SECTION AT
AUTOMATIC TRANSAXLE

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RE5F22A

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PFP:00000

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UCS000M8

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*1: These numbers are prescribed by SAE J2012.
*2: When the fail-safe operation occurs, the MIL illuminates.
*3: The MIL illuminates when both the “Revolution sensor signal” and the “Vehicle speed sensor signal” meet the fail-safe condition at the same time.

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*1: These numbers are prescribed by SAE J2012.
*2: When the fail-safe operation occurs, the MIL illuminates.
*3: The MIL illuminates when both the “Revolution sensor signal” and the “Vehicle speed sensor signal” meet the fail-safe condition at the same time.

PRECAUTIONS

PFP:00001

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

UCS000M9

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. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. 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

UCS000MA

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.

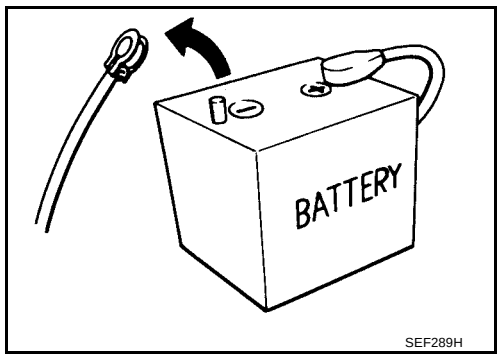
CAUTION:

- **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 or ECM before returning the vehicle to the customer.**

Precautions

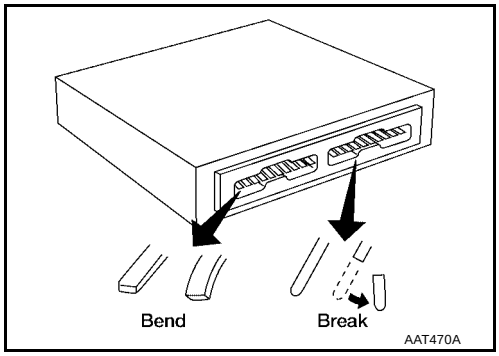
UCS000MB

- **Before connecting or disconnecting the TCM harness connector, turn ignition switch OFF and disconnect negative battery terminal. Failure to do so may damage the TCM. Because battery voltage is applied to TCM even if ignition switch is turned off.**

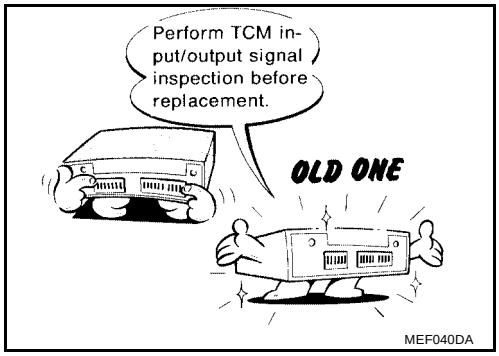


SEF289H

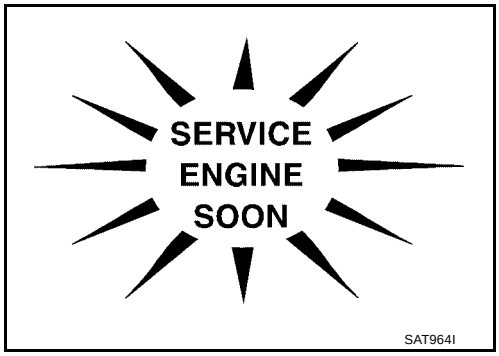
- **When connecting or disconnecting pin connectors into or from TCM, take care not to damage pin terminals (bend or break).**
  Make sure that there are not any bends or breaks on TCM pin terminal, when connecting pin connectors.



- **Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not. Refer to AT-99, "TCM INSPECTION TABLE" .**



- **After performing each TROUBLE DIAGNOSIS, perform "DTC (Diagnostic Trouble Code) CONFIRMATION PROCEDURE".**
  The DTC should not be displayed in the "DTC CONFIRMATION PROCEDURE" if the repair is completed.
- Before proceeding with disassembly, thoroughly clean the outside of the transaxle. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Disassembly should be done in a clean work area.
- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transaxle.



- Place disassembled parts in order for easier and proper assembly.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Gaskets, seals and O-rings should be replaced any time the transaxle is disassembled.
- It is very important to perform functional tests whenever they are indicated.
- The valve body contains precision parts and requires extreme care when parts are removed and serviced. Place disassembled valve body parts in order for easier and proper assembly. Care will also prevent springs and small parts from becoming scattered or lost.
- Properly installed valves, sleeves, plugs, etc. will slide along bores in valve body under their own weight.
- Before assembly, apply a coat of recommended ATF to all parts. Apply petroleum jelly to protect O-rings and seals, or hold bearings and washers in place during assembly. Do not use grease.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- Clean or replace ATF cooler if excessive foreign material is found in oil pan or clogging strainer. Refer to AT-11, "ATF COOLER SERVICE" .
- After overhaul, refill the transaxle with new ATF.
- When the A/T drain plug is removed, only some of the fluid is drained. Old A/T fluid will remain in torque converter and ATF cooling system.
  Always follow the procedures when changing A/T fluid. Refer to MA-22, "Changing A/T Fluid" .

Service Notice or Precautions

UCS000MC

FAIL-SAFE

The TCM has an electronic Fail-Safe (limp home mode). This allows the vehicle to be driven even if a major electrical input/output device circuit is damaged.
Under Fail-Safe, the vehicle always runs in third gear, even with a shift lever position of 1, 2 or D. The customer may complain of sluggish or poor acceleration.
When the ignition key is turned ON following Fail-Safe operation, A/T CHECK indicator lamp blinks for about 8 seconds. [For “TCM Self-diagnostic Procedure (No Tools)”, refer to AT-54, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .]
The blinking of the A/T CHECK indicator lamp for about 8 seconds will appear only once and be cleared. The customer may resume normal driving conditions.
Always follow the “Work Flow” (Refer to AT-63, "Work Flow").
The SELF-DIAGNOSIS results will be as follows:

- The first SELF-DIAGNOSIS will indicate damage to the vehicle speed sensor or the revolution sensor.
- During the next SELF-DIAGNOSIS, performed after checking the sensor, no damages will be indicated.

TORQUE CONVERTER SERVICE

The torque converter should be replaced under any of the following conditions:

- External leaks in the hub weld area.
- Converter hub is scored or damaged.
- Converter pilot is broken, damaged or fits poorly into crankshaft.
- Steel particles are found after flushing the cooler and cooler lines.
- Pump is damaged or steel particles are found in the converter.
- Vehicle has TCC shudder and/or no TCC apply. Replace only after all hydraulic and electrical diagnoses have been made. (Converter clutch material may be glazed.)
- Converter is contaminated with engine coolant containing antifreeze.
- Internal failure of stator roller clutch.
- Heavy clutch debris due to overheating (blue converter).
- Steel particles or clutch lining material found in fluid filter or on magnet when no internal parts in unit are worn or damaged — indicates that lining material came from converter.
  The torque converter should not be replaced if:
- The fluid has an odor, is discolored, and there is no evidence of metal or clutch facing particles.
- The threads in one or more of the converter bolt holes are damaged.
- Transaxle failure did not display evidence of damaged or worn internal parts, steel particles or clutch plate lining material in unit and inside the fluid filter.
- Vehicle has been exposed to high mileage (only). The exception may be where the torque converter clutch dampener plate lining has seen excess wear by vehicles operated in heavy and/or constant traffic, such as taxi, delivery or police use.

ATF COOLER SERVICE

If A/T fluid contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T oil cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. Check Service Bullitens for latest A/T oil cooler cleaning procedure. For radiator replacement, refer to CO-10, "RADIATOR"

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-44 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 “HOW TO ERASE DTC” on AT-41 to complete the repair and avoid unnecessary blinking of the MIL.
- The following self-diagnostic items can be detected using ECM self-diagnostic results mode* only when the A/T CHECK indicator lamp does not indicate any malfunctions.

– park/neutral position (PNP) switch

*: 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 a new style slide-locking type harness connector.**
  For description and how to disconnect, refer to GI-22, "How to Check Terminal" .

Wiring Diagrams and Trouble Diagnosis

UCS000MD

When you read wiring diagrams, refer to the following:

- GI-12, "How to Read Wiring Diagrams"
- PG-3, "POWER SUPPLY ROUTING CIRCUIT"

When you perform trouble diagnosis, refer to the following:

- GI-9, "How to Follow Trouble Diagnoses"
- GI-25, "How to Perform Efficient Diagnosis for an Electrical Incident"

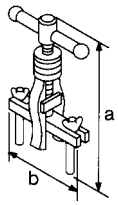
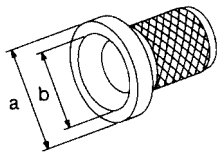
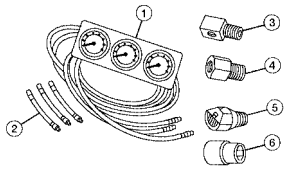
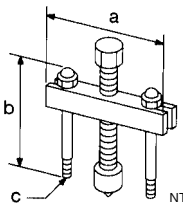
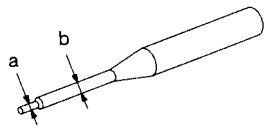
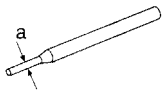
PREPARATION

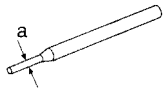
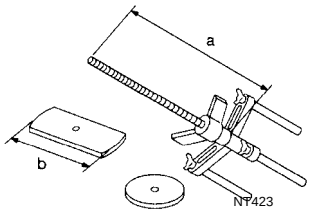
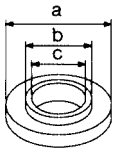
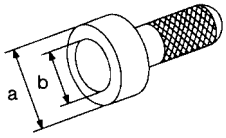
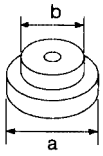
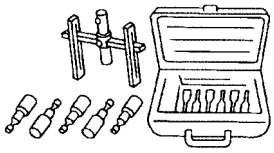
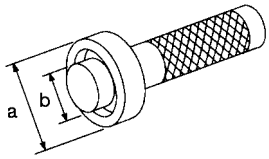
PFP:00002

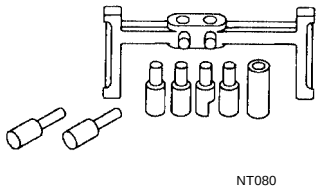
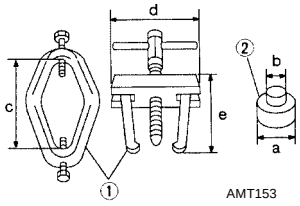
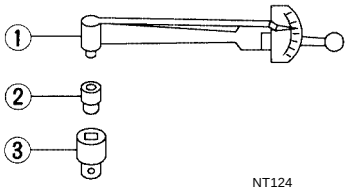
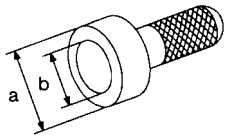
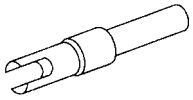
Special Service Tools

UCS000ME

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

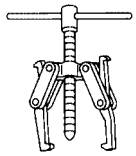
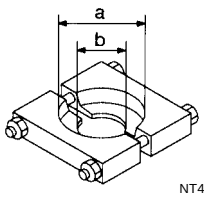
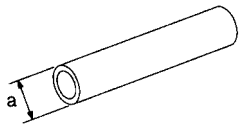
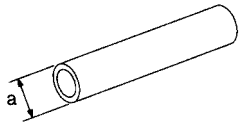
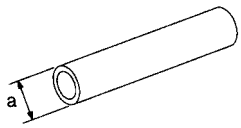
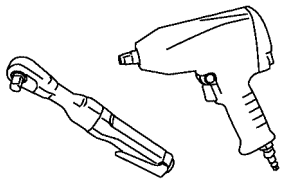
Tool number (Kent-Moore No.) Tool name		Description
KV381054S0 (J34286) Puller	 NT414	● Removing differential side oil seals ● Removing differential side bearing outer race ● Removing idler gear bearing outer race **a: 250 mm (9.84 in)** **b: 160 mm (6.30 in)**
ST33400001 (J26082) Drift	 NT086	● Installing differential side oil seal (RH side) ● Installing oil seal on oil pump housing **a: 60 mm (2.36 in) dia.** **b: 47 mm (1.85 in) dia.**
(J34301-C) Oil pressure gauge set 1 (J34301-1) Oil pressure gauge 2 (J34301-2) Hoses 3 (J34298) Adapter 4 (J34282-2) Adapter 5 (790-301-1230-A) 60° Adapter 6 (J34301-15) Square socket	 AAT896	● Measuring line pressure
ST27180001 (J25726-A) Puller	 NT424	● Removing idler gear **a: 100 mm (3.94 in)** **b: 110 mm (4.33 in)** **c: M8 x 1.25P**
ST23540000 (J25689-A) Pin punch	 NT442	● Removing and installing parking rod plate and manual plate pins **a: 2.3 mm (0.091 in) dia.** **b: 4 mm (0.16 in) dia.**
ST25710000 (J25689-A) Pin punch	 NT410	● Aligning groove of manual shaft and hole of transmission case **a: 2 mm (0.08 in) dia.**

Tool number (Kent-Moore No.) Tool name		Description
KV32101000 (J25689-A) Pin punch	 NT410	● Removing and installing manual shaft retaining pin ● Removing and installing pinion mate shaft lock pin **a: 4 mm (0.16 in) dia.**
KV31102400 (J34285 and J34285-87) Clutch spring compressor	 NT423	● Removing and installing clutch return springs ● Installing low and reverse brake piston **a: 320 mm (12.60 in)** **b: 174 mm (6.85 in)**
KV40100630 (J26092) Drift	 NT107	● Installing reduction gear bearing inner race ● Installing idler gear bearing inner race **a: 67.5 mm (2.657 in) dia.** **b: 44 mm (1.73 in) dia.** **c: 38.5 mm (1.516 in) dia.**
ST30720000 (J25405 and J34331) Bearing installer	 NT115	● Installing idler gear bearing outer race **a: 77 mm (3.03 in) dia.** **b: 55.5 mm (2.185 in) dia.**
ST35321000 (—) Drift	 NT073	● Installing output shaft bearing **a: 49 mm (1.93 in) dia.** **b: 41 mm (1.61 in) dia.**
(J34291-A) Shim setting gauge set	 NT101	● Selecting oil pump cover bearing race and oil pump thrust washer ● Selecting side gear thrust washer
ST33230000 (J25805-01) Drift	 NT084	● Installing differential side bearing inner race (RH side) **a: 51 mm (2.01 in) dia.** **b: 28.5 mm (1.122 in) dia.**

Tool number (Kent-Moore No.) Tool name	Description
(J34290) Shim selecting tool set  NT080	● Selecting differential side bearing adjusting shim
ST3306S001 (J22888-D) Differential side bearing puller set 1 ST33051001 (J22888-D) Puller 2 ST33061000 (J8107-2) Adapter  AMT153	● Removing differential side bearing inner race **a: 38 mm (1.50 in) dia.** **b: 28.5 mm (1.122 in) dia.** **c: 130 mm (5.12 in)** **d: 135 mm (5.31 in)** **e: 100 mm (3.94 in)**
ST3127S000 (J25765-A) Preload gauge 1 GG91030000 (J25765-A) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter  NT124	● Checking differential side bearing preload
ST35271000 (J26091) Drift  NT115	● Installing idler gear **a: 72 mm (2.83 in) dia.** **b: 63 mm (2.48 in) dia.**
(J39713) Preload adapter  NT087	● Selecting differential side bearing adjusting shim ● Checking differential side bearing preload

Commercial Service Tools

UCS000MF

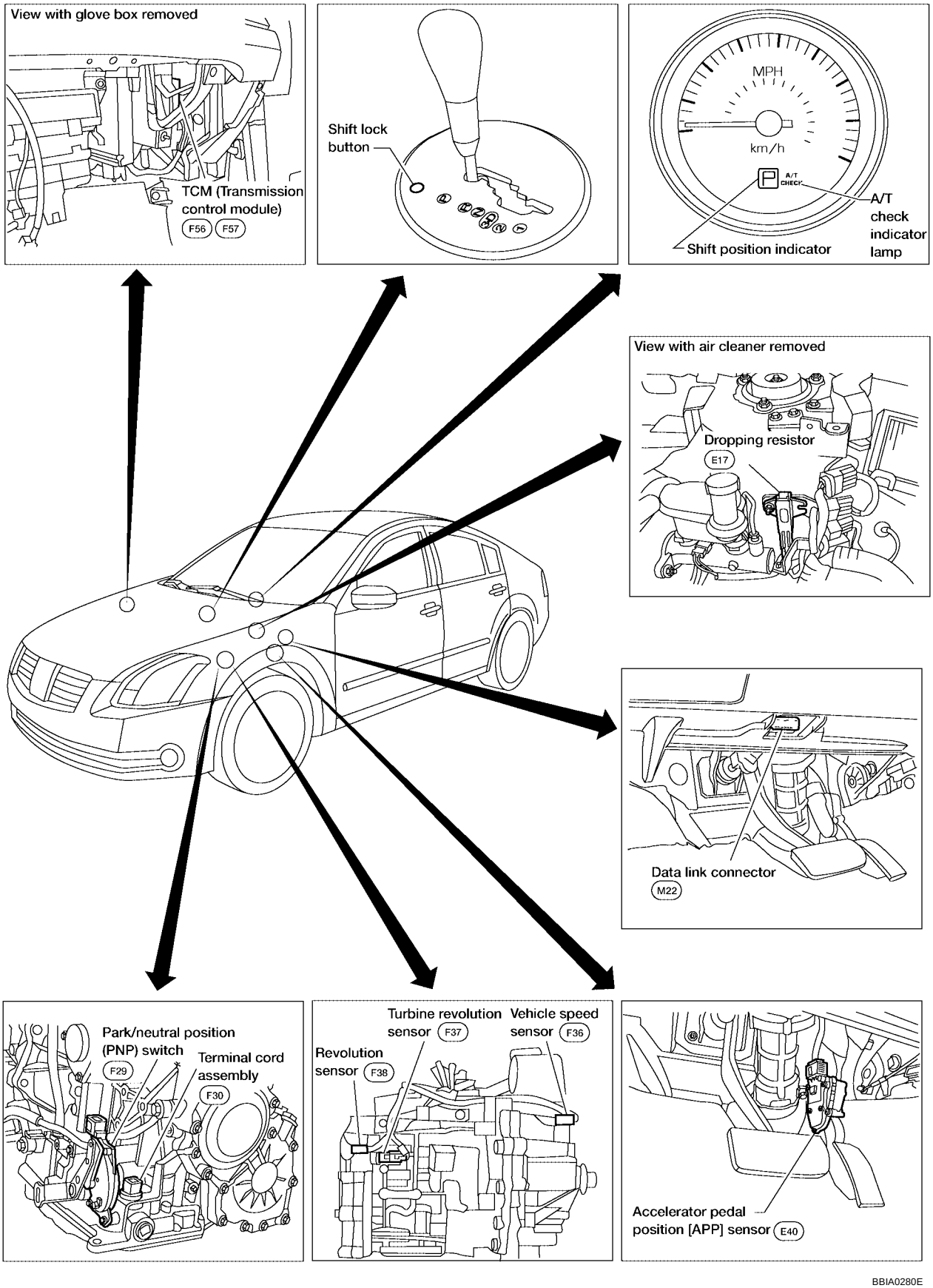
Tool name	Description
Puller  NT077	● Removing idler gear bearing inner race ● Removing and installing band servo piston snap ring
Puller  NT411	● Removing reduction gear bearing inner race **a: 60 mm (2.36 in) dia.** **b: 35 mm (1.38 in) dia.**
Drift  NT083	● Installing needle bearing on bearing retainer **a: 36 mm (1.42 in) dia.**
Drift  NT083	● Removing needle bearing from bearing retainer **a: 33.5 mm (1.319 in) dia.**
Drift  NT083	● Installing differential side bearing outer race (RH side) **a: 75 mm (2.95 in) dia.**
Power tool  PBIC0190E	● Removing transaxle assembly ● Removing transaxle oil pan ● Removing transaxle case and cover

OVERALL SYSTEM

PFP:00000

A/T Electrical Parts Location

UCS000MG



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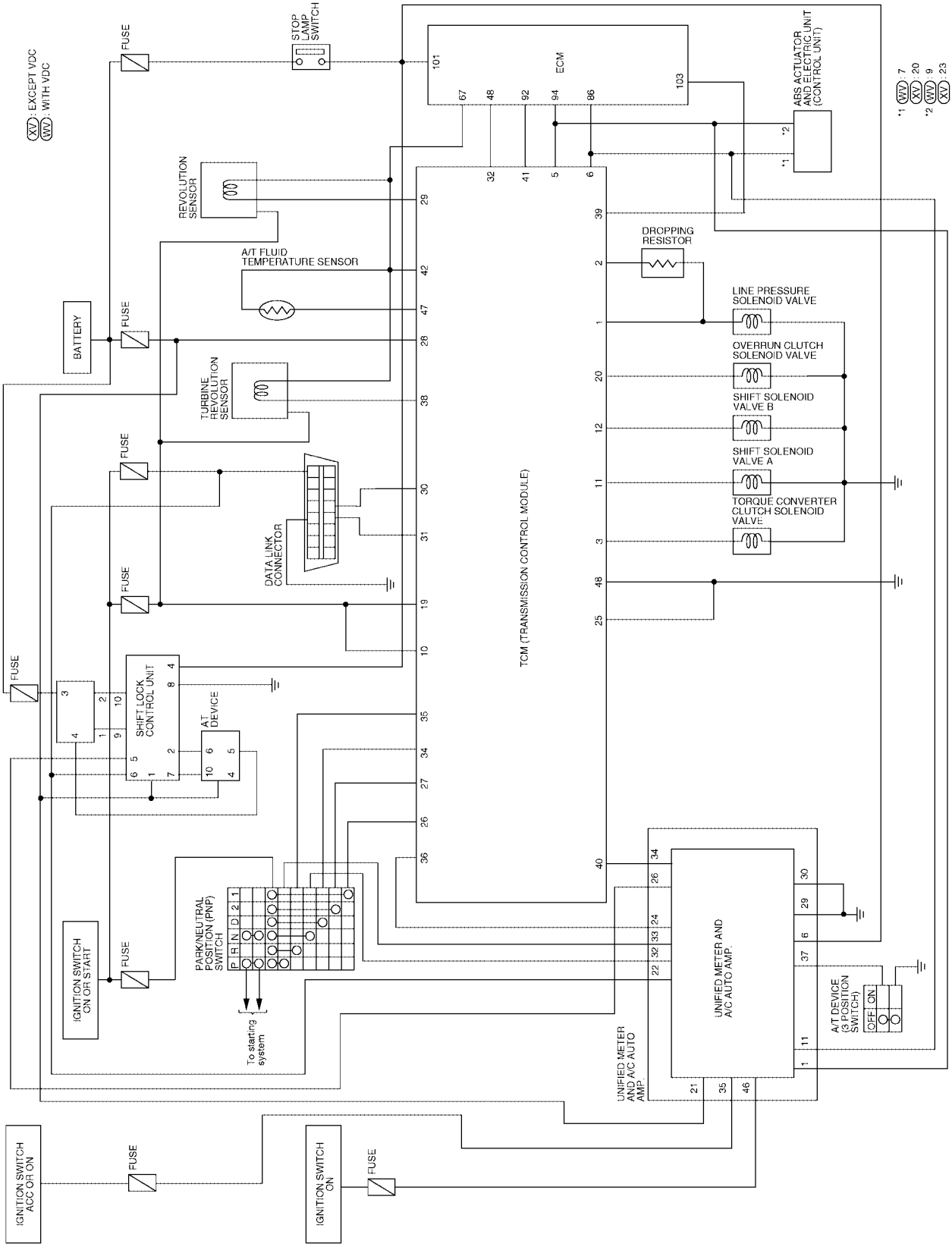
Circuit Diagram

UCS000MH



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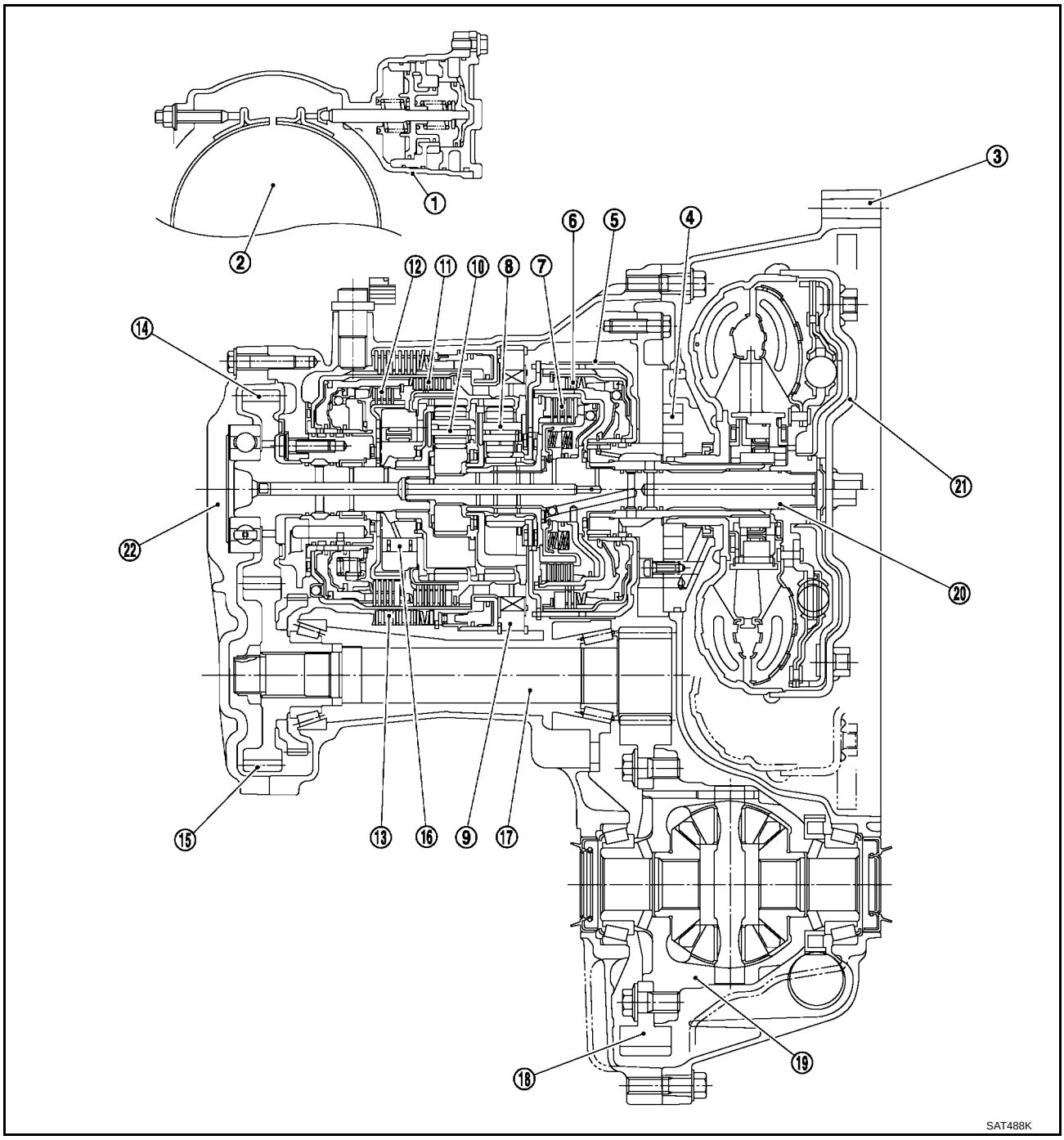
Cross-sectional View

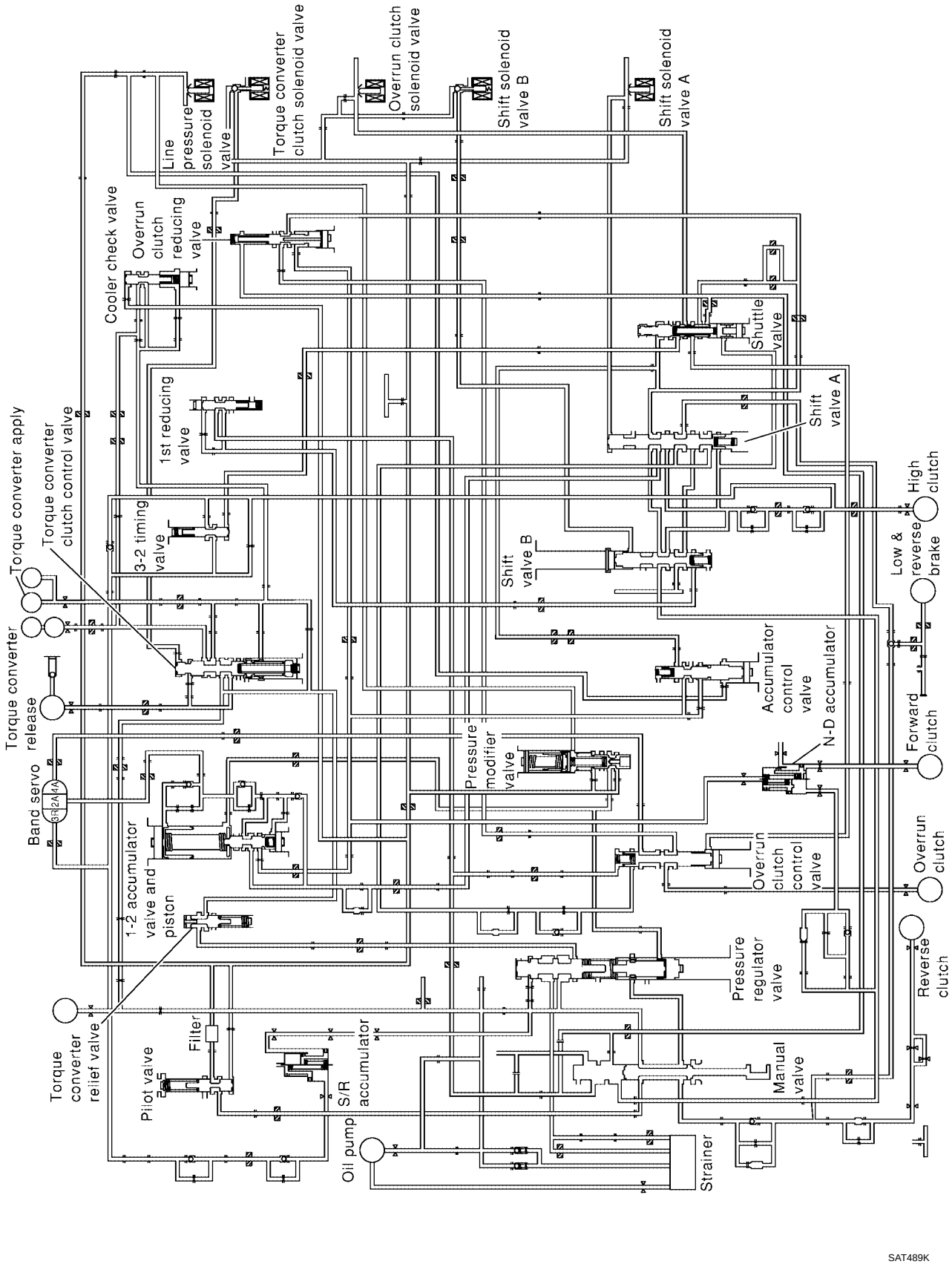
UCS000MI



1. Band servo piston
2. Reverse clutch drum
3. Converter housing
4. Oil pump
5. Brake band
6. Reverse clutch
7. High clutch
8. Front planetary gear
9. Low one-way clutch
10. Rear planetary gear
11. Forward clutch
12. Overrun clutch
13. Low & reverse brake
14. Output gear
15. Idler gear
16. Forward one-way clutch
17. Pinion reduction gear
18. Final gear
19. Differential case
20. Input shaft
21. Torque converter
22. Side cover

Hydraulic Control Circuit

UCS000MJ



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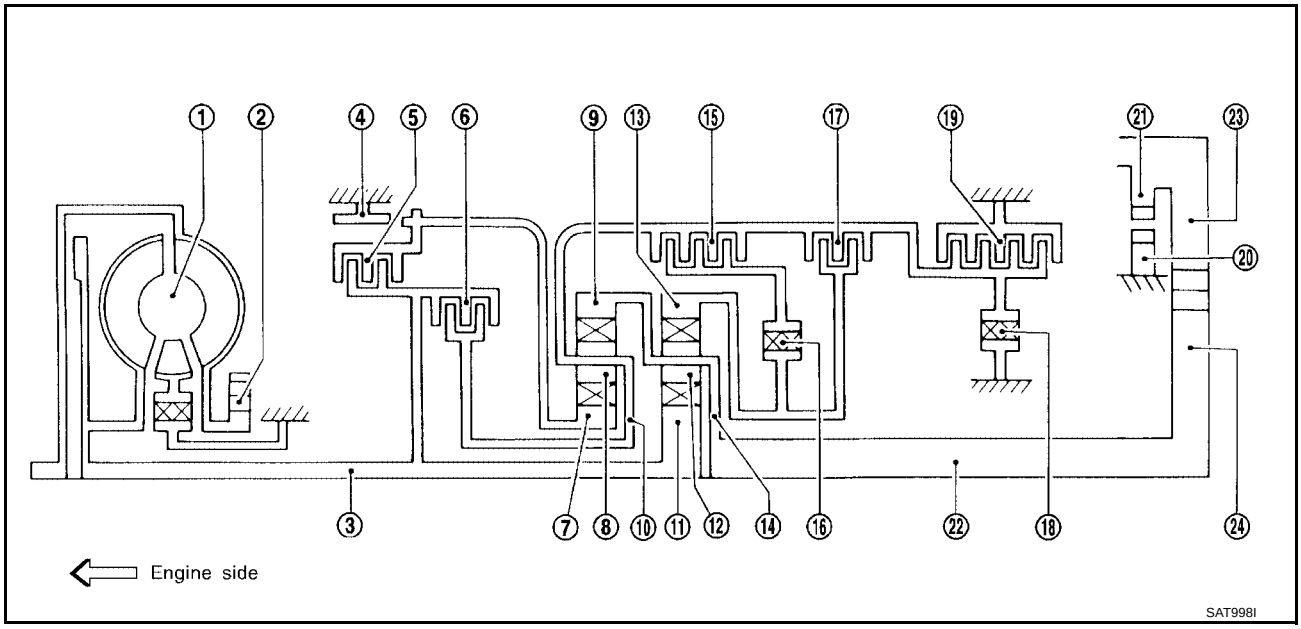
Shift Mechanism

UCS000MK

CONSTRUCTION



1. Torque converter
2. Oil pump
3. Input shaft
4. Brake band
5. Reverse clutch
6. High clutch
7. Front sun gear
8. Front pinion gear
9. Front internal gear
10. Front planetary carrier
11. Rear sun gear
12. Rear pinion gear
13. Rear internal gear
14. Rear planetary carrier
15. Forward clutch
16. Forward one-way clutch
17. Overrun clutch
18. Low one-way clutch
19. Low & reverse brake
20. Parking pawl
21. Parking gear
22. Output shaft
23. Idle gear
24. Output gear

FUNCTION OF CLUTCH AND BRAKE

Clutch and brake components	Abbr.	Function
Reverse clutch **5**	R/C	To transmit input power to front sun gear **7** .
High clutch **6**	H/C	To transmit input power to front planetary carrier **10** .
Forward clutch **15**	F/C	To connect front planetary carrier **10** with forward one-way clutch **16** .
Overrun clutch **17**	O/C	To connect front planetary carrier **10** with rear internal gear **13** .
Brake band **4**	B/B	To lock front sun gear **7** .
Forward one-way clutch **16**	F/O.C	When forward clutch **15** is engaged, to stop rear internal gear **13** from rotating in opposite direction against engine revolution.
Low one-way clutch **18**	L/O.C	To stop front planetary carrier **10** from rotating in opposite direction against engine revolution.
Low & reverse brake **19**	L & R/B	To lock front planetary carrier **10** .

