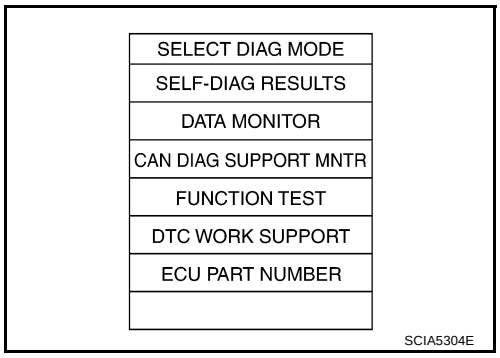
3. Turn ignition switch “ON”.
4. Touch “START”.



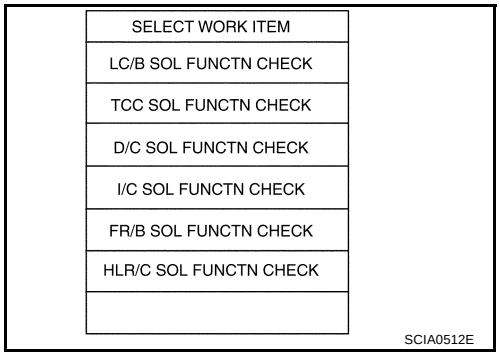
5. Touch “A/T”.



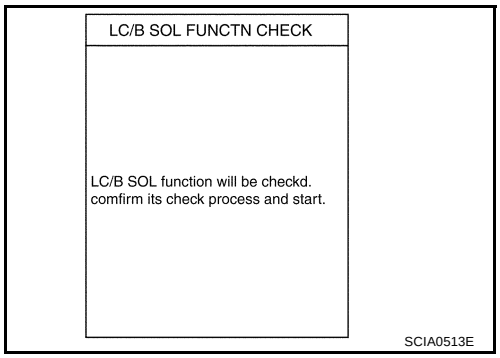
6. Touch “DTC WORK SUPPORT”.



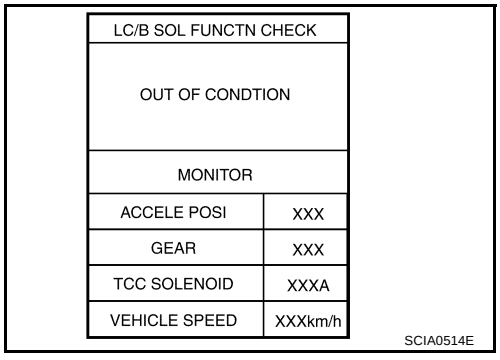
7. Touch select item menu.



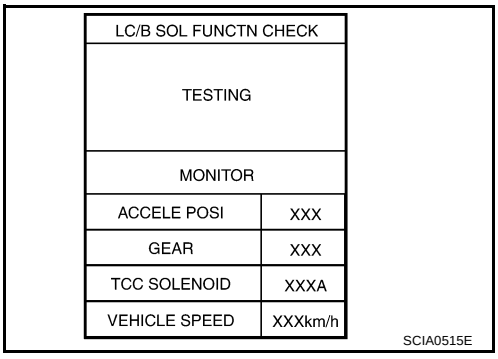
8. Touch “START”.



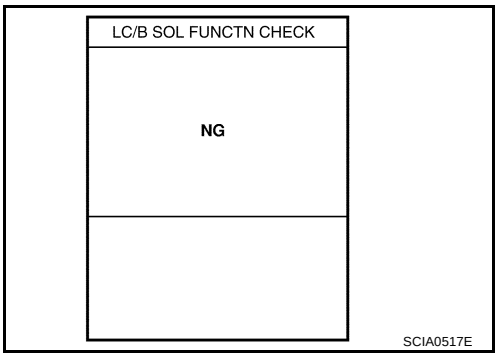
9. Perform driving test according to “DTC CONFIRMATION PROCEDURE” in “TROUBLE DIAGNOSIS FOR DTC”.



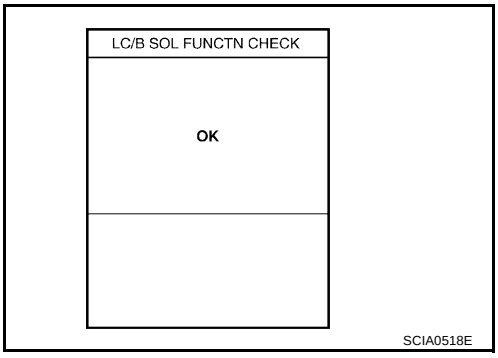
- **When testing conditions are satisfied, CONSULT-II screen changes from “OUT OF CONDITION” to “TESTING”.**

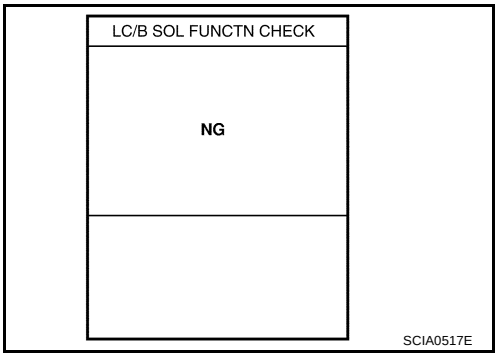


10. Stop vehicle. If “NG” appears on the screen, malfunction may exist. Go to “DIAGNOSTIC PROCEDURE”.
11. Perform test drive to check gear shift feeling in accordance with instructions displayed.
12. Touch “YES” or “NO”.
13. CONSULT-II procedure is ended.



If “NG” appears on the screen, a malfunction may exist. Go to “DIAGNOSTIC PROCEDURE”.





DTC WORK SUPPORT MODE

DTC work support item	Description	Check item
I/C SOLENOID FNCTN (P1754)	Following items for " I/C solenoid function" can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● I/C solenoid valve ● Pressure switch 3 ● Hydraulic control circuit
FR/B SOLENOID FNCT	Following items for "FR/B solenoid function" can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● FR/B solenoid valve ● Pressure switch 1 ● Hydraulic control circuit
D/C SOLENOID FNCTN	Following items for "D/C solenoid function" can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● D/C solenoid valve ● Pressure switch 5 ● Hydraulic control circuit
HLR/C SOL FNCTN	Following items for "HLR/C solenoid function" can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● HLR/C solenoid valve ● Pressure switch 6 ● Hydraulic control circuit
LC/B SOLENOID FNCT	Following items for "D/C solenoid function" can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● LC/B solenoid valve ● Pressure switch 2 ● Hydraulic control circuit
TCC S/V FNCTN	Following items for "TCC solenoid function (lock-up) " can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● TCC solenoid valve ● Hydraulic control circuit

Diagnostic Procedure Without CONSULT-II

ECS002M5

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to EC-130, "Generic Scan Tool (GST) Function" .

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to AT-39, "Malfunction Indicator Lamp (MIL)" .

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Description

In the unlikely event of an abnormality in the electrical system, when the ignition switch is switched "ON", the A/T CHECK indicator lamp lights up for 2 seconds, then flashes for 8 seconds. If there is no abnormality, when the ignition switch is switched "ON", the indicator lamp lights up for 2 seconds. As a method for locating the problem position, when the self-diagnostics start signal is input, the memory for the breakdown location is output and the A/T CHECK indicator lamp flashes to display the problem position.

Diagnostic Procedure

1. CHECK A/T CHECK INDICATOR LAMP

1. Start the engine with selector lever in “P” position. Warm engine to normal operating temperature.
2. Switch the ignition switch on and off at least twice, then leave it in the “OFF” position.
3. Wait 10 seconds.
4. Turn ignition switch to “ON” position.
   (Do not start engine.)
5. Does A/T CHECK indicator lamp come on for about 2 seconds?

Yes or No

Yes >> GO TO 2.
No >> GO TO AT-187, "A/T CHECK Indicator Lamp does not come on" .

2. JUDGEMENT PROCEDURE STEP 1

1. Turn ignition switch “OFF”.
2. Push shift lock release button.
3. Move selector lever from “P” to “D” position.
4. Release accelerator pedal. (Set the closed throttle position signal “ON”.)
5. Depress brake pedal. (Brake switch signal “ON”.)
6. Turn ignition switch “ON”.
7. Wait 3 seconds.
8. Move the selector lever to the Manual shift gate side. (Manual mode switch “ON”.)
9. Release brake pedal. (Brake switch signal “OFF”.)
10. Move the selector lever to “D” position. (Manual mode switch “OFF”.)
11. Depress brake pedal. (Brake switch signal “ON”.)
12. Release brake pedal. (Brake switch signal “OFF”.)
13. Depress accelerator pedal fully and release it.

>> GO TO 3.

3. CHECK SELF-DIAGNOSIS CODE

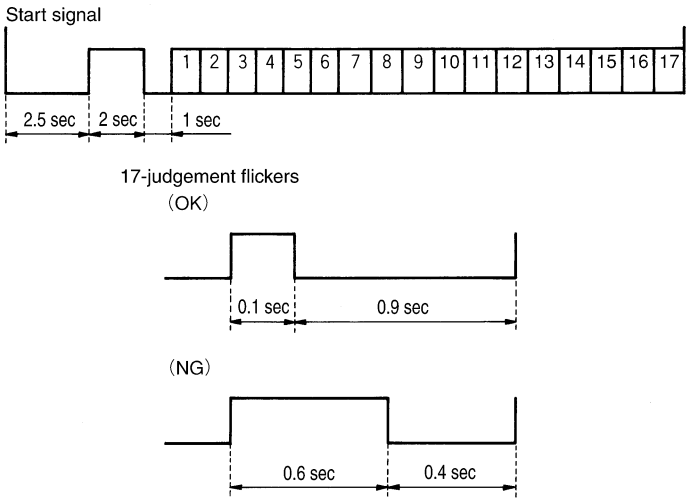
Check A/T CHECK indicator lamp.
Refer to AT-78, "Judgement Self-Diagnosis Code" .
If the system does not go into self-diagnostics. Refer to AT-184, "PARK/NEUTRAL POSITION, MANUAL MODE, BRAKE AND THROTTLE POSITION SWITCH CIRCUIT" .

>> **DIAGNOSIS END**

Judgement Self-Diagnosis Code

If there is an abnormality, the lamp lights up for the time corresponding to the problem path.

1	Revolution sensor 1
2	Direct clutch solenoid valve
3	Torque converter clutch solenoid valve
4	Line pressure solenoid valve
5	Input clutch solenoid valve
6	Front brake solenoid valve
7	Low coast brake solenoid valve
8	High & low reverse clutch solenoid valve
9	PNP switch
10	A/T fluid temperature sensor
11	Turbine revolution sensor
12	A/T interlock
13	A/T 1st engine braking
14	Start signal
15	Accelerator pedal position sensor
16	Engine speed signal
17	CAN



※ Solenoid valve is checked for open and short circuit, and malfunctions.

SCIA0497E

Erase Self-Diagnosis

- In order to make it easier to find the cause of hard-to-duplicate abnormalities, breakdown information is stored into the control unit as necessary during use by the user. This memory is not erased no matter how many times the ignition switch is switched ON/OFF.
- However, this information is erased by switching “OFF” the ignition switch after executing self-diagnostics or by erasing the memory using the CONSULT-II.

DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

ECS002MD

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

On Board Diagnosis Logic

ECS002ME

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “CAN COMM CIRCUIT” with CONSULT-II or U1000 without CONSULT-II is detected when TCM cannot communicate to other control unit.

Possible Cause

ECS002MF

Harness or connectors
(CAN communication line is open or shorted.)

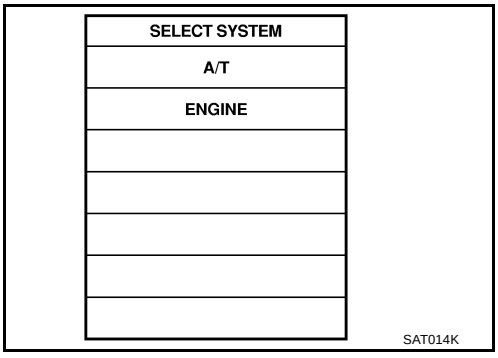
DTC Confirmation Procedure

ECS002FJ

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and wait for at least 6 seconds.
4. If DTC is detected, go to AT-81, "Diagnostic Procedure" .



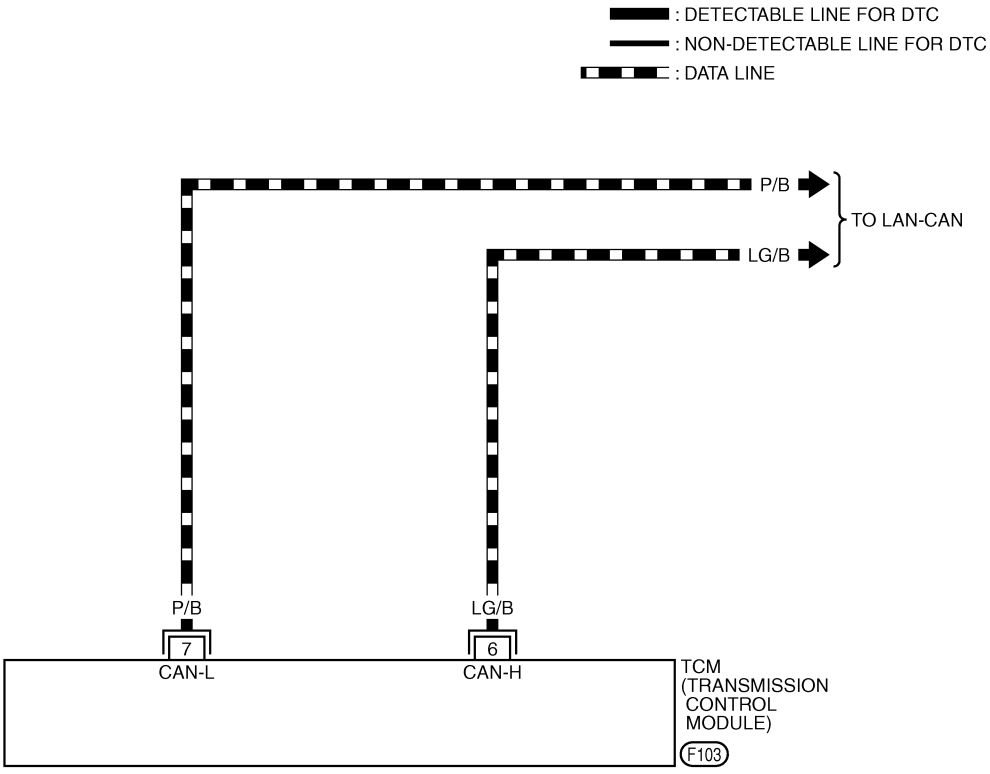
WITH GST

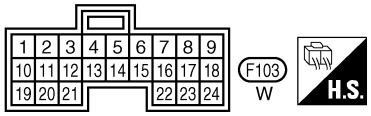
Follow the procedure “WITH CONSULT-II”.

Wiring Diagram — AT — CAN

ECS002FG

AT-CAN-01





TCWM0032E

Diagnostic Procedure

ECS002GE

1. CHECK CAN COMMUNICATION CIRCUIT

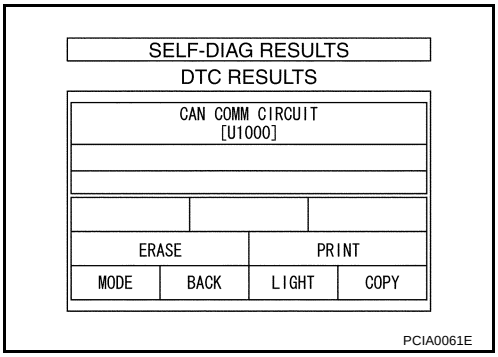
With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.

Is any malfunction of the “CAN COMM CIRCUIT” indicated?

Yes >> Print out CONSULT-II screen, GO TO LAN section. Refer to LAN-24, "CAN SYSTEM (FOR VDC MODELS)" , LAN-42, "CAN SYSTEM (FOR ICC MODELS)" .

No >> **INSPECTION END**



DTC P0615 START SIGNAL CIRCUIT

PFP:25230

Description

ECS002CI

Prohibits cranking other at “P” or “N” position.

On Board Diagnosis Logic

ECS0027Q

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “STARTER RELAY/CIRC” with CONSULT-II or 14th judgement flicker without CONSULT-II is detected when detects as abnormal when switched “ON” other than at “P” or “N” position. (Or when switched “OFF” at “P” or “N” position).

Possible Cause

ECS0027R

Check the following items.

- Harness or connectors
  [The park/neutral position (PNP) relay and TCM circuit is open or shorted.]
- Park/neutral position (PNP) relay

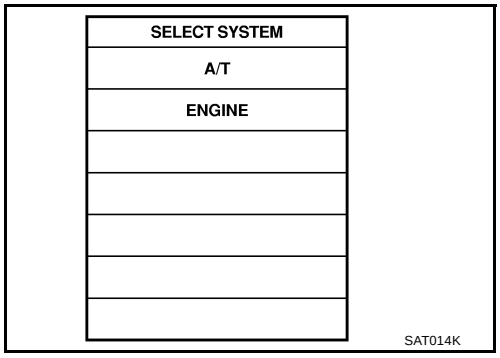
DTC Confirmation Procedure

ECS0027S

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

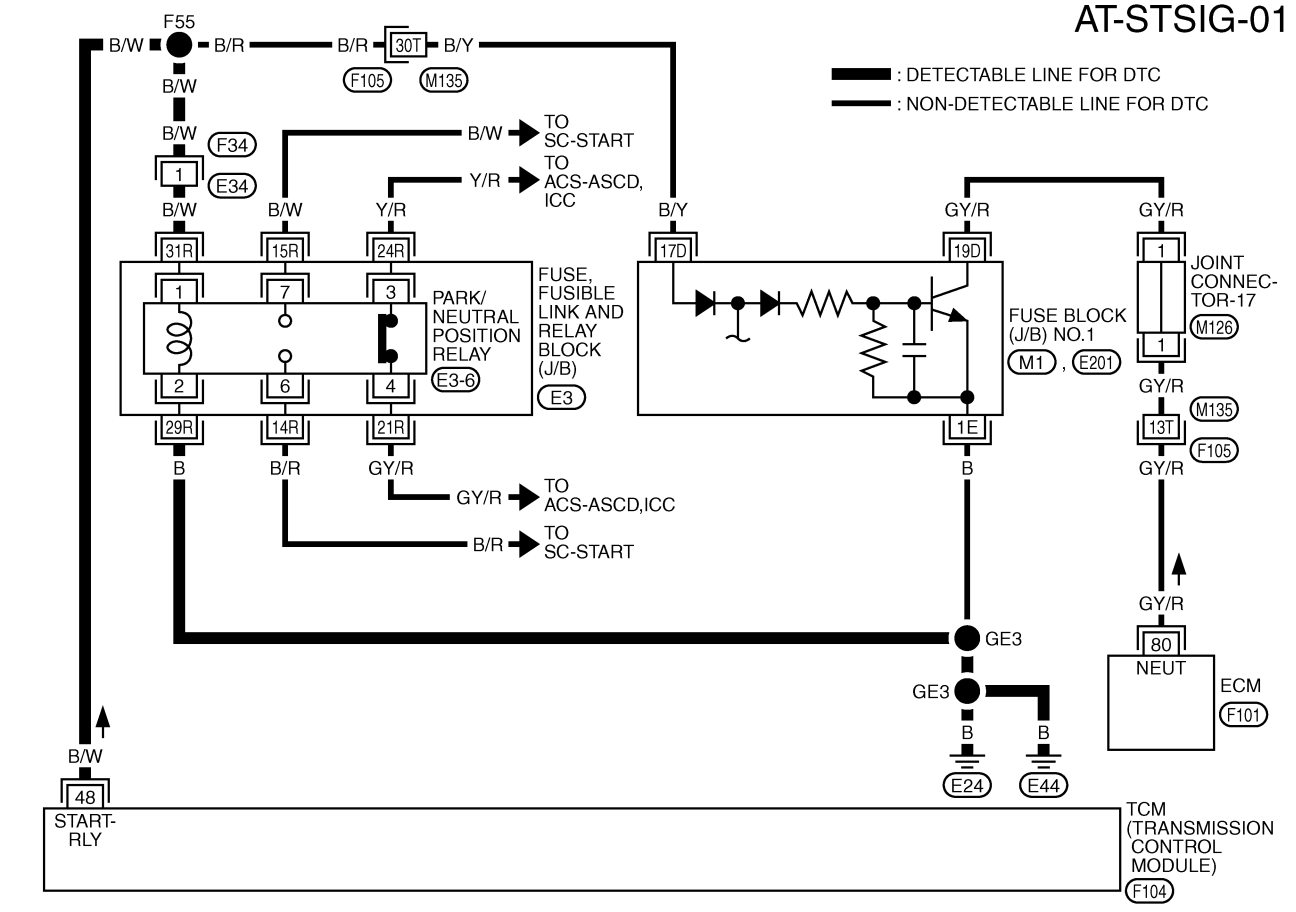
WITH CONSULT-II

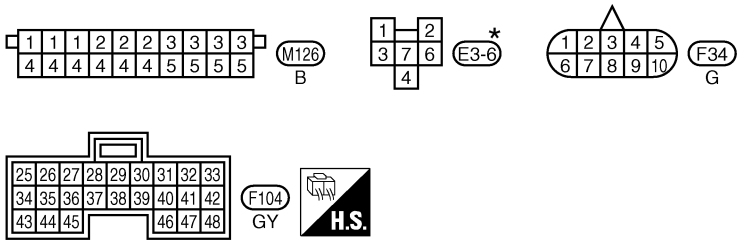
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Vehicle start for at least 2 consecutive seconds.
5. If DTC is detected, go to AT-84, "Diagnostic Procedure" .



Wiring Diagram — AT — STSIG

ECS0027T





∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

REFER TO THE FOLLOWING.
F105 -SUPER MULTIPLE JUNCTION (SMJ)
M1 , E201 -FUSE BLOCK-JUNCTION BOX (J/B) NO.1
E3 -FUSE,FUSIBLE LINK AND RELAY BLOCK (J/B)
F101 -ELECTRICAL UNITS

TCWM0052E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
48	B/W	PNP relay	IGN ON	Selector lever in “N”,“ P” position.	Battery voltage
				Selector lever in other position.	0V

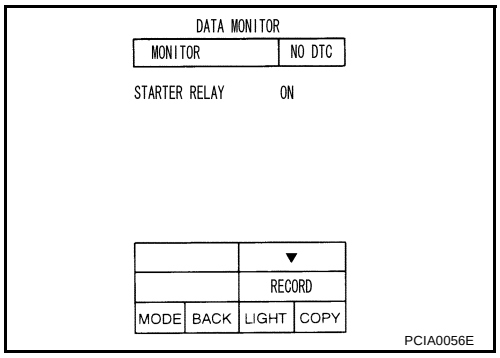
Diagnostic Procedure

ECS002GG

1. CHECK PNP RELAY (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “SELECTION FROM MENU” in “DATA MONITOR” mode for “A/T” with CONSULT-II and check monitor “STARTER RELAY” (PNP relay) ON/OFF.



OK or NG?

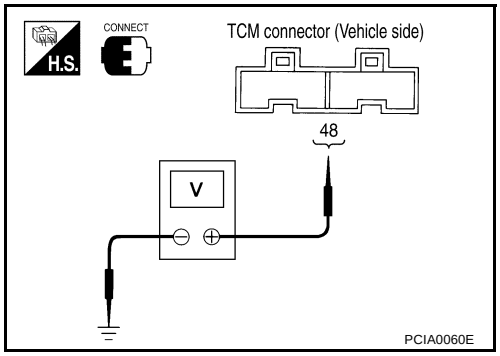
OK >> GO TO 4.
NG >> GO TO 3.

2. CHECK PNP RELAY (WITHOUT CONSULT-II)

Without CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Check the voltage between the TCM connector and ground.

Item	Connector No.	Terminal No.		Shift position	Voltage (Approx.)
PNP relay (Starter relay)	F104	48	Ground	N and P	Battery voltage
				R and D	0V



OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following items.

1. PNP relay. Refer to PG-73, "STANDARDIZED RELAY" .
2. Disconnections or short-circuits in the main harness between TCM and the PNP relay.

OK or NG?

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Check again.

- Refer to AT-82, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END
NG >> Repair or replace damaged parts.

DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

Description

ECS0027F

- The park/neutral position (PNP) switch includes a transmission position switch.
- The transmission range switch detects the selector lever position and sends a signal to the TCM.

On Board Diagnosis Logic

ECS0027H

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PNP SW/CIRC” with CONSULT-II or P0705 without CONSULT-II is detected when TCM does not receive the correct voltage signal from the PNP switch 1, 2, 3, 4 based on the gear position.
- When monitor terminal of PNP switch 3 is disconnected.
- When no other position but “P” position is detected from “3” or “N” positions.

Possible Cause

ECS0027I

Check the following items.

- Harness or connectors
  [The park/neutral position (PNP) switch 1, 2, 3, 4 and TCM circuit is open or shorted.]
- Park/neutral position (PNP) switch 1, 2, 3, 4
- Park/neutral position (PNP) switch 3 monitor terminal disconnected

DTC Confirmation Procedure

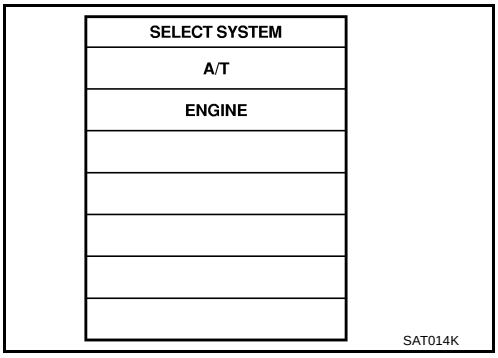
ECS0027J

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine.
4. Vehicle start and maintain the following conditions for at least 2 consecutive seconds.
   THRTL POS SEN: More than 1.2V
5. If DTC is detected, go to AT-87, "Diagnostic Procedure" .



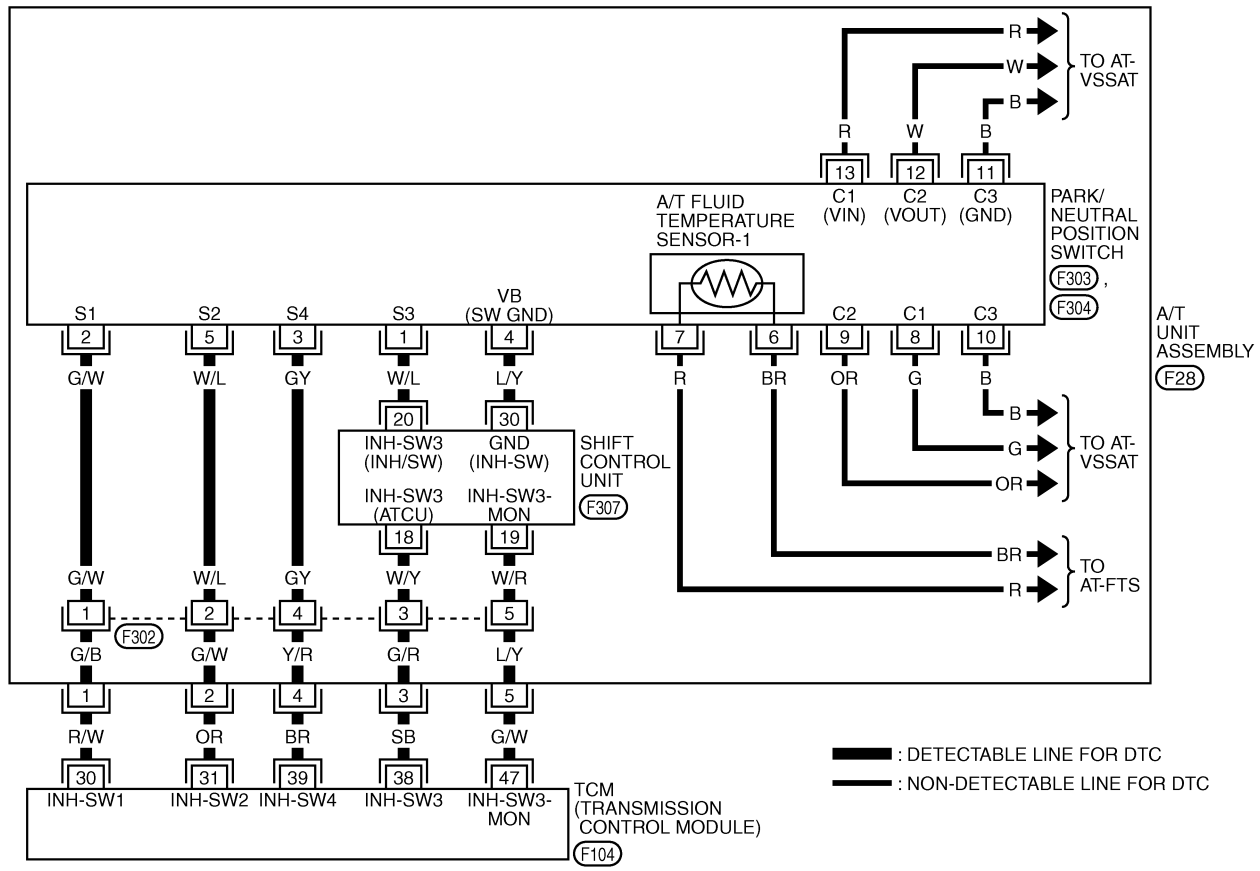
WITH GST

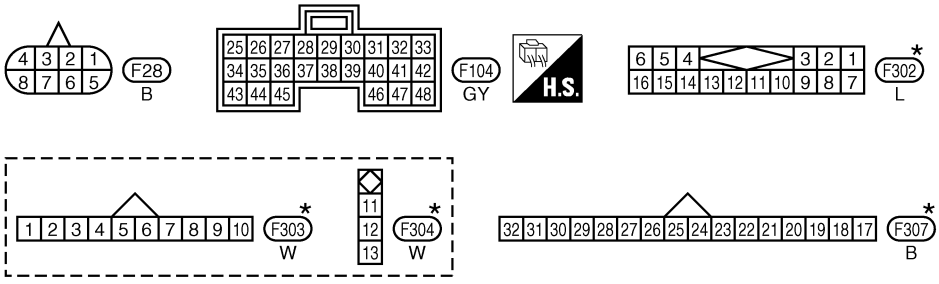
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — PNP/SW

ECS0027K

AT-PNP/SW-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0003E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
30	R/W	PNP switch 1	IGN ON	Selector lever in “P” position.	Battery voltage
				Selector lever in “N” position.	Less than 2.5V
31	OR	PNP switch 2		Selector lever in “P” position.	Battery voltage
				Selector lever in “D” position.	Less than 2.5V
38	SB	PNP switch 3		Selector lever in “D” position.	Battery voltage
				Selector lever in “R” position.	Less than 2.5V
39	BR	PNP switch 4	IGN ON	Selector lever in “D” position.	More than 2.5V
				Selector lever in “R” position.	Less than 2.5V
47	G/W	PNP switch 3 (monitor)		Selector lever in “D” position.	Battery voltage
				Selector lever in “R” position.	Less than 2.5V

Diagnostic Procedure

ECS002GJ

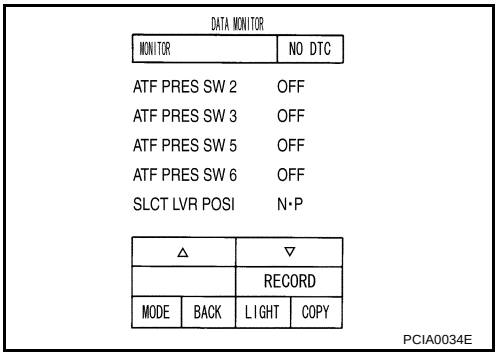
1. CHECK PNP SW CIRCUIT (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out “P”, “R”, “N”, and “D” position switches moving selector lever to each position.

OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.

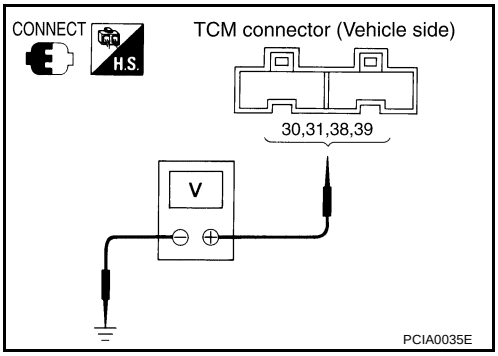


2. CHECK PNP SW CIRCUIT (WITHOUT CONSULT-II)

Without CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Selector lever to “P“, “R”, “N”, or “D” position to check the voltage between the TCM connector terminals and ground.

Shift position	Connector No.		F104	
	Terminal No.			
	30 - Ground	31 - Ground	38 - Ground	39 - Ground
P	Battery voltage	Battery voltage	—	—
R	—	—	Less than 2.5V	Less than 2.5V
N	Less than 2.5V	—	—	—
D	—	Less than 2.5V	Battery voltage	More than 2.5V



OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following items.

- Disconnection or short-circuit in the main harness between TCM and PNP switch 1, 2, 3, 4.
- Disconnection or short-circuit in the main harness between the PNP switch 3 monitor and TCM.
- PNP switch. Refer to AT-88, "Component Inspection" .

OK or NG?

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Check again.

- Refer to AT-85, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

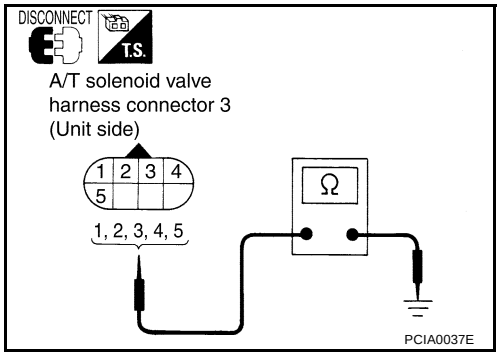
Component Inspection

ECS002GK

PNP SWITCH

1. Selector lever to various positions to check the continuity between terminals on the PNP switch and ground.

PNP SW	Shift position	Connector No.	Terminal No.	Continuity
SW 1	P	F28	1 - Ground	No
SW 2			2 - Ground	
SW 3	D		3 - Ground	
SW 4			4 - Ground	Yes
SW 3 Monitor	P, R, N, D		3 - 5	



2. If NG, check the continuity with the control cable disconnected. (Refer to Step 1 above.)
3. If OK with the control cable disconnected, adjust the control cable. Refer to AT-208, "Control Cable" .
4. If NG even when the control cable is disconnected, replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)

PFP:32702

Description

ECS0027X

The revolution sensor detects the revolution of the idler gear parking pawl lock gear and emits a pulse signal. The pulse signal is sent to the TCM which converts it into vehicle speed.

On Board Diagnosis Logic

ECS0027Z

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “VEH SPD SEN/CIR AT” with CONSULT-II or P0720 without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.
- After ignition switch is turned “ON”, irregular signal input from vehicle sensor MTR before the vehicle starts moving

Possible Cause

ECS00280

Check the following items.

- Harness or connectors
  (The sensor circuit is open or shorted.)
- Revolution sensor

DTC Confirmation Procedure

ECS00281

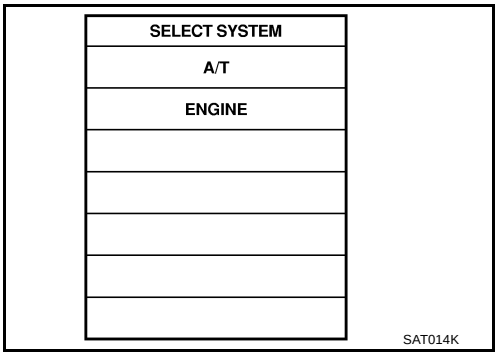
CAUTION:

- **Always drive vehicle at a safe speed.**
- **Be careful not to rev engine into the red zone on the tachometer.**

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle and check for an increase of “VHCL/S SE·MTR” value.
   If the check result is NG, go to AT-127, "DTC P1721 VEHICLE SPEED SENSOR MTR" .
   If the check result is OK, go to following step.
4. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
5. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 30 km/h (19 MPH) or more
   THRTL POS SEN: More than 1.2V
   Selector lever: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
   If the check result is NG, go to AT-91, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
6. Maintain the following conditions for at least 5 consecutive seconds.
   CMPS·RPM (REF): 3,500 rpm or more
   THRTL POS SEN: More than 1.2V
   Selector lever: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
   If the check result is NG, go to AT-91, "Diagnostic Procedure" .



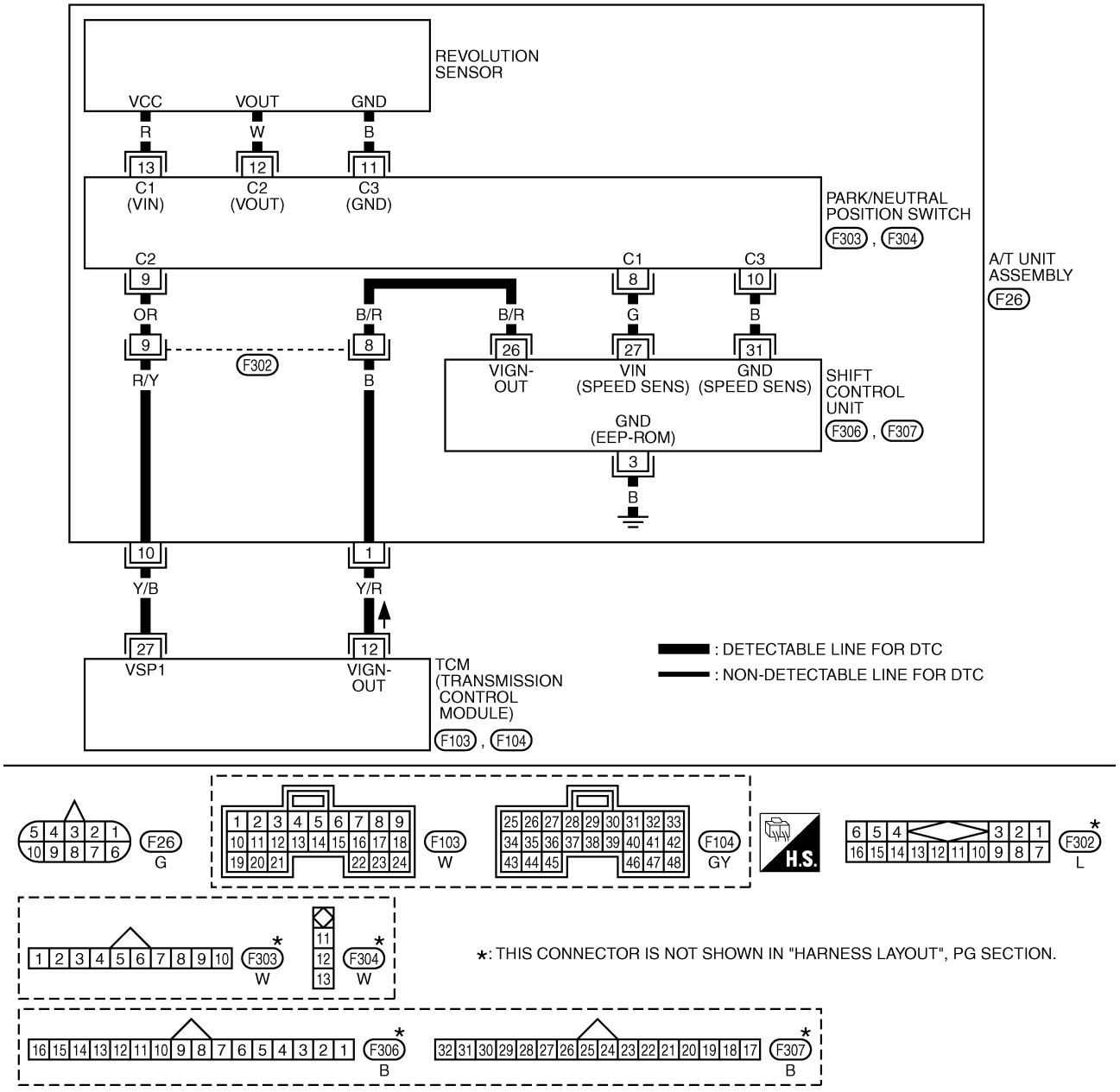
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — VSSA/T

ECS00282

AT-VSSAT-01



TCWM0004E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
12	Y/R	Power supply (out)	IGN ON	–	Battery voltage
			IGN OFF	–	0V
27	Y/B	Vehicle speed sensor A/T (revolution sensor)	When vehicle starts	**CAUTION:** **Connect the diagnosis data link connector to the vehicle side diagnosis connector.**	149 (Hz)

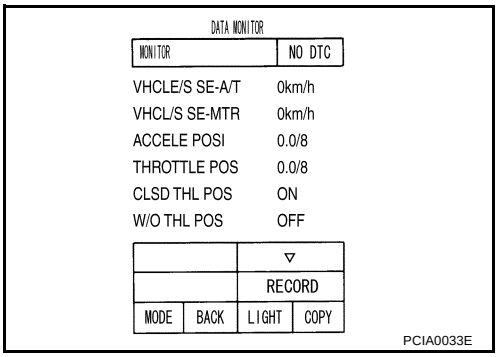
Diagnostic Procedure

ECS002GN

1. CHECK INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start the engine.
4. Read out the value of “VHCL/S SE·A/T” while driving. Check the value changes according to driving speed.