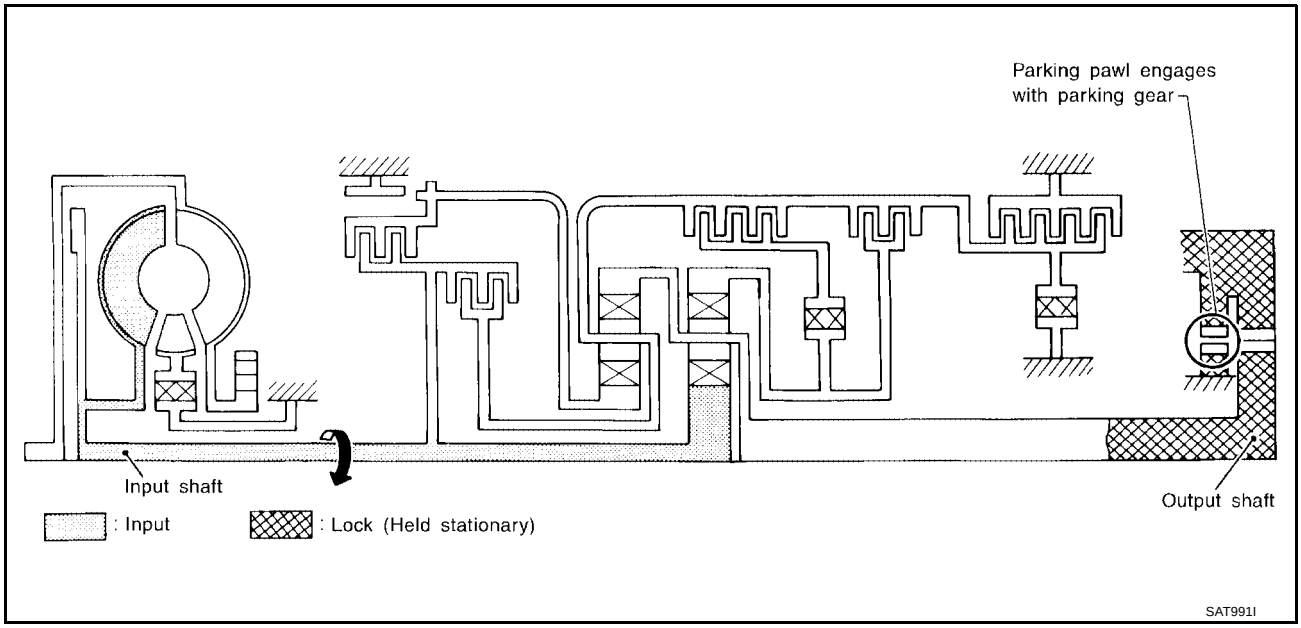
CLUTCH AND BAND CHART

Shift position		Reverse clutch **5**	High clutch **6**	Forward clutch **15**	Overrun clutch **17**	Band servo			Forward one-way clutch **16**	Low one-way clutch **18**	Low & reverse brake **19**	Lock-up	Remarks
						2nd apply	3rd release	4th apply					
P													PARK POSITION
R		O									O		REVERSE POSITION
N													NEUTRAL POSITION
D*4	1st			O	*1D				B	B			Automatic shift 1 ⇔ 2 ⇔ 3 ⇔ 4
	2nd			O	*1 A	O			B				
	3rd		O	O	*1 A	*2C	C		B			*1O	
	4th		O	C		*3C	C	O				O	
2	1st			O	O				B	B			Automatic shift 1 ⇔ 2 ⇐ 3
	2nd			O	O	O			B				
	3rd		O	O	O	*2C	C		B				
1	1st			O	O				B		O		Locks (held stationary) in 1st speed 1 ⇐ 2 ⇐ 3
	2nd			O	O	O			B				
	3rd		O	O	O	*2C	C		B				

*1: Operates when selector lever is set in 3 position.
*2: Oil pressure is applied to both 2nd “apply” side and 3rd “release” side of band servo piston. However, brake band does not contract because oil pressure area on the “release” side is greater than that on the “apply” side.
*3: Oil pressure is applied to 4th “apply” side in condition *2 above, and brake band contracts.
*4: A/T will not shift to 4th when selector lever is set in 3 position.
O: Operates
A: Operates when throttle opening is less than 3/16, activating engine brake.
B: Operates during “progressive” acceleration.
C: Operates but does not affect power transmission.
D: Operates when throttle opening is less than 3/16, but does not affect engine brake.

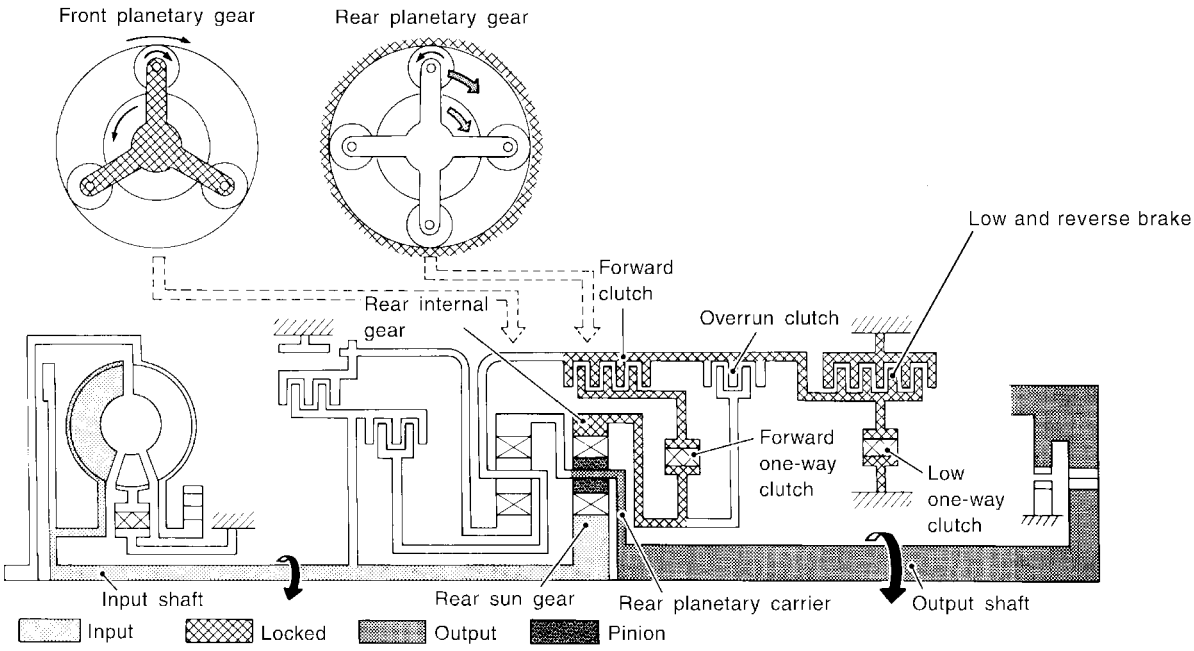
POWER TRANSMISSION

P and N Positions



- P position
  Similar to the N position, the clutches do not operate. The parking pawl engages with the parking gear to mechanically hold the output shaft so that the power train is locked.
- N position
  Power from the input shaft is not transmitted to the output shaft because the clutches do not operate.

11 Position

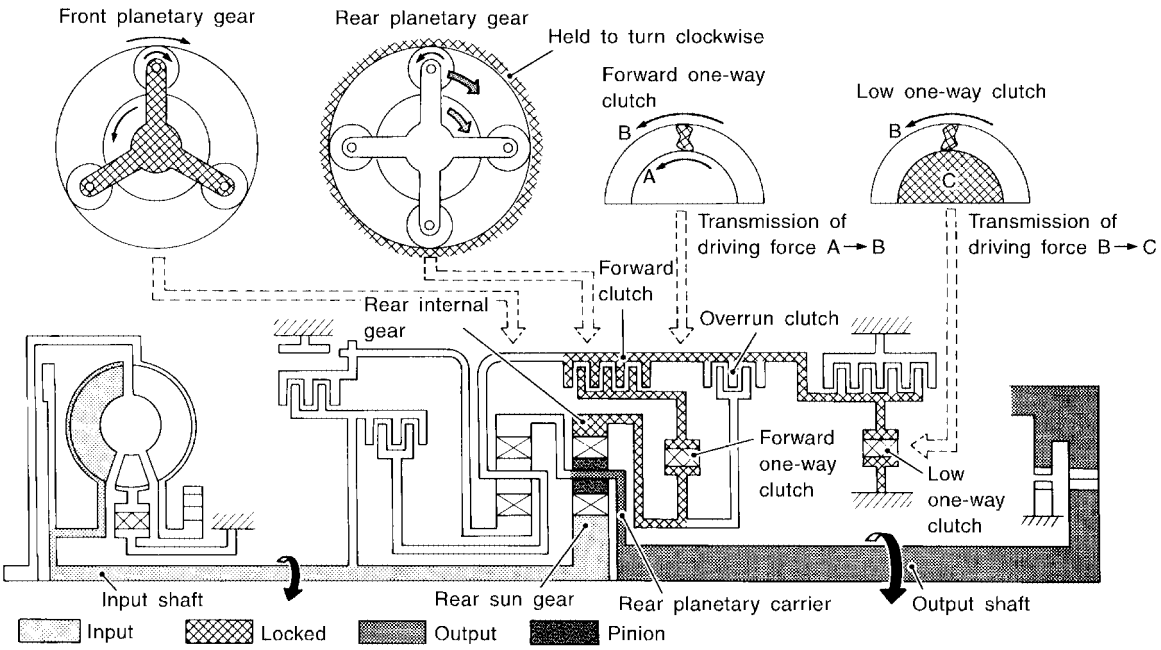


Power flow

Input shaft
⇩
Rear sun gear
⇩
Rear planetary carrier ⇨ Output shaft

● **Forward clutch** ● **Forward one-way clutch** ● **Overrun clutch** ● **Low and reverse brake**	As overrun clutch engages, rear internal gear is locked by the operation of low and reverse brake. This is different from that of D_1 , 2_1 , and 3_1 .
Engine brake	Overrun clutch always engages, therefore engine brake can be obtained when decelerating.

D1 and 21 Positions



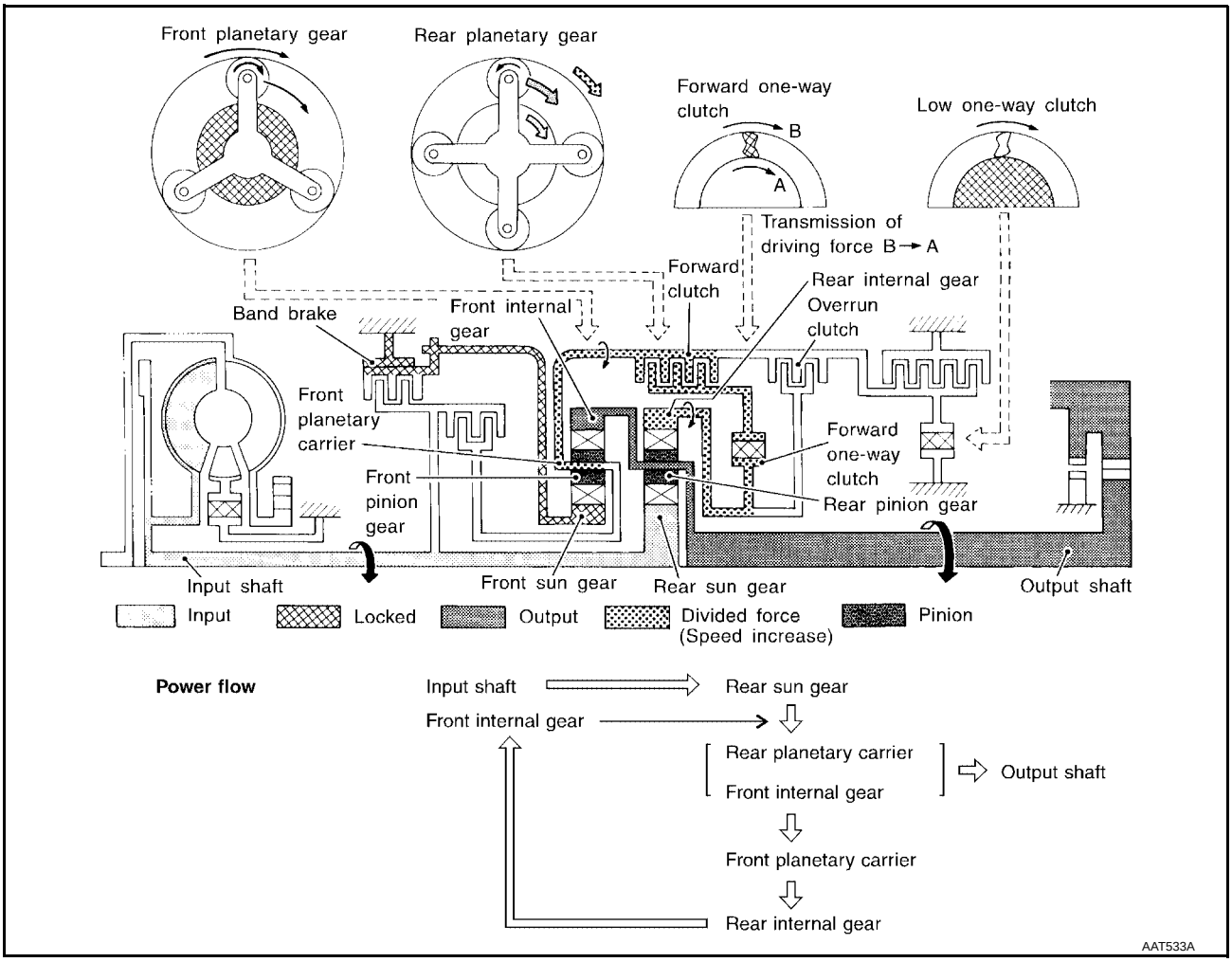
Power flow

Input shaft
⇩
Rear sun gear
⇩
Rear pinion gear
⇩
Rear planetary carrier → Output shaft

AAT532A

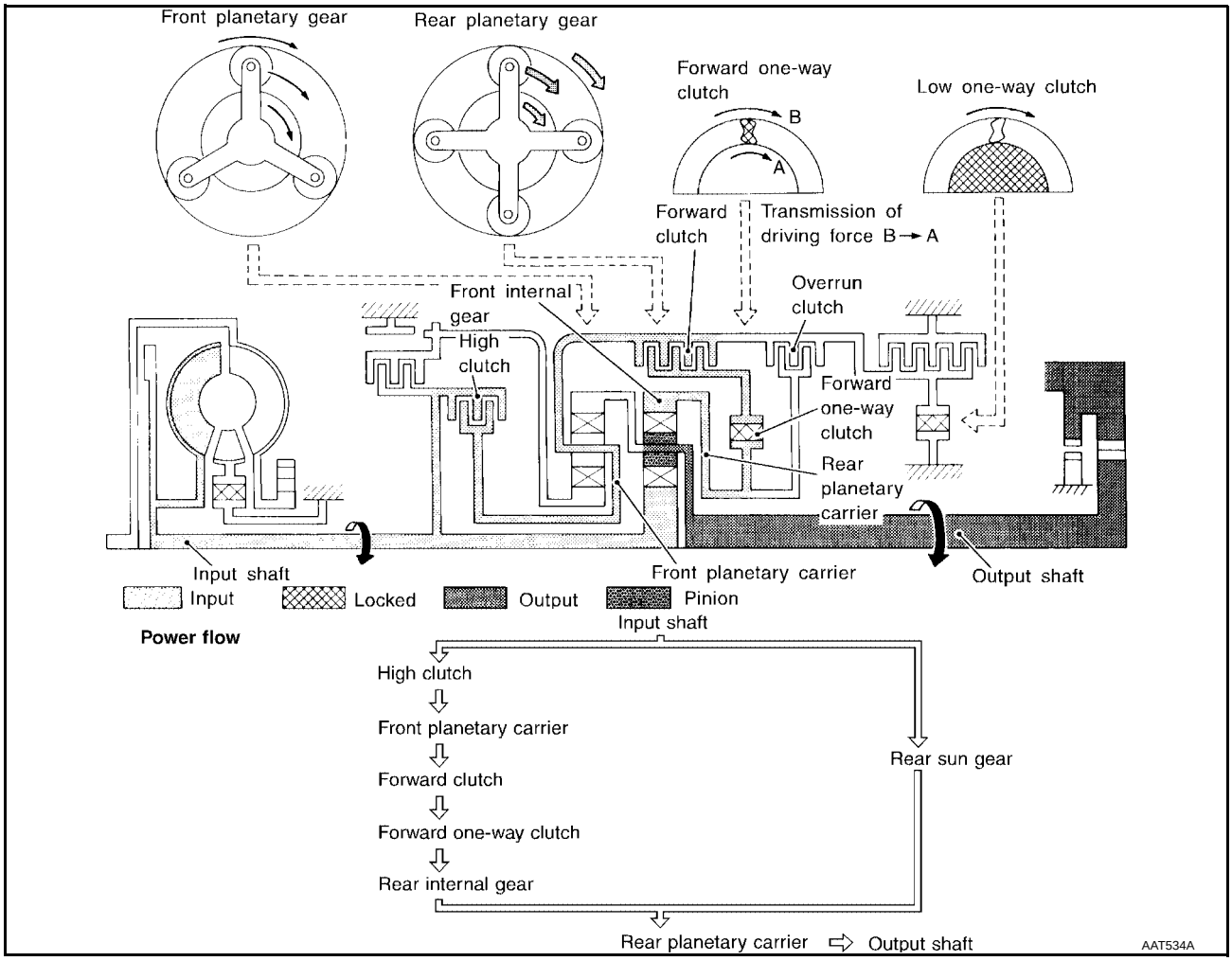
● **Forward one-way clutch** ● **Forward clutch** ● **Low one-way clutch**	Rear internal gear is locked to rotate counterclockwise because of the functioning of these three clutches.
Overrun clutch engagement conditions (Engine brake)	D1 : Overdrive control switch OFF and throttle opening is less than 3/16 21 : Always engaged At D1 and 21 positions, engine brake is not activated due to free turning of low one-way clutch.

D2 , 22 and 12 Positions



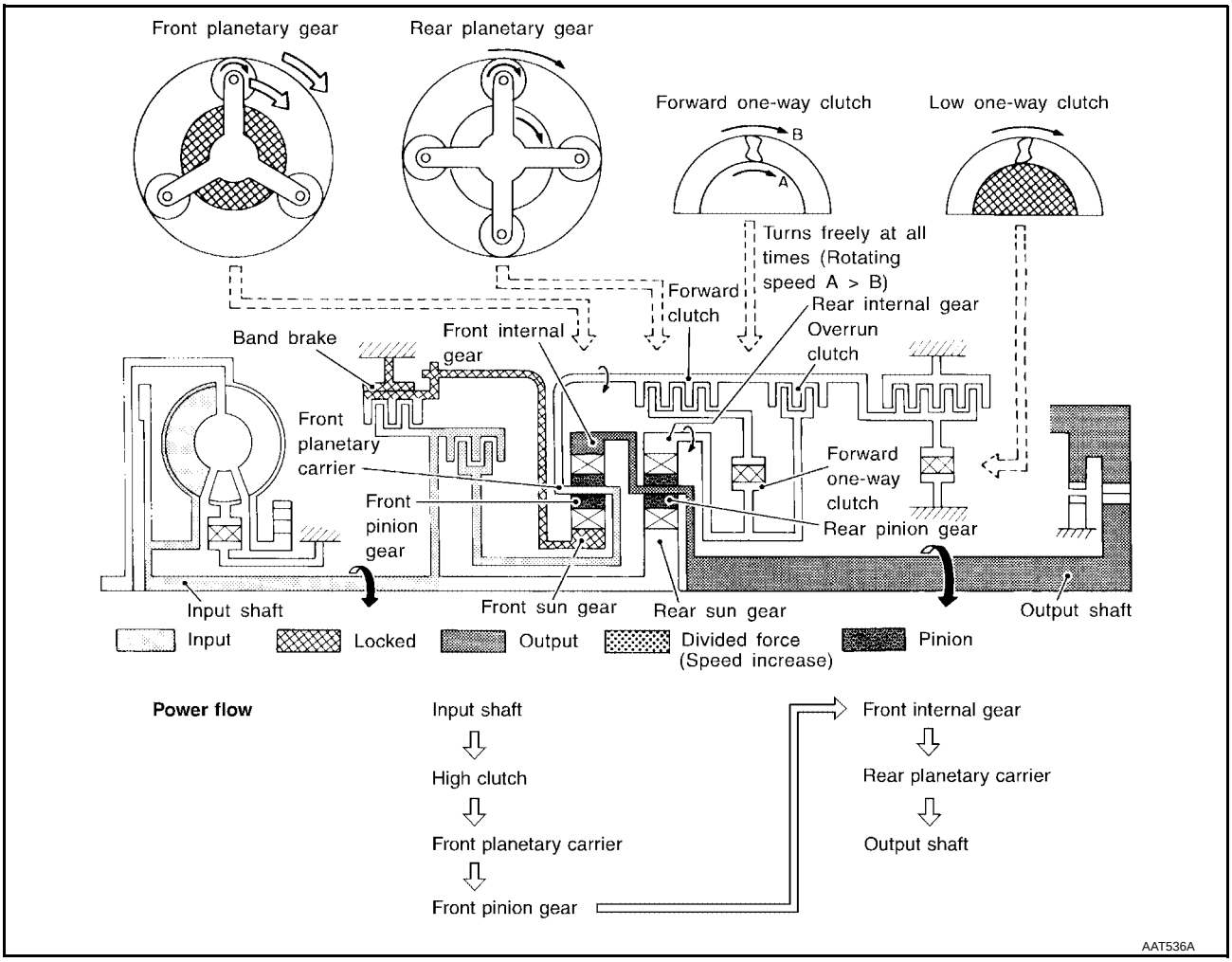
● **Forward clutch** ● **Forward one-way clutch** ● **Brake band**	Rear sun gear drives rear planetary carrier and combined front internal gear. Front internal gear now rotates around front sun gear accompanying front planetary carrier. As front planetary carrier transfers the power to rear internal gear through forward clutch and forward one-way clutch, this rotation of rear internal gear increases the speed of rear planetary carrier compared with that of the 1st speed.
Overrun clutch engagement conditions	D2 : Gear selector lever is set in 3rd position and throttle opening is less than 3/16 22 and 12 : Always engaged

D3 , 23 and 13 Positions



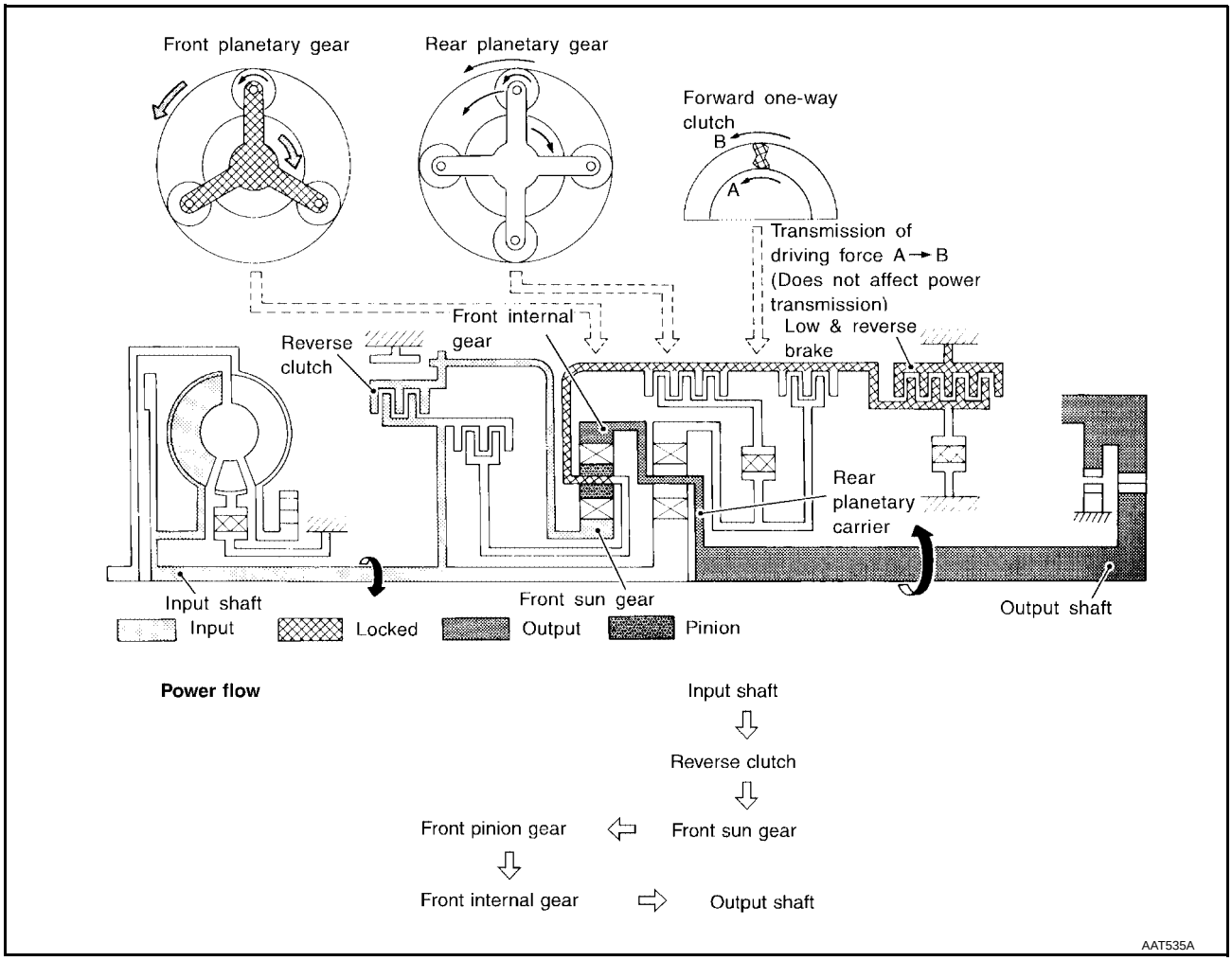
● **High clutch** ● **Forward clutch** ● **Forward one-way clutch**	Input power is transmitted to front planetary carrier through high clutch. And front planetary carrier is connected to rear internal gear by operation of forward clutch and forward one-way clutch. This rear internal gear rotation and another input (the rear sun gear) accompany rear planetary carrier to turn at the same speed.
Overrun clutch engagement conditions	D3 : Selector lever is set in 3rd position and throttle opening is less than 3/16 23 and 13 : Always engaged

D4 Position



● **High clutch** ● **Brake band** ● **Forward clutch** (Does not affect power transmission)	Input power is transmitted to front carrier through high clutch. This front carrier turns around the sun gear which is fixed by brake band and makes front internal gear (output) turn faster.
Engine brake	At D4 position, there is no one-way clutch in the power transmission line and engine brake can be obtained when decelerating.

R Position



● **Reverse clutch** ● **Low and reverse brake**	Front planetary carrier is stationary because of the operation of low and reverse brake. Input power is transmitted to front sun gear through reverse clutch, which drives front internal gear in the opposite direction.
Engine brake	As there is no one-way clutch in the power transmission line, engine brake can be obtained when decelerating.

Control System

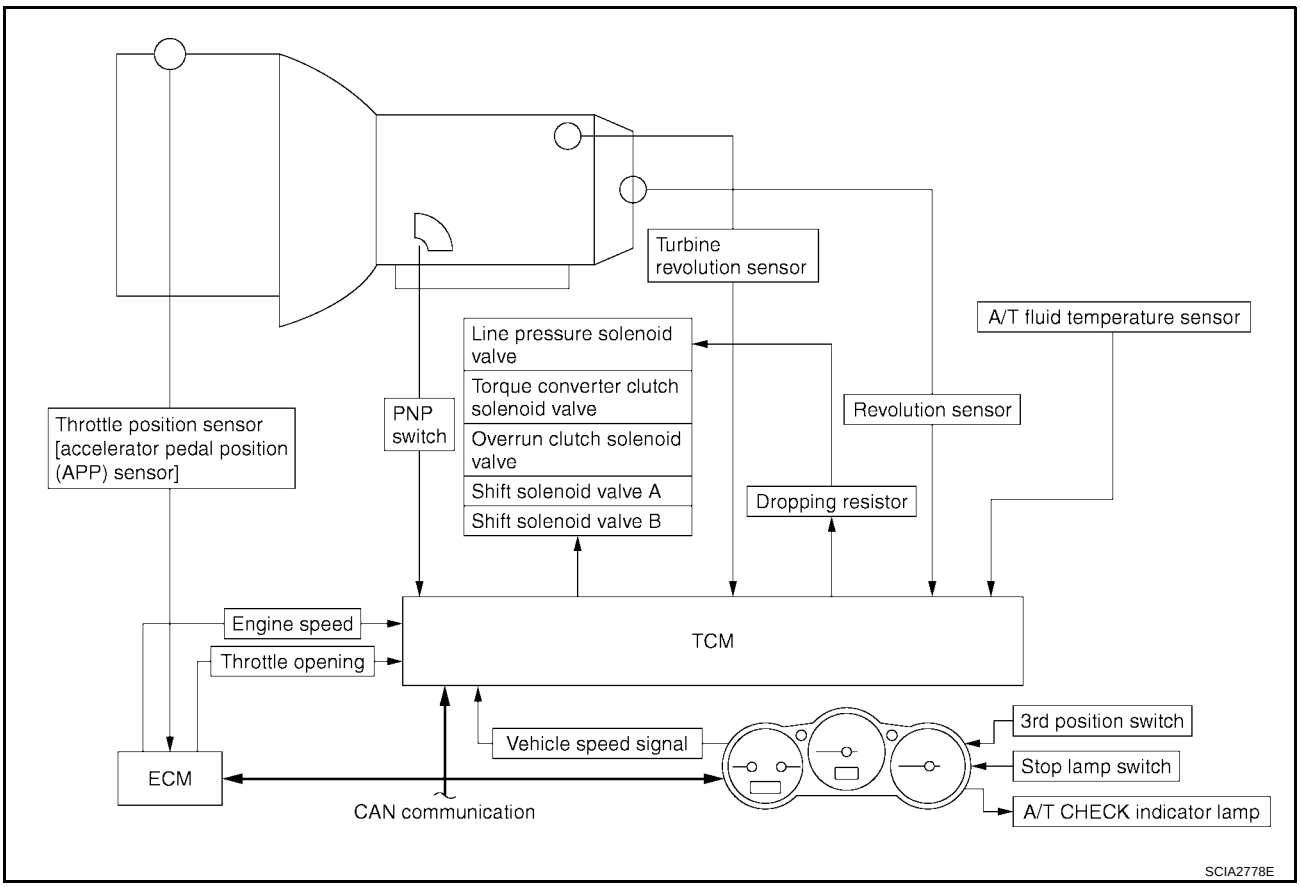
UCS000ML

OUTLINE

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

SENSORS		TCM		ACTUATORS
Park/neutral position (PNP) switch Throttle position sensor [accelerator pedal position (APP) sensor] Engine speed signal A/T fluid temperature sensor Revolution sensor (VHCL/S SE-1) Vehicle speed sensor (VHCL/S SE-2) 3 position switch ASCD control signal Stop lamp switch Turbine revolution sensor	▶	Shift control Line pressure control Lock-up control Overrun clutch control Timing control Fail-safe control Self-diagnosis CAN communication line control	▶	Shift solenoid valve A Shift solenoid valve B Overrun clutch solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve A/T CHECK indicator lamp

CONTROL SYSTEM



TCM FUNCTION

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.

INPUT/OUTPUT SIGNAL OF TCM

	Sensors and solenoid valves	Function
Input	Park/neutral position (PNP) switch	Detects select lever position and sends a signal to TCM.
	Throttle position sensor [accelerator pedal position (APP) sensor]	Detects throttle valve position and sends a signal to TCM.
	Closed throttle position signal	Detects throttle valves fully-closed position and sends a signal from ECM toTCM.
	Wide open throttle position signal	Detects throttle valve position of greater than 1/2 or full throttle and sends a signal from ECM to TCM.
	Engine speed signal	Receives signal from ECM.
	A/T fluid temperature sensor	Detects transmission fluid temperature and sends a signal to TCM.
	Revolution sensor (VHCL/S SE-1)	Detects output shaft rpm and sends a signal to TCM.
	Vehicle speed sensor (VHCL/S SE-2)	Used as an auxiliary vehicle speed sensor. Sends a signal when revolution sensor (installed on transmission) malfunctions.
	3rd position switch	Sends a signal, which prohibits a shift to D_4 (overdrive) position, to the TCM.
	ASCD control signal	Sends the cruise signal and D_4 (overdrive) cancellation signal from ECM to TCM.
	Turbine revolution sensor	Detects forward clutch drum rpm and sends a signal to TCM.
	Stop lamp switch	Send the lock-up release signal to the TCM at time of D_4 (lock-up).
	CAN communication	In CAN communication, control units are connected to 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring.
Output	Shift solenoid valve A/B	Selects shifting point suited to driving conditions in relation to a signal sent from TCM.
	Line pressure solenoid valve	Regulates (or decreases) line pressure suited to driving conditions in relation to a signal sent from TCM.
	Torque converter clutch solenoid valve	Regulates (or decreases) lock-up pressure suited to driving conditions in relation to a signal sent from TCM.
	Overrun clutch solenoid valve	Controls an “engine brake” effect suited to driving conditions in relation to a signal sent from TCM.
	A/T CHECK indicator lamp	Shows TCM faults, when A/T control components malfunction.
	CAN communication	In CAN communication, control units are connected to 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring.

CAN Communication

UCS0015M

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) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
For details, refer to LAN-8, "CAN COMMUNICATION" .

Control Mechanism

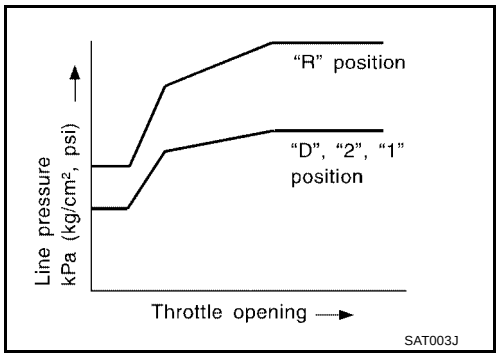
UCS000MM

LINE PRESSURE CONTROL

TCM has various line pressure control characteristics to meet the driving conditions.
An ON-OFF duty signal is sent to the line pressure solenoid valve based on TCM characteristics.
Hydraulic pressure on the clutch and brake is electronically controlled through the line pressure solenoid valve to accommodate engine torque. This results in smooth shift operation.

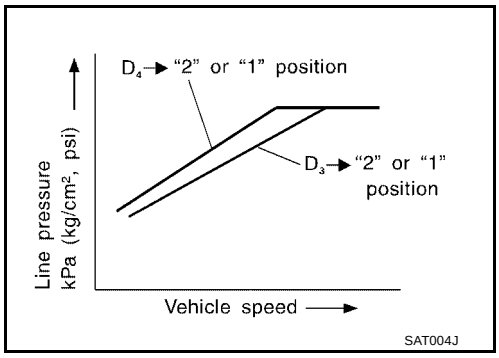
Normal Control

The line pressure to throttle opening characteristics is set for suitable clutch operation.



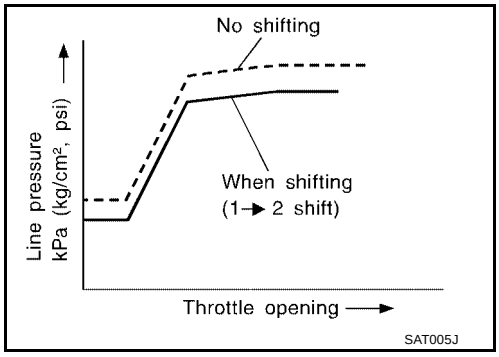
Back-up Control (Engine brake)

If the selector lever is shifted to 2nd position while driving in D_4 (O/D) or D_3 , great driving force is applied to the clutch inside the transmission. Clutch operating pressure (line pressure) must be increased to deal with this driving force.



During Shift Change

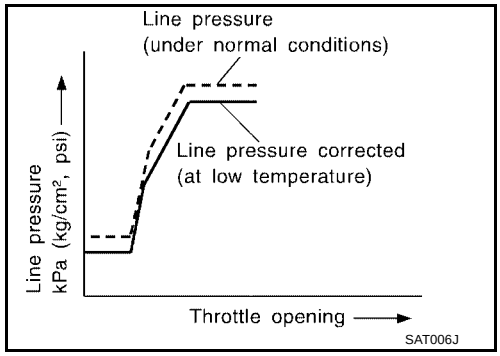
The line pressure is temporarily reduced corresponding to a change in engine torque when shifting gears (that is, when the shift solenoid valve is switched for clutch operation) to reduce shifting shock.



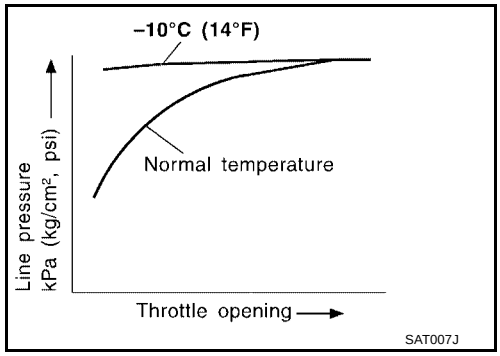
At Low Fluid Temperature

- Fluid viscosity and frictional characteristics of the clutch facing change with fluid temperature. Clutch engaging or band-contacting pressure is compensated for, according to fluid temperature, to stabilize shifting quality.