OK or NG?

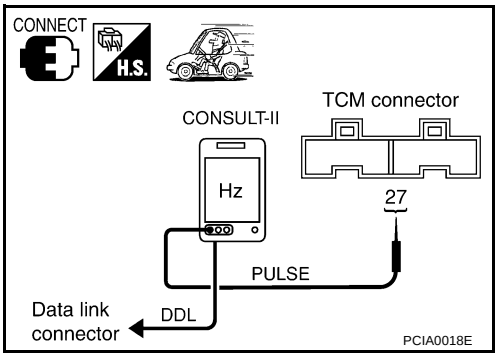
OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK REVOLUTION SENSOR (WITH CONSULT-II)

With CONSULT-II

1. Start the engine.

Condition	Connector No.	Terminal No.	Data (Approx.)
When moving at 20 km/h(12MPH), use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the data link connector to the vehicle-side diagnosis connector.**	F104	27	149 (Hz)



OK or NG?

OK >> GO TO 3.
NG >>
- Harness for short or open between TCM and revolution sensor (Main harness)
- Repair or replace damaged parts.

3. CHECK DTC

Check again.

- Refer to AT-89, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

OK >> INSPECTION END
NG >>
- Repair or replace damaged parts.
- Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P0725 ENGINE SPEED SIGNAL

PFP:24825

Description

ECS00285

The engine speed signal is sent from the ECM to the TCM.

On Board Diagnosis Logic

ECS002NS

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ENGINE SPEED SIG” with CONSULT-II or 16th judgement flicker without CONSULT-II is detected when TCM does not receive the ignition signal in the primary circuit is not sent to ECM during engine cranking or running.

Possible Cause

ECS00287

Check harness or connectors. (The ECM to the TCM circuit is open or shorted.)

DTC Confirmation Procedure

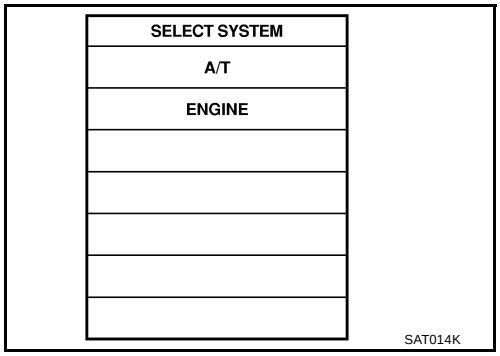
ECS00288

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Start engine and maintain the following conditions for at least 10 consecutive seconds.
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   ACCELE POSI: More than 1/8
   Selector lever: “D” position
3. If DTC is detected, go to AT-92, "Diagnostic Procedure" .



Diagnostic Procedure

ECS002GP

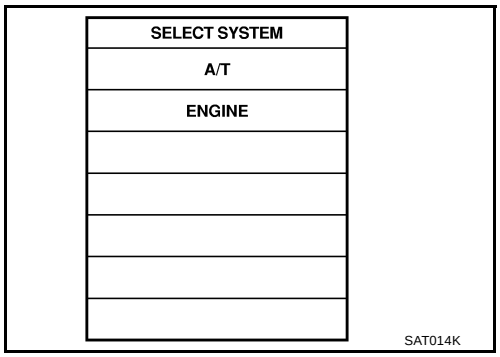
1. CHECK DTC WITH ECM

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “ENGINE” with CONSULT-II. Refer to EC-118, "CONSULT-II Function" .

OK or NG?

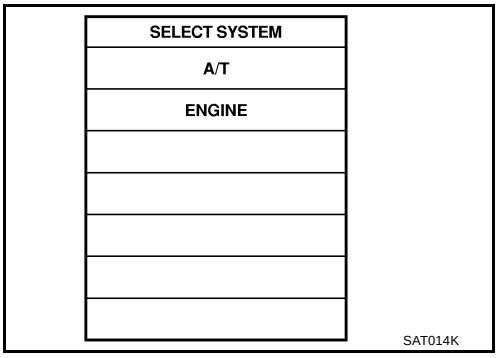
OK >> GO TO 2.
NG >> Check the DTC detected item, go to EC-118, "CONSULT-II Function" .
- If CAN communication line is detected, go to AT-79, "DTC U1000 CAN COMMUNICATION LINE" .



2. CHECK DTC WITH TCM

With CONSULT-II

1. Start engine.
2. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.



OK or NG?

OK >> GO TO 3.
NG >> Check the ignition signal circuit.
- Refer to EC-479, "DTC P1320 IGNITION SIGNAL" .

3. CHECK DTC

Check again.

- Refer to AT-92, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> Repair or replace damaged parts.

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

Description

ECS0028C

- The torque converter clutch solenoid valve is activated, with the gear in D_5 , by the TCM in response to signals sent from the vehicle speed and throttle position sensors. Lock-up piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

On Board Diagnosis Logic

ECS0028E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCC SOLENOID/CIRC” with CONSULT-II or P0740 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

ECS0028F

Check the following items.

- Torque converter clutch solenoid valve
- Harness or connectors
  (The solenoid circuit is open or shorted.)

DTC Confirmation Procedure

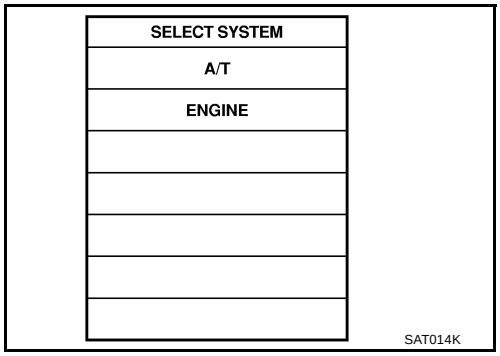
ECS0028G

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 80 km/h (50 MPH) or more
   ACCELE POS: 0.5/8 - 1.0/8
   SELECTOR LEVER: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected go to “AT-96, "Diagnostic Procedure" .



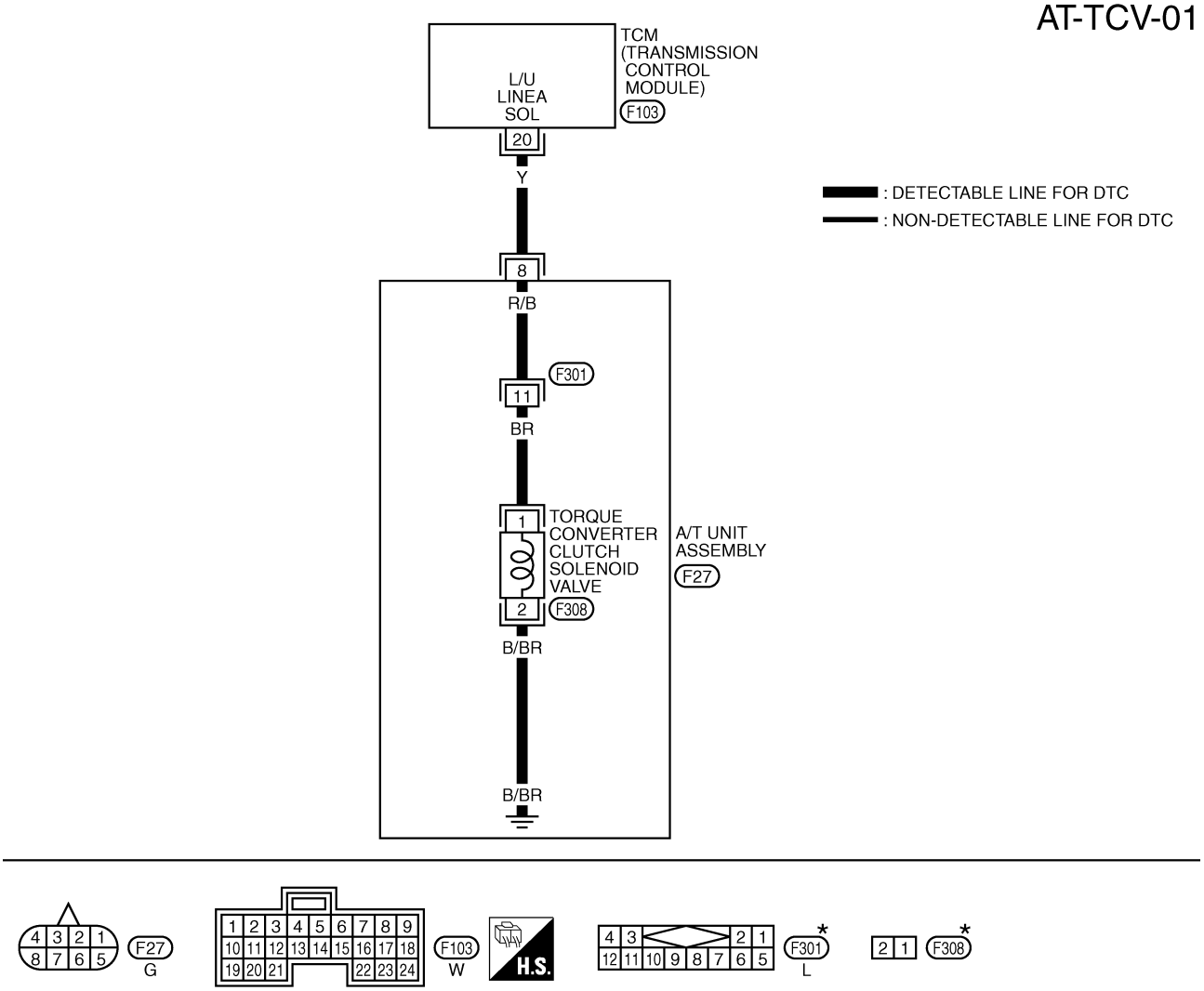
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — TCV

ECS0028H

AT-TCV-01



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0005E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

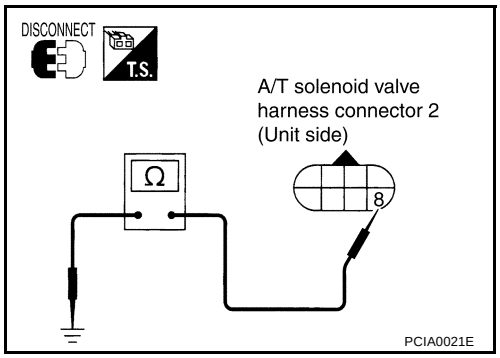
Terminal No.	Wire color	Item	Condition		Data (Approx.)
20	Y	TCC solenoid valve	When vehicle starts	When lock-up	More than 2V
				When not lock-up	0V

Diagnostic Procedure

ECS002GR

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



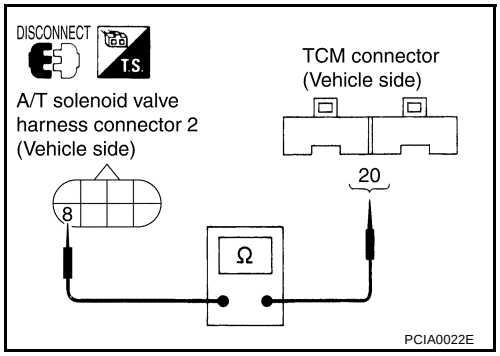
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Torque converter clutch solenoid valve	F27	8 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	20	Yes
A/T solenoid valve harness connector 2	F27	8	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-94, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly.Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)

PFP:31940

Description

ECS0028L

This malfunction is detected when the A/T does not shift into 5th gear position or the torque converter clutch does not lock-up as instructed by the TCM. This is not noly caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

On Board Diagnosis Logic

ECS0028N

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- Diagnostic trouble code “A/T TCC S/V FNCTN” with CONSULT-II or P0744 without CONSULT-II is detected when A/T cannot perform lock-up even if electrical circuit is good.
- Detects abnormal by comparing difference value with slip rotation.

Possible Cause

ECS0028O

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Torque converter clutch solenoid valve
- Hydraulic control circuit

DTC Confirmation Procedure

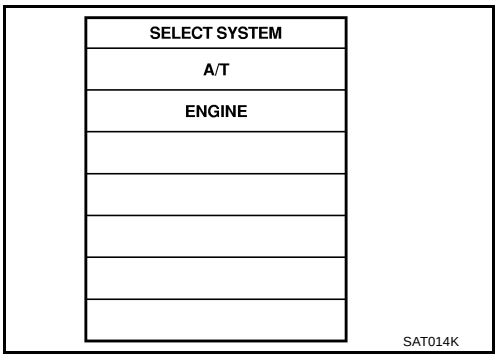
ECS0028P

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Select “TCC S/V FNCTN CHECK” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
3. Accelerate vehicle to more than 80 km/h (50 MPH) and maintain the following condition continuously until “TESTING” has turned to “COMPLETE”. (It will take approximately 30 seconds after “TESTING” shows.)
   ACCELE POSI: 1.5/8 - 2.0/8 (at all times during step 4)
   Selector lever: “D” position
   VHCL/S SE·A/T: Constant speed of more than 80 km/h (50 MPH)



- **Check that “GEAR” shows “5”.**
- **For shift schedule, refer to AT-219, "Vehicle Speed When Performing and Releasing Complete Lock-up" .**
- **If “TESTING” does not appear on CONSULT-II for a long time, select “SELF-DIAG RESULTS”. In case a 1st trip DTC other than P0744 is shown, refer to applicable “TROUBLE DIAGNOSIS FOR DTC”.**

4. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-99, "Diagnostic Procedure" .
   Refer to shift schedule, AT-219, "Vehicle Speed When Performing and Releasing Complete Lock-up" .

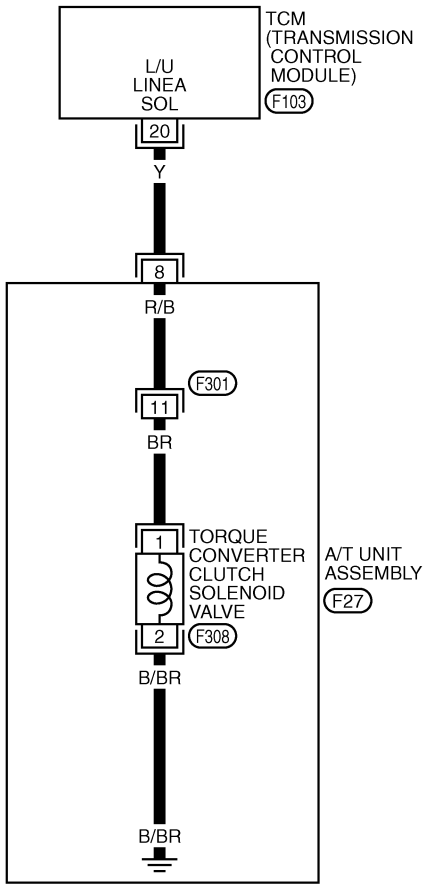
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — TCCSIG

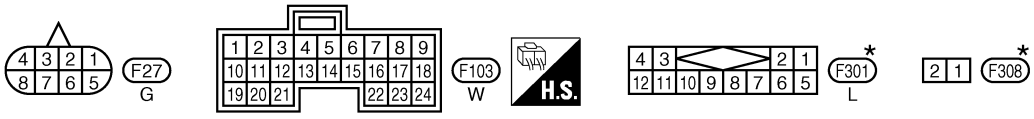
ECS0028Q

AT-TCCSIG-01



: DETECTABLE LINE FOR DTC

: NON-DETECTABLE LINE FOR DTC



∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0006E

TCM terminal and data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

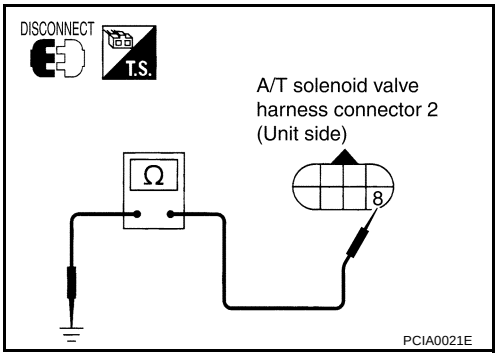
Terminal No.	Wire color	Item	Condition		Data (Approx.)
20	Y	TCC solenoid valve	When vehicle starts	When lock-up	More than 2V
				When not lock-up	0V

Diagnostic Procedure

ECS002OK

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



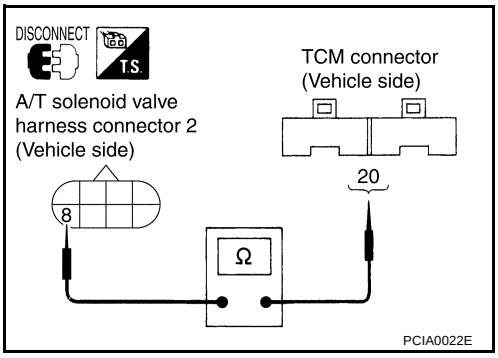
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Torque converter clutch solenoid valve	F27	8 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	20	Yes
A/T solenoid valve harness connector 2	F27	8	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-97, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P0745 LINE PRESSURE SOLENOID VALVE

PFP:31940

Description

ECS0028U

The line pressure solenoid valve regulates the oil pump discharge pressure to suit the driving condition in response to a signal sent from the TCM.

The line pressure duty cycle value is not consistent when the closed throttle position switch is “ON”. To confirm the line pressure duty cycle at low pressure, the accelerator (throttle) should be open until the closed throttle position switch is “OFF”.

On Board Diagnosis Logic

ECS0028W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “L/PRESS SOL/CIRC” with CONSULT-II or P0745 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

ECS0028X

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Line pressure solenoid valve

DTC Confirmation Procedure

ECS0028Y

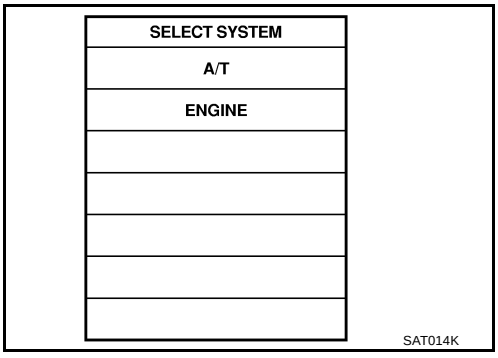
NOTE:

If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position and select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
2. Engine start and wait at least 5 second.



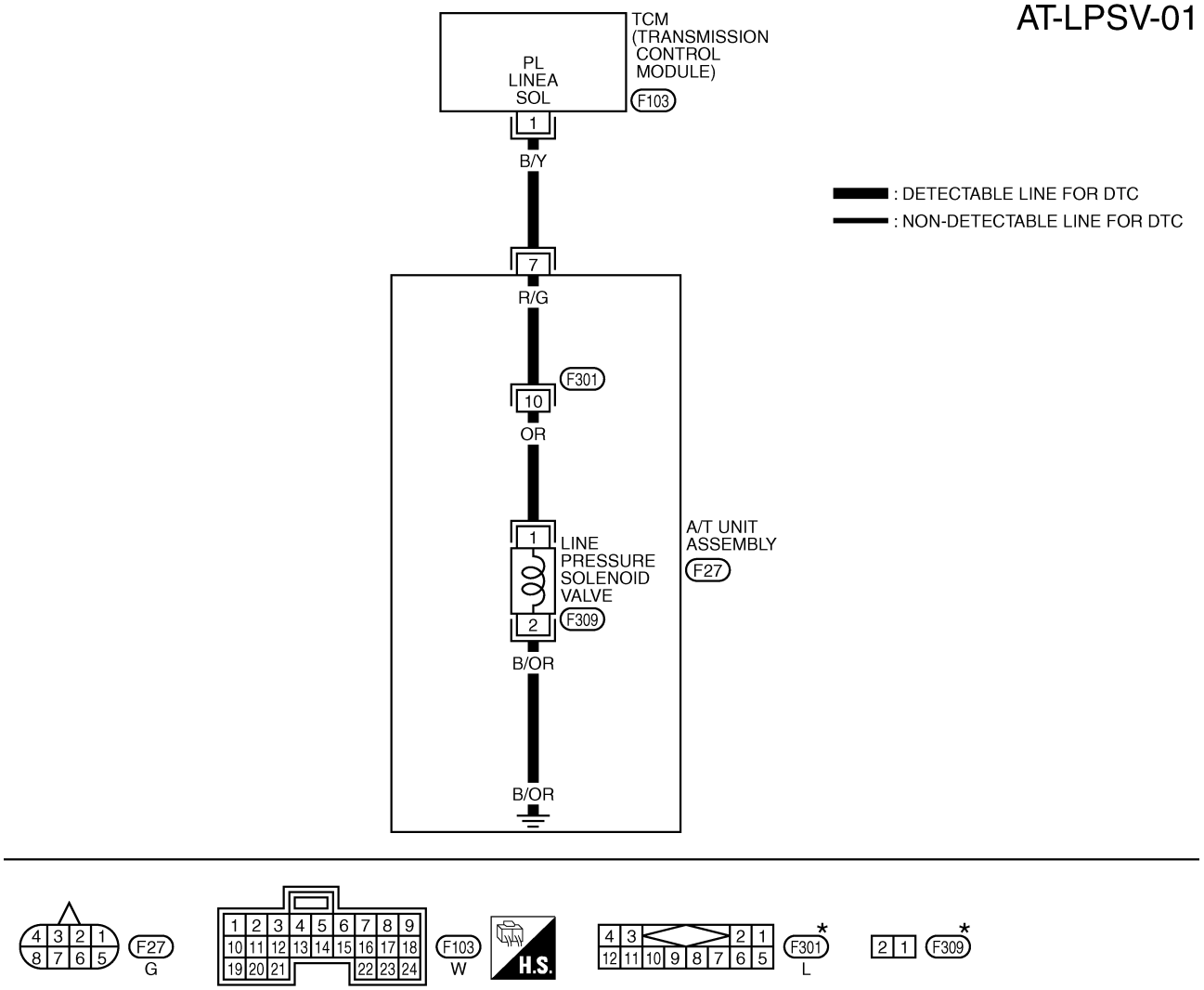
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — LPSV

ECS0028Z

AT-LPSV-01



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0007E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

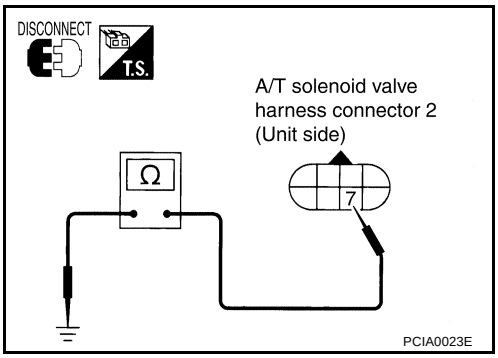
Terminal No.	Wire color	Item	Condition		Data (Approx.)
1	B/Y	Line pressure solenoid valve	IGN ON	After warming up the engine, release your foot from the accelerator pedal.	2V
				After warming up the engine, press the accelerator pedal all the way down.	0.7V

Diagnostic Procedure

ECS002OL

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



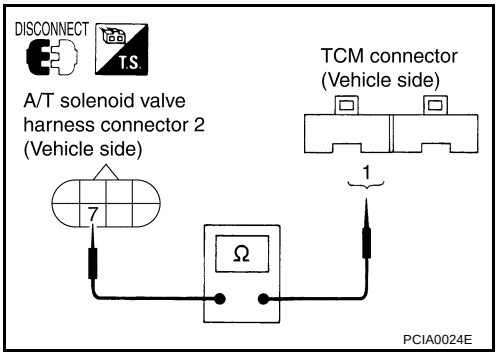
Solenoid Valve	Connector No.	Terminal No	Resistance (Approx.)
Line pressure solenoid valve	F27	7 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	1	Yes
A/T solenoid valve harness connector 2	F27	7	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-101, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1701 TRANSMISSION CONTROL MODULE (POWER SUPPLY)

PFP:31036

Description

ECS00293

When the power supply to the TCM is cut “OFF”, for example because the battery is removed, and the self-diagnostics memory function stops.

On Board Diagnosis Logic

ECS002DV

- This is not an OBD-II self-diagnostic item.
- TCM does not receive the voltage signal from the battery power supply.
- This is not a malfunction message. (Whenever shutting “OFF” a power supply to the TCM, this message appears on the screen.)
- Diagnostic trouble code “TCM-POWER SUPPLY” with CONSULT-II is detected.

Possible Cause

ECS002DW

Check harness or connectors.

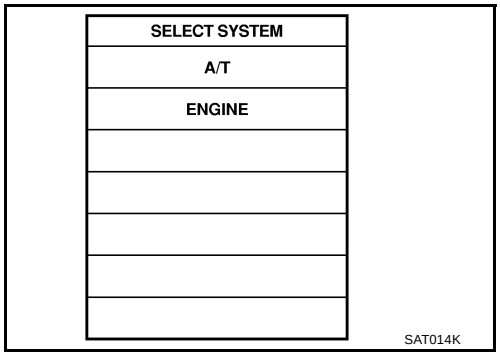
DTC Confirmation Procedure

ECS002DX

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

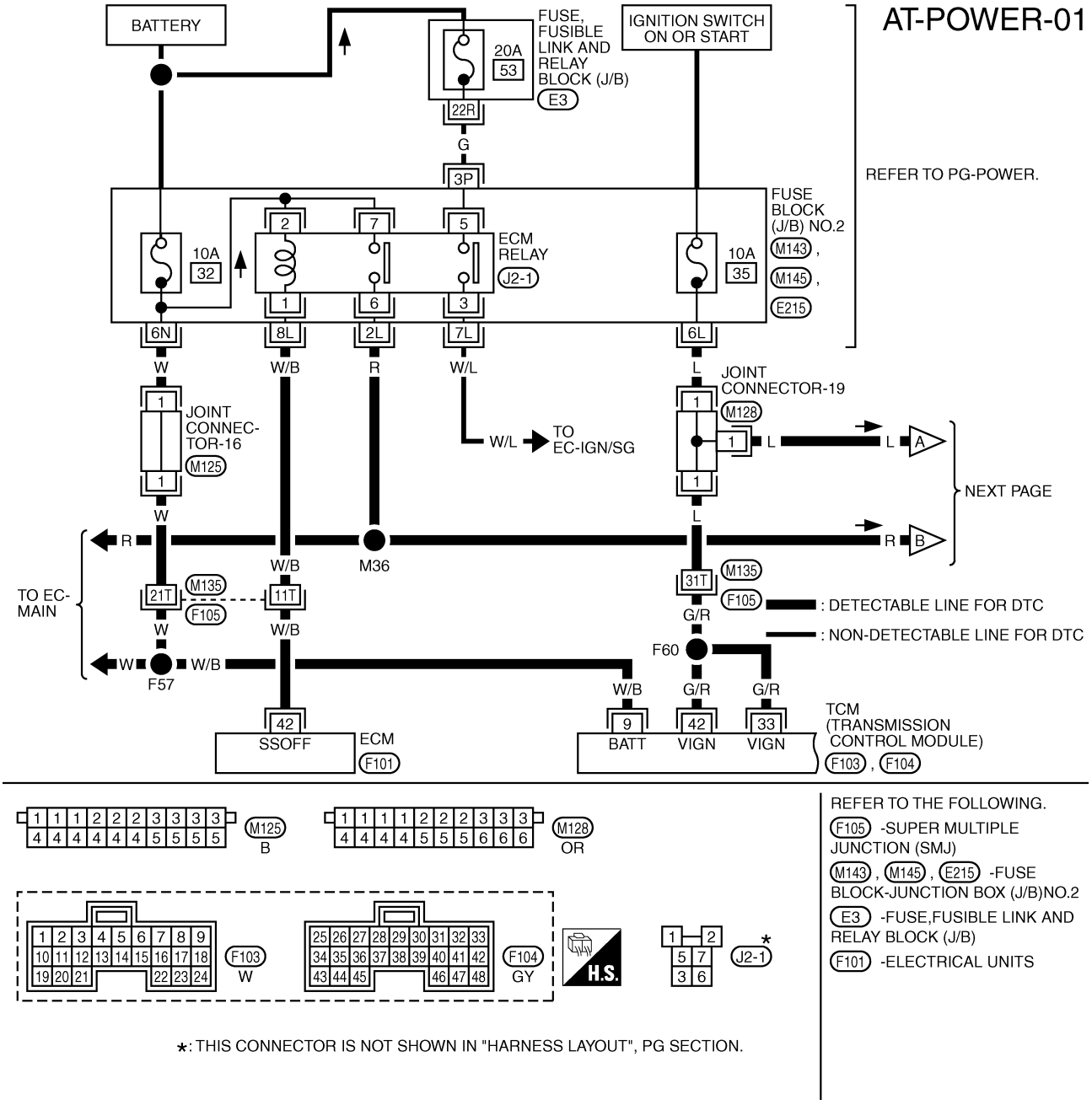
WITH CONSULT-II

1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Wait for at least 2 consecutive seconds.
4. If DTC is detected, go to AT-108, "Diagnostic Procedure" .



Wiring Diagram — AT — POWER

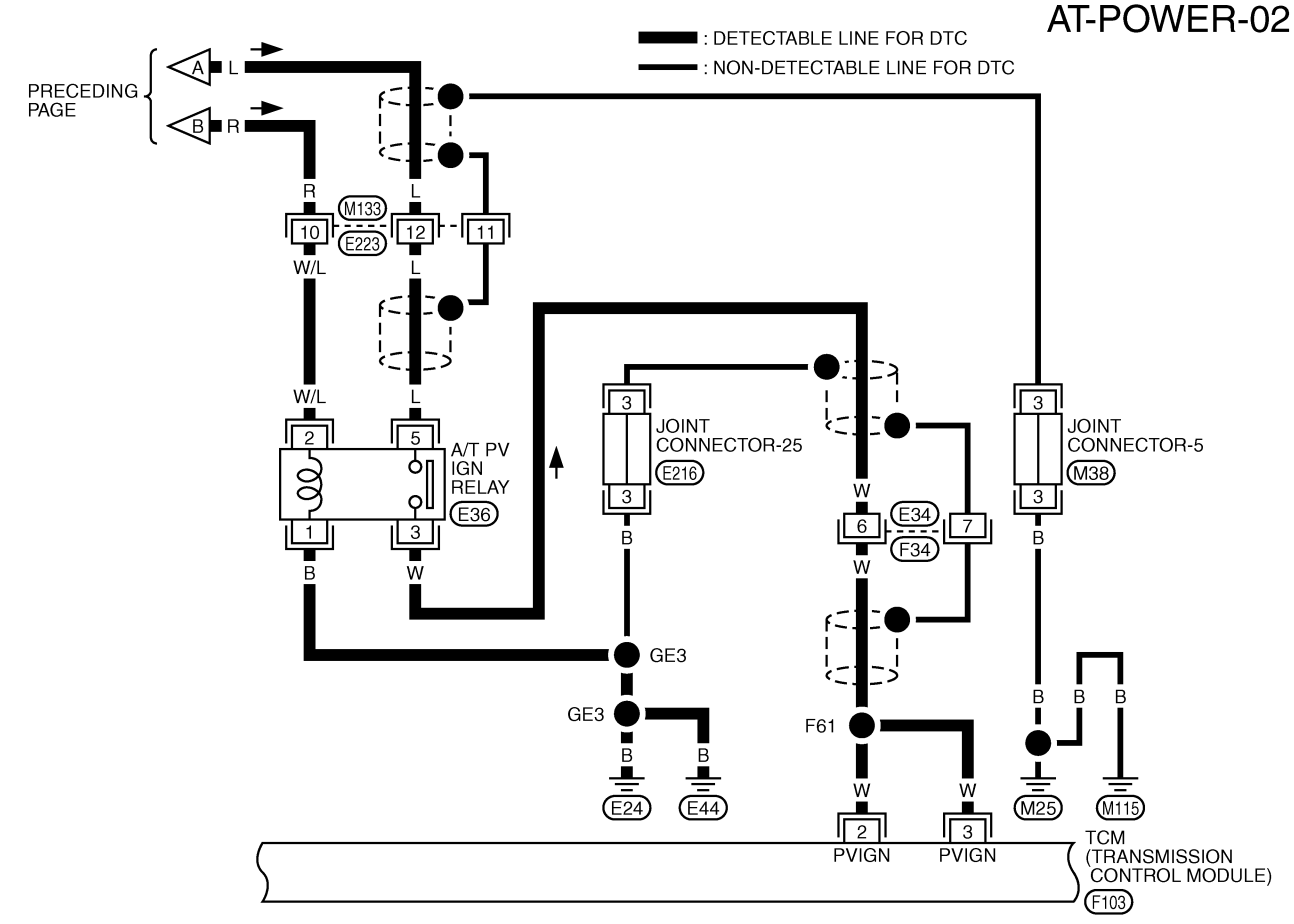
ECS00295

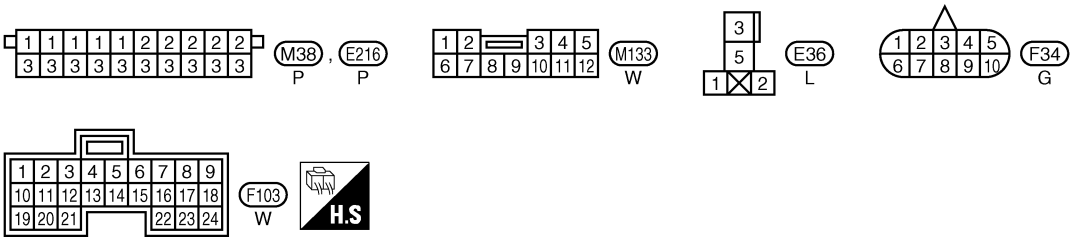


TCWM0008E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
9	W/B	Power supply	IGN ON or OFF	-	Battery voltage
33	G/R	Power supply	IGN ON	-	Battery voltage
			IGN OFF	-	0V
42	G/R	Power supply	IGN ON	-	Battery voltage
			IGN OFF	-	0V


AT-POWER-02
: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
PRECEDING PAGE
A
B
L
R
M133
E223
10
12
11
W/L
L
2
5
1
3
A/T PV IGN RELAY
E36
JOINT CONNECTOR-25
E216
JOINT CONNECTOR-5
M38
E34
F34
6
7
GE3
F61
E24
E44
M25
M115
PVIGN
TCM (TRANSMISSION CONTROL MODULE)
F103

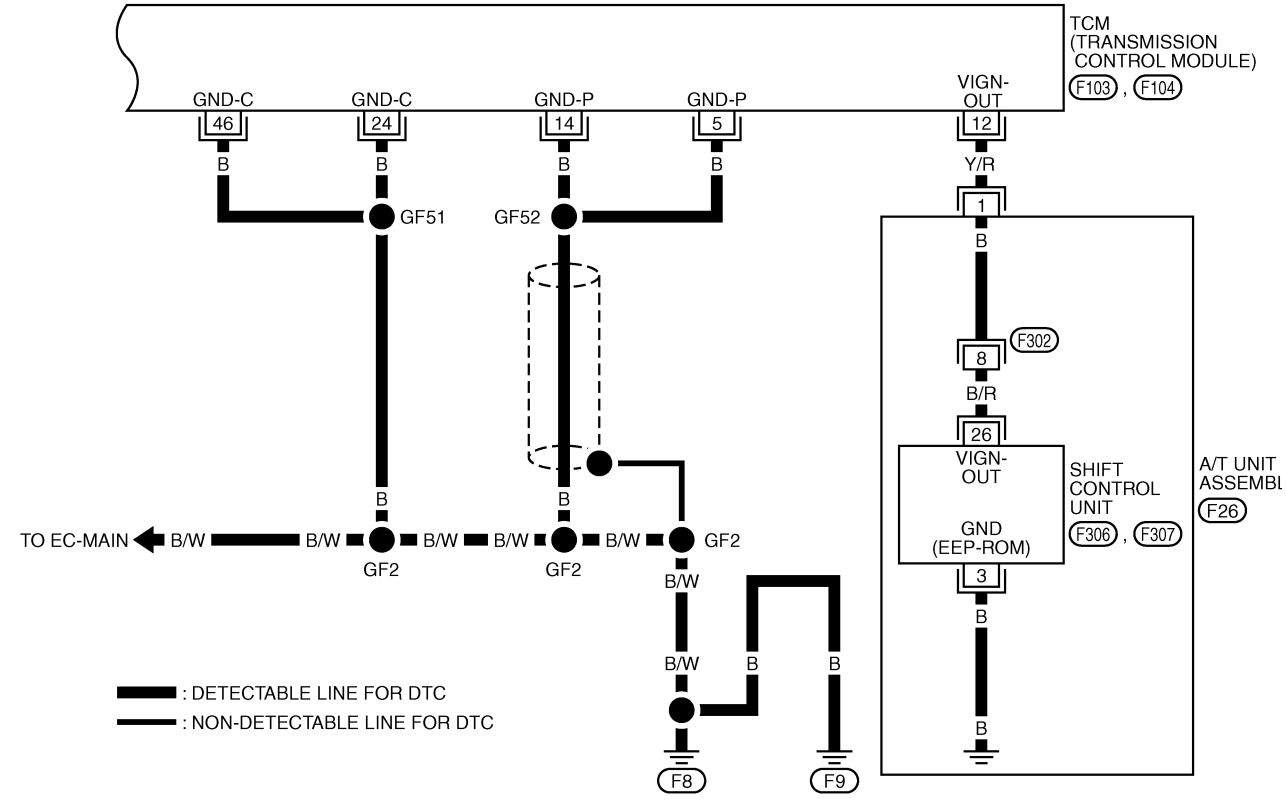

M38
E216
P
M133
W
E36
L
F34
G
F103
W
H.S

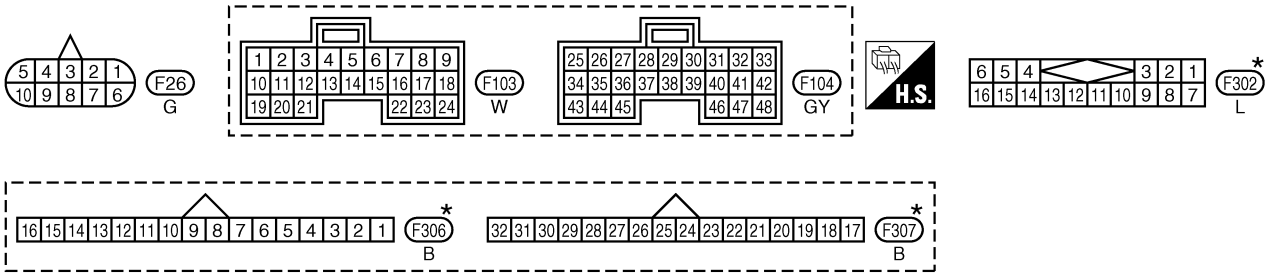
TCWM0009E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
2	W	Power supply	IGN ON	-	Battery voltage
			IGN OFF	Measure 3 seconds after switching “OFF” the ignition switch.	0V
3	W	Power supply	IGN ON	-	Battery voltage
			IGN OFF	Measure 3 seconds after switching “OFF” the ignition switch.	0V

AT-POWER-03





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0010E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
5	B	Ground	-	-	-
14	B	Power supply (out)	-	-	-
24	B	Ground	-	-	-
46	B	Ground	-	-	-

Diagnostic Procedure

ECS00296

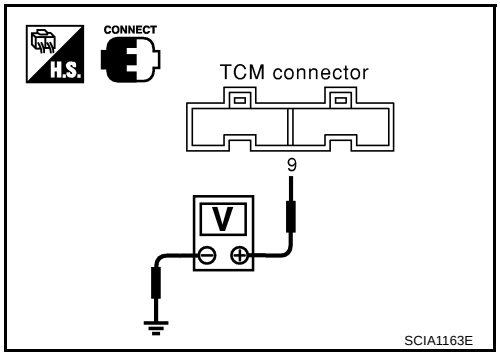
1. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch to “OFF” position. (Do not start engine.)
2. Check voltage between TCM terminal and ground.

Item	Connector No.	Terminal No.	Voltage
TCM	F103	9 - Ground	Battery voltage

OK or NG?

OK >> GO TO 2.
NG >> GO TO 3.



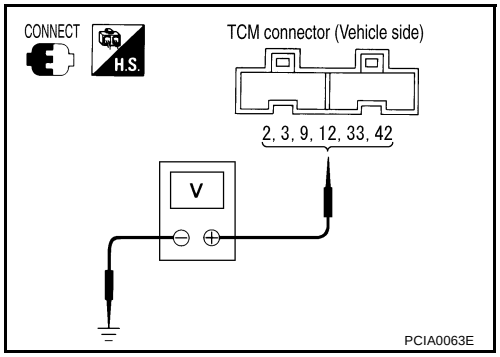
2. CHECK TCM POWER SOURCE STEP 2

1. Turn ignition switch to “ON” position.
2. Check voltage between TCM terminal and ground.

Item	Connector No.	Terminal No.	Voltage
TCM	F103	2 - Ground	Battery voltage
		3 - Ground	
		9 - Ground	
		12 - Ground	
	F104	33 - Ground	
		42 - Ground	

OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.



3. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between battery and TCM terminal 9
- Harness for short or open between ignition switch and TCM terminals 2, 3, 33 and 42
- Ignition switch and 10A fuse [No. 32 or 35, located in the fuse block (J/B)]
  Refer to There is out of section link “nael0005”, “Schematic”.
- Ignition switch, Refer to PG-2, "POWER SUPPLY ROUTING" .
- A/T PV IGN relay and ECM relay, Refer to PG-73, "STANDARDIZED RELAY" .

OK or NG?

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

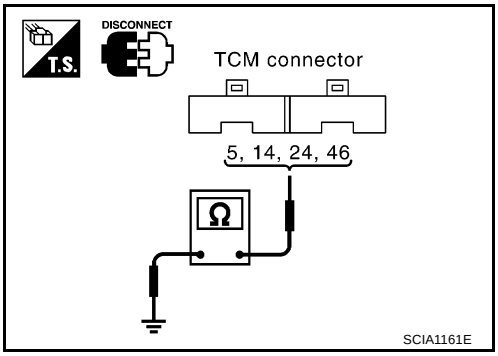
1. Turn ignition switch to “OFF” position.
2. Disconnect TCM harness connector.
3. Check continuity between TCM terminals 5, 14, 24, 46 and ground.

   Continuity should exist.

   If OK, check harness for short to ground and short to power.

OK or NG?

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.



5. CHECK DTC

Check again.Refer to AT-104, "DTC Confirmation Procedure" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

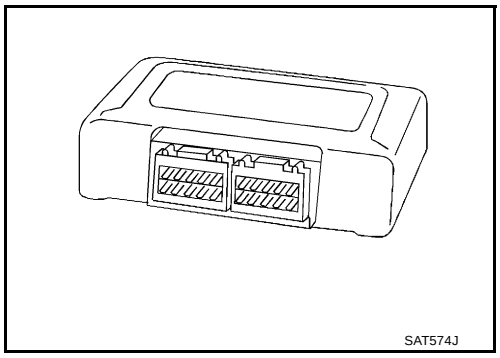
DTC P1702 TRANSMISSION CONTROL MODULE (RAM)

PFP:31036

Description

ECS002DY

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.



On Board Diagnosis Logic

ECS002DZ

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM·RAM” with CONSULT-II is detected when TCM memory RAM is malfunctioning.

Possible Cause

ECS002E0

Check TCM.

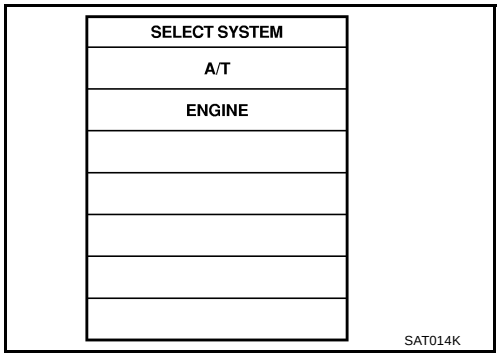
DTC Confirmation Procedure

ECS002E1

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for A/T with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-111, "Diagnostic Procedure" .



Diagnostic Procedure

ECS0029A

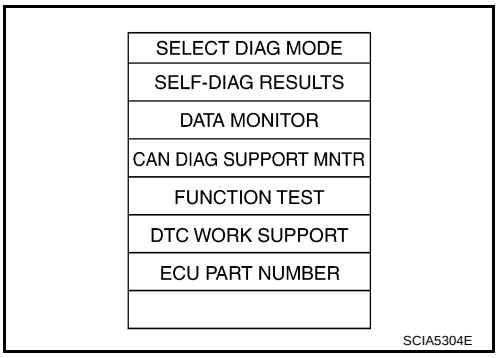
1. CHECK DTC

With CONSULT-II

1. Turn ignition switch “ON” position.(Do not start engine.)
2. Select “SELF DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” position and wait at least 10 seconds.
5. Perform DTC confirmation procedure, AT-110, "DTC Confirmation Procedure" .

Is the “TCM·RAM” displayed again?

Yes >> Replace TCM.
No >> INSPECTION END



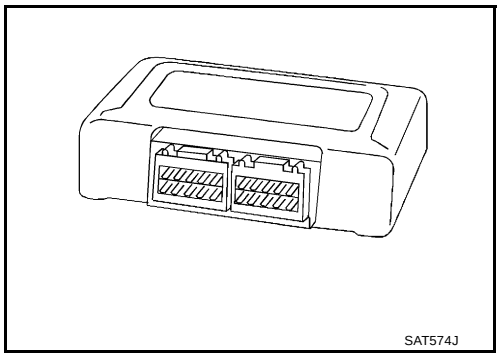
DTC P1703 TRANSMISSION CONTROL MODULE (ROM)

PFP:31036

Description

ECS002E2

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.



On Board Diagnosis Logic

ECS002E3

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM·ROM” with CONSULT-II is detected when TCM memory ROM is malfunctioning.

Possible Cause

ECS002E4

Check TCM.

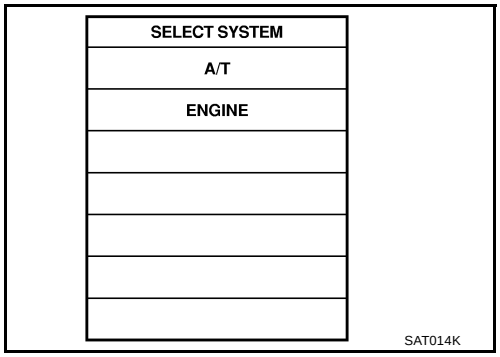
DTC Confirmation Procedure

ECS002E5

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for A/T with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-113, "Diagnostic Procedure" .



Diagnostic Procedure

ECS0029D

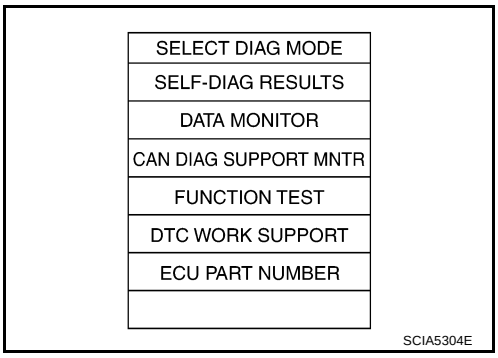
1. CHECK DTC

With CONSULT-II

1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “SELF DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” position and wait at least 10 seconds.
5. Perform DTC confirmation procedure, AT-112, "DTC Confirmation Procedure" .

Is the “TCM·ROM” displayed again?

Yes >> Replace TCM.
No >> INSPECTION END



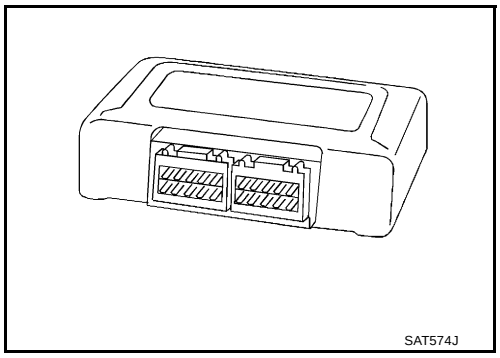
DTC P1704 TRANSMISSION CONTROL MODULE (EEPROM)

PFP:31036

Description

ECS0029F

The TCM consists of a microcomputer and connectors for signal input and output and for power supply. The TCM controls the A/T.



On Board Diagnosis Logic

ECS002E7

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM·EEPROM” with CONSULT-II is detected when TCM memory EEPROM is malfunctioning.

Possible Cause

ECS002E8

Check TCM.

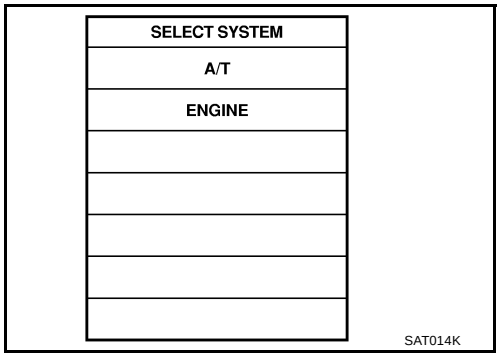
DTC Confirmation Procedure

ECS002E9

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for A/T with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-115, "Diagnostic Procedure" .



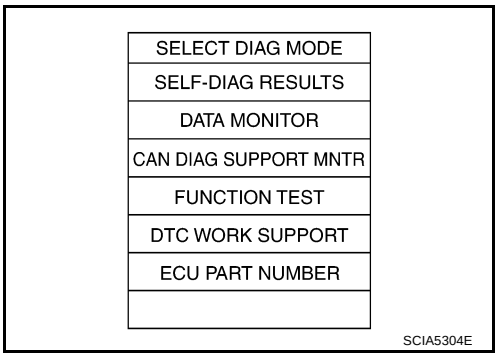
Diagnostic Procedure

ECS002EA

1. CHECK DTC

With CONSULT-II

1. Turn ignition switch to “ON” position and select “SELF DIAGNOSIS” mode for “A/T” with CONSULT-II.
2. Move selector lever to “R” position.
3. Depress accelerator pedal (Full throttle position).
4. Touch “ERASE”.
5. Turn ignition switch to “OFF” position and wait at least 10 seconds.
6. Perform “DTC Confirmation Procedure”,Refer to AT-114, "DTC Confirmation Procedure" .



Is the “TCM·EEPROM” displayed again?

Yes >> Replace TCM.
No >> INSPECTION END

DTC P1705 THROTTLE POSITION SENSOR

PFP:22620

Description

ECS002NX

Electric throttle control actuator consists of throttle control motor, acceleration pedal position sensor, throttle position sensor, etc. The actuator sends a signal to the TCM.

On Board Diagnosis Logic

ECS0022C

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “TP SEN/CIRC A/T” with CONSULT-II or 15th judgement flicker without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

ECS0022D

Harness or connectors
(The sensor circuit is open or shorted.)

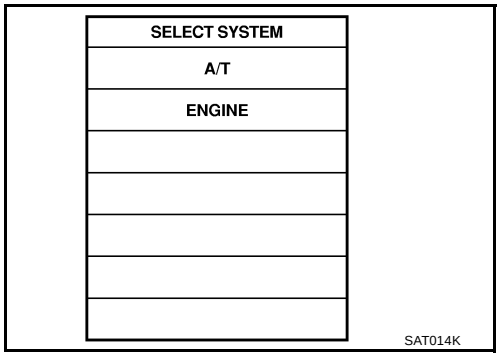
DTC Confirmation Procedure

ECS002O2

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected go to “AT-96, "Diagnostic Procedure" .



Diagnostic Procedure

ECS0022G

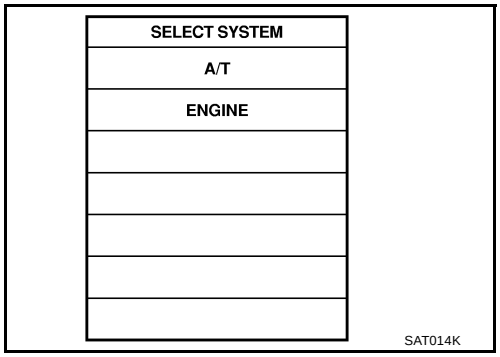
1. CHECK DTC WITH ECM

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “ENGINE” with CONSULT-II. Refer to EC-118, "CONSULT-II Function" .

OK or NG?

OK >> GO TO 2.
NG >> Check the DTC detected item.go to EC-118, "CONSULT-II Function" .
- If CAN communication line is detected, go to AT-79, "DTC U1000 CAN COMMUNICATION LINE" .



2. CHECK DTC WITH TCM

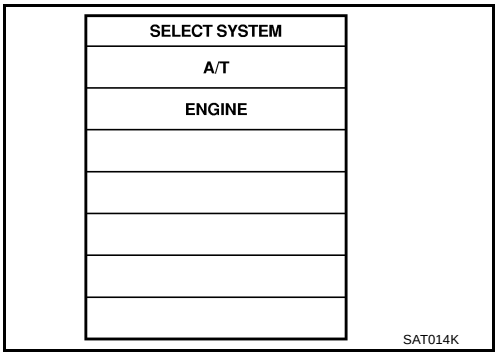
With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Read out the value of “ENGINE SPEED”.
   Check engine speed changes according to throttle position.

OK or NG?

OK >> GO TO 3.
NG >> Check the accelerator pedal position sensor circuit.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .



3. CHECK DTC

Check again.

- Refer to AT-92, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> Repair or replace damaged parts.

DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31940

Description

ECS0029J

The A/T fluid temperature sensor detects the A/T fluid temperature and sends a signal to the TCM.

On Board Diagnosis Logic

ECS0029M

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF TEMP SEN/CIRC” with CONSULT-II or P1710(A/T), P0710(ENGINE) without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

ECS0029N

Check the following items.

- Harness or connectors
  (The sensor circuit is open or shorted.)
- A/T fluid temperature sensors 1, 2

DTC Confirmation Procedure

ECS0029O

CAUTION:

Always drive vehicle at a safe speed.

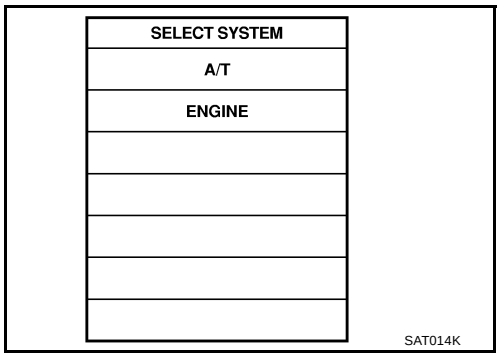
NOTE:

If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   THRTL POS SEN: More than 1.2V
   Selector lever: “D” position



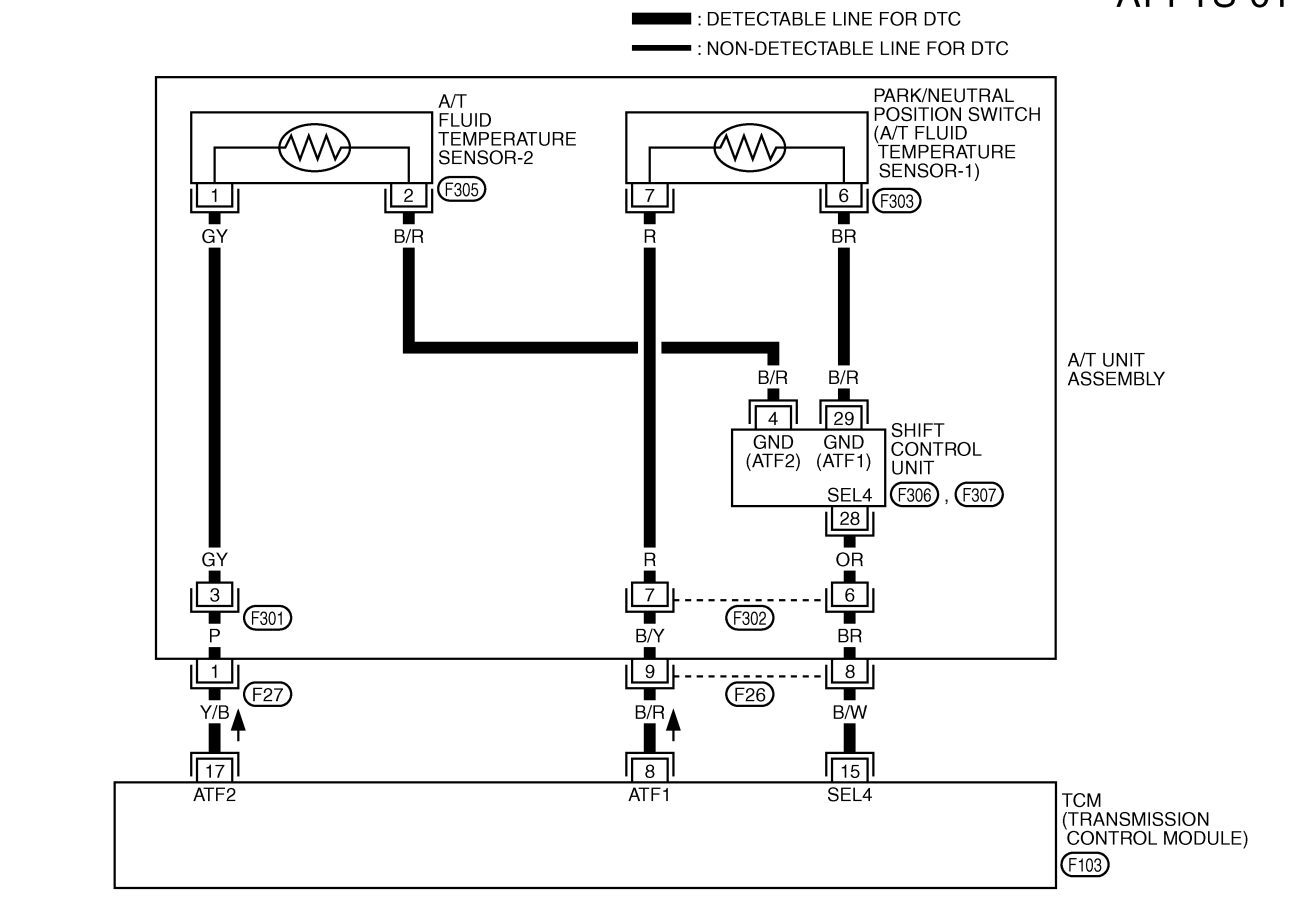
WITH GST

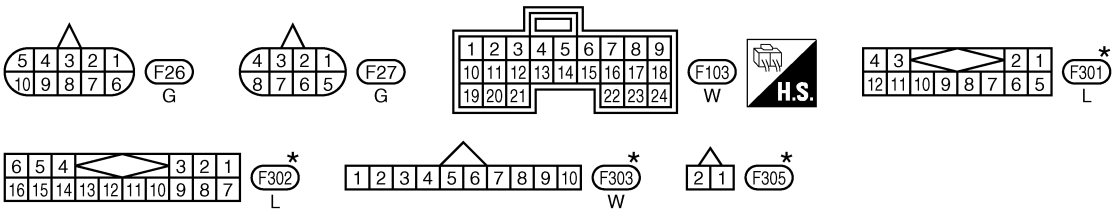
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — FTS

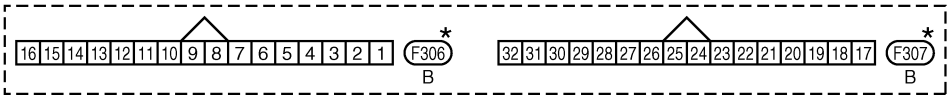
ECS0029P

AT-FTS-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.



TCWM0011E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
8	B/R	Fluid temperature sensor 1	IGN ON	When ATF temperature 0°C (32°F)	3.3V
				When ATF temperature 20°C (68°F)	2.7V
				When ATF temperature 80°C (176°F)	0.9V
15	B/W	SEL4	–	–	–
17	Y/B	Fluid temperature sensor 2	IGN ON	When ATF temperature about 0°C (32°F)	3.3V
				When ATF temperature about 20°C (68°F)	2.5V
				When ATF temperature about 80°C (176°F)	0.7V

Diagnostic Procedure

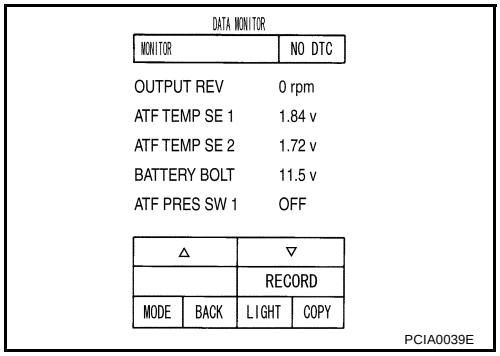
ECS002H9

1. CHECK FLUID TEMPERATURE SENSOR (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out the value of “FLUID TEMP SE”.

Item name	Condition °C (°F)	Display value (Approx.) V
Fluid temperature sensor 1	0(32) - 20(68) - 80(176)	3.3 - 2.7 - 0.9
Fluid temperature sensor 2		3.3 - 2.5 - 0.7



OK or NG?

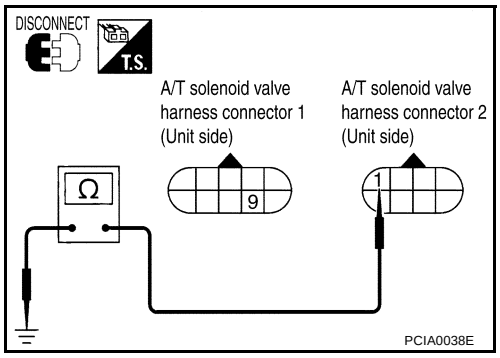
OK >> GO TO 4.
NG >> Check the following items.

- Refer to AT-122, "Component Inspection" .

2. CHECK FLUID TEMPERATURE SENSOR (WITHOUT CONSULT-II)

Without CONSULT-II

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 1, 2 at the transmission right side.
3. Check the resistance between terminal and ground.



Name	Connector No.	Terminal No.	Temperature °C (°F)	Resistance (KΩ) (Approx.)
Fluid temperature sensor 1	F26 A/T solenoid valve harness connector 1	9 - Ground	0 (32)	15
			20 (68)	6.5
			80 (176)	0.9
Fluid temperature sensor 2	F27 A/T solenoid valve harness connector 2	1 - Ground	0 (32)	10.5
			20 (68)	4.3
			80 (176)	0.5

4. Reinstall any part removed.

OK or NG?

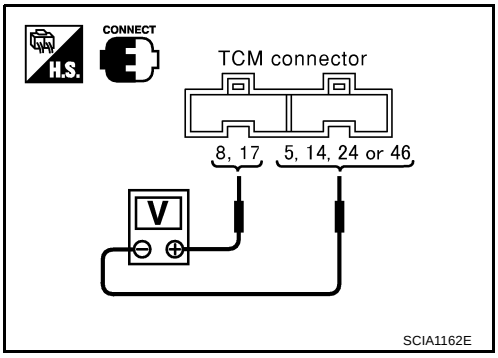
OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. INPUT SIGNALS FROM THE OIL TEMPERATURE SENSOR (WITHOUT CONSULT-II)

Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector and ground while warming up A/T. Refer to AT-119, "Wiring Diagram — AT — FTS" .

Name	Connector No.	Terminal No.	Temperature °C(°F)	Voltage (V) (Approx.)
Fluid temperature sensor 1	F103	8 - 5, 14, 24 or 46 (ground)	0 (32)	3.3V
			20 (68)	2.7V
			80 (176)	0.9V
Fluid temperature sensor 2		17 - 5, 14, 24 or 46 (ground)	0 (32)	3.3V
			20 (68)	2.5V
			80 (176)	0.7V



3. Turn ignition switch to “OFF” position.
4. Disconnect the TCM connector.
5. Check if there is continuity between the connector terminal and ground.

OK or NG?

OK >> GO TO 4.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short to ground or short to power or open between TCM and A/T solenoid valve harness connector 1, 2 (Main harness).

OK or NG

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

5. CHECK DTC

Check again.

- Refer to AT-118, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG

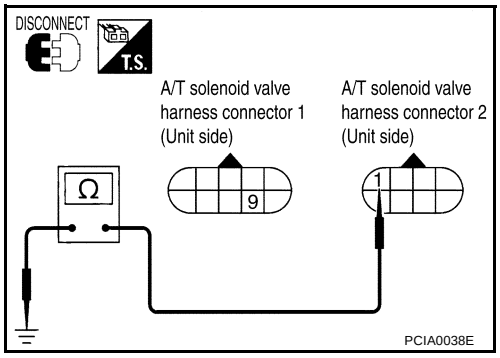
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Component Inspection

ECS002HA

FLUID TEMPERATURE SENSOR

Name	Connector No.	Terminal No.	Temperature °C (°F)	Resistance (KΩ) (Approx.)
Fluid temperature sensor 1	F26 A/T solenoid valve harness connector 1	9 - Ground	0 (32)	15
			20 (68)	6.5
			80 (176)	0.9
Fluid temperature sensor 2	F27 A/T solenoid valve harness connector 2	1 - Ground	0 (32)	10.5
			20 (68)	4.3
			80 (176)	0.5



DTC P1716 TURBINE REVOLUTION SENSOR

PFP:31935

Description

ECS002CM

The turbine revolution sensor detects input shaft rpm (revolutions per minute). It is located on the input side of the automatic transmission. Display revolution of sensor 1 and sensor 2 abnormality.

On Board Diagnosis Logic

ECS0029V

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TURBINE REV S/CIRC” with CONSULT-II or P1716 without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.
- Detects abnormality only at position of 4th gear for turbine revolution sensor 2.

Possible Cause

ECS0029W

Check the following items.

- Harness or connectors
  (The sensor circuit is open or shorted.)
- Turbine revolution sensor

DTC Confirmation Procedure

ECS0029X

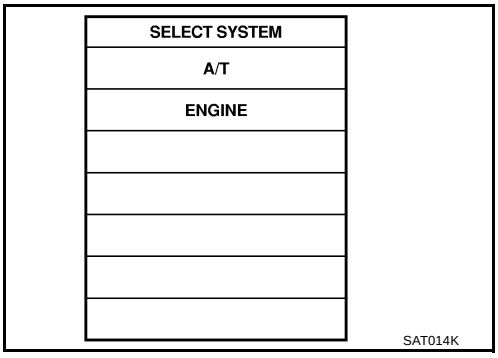
CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 40 km/h (25 MPH) or more
   ENGINE SPEED: 1,500 rpm or more
   Selector lever: “D” position

Items	Gear position
Turbine revolution sensor 1	All
Turbine revolution sensor 2	4th or 5th



Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

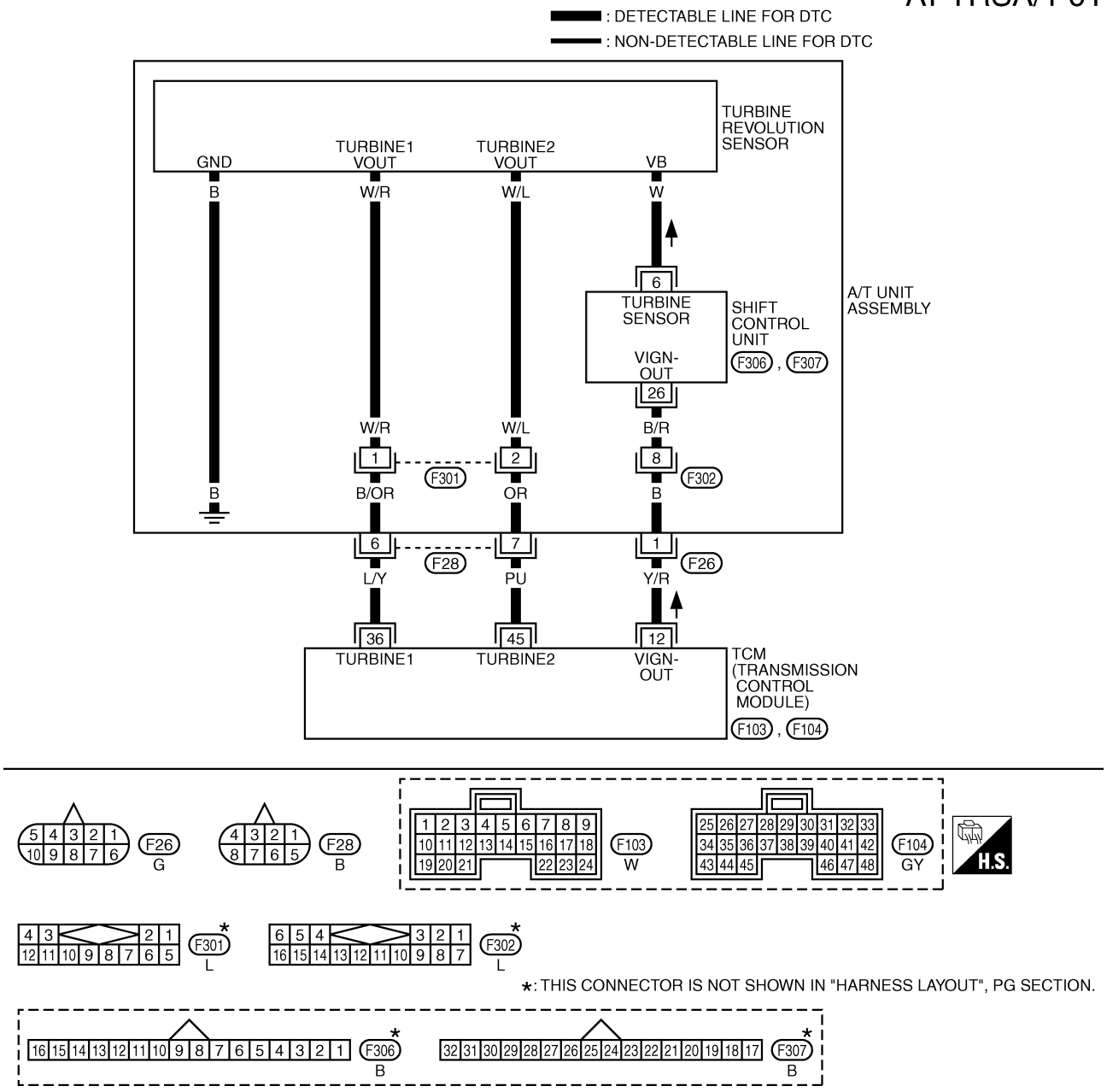
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — TRSA/T

ECS002CN

AT-TRSA/T-01



TCWM0012E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
12	Y/R	Power supply (out)	IGN ON	-	Battery voltage
			IGN OFF	-	0V

Terminal No.	Wire color	Item	Condition		Data (Approx.)
36	L/Y	Turbine revolution sensor 1	When vehicle starts	When moving at 20 km/h (12MPH) in 1st speed with the closed throttle position switch “OFF”, use the CONSULT-I pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	1.1 (kHz)
45	PU	Turbine revolution sensor 2		When running at 50 km/h (31MPH) in 4th speed with the closed throttle position switch “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	

Diagnostic Procedure

ECS002O8

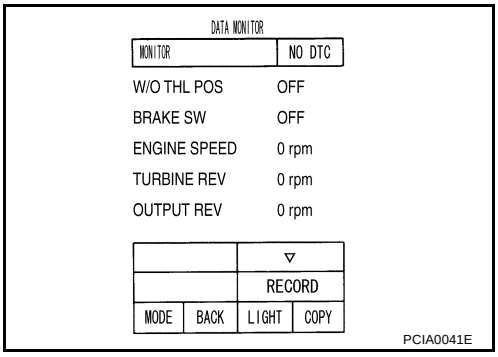
1. CHECK INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Vehicle start and read out the value of “TURBINE REV”.

OK or NG?

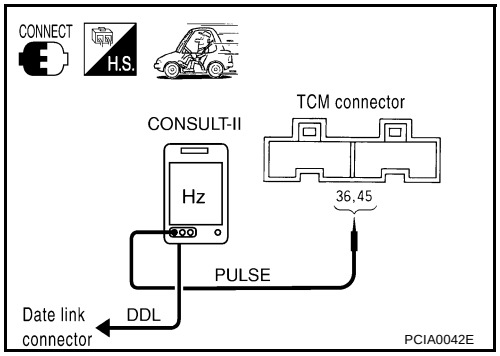
OK >> GO TO 3.
NG >> GO TO 2.



2. CHECK TURBINE REVOLUTION SENSOR (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch to “OFF” position.
2. Start engine.
3. Check the frequency.



Name	Condition
Turbine revolution sensor 1	When moving at 20 km/h (12MPH) in 1st speed with the closed throttle position switch “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**
Turbine revolution sensor 2	When running at 50 km/h (31MPH) in 4th speed with the closed throttle position switch “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**

Item	Connector No.	Terminal No.	Name	Data (Approx.)
TCM	F104	36	Turbine revolution sensor 1	1.1 (kHz)
		45	Turbine revolution sensor 2	

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-123, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1721 VEHICLE SPEED SENSOR MTR

PFP:24814

Description

ECS002A2

The vehicle speed sensor·MTR is built into the speedometer assembly. The sensor functions as an auxiliary device to the revolution sensor when it is malfunctioning. The TCM will then use a signal sent from the vehicle speed sensor·MTR.

On Board Diagnosis Logic

ECS002A3

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “VHE SPD SE·MTR” with CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.

Possible Cause

ECS002A4

Check the following items.

- Harness or connectors
  (The sensor circuit is open or shorted.)
- Vehicle speed sensor

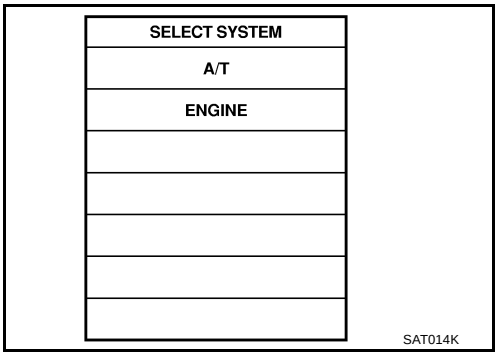
DTC Confirmation Procedure

ECS002A5

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1/8 or less
   VHCL SPEED SE: 30 km/h (17 MPH) or more



Diagnostic Procedure

ECS002HB

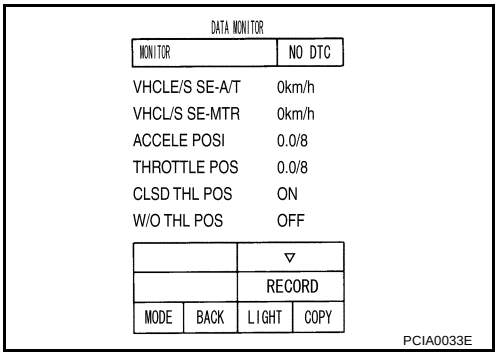
1. CHECK INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Vehicle start and read out the value of “VHCL/S SE·MTR”.

OK or NG?

OK >> GO TO 3.
NG >> GO TO 2.



2. CHECK DTC STEP 1

Check following items.

1. Refer to AT-79, "DTC U1000 CAN COMMUNICATION LINE" .
2. Refer to BRC-30, "Functions of CONSULT-II" .
3. Refer to DI-5, "COMBINATION METERS" .

OK or NG?

OK >> INSPECTION END
NG >> If NG, recheck pin terminals for damage or loose connection with harness connector.

3. CHECK DTC STEP 2

Perform DTC confirmation procedure. AT-127, "DTC Confirmation Procedure" .

OK or NG?

OK >> INSPECTION END
NG >> If NG, recheck pin terminals for damage or loose connection with harness connector.

DTC P1730 A/T INTERLOCK

PFP:00000

Description

ECS0017C

- Fail-safe function to detect interlock conditions.
- Fail-safe function to the transmission range switch detects the selector position and sends a signal to the TCM.

On Board Diagnosis Logic

ECS001YH

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T INTERLOCK” with CONSULT-II or P1730 without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor and switch.
- Monitors and compares gear position and conditions of each pressure switch when gear is steady.

Possible Cause

ECS001YI

Check the following items.

- Harness or connectors
  (The solenoid and switch circuit is open or shorted.)
- Low coast brake solenoid valve
- Pressure switch 2

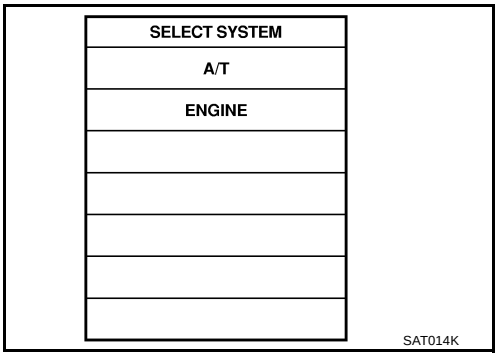
DTC Confirmation Procedure

ECS001YJ

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 2 consecutive seconds.
   Selector lever: “D” position
4. If DTC is detected, go to AT-133, "Diagnostic Procedure" .