- The line pressure is reduced below 60°C (140°F) to prevent shifting shock due to low viscosity of automatic transmission fluid when temperature is low.



- Line pressure is increased to a maximum irrespective of the throttle opening when fluid temperature drops to –10°C (14°F). This pressure rise is adopted to prevent a delay in clutch and brake operation due to extreme drop of fluid viscosity at low temperature.

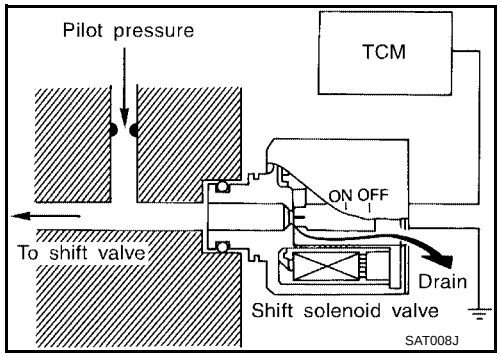


SHIFT CONTROL

The shift is regulated entirely by electronic control to accommodate vehicle speed and varying engine operations. This is accomplished by electrical signals transmitted by the revolution sensor and the ECM (throttle opening). This results in improved acceleration performance and fuel economy.

Control of Shift Solenoid Valves A and B

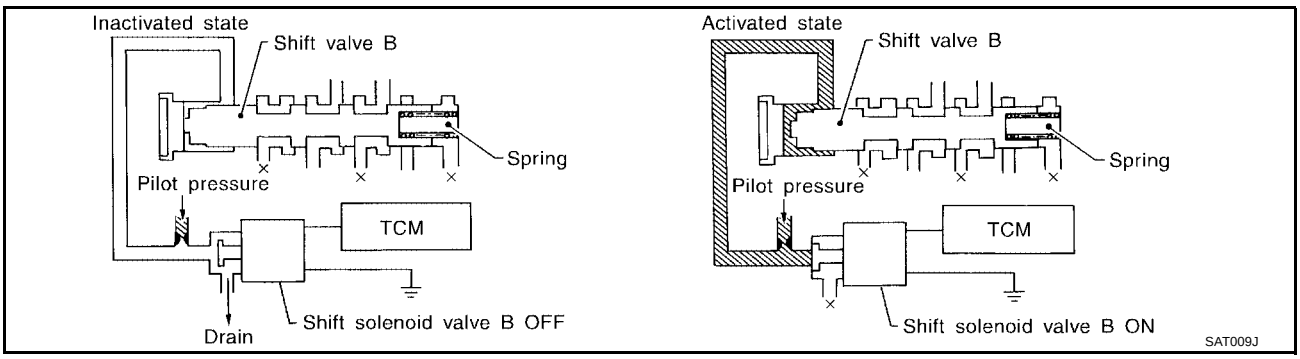
The shift solenoid valve performs simple ON-OFF operation. When set to ON, the drain circuit closes and pilot pressure is applied to the shift valve.
The TCM activates shift solenoid valves A and B according to signals from the ECM (throttle opening) and revolution sensor to select the optimum gear position on the basis of the shift schedule memorized in the TCM.



Relation between shift solenoid valves A and B and gear positions

Shift solenoid valve	Gear position				
	D_1 , 2_1 , 1_1	D_2 , 2_2 , 1_2	D_3	D_4 (O/D)	N-P
A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)	ON (Closed)
B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)

Control of Shift Valves A and B



Pilot pressure generated by the operation of shift solenoid valves A and B is applied to the end face of shift valves A and B.
The drawing above shows the operation of shift valve B. When the shift solenoid valve is ON, pilot pressure applied to the end face of the shift valve overcomes spring force, moving the valve upward.

LOCK-UP CONTROL

The torque converter clutch piston in the torque converter is locked to eliminate torque converter slip to increase power transmission efficiency. The solenoid valve is controlled by an ON-OFF duty signal sent from the TCM. The signal is converted to an oil pressure signal which controls the lock-up piston.

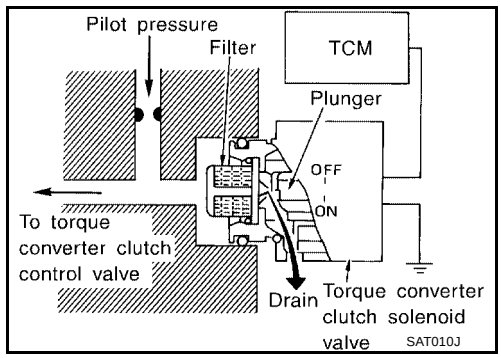
Conditions for Lock-up Operation

When vehicle is driven in 3rd or 4th gear positions, vehicle speed and throttle opening are detected. If the detected values fall within the lock-up zone memorized in the TCM, lock-up is performed.

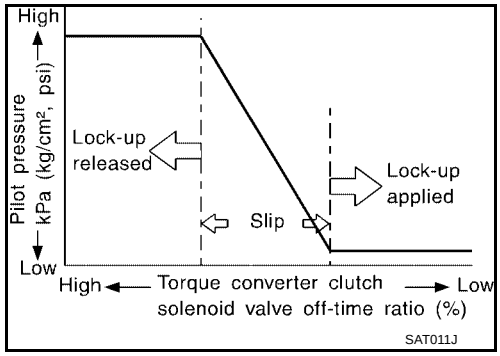
Selector lever	D position	3rd position
Gear position	D_4	D_3
Vehicle speed sensor	More than set value	
ECM (throttle opening)	Less than set opening	
Closed throttle position signal	OFF	
A/T fluid temperature sensor	More than 40°C (104°F)	

Torque Converter Clutch Solenoid Valve Control

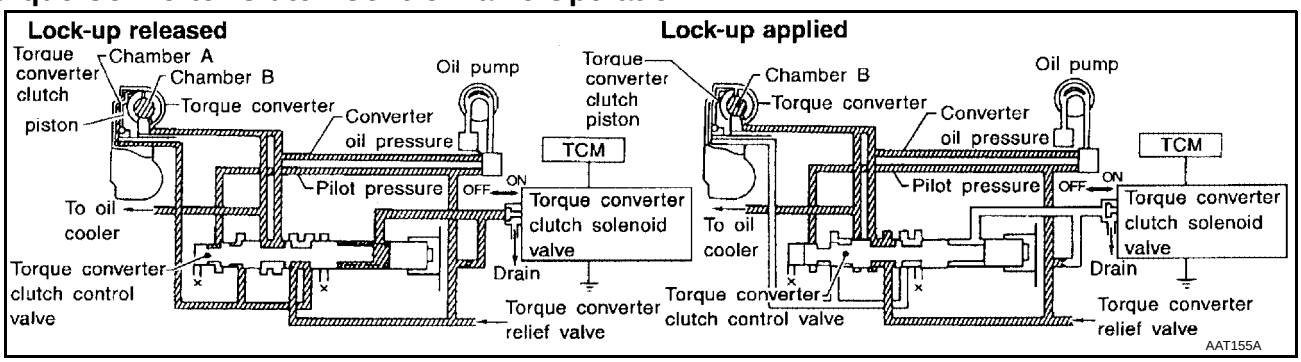
The torque converter clutch solenoid valve is controlled by the TCM. The plunger closes the drain circuit during the OFF period, and opens the circuit during the ON period. If the percentage of OFF-time increases in one cycle, the pilot pressure drain time is reduced and pilot pressure remains high.



The torque converter clutch piston is designed to slip to adjust the ratio of ON-OFF, thereby reducing lock-up shock.
OFF-time INCREASING
↓
Amount of drain DECREASING
↓
Pilot pressure HIGH
↓
Lock-up RELEASING



Torque Converter Clutch Control Valve Operation



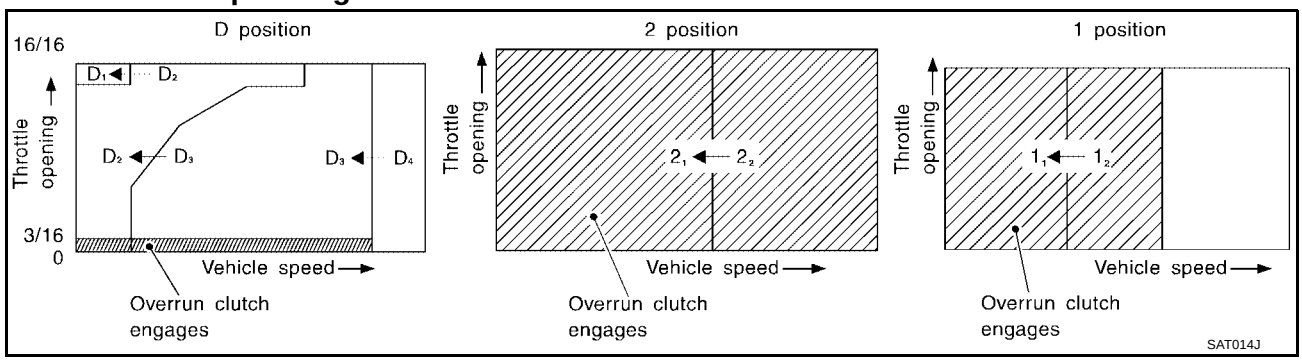
LOCK-UP RELEASED
The OFF-duration of the torque converter clutch solenoid valve is long, and pilot pressure is high. The pilot pressure pushes the end face of the torque converter clutch control valve in combination with spring force to move the valve to the left. As a result, converter pressure is applied to chamber A (torque converter clutch piston release side). Accordingly, the torque converter clutch piston remains unlocked.

LOCK-UP APPLIED
When the OFF-duration of the torque converter clutch solenoid valve is short, pilot pressure drains and becomes low. Accordingly, the control valve moves to the right by the pilot pressure of the other circuit and converter pressure. As a result, converter pressure is applied to chamber B, keeping the torque converter clutch piston applied.
Also smooth lock-up is provided by transient application and release of the lock-up.

OVERRUN CLUTCH CONTROL (ENGINE BRAKE CONTROL)

Forward one-way clutch is used to reduce shifting shocks in downshifting operations. This clutch transmits engine torque to the wheels. However, drive force from the wheels is not transmitted to the engine because the one-way clutch rotates idle. This means the engine brake is not effective.
The overrun clutch operates when the engine brake is needed.

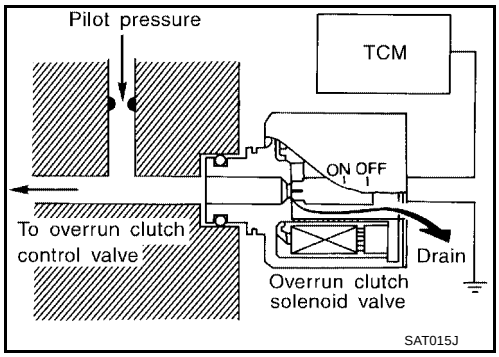
Overrun Clutch Operating Conditions



Selector lever position	Gear position	Throttle opening
D position	D1 , D2 , D3 gear position	Less than 3/16
2nd position	21 , 22 gear position	At any position
1st position	11 , 12 gear position	

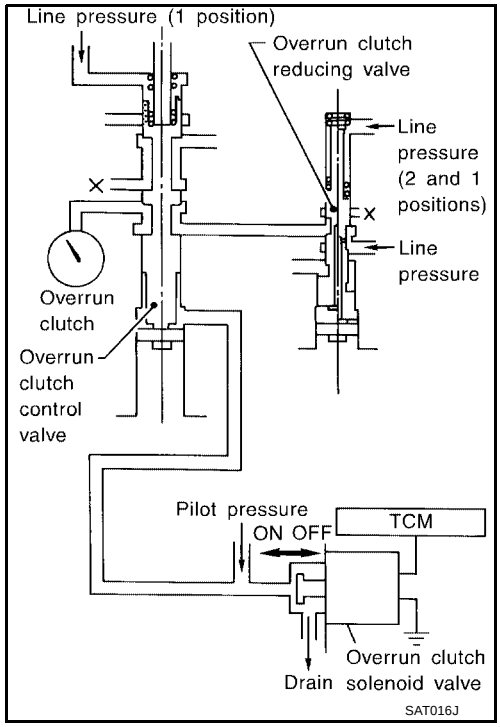
Overrun Clutch Solenoid Valve Control

The overrun clutch solenoid valve is operated by an ON-OFF signal transmitted by the TCM to provide overrun clutch control (engine brake control).
When this solenoid valve is ON, the pilot pressure drain port closes. When it is OFF, the drain port opens.
During the solenoid valve ON pilot pressure is applied to the end face of the overrun clutch control valve.



Overrun Clutch Control Valve Operation

When the solenoid valve is ON, pilot pressure is applied to the overrun clutch control valve. This pushes up the overrun clutch control valve. The line pressure is then shut off so that the clutch does not engage.
When the solenoid valve is OFF, pilot pressure is not generated. At this point, the overrun clutch control valve moves downward by spring force. As a result, overrun clutch operation pressure is provided by the overrun clutch reducing valve. This causes the overrun clutch to engage.
In the 1st position, the overrun clutch control valve remains pushed down so that the overrun clutch is engaged at all times.



UCS000MN

Control Valve

FUNCTION OF CONTROL VALVES

Valve name	Function
Pressure regulator valve, plug and sleeve plug	Regulates oil discharged from the oil pump to provide optimum line pressure for all driving conditions.
Pressure modifier valve and sleeve	Used as a signal supplementary valve to the pressure regulator valve. Regulates pressure-modifier pressure (signal pressure) which controls optimum line pressure for all driving conditions.
Pilot valve	Regulates line pressure to maintain a constant pilot pressure level which controls lock-up mechanism, overrun clutch, shift timing.
Accumulator control valve	Regulates accumulator back-pressure to pressure suited to driving conditions.
Manual valve	Directs line pressure to oil circuits corresponding to select positions. Hydraulic pressure drains when the shift lever is in Neutral.
Shift valve A	Simultaneously switches three oil circuits using output pressure of shift solenoid valve A to meet driving conditions (vehicle speed, throttle opening, etc.). Provides automatic downshifting and up-shifting (1st → 2nd → 3rd → 4th gears/4th → 3rd → 2nd → 1st gears) in combination with shift valve B.
Shift valve B	Simultaneously switches two oil circuits using output pressure of shift solenoid valve B in relation to driving conditions (vehicle speed, throttle opening, etc.). Provides automatic downshifting and up-shifting (1st → 2nd → 3rd → 4th gears/4th → 3rd → 2nd → 1st gears) in combination with shift valve A.
Overrun clutch control valve	Switches hydraulic circuits to prevent engagement of the overrun clutch simultaneously with application of the brake band in D_4 . (Interlocking occurs if the overrun clutch engages during D_4 .)
“1” reducing valve	Reduces low & reverse brake pressure to dampen engine-brake shock when down-shifting from the 1st position 1_2 to 1_1 .
Overrun clutch reducing valve	Reduces oil pressure directed to the overrun clutch and prevents engine-brake shock. In 1st and 2nd positions, line pressure acts on the overrun clutch reducing valve to increase the pressure-regulating point, with resultant engine brake capability.
Torque converter relief valve	Prevents an excessive rise in torque converter pressure.

Valve name	Function
Torque converter clutch control valve, plug and sleeve	Activates or inactivates the lock-up function. Also provides smooth lock-up through transient application and release of the lock-up system.
1-2 accumulator valve and piston	Dampens the shock encountered when 2nd gear band servo contracts, and provides smooth shifting.
3-2 timing valve	Switches the pace that oil pressure is released depending on vehicle speed; maximizes the high clutch release timing, and allows for soft down shifting.
Shuttle valve	Determines if the overrun clutch solenoid valve should control the 3-2 timing valve or the overrun clutch control valve and switches between the two.
Cooler check valve	At low speeds and with a small load when little heat is generated, saves the volume of cooler flow, and stores the oil pressure for lock up.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

PFP:00000

Introduction

UCS000MO

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 (transmission control module) 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 details, refer to AT-39, "OBD-II Function for A/T System" .

OBD-II Function for A/T System

UCS000MP

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

UCS000MQ

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
A/T-related parts for which the MIL illuminates during the first or second test drive are listed below.

Items	MIL	
	One trip detection	Two trip detection
Shift solenoid valve A — DTC: P0750	X	
Shift solenoid valve B — DTC: P0755	X	
Accelerator pedal position (APP) sensor — DTC: P1705	X	
Except above		X

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)

UCS000MR

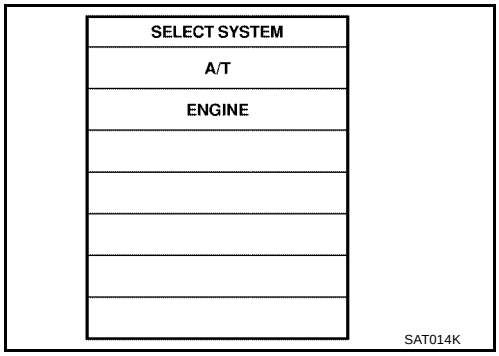
HOW TO READ DTC AND 1ST TRIP DTC

DTC and 1st trip DTC can be read by the following methods.

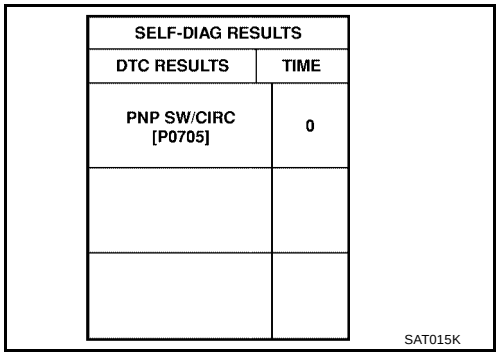
(With CONSULT-II or GST) GST) CONSULT-II or GST (Generic Scan Tool) Examples: P0705, P0710, P0720, P0725, etc.
These DTCs are prescribed by SAE J2012.
(CONSULT-II also displays the malfunctioning component or system.)

- **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, using CONSULT-II (if available) is recommended.

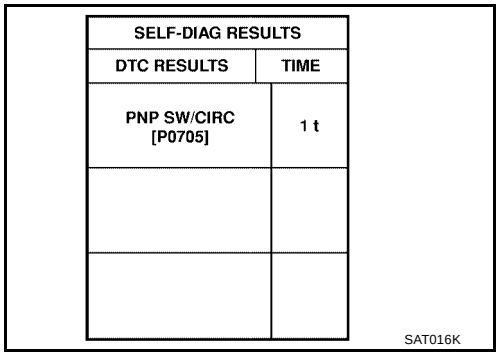
A sample of CONSULT-II display for DTC and 1st trip DTC is shown in the following page. DTC or 1st trip DTC of a malfunction is displayed in “SELF DIAGNOSIS” mode for “ENGINE” with CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.



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



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



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 details, refer to EC-56, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA" .
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 DTCs) 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)

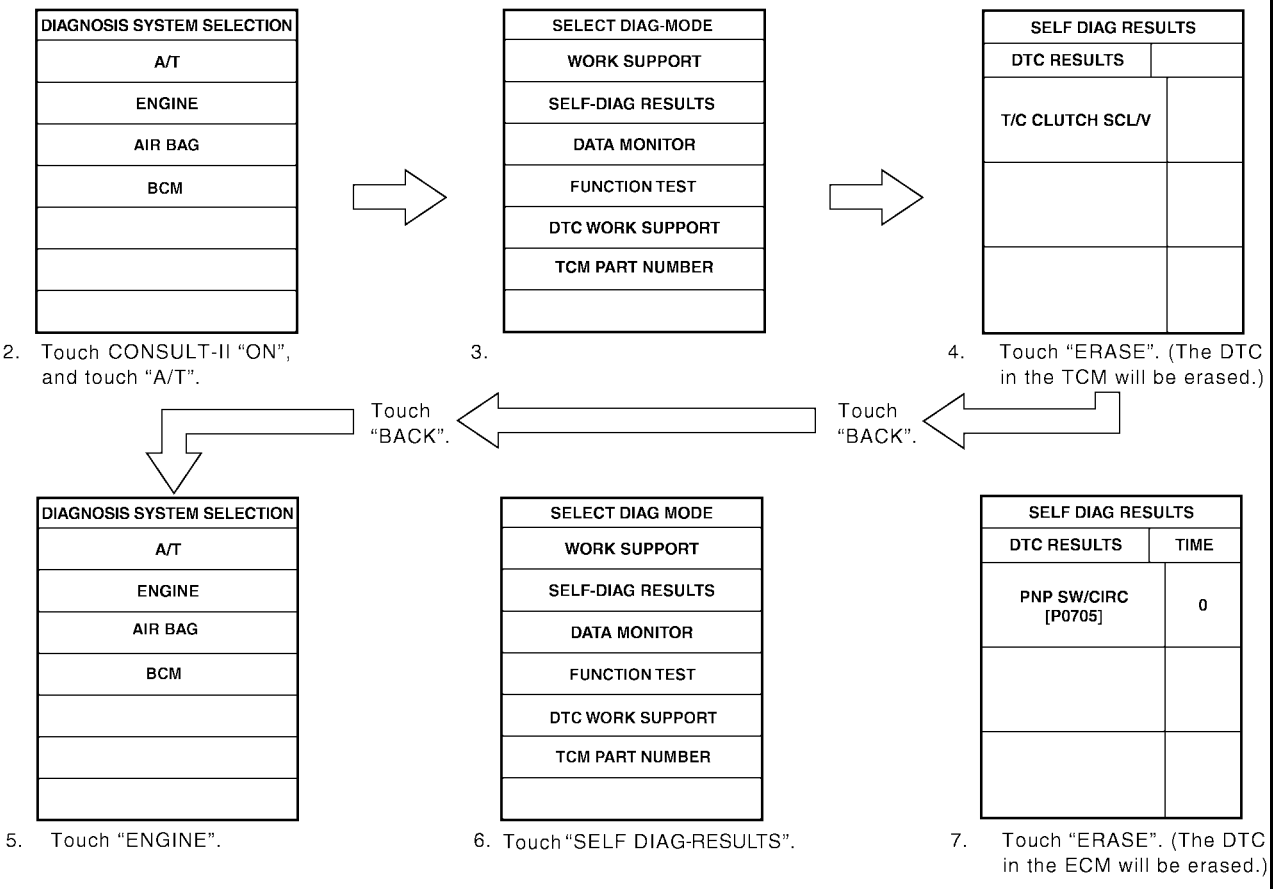
- **If a DTC is displayed for both ECM and TCM, it needs to be erased for both ECM and TCM.**

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 DIAGNOSIS”.

7. Touch “ERASE”. (The DTC in the ECM will be erased.)

How to erase DTC (With CONSULT-II)

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.



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 “TCM SELF-DIAGNOSTIC PROCEDURE (No Tools)”. Refer to AT-54, "TCM 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-124, "Generic Scan Tool (GST) Function" .

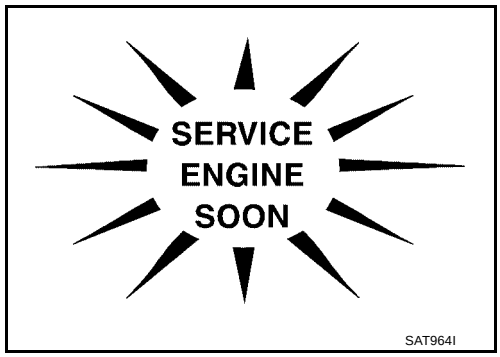
HOW TO ERASE DTC (NO TOOLS)

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-54, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Perform “OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)”. Refer to EC-65, "How to Erase DTC" .

Malfunction Indicator Lamp (MIL)

UCS000MS

1. The malfunction indicator lamp will light up when the ignition switch is turned ON without the engine running. This is for checking the lamp.
   - If the malfunction indicator lamp does not light up, refer to DI-45, "WARNING LAMPS" .
     [Or see EC-669, "MIL AND DATA LINK CONNECTOR" .]
2. When the engine is started, the malfunction indicator lamp should go off.
   If the lamp remains on, the on board diagnostic system has detected an emission-related (OBD-II) malfunction. For details, refer to EC-51, "Emission-related Diagnostic Information" .



CONSULT-II

UCS000MT

After performing “SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)” (AT-43, "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)"), place check marks for results on the “Diagnostic Worksheet”, AT-60, "DIAGNOSTIC WORKSHEET" . Reference pages are provide 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.

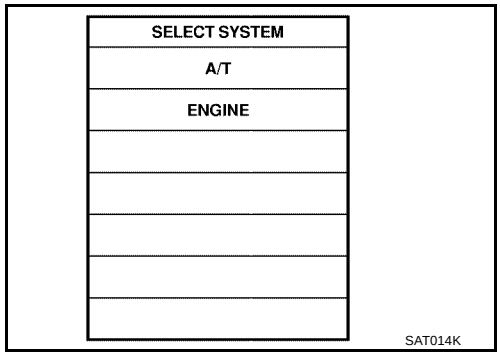
3. Shift solenoid valve “A” or “B” is displayed on CONSULT-II at the start of shifting. Gear position is displayed upon completion of shifting (which is computed by TCM).
4. Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II unit.

SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

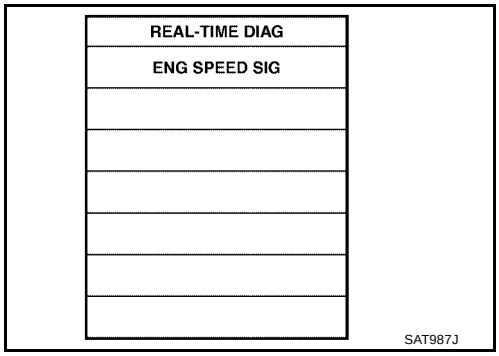
CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

1. Touch on CONSULT-II, touch “START (NISSAN BASED VHCL)”, 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-102, "TROUBLE DIAGNOSIS FOR POWER SUPPLY" . If result is NG, refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .



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



SELF-DIAGNOSTIC RESULT TEST MODE

Detected items (Screen terms for CONSULT-II, “SELF DIAGNOSIS” test mode)		Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)
“A/T”	“ENGINE”		Available by A/T CHECK indicator lamp or “A/T” on CONSULT-II	Available by malfunction indicator lamp*2, SERVICE ENGINE SOON “ENGINE” on CONSULT-II or GST
Park/neutral position (PNP) switch circuit		● TCM does not receive the correct voltage signal (based on the gear position) from the switch.	—	P0705
—	PNP SW/CIRC			
Revolution sensor		● TCM does not receive the proper voltage signal from the sensor.	X	P0720
VHCL SPEED SEN·A/T	VEH SPD SEN/ CIR AT			
Vehicle speed sensor (Meter)		● TCM does not receive the proper voltage signal from the sensor.	X	—
VHCL SPEED SEN·MTR	—			
A/T 1st gear function		● A/T cannot be shifted to the 1st gear position even if electrical circuit is good.	—	P0731*1
A/T 1ST GR FNCTN	A/T 1ST GR FNCTN			
A/T 2rd gear function		● A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.	—	P0732*1
A/T 2ND GR FNCTN	A/T 2ND GR FNCTN			
A/T 3rd gear function		● A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.	—	P0733*1
A/T 3RD GR FNCTN	A/T 3RD GR FNCTN			
A/T 4th gear function		● A/T cannot be shifted to the 4th gear position even if electrical circuit is good.	—	P0734*1
A/T 4TH GR FNCTN	A/T 4TH GR FNCTN			
A/T TCC S/V function (lock-up)		● A/T cannot perform lock-up even if electrical circuit is good.	—	P0744*1
A/T TCC S/V FNCTN	A/T TCC S/V FNCTN			
Shift solenoid valve A		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0750
SHIFT SOLENOID/V A	SFT SOL A/CIRC			
Shift solenoid valve B		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0755
SHIFT SOLENOID/V B	SFT SOL B/CIRC			
Overrun clutch solenoid valve		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P1760
OVERRUN CLUTCH S/V	O/R CLUCH SOL/ CIRC			
T/C clutch solenoid valve		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0740
T/C CLUTCH SOL/V	TCC SOLENOID/ CIRC			

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode)		Malfunction is detected when...	TCM self-diagnosis	OBD-II (DTC)
"A/T"	"ENGINE"		Available by A/T CHECK indicator lamp or "A/T" on CONSULT-II	Available by malfunction indicator lamp*2, SERVICE ENGINE SOON "ENGINE" on CONSULT-II or GST
Line pressure solenoid valve		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0745
LINE PRESSURE S/V	L/PRESS SOL/ CIRC			
Throttle position sensor [accelerator pedal position (APP) sensor]		● TCM receives an excessively low or high voltage from this sensor	X	P1705
THROTTLE POSI SEN	TP/SEN/CIRC A/T			
Engine speed signal		● TCM does not receive the proper voltage signal from the ECM.	X	P0725
ENGINE SPEED SIG	—			
A/T fluid temperature sensor		● TCM receives an excessively low or high voltage from the sensor.	X	P0710
BATT/FLUID TEMP SEN	ATF TEMP SEN/ CIRC			
CAN communication*3		● When malfunction is detected in CAN communication line.	X	U1000
CAN COMM CIRCUIT	—			
Turbine revolution sensor		● TCM does not receive proper voltage signal from sensor	X	—
TURBINE REV	—			
TCM (RAM)		● TCM memory (RAM) is malfunctioning	—	—
CONTROL UNIT (RAM)	—			
TCM (ROM)		● TCM memory (ROM) is malfunctioning	—	—
CONTROL UNIT (ROM)	—			
TCM (EEP ROM)		● TCM memory (EEP ROM) is malfunctioning.	—	—
CONT UNIT(EEP ROM)	—			
Initial start		● This is not a malfunction message (Whenever shutting off a power supply to the TCM, this message appears on the screen.)	X	—
INITIAL START	—			
No failure (NO SELF DIAGNOSTIC FAILURE INDICATED FURTHER TESTING MAY BE REQUIRED**)		● No failure has been detected.	X	X

X: Applicable
–: Not applicable

*1: These malfunctions cannot be displayed by MIL SERVICE ENGINE SOON if another malfunction is assigned to MIL.
*2: Refer to EC-67, "Malfunction Indicator Lamp (MIL)" .
*3: If malfunction is detected in multiple systems including CAN communication line, CAN communication line trouble diagnosis shall be performed first.

DATA MONITOR MODE (A/T)

Item	Display	Monitor item				Description	Remarks
		TCM INPUT SIGNALS	MAIN SIGNALS	CAN DIAG SUPPORT MNTR	SELECTION FROM MENU		
Vehicle speed sensor 1 (A/T) (Revolution sensor)	VHCL/S SE·A/T [km/h] or [mph]	X	—	—	▼	● Vehicle speed computed from signal of revolution sensor is displayed.	● When racing engine in N or P with vehicle stationary, CONSULT-II data may not indicate 0 km/h (0 mph).
Vehicle speed sensor 2 (Meter)	VHCL/S SE·MTR [km/h] or [mph]	X	—	—	▼	● Vehicle speed computed from signal of vehicle speed sensor is displayed.	● Vehicle speed display may not be accurate under approx. 10 km/h (6 mph). It may not indicate 0 km/h (0 mph) when vehicle is stationary.
Throttle position sensor [accelerator pedal position (APP) sensor]	THRTL POS SEN [V]	X	—	—	▼	● Throttle position sensor signal voltage is displayed	
A/T fluid temperature sensor	FLUID TEMP SE [V]	X	—	—	▼	● A/T fluid temperature sensor signal voltage is displayed. ● Signal voltage lowers as fluid temperature rises.	
Battery voltage	BATTERY VOLT [V]	X	—	—	▼	● Source voltage of TCM is displayed.	
Engine speed	ENGINE SPEED [rpm]	X	X	—	▼	● Engine speed, computed from engine speed signal, is displayed.	● Engine speed display may not be accurate under approx. 800 rpm. It may not indicate 0 rpm even when engine is not running.
Turbine revolution sensor	TURBINE REV [rpm]	X	—	—	▼	● Checks changing speed then performs oil pressure control and torque down control	
3rd position switch	OVERDRIVE SW [ON/OFF]	X	—	—	▼	● ON/OFF state computed from signal of 3rd position switch is displayed.	
PN position (PNP) switch	PN POSI SW [ON/OFF]	X	—	—	▼	● ON/OFF state computed from signal of PN position SW is displayed.	
R position switch	R POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF state computed from signal of R position SW is displayed.	

Item	Display	Monitor item				Description	Remarks
		TCM INPUT SIGNALS	MAIN SIGNALS	CAN DIAG SUPPORT MNTR	SELECTION FROM MENU		
D position switch	D POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF state computed from signal of D position SW is displayed.	
2 position switch	2 POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of 2nd position SW, is displayed.	
1 position switch	1 POSITION SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of 1st position SW, is displayed.	
ASCD cruise signal	ASCD·CRUISE [ON/OFF]	X	—	—	▼	● Status of ASCD cruise signal is displayed. ON ... Cruising state OFF ... Normal running state	
ASCD OD cut signal	ASCD·OD CUT [ON/OFF]	X	—	—	▼	● Status of ASCD OD release signal is displayed. ON ... OD released OFF ... OD not released	
Kickdown switch	KICKDOWN SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of kickdown SW, is displayed.	● This is displayed even when no kickdown switch is equipped.
A/T mode switch	POWER SHIFT SW [ON/OFF]	X	—	—	▼		● Not mounted but displayed
Closed throttle position signal	CLOSED THL/SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of closed throttle position signal, is displayed.	● This means closed throttle position signal input via CAN communication line.
Wide open throttle position signal	W/O THRL/P-SW [ON/OFF]	X	—	—	▼	● ON/OFF status, computed from signal of wide open throttle position signal, is displayed.	● This means wide open throttle position signal input via CAN communication line.
Shift solenoid valve A	*SHIFT S/V A [ON/OFF]	—	—	—	▼	Displays status of check signal (reinput signal) for TCM control signal output. Remains unchanged when solenoid valves are open or shorted.	
Shift solenoid valve B	*SHIFT S/V B [ON/OFF]	—	—	—	▼		
Overrun clutch solenoid valve	*OVRRUN/CS/V [ON/OFF]	—	—	—	▼		
A/T mode switch	HOLD SW [ON/OFF]	X	—	—	▼		● Not mounted but displayed

Item	Display	Monitor item				Description	Remarks
		TCM INPUT SIGNALS	MAIN SIGNALS	CAN DIAG SUPPORT MNTR	SELECTION FROM MENU		
Stop lamp switch	BRAKE SW [ON/OFF]	X	—	—	—	● ON/OFF status is displayed. ON ... Brake pedal is depressed. OFF ... Brake pedal is released.	
Selector lever position	SLCT LVR POSI	—	X	—	▼	● Selector lever position data, used for computation by TCM, is displayed.	● A specific value used for control is displayed if fail-safe is activated due to error.
Vehicle speed	VEHICLE SPEED [km/h] or [mph]	—	X	—	▼	● Vehicle speed data, used for computation by TCM, is displayed.	
Throttle position [Accelerator pedal position (APP) sensor]	THROTTLE POSI [/8]	—	X	—	—	● Throttle position data, used for computation by TCM, is displayed.	● A specific value used for control is displayed if fail-safe is activated due to error.
Gear position	GEAR	—	X	—	▼	● Gear position data used for computation by TCM, is displayed.	
Line pressure duty	LINE PRES DTY [%]	—	X	—	—	● Control value of line pressure solenoid valve, computed by TCM from each input signal, is displayed.	
Torque converter clutch solenoid valve duty	TCC S/V DUTY [%]	—	X	—	—	● Control value of torque converter clutch solenoid valve, computed by TCM from each input signal, is displayed.	
Shift solenoid valve A	SHIFT S/V A [ON/OFF]	—	X	—	—	● Control value of shift solenoid valve A, computed by TCM from each input signal, is displayed.	● Control value of solenoid is displayed even if solenoid circuit is disconnected. The OFF signal is displayed if solenoid circuit is shorted.
Shift solenoid valve B	SHIFT S/V B [ON/OFF]	—	X	—	—	● Control value of shift solenoid valve B, computed by TCM from each input signal, is displayed.	
Overrun clutch solenoid valve	OVERRUN/C S/V [ON/OFF]	—	X	—	▼	● Control value of overrun clutch solenoid valve computed by TCM from each input signal is displayed.	
Self-diagnosis display lamp [A/T CHECK indicator lamp]	SELF-D DP LMP [ON/OFF]	—	X	—	▼	● Control status of A/T CHECK indicator lamp is displayed.	