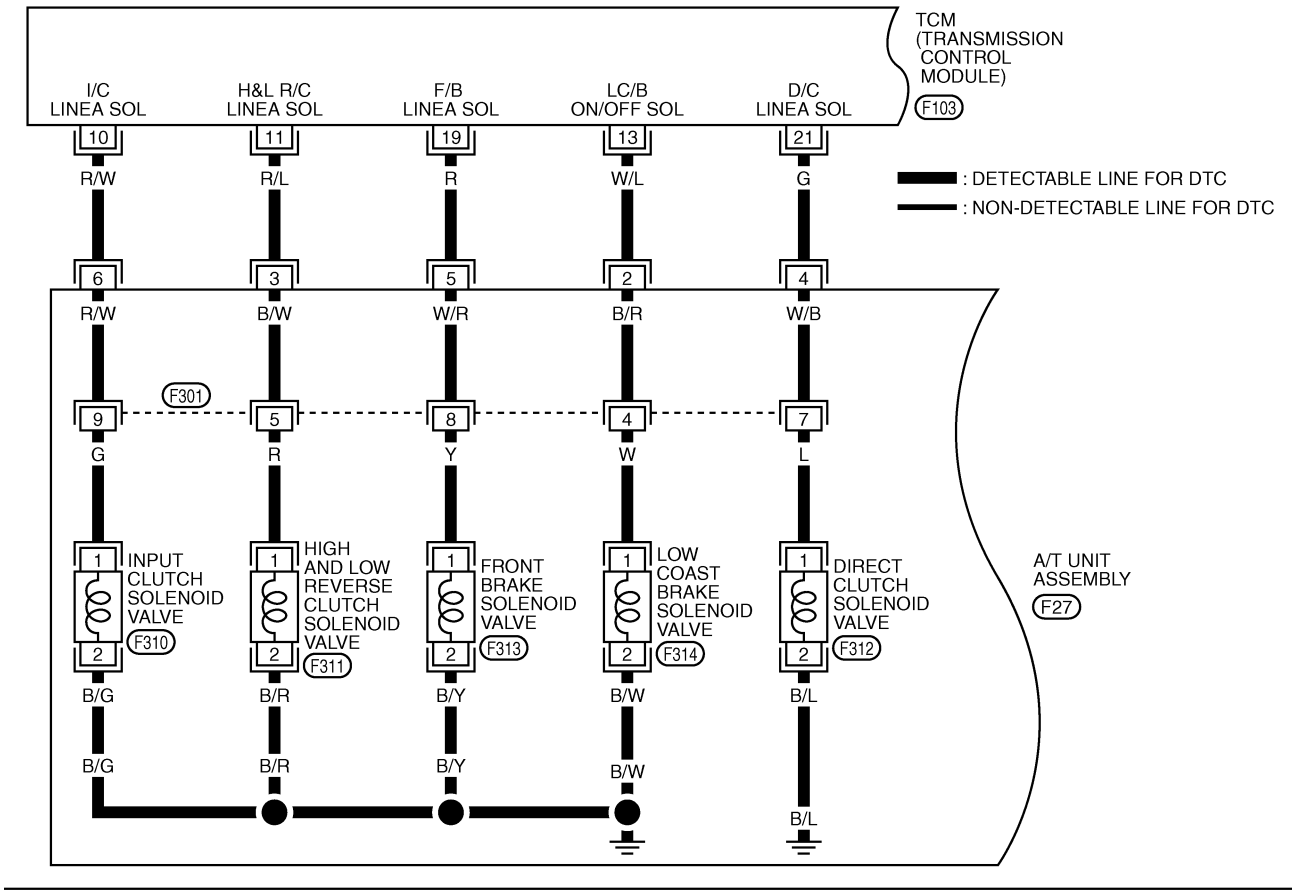
WITH GST

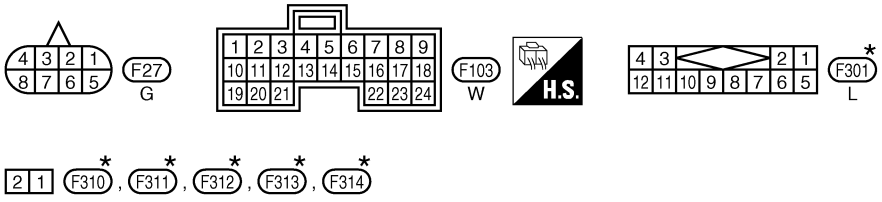
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — I/LOCK

ECS0017D

AT-I/LOCK-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

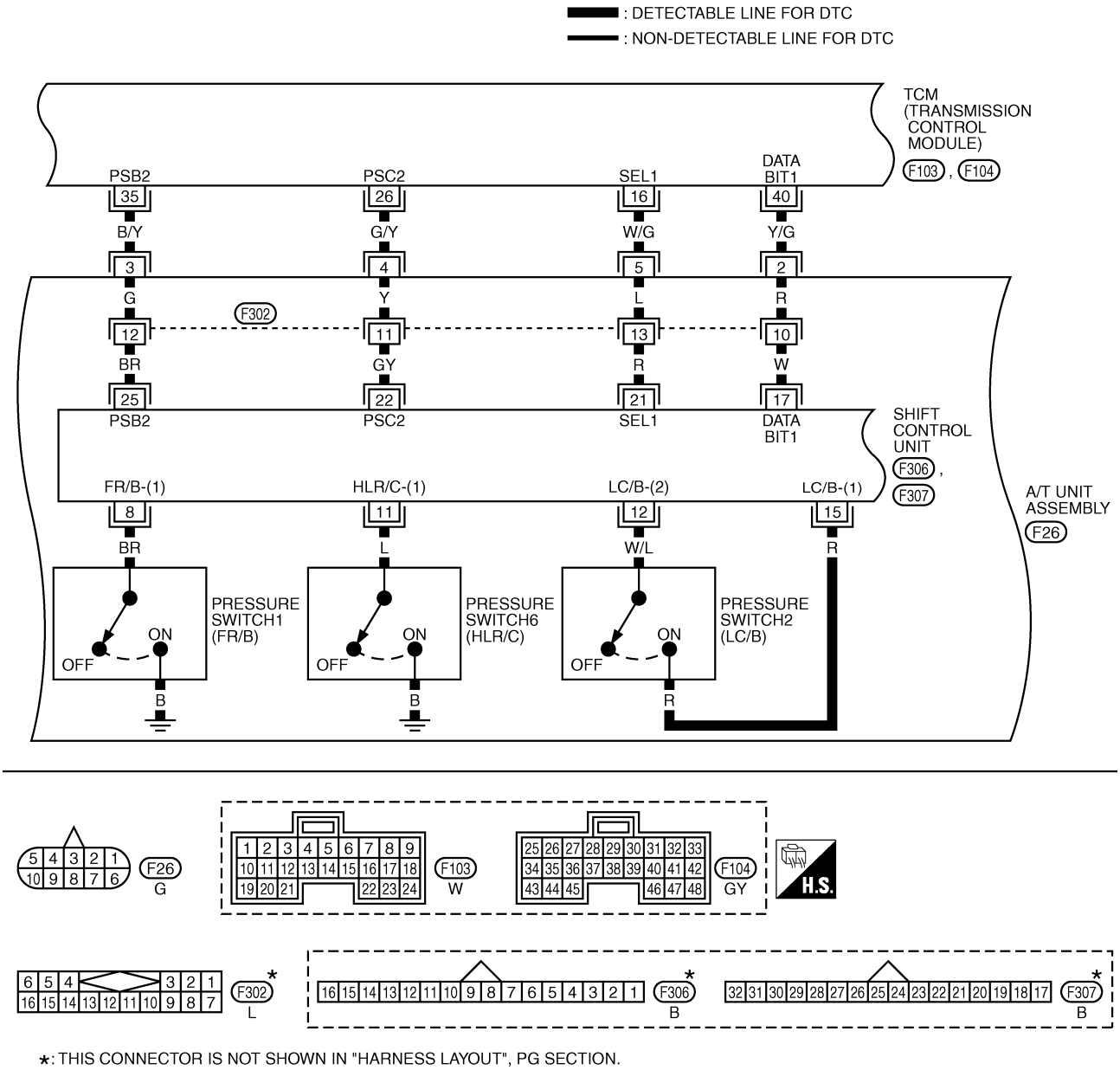
TCWM0013E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
10	R/W	Input clutch solenoid valve	When vehicle starts	When the solenoid valve operating (in 1st speed, 2nd speed, or 3rd speed)	2V min.
				When the solenoid valve is not operating (4th speed or 5th speed)	0V
11	R/L	High & low reverse clutch solenoid valve		When the solenoid valve operating {6 km/h (4MPH) or faster in 1st speed or 2nd speed}	2V min.
				When the solenoid valve is not operating {6 km/h (4MPH) or slower in 1st speed or 3rd, 4th, or 5th speed}	0V

Terminal No.	Wire color	Item	Condition		Data (Approx.)
13	W/L	Low coast brake solenoid valve	When vehicle starts	When the solenoid valve is operating (when running in M1-1 speed or M2-2 speed)	Battery voltage
				When the solenoid valve is not operating (when running in “D”)	0V
19	R	Front brake solenoid valve		When the solenoid valve is operating (other than 4th speed)	2V min.
				When the solenoid valve is not operating (4th speed)	0V
21	G	Direct clutch solenoid valve		When the solenoid valve is operating (1st speed or 5th speed)	0V
				When the solenoid valve is not operating (2nd speed, 3rd speed, or 4th speed)	0V

AT-I/LOCK-02

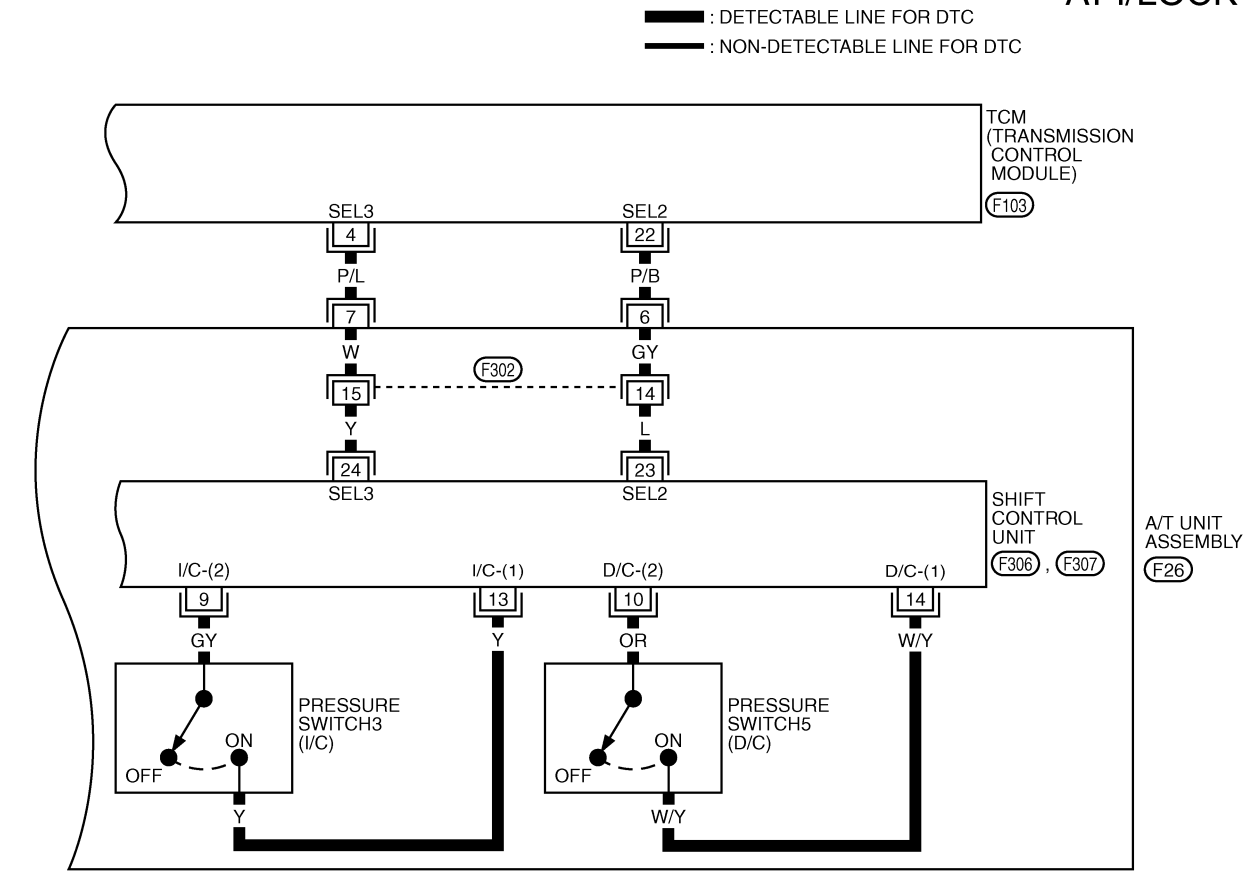


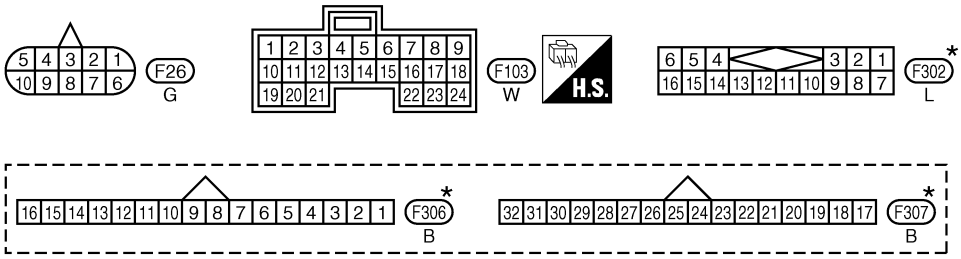
TCWM0014E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
16	W/G	SEL1 (pressure switches 2, 3, 5)	–	–	–
26	G/Y	PSC2 (pressure switch 6)	When running	When high & low reverse clutch solenoid valve “ON”.	0V
				When high & low reverse clutch solenoid valve “OFF”.	Battery voltage
35	B/Y	PSB2 (pressure switch 1)	When running	When front brake solenoid valve “OFF”.	Battery voltage
				When front brake solenoid valve“ ON”.	0V
40	Y/G	DATA BIT1	–	–	–

AT-I/LOCK-03





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0015E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
4	P/L	SEL3 (pressure switches 2, 3, 5)	–	–	–
22	P/B	SEL2	–	–	–

Judgement of A/T Interlock

ECS002HD

When A/T Interlock is judged to be abnormal, the vehicle should be fixed in 2nd gear, and should be set in a condition in which it can travel.
When one of the following fastening patterns is detected, the fail-safe function in correspondence with the individual pattern should be executed.

A/T INTERLOCK COUPLING PATTERN TABLE

●: NG, X:OK

Gear position		Hydraulic pressure switch output					Fail-safe function	Clutch pressure output pattern after fail-safe function					
		SW3 (I/C)	SW6 (H&LR/C)	SW5 (D/C)	SW1 (Fr/B)	SW2 (LC/B)		I/C	H&LR/C	D/C	Fr/B	LC/B	L/U
A/T interlock coupling pattern	3rd		X	X		●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
	4th		X	X		●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
	5th	X	X		X	●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF

Diagnostic Procedure

ECS002HE

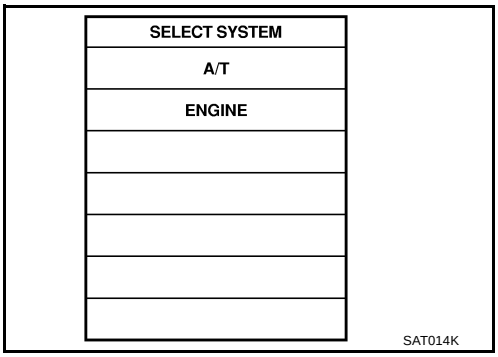
1. SELF-DIAGNOSIS (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Drive the vehicle.

OK or NG?

OK >> GO TO 2.
NG >> ● Check each solenoid valves, Refer to AT-162, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" , AT-165, "DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION" .



2. CHECK DTC

Check again.

- Refer to AT-129, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1731 A/T 1ST ENGINE BRAKING

PFP:00000

Description

ECS002AC

Fail-safe function to prevent sudden decrease in speed by engine brake other than at 1st position or at 1st gear.

On Board Diagnosis Logic

ECS002AE

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 1ST E/BRAKING” with CONSULT-II or 13th judgement flicker without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.
- Monitors each pressure switch and solenoid monitor value, and detects as abnormal when engine brake acts other than at 1st position.

Possible Cause

ECS002AF

Check the following items.

- Harness or connectors
  (The sensor circuit is open or shorted.)
- Low coast brake solenoid valve
- Pressure switch 2

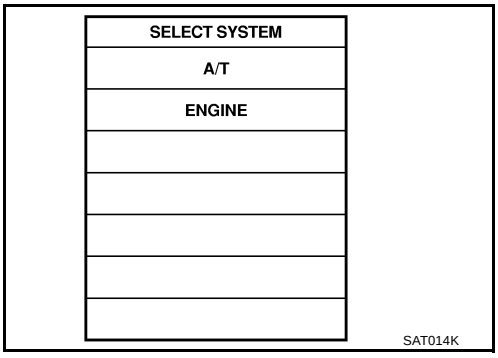
DTC Confirmation Procedure

ECS002AG

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

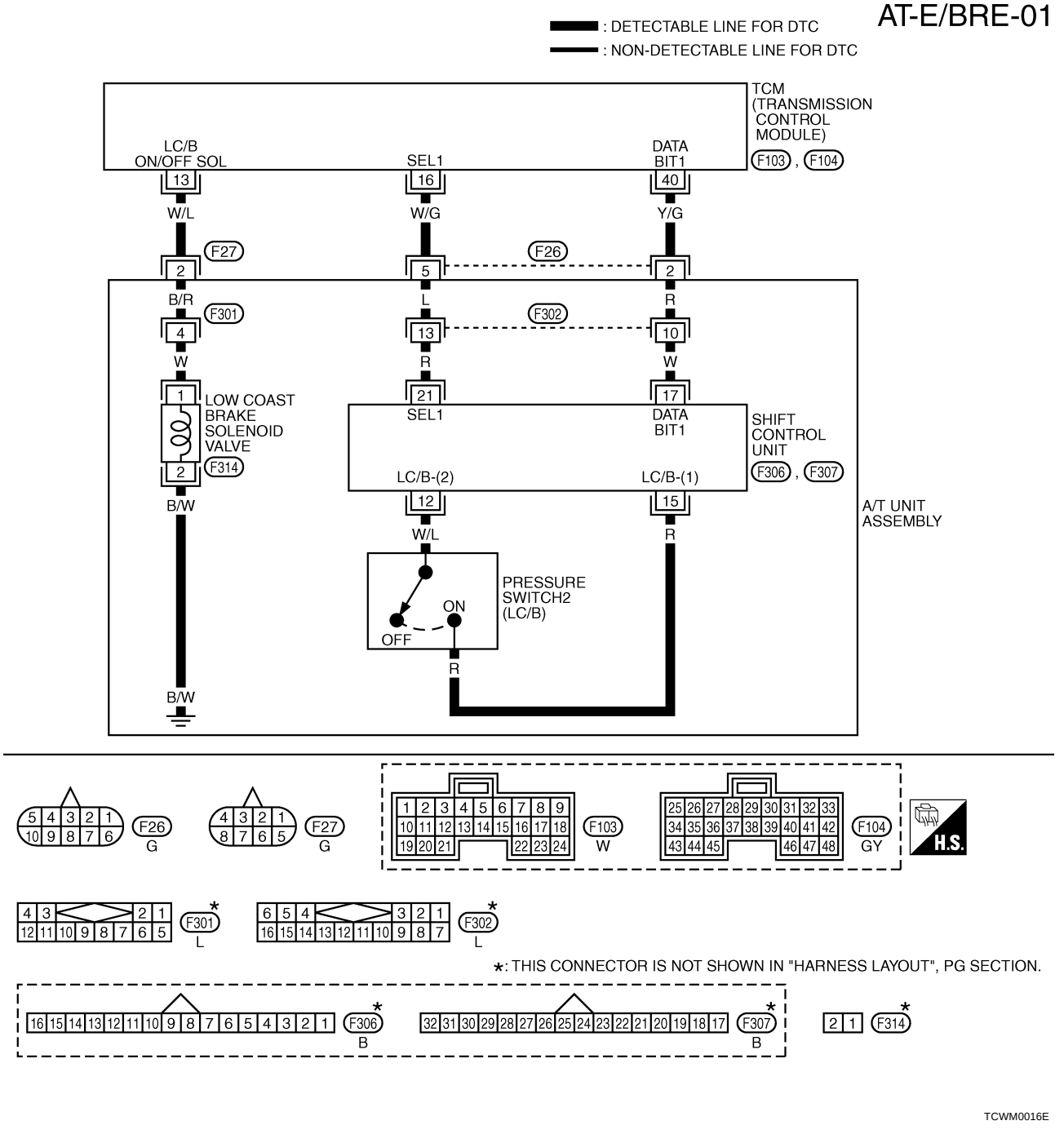
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 2 consecutive seconds.
   ENGINE SPEED: 1,200 rpm
   Selector lever: “D” position
4. If DTC is detected, go to AT-137, "Diagnostic Procedure" .



Wiring Diagram — AT — E/BRE

ECS002AH

AT-E/BRE-01



TCWM0016E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
13	W/L	Low coast brake solenoid valve	When vehicle starts	When the solenoid valve is operating (when running in M1-1 speed or M2-2 speed)	Battery voltage
				When the solenoid valve is not operating (when running in “D”)	0V
16	W/G	SEL1 (pressure switches 2, 3, 5)	–	–	–
40	Y/G	DATA BIT1	–	–	–

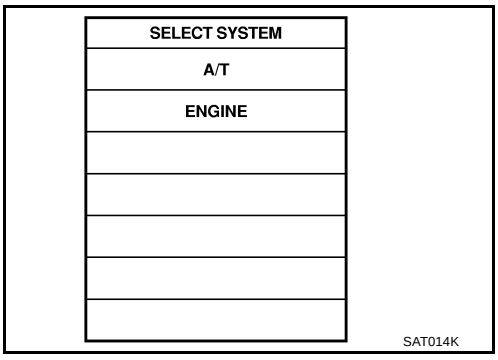
Diagnostic Procedure

ECS002HG

1. CHECK SELF-DIAGNOSIS (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch to “ON” position.
2. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Drive the vehicle.



OK or NG?

OK >> GO TO 3.

NG >>
- Check the pressure switch. Refer to AT-172, "DTC P1841 ATF PRESSURE SWITCH 1" , AT-175, "DTC P1843 ATF PRESSURE SWITCH 3" , AT-178, "DTC P1845 ATF PRESSURE SWITCH 5" , AT-181, "DTC P1846 ATF PRESSURE SWITCH 6" .
- Check the low coast brake solenoid. Refer to AT-162, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" .

2. CHECK SELF-DIAGNOSIS (WITHOUT CONSULT-II)

No Tools

1. Turn ignition switch to “ON” position.
2. Perform self-diagnosis. Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .
3. Drive the vehicle.

OK or NG?

OK >> GO TO 3.

NG >>
- Check the pressure switch. Refer to AT-172, "DTC P1841 ATF PRESSURE SWITCH 1" , AT-175, "DTC P1843 ATF PRESSURE SWITCH 3" , AT-178, "DTC P1845 ATF PRESSURE SWITCH 5" , AT-181, "DTC P1846 ATF PRESSURE SWITCH 6" .
- Check the low coast brake solenoid. Refer to AT-162, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE" .

3. CHECK DTC

Check again.

- Refer to AT-135, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1752 INPUT CLUTCH SOLENOID VALVE

PFP:31940

Description

ECS0017K

Input clutch solenoid valve operation by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.

On Board Diagnosis Logic

ECS002ET

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “I/C SOLENOID/CIRC” with CONSULT-II or P1752 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

ECS002EI

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Input clutch solenoid valve

DTC Confirmation Procedure

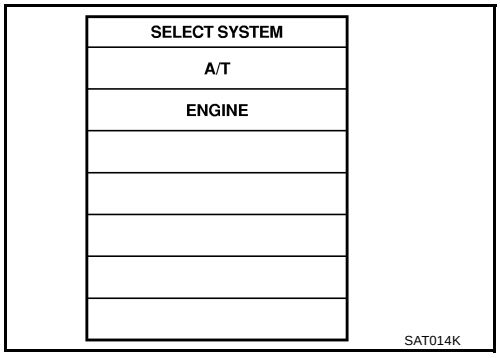
ECS002EJ

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected go to “AT-140, "Diagnostic Procedure" .



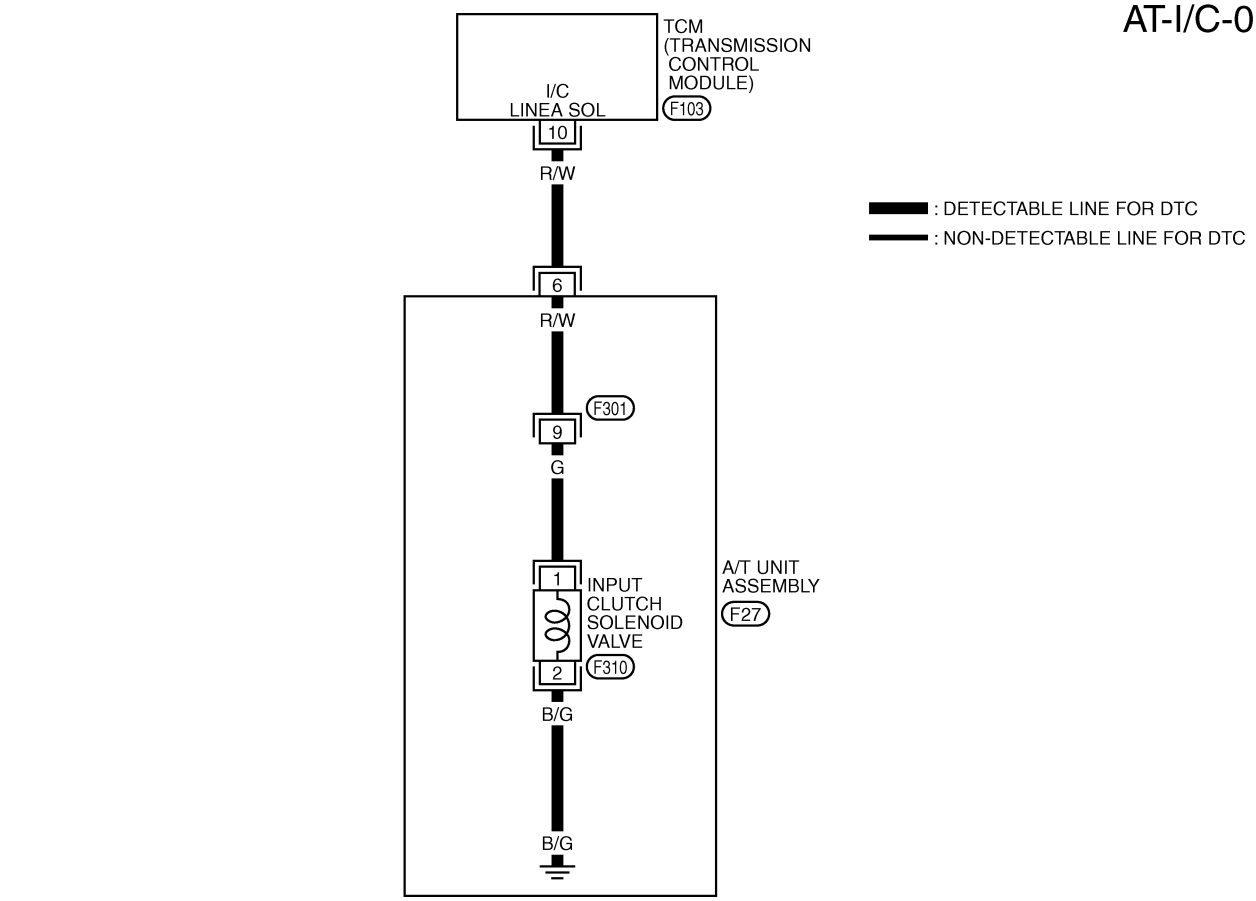
WITH GST

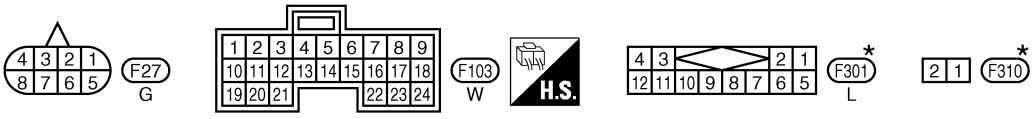
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — I/C

ECS0017L

AT-I/C-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0017E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

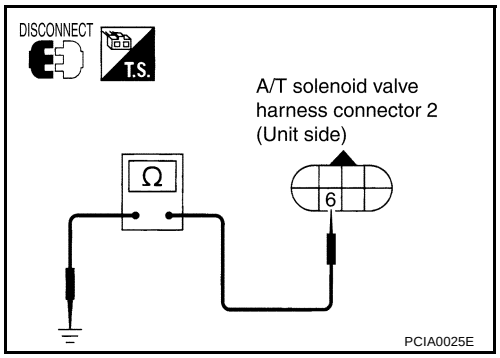
Terminal No.	Wire color	Item	Condition		Data (Approx.)
10	R/W	Input clutch solenoid valve	When vehicle starts	When the solenoid valve operating (in 1st speed, 2nd speed, or 3rd speed)	More than 2V
				When the solenoid valve is not operating (4th speed or 5th speed)	0V

Diagnostic Procedure

ECS002OA

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



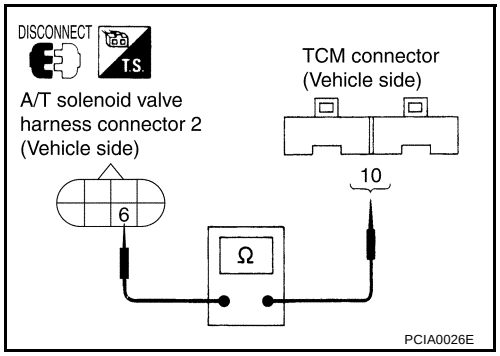
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Input Clutch Solenoid Valve	F27	6 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	10	Yes
A/T solenoid valve harness connector 2	F27	6	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-138, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1754 INPUT CLUTCH SOLENOID VALVE FUNCTION

PFP:31940

Description

ECS002CU

- Input clutch solenoid valve operation by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

ECS002EV

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- Diagnostic trouble code “I/C SOLENOID FNCTN” with CONSULT-II or P1754 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When condition of pressure switch 3 is different from monitor value, and relation between gear position and actual gear ratio is abnormal.

Possible Cause

ECS002EK

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Input clutch solenoid valve
- Pressure switch 3

DTC Confirmation Procedure

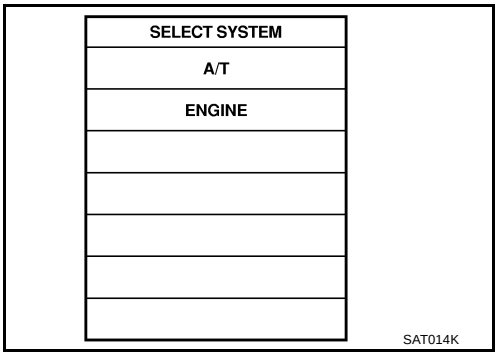
ECS002NF

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Select “I/C SOLENOID FNCTN CHECK” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
3. Accelerate vehicle to maintain the following condition continuously until “TESTING” has turned to “COMPLETE”. (It will take approximately 4 seconds after “TESTING” shows.)
   ACCLE POSI: 1.5/8 - 2.0/8 (at all times during step 4)
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.



4. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-143, "Diagnostic Procedure" .
   If DTC (P1752) is detected, go to AT-140, "Diagnostic Procedure" .
   If DTC (P1843) is detected, go to AT-177, "Diagnostic Procedure" .

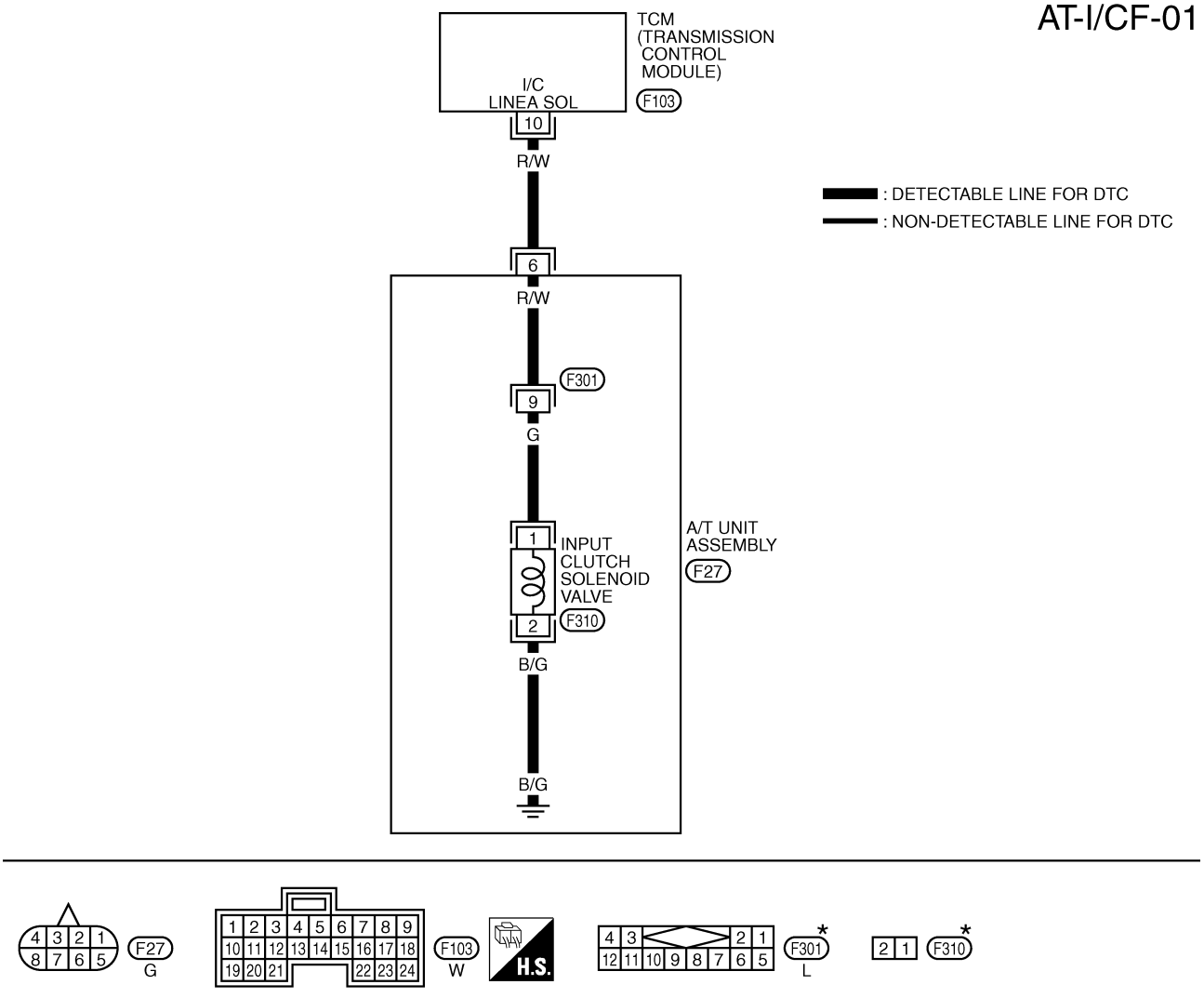
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — I/CF

ECS0017P

AT-I/CF-01



∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0018E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
10	R/W	Input clutch solenoid valve	When vehicle starts	When the solenoid valve operating (in 1st speed, 2nd speed, or 3rd speed)	More than 2V
				When the solenoid valve is not operating (4th speed or 5th speed)	0V

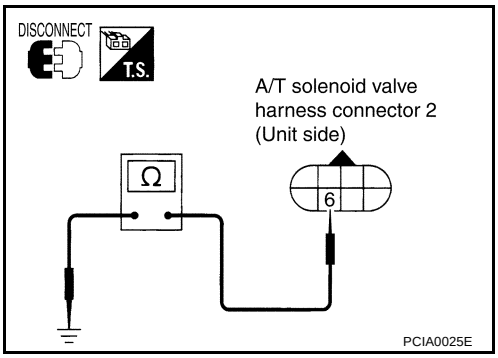
Diagnostic Procedure

ECS002HL

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.

Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Input clutch solenoid valve	F27	6 - Ground	3 - 9 Ω



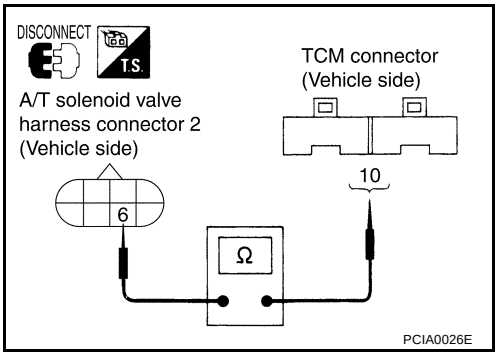
OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.

Item	Connector No.	Terminal No.	Continuity
TCM	F103	10	Yes
A/T solenoid valve harness connector 2	F27	6	



4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-141, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1757 FRONT BRAKE SOLENOID VALVE

PFP:31940

Description

ECS002CY

Front brake solenoid valve operation by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.

On Board Diagnosis Logic

ECS002EX

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “FR/B SOLENOID/CIRC” with CONSULT-II or P1757 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

ECS002EL

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Front brake solenoid valve

DTC Confirmation Procedure

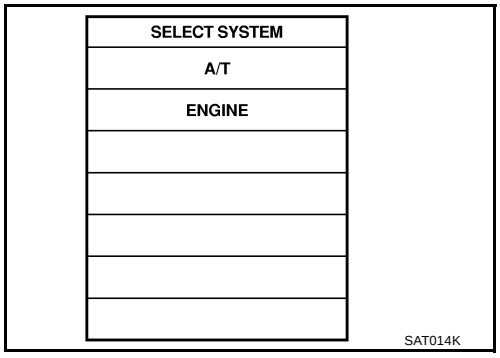
ECS001YV

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 3rd Gear (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected go to AT-146, "Diagnostic Procedure" .



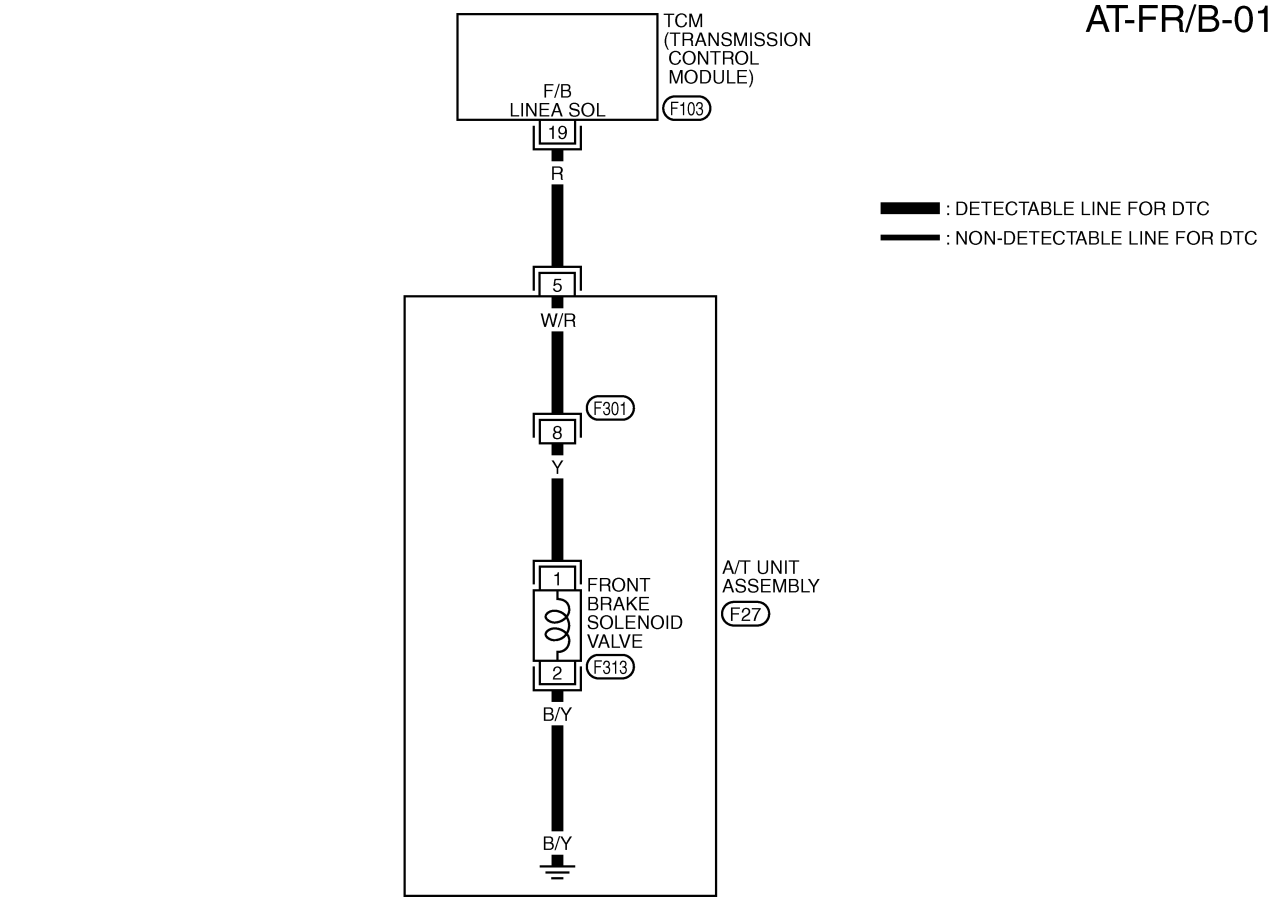
WITH GST

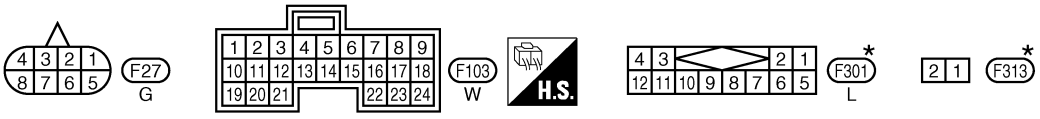
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — FR/B

ECS0017T

AT-FR/B-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0019E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

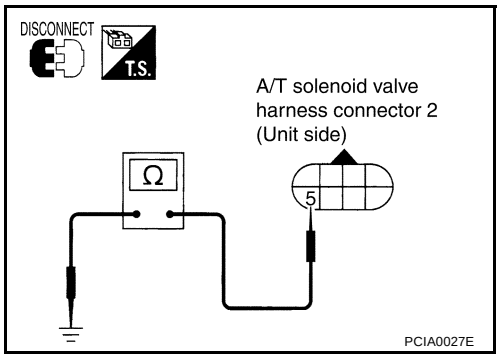
Terminal No.	Wire color	Item	Condition		Data (Approx.)
19	R	Front brake solenoid valve	When vehicle starts	When the solenoid valve is operating (other than 4th speed)	More than 2V
				When the solenoid valve is not operating (4th speed)	0V

Diagnostic Procedure

ECS002OC

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



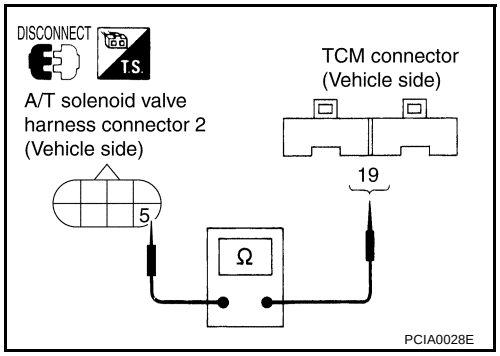
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Front brake solenoid valve	F27	5 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	19	Yes
A/T solenoid valve harness connector 2	F27	5	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-144, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1759 FRONT BRAKE SOLENOID VALVE FUNCTION

PFP:31940

Description

ECS002D2

- Front brake solenoid valve operation by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

ECS002EZ

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- Diagnostic trouble code “FR/B SOLENOID FNCT” with CONSULT-II or P1759 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When condition of pressure switch 1 is different from monitor value, and relation between gear position and actual gear ratio is abnormal.

Possible Cause

ECS002EM

Check the following items.

- Harness or connectors
  (The solenoid and switch circuit is open or shorted.)
- Front brake solenoid valve
- Pressure switch 1

DTC Confirmation Procedure

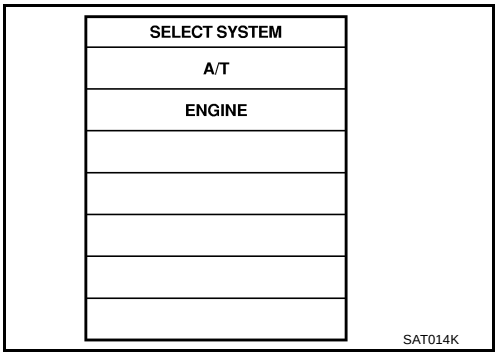
ECS002NG

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Select “FR/B SOLENOID FNCT CHECK” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
3. Accelerate vehicle to maintain the following condition continuously until “TESTING” has turned to “COMPLETE”. (It will take approximately 4 seconds after “TESTING” shows.)
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 3rd Gear (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.



4. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-149, "Diagnostic Procedure" .
   If DTC (P1757) is detected, go to AT-149, "Diagnostic Procedure" .
   If DTC (P1841) is detected, go to AT-174, "Diagnostic Procedure" .

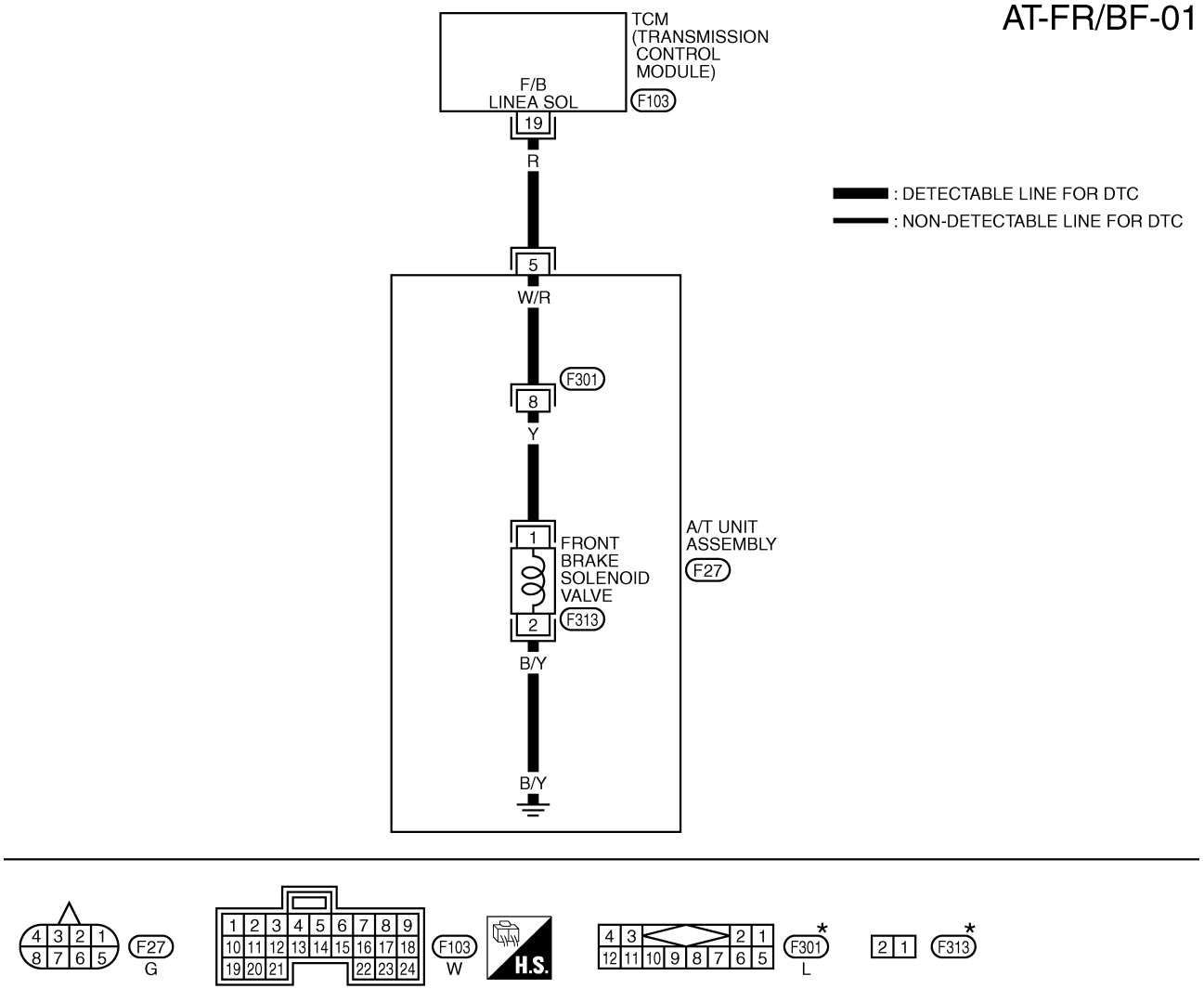
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — FR/BF

ECS0017X

AT-FR/BF-01



∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0020E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

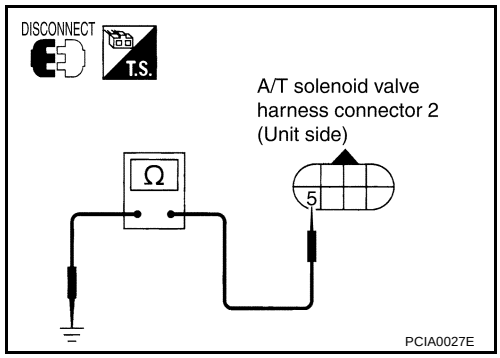
Terminal No.	Wire color	Item	Condition		Data (Approx.)
19	R	Front brake solenoid valve	When vehicle starts	When the solenoid valve is operating (other than 4th speed)	More than 2V
				When the solenoid valve is not operating (4th speed)	0V

Diagnostic Procedure

ECS002OM

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal 5 and ground.



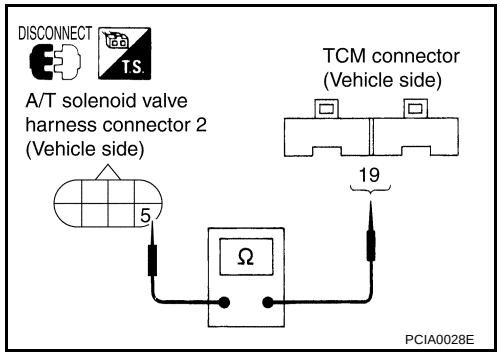
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Front brake solenoid valve	F27	5 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	19	Yes
A/T solenoid valve harness connector 2	F27	5	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-147, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1762 DIRECT CLUTCH SOLENOID VALVE

PFP:31940

Description

ECS002ON

Direct clutch solenoid valve operation by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.

On Board Diagnosis Logic

ECS002OO

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “D/C SOLENOID/CIRC” with CONSULT-II or P1762 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as irregular by comparing target value with monitor value.

Possible Cause

ECS002EN

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Direct clutch solenoid valve

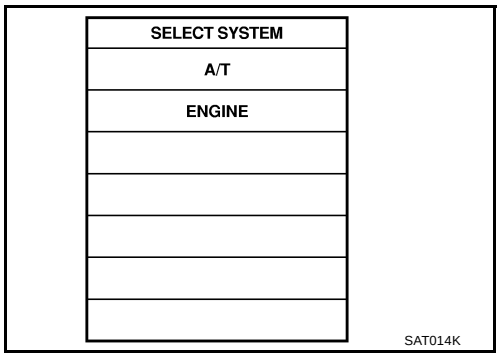
DTC Confirmation Procedure

ECS001Z1

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 2nd Gear (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected, go to AT-152, "Diagnostic Procedure" .



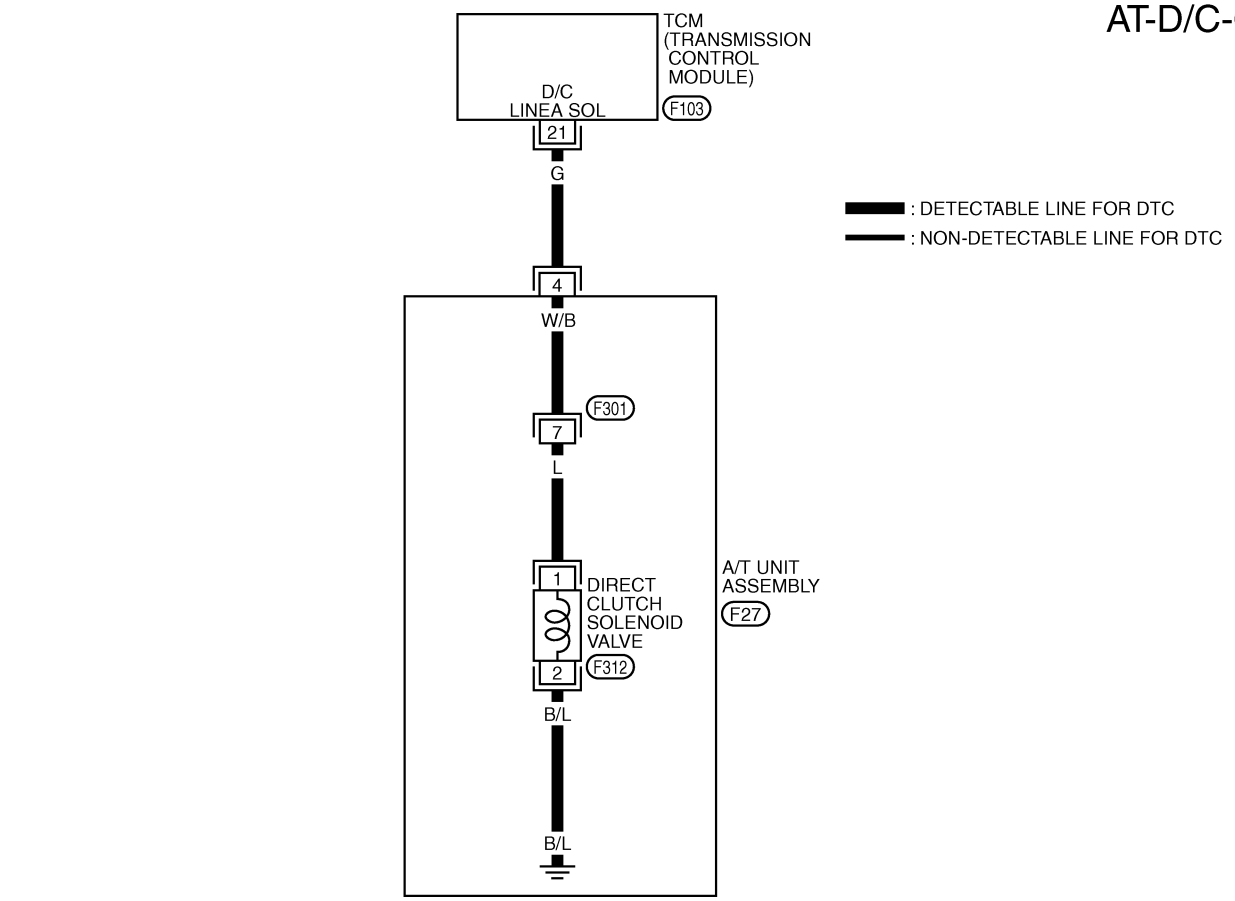
WITH GST

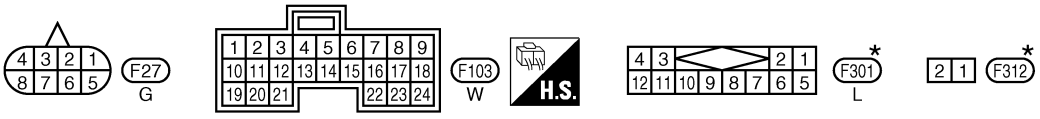
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — D/C

ECS00181

AT-D/C-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0021E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

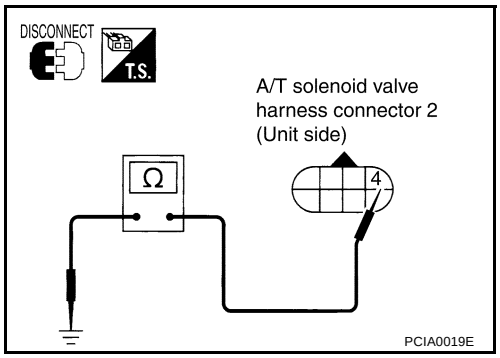
Terminal No.	Wire color	Item	Condition		Data (Approx.)
21	G	Direct clutch solenoid valve	When vehicle starts	When the solenoid valve is operating (1st speed or 5th speed)	More than 2V
				When the solenoid valve is not operating (2nd speed, 3rd speed, or 4th speed)	0V

Diagnostic Procedure

ECS002OD

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



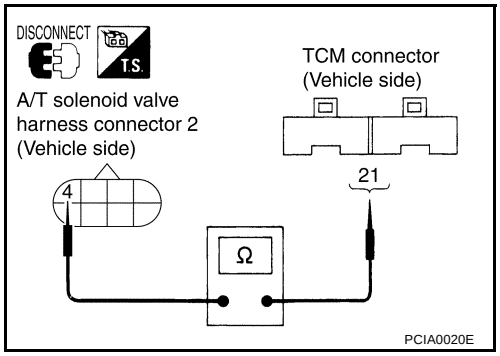
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Direct clutch solenoid valve	F27	4 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	21	Yes
A/T solenoid valve harness connector 2	F27	4	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-150, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1764 DIRECT CLUTCH SOLENOID VALVE FUNCTION

PFP:31940

Description

ECS002OP

- Direct clutch solenoid valve operation by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

ECS002OQ

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- Diagnostic trouble code “D/C SOLENOID FNCTN” with CONSULT-II or P1764 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When condition of pressure switch 1 is different from monitor value, and relation between gear position and actual gear ratio is abnormal.

Possible Cause

ECS002EO

Check the following items.

- Harness or connectors
  (The solenoid and switch circuit is open or shorted.)
- Direct clutch solenoid valve
- Pressure switch 5

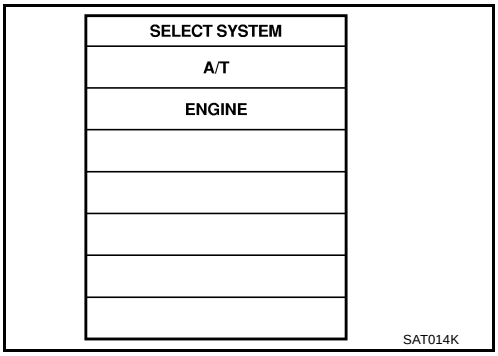
DTC Confirmation Procedure

ECS002NH

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Select “FR/B SOLENOID FNCT CHECK” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
3. Accelerate vehicle to maintain the following condition continuously until “TESTING” has turned to “COMPLETE”. (It will take approximately 4 seconds after “TESTING” shows.)
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 2nd Gear (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.



4. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDUR”).
   Refer to AT-155, "Diagnostic Procedure" .
   If DTC (P1762) is detected, go to AT-152, "Diagnostic Procedure" .
   If DTC (P1845) is detected, go to AT-180, "Diagnostic Procedure" .

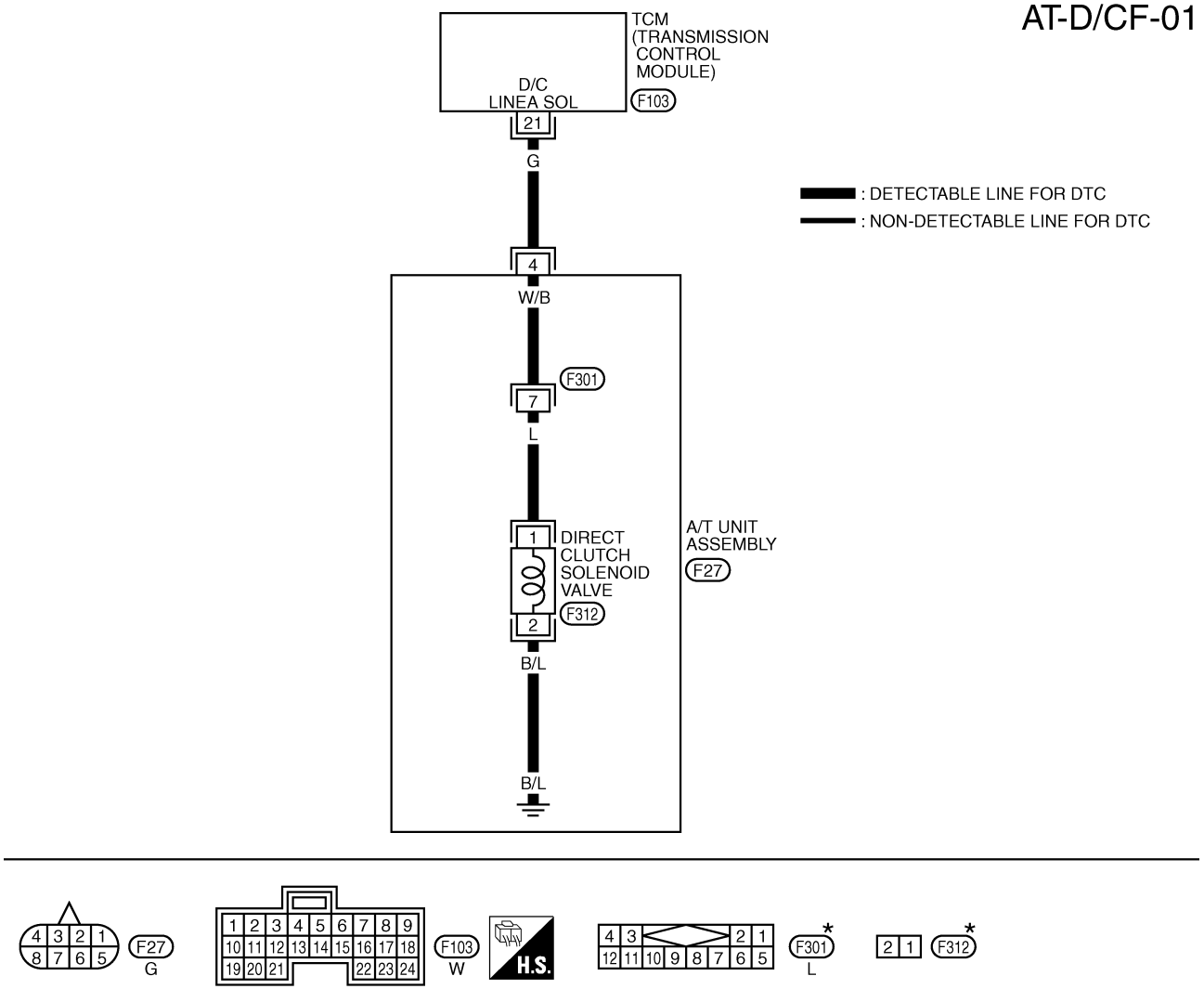
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — D/CF

ECS00185

AT-D/CF-01



∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0022E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

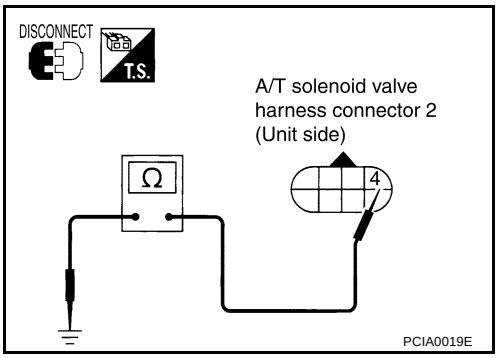
Terminal No.	Wire color	Item	Condition		Data (Approx.)
21	G	Direct clutch solenoid valve	When vehicle starts	When the solenoid valve is operating (1st speed or 5th speed)	More than 2V
				When the solenoid valve is not operating (2nd speed, 3rd speed, or 4th speed)	0V

Diagnostic Procedure

ECS002OE

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



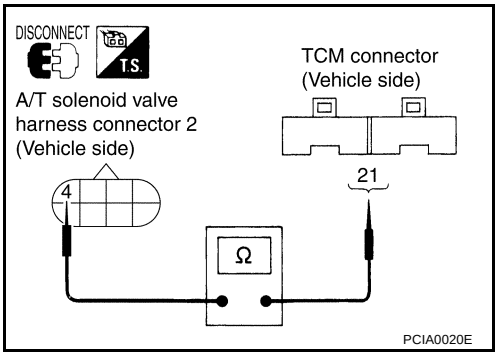
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Direct clutch solenoid valve	F27	4 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	21	Yes
A/T solenoid valve harness connector 2	F27	4	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-153, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE

PFP:31940

Description

ECS002OR

High & low reverse clutch solenoid valve operation by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.

On Board Diagnosis Logic

ECS002OS

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “HLR/C SOL/CIRC” with CONSULT-II or P1767 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as irregular by comparing target value with monitor value.

Possible Cause

ECS002EP

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- High & low reverse clutch solenoid valve

DTC Confirmation Procedure

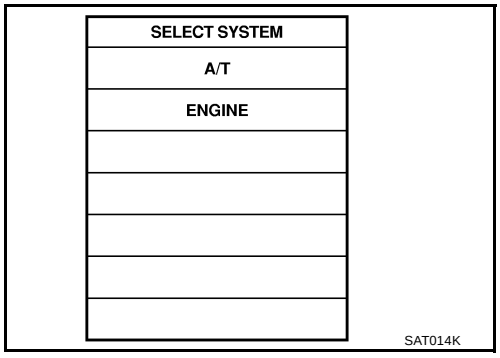
ECS001Z8

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 3rd Gear (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected, go to AT-158, "Diagnostic Procedure" .



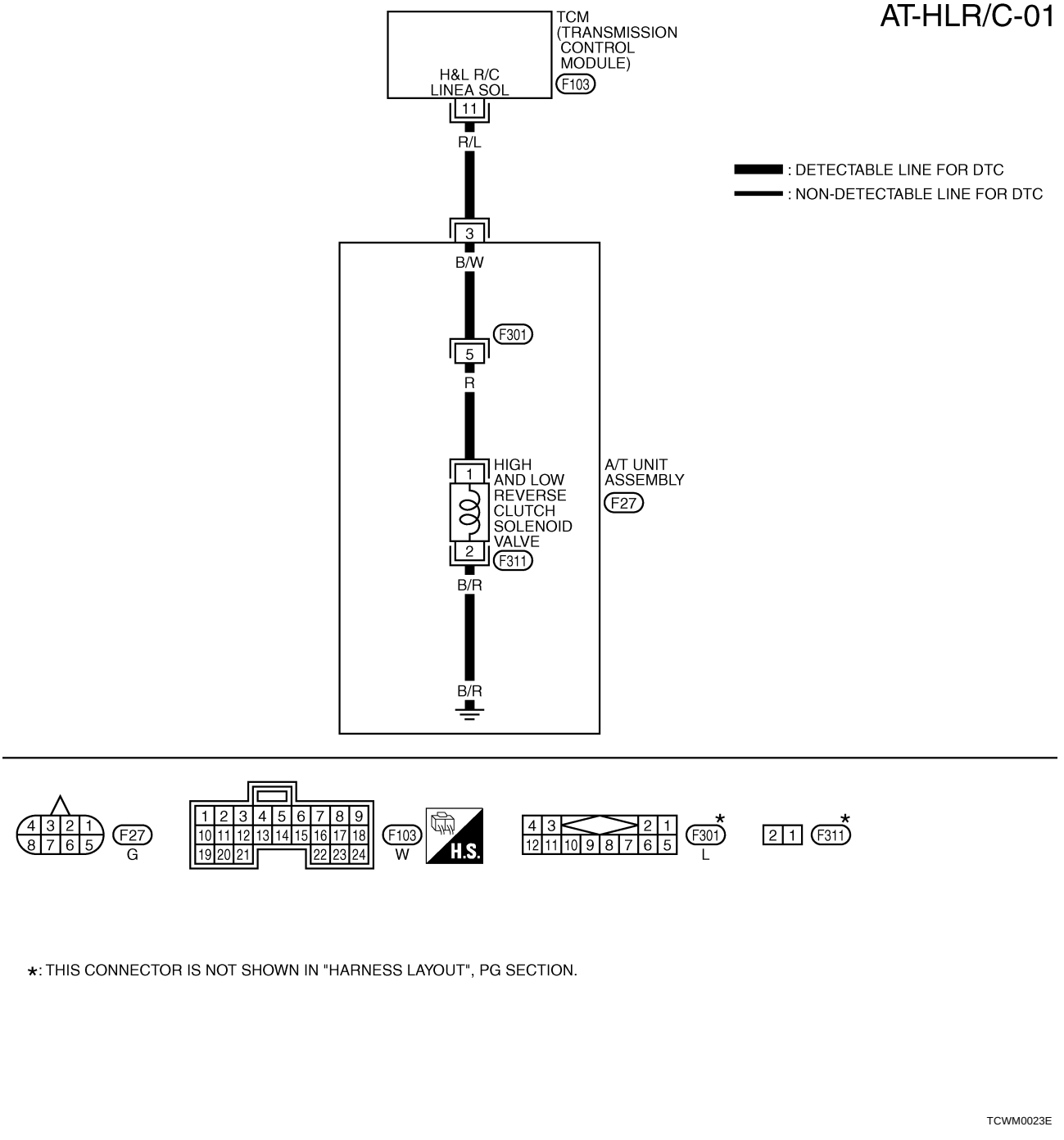
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — HLR/C

ECS0018A

AT-HLR/C-01



*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0023E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

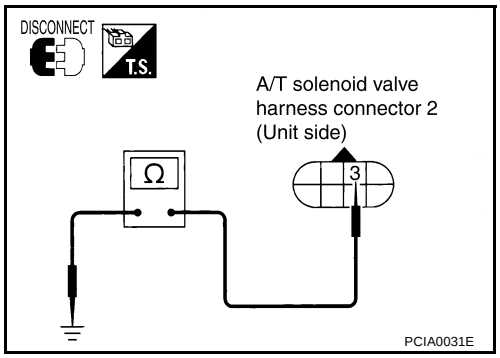
Terminal No.	Wire color	Item	Condition		Data (Approx.)
11	R/L	High & low reverse clutch solenoid valve	When vehicle starts	When the solenoid valve operating [6 km/h (4MPH) or faster in 1st speed or 2nd speed]	More than 2V
				When the solenoid valve is not operating [6 km/h (4MPH) or slower in 1st speed or 3rd, 4th, or 5th speed]	0V

Diagnostic Procedure

ECS002OF

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



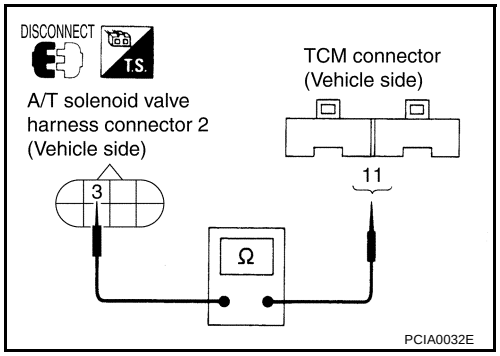
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
High & low reverse clutch solenoid valve	F27	3 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	11	Yes
A/T solenoid valve harness connector 2	F27	3	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-156, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1769 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE FUNCTION

PFP:31940

Description

ECS002OT

- High & low reverse clutch solenoid valve operation by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

ECS002OU

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- Diagnostic trouble code “HLR/C SOL FNCTN” with CONSULT-II or P1764 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When condition of pressure switch 1 is different from monitor value, and relation between gear position and actual gear ratio is abnormal.

Possible Cause

ECS002EQ

Check the following items.

- Harness or connectors
  (The solenoid and switch circuit is open or shorted.)
- High & low reverse clutch solenoid valve
- Pressure switch 6

DTC Confirmation Procedure

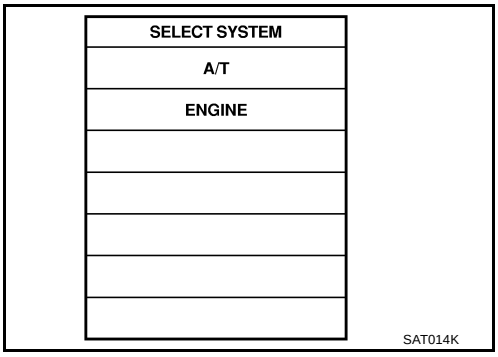
ECS002NI

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Select “FR/B SOLENOID FNCT CHECK” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
3. Accelerate vehicle to maintain the following condition continuously until “TESTING” has turned to “COMPLETE”. (It will take approximately 4 seconds after “TESTING” shows.)
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 3rd Gear (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.



4. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDUR”).
   Refer to AT-161, "Diagnostic Procedure" .
   If DTC (P1767) is detected, go to AT-158, "Diagnostic Procedure" .
   If DTC (P1846) is detected, go to AT-183, "Diagnostic Procedure" .

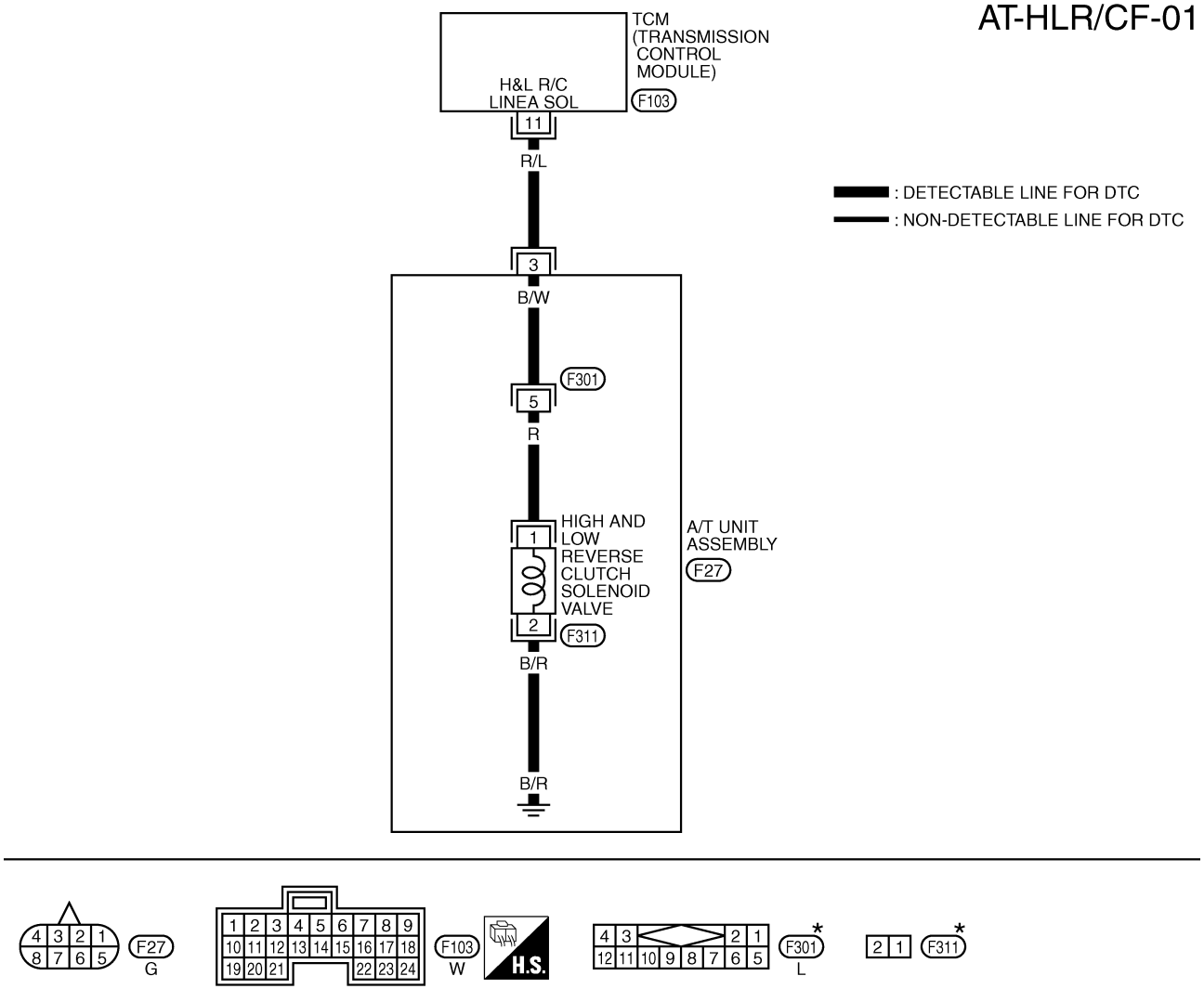
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — HLR/CF

ECS0018D

AT-HLR/CF-01



∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0024E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

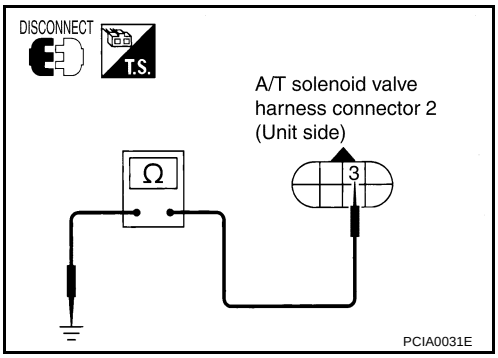
Terminal No.	Wire color	Item	Condition		Data (Approx.)
11	R/L	High & low reverse clutch solenoid valve	When vehicle starts	When the solenoid valve operating {6 km/h (4MPH) or faster in 1st speed or 2nd speed}	More than 2V
				When the solenoid valve is not operating{(6 km/h (4MPH) or slower in 1st speed or 3rd, 4th, or 5th speed}	0V

Diagnostic Procedure

ECS002OG

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



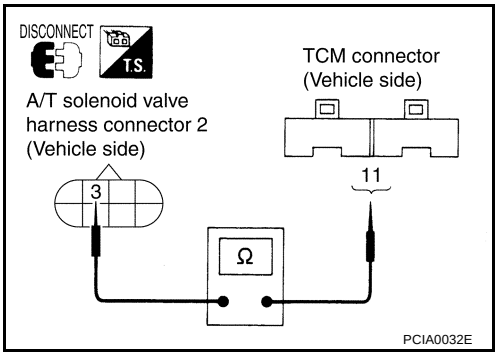
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
High & low reverse clutch solenoid valve	F27	3 - Ground	3 - 9 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	11	Yes
A/T solenoid valve harness connector 2	F27	3	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-159, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1772 LOW COAST BRAKE SOLENOID VALVE

PFP:31940

Description

ECS002OW

Low coast brake solenoid valve a turned “ON” or “OFF” by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.

On Board Diagnosis Logic

ECS002F9

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “LC/B SOLENOID/CIRC” with CONSULT-II or P1772 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

ECS002ER

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Low coast brake solenoid valve

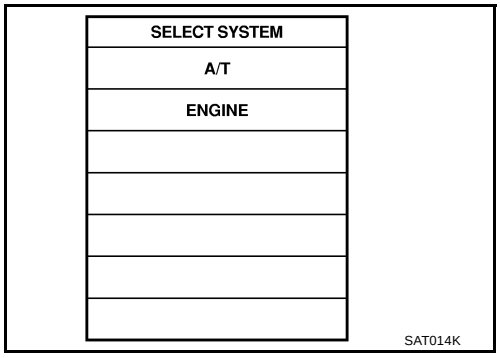
DTC Confirmation Procedure

ECS001ZE

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   Selector lever: “M” position
   Gear position: 1st ⇒ 2nd Gear (LC/B ON/OFF)
4. If DTC is detected, go to AT-164, "Diagnostic Procedure" .