Item	Display	Monitor item				Description	Remarks
		TCM INPUT SIGNALS	MAIN SIGNALS	CAN DIAG SUPPORT MNTR	SELECTION FROM MENU		
Torque converter slip ratio	TC SLIP RATIO [0.000]	—	—	—	▼	● Ratio of engine revolution to input shaft revolution of torque converter.	
Torque converter slip speed	TC SLIP SPEED [rpm]	—	—	—	▼	● Difference in revolution between input shaft revolution and torque converter input shaft revolution.	● Display does not indicate engine is stopped even if 0 rpm — this is not a malfunction.
CAN communication	CAN COMM [OK/UNKWN]	—	—	X	▼		
CAN circuit 1	CAN CIRC 1 [OK/UNKWN]	—	—	X	▼		
CAN circuit 2	CAN CIRC 2 [OK/UNKWN]	—	—	X	▼		
CAN circuit 3	CAN CIRC 3 [OK/UNKWN]	—	—	X	▼		
CAN circuit 4	CAN CIRC 4 [OK/UNKWN]	—	—	X	▼		
CAN circuit 5	CAN CIRC 5 [OK/UNKWN]	—	—	X	▼		
Voltage	Voltage [V]	—	—	—	▼	● Value measured by voltage probe is displayed.	
Frequency	Frequency [Hz]	—	—	—	▼	● Value measured by pulse probe is displayed. If measurement is impossible, "#" sign is displayed. "#" sign is also displayed at the final data value until the measurement result is obtained.	
Duty cycle (high)	DUTY-HI [%]	—	—	—	▼	● Duty cycle value for measurement probe is displayed.	
Duty cycle (low)	DUTY-LOW [%]	—	—	—	▼		
Plus width (high)	PLS WIDTH-HI [msec]	—	—	—	▼	● Measured pulse width of measurement probe is displayed.	
Plus width (low)	PLS WIDTH-LOW [msec]	—	—	—	▼		

X: Applicable
—: Not applicable
▼: Option

DTC WORK SUPPORT MODE WITH CONSULT-II

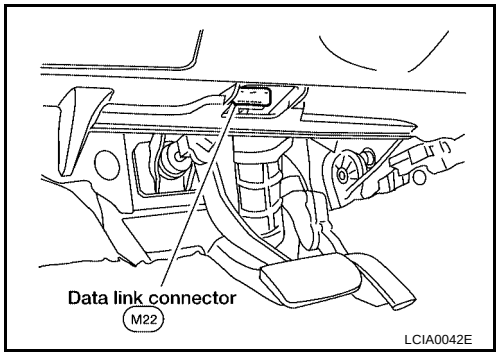
CONSULT-II Setting Procedure

CAUTION:

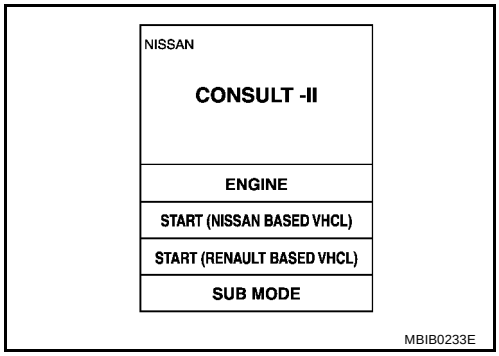
If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

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

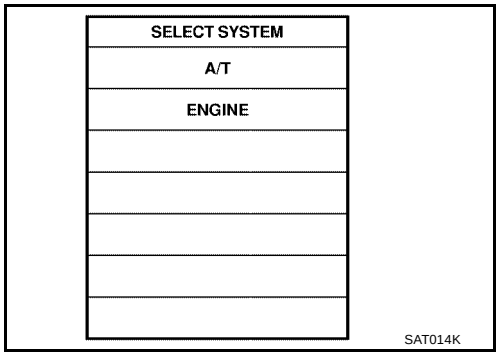
1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector, which is located in instrument lower panel on driver side.



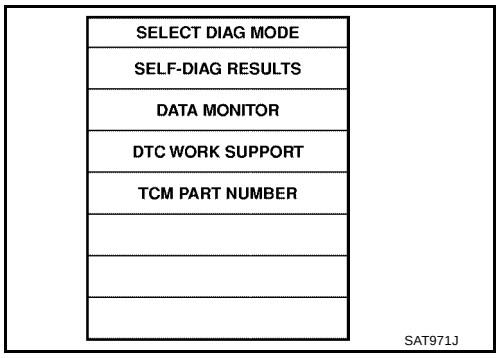
3. Turn ignition switch to ON position. (Do not start engine.)
4. Touch “START (NISSAN BASED VHCL)”.



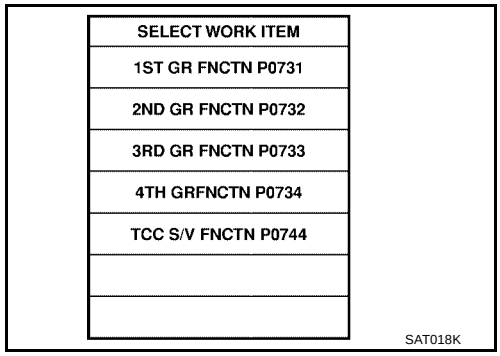
5. Touch “A/T”.
   If “A/T” is not indicated, go to GI-36, "CONSULT-II Data Link Connector (DLC) Circuit" .



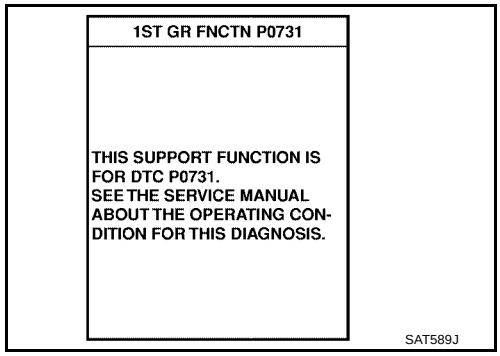
6. Touch “DTC WORK SUPPORT”.



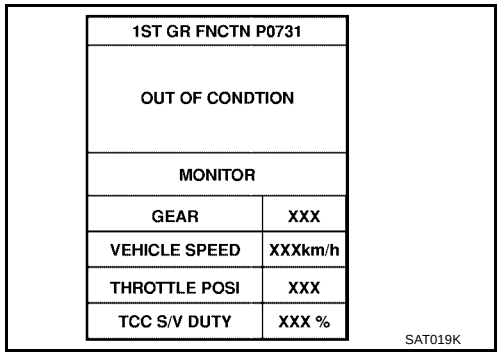
7. Touch select item menu (1ST, 2ND, etc.).



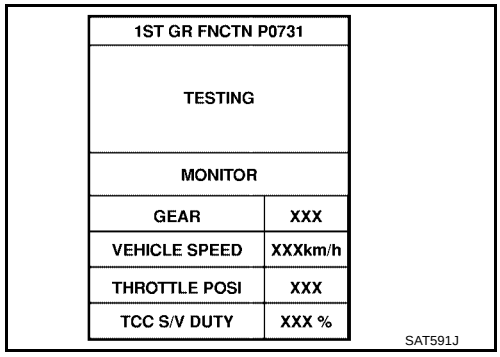
8. Touch “START”.



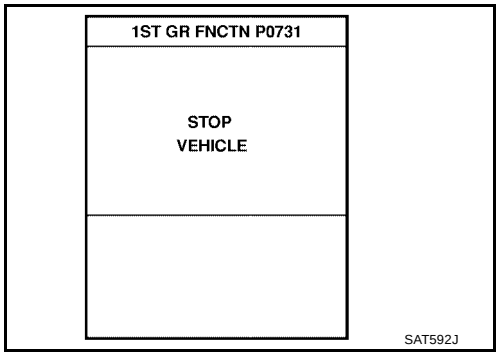
9. Perform driving test according to “DTC CONFIRMATION PROCEDURE” in “TROUBLE DIAGNOSIS FOR DTC”.

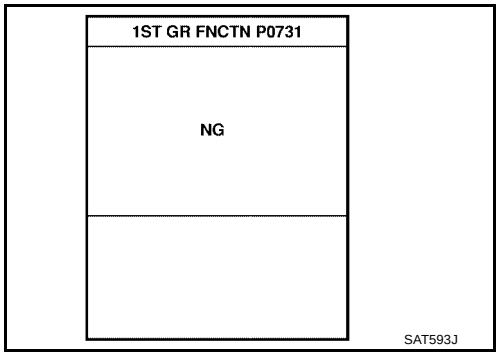


- **When testing conditions are satisfied, CONSULT-II screen changes from “OUT OF CONDITION” to “TESTING”.**

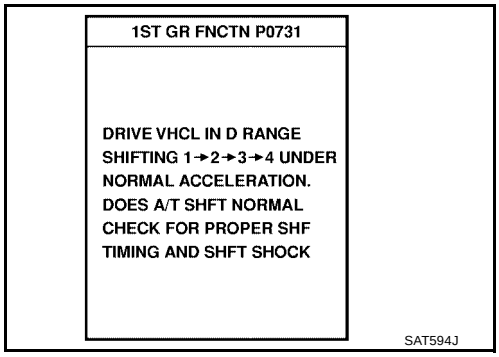


10. Stop vehicle. If “NG” appears on the screen, malfunction may exist. Go to “DIAGNOSTIC PROCEDURE”.

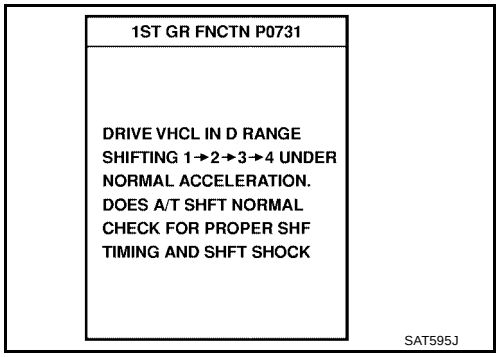




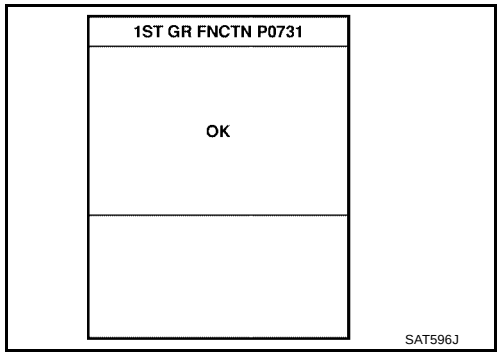
11. Perform test drive to check gear shift feeling in accordance with instructions displayed.

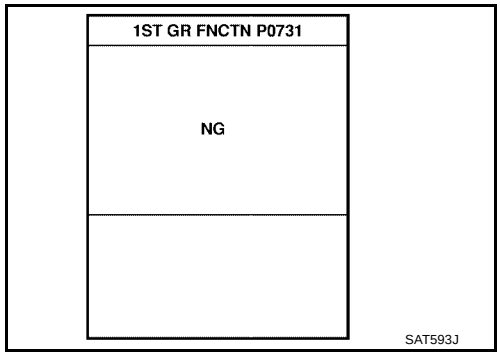


12. Touch “YES” or “NO”.



13. CONSULT-II procedure ended.
If “NG” appears on the scene, a malfunction may exist. Go to “DIAGNOSTIC PROCEDURE”.





DTC WORK SUPPORT MODE

DTC work support item	Description	Check item
1ST GR FNCTN P0731	Following items for “A/T 1st gear function (P0731)” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● Shift solenoid valve A ● Shift solenoid valve B ● Each clutch ● Hydraulic control circuit
2ND GR FNCTN P0732	Following items for “A/T 2nd gear function (P0732)” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● Shift solenoid valve B ● Each clutch ● Hydraulic control circuit
3RD GR FNCTN P0733	Following items for “A/T 3rd gear function (P0733)” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● Shift solenoid valve A ● Each clutch ● Hydraulic control circuit
4TH GR FNCTN P0734	Following items for “A/T 4th gear function (P0734)” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● Shift solenoid valve A ● Shift solenoid valve B ● Overrun clutch solenoid valve ● Line pressure solenoid valve ● Each clutch ● Hydraulic control circuit
TCC S/V FNCTN P0744	Following items for “A/T TCC S/V function (lock-up) (P0744)” can be confirmed. ● Self-diagnosis status (whether the diagnosis is being conducted or not) ● Self-diagnosis result (OK or NG)	● Torque converter clutch solenoid valve ● Each clutch ● Hydraulic control circuit

Diagnostic Procedure Without CONSULT-II

UCS000MU

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to EC-124, "Generic Scan Tool (GST) Function" .

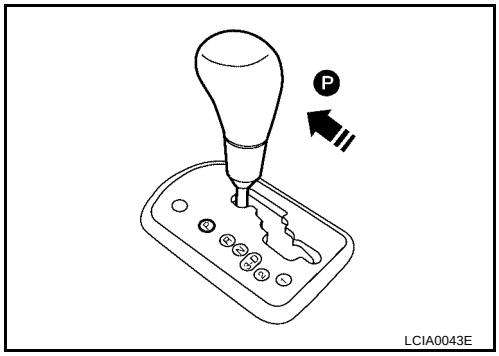
OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to EC-67, "Malfunction Indicator Lamp (MIL)" .

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

1. CHECK A/T CHECK NDICATOR LAMP

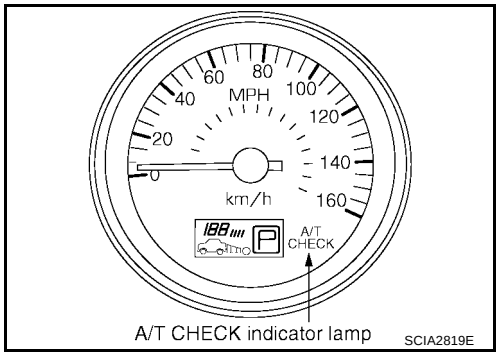
1. Move selector lever to P position.
   Start engine and warm it up to normal engine operating temperature.
2. Turn ignition switch to OFF position.
3. Wait 5 seconds.
4. Turn ignition switch to ON position. (Do not start engine.)



5. Does A/T CHECK indicator lamp come on for about 2 seconds?

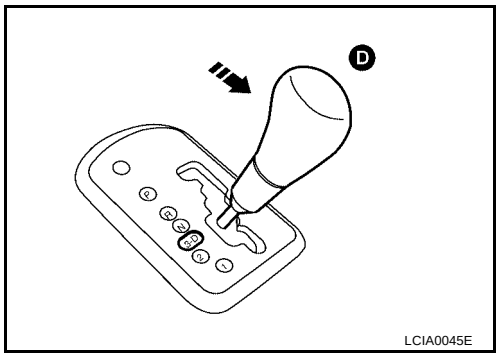
Yes or No

Yes >> GO TO 2.
No >> Stop procedure. Perform AT-215, "A/T CHECK Indicator Lamp Does Not Come On" before proceeding.



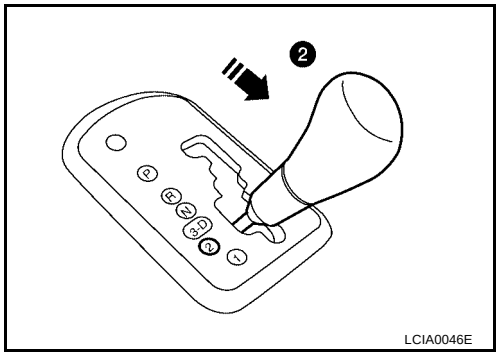
2. JUDGEMENT PROCEDURE STEP 1

1. Turn ignition switch to OFF position.
2. Turn ignition switch to ON position. (Do not start engine.)
3. Depress the brake pedal, then move gear selector lever from P to D position.
4. Wait 3 seconds.



5. Move selector lever to 2nd position.
6. Release accelerator pedal and brake pedal.

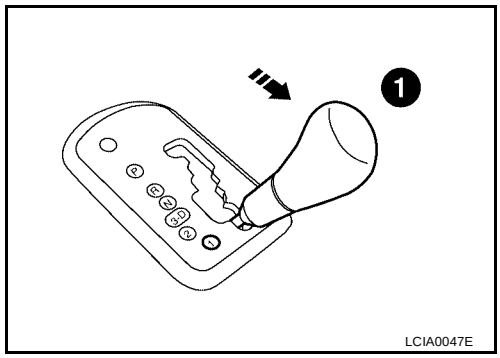
>> GO TO 3.



3. JUDGEMENT PROCEDURE STEP 2

1. Move selector lever to 1st position.
2. Depress brake pedal.
3. Depress accelerator pedal fully and release it.
4. The A/T CHECK indicator lamp will begin to flash.

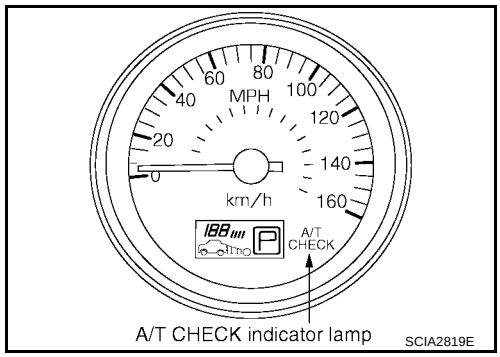
>> GO TO 4.



4. CHECK SELF-DIAGNOSTIC CODE

Check A/T CHECK indicator lamp.
Refer to AT-56, "JUDGEMENT OF SELF-DIAGNOSIS CODE" .

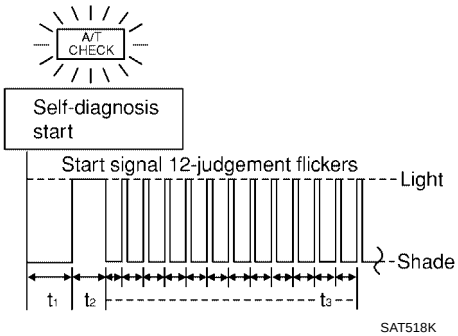
>> **DIAGNOSIS END**



JUDGEMENT OF SELF-DIAGNOSIS CODE

A/T CHECK indicator lamp:

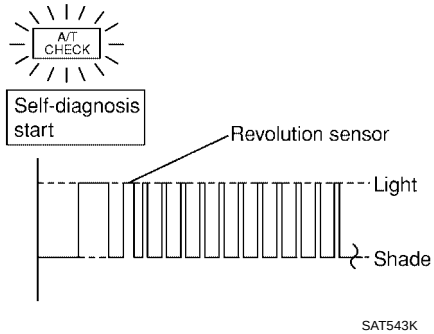
All judgement flickers are the same.



SAT518K

All circuits that can be confirmed by self-diagnosis are OK.

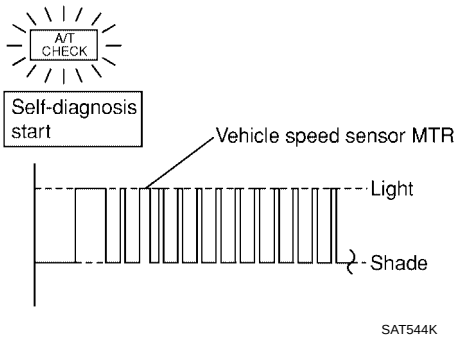
1st judgement flicker is longer than others.



SAT543K

Revolution sensor circuit is short-circuited or disconnected.
⇒ **Go to** AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" **.**

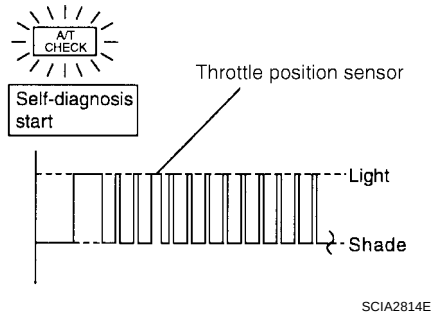
2nd judgement flicker is longer than others.



SAT544K

Vehicle speed sensor circuit is short-circuited or disconnected.
⇒ **Go to** AT-197, "DTC VEHICLE SPEED SENSOR MTR" **.**

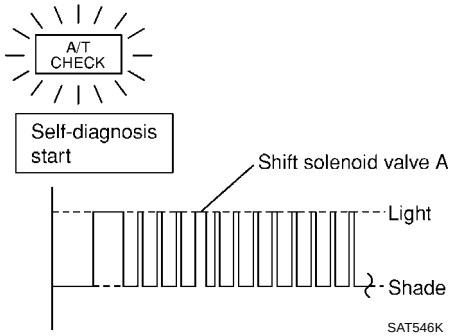
3rd judgement flicker is longer than others.



SCIA2814E

Throttle position sensor circuit is short-circuited or disconnected.
⇒ **Go to** AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" **.**

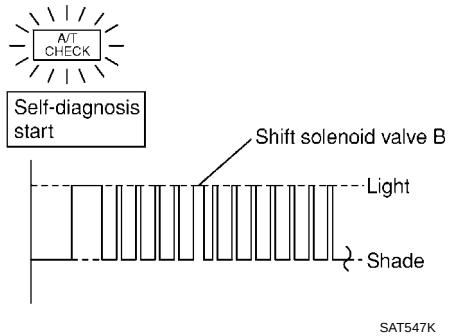
4th judgement flicker is longer than others.



SAT546K

Shift solenoid valve A circuit is short-circuited or disconnected.
⇒ **Go to** AT-167, "DTC P0750 SHIFT SOLENOID VALVE A" **.**

5th judgement flicker is longer than others.

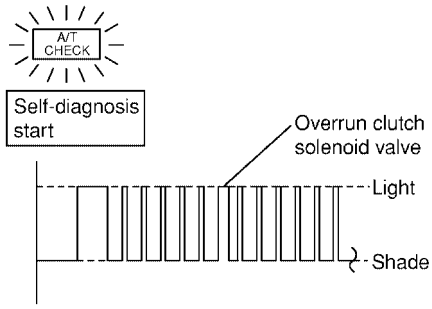


SAT547K

Shift solenoid valve B circuit is short-circuited or disconnected.
⇒ **Go to** AT-172, "DTC P0755 SHIFT SOLENOID VALVE B" **.**

A/T CHECK indicator lamp:

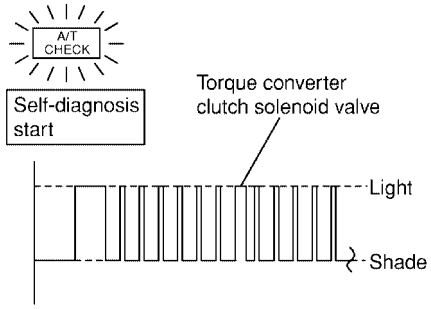
6th judgement flicker is longer than others.



SAT548K

Overrun clutch solenoid valve circuit is short-circuited or disconnected.
⇒ **Go to** **AT-183, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"** .

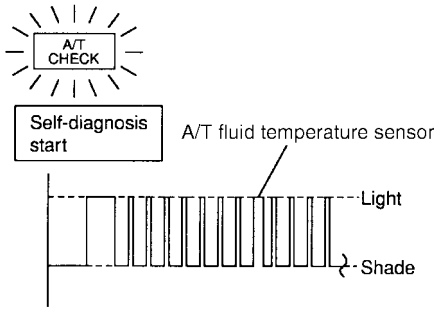
7th judgement flicker is longer than others.



SAT549K

Torque converter clutch solenoid valve circuit is short-circuited or disconnected.
⇒ **Go to** **AT-148, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"** .

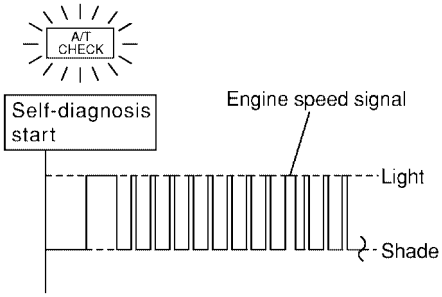
8th judgement flicker is longer than others.



SCIA2816E

A/T fluid temperature sensor is disconnected or TCM power source circuit is damaged.
⇒ **Go to** **AT-111, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"** .

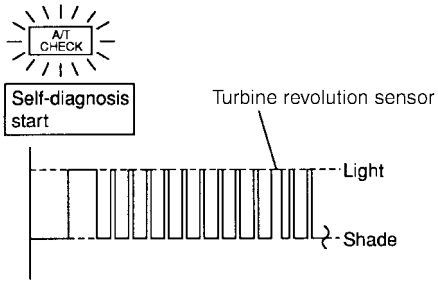
9th judgement flicker is longer than others.



SAT551K

Engine speed signal circuit is short-circuited or disconnected.
⇒ **Go to** **AT-122, "DTC P0725 ENGINE SPEED SIGNAL"** .

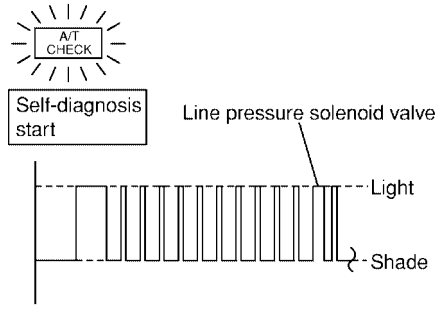
10th judgement flicker is longer than others.



SCIA2815E

Turbine revolution sensor circuit is short-circuited or disconnected.
⇒ **Go to** **AT-202, "DTC TURBINE REVOLUTION SENSOR"** .

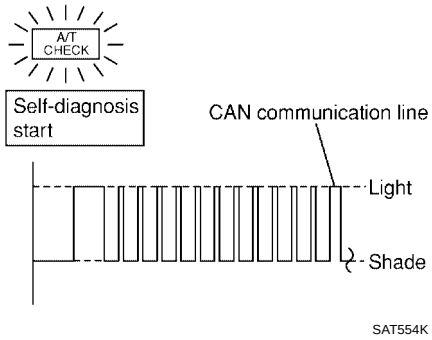
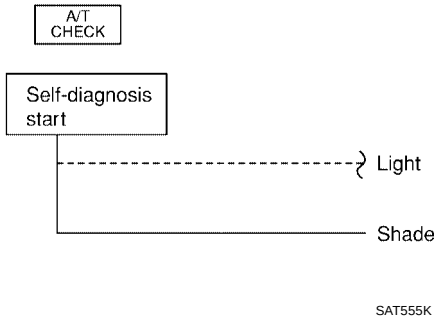
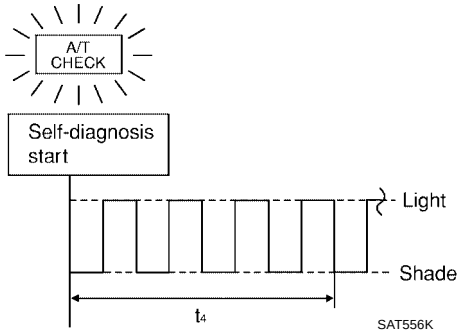
11th judgement flicker is longer than others.



SAT553K

Line pressure solenoid valve circuit is short-circuited or disconnected.
⇒ **Go to** **AT-161, "DTC P0745 LINE PRESSURE SOLENOID VALVE"** .

A/T CHECK indicator lamp:

12th judgement flicker is longer than others.  SAT554K CAN communication line is damaged. ⇒ **Go to** AT-188, "DTC U1000 CAN COMMUNICATION LINE" .	Lamp turns off.  SAT555K Park/neutral position (PNP) switch, and 3rd position switch circuit is disconnected or TCM is damaged. ⇒ **Go to** AT-255, "TCM Self-diagnosis Does Not Activate (PNP & 3rd Position Switches Circuit Checks), and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor] Circuit Check" .
Flickers as shown below.  SAT556K Battery power is low. Battery has been disconnected for a long time. Battery is connected conversely. (When reconnecting TCM connectors.—This is not a problem.)	

t_1 = 2.5 seconds t_2 = 2.0 seconds t_3 = 1.0 second t_4 = 1.0 second

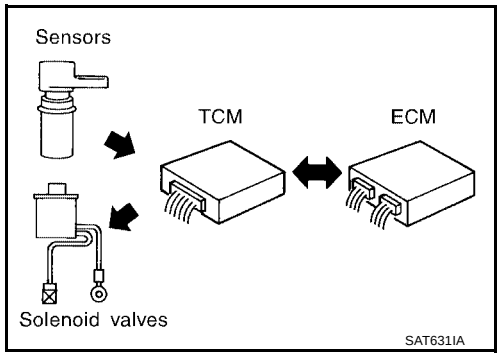
TROUBLE DIAGNOSIS - INTRODUCTION

PFP:00000

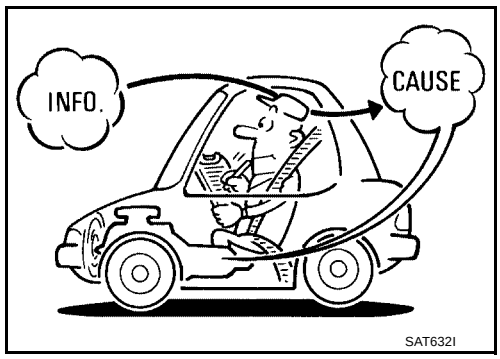
Introduction

UCS000MV

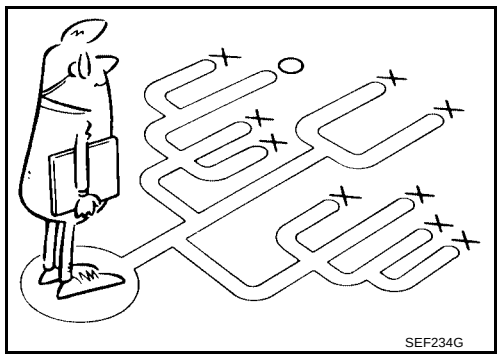
The TCM receives a signal from the vehicle speed sensor, ECM (throttle opening) or park/neutral position (PNP) switch and provides shift control or lock-up control via A/T solenoid valves.
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related 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 “Work Flow”. Refer to AT-63, "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” like the example on page AT-61 should be used.
Start your diagnosis by looking for “conventional” problems first. This will help troubleshoot driveability problems on an electronically controlled engine vehicle.
Also check related Service bulletins for information.



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)	
	❑ No down-shift (❑ 4th → 3rd ❑ 3rd → 2nd ❑ 2nd → 1st)	
	❑ Lockup malfunction	
	❑ Shift point too high or too low.	
	❑ Shift shock or slip (❑ N → D ❑ Lockup ❑ Any drive position)	
	❑ Noise or vibration	
	❑ No kickdown	
	❑ 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

1.	❑ Read the Fail-safe and listen to customer complaints.			AT-11
2.	❑ CHECK A/T FLUID			AT-65
		❑ Leakage (Follow specified procedure) ❑ Fluid condition ❑ Fluid level		
3.	❑ Perform STALL TEST and PRESSURE TEST.			AT-68, AT-71
		❑ Stall test — Mark possible damaged components/others.		
			❑ Torque converter one-way clutch ❑ Reverse clutch ❑ Forward clutch ❑ Overrun clutch ❑ Forward one-way clutch	❑ Low & reverse brake ❑ Low one-way clutch ❑ Engine ❑ Line pressure is low ❑ Clutches and brakes except high clutch and brake band are OK
		❑ Line pressure test — Suspected parts:		
4.	❑ Perform all ROAD TEST and mark required procedures.			AT-72
	4-1.	Check before engine is started.		AT-74
		❑ A/T CHECK Indicator Lamp Does Not Come On, AT-215 ❑ SELF-DIAGNOSTIC PROCEDURE - Mark detected items.		
			❑ Park/neutral position (PNP) switch, AT-105 . ❑ A/T fluid temperature sensor, AT-111 . ❑ Vehicle speed sensor·A/T (Revolution sensor), AT-117 . ❑ Engine speed signal, AT-122 . ❑ Turbine revolution sensor, AT-202 . ❑ Torque converter clutch solenoid valve, AT-148 . ❑ Line pressure solenoid valve, AT-161 . ❑ Shift solenoid valve A, AT-167 . ❑ Shift solenoid valve B, AT-172 . ❑ Throttle position sensor [accelerator pedal position (APP) sensor], AT-177 . ❑ Overrun clutch solenoid valve, AT-183 . ❑ Park/neutral position (PNP) & 3 position switches circuit checks, and throttle position sensor [accelerator pedal position (APP) sensor circuit check AT-255 . ❑ A/T fluid temperature sensor, AT-111 . ❑ Vehicle speed sensor·MTR, AT-197 . ❑ CAN communication line, AT-188 . ❑ Control unit (RAM), Control unit (ROM), AT-207 . ❑ Control unit (EEP ROM), AT-209 . ❑ Battery ❑ Others	

	4-2.	Check at idle	AT-74
		❏ Engine Cannot Be Started In P and N Position, AT-217 . ❏ In P Position, Vehicle Moves Forward or Backward When Pushed, AT-218 . ❏ In N Position, Vehicle Moves, AT-219 . ❏ Large Shock. N → R Position, AT-221 . ❏ Vehicle Does Not Creep Backward In R Position, AT-223 . ❏ Vehicle Does Not Creep Forward In D, 2 or 1 Position, AT-226 .	
	4-3.	Cruise test	AT-76 AT-81
		Part-1	
		❏ Vehicle Cannot Be Started From D_1 , AT-229 . ❏ A/T Does Not Shift: D_1 → D_2 or Does Not Kickdown: D_4 → D_2 , AT-232 . ❏ A/T Does Not Shift: D_2 → D_3 , AT-235 . ❏ A/T Does Not Shift: D_3 → D_4 , AT-238 . ❏ A/T Does Not Perform Lock-up, AT-241 . ❏ A/T Does Not Hold Lock-up Condition, AT-243 . ❏ Lock-up Is Not Released, AT-245 . ❏ Engine Speed Does Not Return To Idle (Light Braking D_4 → D_3), AT-246 .	
		Part-2	AT-84
		❏ Vehicle Does Not Start From D_1 , AT-248 . ❏ A/T Does Not Shift: D_1 → D_2 or Does Not Kickdown: D_4 → D_2 , AT-232 . ❏ A/T Does Not Shift: D_2 → D_3 , AT-235 . ❏ A/T Does Not Shift: D_3 → D_4 , AT-238 .	
4.		Part-3	AT-86
		❏ A/T Does Not Shift: D_4 → D_3 , When Selector Lever D → 3rd Position, AT-249 . ❏ Engine Speed Does Not Return To Idle (Engine Brake In D_3), AT-246 . ❏ A/T Does Not Shift: D_3 → 2_2 , When Selector Lever D → 2nd Position, AT-250 . ❏ Engine Speed Does Not Return To Idle (Engine Brake In 2_2), AT-246 . ❏ A/T Does Not Shift: 2_2 → 1_1 , When Selector Lever 2nd → 1st Position, AT-251 . ❏ Vehicle Does Not Decelerate By Engine Brake, AT-253 . ❏ SELF-DIAGNOSTIC PROCEDURE — Mark detected items.	
		❏ Park/neutral position (PNP) switch, AT-105 . ❏ A/T fluid temperature sensor, AT-111 . ❏ Vehicle speed sensor·A/T (Revolution sensor), AT-117 . ❏ Engine speed signal, AT-122 . ❏ Turbine revolution sensor, AT-202 . ❏ Torque converter clutch solenoid valve, AT-148 . ❏ Line pressure solenoid valve, AT-161 . ❏ Shift solenoid valve A, AT-167 . ❏ Shift solenoid valve B, AT-172 . ❏ Throttle position sensor [accelerator pedal position (APP) sensor], AT-177 . ❏ Overrun clutch solenoid valve, AT-183 . ❏ Park/neutral position (PNP) & 3rd position switches circuit checks, and throttle position sensor [accelerator pedal position (APP) sensor] circuit check, AT-255 . ❏ A/T fluid temperature sensor, AT-111 . ❏ Vehicle speed sensor·MTR, AT-197 . ❏ CAN communication line, AT-188 . ❏ Control unit (RAM), Control unit (ROM), AT-207 . ❏ Control unit (EEP ROM), AT-209 . ❏ Battery ❏ Others	
5.	❏ For self-diagnosis NG items, inspect each component. Repair or replace the damaged parts.		AT-267
6.	❏ Perform all ROAD TEST and re-mark required procedures.		AT-72
7.	❏ Perform DTC CONFIRMATION PROCEDURE for following MIL indicating items and check out NG items. Refer toEC-51, "Emission-related Diagnostic Information" .		EC-51
	❏ DTC (P0731) A/T 1st gear function, AT-126 . ❏ DTC (P0732) A/T 2nd gear function, AT-131 . ❏ DTC (P0733) A/T 3rd gear function, AT-136 . ❏ DTC (P0734) A/T 4th gear function, AT-141 . ❏ DTC (P0744) A/T TCC S/V function (lock-up), AT-153 .		