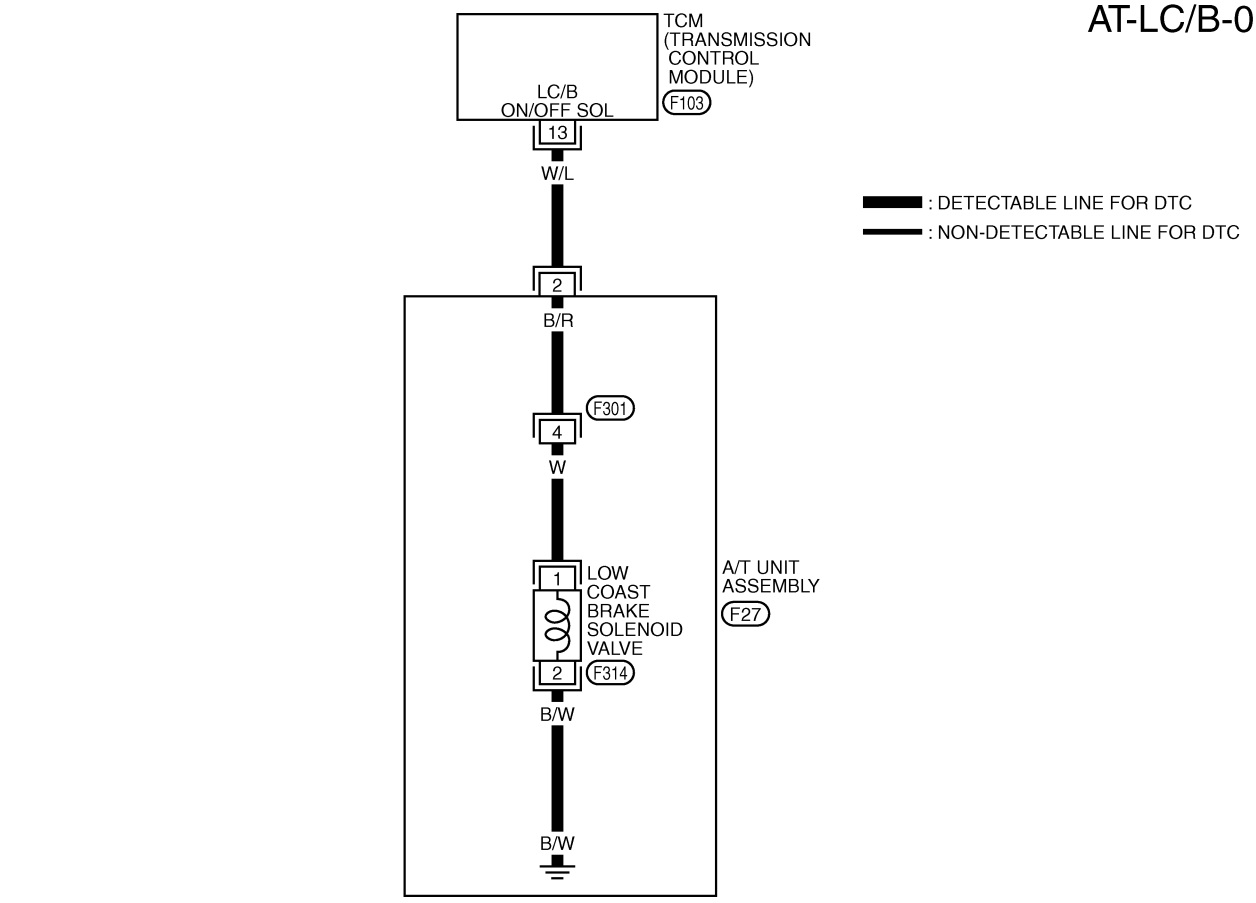
WITH GST

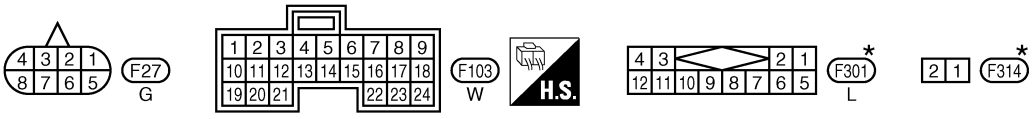
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — LC/B

ECS0018H

AT-LC/B-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0025E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

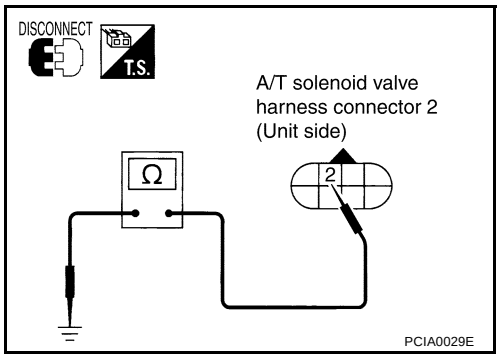
Terminal No.	Wire color	Item	Condition		Data (Approx.)
13	W/L	Low coast brake solenoid valve	When vehicle starts	When the solenoid valve is operating (when running in M1-1 speed or M2-2 speed)	Battery voltage
				When the solenoid valve is not operating (when running in “D”)	0V

Diagnostic Procedure

ECS002OH

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



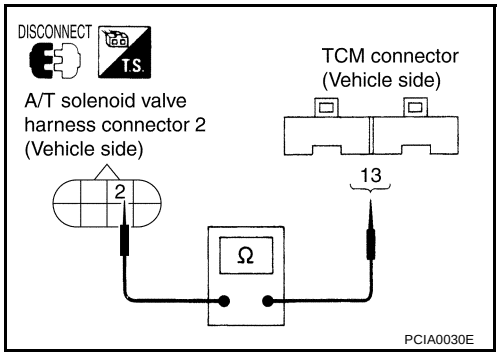
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Low coast brake solenoid valve	F27	2 - Ground	20 - 40 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	13	Yes
A/T solenoid valve harness connector 2	F27	2	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-162, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1774 LOW COAST BRAKE SOLENOID VALVE FUNCTION

PFP:31940

Description

ECS002OV

- Low coast brake solenoid valve a turned “ON” or “OFF” by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.
- This is not only caused by electrical malfunction (circuits open or shorted) but also by mechanical malfunction such as control valve sticking, improper solenoid valve operation.

On Board Diagnosis Logic

ECS002FB

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- Diagnostic trouble code “LC/B SOLENOID FNCT” with CONSULT-II or P1774 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- When condition of pressure switch 2 is different from monitor value, and relation between gear position and actual gear ratio is abnormal.

Possible Cause

ECS002ES

Check the following items.

- Harness or connectors
  (The solenoid and switch circuit is open or shorted.)
- Low coast brake solenoid valve
- Pressure switch 2

DTC Confirmation Procedure

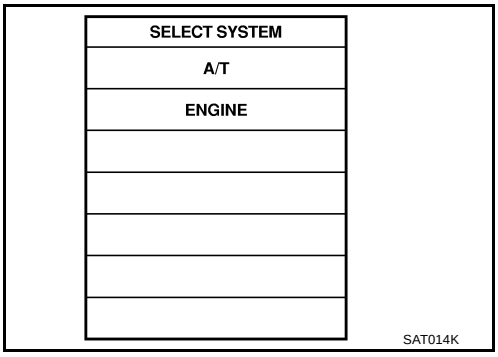
ECS002NJ

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Select “FR/B SOLENOID FNCT CHECK” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.
3. Accelerate vehicle to maintain the following condition continuously until “TESTING” has turned to “COMPLETE”. (It will take approximately 4 seconds after “TESTING” shows.)
   Selector lever: “M” position
   Gear position: 1st ⇒ 2nd Gear (LC/B ON/OFF)
4. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDUR”).
   Refer to AT-167, "Diagnostic Procedure" .
   If DTC (P1772) is detected, go to, AT-164, "Diagnostic Procedure" .



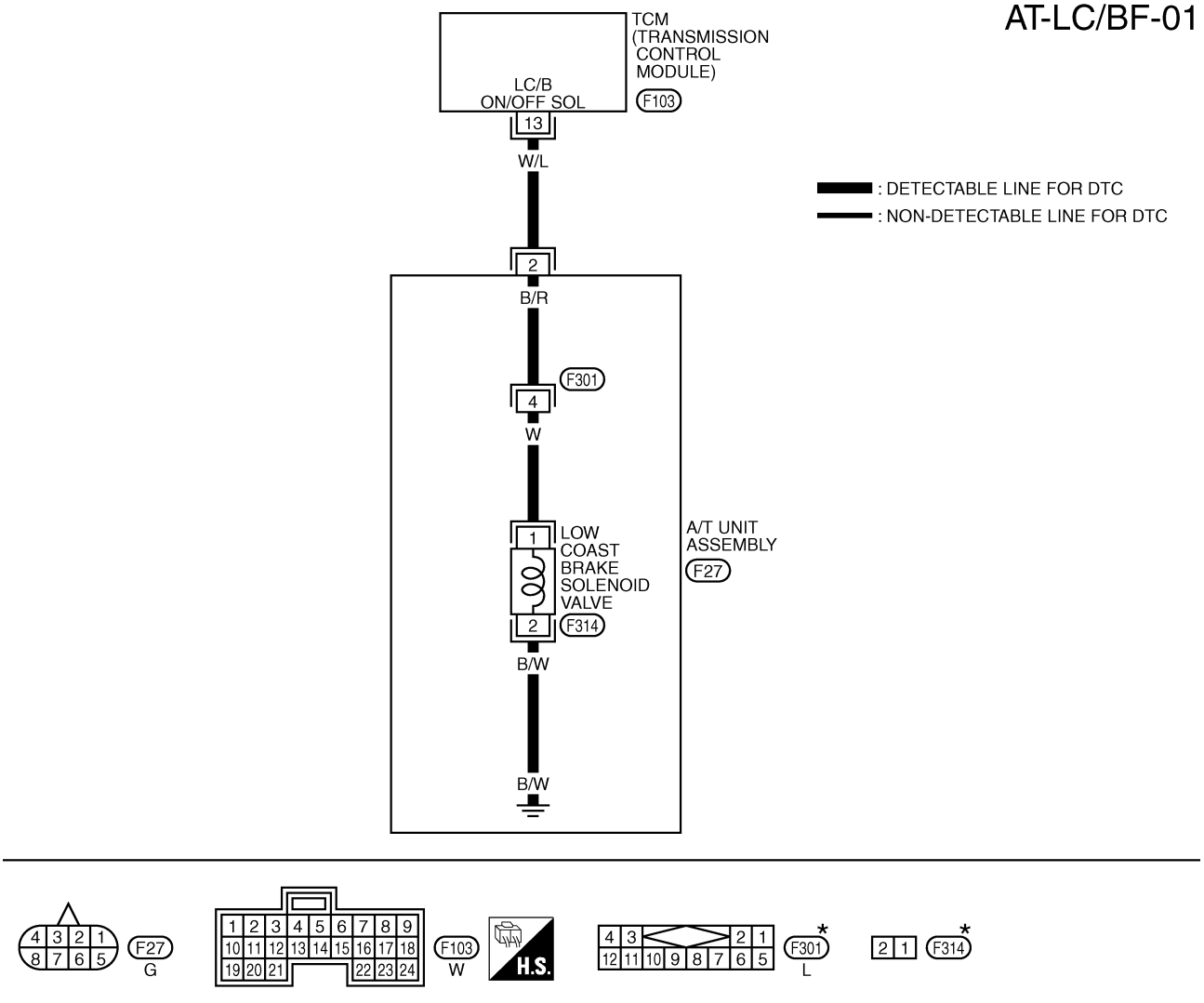
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — LC/BF

ECS0018L

AT-LC/BF-01



∗: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TCWM0026E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

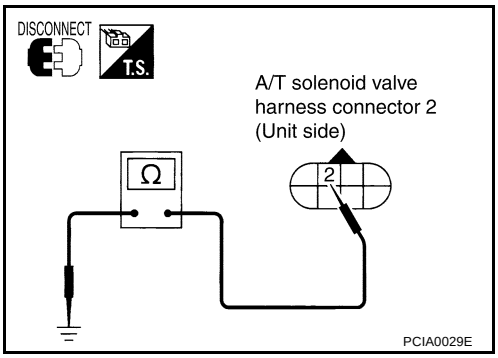
Terminal No.	Wire color	Item	Condition		Data (Approx.)
13	W/L	Low coast brake solenoid valve	When vehicle starts	When the solenoid valve is operating (when running in M1-1 speed or M2-2 speed)	Battery voltage
				When the solenoid valve is not operating (when running in “D”)	0V

Diagnostic Procedure

ECS002OI

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.



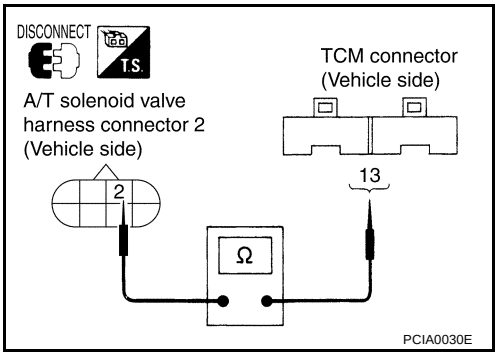
Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Low coast brake solenoid valve	F27	2 - Ground	20 - 40 Ω

OK or NG?

OK >> GO TO 2.
NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM connector.
3. Check continuity between A/T solenoid valve harness connector 2 and TCM connector.



Item	Connector No.	Terminal No.	Continuity
TCM	F103	13	Yes
A/T solenoid valve harness connector 2	F27	2	

4. If OK, check harness for short to ground and short to power.
5. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Check again.

- Refer to AT-165, "DTC Confirmation Procedure" .
- Refer to AT-76, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1815 MANUAL MODE SWITCH

PFP:34901

Description

ECS002BC

When an impossible pattern of switch signals is detected, this is judged to be an irregularity.

CONSULT-II Reference Value in Data Monitor Mode

ECS002IX

Monitor Item		Condition	Reference Value
MANU MODE SW	[ON - OFF]	Manual shift gate position (neutral)	ON
		Other than the above	OFF
NON M-MODE SW	[ON - OFF]	Manual shift gate position	OFF
		Other than the above	ON
UP SW LEVER	[ON - OFF]	Select lever: + side	ON
		Other than the above	OFF
DOWN SW LEVER	[ON - OFF]	Select lever: - side	ON
		Other than the above	OFF

On Board Diagnosis Logic

ECS002BE

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “MANU MODE SW/CIR” with CONSULT-II is detected when monitors Manual mode, Non manual mode, Up or Down switch signal, and detects as irregular when impossible input pattern occurs 1 second or more.

Possible Cause

ECS002BF

Check the following items.

- Harness or connectors
  (These switches circuit is open or shorted.)
- Manual mode switch
- Non manual mode switch
- Up switch
- Down switch

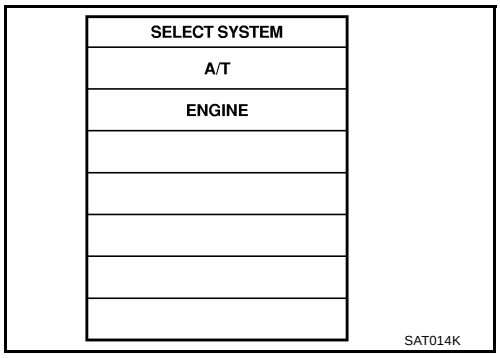
DTC Confirmation Procedure

ECS002BG

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

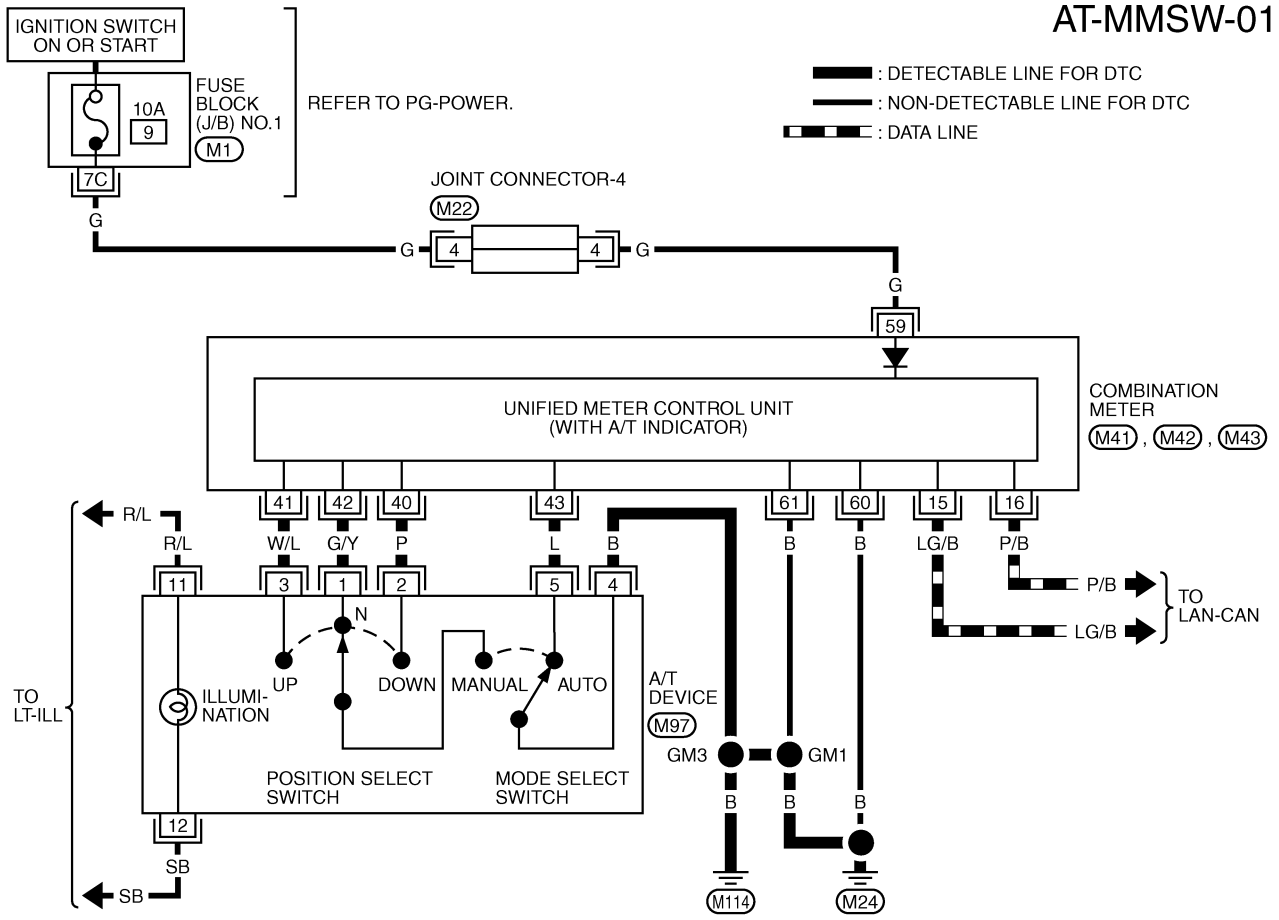
WITH CONSULT-II

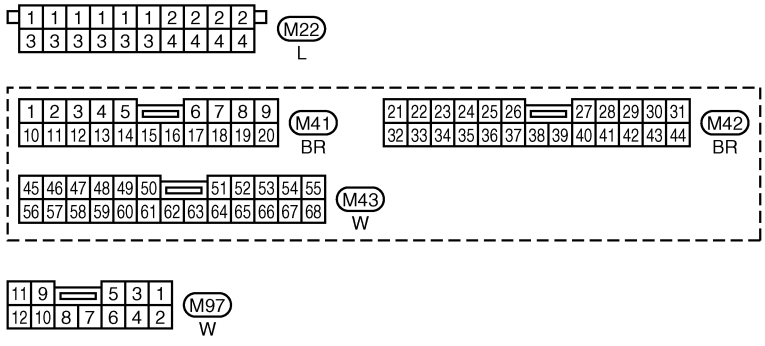
1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Move selector lever to “M” position.
4. Start engine and vehicle start for at least 2 consecutive seconds.



Wiring Diagram — AT — MMSW

ECS002BH





REFER TO THE FOLLOWING.

M1 -FUSE BLOCK-JUNCTION BOX (J/B) NO.1

TCWM0053E

Diagnostic Procedure

ECS002IY

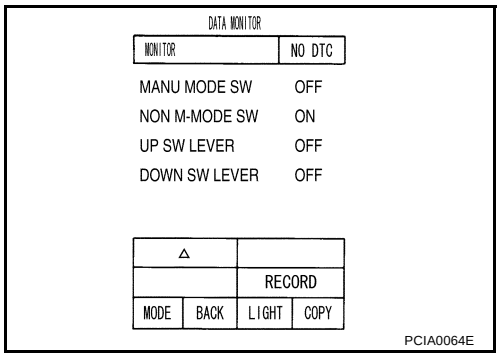
1. CHECK MANUAL MODE SWITCH CIRCUIT (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out ON/OFF switching action of the manual mode switch.

OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.



2. CHECK MANUAL MODE SWITCH CIRCUIT (WITHOUT CONSULT-II)

Without CONSULT-II

Drive the vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “- (down)” side (1st ⇔ 5th gear).

OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following items.

- Check power supply. Refer to DI-5, "COMBINATION METERS" .
- Manual mode switch. Refer to AT-170, "Component Inspection" .
- Check pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> GO TO 4
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform DTC confirmation procedure. Refer to AT-168, "DTC Confirmation Procedure" .

OK or NG?

OK >> INSPECTION END
NG >> Replace the control device assembly.

Component Inspection

ECS002IZ

MANUAL MODE SWITCH

Check continuity between terminals. Refer to AT-169, "Wiring Diagram — AT — MMSW" .

Item	Position	Connector No.	Terminal No. (Unit side)	Continuity
Manual mode (select) SW	Auto	M97	4 - 5	Yes
	Manual		1 - 4	
UP SW	Up		3 - 4	
DOWN SW	Down		2 - 4	

Position Indicator Lamp

ECS002J0

DIAGNOSTIC PROCEDURE

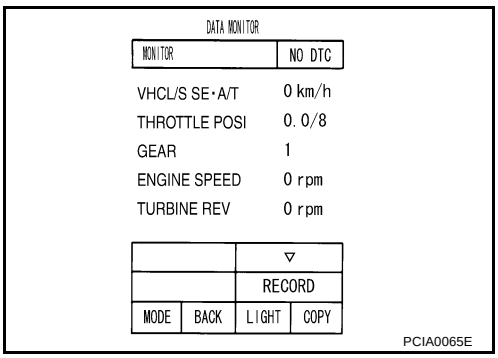
1. CHECK INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start the engine.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for A/T with CONSULT-II and read out the value of “GEAR”.
3. Drive the vehicle in the manual mode, and confirm that the actual gear position and the meter's indication of the position mutually coincide when the select lever is shifted to the “+ (up)” or “- (down)” side (1st ⇔ 5th gear).

OK or NG?

OK >> INSPCTION END
NG >> Check the following items.



Position Indicator Lamp Symptom Chart

Items	Presumed Location of Trouble
The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). The position indicator lamp is not indicated.	Manual mode SW Refer to AT-168, "DTC P1815 MANUAL MODE SWITCH" . A/T main system (Fail-safe function actuated) ● Refer to AT-68, "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)" .
The actual gear position changes, but the position indicator lamp is not indicated.	Execute the self-diagnosis function. ● Refer to AT-68, "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)" .
The actual gear position and the indication on the position indicator lamp do not coincide.	Execute the self-diagnosis function. ● Refer to AT-68, "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)" .
Only a specific position or positions is/are not indicated on the position indicator lamp.	Check the meter Control unit. Refer to DI-5, "COMBINATION METERS" .

DTC P1841 ATF PRESSURE SWITCH 1

PFP:25240

Description

ECS002BM

Fail-safe function to detect front brake clutch solenoid valve condition.

On Board Diagnosis Logic

ECS002BP

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 1/CIRC” with CONSULT-II is detected.
- When condition of pressure switch 1 is different from monitor value, and relation between gear position and actual gear ratio is irregular. (Other than during speed change)

Possible Cause

ECS002EB

- Pressure switch 1
- Harness or connectors
  (The switch circuit is open or shorted.)

DTC Confirmation Procedure

ECS002BQ

CAUTION:

Always drive vehicle at a safe speed.

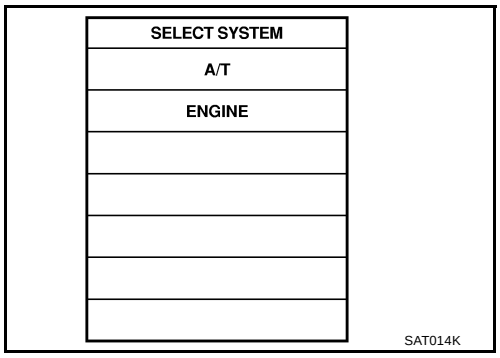
NOTE:

If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.

After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

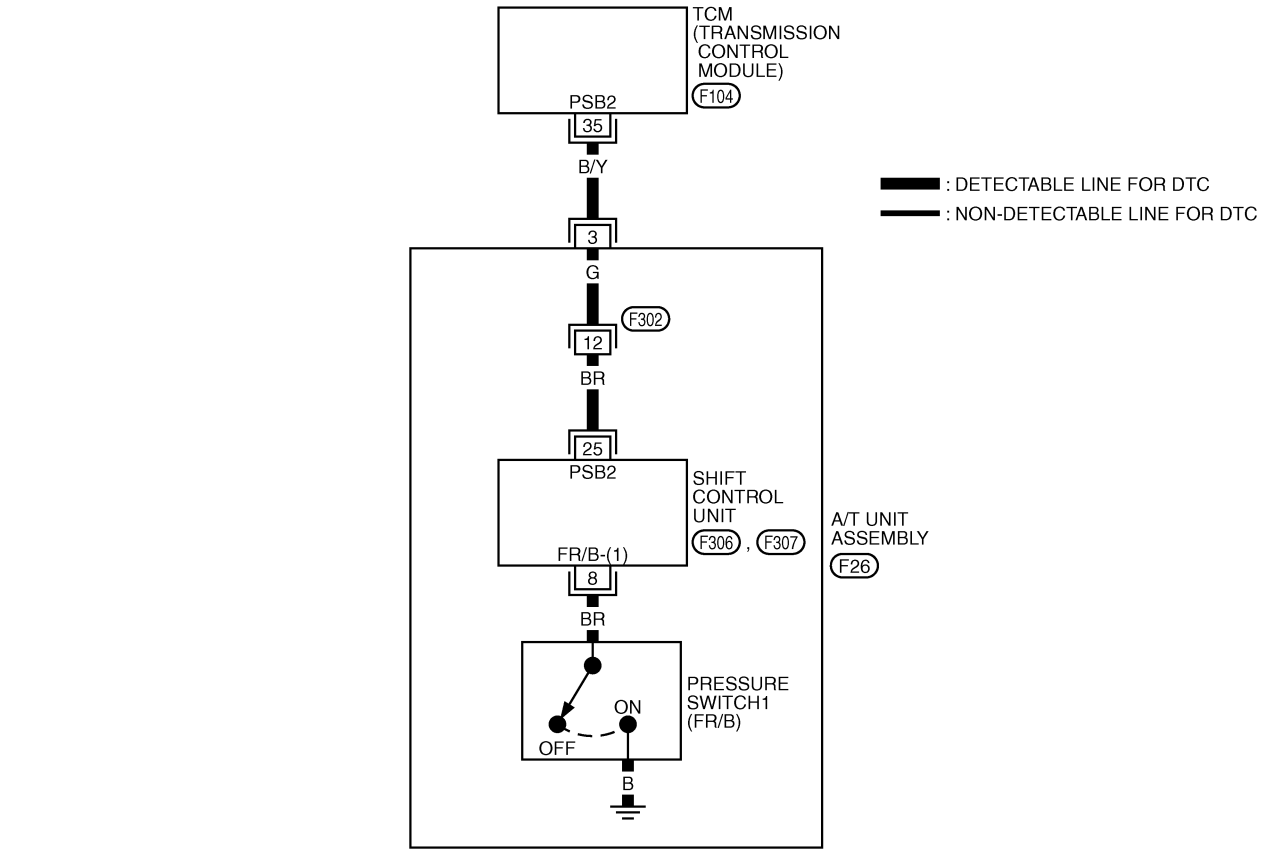
1. Turn ignition switch to “ON” position and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Start engine and maintain the following conditions for at least 4 consecutive seconds. (Other than during speed change).
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 3rd Gear (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. If DTC (P1841) is detected, go to AT-174, "Diagnostic Procedure" .
   If DTC (P1757) is detected, go to AT-146, "Diagnostic Procedure" .

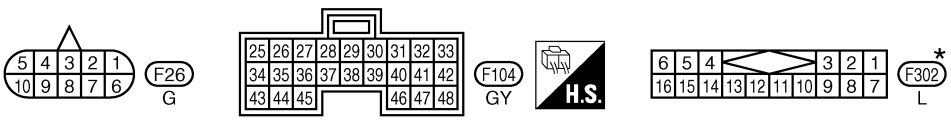


Wiring Diagram — AT — FPSW1

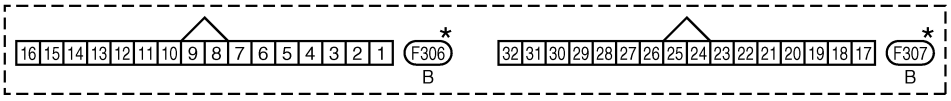
ECS002BR

AT-FPSW1-01





★: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.



TCWM0028E

TCM terminal and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
35	B/Y	PSB2 (pressure switch 1)	When vehicle starts	When front brake solenoid valve “OFF”.	Battery voltage
				When front brake solenoid valve“ ON”.	0V

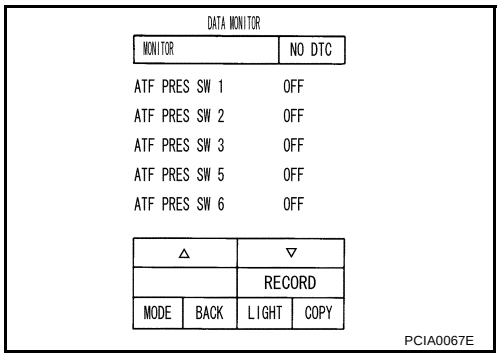
Diagnostic Procedure

ECS002IM

1. INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive the vehicle in the “D” position (1st ⇒ 3rd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 1”.



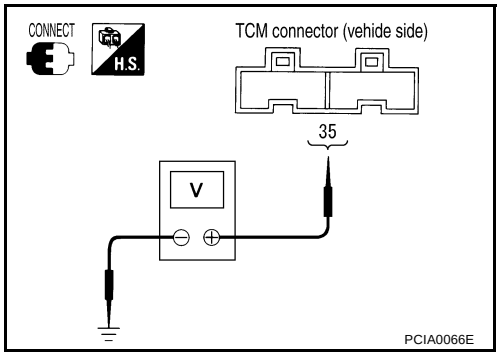
OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.

2. INPUT SIGNALS (WITHOUT CONSULT-II)

Without CONSULT-II

1. Start engine.
2. Drive the vehicle in the “D” position (1st ⇒ 3rd gear), and check the voltage between the TCM connector terminals and ground.



Solenoid Valve		Terminal No.	Voltage
Front brake solenoid valve	OFF	35 –Ground	Power source voltage
	ON		Approx. 0 V

OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following items.

1. Check disconnection or short-circuit in the main harness between pressure switch 1 (FR/B) (PSB2) and TCM.
2. Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform DTC confirmation procedure. Refer to AT-144, "DTC Confirmation Procedure" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1843 ATF PRESSURE SWITCH 3

PFP:25240

Description

ECS002BU

Fail-safe function to detect input clutch solenoid valve condition.

On Board Diagnosis Logic

ECS002BV

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 3/CIRC” with CONSULT-II is detected.
- When condition of pressure switch 3 is different from monitor value, and relation between gear position and actual gear ratio is irregular. (Other than during speed change)

Possible Cause

ECS002BW

Check the following items.

- Pressure switch 3
- Harness or connectors
  (The switch circuit is open or shorted.)

DTC Confirmation Procedure

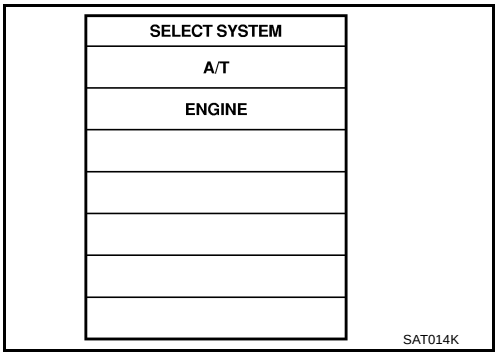
ECS002BX

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

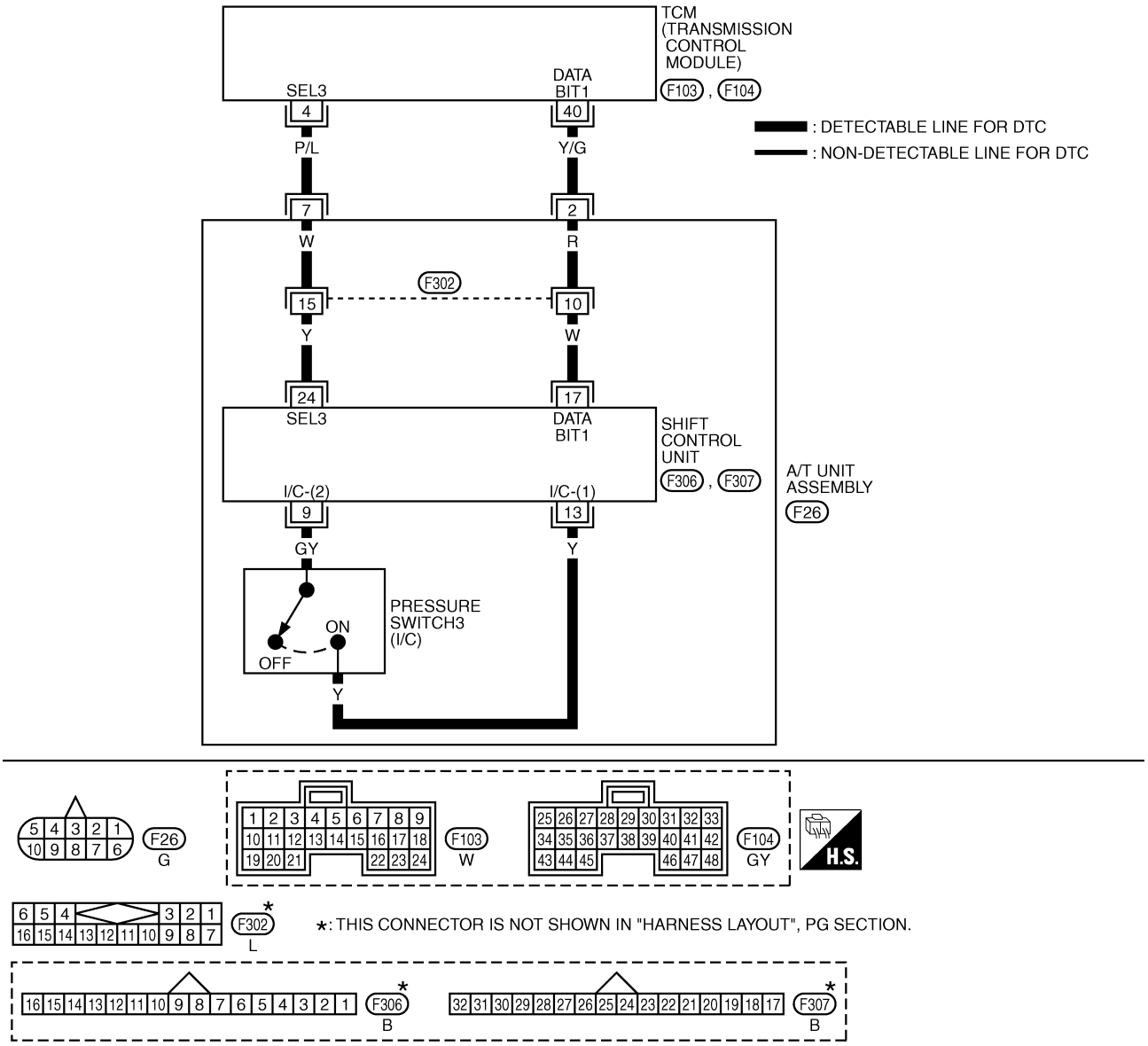
1. Turn ignition switch “ON” position and select “DATA MONITOR” mode for A/T with CONSULT-II.
2. Start engine and maintain the following conditions for at least 4 consecutive seconds. (Other than during speed change).
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. If DTC (P1843) is detected, go to AT-177, "Diagnostic Procedure" .
   If DTC (P1752) is detected, go to AT-140, "Diagnostic Procedure" .



Wiring Diagram — AT — FPSW3

ECS002BY

AT-FPSW3-01



TCWM0029E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
4	P/L	SEL3 (pressure switches 2, 3, 5)	–	–	–
40	Y/G	DATA BIT1	–	–	–

Diagnostic Procedure

ECS002IN

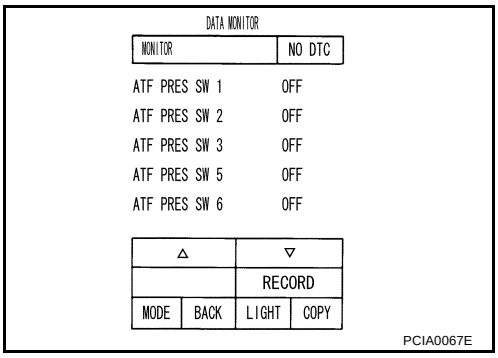
1. INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start the engine.
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive the vehicle in the “D” range (3rd ⇒ 4th gear), and confirm the ON/OFF actuation of the “ATF PRES SW 3”.

OK or NG?

OK >> GO TO 3.
NG >> GO TO 2.



2. DETECT MALFUNCTIONING ITEM

Check the following items.

1. Check disconnection or short-circuit in the main harness between pressure switch 3 (I/C) (SEL 3 or DATA BIT 1) and TCM.
2. Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK DTC

Perform DTC confirmation procedure. Refer to AT-175, "DTC Confirmation Procedure" .

OK or NG?

OK >> INSPECTION END
NG >> Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

DTC P1845 ATF PRESSURE SWITCH 5

PFP:25240

Description

ECS002C1

Fail-safe function to detect direct clutch solenoid valve condition.

On Board Diagnosis Logic

ECS002C2

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 5/CIRC” with CONSULT-II is detected.
- When condition of pressure switch 1 is different from monitor value, and relation between gear position and actual gear ratio is irregular. (Other than during speed change)

Possible Cause

ECS002C3

Check the following items.

- Pressure switch 5
- Harness or connectors
  (The switch circuit is open or shorted.)