8.	❏ Perform the Diagnostic Procedures for all remaining items marked NG. Repair or replace the damaged parts. Refer to the Symptom Chart when you perform the procedures. (The chart also shows some other possible symptoms and the component inspection orders.)	AT-43 AT-53
9.	❏ Erase DTC from TCM and ECM memories.	AT-41

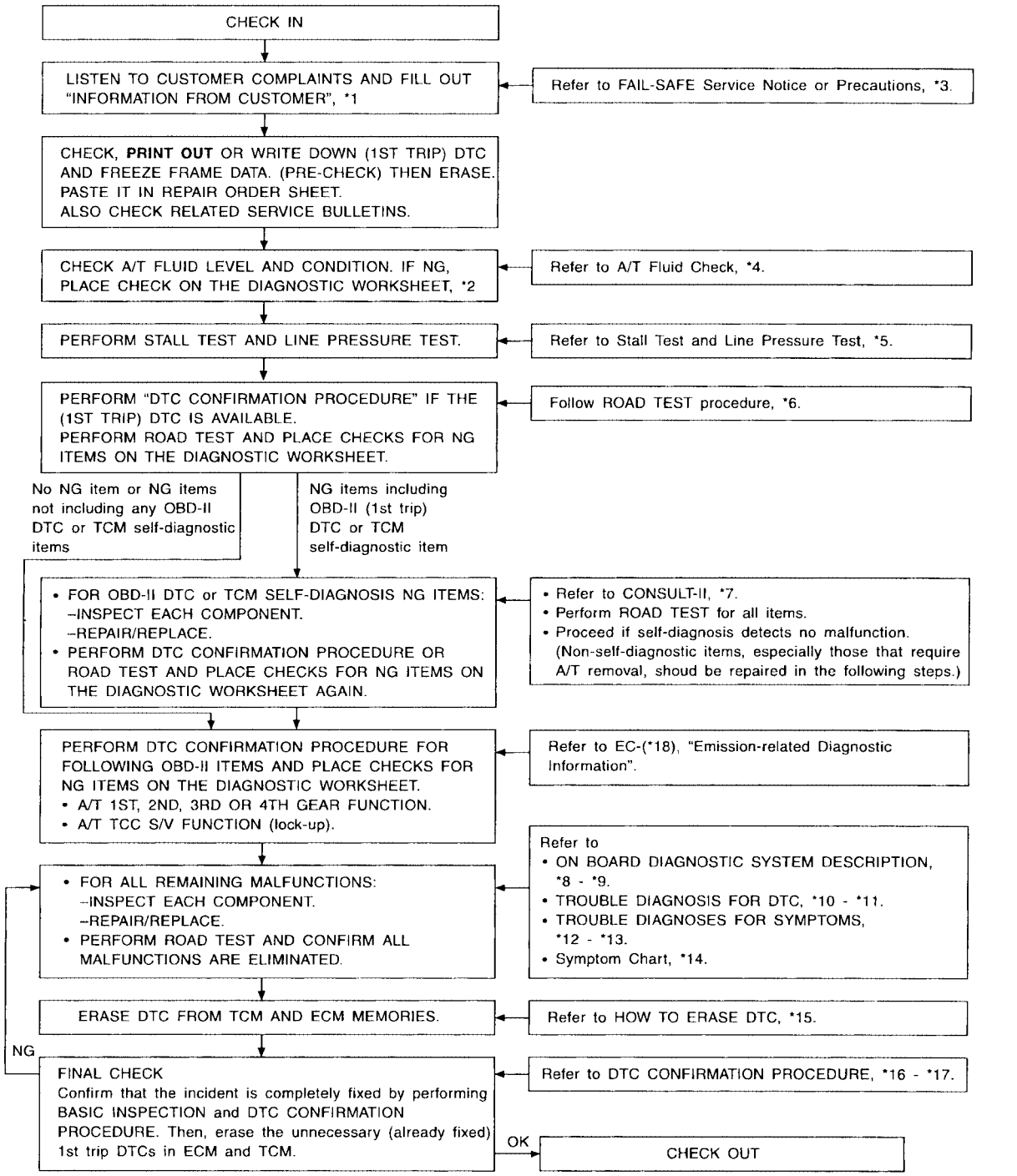
Work Flow

UCS000MW

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

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, AT-60, "Information from Customer" and AT-61, "Diagnostic Work-sheet" , to perform the best troubleshooting possible.

WORK FLOW CHART



SAT086JI

*1: AT-60
*2: AT-61
*3: AT-11
*4: AT-65
*5: AT-68, AT-71
*6: AT-72
*7: AT-43
*8: AT-39
*9: AT-39
*10: AT-39
*11: AT-39
*12: AT-211
*13: AT-211
*14: AT-88
*15: AT-41
*16: AT-105
*17: AT-191
*18: EC-51

TROUBLE DIAGNOSIS - BASIC INSPECTION

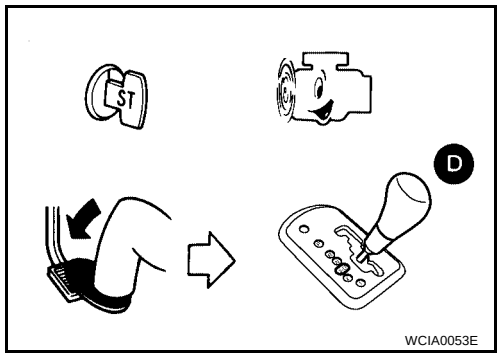
PFP:00000

A/T Fluid Check

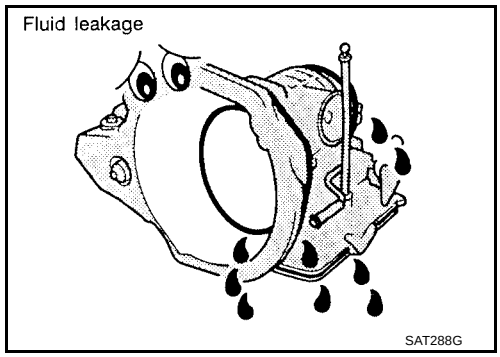
UCS000MX

FLUID LEAKAGE CHECK

1. Clean area suspected of leaking. — for example, mating surface of converter housing and transmission case.
2. Start engine, apply foot brake, place selector lever in D position and wait a few minutes.
3. Stop engine.

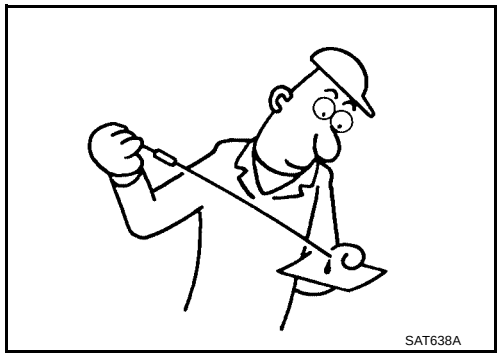


4. Check for fresh leakage.



FLUID CONDITION CHECK

Fluid color	Suspected problem
Dark or black with burned odor	Wear of frictional material
Milky pink	Water contamination — Road water entering through filler tube or breather
Varnished fluid, light to dark brown and tacky	Oxidation — Over or under filling, — Overheating



FLUID LEVEL CHECK

Refer to MA-22, "Changing A/T Fluid" .

A/T Fluid Cooler Cleaning

UCS0015J

Whenever an automatic transaxle is repaired, overhauled, or replaced, the A/T fluid cooler mounted in the radiator must be inspected and cleaned.
Metal debris and friction material, if present, can become trapped in the A/T fluid cooler. This debris can contaminate the newly serviced A/T or, in severe cases, can block or restrict the flow of A/T fluid. In either case, malfunction of the newly serviced A/T may result.
Debris, if present, may build up as A/T fluid enters the cooler inlet. It will be necessary to back flush the cooler through the cooler outlet in order to flush out any built up debris.

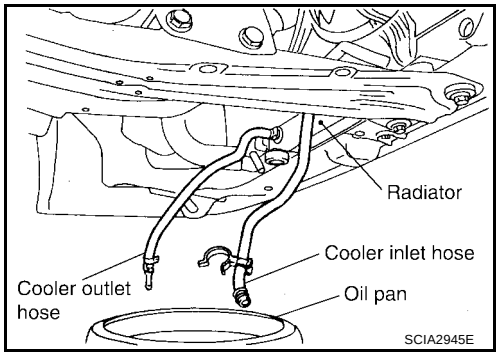
A/T FLUID COOLER CLEANING PROCEDURE

1. Position an oil pan under the automatic transaxle's inlet and outlet cooler hoses.
2. Identify the inlet and outlet fluid cooler hoses.

3. Disconnect the fluid cooler inlet and outlet rubber hoses from the steel cooler tubes or bypass valve.

   NOTE:
   Replace the cooler hoses if rubber material from the hose remains on the tube fitting.

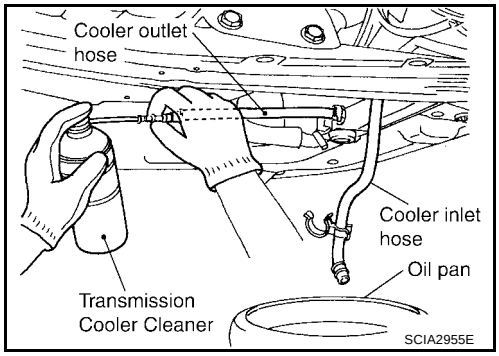
4. Allow any A/T fluid that remains in the cooler hoses to drain into the oil pan.



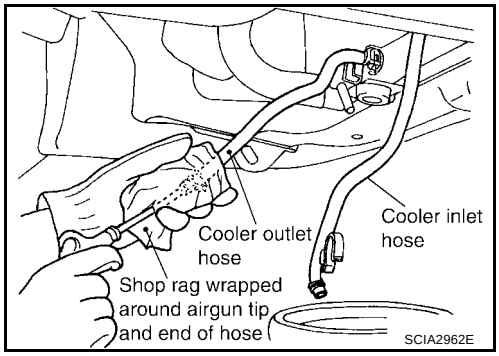
5. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

   CAUTION:
   - **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
   - **Spray cooler cleaner only with adequate ventilation.**
   - **Avoid contact with eyes and skin.**
   - **Do not breath vapors or spray mist.**

6. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until fluid flows out of the cooler inlet hose for 5 seconds.



7. Insert the tip of an air gun into the end of the cooler outlet hose.
8. Wrap a shop rag around the air gun tip and of the cooler outlet hose.



9. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through the cooler outlet hose for 10 seconds to force out any remaining fluid.
10. Repeat steps 5 through 9 three additional times.
11. Position an oil pan under the banjo bolts that connect the fluid cooler steel lines to the transaxle.
12. Remove the banjo bolts.
13. Flush each steel line from the cooler side back toward the transaxle by spraying Transmission Cooler Cleaner in a continuous stream for 5 seconds.
14. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through each steel line from the cooler side back toward the transaxle for 10 seconds to force out any remaining fluid.
15. Ensure all debris is removed from the steel cooler lines.
16. Ensure all debris is removed from the banjo bolts and fittings.
17. Perform AT-66, "A/T FLUID COOLER DIAGNOSIS PROCEDURE" .

A/T FLUID COOLER DIAGNOSIS PROCEDURE

NOTE:
Insufficient cleaning of the cooler inlet hose exterior may lead to inaccurate debris identification.

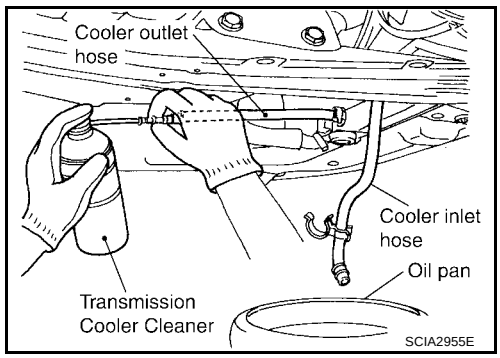
1. Position an oil pan under the automatic transaxle's inlet and outlet cooler hoses.
2. Clean the exterior and tip of the cooler inlet hose.

3. Insert the extension adapter hose of a can of Transmission Cooler Cleaner (Nissan P/N 999MP-AM006) into the cooler outlet hose.

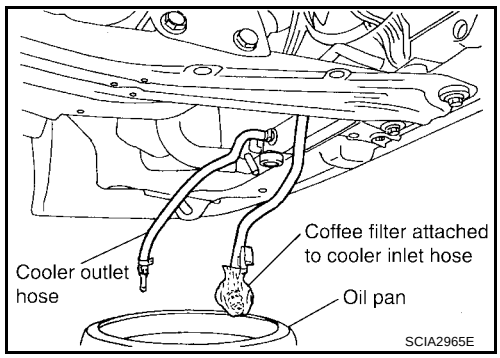
CAUTION:

- **Wear safety glasses and rubber gloves when spraying the Transmission Cooler Cleaner.**
- **Spray cooler cleaner only with adequate ventilation.**
- **Avoid contact with eyes and skin.**
- **Do not breath vapors or spray mist.**

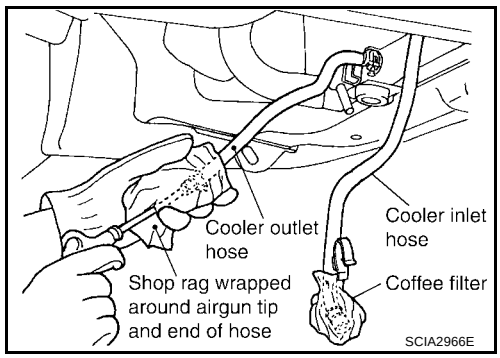
4. Hold the hose and can as high as possible and spray Transmission Cooler Cleaner in a continuous stream into the cooler outlet hose until fluid flows out of the cooler inlet hose for 5 seconds.



5. Tie a common white, basket-type coffee filter to the end of the cooler inlet hose.



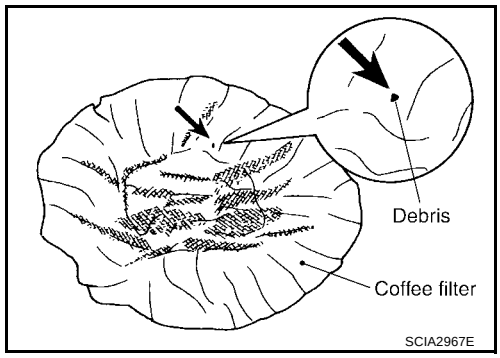
6. Insert the tip of an air gun into the end of the cooler outlet hose.
7. Wrap a shop rag around the air gun tip and end of cooler outlet hose.
8. Blow compressed air regulated to 5 - 9 kg/cm^2 (70 - 130 psi) through the cooler outlet hose to force any remaining A/T fluid into the coffee filter.
9. Remove the coffee filter from the end of the cooler inlet hose.
10. Perform AT-67, "A/T FLUID COOLER INSPECTION PROCEDURE" .



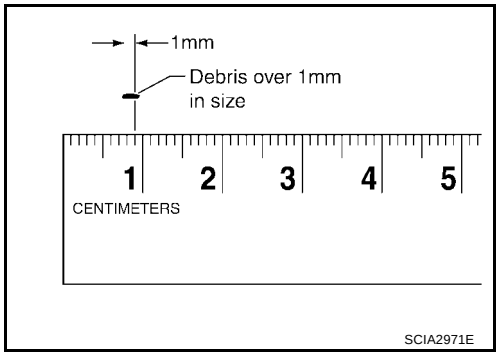
A/T FLUID COOLER INSPECTION PROCEDURE

1. Inspect the coffee filter for debris.

a. If small metal debris less than 1mm (0.040 in) in size or metal powder is found in the coffee filter, this is normal. If normal debris is found, the A/T fluid cooler/radiator can be re-used and the procedure is ended.



b. If one or more pieces of debris are found that are over 1mm in size and/or peeled clutch facing material is found in the coffee filter, the fluid cooler is not serviceable. The radiator/fluid cooler must be replaced and the inspection procedure is ended.



A/T FLUID COOLER FINAL INSPECTION

After performing all procedures, ensure that all remaining oil is cleaned from all components.

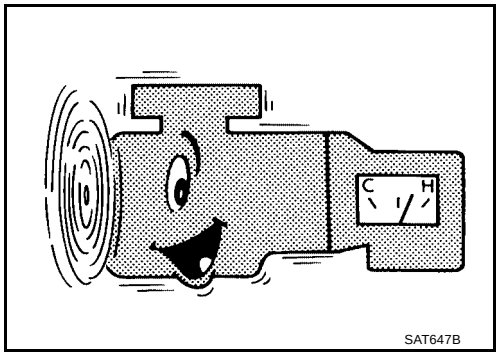
Stall Test

UCS000MY

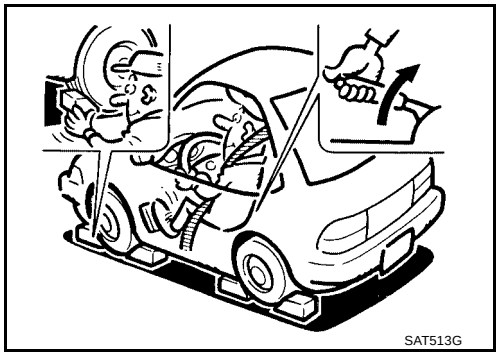
STALL TEST PROCEDURE

1. Check A/T fluid and engine oil levels. If necessary, add fluid and oil.
2. Drive vehicle for approximately 10 minutes or until fluid and oil reach operating temperature.

ATF operating temperature :50 - 80°C (122 - 176°F)

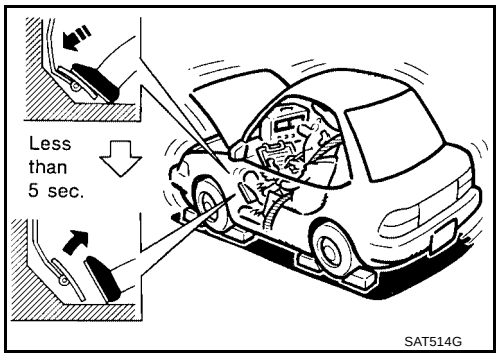


3. Set parking brake and block wheels.
4. Install a tachometer where it can be seen by driver during test.
   - **It is good practice to mark the point of specified engine rpm on indicator.**

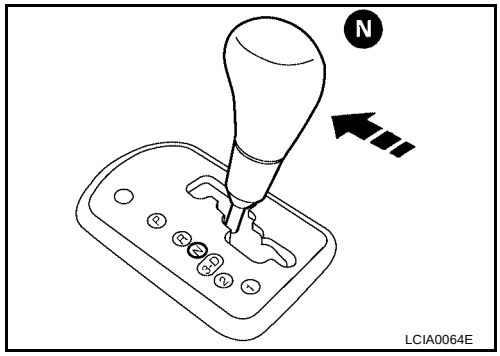


5. Start engine, apply foot brake, and place selector lever in D position.
6. Accelerate to wide open throttle gradually while applying foot brake.
7. Quickly note the engine stall revolution and immediately release throttle.
   - **During test, never hold throttle wide open for less than 5 seconds.**

Stall revolution : 2,550 - 3,050 rpm



8. Move selector lever to N position.
9. Cool off ATF.
   - **Run engine at idle for at least one minute.**
10. Repeat steps 5 through 9 with selector lever in 2nd, 1st and R positions.



JUDGEMENT OF STALL TEST

The test result and possible damaged components relating to each result are shown in the illustrations on next page.
In order to pinpoint the possible damaged components, refer to AT-64, "WORK FLOW CHART" .

NOTE:
Stall revolution is too high in D, 2nd or 1st position:

- Slippage occurs in 1st gear but not in 2nd and 3rd gears. ..... Low one-way clutch slippage
- Slippage occurs in the following gears:
  1st through 3rd gears in D position and engine brake functions.
  1st and 2nd gears in 2nd position and engine brake functions with accelerator pedal released (fully closed throttle). ..... Forward clutch or forward one-way clutch slippage

Stall revolution is too high in R position:

- Engine brake does not function in 1st position. ..... Low & reverse brake slippage
- Engine brake functions in 1st position. ..... Reverse clutch slippage

Stall revolution within specifications:

- Vehicle does not achieve speed of more than 80 km/h (50 MPH). ..... One-way clutch seizure in torque converter housing

CAUTION:
Be careful since automatic fluid temperature increases abnormally.

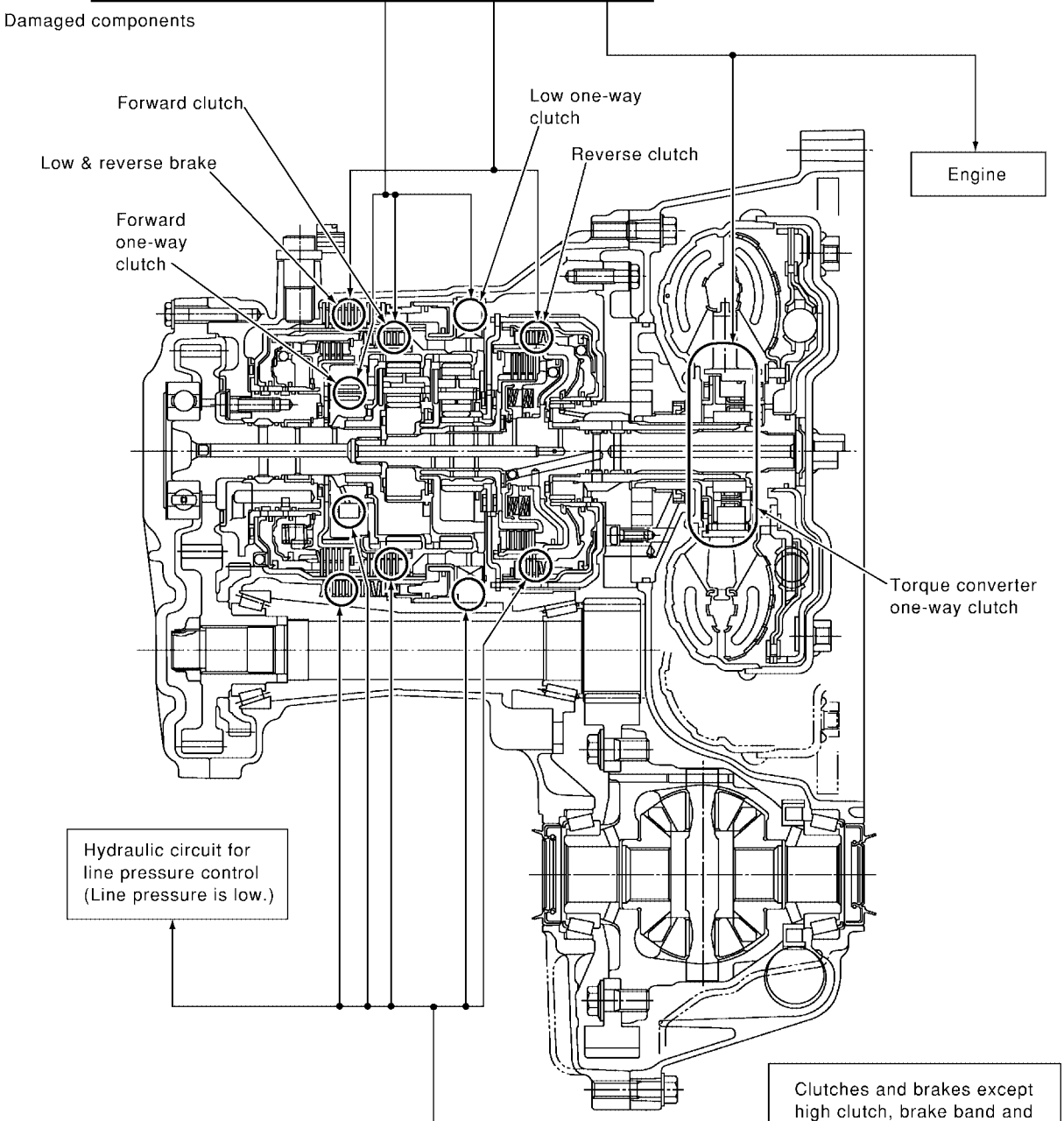
- Slippage occurs in 3rd and 4th gears in D position. ..... High clutch slippage
- Slippage occurs in 2nd and 4th gear in D position. ..... Brake band slippage
- Engine brake does not function in 2nd and 3rd gears in D position with 3rd position switch set to ON, 2nd gear in 2nd position, and 1st gear in 1st position. ..... Overrun clutch slippage

Stall revolution less than specifications:

- Poor acceleration during starts. ..... One-way clutch seizure in torque converter

Selector lever position	Judgement		
D	H	O	L
2	H	O	L
1	H	O	L
R	O	H	L

O : Stall revolution is normal.
H : Stall revolution is higher than specified.
L : Stall revolution is lower than specified.



D	H	O
2	H	O
1	H	O
R	H	O
Selector lever position	Judgement	

SAT499K

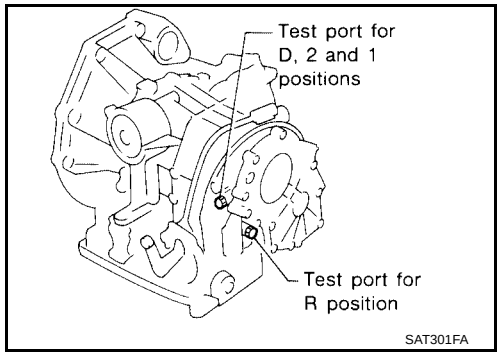
Line Pressure Test

UCS000MZ

LINE PRESSURE TEST PORTS

Location of line pressure test ports are shown in the illustration.

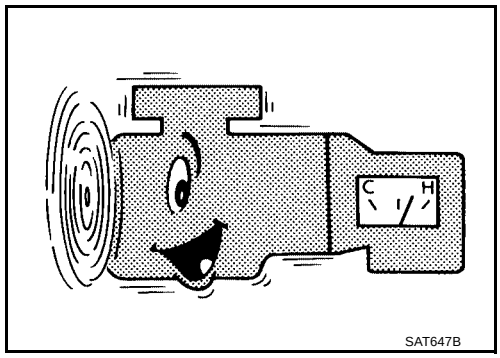
- **Always replace pressure plugs as they are self-sealing bolts.**



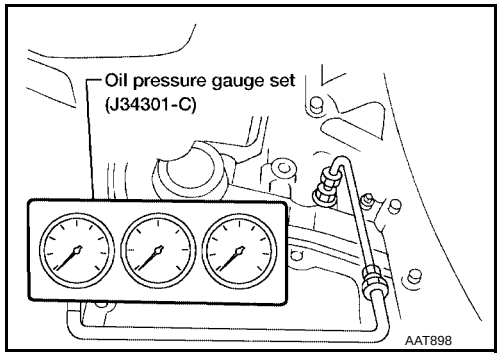
LINE PRESSURE TEST PROCEDURE

1. Check A/T fluid and engine oil levels. If necessary, add fluid and oil.
2. Drive vehicle for approximately 10 minutes or until fluid and oil reach operating temperature.

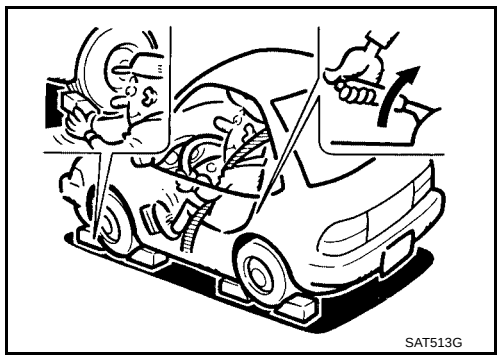
   ATF operating temperature :50 - 80°C (122 - 176°F)



3. Install pressure gauge to corresponding line pressure port.

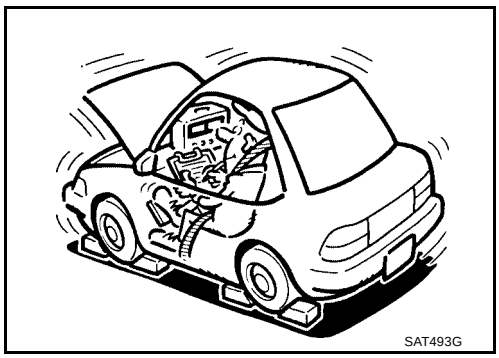


4. Set parking brake and block wheels.
   - **Continue to depress brake pedal fully while line pressure test is being performed at stall speed.**



5. Start engine and measure line pressure at idle and stall speed.
   - **When measuring line pressure at stall speed, follow the stall test procedure.**

   Line pressure : AT-378, "Line Pressure"


SAT493G

JUDGEMENT OF LINE PRESSURE TEST

Judgement		Suspected parts
At idle	Line pressure is low in all positions.	● Oil pump wear ● Control piston damage ● Pressure regulator valve or plug sticking ● Spring for pressure regulator valve damaged ● Fluid pressure leakage between oil strainer and pressure regulator valve ● Clogged strainer
	Line pressure is low in particular position.	● Fluid pressure leakage between manual valve and particular clutch ● For example, line pressure is: – Low in R and 1st positions, but – Normal in D and 2nd positions. Therefore, fluid leakage exists at or around low and reverse brake circuit. Refer to AT-22, "CLUTCH AND BAND CHART" .
	Line pressure is high.	● Maladjustment of throttle position sensor ● A/T fluid temperature sensor damaged ● Line pressure solenoid valve sticking ● Short circuit of line pressure solenoid valve circuit ● Pressure modifier valve sticking ● Pressure regulator valve or plug sticking ● Open in dropping resistor circuit
At stall speed	Line pressure is low.	● Maladjustment of throttle position sensor ● Line pressure solenoid valve sticking ● Short circuit of line pressure solenoid valve circuit ● Pressure regulator valve or plug sticking ● Pressure modifier valve sticking ● Pilot valve sticking

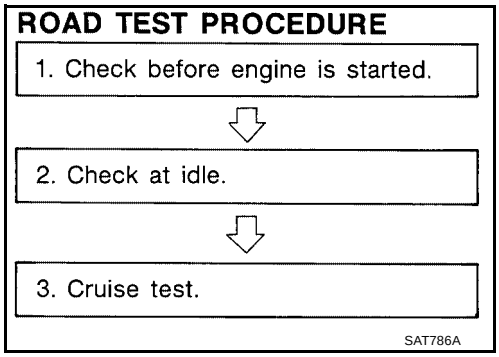
Road Test

UCS000N0

DESCRIPTION

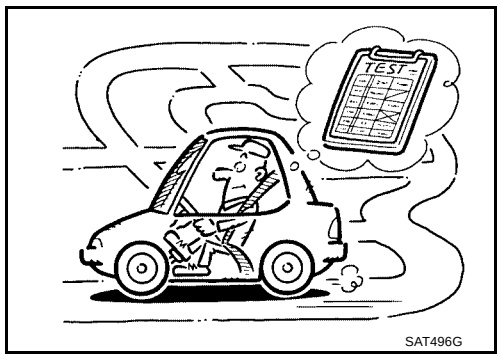
- The purpose of the test is to determine overall performance of A/T and analyze causes of problems.
- The road test consists of the following three parts:

1. Check before engine is started
2. Check at idle
3. Cruise test



SAT786A

- Before road test, familiarize yourself with all test procedures and items to check.
- Conduct tests on all items until specified symptom is found. Troubleshoot items which check out No Good after road test. Refer to AT-39, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION" , and AT-211, "TROUBLE DIAGNOSIS FOR SYMPTOMS" .



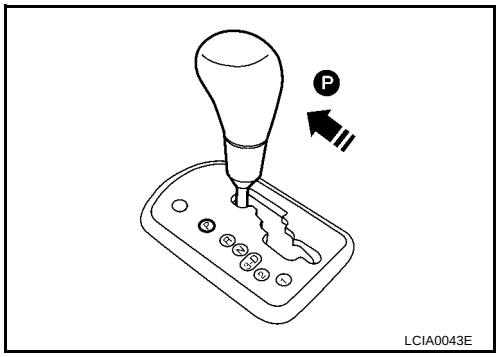
1. CHECK BEFORE ENGINE IS STARTED

1. CHECK A/T CHECK INDICATOR LAMP

1. Park vehicle on flat surface.
2. Move selector lever to P position.
3. Turn ignition switch to OFF position. Wait at least 5 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 >> Stop ROAD TEST. Go to AT-215, "A/T CHECK Indicator Lamp Does Not Come On" .

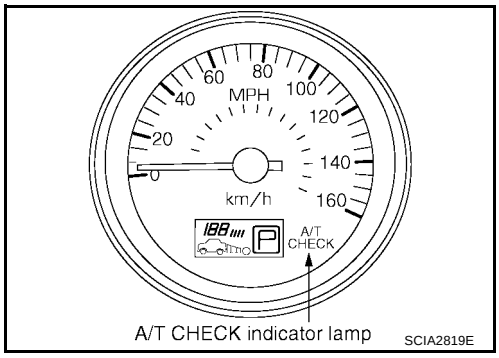


2. CHECK A/T CHECK INDICATOR LAMP

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

Yes or No

Yes >> Perform self-diagnosis and check NG items on the DIAGNOSTIC WORKSHEET, AT-61 . Refer to AT-54, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .
No >> 1. Turn ignition switch to OFF position.
2. Perform self-diagnosis and note NG items. Refer to AT-54, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .
3. Go to AT-74, "2. CHECK AT IDLE" .



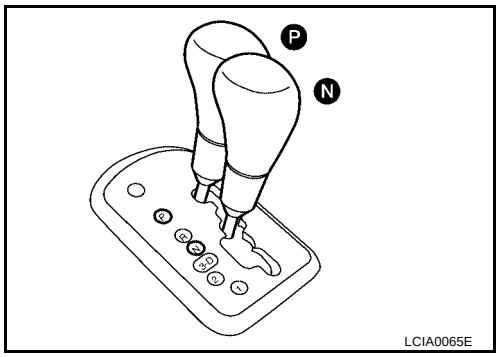
2. CHECK AT IDLE

1. CHECK ENGINE START

1. Park vehicle on flat surface.
2. Move selector lever to P position.
3. Turn ignition switch to OFF position.
4. Turn ignition switch to START position.
5. Is engine started?

Yes or No

Yes >> GO TO 2.
No >> Stop ROAD TEST. Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-217, "Engine Cannot Be Started In P and N Position" . Continue ROAD TEST.



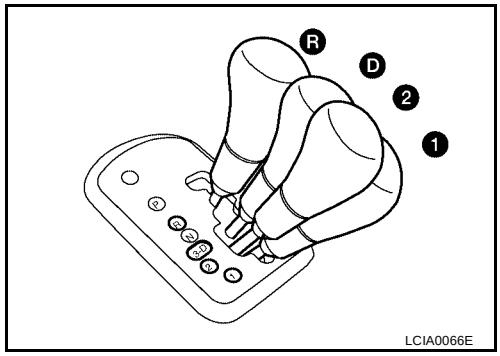
2. CHECK ENGINE START

1. Turn ignition switch to ACC position.
2. Move selector lever to D, 1st, 2nd or R position.
3. Turn ignition switch to START position.
4. Is engine started?

Yes or No

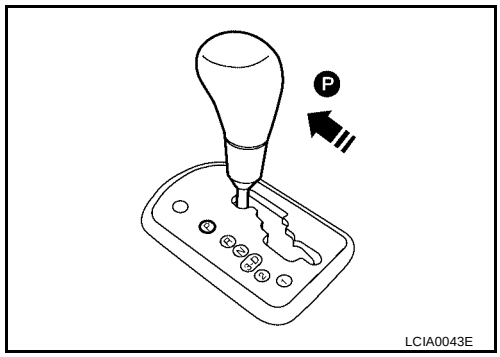
Yes >> Stop ROAD TEST. Mark the box on the DIAGNOSTIC WORKSHEET. Go to AT-217, "Engine Cannot Be Started In P and N Position" . Continue ROAD TEST.

No >> GO TO 3.



3. CHECK VEHICLE MOVE

1. Move selector lever to P position.
2. Turn ignition switch to OFF position.
3. Release parking brake.

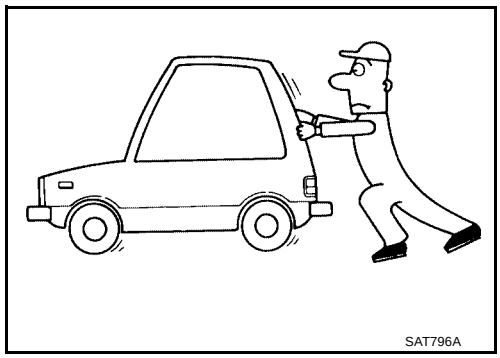


4. Push vehicle forward or backward.
5. Does vehicle move when it is pushed forward or backward?
6. Apply parking brake.

Yes or No

Yes >> Mark the box “In P Position, Vehicle Moves Forward Or Backward When Pushed” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.

No >> GO TO 4.



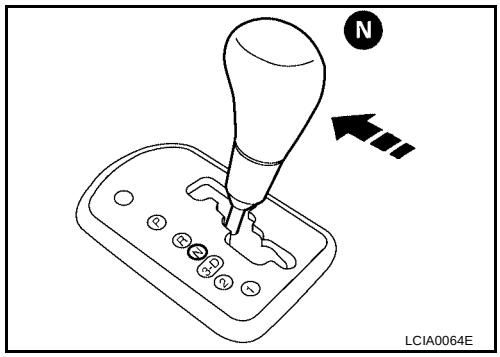
4. CHECK VEHICLE MOVE

1. Start engine.
2. Move selector lever to N position.
3. Release parking brake.
4. Does vehicle move forward or backward?

Yes or No

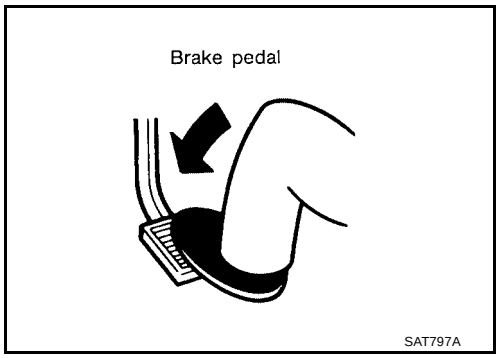
Yes >> Mark the box “In N Position, Vehicle Moves” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.

No >> GO TO 5.



5. CHECK SHIFT LOCK

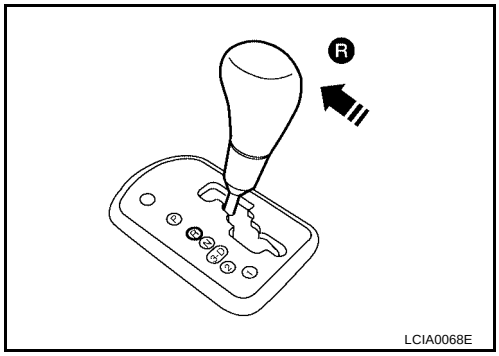
1. Apply foot brake.



2. Move selector lever to R position.
3. Is there large shock when changing from N to R position?

Yes or No

Yes >> Mark the box “Large shock N →R Position” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.
No >> GO TO 6.

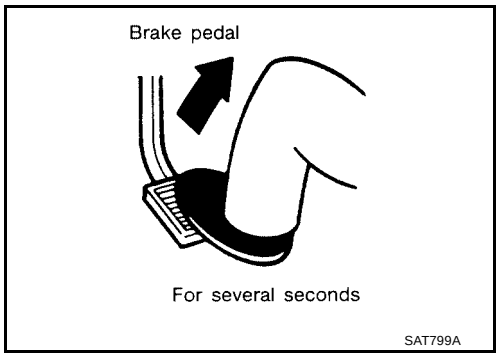


6. CHECK VEHICLE MOVE

1. Release foot brake for several seconds.
2. Does vehicle creep backward when foot brake is released?

Yes or No

Yes >> GO TO 7.
No >> Mark the box “Vehicle Does Not Creep Backward In R Position” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.

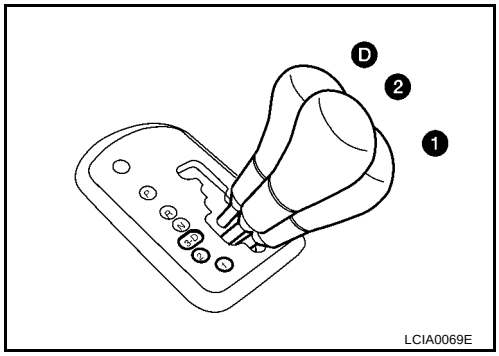


7. CHECK VEHICLE MOVE

1. Move selector lever to D, 2nd and 1st positions and check if vehicle creeps forward.
2. Does vehicle creep forward in all three positions?

Yes or No

Yes >> Go to AT-76, "3. CRUISE TEST" .
No >> Mark the box “Vehicle Does Not Creep Forward In D, 2nd Or 1st Position” on the DIAGNOSTIC WORK-SHEET. Continue ROAD TEST.

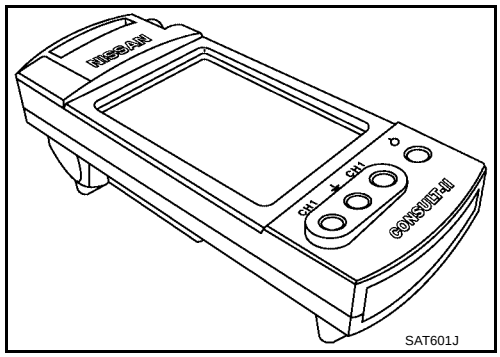


3. CRUISE TEST

- Check all items listed in Parts 1 through 3.

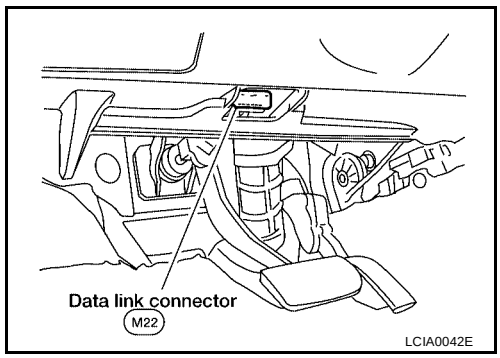
With CONSULT-II

- Using CONSULT-II, conduct a cruise test and record the result.
- Print the result and ensure that shifts and lock-ups take place as per Shift Schedule. Refer to AT-377, "Shift Schedule"

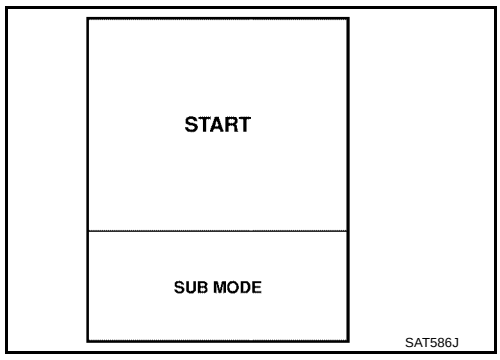


CONSULT-II Setting Procedure

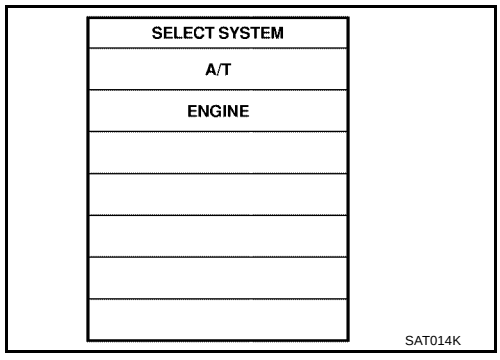
1. Turn ignition switch OFF.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector, which is located in left side dash panel.



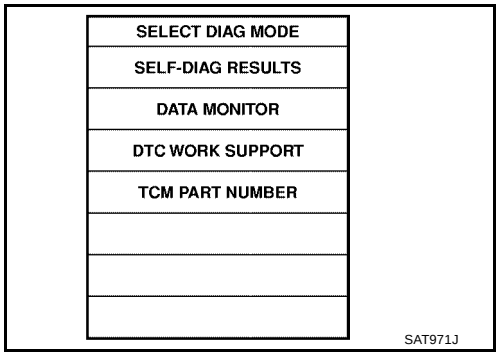
3. Turn ignition switch ON.



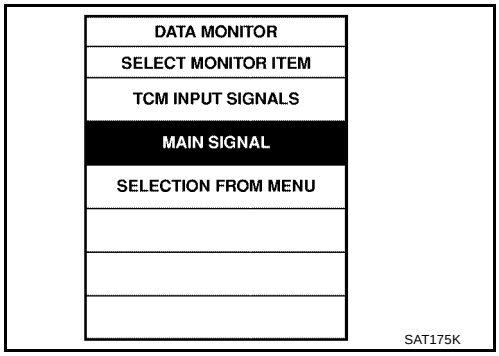
4. Touch “START”.
5. Touch “A/T”.
   If “A/T” is not indicated, go to GI-36, "CONSULT-II Data Link Connector (DLC) Circuit" .



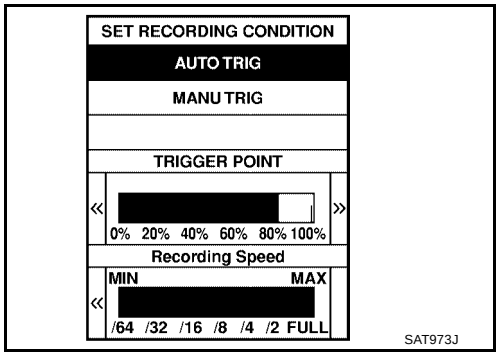
6. Touch “DATA MONITOR”.



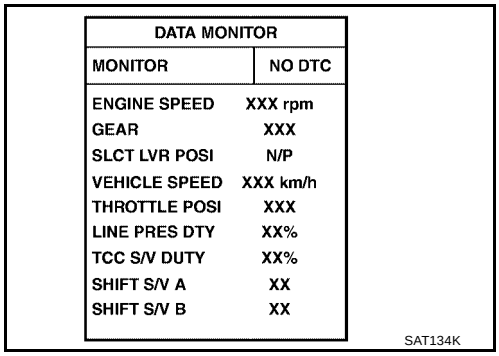
7. Touch “MAIN SIGNALS” or “TCM INPUT SIGNALS”.
8. See “Numerical Display”, “Barchart Display” or “Line Graph Display”.



9. Touch “SETTING” to set recording condition (“AUTO TRIG” or “MANU TRIG”) and touch “BACK”.
10. Touch “Start”.



11. When performing cruise test, touch “RECORD”.



12. After finishing cruise test part 1, touch “STOP”.

DATA MONITOR	
Recording Data X%	DTC DETECTED
ENGINE SPEED	XXX rpm
GEAR	XXX
SLCT LVR POSI	N/P
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
LINE PRES DTY	XX%
TCC S/V DUTY	XX%
SHIFT S/V A	XX
SHIFT S/V B	XX

SAT135K

13. Touch “STORE” and touch “BACK”.

REAL-TIME DIAG
ENG SPEED SIG

SAT987J

STORE	
SYSTEM	SAVE REC DATA

SAT974J

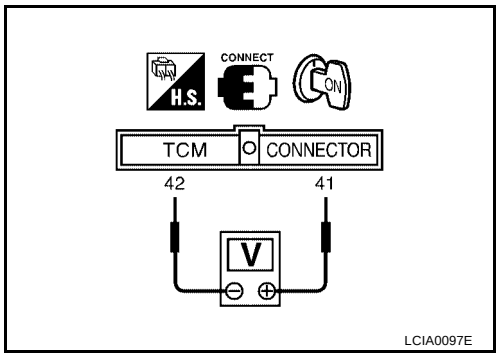
14. Touch “DISPLAY”.
15. Touch “PRINT”.
16. Check the monitor data printed out.
17. Continue cruise test part 2 and 3.

Trigger	VHCL S/SEN A/T	VHCL S/SEN MTR	THRTL POSI SEN
	km/h	km/h	V

SAT975J

Without CONSULT-II

- Throttle position sensor can be checked by voltage across terminals 41 (W) and 42 (B) of TCM.



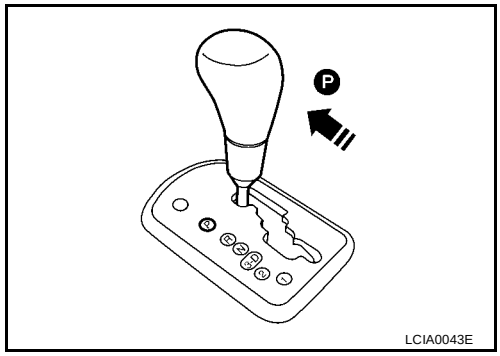
Cruise Test — Part 1

1. CHECK STARTING GEAR (D_1) POSITION

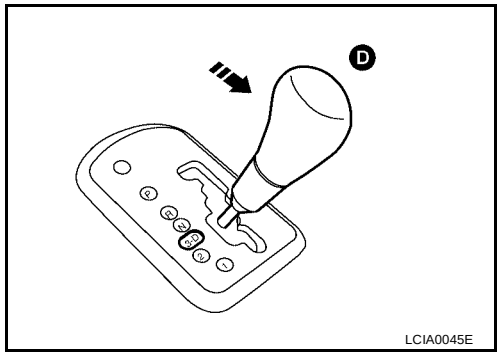
1. Drive vehicle for approximately 10 minutes to warm engine oil and ATF up to operating temperature.

   ATF operating temperature :50 - 80°C (122 - 176°F)

2. Park vehicle on flat surface.
3. Set gear selector lever to D position.
4. Move selector lever to P position.
5. Start engine.



6. Move selector lever to D position.



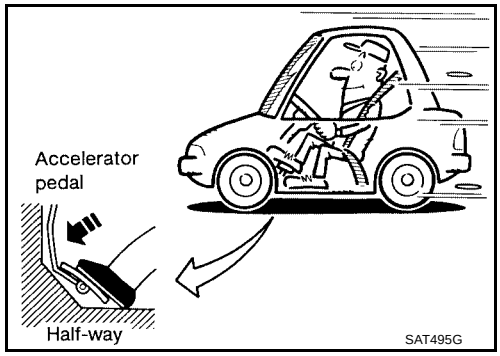
7. Accelerate vehicle by constantly depressing accelerator pedal half-way.
8. Does vehicle start from D_1 ?

   Read gear position.

Yes or No

Yes >> GO TO 2.

No >> Mark the box of “Vehicle Cannot Be Started From D_1 ” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.

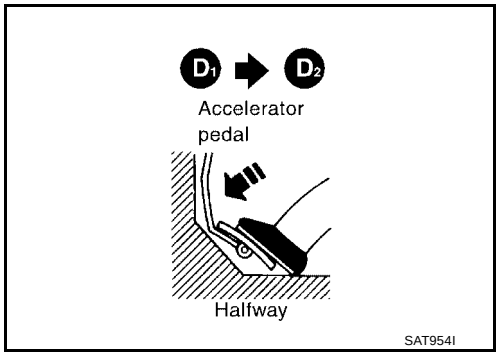


2. CHECK SHIFT UP (D_1 TO D_2)

Does A/T shift from D_1 to D_2 at the specified speed?

Read gear position, throttle opening and vehicle speed.

Specified speed when shifting from D_1 to D_2 **:Refer to AT-377, "Shift Schedule" .**



Yes or No

Yes >> GO TO 3.

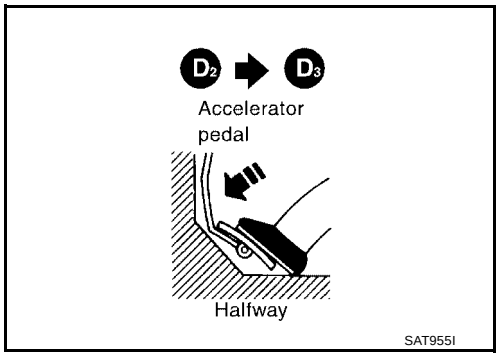
No >> Mark the box of "A/T Does Not Shift: D_1 →D_2 Or Does Not Kickdown: D_4 →D_2 " on the DIAGNOSTIC WORK-SHEET. Continue ROAD TEST. Continue ROAD TEST.

3. CHECK SHIFT UP (D_2 TO D_3)

Does A/T shift from D_2 to D_3 at the specified speed?

Read gear position, throttle opening and vehicle speed.

Specified speed when shifting from D_2 to D_3 **:Refer to AT-377, "Shift Schedule"**



Yes or No

Yes >> GO TO 4.

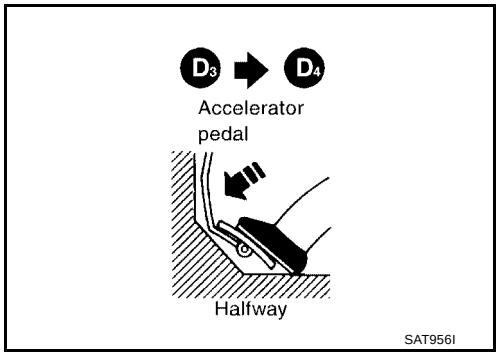
No >> Mark the box of "A/T Does Not Shift: D_2 → D_3 " on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST. Continue ROAD TEST.

4. CHECK SHIFT UP (D_3 TO D_4)

Does A/T shift from D_3 to D_4 at the specified speed?

Read gear position, throttle opening and vehicle speed.

Specified speed when shifting from D_3 to D_4 **:Refer to AT-377, "Shift Schedule" .**



Yes or No

Yes >> GO TO 5.

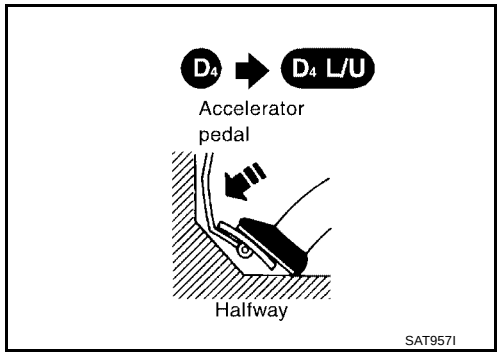
No >> Mark the box of "A/T Does Not Shift: D_3 → D_4 " on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST. Continue ROAD TEST.

5. CHECK LOCK-UP (D4 TO D4 L/U)

Does A/T perform lock-up at the specified speed?

Read vehicle speed, throttle opening when lock-up duty becomes 94%.

Specified speed when lock-up occurs :Refer to AT-377, "Shift Schedule" .



Yes or No

Yes >> GO TO 6.

No >> Mark the box of “A/T Does Not Perform Lock-up” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.

6. CHECK HOLD LOCK-UP

Does A/T hold lock-up condition for more than 30 seconds?

Yes or No

Yes >> GO TO 7.

No >> Mark the box of “A/T Does Not Hold Lock-up Condition” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.

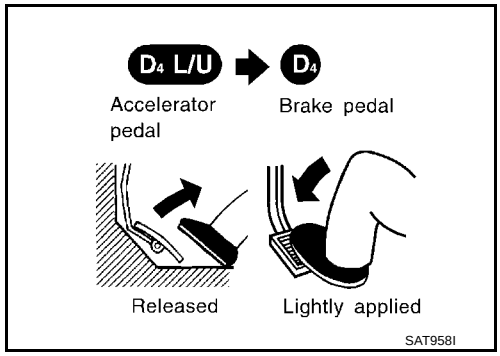
7. CHECK SHIFT DOWN (D4 L/U TO D4)

1. Release accelerator pedal.
2. Is lock-up released when accelerator pedal is released?

Yes or No

Yes >> GO TO 8.

No >> Mark the box of “Lock-up Is Not Released” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



8. CHECK SHIFT DOWN (D4 TO D3)

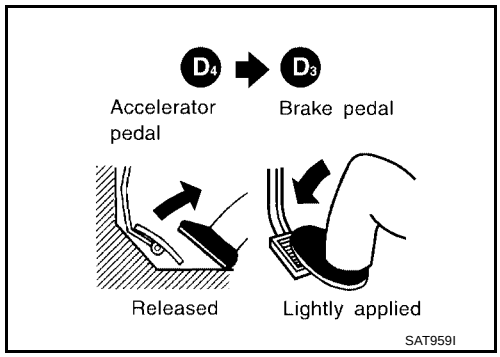
1. Decelerate vehicle by applying foot brake lightly.
2. Does engine speed return to idle smoothly when A/T is shifted from D4 to D3 ?

Read gear position and engine speed.

Yes or No

Yes >> 1. Stop vehicle.
2. Go to AT-84, "Cruise Test — Part 2" .

No >> Mark the box of “Engine Speed Does Not Return To Idle (Light Braking D4 →D3)” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



Cruise Test — Part 2

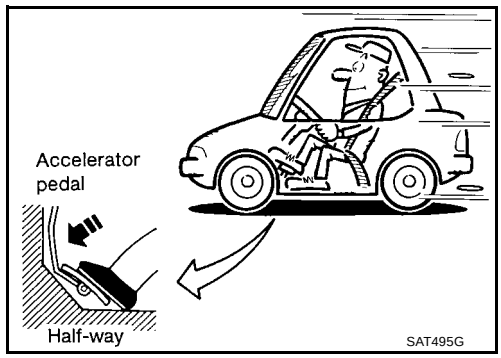
1. CHECK STARTING GEAR (D_1) POSITION

1. Confirm gear selector lever is in D position.
2. Accelerate vehicle by half throttle again.
3. Does vehicle start from D_1 ?

Read gear position.

Yes or No

Yes >> GO TO 2.
No >> Mark the box of “Vehicle Does Not Start From D_1 ” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



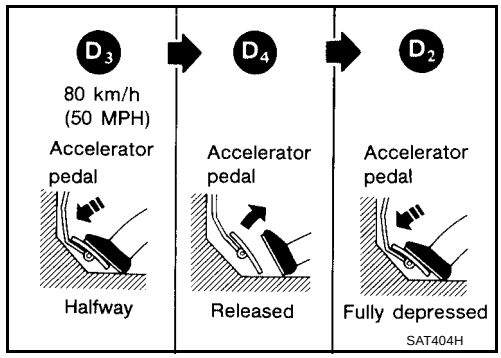
2. CHECK SHIFT UP AND SHIFT DOWN (D_3 TO D_4 TO D_2)

1. Accelerate vehicle to 80 km/h (50 MPH) as shown in illustration.
2. Release accelerator pedal and then quickly depress it fully.
3. Does A/T shift from D_4 to D_2 as soon as accelerator pedal is depressed fully?

Read gear position and throttle opening.

Yes or No

Yes >> GO TO 3.
No >> Mark the box of “A/T Does Not Shift: $D_1 \rightarrow D_2$ Or Does Not Kickdown: $D_4 \rightarrow D_2$ ” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



3. CHECK SHIFT UP (D_2 TO D_3)

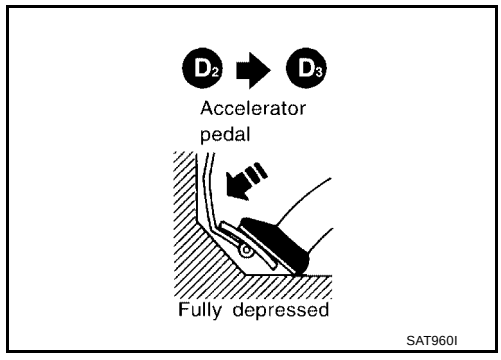
Does A/T shift from D_2 to D_3 at the specified speed?

Read gear position, throttle opening and vehicle speed.

Specified speed when shifting from D_2 to D_3	**:Refer to AT-377, "Shift Schedule" .**

Yes or No

Yes >> GO TO 4.
No >> Mark the box of “A/T Does Not Shift: $D_2 \rightarrow D_3$ ” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



4. CHECK SHIFT UP (D_3 TO D_4) AND ENGINE BRAKE

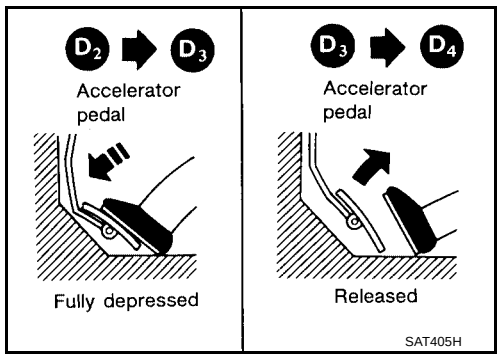
Release accelerator pedal after shifting from D_2 to D_3.
Does A/T shift from D_3 to D_4 and does vehicle decelerate by engine brake?

Read gear position, throttle opening and vehicle speed.

Yes or No

Yes >> 1. Stop vehicle.
2. Go to AT-86, "Cruise Test — Part 3".

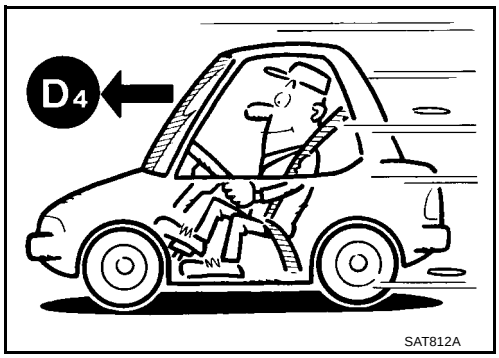
No >> Mark the box of “A/T Does Not Shift: D_3 →D_4 ” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



Cruise Test — Part 3

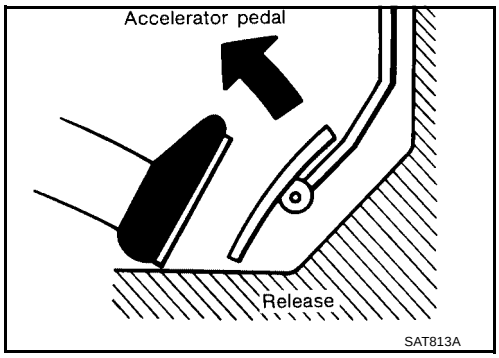
1. VEHICLE SPEED (D_4) POSITION

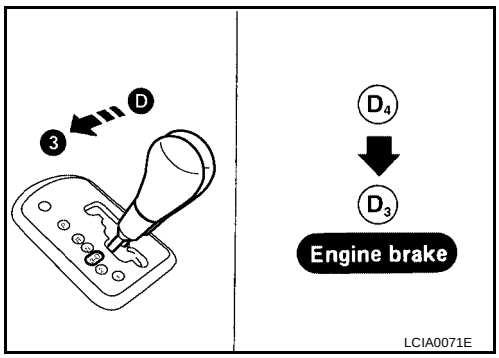
1. Confirm gear selector lever is in D position.
2. Accelerate vehicle using half-throttle to D_4.



3. Release accelerator pedal.
4. Move gear selector lever from D position to 3rd position while driving in D_4.
5. Does A/T shift from D_4 to D_3 ?

   Read gear position and vehicle speed.





Yes or No

Yes >> GO TO 2.

No >> Mark the box of “A/T Does Not Shift: D_4 →D_3 , When Selector Lever D →3rd Position” on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.

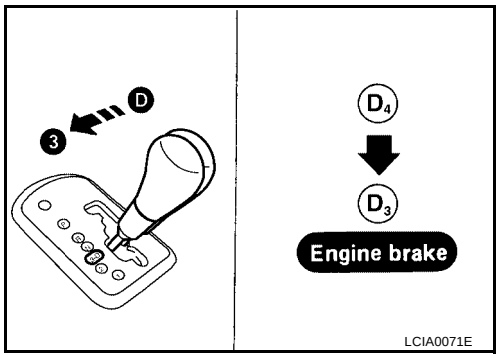
2. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

Yes >> GO TO 3.

No >> Mark the box of “Engine Speed Does Not Return To Idle (Light Braking D_4 →D_3 ” on the DIAGNOSTIC WORK-SHEET. Continue ROAD TEST.



3. CHECK SHIFT DOWN (D_3 TO 2_2)

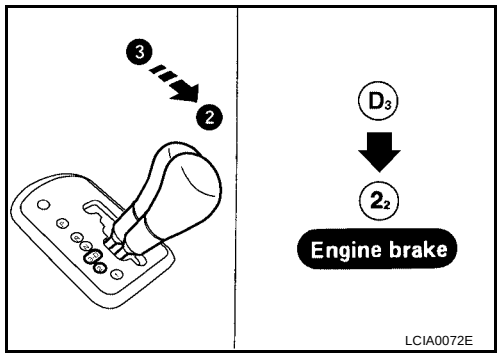
1. Move selector lever from 3rd to 2nd position while driving in D_3.
2. Does A/T shift from D_3 to 2_2?

Read gear position.

Yes or No

Yes >> GO TO 4.

No >> Mark the box of "A/T Does Not Shift: $D_3 \rightarrow D_2$, When Selector Lever 3rd →2nd Position" on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



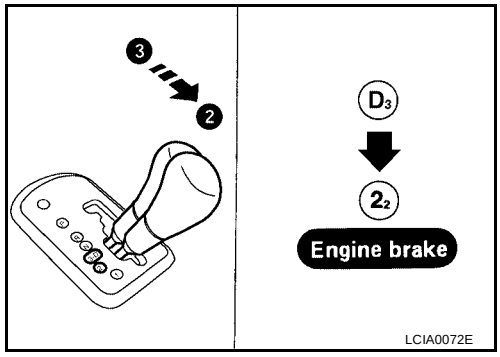
4. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

Yes >> GO TO 5.

No >> Mark the box of "Engine Speed Does Not Return To Idle (Light Braking $D_4 \rightarrow D_3$)" on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



5. CHECK SHIFT DOWN (2_2 TO 1_1)

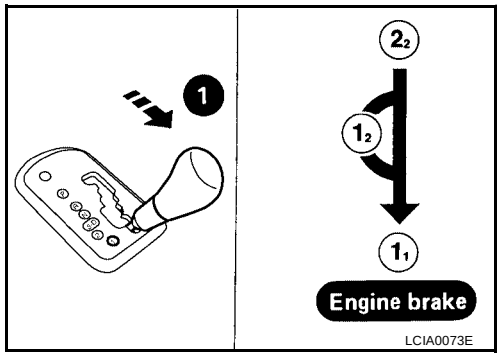
1. Move selector lever from 2nd to 1st position while driving in 2_2.
2. Does A/T shift from 2_2 to 1_1 position?

Read gear position.

Yes or No

Yes >> GO TO 6.

No >> Mark the box of "A/T Does Not Shift: $2_2 \rightarrow 1_1$, When Selector Lever 2nd →1st Position" on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



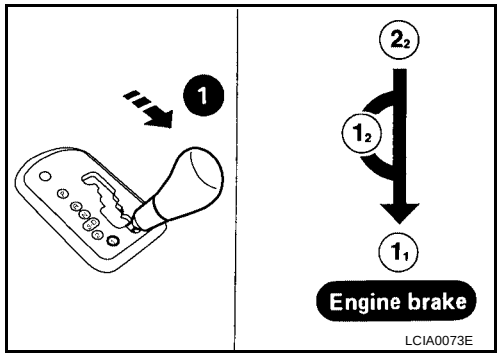
6. CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?

Yes or No

Yes >> 1. Stop vehicle.
2. Perform self-diagnosis. Refer to AT-54, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)".

No >> Mark the box of "Vehicle Does Not Decelerate By Engine Brake" on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.



TROUBLE DIAGNOSIS - GENERAL DESCRIPTION

PFP:00000

Symptom Chart

UCS000N1

Numbers are arranged in order of inspection.
Perform inspections starting with number one and work up.

Items	Symptom	Condition	Diagnostic Item	Reference Page
No Lock-up Engagement/ TCC Inoperative	Torque converter is not locked up.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			3. Engine speed signal	AT-122
			4. A/T fluid temperature sensor	AT-111
			5. Line pressure test	AT-71
			6. Torque converter clutch solenoid valve	AT-148
			7. Control valve assembly	AT-267
		OFF vehicle	8. Torque converter	AT-282
	Torque converter clutch piston slip.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. Torque converter clutch solenoid valve	AT-148
			5. Line pressure solenoid valve	AT-161
			6. Control valve assembly	AT-267
		OFF vehicle	7. Torque converter	AT-282
	Lock-up point is extremely high or low.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			3. Torque converter clutch solenoid valve	AT-148
			4. Control valve assembly	AT-267
Shift Shock	Sharp shock in shifting from N to D position.	ON vehicle	1. Engine idling rpm	EC-34
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. A/T fluid temperature sensor	AT-111
			5. Engine speed signal	AT-122
			6. Line pressure solenoid valve	AT-161
			7. Control valve assembly	AT-267
			8. Accumulator N-D	AT-282
		OFF vehicle	9. Forward clutch	AT-327

Items	Symptom	Condition	Diagnostic Item	Reference Page
Shift Shock	Too sharp a shock in change from D_1 to D_2.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Line pressure test	AT-71
			3. Accumulator servo release	AT-282
			4. Control valve assembly	AT-267
			5. A/T fluid temperature sensor	AT-111
		OFF vehicle	6. Brake band	AT-282
	Too sharp a shock in change from D_2 to D_3.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Line pressure test	AT-71
			3. Control valve assembly	AT-267
		OFF vehicle	4. High clutch	AT-322
			5. Brake band	AT-282
	Too sharp a shock in change from D_3 to D_4.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Line pressure test	AT-71
			3. Control valve assembly	AT-267
		OFF vehicle	4. Brake band	AT-282
			5. Overrun clutch	AT-327
			6. Forward one-way clutch	AT-335
	Gear change shock felt during deceleration by releasing accelerator pedal.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Line pressure test	AT-71
			3. Overrun clutch solenoid valve	AT-183
			4. Control valve assembly	AT-267
	Large shock changing from 1_2 to 1_1 in 1st position.	ON vehicle	1. Control valve assembly	AT-267
		OFF vehicle	2. Low & reverse brake	AT-333
Improper Shift Timing	Too high a gear change point from D_1 to D_2, from D_2 to D_3, from D_3 to D_4.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			3. Shift solenoid valve A	AT-167
			4. Shift solenoid valve B	AT-172
	Gear change directly from D_1 to D_3 occurs.	ON vehicle	1. Fluid level	AT-65
			2. Accumulator servo release	AT-277
		OFF vehicle	3. Brake band	AT-282
	Too high a change point from D_4 to D_3, from D_3 to D_2, from D_2 to D_1.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
	Kickdown does not operate when depressing pedal in D_4 within kickdown vehicle speed.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			3. Shift solenoid valve A	AT-167
			4. Shift solenoid valve B	AT-172

Items	Symptom	Condition	Diagnostic Item	Reference Page
Improper Shift Timing	Kickdown operates or engine overruns when depressing pedal in D_4 beyond kickdown vehicle speed limit.	ON vehicle	1. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Shift solenoid valve A	AT-167
			4. Shift solenoid valve B	AT-172
	Gear change from 2_2 to 2_3 in 2nd position.	ON vehicle	1. Park/neutral position (PNP) switch adjustment	AT-269
			2. Control cable adjustment	AT-272
	Gear change from 1_1 to 1_2 in 1st position.	ON vehicle	1. Park/neutral position (PNP) switch adjustment	AT-269
			2. Control cable adjustment	AT-272
No Down Shift	Failure to change gear from D_4 to D_3.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Overrun clutch solenoid valve	AT-183
			4. Shift solenoid valve A	AT-167
			5. Line pressure solenoid valve	AT-161
			6. Control valve assembly	AT-267
		OFF vehicle	7. Brake band	AT-282
			8. Overrun clutch	AT-327
	Failure to change gear from D_3 to D_2 or from D_4 to D_2.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Shift solenoid valve A	AT-167
			4. Shift solenoid valve B	AT-172
			5. Control valve assembly	AT-267
		OFF vehicle	6. High clutch	AT-322
			7. Brake band	AT-282
	Failure to change gear from D_2 to D_1 or from D_3 to D_1.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Shift solenoid valve A	AT-167
			4. Shift solenoid valve B	AT-172
			5. Control valve assembly	AT-267
		OFF vehicle	6. Low one-way clutch	AT-282
			7. High clutch	AT-322
			8. Brake band	AT-282

Items	Symptom	Condition	Diagnostic Item	Reference Page
No Down Shift	Failure to change from D_3 to 2_2 when changing lever into 2nd position. AT-250	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Shift solenoid valve B	AT-172
			3. Control valve assembly	AT-267
			4. Control cable adjustment	AT-272
		OFF vehicle	5. Brake band	AT-282
	Does not change from 1_2 to 1_1 in 1st position.	ON vehicle	1. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			2. Shift solenoid valve A	AT-167
			3. Control valve assembly	AT-267
			4. Low one-way clutch	AT-282
		OFF vehicle	5. Overrun clutch	AT-327
			6. Low & reverse brake	AT-333
No Up Shift	Failure to change gear from D_1 to D_2 .	ON vehicle	1. Control cable adjustment	AT-272
			2. Shift solenoid valve A	AT-167
			3. Control valve assembly	AT-267
			4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			5. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
		OFF vehicle	6. Brake band	AT-282
	Failure to change gear from D_2 to D_3 .	ON vehicle	1. Control cable adjustment	AT-272
			2. Shift solenoid valve B	AT-172
			3. Control valve assembly	AT-267
			4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			5. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
		OFF vehicle	6. High clutch	AT-322
			7. Brake band	AT-282

Items	Symptom	Condition	Diagnostic Item	Reference Page
No Up Shift	Failure to change gear from D_3 to D_4 .	ON vehicle	1. Park/neutral position (PNP) switch adjustment	AT-269
			2. 3rd position switch	AT-255
			3. Control cable adjustment	AT-272
			4. Shift solenoid valve A	AT-167
			5. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			6. A/T fluid temperature sensor	AT-111
		OFF vehicle	7. Brake band	AT-282
	A/T does not shift to D_4 when driving with overdrive control switch ON.	ON vehicle	1. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			2. Park/neutral position (PNP) switch adjustment	AT-269
			3. 3rd position switch	AT-255
			4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			5. Shift solenoid valve A	AT-167
			6. Overrun clutch solenoid valve	AT-183
			7. Control valve assembly	AT-267
			8. A/T fluid temperature sensor	AT-111
			9. Line pressure solenoid valve	AT-161
		OFF vehicle	10. Brake band	AT-282
			11. Overrun clutch	AT-327
Slips/Will Not Engage	Vehicle will not run in R position (but runs in D, 2nd and 1st positions). Clutch slips. Very poor acceleration.	ON vehicle	1. Control cable adjustment	AT-272
			2. Stall test	AT-68
			3. Line pressure test	AT-71
			4. Line pressure solenoid valve	AT-161
			5. Control valve assembly	AT-267
		OFF vehicle	6. Reverse clutch	AT-319
			7. High clutch	AT-322
			8. Forward clutch	AT-327
			9. Overrun clutch	AT-327
			10. Low & reverse brake	AT-333
	Vehicle will not run in D and 2nd positions (but runs in 1st and R positions).	ON vehicle	1. Control cable adjustment	AT-272
		OFF vehicle	2. Low one-way clutch	AT-282