DTC Confirmation Procedure

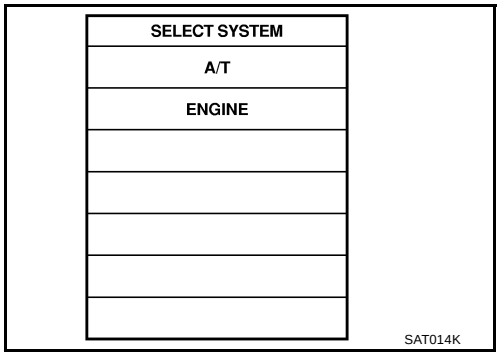
ECS002C4

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

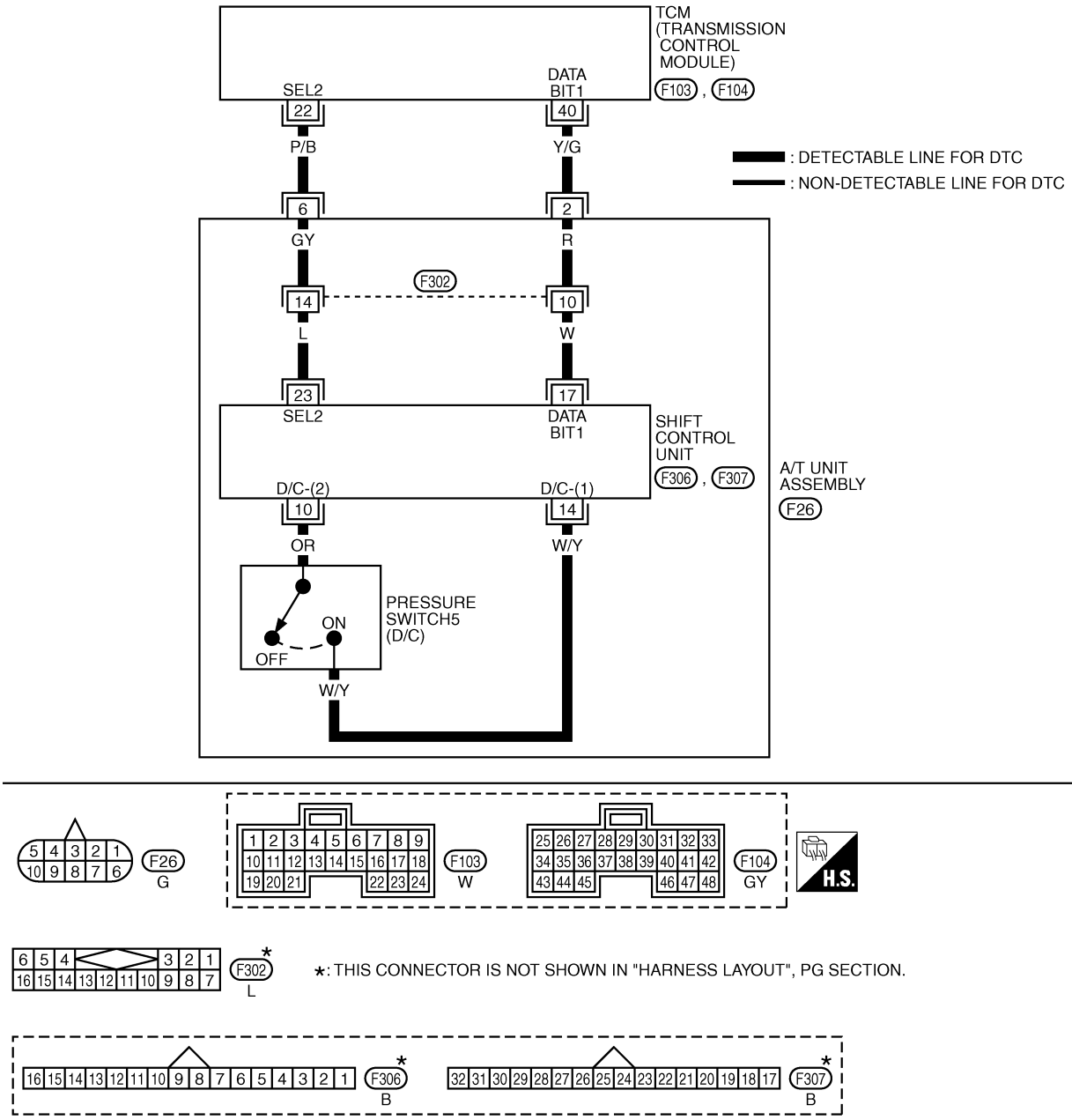
1. Turn ignition switch “ON” position and select “DATA MONITOR” mode for A/T with CONSULT-II.
2. Start engine and maintain the following conditions for at least 4 consecutive seconds. (Other than during speed change).
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 2nd Gear (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. If DTC (P1845) is detected, go to AT-180, "Diagnostic Procedure" .
   If DTC (P1762) is detected, go to AT-152, "Diagnostic Procedure" .



Wiring Diagram — AT — FPSW5

ECS002C5

AT-FPSW5-01



TCWM0030E

TCM terminals and Data are reference value. Measured between each terminals 5, 14, 24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
22	P/B	SEL2	–	–	–
40	Y/G	DATA BIT1	–	–	–

Diagnostic Procedure

ECS002IO

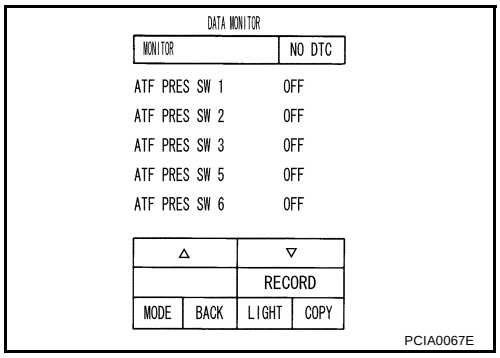
1. INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive the vehicle in the “D” position (1st ⇒ 2nd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 5”.

OK or NG?

OK >> GO TO 3.
NG >> GO TO 2.



2. DETECT MALFUNCTIONING ITEM

Check the following items.

1. Check disconnection or short-circuit in the main harness between pressure switch 5 (D/C) (SEL 2 or DATA BIT 1) and TCM.
2. Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK DTC

Perform DTC confirmation procedure. Refer to AT-178, "DTC Confirmation Procedure" .

OK or NG?

OK >> INSPECTION END
NG >> Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement"

DTC P1846 ATF PRESSURE SWITCH 6

PFP:25240

Description

ECS002C8

Fail-safe function to detect high & low reverse clutch solenoid valve condition.

On Board Diagnosis Logic

ECS002CA

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 6/CIRC” with CONSULT-II is detected.
- When condition of pressure switch 6 is different from monitor value, and relation between gear position and actual gear ratio is irregular. (Other than during speed change)

Possible Cause

ECS002CB

Check the following items.

- Pressure switch 6
- Harness or connectors
  (The switch circuit is open or shorted.)

DTC Confirmation Procedure

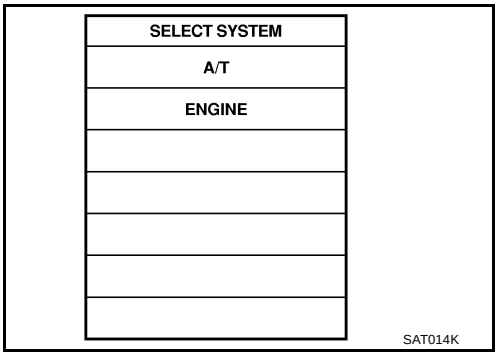
ECS002CC

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

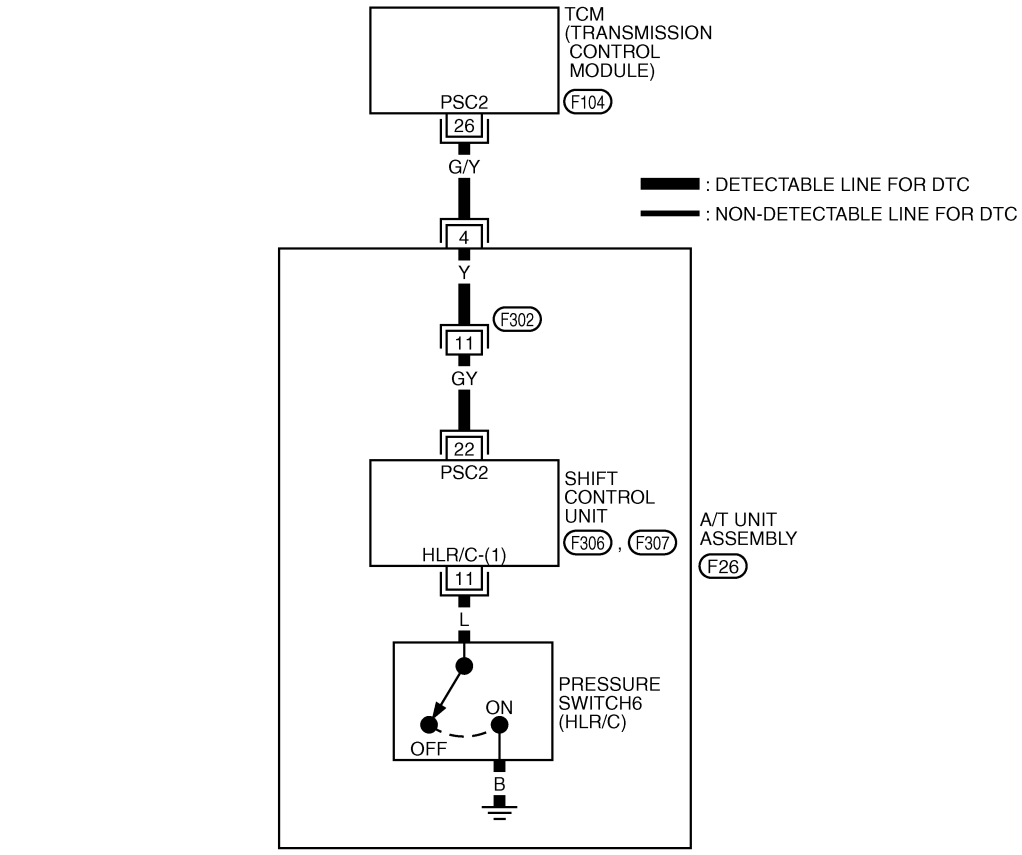
1. Turn ignition switch “ON” position and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Start engine and maintain the following conditions for at least 4 consecutive seconds. (Other than during speed change).
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st ⇒ 3rd Gear (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. If DTC (P1846) is detected, go to AT-183, "Diagnostic Procedure" .
   If DTC (P1767) is detected, go to AT-158, "Diagnostic Procedure" .

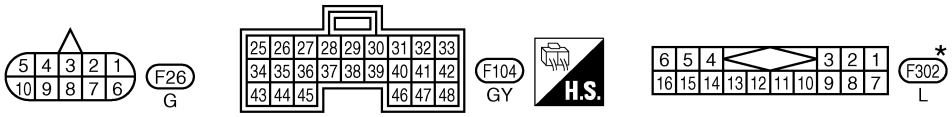


Wiring Diagram — AT — FPSW6

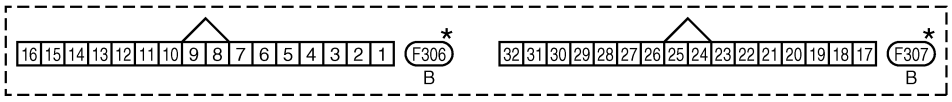
ECS002CD

AT-FPSW6-01





*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.



TCWM0031E

TCM terminal and Data are reference value. Measured between each terminals 5,14,24 and 46 (TCM ground).

Terminal No.	Wire color	Item	Condition		Data (Approx.)
26	G/Y	PSC2 (pressure switch 6)	When vehicle starts	When high & low reverse clutch solenoid valve “ON”.	0V
				When high & low reverse clutch solenoid valve “OFF”.	Battery voltage

Diagnostic Procedure

ECS002IQ

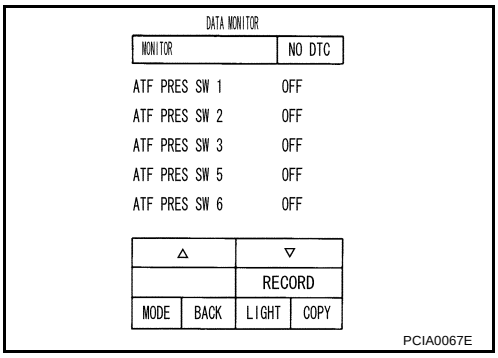
1. INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start the engine.
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive the vehicle in the “D” position (1st ⇒ 3rd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 6”.

OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.



2. INPUT SIGNALS (WITHOUT CONSULT-II)

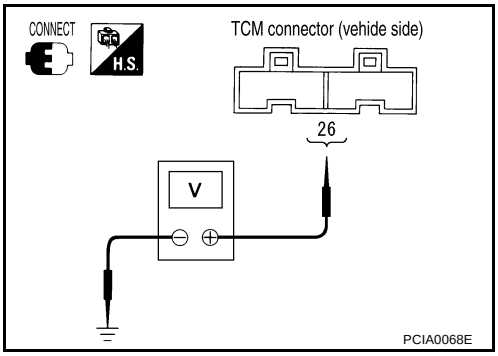
Without CONSULT-II

1. Start the engine.
2. Drive the vehicle in the “D” position (1st ⇒ 3rd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 6”.

Solenoid Valve		Terminal No.	Voltage
High & low reverse clutch solenoid valve	OFF	26 –Ground	Battery voltage
	ON		Approx. 0 V

OK or NG?

OK >> GO TO 4.
NG >> GO TO 3.



3. DETECT MALFUNCTIONING ITEM

Check the following items.

1. Check disconnection or short-circuit in the main harness between pressure switch 6 (HLR/C) (PSC 2) and TCM.
2. Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

OK >> GO TO 4.
NG >> Repair or replace damaged parts.

4. CHECK DTC

Perform DTC confirmation procedure. Refer to AT-181, "DTC Confirmation Procedure" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

PARK/NEUTRAL POSITION, MANUAL MODE, BRAKE AND THROTTLE POSITION SWITCH CIRCUIT

PFP:31918

Diagnostic Procedure

ECS002JX

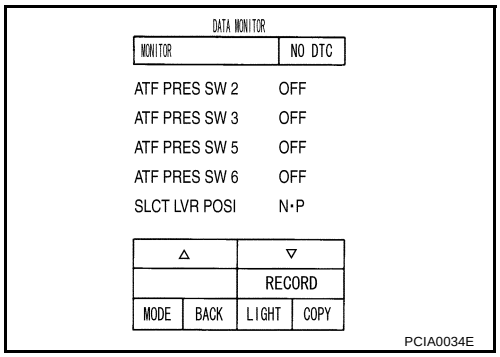
1. CHECK PNP SW CIRCUIT

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out “P”, “R”, “N”, and “D” position switches moving selector lever to each position.

OK or NG?

OK >> GO TO 3.
NG >> GO TO 2.



2. DETECT MALFUNCTIONING ITEM

Check the following items.

- Disconnection or short-circuit in the main harness between TCM and PNP switch 1, 2, 3, 4.
- Disconnection or short-circuit in the main harness between the PNP switch 3 monitor and TCM.
- PNP switch. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

OK or NG?

OK >> GO TO 3.
NG >> Repair or replace damaged parts.

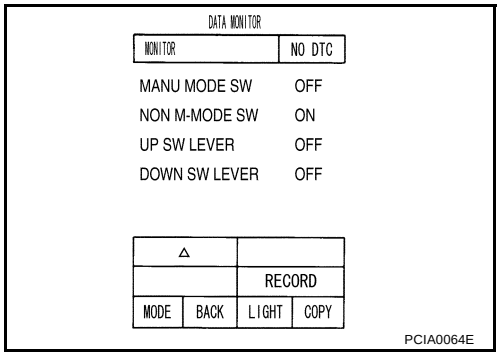
3. CHECK MANUAL MODE SWITCH CIRCUIT

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out ON/OFF switching action of the manual mode switch.

OK or NG?

OK >> GO TO 5.
NG >> GO TO 4.



4. DETECT MALFUNCTIONING ITEM

Check the following items.

- Manual mode switch. Refer to AT-168, "DTC P1815 MANUAL MODE SWITCH" .
- Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

OK >> GO TO 5.
NG >> Repair or replace damaged parts.

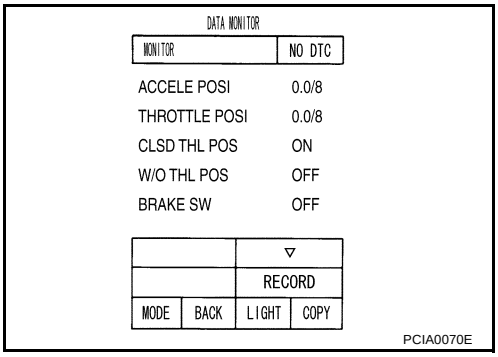
5. CHECK BRAKE SWITCH CIRCUIT

With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.

OK or NG?

OK >> GO TO 6.
NG >> Refer to BRC-30, "Functions of CONSULT-II" .



6. CHECK CLOSED THROTTLE POSITION SWITCH CIRCUIT

With CONSULT-II

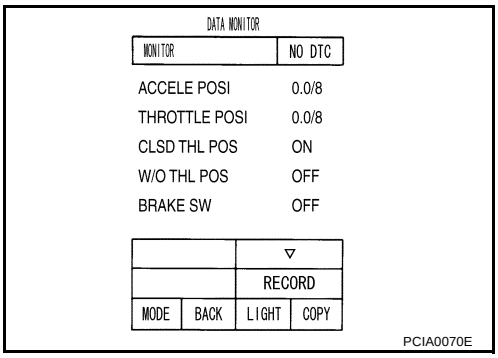
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out ON/OFF, switching action of the accelerator pedal.

Accelerator Pedal Operation	Monitor Item	
	CLSD THL POS	W/O THL POS
Released	ON	OFF
Fully depressed	OFF	ON

4. If DTC(P0121) is detected, go to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 7.



7. CHECK DTC

Perform DTC confirmation procedure.

- Refer to AT-67, "CONSULT-II" .
- CAN Communication Line. Refer to AT-79 .

OK or NG?

OK >> INSPECTION END
NG >> GO TO 8.

8. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

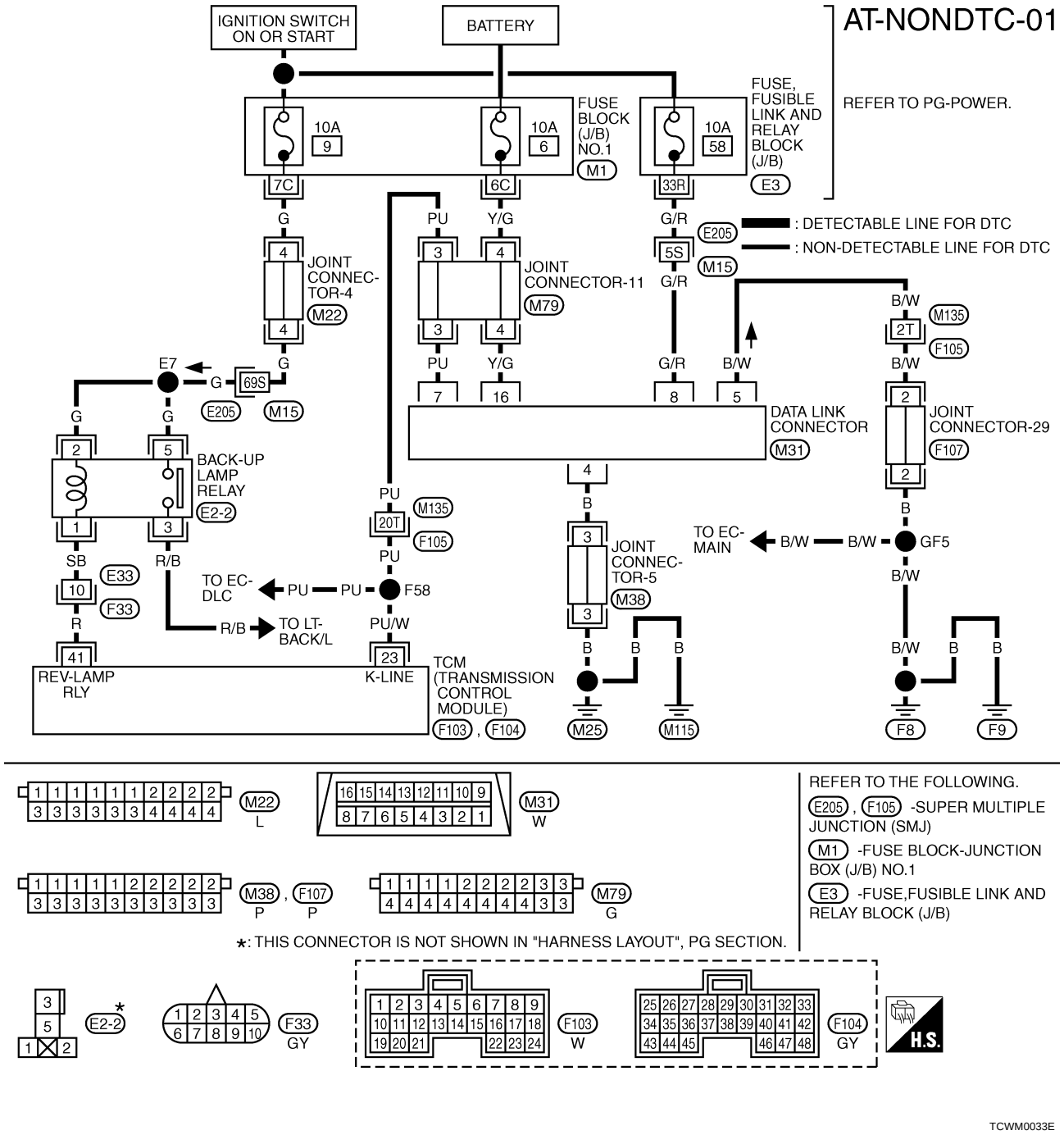
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

Wiring Diagram — AT — NONDTC

ECS00191



TCWM0033E

A/T CHECK Indicator Lamp does not come on

ECS002J6

SYMPTOM

A/T CHECK indicator lamp does not come on for about 2 seconds when turning ignition switch to "ON".

DIAGNOSTIC PROCEDURE

1. CHECK TCM POWER SOURCE STEP 1

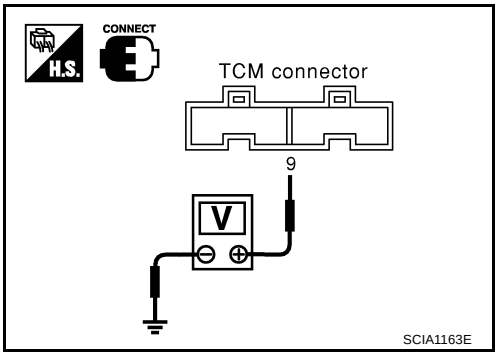
1. Turn ignition switch to "OFF" position.
2. Check the voltage between TCM connector terminals 9 and ground. Refer to AT-105, "Wiring Diagram — AT — POWER" .

Voltage :Battery voltage

OK or NG

OK >> GO TO 2.
NG >> Check the following items.

- Main harness for short or open between battery and the TCM connector terminals 9.
- Fuse.



2. CHECK TCM POWER SOURCE STEP 2

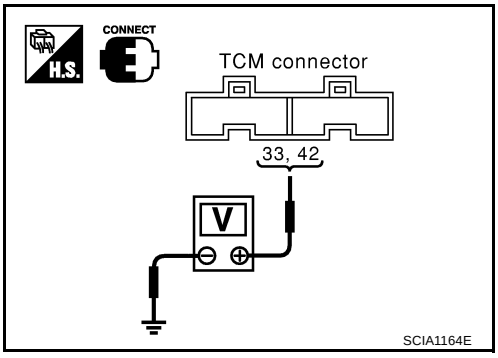
1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Check the voltage between TCM connector terminals 33,42 and ground. Refer to AT-105, "Wiring Diagram — AT — POWER" .

Voltage :Battery voltage

OK or NG

OK >> GO TO 3.
NG >> Check the following items.

- Main harness for short or open between ignition switch and TCM connector terminals 33, 42.
- Ignition switch and fuse.

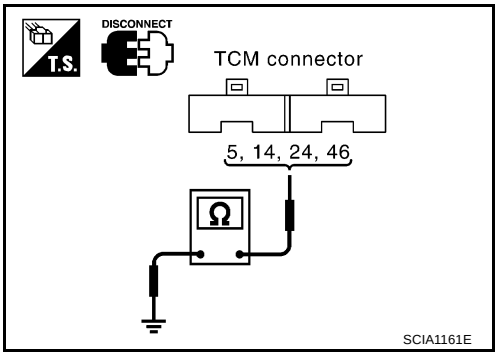


3. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Disconnect the TCM connector.
3. Check continuity between terminals 5, 14, 24, 46 and ground. Refer to AT-105, "Wiring Diagram — AT — POWER" .
4. If OK, check the harness for short-circuit to ground or the power source.

OK or NG

OK >> GO TO 4.
NG >> Repair the short-circuit(s) in the harness or connector to ground or the power source.



4. CHECK A/T CHECK INDICATOR LAMP CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Check the combination meter.
   Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 5.
NG >> Check the following item.
- Refer to LAN-21, "CAN COMMUNICATION" .

5. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Engine Cannot Be Started In “P” and “N” Position

ECS00193

SYMPTOM:

- **Engine cannot be started with selector lever in “P” or “N” position.**
- **Engine can be started with selector lever in “D”or “R” position.**

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 2.

2. CHECK STARTING SYSTEM

Check starting system. Refer to SC-20, "STARTING SYSTEM" .

OK or NG

OK >> INSPECTION END
NG >> Repair or replace damaged parts.

In “P” Position, Vehicle Moves When Pushed

ECS002J7

SYMPTOM

Even though the shift lever is set in the “P” position, the parking mechanism is not actuated, allowing the vehicle to be moved when it is pushed.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SW CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 2.

2. CHECK CONTROL LINKAGE

Check the control linkage.

- Refer to AT-209, "Adjustment of A/T Positions" .

OK or NG

OK >> GO TO 3.
NG >>
- Adjust control linkage. Refer to AT-209, "Adjustment of A/T Positions" .
- Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

3. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

In “N” Position, Vehicle Moves

ECS00195

SYMPTOM

Vehicle moves forward or backward when selecting “N” position.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

No >> GO TO 2.

2. CHECK CONTROL LINKAGE

Check the control linkage.

- Refer to AT-209, "Adjustment of A/T Positions" .

OK or NG

OK >> GO TO 3.

NG >>
- Adjust control linkage. Refer to AT-209, "Adjustment of A/T Positions" .
- Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

3. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Large Shock “N” to “D” Position

ECS002J9

SYMPTOM

A noticeable shock occurs when the shift lever is shifted from the “N” to “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Execute self-diagnosis.

Do the self-diagnosis results indicate A/T fluid temperature sensor, line pressure solenoid valve, or throttle sensor?

Yes >> Check the malfunctioning system. Refer to AT-101, "DTC P0745 LINE PRESSURE SOLENOID VALVE" , AT-116, "DTC P1705 THROTTLE POSITION SENSOR" , AT-118, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" .

No >> GO TO 2.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace the accelerator pedal position sensor.

3. CHECK THE LINE PRESSURE

Check the line pressure with the engine idling in the “D” position.

- Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 4.
NG >> Check line pressure solenoid valve. Refer to AT-101, "DTC P0745 LINE PRESSURE SOLENOID VALVE" .

4. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Vehicle Does Not Creep Backward In “R” Position

ECS002JA

SYMPTOM

The vehicle does not creep in the “R” position. Or an extreme lack of acceleration is observed.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVER

Check A/T fluid level again. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK START TEST

Check the number of revolutions when the engine is stalled.

- Refer to AT-50, "STALL TEST" .

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK LINE PRESSURE

Check the line pressure with the engine idling.

- Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 4.
NG >> Check line pressure solenoid valve. Refer to AT-101, "DTC P0745 LINE PRESSURE SOLENOID VALVE" .

4. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 5.

5. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Vehicle Does Not Creep Forward In “D” Position

ECS00198

SYMPTOM

Vehicle does not creep forward when selecting “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check A/T fluid level again. Refer to AT-12, "Checking A/T Fluid" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK STALL TEST

Check stall revolution with selector lever in “D” position.
Refer to AT-50, "STALL TEST" .

OK or NG

OK >> GO TO 3.
NG >> GO TO 4.

3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “R” position.
Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 4.
NG >> Check line pressure solenoid valve. Refer to AT-52, "LINE PRESSURE TEST" .

4. CHECK PNP SWITCH CIRCUIT

With CONSULT-II
Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?
No Tools
Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 5.

5. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Vehicle Cannot Be Started From D1

ECS002JC

SYMPTOM:

Vehicle cannot be started from D1 on cruise test - Part 1.

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep in “R” position.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-192, "Vehicle Does Not Creep Backward In “R” Position" .

2. CHECK SELF-DIAGNOSIS RESULTS

Execute self-diagnosis.

Do the self-diagnosis results indicate vehicle speed sensor A/T (revolution sensor), line pressure solenoid?

YES >> Check the malfunctioning system. Refer to AT-89, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-101, "DTC P0745 LINE PRESSURE SOLENOID VALVE" .
NO >> GO TO 2.

3. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace the accelerator pedal position sensor.

4. CHECK LINE PRESSURE

Check the line pressure at the engine stall point.

- Refer to AT-52, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 5.
NG >> Replace the transmission assembly.

5. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Shift: $D_1 \rightarrow D_2$ Or Does Not Kick down: $D_4 \rightarrow D_2$

ECS002JD

SYMPTOM

The vehicle does not shift up from the 1st to the 2nd gear at the specified speed, or it does not kick down from the 4th to the 2nd gear even when the accelerator pedal is fully depressed.

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep forward in “D” position and vehicle cannot be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-194, "Vehicle Does Not Creep Forward In “D” Position" , AT-195, "Vehicle Cannot Be Started From D_1" .

2. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 3.

3. CHECK SELF-DIAGNOSIS RESULTS

Check vehicle speed sensor A/T (revolution sensor) and vehicle speed sensor MTR circuits.

- Refer to AT-89, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-127, "DTC P1721 VEHICLE SPEED SENSOR MTR" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace vehicle speed sensor A/T (revolution sensor) or vehicle speed sensor MTR.

4. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG

OK >> GO TO 5.
NG >> Repair or replace the accelerator pedal position sensor.

5. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Shift: $D_2 \rightarrow D_3$

ECS002JE

SYMPTOM

A/T does not shift from D2 to D3 at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep forward in “D” position” and vehicle cannot be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-194, "Vehicle Does Not Creep Forward In “D” Position" ,AT-195, "Vehicle Cannot Be Started From D_1" .

2. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 3.

3. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace the accelerator pedal position sensor.

4. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Shift: $D_3 \rightarrow D_4$

ECS002JF

SYMPTOM

- The vehicle does not shift up from the D_3 to D_4 gear at the specified speed.
- The vehicle does not shift up from the D_3 to D_4 gear unless A/T is warmed up.

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep forward in “D” position and vehicle cannot be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-194, "Vehicle Does Not Creep Forward In “D” Position" , AT-195, "Vehicle Cannot Be Started From D_1" .

2. PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 3.

3. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace the accelerator pedal position sensor.

4. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Shift: D4 → D5

ECS002JO

SYMPTOM

- The vehicle does not shift up from the D4 to D5 gear at the specified speed.
- The vehicle does not shift up from the D4 to D5 gear unless A/T is warmed up.

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep forward In “D” position” and vehicle cannot be started from D1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-194, "Vehicle Does Not Creep Forward In “D” Position" ,AT-195, "Vehicle Cannot Be Started From D1" .

2. CHECK SELF-DIAGNOSIS RESULTS

With CONSULT-II

After executing a traveling test, confirm that the self-diagnosis results indicate the following defective items:

- PNP switch
- A/T fluid temperature sensor
- Vehicle speed sensor A/T (revolution sensor)
- Vehicle speed sensor MTR

No Tools

Execute the self-diagnosis and confirm that a malfunction is indicated in the results.

Yes or No

Yes >> Check the defective system(s). Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-89, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-118, "DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" , AT-127, "DTC P1721 VEHICLE SPEED SENSOR MTR" .
No >> GO TO 3.

3. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace the accelerator pedal position sensor.

4. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 5.

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Perform Lock-up

ECS002JG

SYMPTOM

A/T does not lock-up at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Execute self-diagnosis results indicate TCC solenoid valve.

Yes or No

Yes >> Check the TCC solenoid valve circuit. Refer to AT-94, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" .

No >> GO TO 2.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG

OK >> GO TO 3.

NG >> Repair or replace the accelerator pedal position sensor.

3. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.

2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Hold Lock-up Condition

ECS002JH

SYMPTOM

The lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Does self-diagnosis show damage to engine speed signal circuit after cruise test.

Yes or No

Yes >> Check the engine speed signal circuit. Refer to AT-92, "DTC P0725 ENGINE SPEED SIGNAL" .
No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Lock-up Is Not Released

ECS002JI

SYMPTOM

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to closed throttle position and wide open throttle position switch circuit. Refer to AT-79, "DTC U1000 CAN COMMUNICATION LINE" .

No Tools

Execute the self-diagnosis and confirm that a malfunction in the CAN communication is indicated in the results.

Yes or No

Yes >> Check the CAN communication line.
No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly.Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Engine Speed Does Not Return To Idle

ECS002JJ

SYMPTOM:

- When a shift-down is performed, the engine speed does not smoothly return to the idling speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Execute self-diagnosis.

Do the self-diagnosis results indicate a malfunction in the manual mode SW?

Yes >> ● Check the manual mode SW.
● Refer to AT-168, "DTC P1815 MANUAL MODE SWITCH" .

No >> GO TO 2.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor.

- Refer to EC-186, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR" .

OK or NG

OK >> GO TO 3.
NG >> Repair or replace the accelerator pedal position sensor.

3. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Shift: D5 → D4

ECS002JK

SYMPTOM:

The vehicle does not shift down from the 5th to the 4th gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS

With CONSULT-II

After executing a traveling test, confirm that the self-diagnosis results indicate the following malfunctioning items:

- Input clutch solenoid valve
- Vehicle speed sensor A/T (revolution sensor)
- Vehicle speed sensor MTR

No Tools

Execute the self-diagnosis and confirm that a malfunction is indicated in the results.

Yes or No

Yes >> Check the malfunctioning system(s). Refer to AT-89, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-127, "DTC P1721 VEHICLE SPEED SENSOR MTR" , AT-138, "DTC P1752 INPUT CLUTCH SOLENOID VALVE" .

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.

2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Shift: D4 → D3

ECS002JP

SYMPTOM:

The vehicle does not shift down from the 4th to the 3rd gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS

With CONSULT-II

After executing a traveling test, confirm that the self-diagnosis results indicate the following malfunctioning items:

- High & low reverse clutch solenoid valve
- Vehicle speed sensor A/T (revolution sensor)
- Vehicle speed sensor MTR

No Tools

Execute the self-diagnosis and confirm that a malfunction is indicated in the results.

Yes or No

Yes >> Check the defective system(s). Refer to AT-89, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-127, "DTC P1721 VEHICLE SPEED SENSOR MTR" , AT-156, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE" .

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.

2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Shift: D3 → D2

ECS002JL

SYMPTOM:

The vehicle does not shift down from the 3rd to the 2nd gear.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS

With CONSULT-II

After executing a traveling test, confirm that the self-diagnosis results indicate the following malfunctioning items:

- Direct clutch solenoid valve
- Vehicle speed sensor A/T (revolution sensor)
- Vehicle speed sensor MTR

No Tools

Execute the self-diagnosis and confirm that a malfunction is indicated in the results.

Yes or No

Yes >> Check the malfunctioning system(s).Refer to AT-89, "DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)" , AT-127, "DTC P1721 VEHICLE SPEED SENSOR MTR" , AT-150, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE" .

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.

2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

A/T Does Not Shift: D2 → D1

ECS002JM

SYMPTOM:

The vehicle does not shift down from the 2nd to the 1st gear.

DIAGNOSTIC PROCEDURE

1. PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

No >> GO TO 3.

2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

Vehicle Does Not Decelerate By Engine Brake

ECS002JQ

SYMPTOM:

No engine brake is applied when the gear is shifted from the 2nd to the 1st gear.

DIAGNOSTIC PROCEDURE

1. PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

No Tools

Does self-diagnosis show damage to PNP switch circuit?

Yes or No

Yes >> Check PNP switch circuit. Refer to AT-85, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 3.

2. CHECK SYMPTOM

Check again.

OK or NG

OK >> INSPECTION END
NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

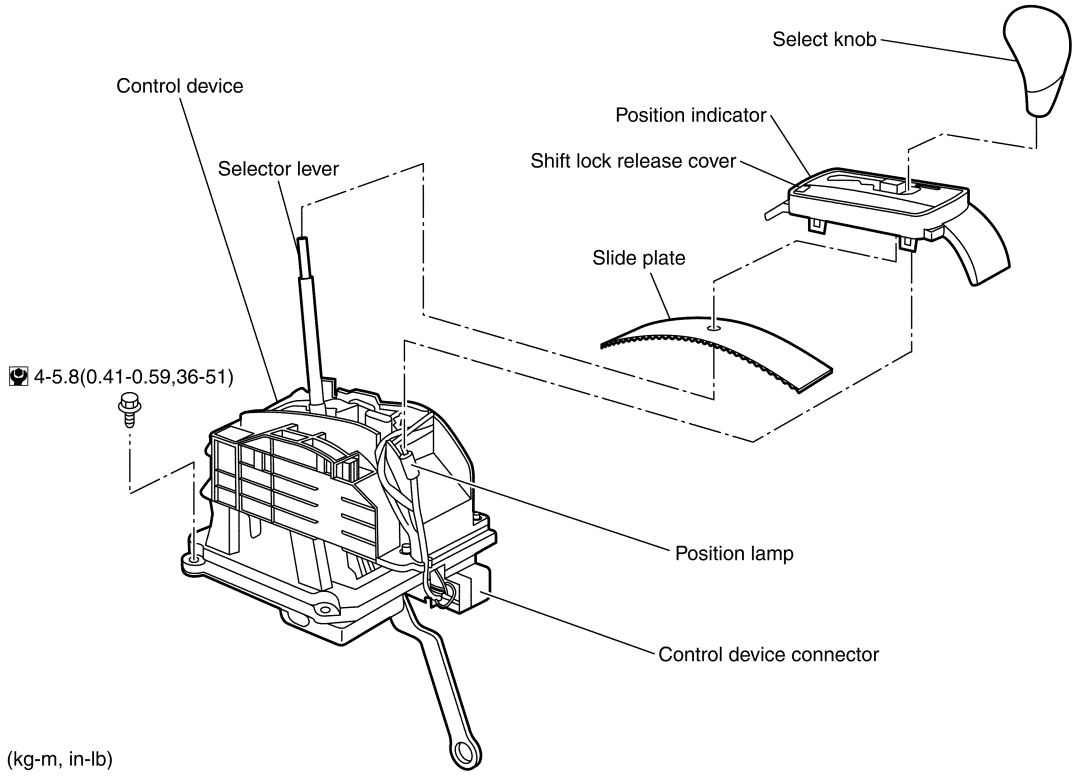
SHIFT CONTROL SYSTEM

PFP:34901

Control Device

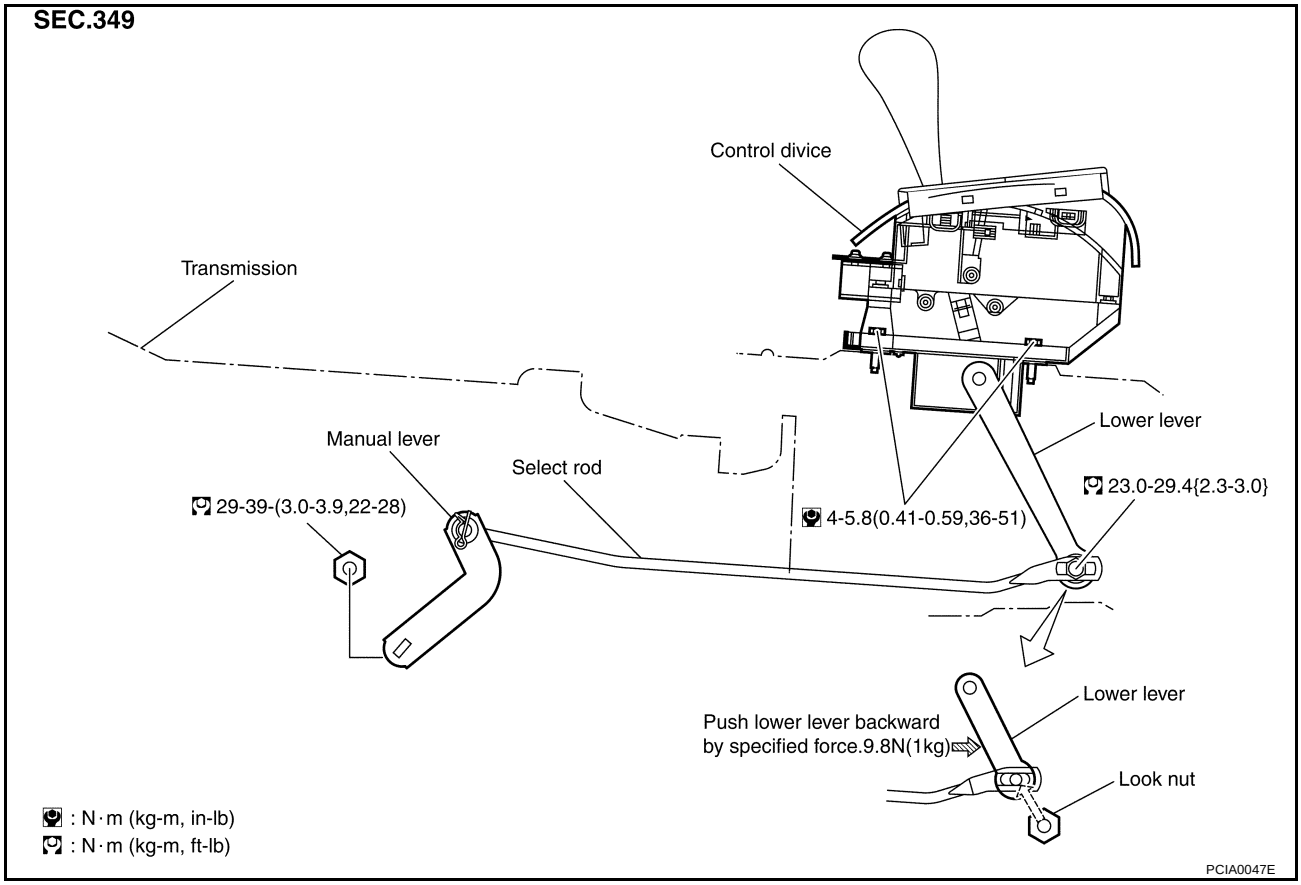
ECS002J4

SEC.349



Control Cable

ECS002J5



INSTALLATION AND ADJUSTMENT

1. Set lower lever in “P” position.
2. Insert the select rod into trunnion of the lower lever.
3. Set manual lever in “P” position.
4. While pressing the lower lever toward rearward of the vehicle, tighten the nut with a torque of 9.8 N (1 kg, lb) until it reaches the end surface of the trunnion.