Items	Symptom	Condition	Diagnostic Item	Reference Page
Slips/Will Not Engage	Vehicle will not run in D, 1st, 2nd positions (but runs in R position). Clutch slips. Very poor acceleration.	ON vehicle	1. Fluid level	AT-65
			2. Stall test	AT-68
			3. Line pressure test	AT-71
			4. Line pressure solenoid valve	AT-161
			5. Control valve assembly	AT-267
			6. Accumulator N-D	AT-282
		OFF vehicle	7. Reverse clutch	AT-319
			8. High clutch	AT-322
			9. Forward clutch	AT-327
			10. Forward one-way clutch	AT-282
			11. Low one-way clutch	AT-282
	Clutches or brakes slip somewhat in starting.	ON vehicle	1. Fluid level	AT-65
			2. Control cable adjustment	AT-272
			3. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			4. Line pressure test	AT-71
			5. Line pressure solenoid valve	AT-161
			6. Control valve assembly	AT-267
			7. Accumulator N-D	AT-282
			8. Shift solenoid valve A	AT-167
			9. Shift solenoid valve B	AT-172
			10. Overrun clutch solenoid valve	AT-183
			11. Torque converter clutch solenoid valve	AT-148
		OFF vehicle	12. Forward clutch	AT-327
			13. Reverse clutch	AT-319
			14. Low & reverse brake	AT-333
			15. Oil pump	AT-300
			16. Torque converter	AT-282
	No creep at all. AT-223, AT-226	ON vehicle	1. Fluid level	AT-65
			2. Line pressure test	AT-71
			3. Control valve assembly	AT-267
		OFF vehicle	4. Forward clutch	AT-327
			5. Oil pump	AT-300
			6. Torque converter	AT-282
	Almost no shock or clutches slipping in change from D_1 to D_2.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. Accumulator servo release	AT-277
			5. Control valve assembly	AT-267
		OFF vehicle	6. Brake band	AT-282

Items	Symptom	Condition	Diagnostic Item	Reference Page
Slips/Will Not Engage	Almost no shock or slipping in change from D_2 to D_3 .	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. Control valve assembly	AT-267
		OFF vehicle	5. High clutch	AT-322
			6. Forward clutch	AT-327
	Almost no shock or slipping in change from D_3 to D_4 .	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. Control valve assembly	AT-267
		OFF vehicle	5. Brake band	AT-282
	Races extremely fast or slips in changing from D_4 to D_3 when depressing pedal.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. Line pressure solenoid valve	AT-161
			5. Shift solenoid valve A	AT-167
			6. Control valve assembly	AT-267
		OFF vehicle	7. Brake band	AT-282
			8. Forward clutch	AT-327
	Races extremely fast or slips in changing from D_4 to D_2 when depressing pedal.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. Line pressure solenoid valve	AT-161
			5. Shift solenoid valve A	AT-167
			6. Shift solenoid valve B	AT-172
			7. Control valve assembly	AT-267
		OFF vehicle	8. Brake band	AT-282
			9. Forward clutch	AT-327
	Races extremely fast or slips in changing from D_3 to D_2 when depressing pedal.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. Line pressure solenoid valve	AT-161
			5. Shift solenoid valve B	AT-172
			6. Control valve assembly	AT-267
		OFF vehicle	7. Brake band	AT-282
			8. High clutch	AT-322

Items	Symptom	Condition	Diagnostic Item	Reference Page
Slips/Will Not Engage	Races extremely fast or slips in changing from D_4 or D_3 to D_1 when depressing pedal.	ON vehicle	1. Fluid level	AT-65
			2. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			3. Line pressure test	AT-71
			4. Line pressure solenoid valve	AT-161
			5. Shift solenoid valve A	AT-167
			6. Shift solenoid valve B	AT-172
			7. Control valve assembly	AT-267
		OFF vehicle	8. Forward clutch	AT-327
			9. Forward one-way clutch	AT-282
			10. Low one-way clutch	AT-282
	Vehicle will not run in any position.	ON vehicle	1. Fluid level	AT-65
			2. Control cable adjustment	AT-272
			3. Line pressure test	AT-71
			4. Line pressure solenoid valve	AT-161
		OFF vehicle	5. Oil pump	AT-300
			6. Torque converter	AT-282
			7. Parking components	AT-297
NOT USED	Engine cannot be started in P and N positions. AT-217	ON vehicle	1. Ignition switch and starter	SC-6
			2. Control cable adjustment	AT-272
			3. Park/neutral position (PNP) switch adjustment	AT-269
	Engine starts in positions other than P and N.	ON vehicle	1. Control cable adjustment	AT-272
			2. Park/neutral position (PNP) switch adjustment	AT-269
	Transaxle noise in P and N positions.	ON vehicle	1. Fluid level	AT-65
			2. Line pressure test	AT-71
			3. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			4. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
		OFF vehicle	5. Oil pump	AT-300
			6. Torque converter	AT-282
	Vehicle moves when changing into P position or parking gear does not disengage when shifted out of P position.	ON vehicle	1. Control cable adjustment	AT-272
		OFF vehicle	2. Parking components	AT-297

Items	Symptom	Condition	Diagnostic Item	Reference Page
NOT USED	Vehicle runs in N position. AT-219	ON vehicle	1. Control cable adjustment	AT-272
		OFF vehicle	2. Forward clutch	AT-327
			3. Reverse clutch	AT-319
			4. Overrun clutch	AT-327
	Vehicle braked when shifting into R position.	ON vehicle	1. Fluid level	AT-65
			2. Line pressure test	AT-71
			3. Line pressure solenoid valve	AT-161
			4. Control valve assembly	AT-267
		OFF vehicle	5. High clutch	AT-322
			6. Brake band	AT-282
			7. Forward clutch	AT-327
			8. Overrun clutch	AT-327
	Excessive creep.	ON vehicle	1. Engine idling rpm	EC-34
	Engine stops when shifting lever into R, D, 2nd and 1st.	ON vehicle	1. Engine idling rpm	EC-34
			2. Fluid level	AT-65
			3. Torque converter clutch solenoid valve	AT-148
			4. Control valve assembly	AT-267
		OFF vehicle	5. Torque converter	AT-282
	Vehicle braked by gear change from D_1 to D_2.	ON vehicle	1. Fluid level	AT-65
		OFF vehicle	2. Reverse clutch	AT-319
			3. Low & reverse brake	AT-333
			4. High clutch	AT-322
			5. Low one-way clutch	AT-282
	Vehicle braked by gear change from D_2 to D_3.	ON vehicle	1. Fluid level	AT-65
		OFF vehicle	2. Brake band	AT-282
	Vehicle braked by gear change from D_3 to D_4.	ON vehicle	1. Fluid level	AT-65
		OFF vehicle	2. Overrun clutch	AT-327
			3. Forward one-way clutch	AT-282
			4. Reverse clutch	AT-319

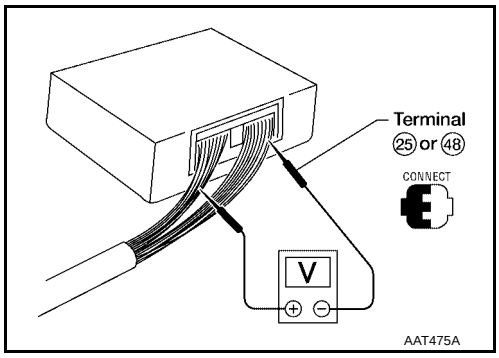
Items	Symptom	Condition	Diagnostic Item	Reference Page
NOT USED	Maximum speed not attained. Acceleration poor.	ON vehicle	1. Fluid level	AT-65
			2. Park/neutral position (PNP) switch adjustment	AT-269
			3. 3rd position switch	AT-255
			4. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			5. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			6. Shift solenoid valve A	AT-167
			7. Shift solenoid valve B	AT-172
			8. Control valve assembly	AT-267
		OFF vehicle	9. Reverse clutch	AT-319
			10. High clutch	AT-322
			11. Brake band	AT-282
			12. Low & reverse brake	AT-333
			13. Oil pump	AT-300
			14. Torque converter	AT-282
	Transaxle noise in D, 2nd, 1st and R positions.	ON vehicle	1. Fluid level	AT-65
		OFF vehicle	2. Torque converter	AT-282
	Engine brake does not operate in 1st position.	ON vehicle	1. Park/neutral position (PNP) switch adjustment	AT-269
			2. Control cable adjustment	AT-272
			3. Vehicle speed sensor·A/T (Revolution sensor) and vehicle speed sensor·MTR	AT-117, AT-197
			4. Control valve assembly	AT-267
			5. Overrun clutch solenoid valve	AT-183
		OFF vehicle	6. Overrun clutch	AT-327
			7. Low & reverse brake	AT-333
	Transaxle overheats.	ON vehicle	1. Fluid level	AT-65
			2. Engine idling rpm	EC-34
			3. Throttle position sensor [accelerator pedal position (APP) sensor]	AT-177
			4. Line pressure test	AT-71
			5. Line pressure solenoid valve	AT-161
			6. Control valve assembly	AT-267
		OFF vehicle	7. Oil pump	AT-300
			8. Reverse clutch	AT-319
			9. High clutch	AT-322
			10. Brake band	AT-282
			11. Forward clutch	AT-327
			12. Overrun clutch	AT-327
			13. Low & reverse brake	AT-333
			14. Torque converter	AT-282

Items	Symptom	Condition	Diagnostic Item	Reference Page
NOT USED	ATF shoots out during operation. White smoke emitted from exhaust pipe during operation.	ON vehicle	1. Fluid level	AT-65
		OFF vehicle	2. Reverse clutch	AT-319
			3. High clutch	AT-322
			4. Brake band	AT-282
			5. Forward clutch	AT-327
			6. Overrun clutch	AT-327
			7. Low & reverse brake	AT-333
	Offensive smell at fluid charging pipe.	ON vehicle	1. Fluid level	AT-65
		OFF vehicle	2. Torque converter	AT-282
			3. Oil pump	AT-300
			4. Reverse clutch	AT-319
			5. High clutch	AT-322
			6. Brake band	AT-282
			7. Forward clutch	AT-327
			8. Overrun clutch	AT-327
			9. Low & reverse brake	AT-333

TCM Terminals and Reference Value

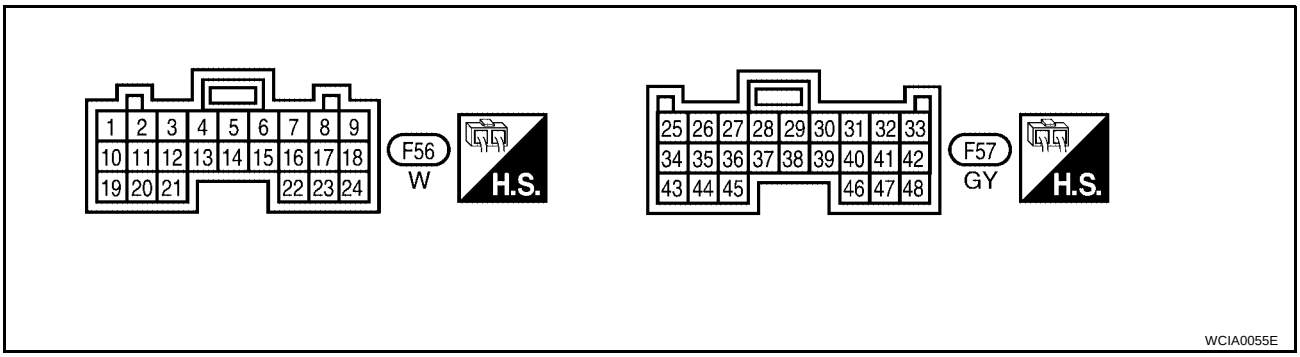
UCS000N2

PREPARATION



- Measure voltage between each terminal and terminal 25 or 48 by following “TCM INSPECTION TABLE”.

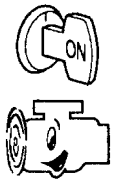
TCM HARNESS CONNECTOR TERMINAL LAYOUT



TCM INSPECTION TABLE

(Data are reference values.)

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
1	O/B	Line pressure solenoid valve		When releasing accelerator pedal after warming up engine.	1.5 - 3.0V
				When depressing accelerator pedal fully after warming up engine.	0V
2	W/B	Line pressure solenoid valve (with dropping resistor)		When releasing accelerator pedal after warming up engine.	4 - 14V
				When depressing accelerator pedal fully after warming up engine.	0V
3	G/B	Torque converter clutch solenoid valve		When A/T performs lock-up.	8 - 15V
				When A/T does not perform lock-up.	0V
5*	L	CAN-H	—	—	—
6*	Y	CAN-L	—	—	—
10	Y	Power source	 or 	With ignition switch ON.	Battery voltage
				With ignition switch OFF.	0V
11	R/Y	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in D_1 or D_4.)	Battery voltage
				When shift solenoid valve A does not operate. (When driving in D_2 or D_3.)	0V
12	LG/B	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in D_1 or D_2.)	Battery voltage
				When shift solenoid valve B does not operate. (When driving in D_3 or D_4.)	0V
19	Y	Power source	Same as No. 10		
20	BR/Y	Overrun clutch solenoid valve		When overrun clutch solenoid valve operates.	Battery voltage
				When overrun clutch solenoid valve does not operate.	0V
25	B	Ground	Always		0V
26	V/W	PNP switch 1st position		When setting selector lever to 1st position.	Battery voltage
				When setting selector lever to other positions.	0V
27	P/B	PNP switch 2nd position		When setting selector lever to 2nd position.	Battery voltage
				When setting selector lever to other positions.	0V
28	Y/R	Power source (Memory back-up)	Always		Battery voltage

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
29	W	Revolution sensor		When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 **CAUTION:** **Connect the diagnosis data link cable to the vehicle diagnosis connector.** *1: A circuit tester cannot be used to test this item.	450 Hz
				When vehicle is parked.	0V
30**	BR/Y	Data link connector (RX)		—	—
31**	Y	Data link connector (TX)		—	—
32	G	Sensor power		Ignition switch ON.	4.5 - 5.5V
				Ignition switch OFF.	0V
34	L/W	PNP switch D position		When setting selector lever to D position.	Battery voltage
				When setting selector lever to other positions.	0V
35	G/W	PNP switch R position		When setting selector lever to R position.	Battery voltage
				When setting selector lever to other positions.	0V
36	R/B	PNP switch P or N position		When setting selector lever to P or N position.	Battery voltage
				When setting selector lever to other positions.	0V
38	R	Turbine revolution sensor		When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 **CAUTION:** **Connect the diagnosis data link cable to the vehicle diagnosis connector.** *1: A circuit tester cannot be used to test this item.	240 Hz
				When vehicle is parked.	Under 1.3V or over 4.5V
39	W/G	Engine speed signal		Refer to EC-101, "ECM INSPECTION TABLE" .	
40	V/R	Vehicle speed sensor		When moving vehicle at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.	Voltage varies between less than 1V and more than 4.5V
41	W	Throttle position sensor [accelerator pedal position (APP) sensor]		When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: 0.5V Fully-open throttle: 4V
42	B	Sensor ground	Always		0V

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
47	L/Y	A/T fluid temperature sensor		When ATF temperature is 20°C (68°F).	1.5V
				When ATF temperature is 80°C (176°F).	0.5V
48	B	Ground	Always		0V

*: These terminals are connected to the ECM.
**: These terminals are connected to the Data link connector.

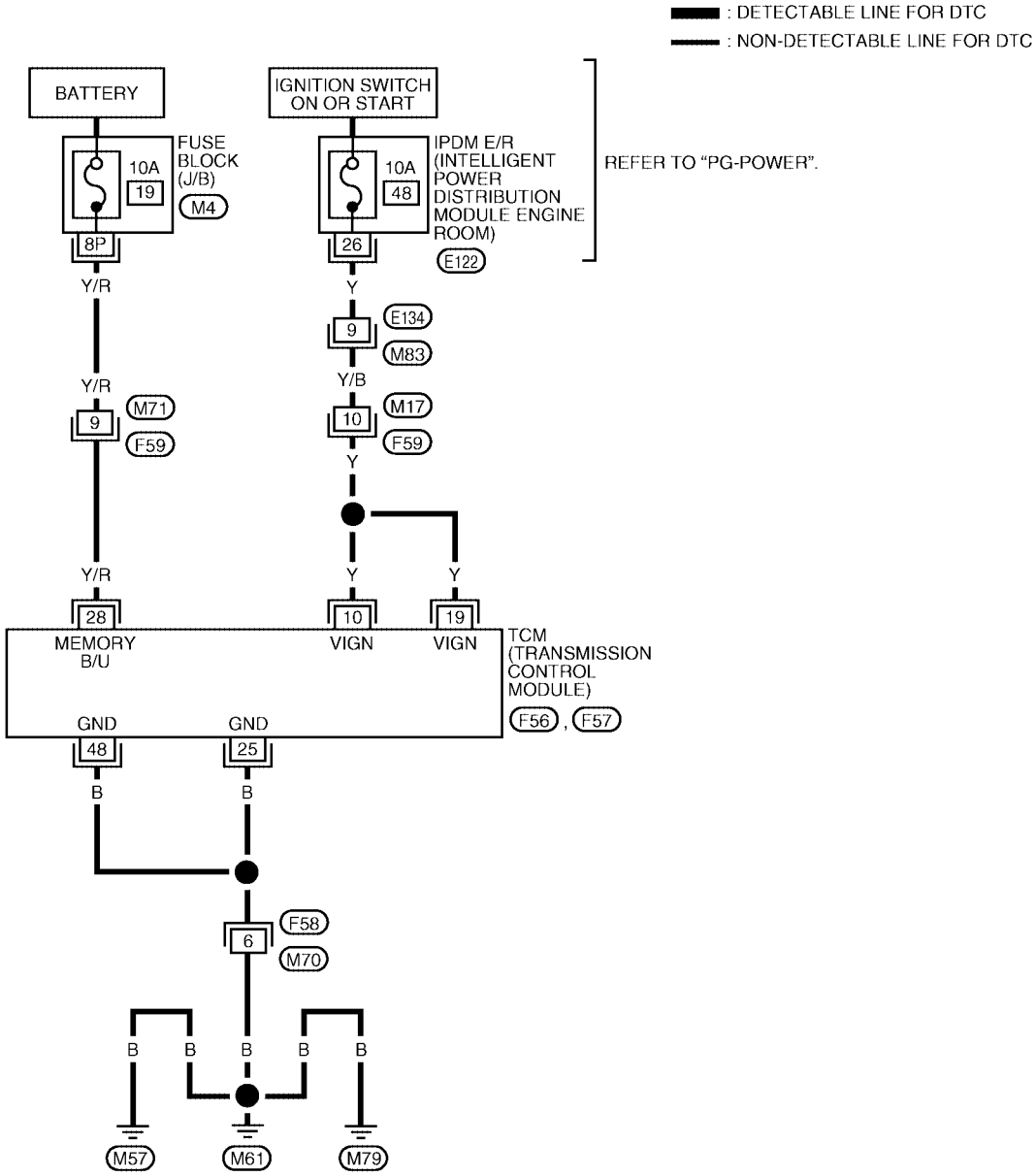
TROUBLE DIAGNOSIS FOR POWER SUPPLY

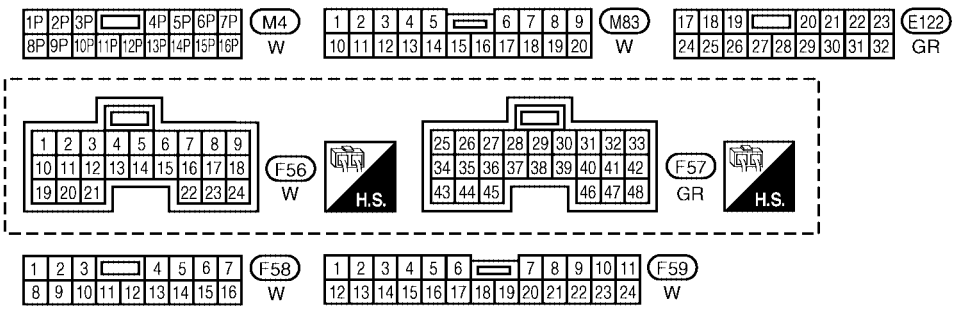
PFP:00000

Wiring Diagram — AT — MAIN

UCS000N4

AT-MAIN-01





BBWA0564E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
10	Y	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
			IGNITION OFF	0V
19	Y	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
			IGNITION OFF	0V
25	B	GROUND	Always	0V
28	Y/R	POWER SOURCE (MEMORY BACKUP)	Always	0V
48	B	GROUND	Always	0V

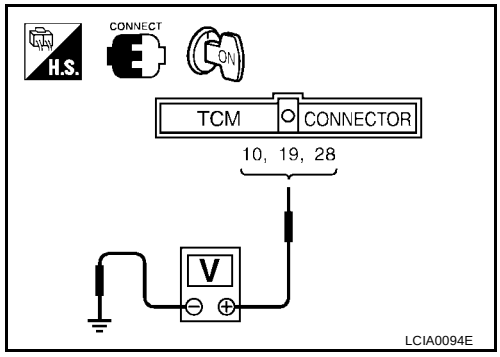
Diagnostic Procedure

UCS000N5

1. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCM harness connectors F56, F57 terminals 10(Y), 19(Y), 28(Y/R) and ground.

Voltage : Battery voltage



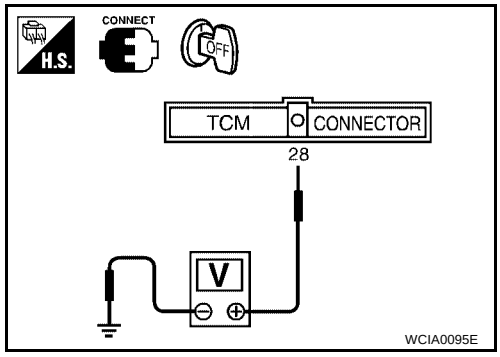
OK or NG

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

2. CHECK TCM POWER SOURCE STEP 2

1. Turn ignition switch to OFF position.
2. Check voltage between TCM harness connector F57 terminal 28 (Y/R) and ground.

Voltage : Battery voltage



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 ignition switch and TCM harness connectors F56, F57 terminals 10(Y), 19(Y) and 28(Y/R)
- Fuse
- Ignition switch
  Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

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 harness connector F57 terminals 25(B), 48(B) and ground. Refer to AT-102, "Wiring Diagram — AT — MAIN" .

Continuity should exist.

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

OK or NG

OK >> **INSPECTION END**
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

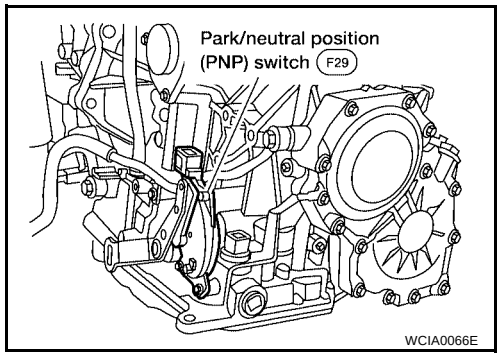
DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

Description

UCS000N6

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



On Board Diagnosis Logic

UCS000N7

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 switch based on the gear position.

Possible Cause

UCS000N8

Check the following items.

- Harness or connectors
  (The park/neutral position (PNP) switch circuit is open or shorted.)
- Park/neutral position (PNP) switch

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000N9

CAUTION:

Always drive vehicle at a safe speed.

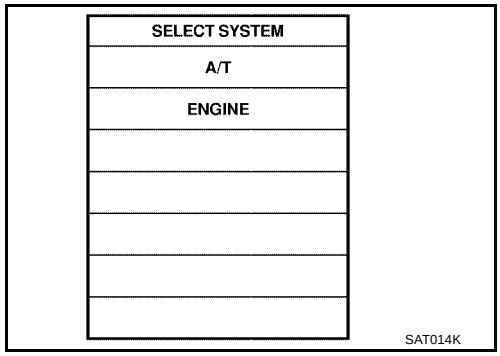
NOTE:

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

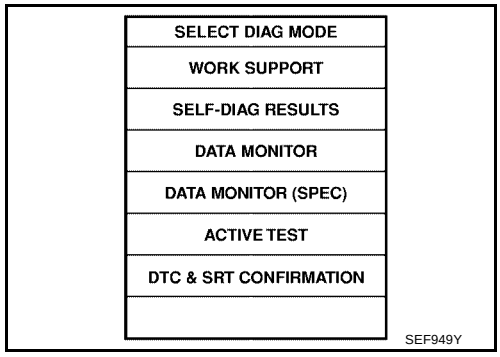
After the repair, perform the following procedure to confirm the malfunction is eliminated.

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: 10 km/h (6 MPH) or more
   THRTL POS SEN: More than 1.3V
   Selector lever: 3rd or D position

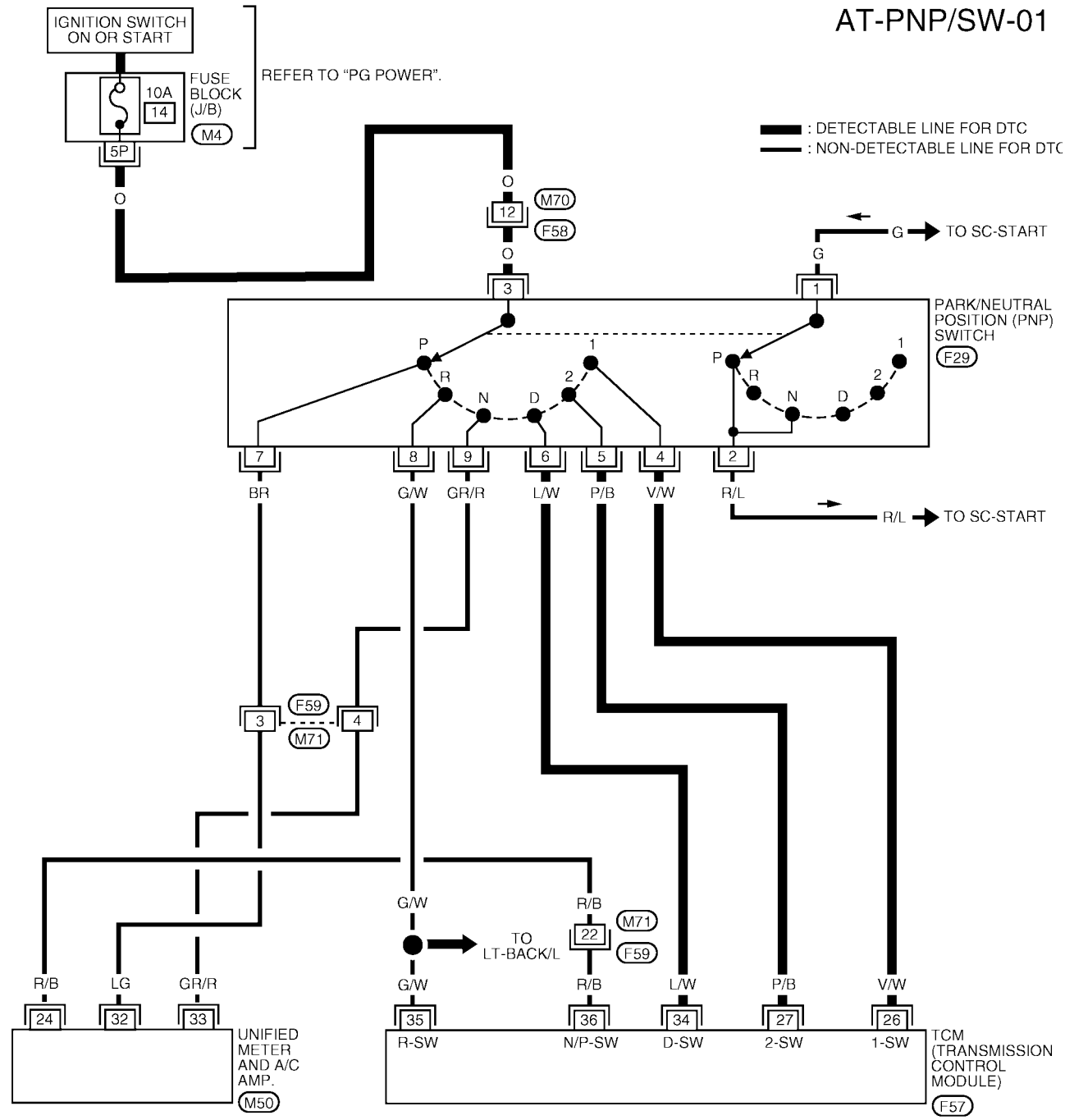


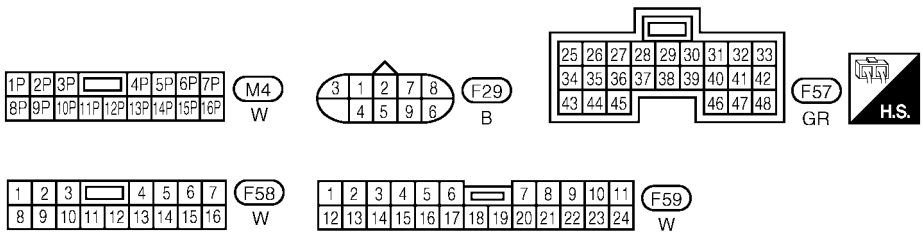
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — PNP/SW

UCS000NA





BBWA0565E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
26	V/W	PNP SWITCH 1st POSITION	WHEN SETTING SELECTOR LEVER IN 1ST POSITION	BATTERY VOLTAGE
			WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS	0V
27	P/B	PNP SWITCH 2nd POSITION	WHEN SETTING SELECTOR LEVER IN 2ND POSITION	BATTERY VOLTAGE
			WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS	0V
34	L/W	PNP SWITCH D POSITION	WHEN SETTING SELECTOR LEVER IN D POSITION	BATTERY VOLTAGE
			WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS	0V
35	G/W	PNP SWITCH R POSITION	WHEN SETTING SELECTOR LEVER IN R POSITION	BATTERY VOLTAGE
			WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS	0V
36	R/B	PNP SWITCH P OR N POSITION	WHEN SETTING SELECTOR LEVER IN P OR N POSITION	BATTERY VOLTAGE
			WHEN SETTING SELECTOR LEVER IN OTHER POSITIONS	0V

Diagnostic Procedure

UCS000NB

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

Yes >> GO TO 2.
No >> GO TO 6.

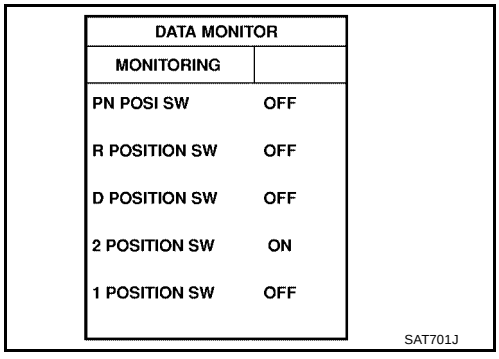
2. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITH CONSULT-II)

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 P, R, N, D, 2nd and 1st position switches moving selector lever to each position.
   Check that the signal of the selector lever position is indicated properly.

OK or NG

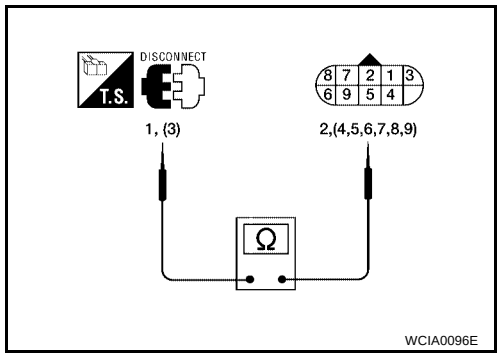
OK >> GO TO 7.
NG >> GO TO 3.



3. DETECT MALFUNCTIONING ITEM

Check the following item:

- Park/neutral position (PNP) switch
  Check continuity between PNP switch harness connector F29 terminals 1 (G) and 2 (R/L) and between terminals 3 (O) and 4 (V/W), 5 (P/B), 6 (L/W), 7 (BR), 8 (G/W) and 9 (GR/R) while moving manual shaft through each position.



Lever position	Terminal No.	
P	3 - 7	1 - 2
R	3 - 8	
N	3 - 9	1 - 2
D	3 - 6	
2	3 - 5	
1	3 - 4	

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK MANUAL CONTROL CABLE ADJUSTMENT

Check PNP switch again with manual control cable disconnected from manual shaft of A/T assembly. Refer to test group 2(With CONSULT-II) or 6(With out CONSULT-II).

OK or NG

OK >> Adjust manual control cable. Refer to AT-272, "Control Cable Adjustment" .
NG >> Repair or replace PNP switch.

5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between ignition switch and park/neutral position (PNP) switch
- Harness for short or open between park/neutral position (PNP) switch and TCM
- Fuse
- Ignition switch
  Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

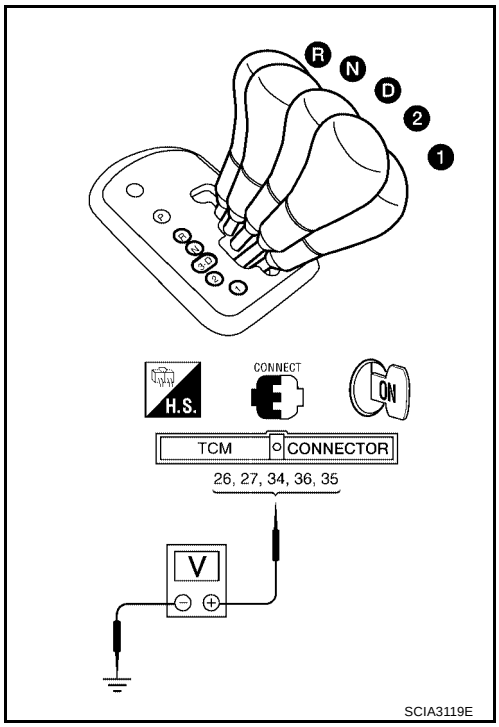
6. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITHOUT CONSULT-II)

Without CONSULT-II

1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCMharness connector F57 terminals 26 (V/W), 27 (P/B), 34 (L/W), 35 (G/W), 36 (R/B) and ground while moving selector lever through each position.

Lever Position	Terminal No.				
	36	35	34	27	26
P, N	B	0	0	0	0
R	0	B	0	0	0
D	0	0	B	0	0
2	0	0	0	B	0
1	0	0	0	0	B

B: Battery voltage
0: 0V



OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

7. CHECK DTC

Perform AT-105, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

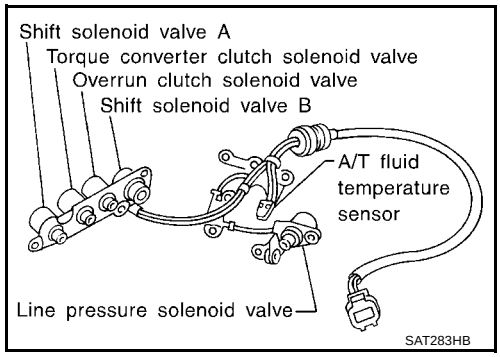
DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

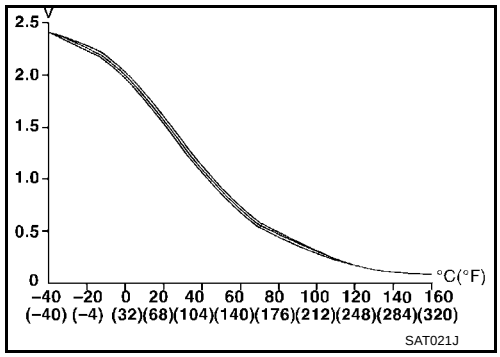
PFP:31940

Description

UCS000NC

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





CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification (Approximately)	
A/T fluid temperature sensor	Cold [20°C (68°F)] ↓ Hot [80°C (176°F)]	1.5V ↓ 0.5V	2.5 kΩ ↓ 0.3 kΩ

On Board Diagnosis Logic

UCS000ND

Diagnostic trouble code ATF TEMP SEN/CIRC with CONSULT-II or P0710 without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

UCS000NE

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000NF

CAUTION:

Always drive vehicle at a safe speed.