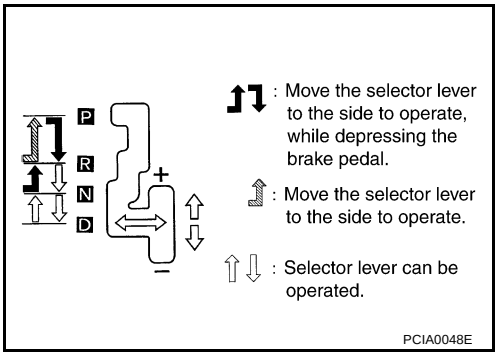
PARK/NEUTRAL POSITION (PNP) SWITCH

PFP:31918

Checking of A/T Positions

ECS002J2

1. Operate selector lever to confirm that there are no faults including “abnormal heaviness”, “getting stuck”, “abnormal noise”, or “rattle”.
2. When selector lever is operated, the driver should be able to feel a firm clicking response from the lever each time it is set to a lever position correctly. Confirm that the actual shift position on the transmission and the position indicated by the position indicator lamp correctly correspond each other without misalignment.
3. The method of operating the lever to individual positions correctly should be as shown on the diagram.
4. When the lever is set to the “R” position, the reverse lamp should be lit up.
5. It must be possible to start the engine from the “P” and the “N” positions, but not from any other position.
6. The transmission must be fully locked in the “P” position.



Adjustment of A/T Positions

ECS002J3

1. Set the lower lever to the “P” position.
2. Insert the select rod into trunnion of the lower lever.
3. Set the manual lever to the “P” position.
4. While pressing the lower lever toward rearward of the vehicle, tighten the nut with a torque of 9.8 N (1 kg, lb) until it reaches the end surface of the trunnion.

A/T SHIFT LOCK SYSTEM

PFP:34950

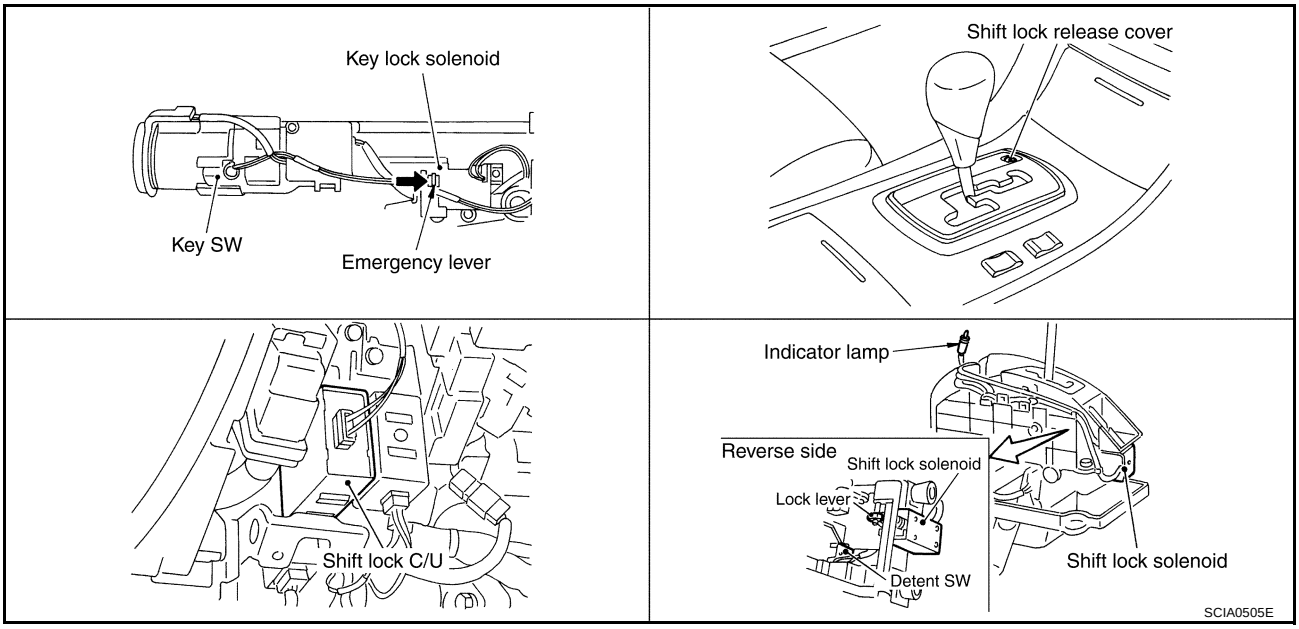
Description

ECS002J1

- The mechanical key interlock mechanism also operates as a shift lock:
  The key switch turned to “ON”,the selector lever cannot be shifted from “P” to any other position unless the brake pedal is depressed.
  With the key removed, the selector lever cannot be shifted from “P” to any other position.
  The key cannot be removed unless the selector lever is placed in “P”.
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder, respectively.

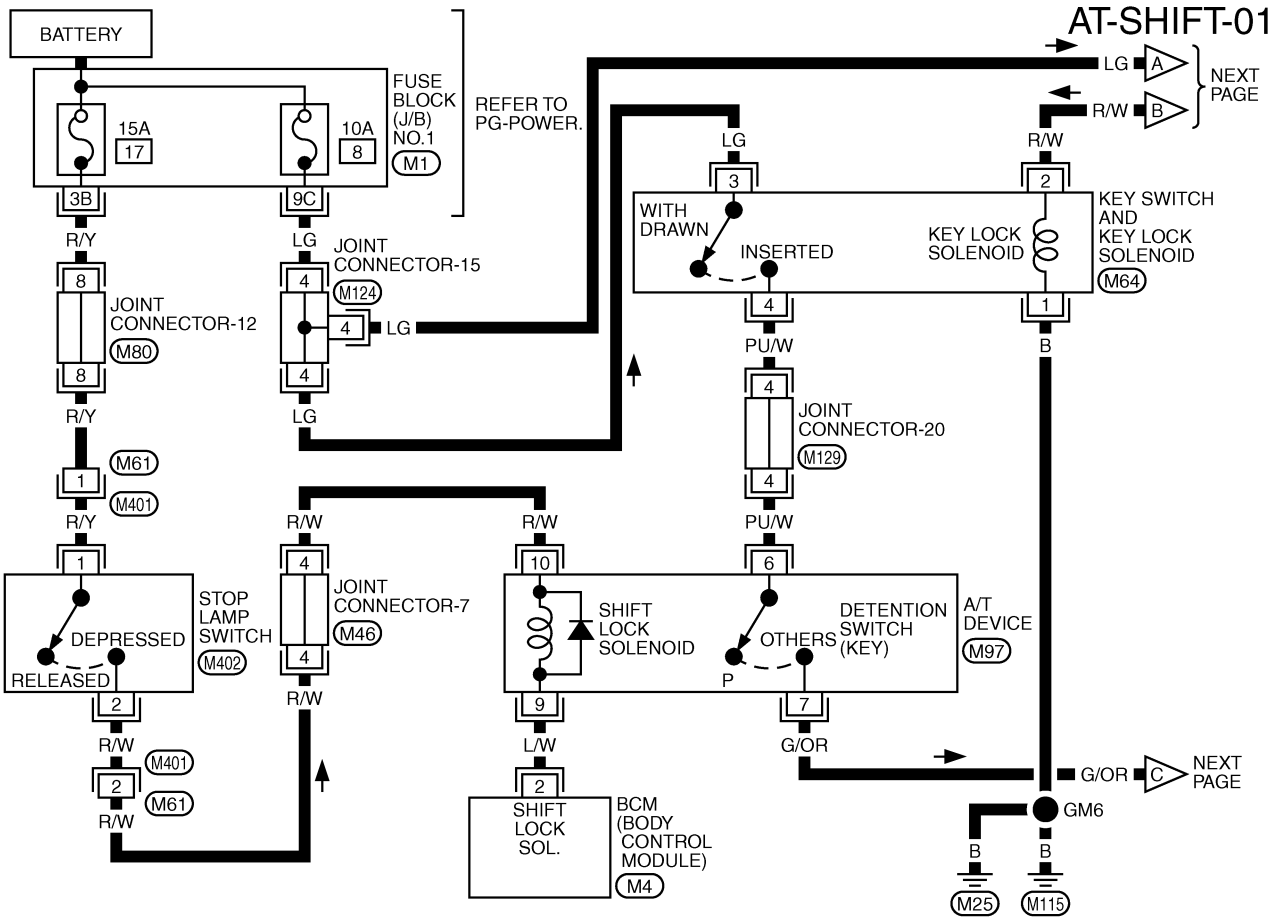
Electrical Parts Location

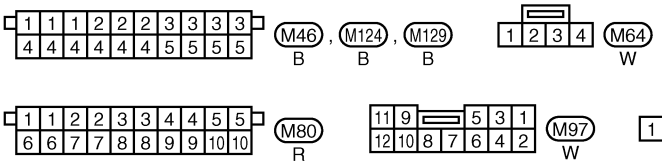
ECS002IT



Wiring Diagram — AT — SHIFT

ECS002IU



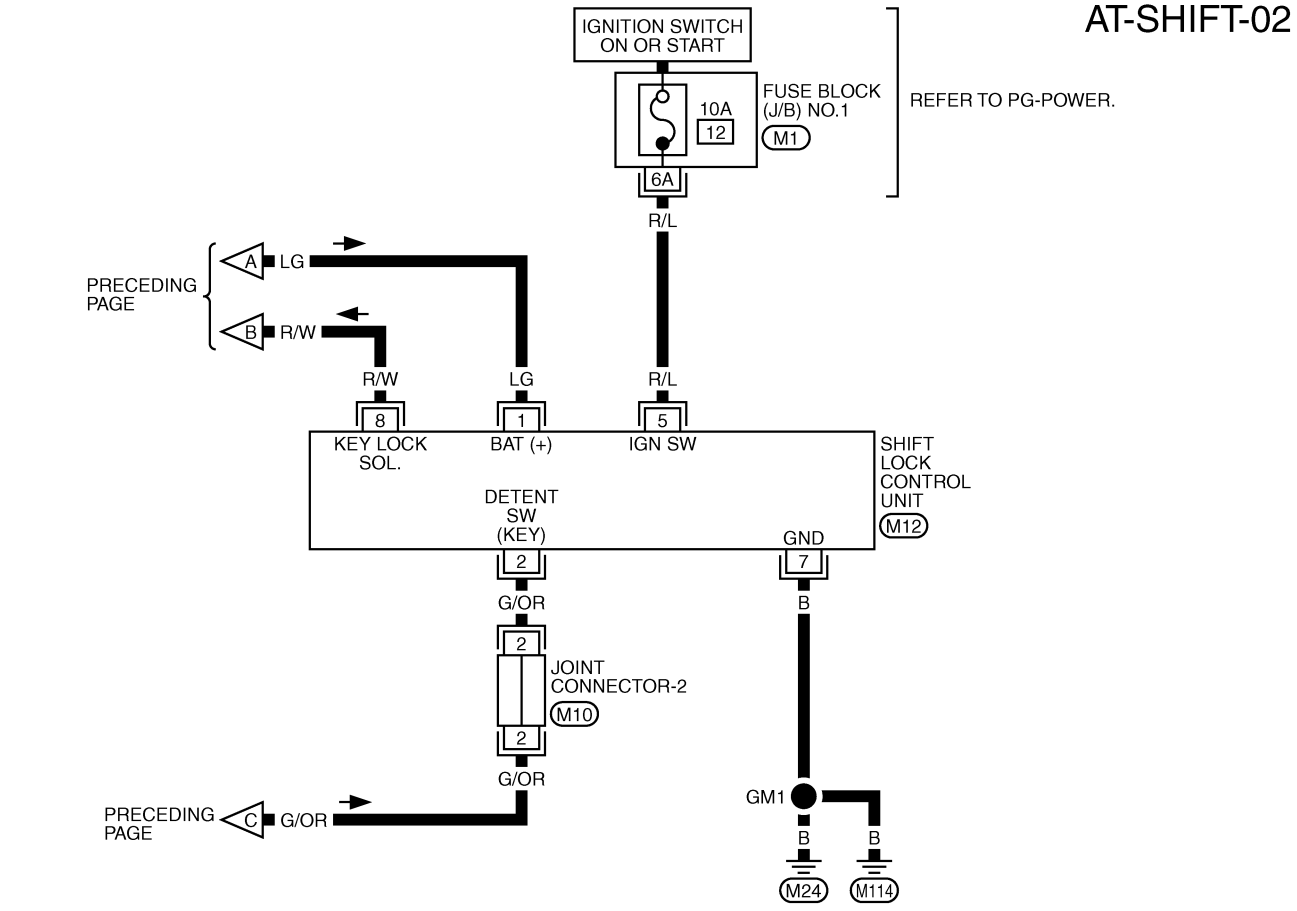


REFER TO THE FOLLOWING.

M1 -FUSE BLOCK-JUNCTION BOX (J/B) NO.1

M4 -ELECTRICAL UNITS

TCWM0034E

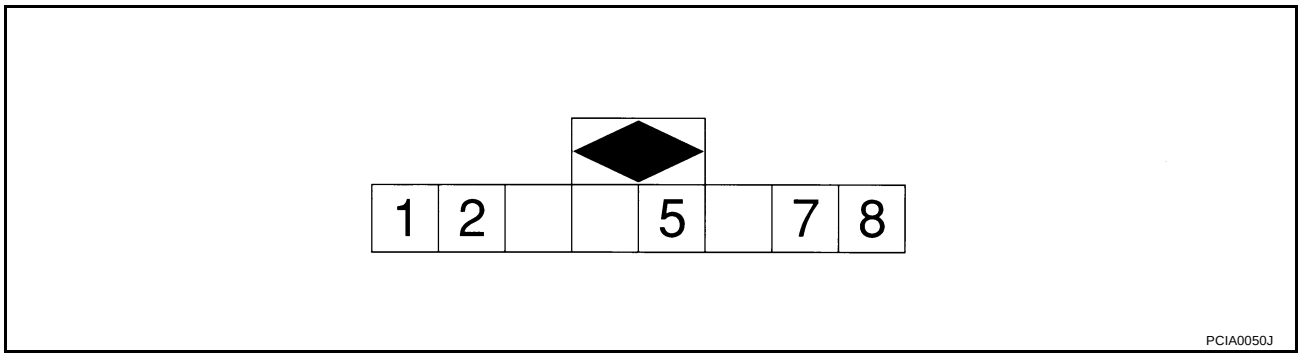


TCWM0035E

Shift Lock Control Unit Reference Values

ECS002IV

SHIFT LOCK HARNESS CONNECTOR TERMINALS LAYOUT



SHIFT LOCK CONTROL UNIT INSPECTION TABLE

Data are reference values.

Terminal No. (+)	Terminal No. (-)	Item	Condition	Judgement standard
1	7	Power source	IGN SW: “ON”	Battery voltage
			IGN SW: “OFF”	
2	7	Detention SW (for key)	The position when the key is inserted and the selector lever is set to a position other than the “P” position, or when it is shifted from the “R” to the“ P” position	Battery voltage
			Except the above	Approx. 0V
5	7	IGN Signal	IGN SW: “ON”	Battery voltage
			IGN SW: “OFF”	Approx. 0V
7	-	Ground	IGN SW: “ON”	Approx. 0V
7	8	Key Lock Signal	When the selector lever is set to a position other than the “P” position, and the key SW is shifted from “ON” to “OFF”	Battery voltage for approx. 1 sec. (Note)
			Except the above	Approx. 0V
8	7	Key Unlock Signal	When the selector lever is set to the“ P” position (without the selector button being depressed)	Battery voltage for approx. 1 sec. (Note)
			Except the above	Approx. 0V

CAUTION:

Confirm that the pointer swings only momentarily because the output time is so short. If the inspection is done with an oscilloscope, it should be observed that the power source voltage lasts for 3.5 to 10 ms.

Component Inspection

ECS002IW

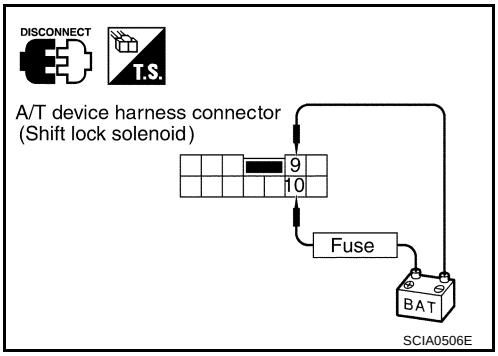
SHIFT LOCK SOLENOID

- Check operation by applying battery voltage to control device connector.

CAUTION:

Be sure to apply the voltage of the correct polarity to the respective terminals. Otherwise, the part may be damaged.

Connector No.	Terminal No.
M97	10 (Battery voltage) - 9 (Ground)

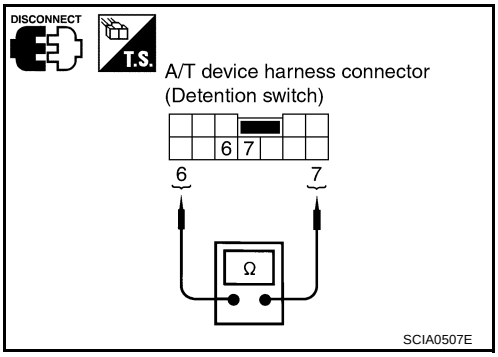


DETENTION SWITCH

For Key:

- Check continuity between terminals of the control device connector.

Condition	Connector No.	Terminal No.	Continuity
The position when the selector lever is set to a position other than the “P” position, or when it is shifted from the “R” to the “P” position	M97	6 - 7	Yes
Except the above			No



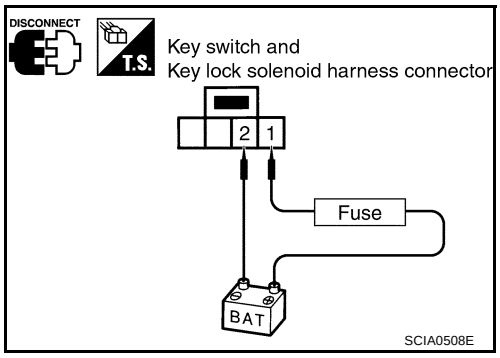
KEY LOCK SOLENOID

Key Lock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:
Be careful not to cause burnout of the harness.

Connector No.	Terminal No.
M64	1 (Battery voltage) - 2 (Ground)

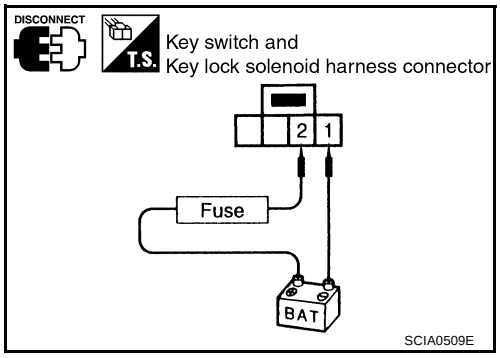


Key Unlock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:
Be careful not to cause burnout of the harness.

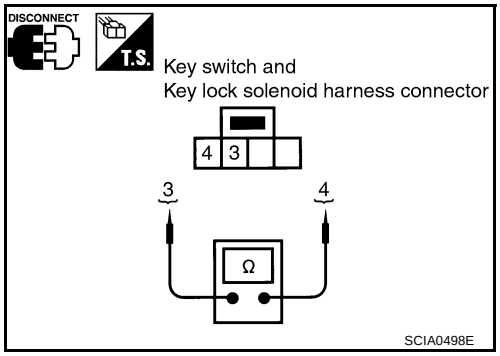
Connector No.	Terminal No.
M64	2 (Battery voltage) - 1 (Ground)



KEY SWITCH

- Check continuity between terminals of the key switch and key lock solenoid connector.

Condition	Connector No.	Terminal No.	Continuity
Key inserted	M64	3 - 4	Yes
Key withdrawn			No

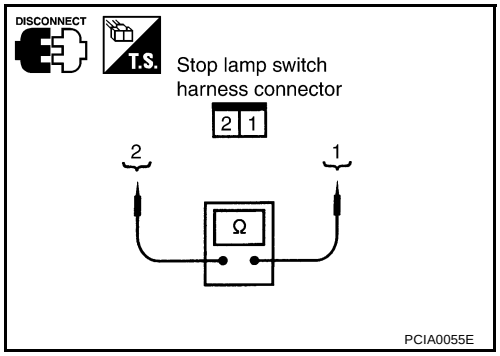


STOP LAMP SWITCH

- Check continuity between terminals of the stop lamp switch connector.

Condition	Connector No.	Terminal No.	Continuity
When brake pedal is depressed	M402	1 - 2	Yes
When brake pedal is released			No

Check stop lamp switch after adjusting brake pedal. Refer to BR-6, "BRAKE PEDAL" .



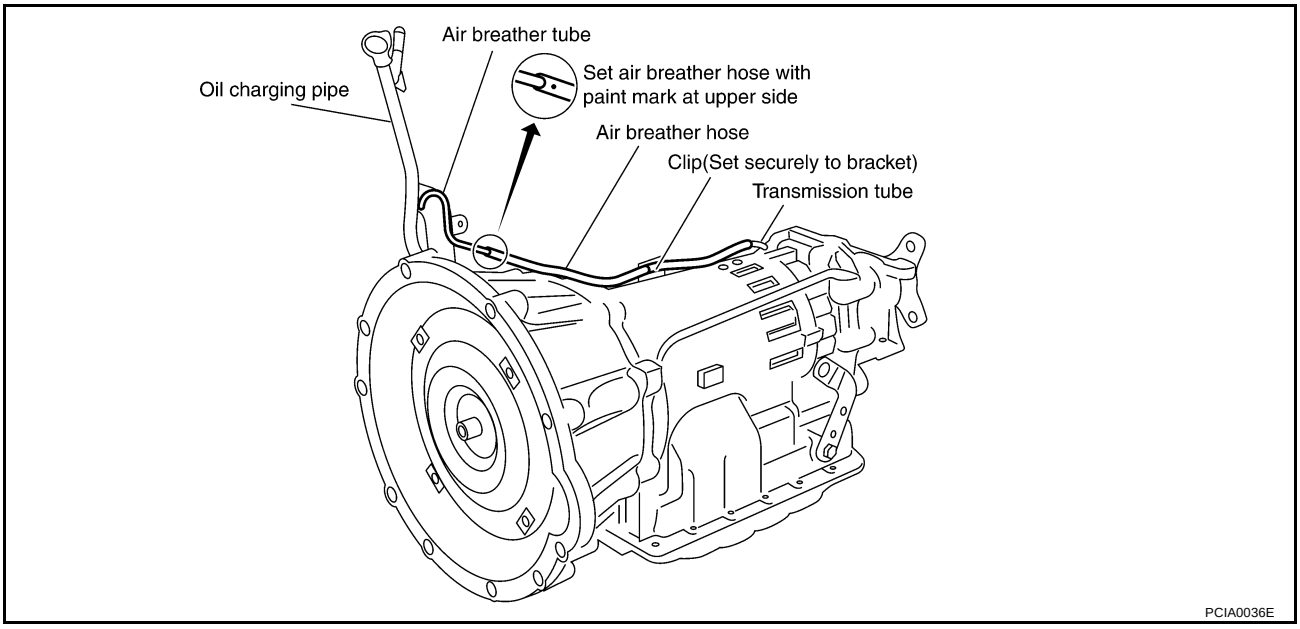
AIR BREATHER HOSE

PFP:31098

Removal and Installation

ECS002IS

Refer to the diagram below for procedure for removal and installation of air breather hose.



CAUTION:

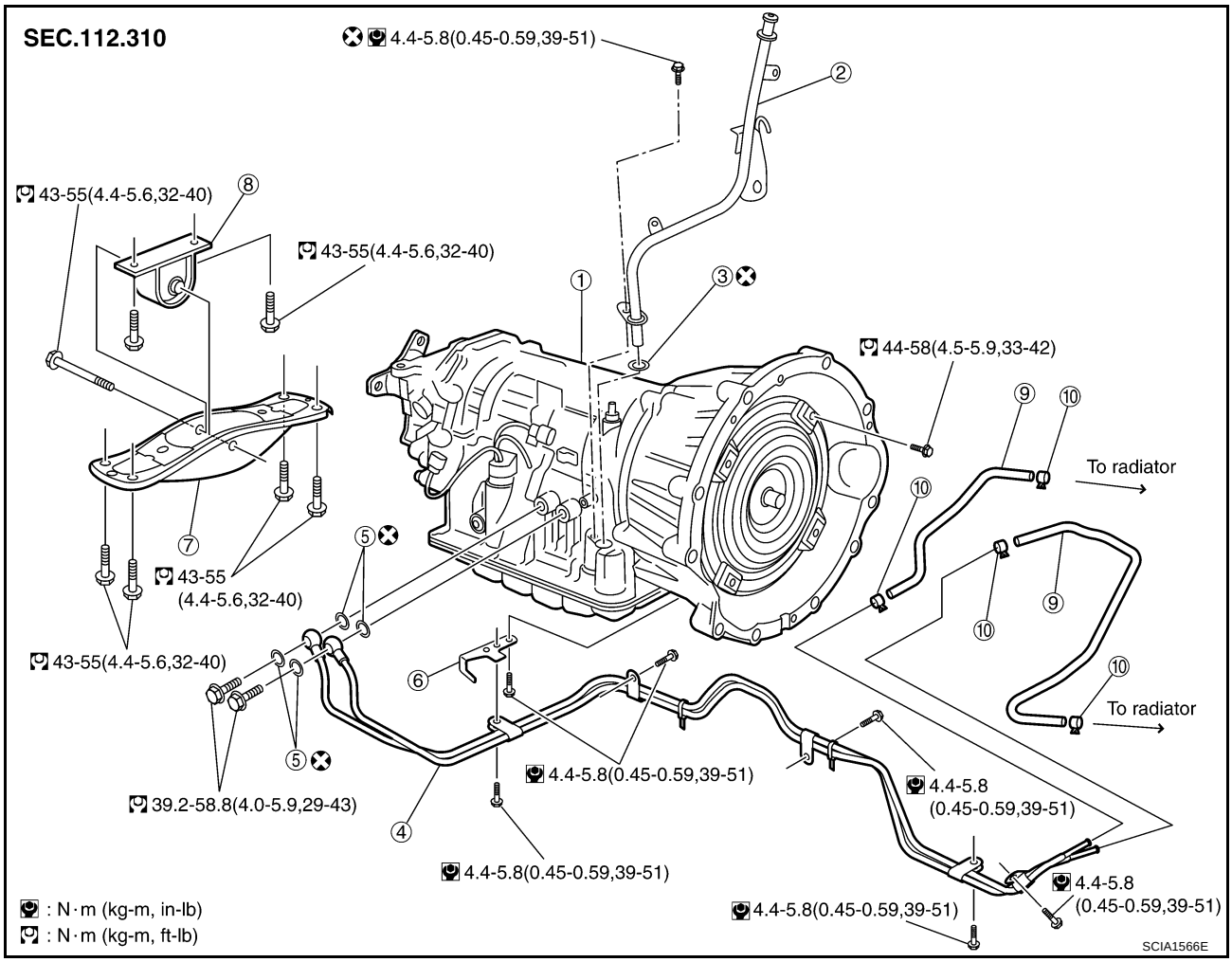
- **When installing an air breather hose, be careful not to be crushed or blocked by folding or bending the hose.**
- **When inserting a hose to the transmission tube, be sure to insert it fully until its end reaches the tube bend R portion.**

TRANSMISSION ASSEMBLY

PFP:31020

Removal and Installation

ECS002IR



1. Transmission assembly
2. A/T fluid charging pipe
3. O-ring
4. Fluid cooler tube
5. Copper washer
6. Bracket
7. Engine rear member
8. Insulator
9. Fluid cooler hose
10. Hose band

REMOVAL

CAUTION:

When removing the A/T assembly from engine, first remove the crankshaft position sensor (POS) from the A/T assembly.

Be careful not to damage sensor edge.

1. Remove the crankshaft position sensor.
2. Remove the engine cover and battery.
3. Remove the exhaust front tube and the heat insulator with power tool.
4. Remove the propeller shaft.
5. Remove A/T control rod from the transmission.
6. Disconnect A/T solenoid valve harness connectors.
7. Remove the tightening bolt for A/T fluid level gauge.
8. Remove the fluid cooler tube.
9. Remove the starter motor.
10. Support A/T assembly with a jack.

CAUTION:

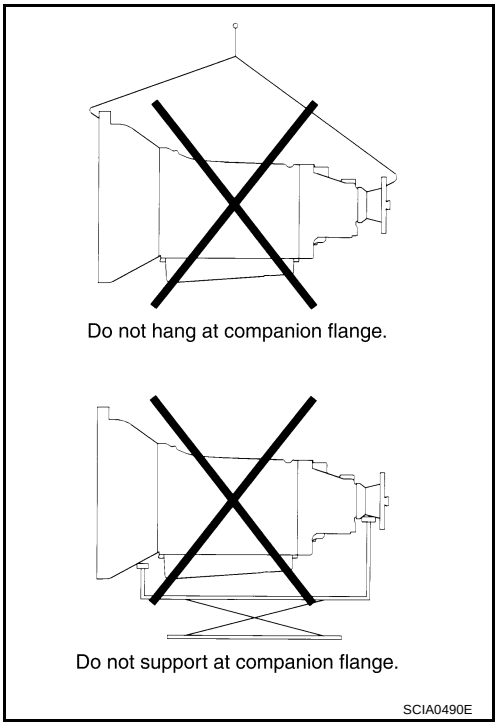
When setting the transmission jack, be careful not to allow it to collide against the drain plug.

11. Remove the dust cover from the converter housing part.
12. Turn the crankshaft, and remove the four tightening bolts for the drive plate and the torque converter.

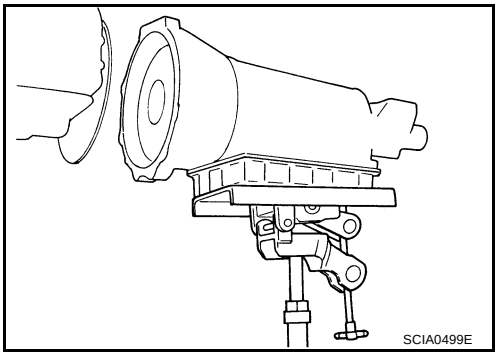
CAUTION:
When turning the crankshaft, turn it clockwise as viewed from the front of the engine.

13. Remove the engine rear member with power tool.
14. Disconnect the A/T fluid charging pipe.
15. Remove the mounting bolts for the engine and the transmission with power tool.

CAUTION:
For the RE5R05A type transmission, do not perform any work that uses the companion flange section located at the rear part of the transmission as a point of support.



16. Remove the transmission from the vehicle.

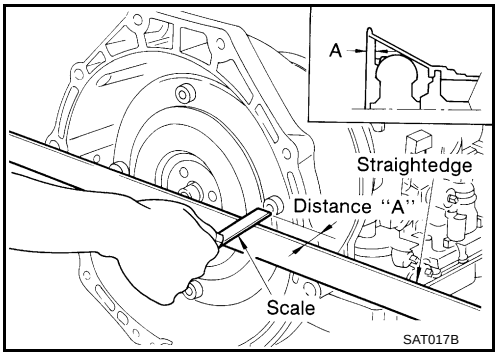


INSPECTION

Installation and Inspection of Torque Converter

- After inserting a torque converter to a transmission, be sure to check dimension A to ensure it is within the reference value limit.

Dimension A :22.0 mm (0.87 in) or more



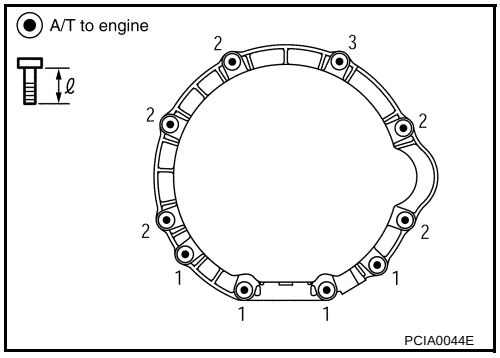
INSTALLATION

Install the removed parts in the reverse order of the removal, while paying attention to the following work.

- When installing transmission to the engine, attach the mounting bolts in accordance with the following standard.

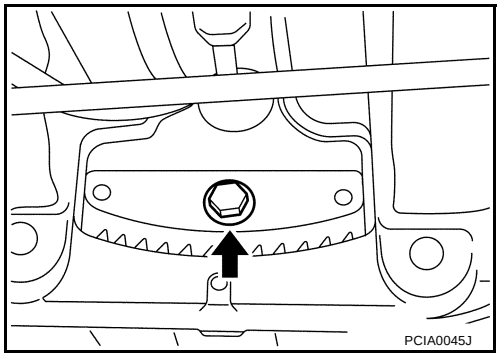
Bolt No.	1	2	3*
Number of bolts	4	5	1
Bolt length "ℓ"mm (in)	65 (2.56)	70 (2.76)	70 (2.76)
Tightening torque N·m (kg-m, ft-lb)	69 - 79 (7.1 - 8.0, 51 - 58)	110 - 118 (11.3 - 12.0, 82 - 87)	

*: Tightening the bolt With A/T fluid charging pipe.



- Align the positions of tightening bolts for drive plate with those of the torque converter, and temporarily tighten the bolts. Then, tighten the bolts with the specified torque.

: **44 - 58 N·m (4.5 - 5.9 kg-m, 33 - 42 ft-lb)**



CAUTION:

- **When turning the crankshaft, turn it clockwise as viewed from the front of the engine.**
- **Before tightening the tightening bolts for the torque converter after fixing the crank pulley bolts, be sure to confirm the tightening torque of the crank pulley mounting bolts.**
- Install crankshaft position sensor (POS). Refer to EM-25, "OIL PAN AND OIL STRAINER" .
- Install the removed A/T fluid level gauge in the oil changing pipe.

: **4.4 - 5.8 N·m (0.45 - 0.59 kg-m, 39 - 51 in-lb)**

- After completing installation, check oil leakage, oil level, and the positions of A/T. Refer to AT-12, "Checking A/T Fluid" , AT-209, "Checking of A/T Positions" , AT-209, "Adjustment of A/T Positions" .
- When replacing the A/T assembly, erase EFP ROM in TCM. Refer to AT-8, "Precautions for A/T Assembly Replacement" .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS001CA

Applied model		VK45DE engine
Automatic transmission model		RE5R05A
Transmission model code number		90X02
Stall torque ratio		2.0: 1
Transmission gear ratio	1st	3.540
	2nd	2.264
	3rd	1.471
	4th	1.000
	5th	0.834
	Reverse	2.370
Recommended fluid		Nissan Matic Fluid J*1
Fluid capacity		10.1 liter (10-5/8 US qt, 8-7/8 Imp qt)

CAUTION:

- **Use only Nissan Genuine ATF Matic Fluid J. Do not mix with other fluid.**
- **Using automatic transmission fluid other than Nissan Genuine ATF Matic Fluid J will deteriorate in drive ability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the INFINITI new vehicle limited warranty.**

*1: Refer to MA-10, "Fluids and Lubricants" .

Vehicle Speed When Shifting Gears Throttle Position

ECS002I8

Throttle position	Vehicle Speed km/h (MPH)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
Full throttle	73 - 77 (45 - 48)	109 - 117 (68 - 73)	170 - 180 (106 - 112)	252 - 262 (157 - 163)	248 - 258 (154 - 160)	160 - 170 (99 - 106)	99 - 107 (62 - 66)	43 - 47 (27 - 29)
Half throttle	36 - 40 (22 - 25)	69 - 75 (43 - 47)	116 - 124 (72 - 77)	162 - 170 (101 - 106)	125 - 133 (78 - 83)	73 - 81 (45 - 50)	46 - 52 (29 - 32)	9 - 13 (6 - 8)

- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed When Performing and Releasing Complete Lock-up

ECS002I9

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up “ON”	Lock-up “OFF”
Closed throttle	76 - 84 (47 - 52)	61 - 69 (38 - 43)
Half throttle	208 - 216 (130 - 134)	157 - 165 (98 - 103)

- At closed throttle, the accelerator opening is less than 1/8.
- At half throttle, the accelerator opening is 4/8 of the full opening.

Vehicle Speed When Performing and Releasing Slip Lock-up

ECS002IA

Throttle position	Gear position	Vehicle speed km/h (MPH)	
		Slip lock-up “ON”	Slip lock-up “OFF”
Closed throttle	4th	38 - 46 (24 - 29)	35 - 43 (22 - 27)
	5th	48 - 56 (30 - 35)	44 - 52 (27 - 32)

- At closed throttle, the accelerator opening is less than 1/8.

Stall Revolution

ECS001CC

Stall revolution	2,200 - 2,500 rpm

Line Pressure

ECS002IC

Engine speed rpm	Line Pressure kpa (kg/cm^2)	
	R position	D, M positions
Idling Revolution	392 - 441 (4.0 - 4.5)	373 - 422 (3.8 - 4.3)
Stall Revolution	1,310 - 1,500 (13.4 - 15.3)	

Solenoid Valves

ECS001CM

Name	Resistance (Approx.) (Ω)	Terminal No.
Line pressure solenoid valve	3 - 9	7
Torque converter clutch solenoid valve		8
Input clutch solenoid valve		6
High & low reverse clutch solenoid valve		3
Front brake solenoid valve		5
Direct clutch solenoid valve		4
Low coast brake solenoid valve	20 - 40	2

A/T Fluid Temperature Sensor

ECS002IE

Name	Condition	CONSULT-II “DATA MONITOR” (Approx.) (V)	Resistance (Approx.) (kΩ)
A/T fluid temperature sensor-1	0°C (32°F)	3.3	15
	20°C (68°F)	2.7	6.5
	80°C (176°F)	0.9	0.9
A/T fluid temperature sensor-2	0°C (32°F)	3.3	10
	20°C (68°F)	2.5	4
	80°C (176°F)	0.7	0.5

Turbine Revolution Sensor

ECS002IF

Name	Condition	Data (Approx.)
Turbine revolution sensor-1	When moving at 20 km/h (12MPH) in 1st speed with the closed throttle position switch “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	1.1 (kHz)
Turbine revolution sensor-2	When running at 50 km/h (31MPH) in 4th speed with the closed throttle position switch “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	

Revolution Sensor

ECS002IG

Name	Condition	Data (Approx.)
Revolution sensor	When moving at 20 km/h (12MPH) in 1st speed with the closed throttle position switch “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	149 (Hz)

Tightening Torque

ECS002IH

Unit: N·m (kg-m, ft-lb)

Transmission to Engine mounting bolts	A/T to engine	69 - 79 (7.1 - 8.0, 51 - 58)
		110 - 118 (11.3 - 12.0, 82 - 87)