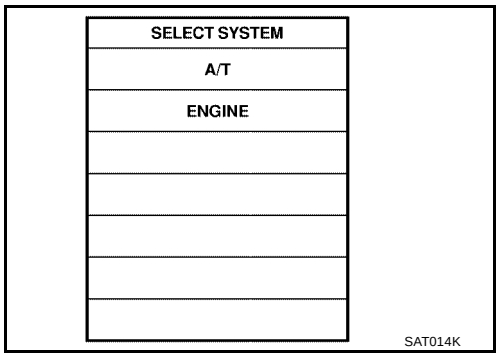
NOTE:

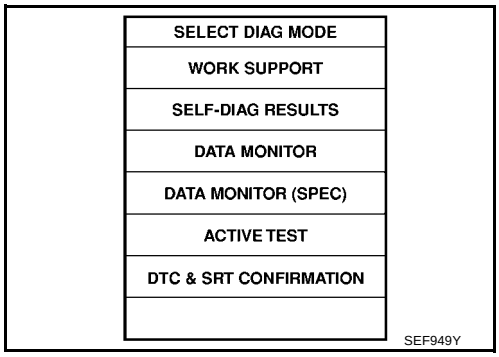
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

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

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.





2. Select "ECM INPUT SIGNALS" touch "START".
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)
   ENG SPEED: 450 rpm or more
   VEHICLE SPEED: 10 km/h (6 MPH) or more
   THRTL POSI: More than 1.2V
   Selector lever: D position

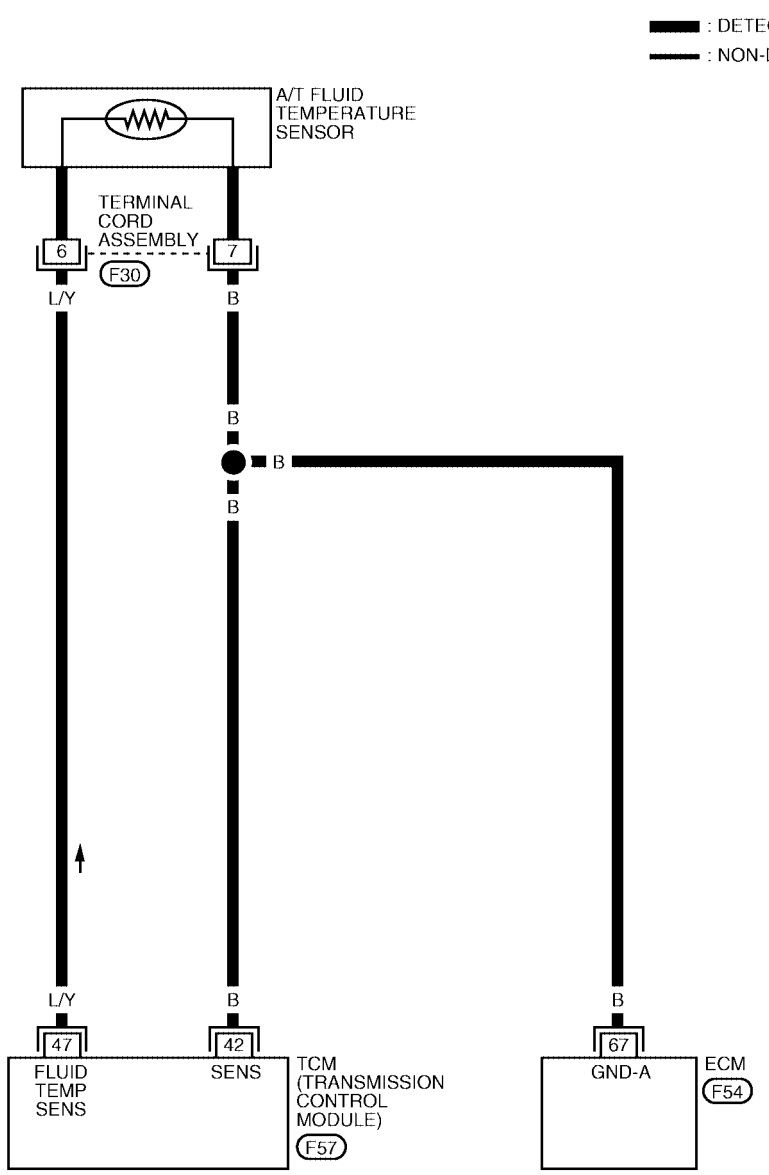
WITH GST

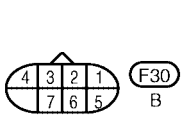
Follow the procedure “With CONSULT-II”.

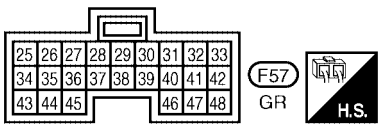
Wiring Diagram — AT — FTS

UCS000NG

AT-FTS-01







REFER TO THE FOLLOWING.
F54 - ELECTRICAL UNITS

BBWA0566E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
42	B	SENSOR GROUND	Always	0V
47	L/Y	A/T FLUID TEMPERATURE SENSOR	IGNITION ON AND ATF TEMPERATURE IS 20°C (68°F)	1.5V
			IGNITION ON AND ATF TEMPERATURE IS 80°C (176°F)	0.5V

Diagnostic Procedure

UCS000NH

1. INSPECTION START

Do you have CONSULT-II?

Yes or No

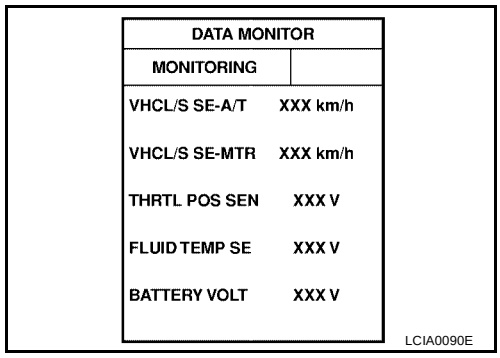
Yes >> GO TO 2.
No >> GO TO 6.

2. CHECK INPUT SIGNAL OF A/T 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”.

Voltage :Cold [20°C (68°F)] → Hot [80°C (176°F)]
:Approximately 1.5V → 0.5V



OK or NG

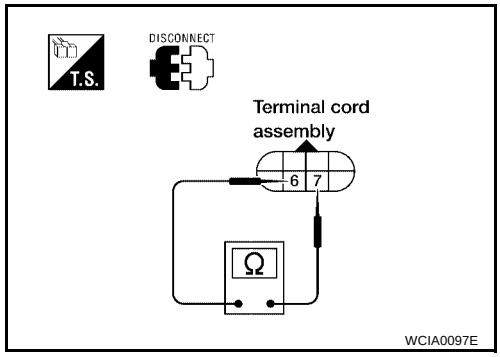
OK >> GO TO 7.
NG >> GO TO 3.

3. CHECK A/T FLUID TEMPERATURE SENSOR WITH TERMINAL CORD ASSEMBLY

1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord F30 terminals 6(L/Y) and 7(B) when A/T is cold.

Temperature	Resistance (Approx.)
Cold [20°C (68°F)]	2.5kΩ

4. Reinstall any part removed.



OK or NG

OK >> GO TO 4.
NG >> GO TO 5.

4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short to ground or short to power or open between TCM, ECM and terminal cord assembly
- Ground circuit for ECM
  Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

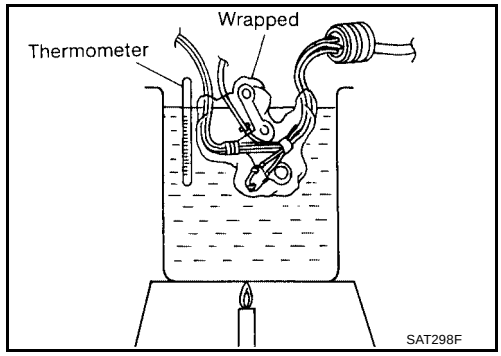
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

1. Remove oil pan. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

– A/T fluid temperature sensor
Check resistance between A/T fluid temperature sensor harness connector F30 terminals 6(L/Y) and 7(B) while changing temperature as shown at below.



Temperature	Resistance (Approx.)
20 (68)	2.5kΩ
80 (176)	0.3kΩ

– Harness of terminal cord assembly for short or open

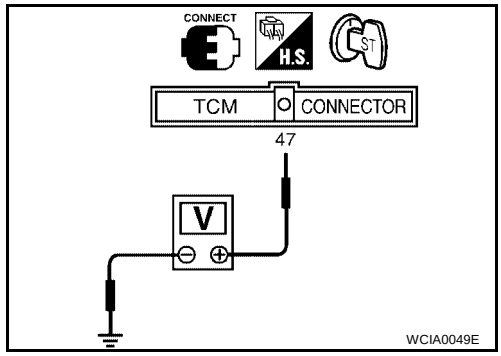
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (WITHOUT CONSULT-II)

Without CONSULT-II

1. Start engine.
2. Check voltage between TCM harness connector F57 terminal 47 (L/Y) and ground while warming up A/T.



Temperature	Voltage (Approx.)
Cold [20°C (68°F)] → Hot [80°C (176°F)]	1.5V → 0.5V

OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

7. CHECK DTC

Perform AT-111, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

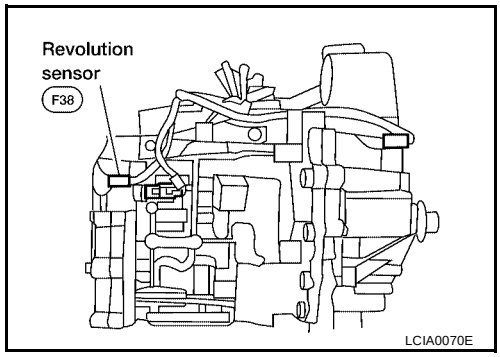
DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)

PFP:32702

Description

UCS000NI

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

UCS000NJ

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.

Possible Cause

UCS000NK

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000NL

CAUTION:

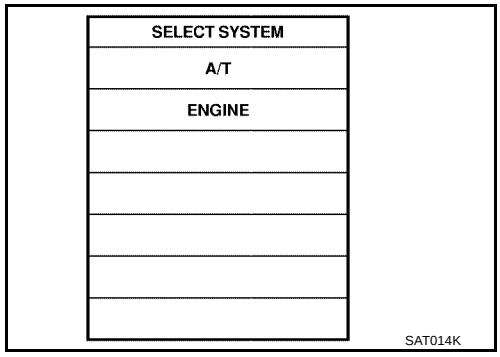
- **Always drive vehicle at a safe speed.**
- **Be careful not to rev engine into the red zone on the tachometer.**

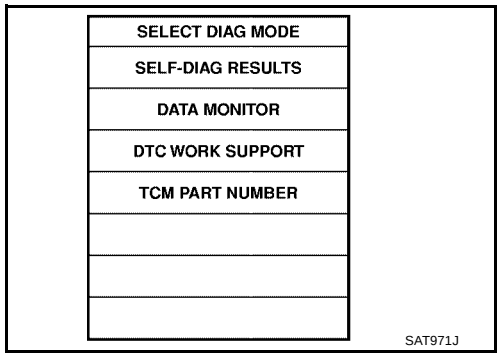
NOTE:

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.

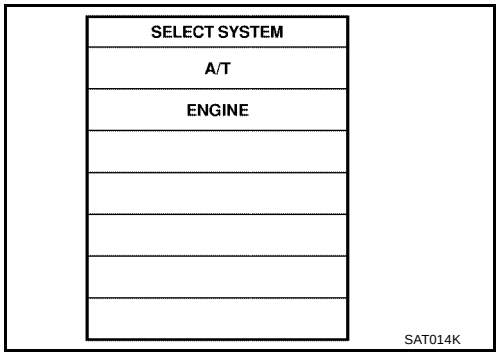
WITH CONSULT-II

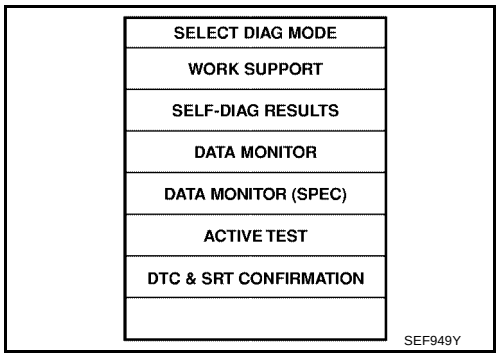
1. Turn ignition switch ON and select “DATA MONITOR” mode for “A/T” with CONSULT-II.





2. Drive vehicle and check for an increase of “VHCL/S SE·MTR” value.
   If the check result is NG, go to AT-120, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
3. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.





4. 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-120, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
5. 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.

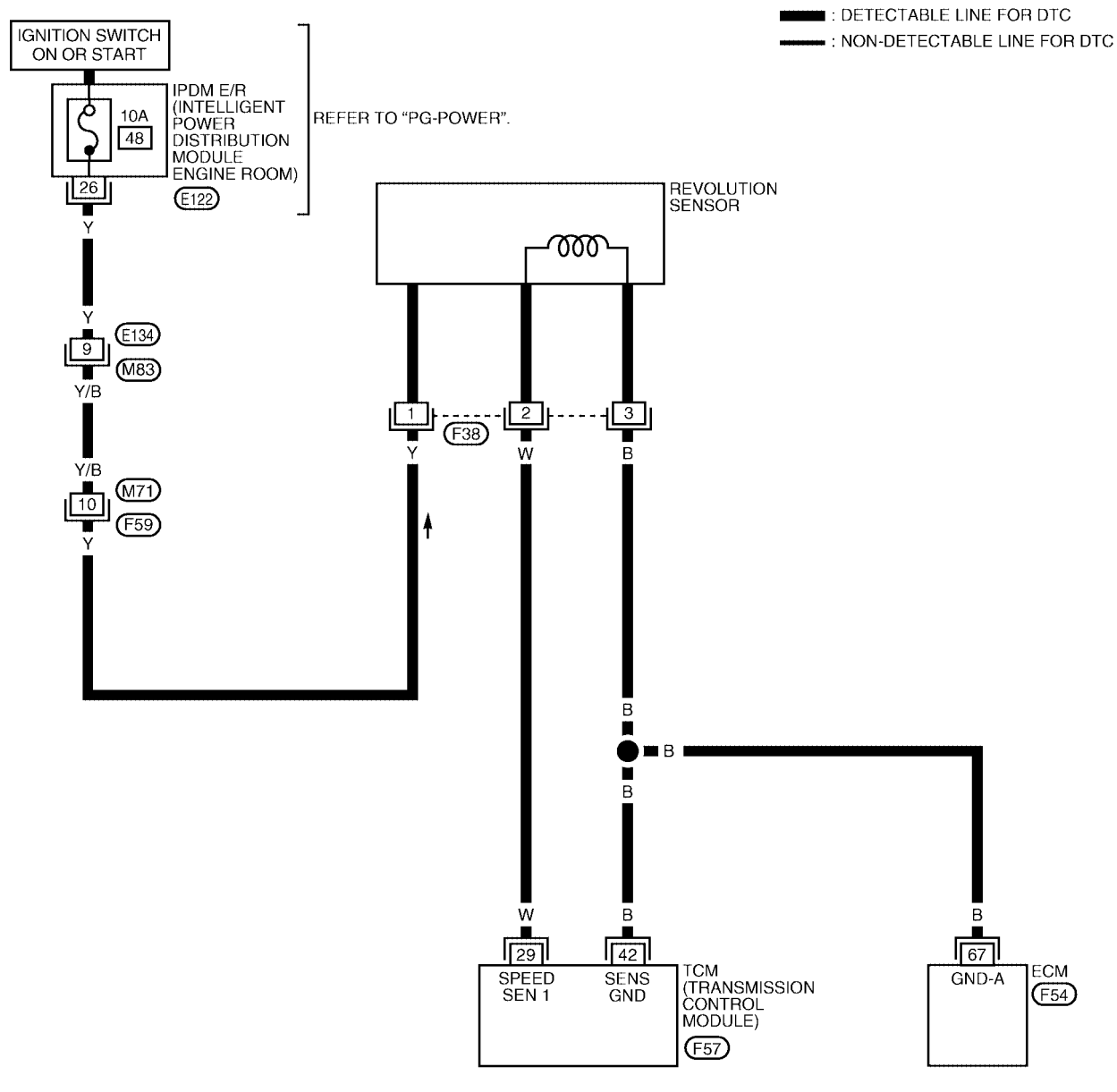
WITH GST

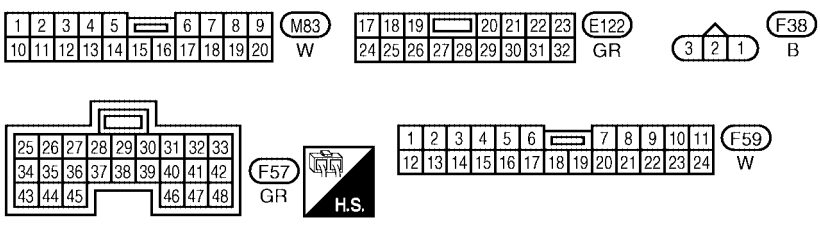
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — VSSA/T

UCS000NM

AT-VSSA/T-01





REFER TO THE FOLLOWING.
F54 - ELECTRICAL UNITS

BBWA0567E

TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
29	W	REVOLUTION SENSOR	VEHICLE MOVING AT 20 KM/H (12 MPH). USE THE CONSULT-II PULSE FREQUENCY MEASURING FUNCTION. A CIRCUIT TESTER CANNOT BE USED TO TEST THIS ITEM. CAUTION: CONNECT THE DIAG-NOSIS DATA LINK CABLE TO THE VEHICLE DIAGNOSIS CON-NECTOR.	450 HZ
			VEHICLE NOT MOVING.	0V
42	B	SENSOR GROUND	Always	0V

Diagnostic Procedure

UCS000NN

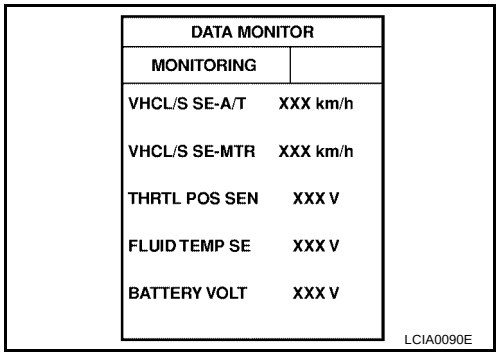
1. CHECK INPUT SIGNAL (WITH CONSULT-II)

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 “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)

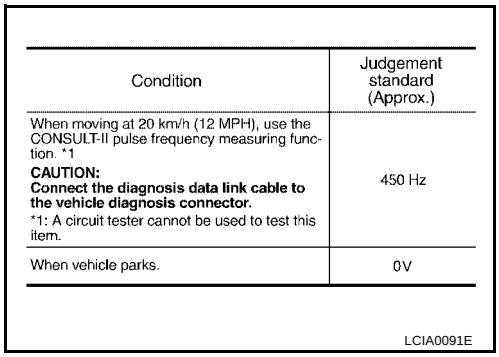
With CONSULT-II

1. Start engine.

- Harness for short or open between TCM, ECM and revolution sensor
- Harness for short or open between ignition switch and revolution sensor

OK or NG

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



3. CHECK DTC

Perform AT-117, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

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

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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 P0725 ENGINE SPEED SIGNAL

PFP:24825

Description

UCS000NO

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

On Board Diagnosis Logic

UCS000NP

Diagnostic trouble code ENGINE SPEED SIG with CONSULT-II or P0725 without CONSULT-II is detected when TCM does not receive the proper voltage signal from ECM.

Possible Cause

UCS000NQ

Check harness or connectors. (The sensor circuit is open or shorted.)

Diagnostic Trouble Code (DTC) Confirmation Procedure

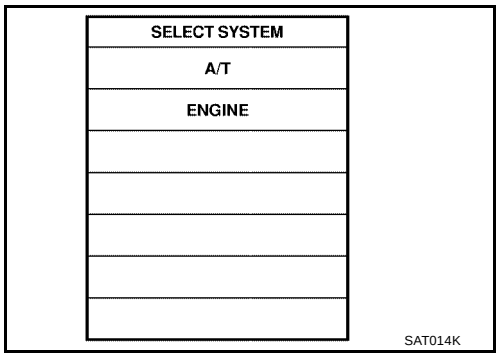
UCS000NR

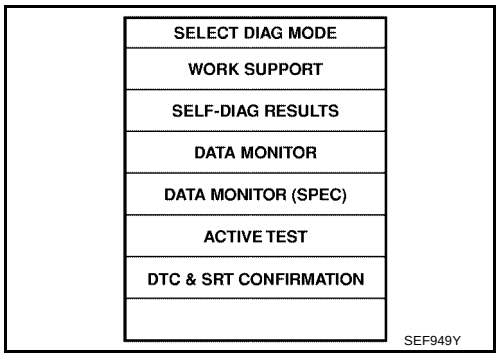
CAUTION:
Always drive vehicle at a safe speed.

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 and select “DATA MONITOR” mode for “ENGINE” 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
   THRTL POS SEN: More than 1.2V
   Selector lever: D position

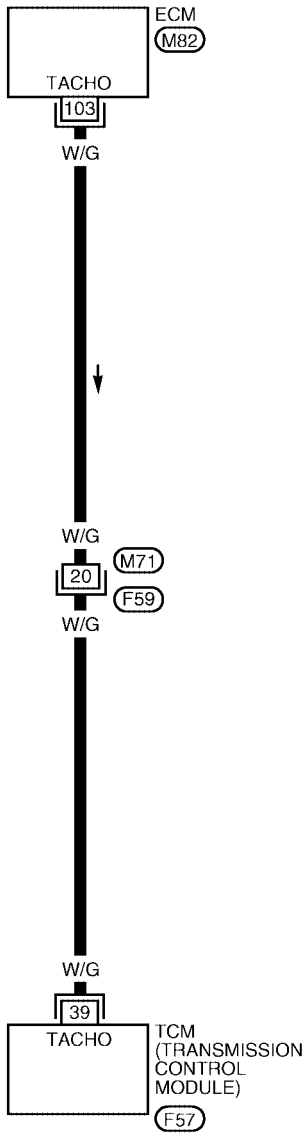
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — ENGSS

UCS000NS

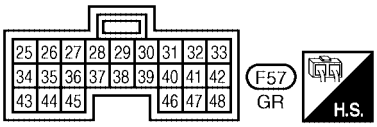
AT-ENGSS-01

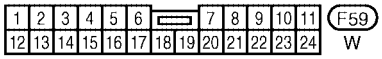


: DETECTABLE LINE FOR DTC

: NON-DETECTABLE LINE FOR DTC

REFER TO THE FOLLOWING.
M82 - ELECTRICAL UNITS





BBWA0568E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA
39	W/G	ENGINE SPEED SIGNAL	EC-101, "ECM INSPECTION TABLE"	

Diagnostic Procedure

UCS000NT

1. CHECK DTC WITH ECM

- Check P code with CONSULT-II “ENGINE”.
  Turn ignition switch ON and select “SELF-DIAGNOSTIC RESULTS” mode for “ENGINE” with CONSULT-II.
  Refer to EC-67, "Malfunction Indicator Lamp (MIL)" .

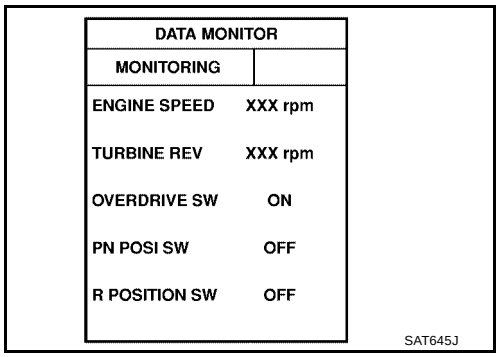
OK or NG

OK (with CONSULT-II)>> GO TO 2.
OK (without CONSULT-II)>> GO TO 4.
NG >> Check ignition signal circuit for engine control. Refer to EC-613, "IGNITION SIGNAL" .

2. CHECK INPUT SIGNAL (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 “ENGINE SPEED”.
   Check engine speed changes according to throttle position.



OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil
  Refer to EC-613, "IGNITION SIGNAL" .

OK or NG

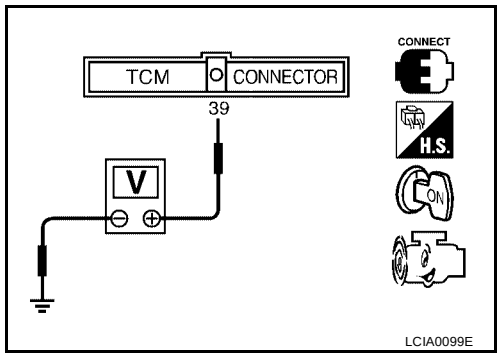
OK >> GO TO 5.
NG >> Repair or replace damaged parts.

4. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

Without CONSULT-II

1. Start engine.
2. Check voltage between TCM harness connector F57 terminal 39 (W/G) and ground.

Voltage :0.6 (Idle speed) - 2.2V (3,000 rpm)



OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

5. CHECK DTC

Perform AT-122, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

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

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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 P0731 A/T 1ST GEAR FUNCTION

PFP:31940

Description

UCS000NU

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into first gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

UCS000NV

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:
Torque converter slip ratio = A x C/B
A: Output shaft revolution signal from revolution sensor
B: Engine speed signal from ECM
C: Gear ratio determined as gear position which TCM supposes
If the actual gear position is higher than the position (1st) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.
This malfunction will be caused when either shift solenoid valve A is stuck open or shift solenoid valve B is stuck open.
Gear positions supposed by TCM are as follows.
In case of gear position with no malfunctions: **1** , 2, 3 and 4 positions
In case of gear position with shift solenoid valve A stuck open: **2*** , 2, 3 and 3 positions
In case of gear position with shift solenoid valve B stuck open: **4*** , 3, 3 and 4 positions to each gear position above
*: P0731 is detected.
Diagnostic trouble code A/T 1ST GR FNCTN with CONSULT-II or P0731 without CONSULT-II is detected when A/T cannot be shifted to the 1st gear position even if electrical circuit is good.

Possible Cause

UCS000NW

Check the following items.

- Shift solenoid valve A
- Shift solenoid valve B
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000NX

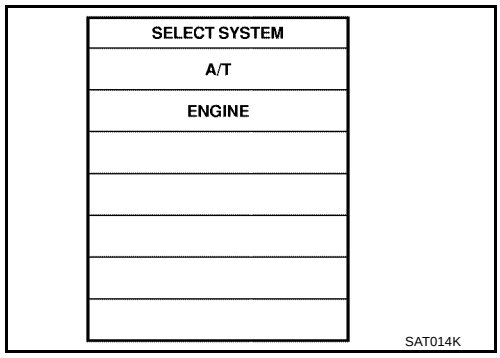
CAUTION:

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

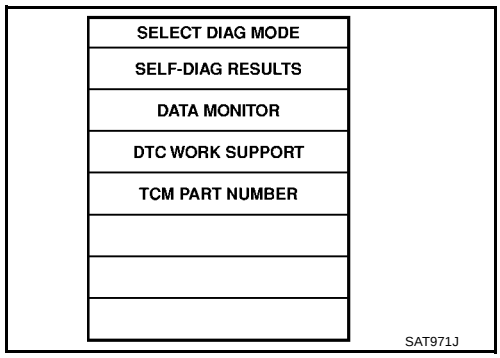
NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Always drive vehicle on a level road to improve the accuracy of test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
   FLUID TEMP SEN: 0.4 - 1.5V
   If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).
3. Select “1ST GR FNCTN P0731” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.

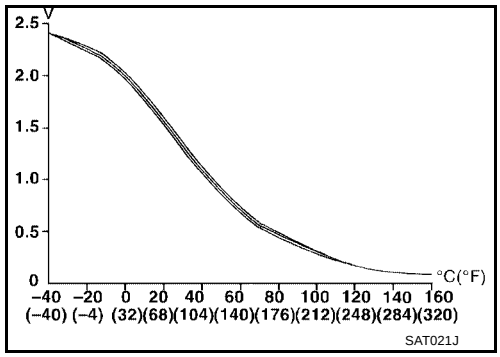


4. Accelerate vehicle to 20 to 25 km/h (12 to 16 MPH) under the following condition and release the accelerator pedal completely.
   THROTTLE POSI: Less than 1.0/8 (at all times during step 4)
   Selector lever: D position
   - **Check that “GEAR” shows “2” after releasing pedal.**
5. Depress accelerator pedal to WOT (more than 7.0/8 of “THROTTLE POSI”) quickly from a speed of 20 to 25 km/h (12 to 16 MPH) until “TESTING” changes to “STOP VEHICLE” or “COMPLETED”. (It will take approximately 3 seconds.)
   If the check result NG appears on CONSULT-II screen, go to AT-129, "Diagnostic Procedure" .
   If “STOP VEHICLE” appears on CONSULT-II screen, go to the following step.
   - **Check that “GEAR” shows “1” when depressing accelerator pedal to WOT.**
   - **If “TESTING” does not appear on CONSULT-II for a long time, select “SELF-DIAG RESULTS” for “ENGINE”. In case a 1st trip DTC other than P0731 is shown, refer to applicable “TROUBLE DIAGNOSIS FOR DTC”.**



6. Stop vehicle.
7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)

Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 → 2 → 3 → 4
No malfunction exists.	1 → 2 → 3 → 4
Malfunction for P0731 exists.	2 → 2 → 3 → 3
	4 → 3 → 3 → 4



8. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-129, "Diagnostic Procedure" .
   Refer to AT-377, "Shift Schedule" .

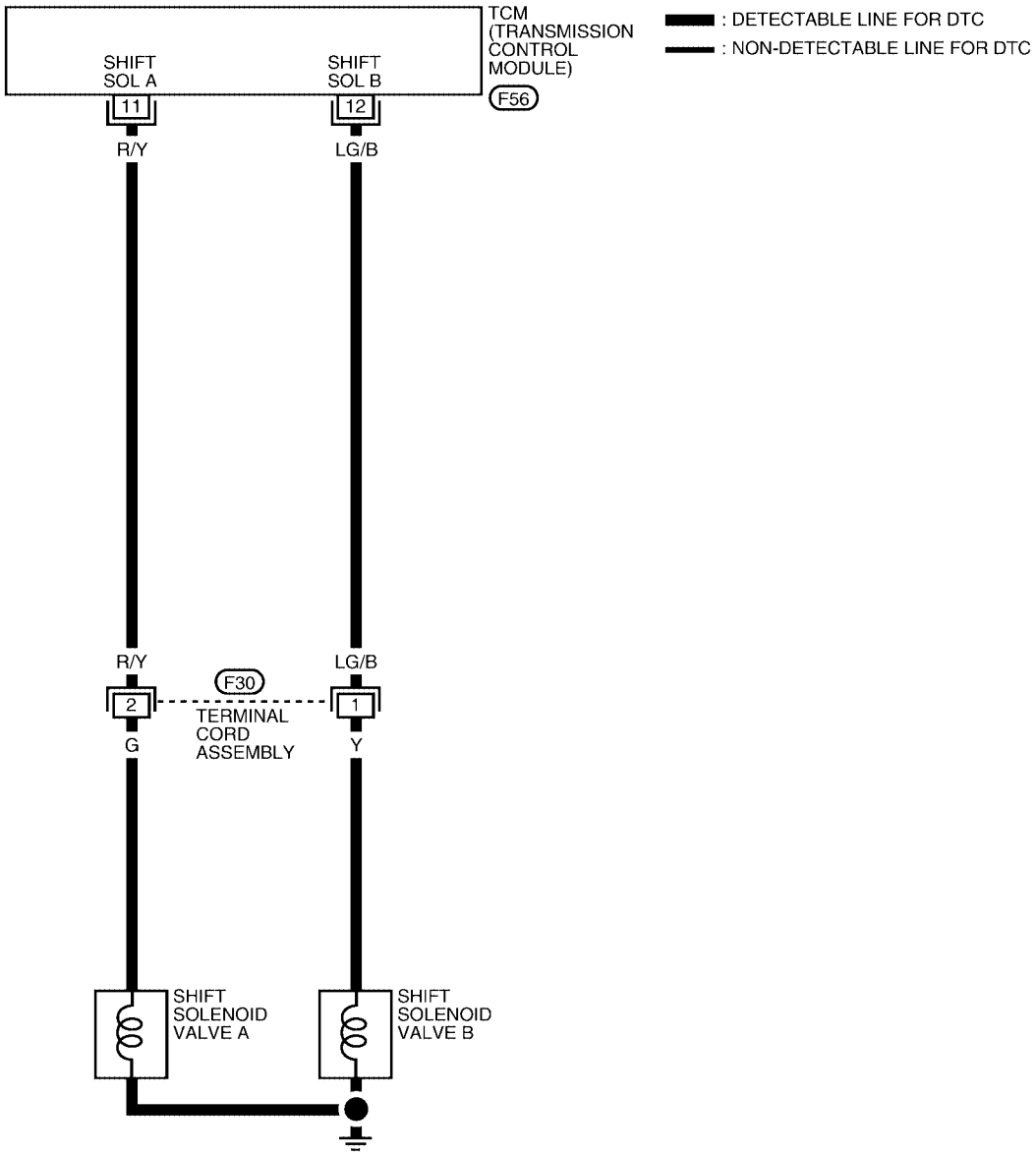
WITH GST

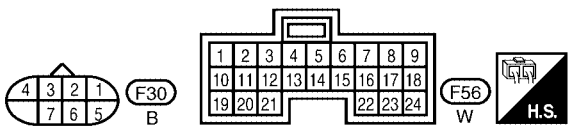
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — 1ST

UCS000NY

AT-1STSIG-01





LCWA0010E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
11	R/Y	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D_1 OR D_4)	BATTERY VOLTAGE
			WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D_2 OR D_3)	0V
12	LG/B	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D_1 OR D_2)	BATTERY VOLTAGE
			WHEN SHIFT SOLENOID VALVE B IS NOT OPERATING (DRIVING IN D_3 OR D_4)	0V

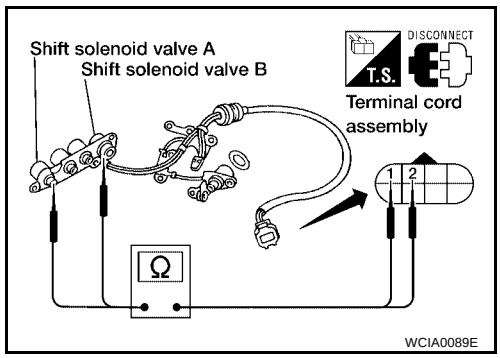
Diagnostic Procedure

UCS000NZ

1. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Shift solenoid valve A
- Shift solenoid valve B
2. Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve A	2	Ground	20 - 30Ω
Shift solenoid valve B	1		5 - 20Ω

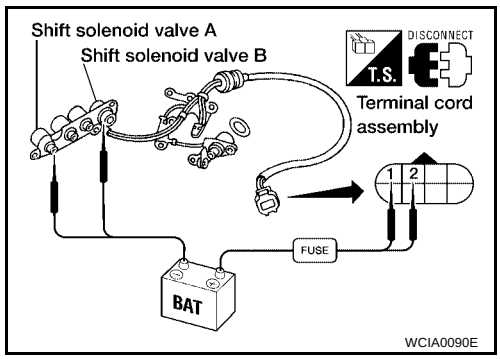


OK or NG

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

2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Shift solenoid valve A
- Shift solenoid valve B
2. Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.



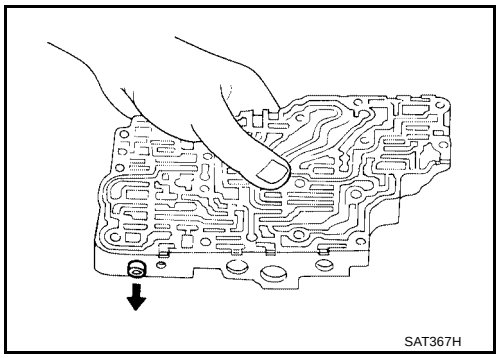
OK or NG

OK >> GO TO 3.
NG >> Repair or replace shift solenoid valve assembly.

3. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to AT-304, "Control Valve Assembly" .
2. Check to ensure that:

- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.



OK or NG

OK >> GO TO 4.
NG >> Repair control valve assembly.

4. CHECK DTC

Perform AT-126, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Check control valve again. Repair or replace control valve assembly.

DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

Description

UCS000O0

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into second gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

UCS000O1

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:
Torque converter slip ratio = A x C/B
A: Output shaft revolution signal from revolution sensor
B: Engine speed signal from ECM
C: Gear ratio determined as gear position which TCM supposes
If the actual gear position is higher than the position (2nd) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.
This malfunction will be caused when shift solenoid valve B is stuck open.
Gear positions supposed by TCM are as follows.
In case of gear position with no malfunctions: 1, **2** , 3 and 4 positions
In case of gear position with shift solenoid valve B stuck open: 4, **3*** , 3 and 4 positions to each gear position above
*: P0732 is detected.
Diagnostic trouble code A/T 2ND GR FNCTN with CONSULT-II or P0732 without CONSULT-II is detected when A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.

Possible Cause

UCS000O2

Check the following items.

- Shift solenoid valve B
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000O3

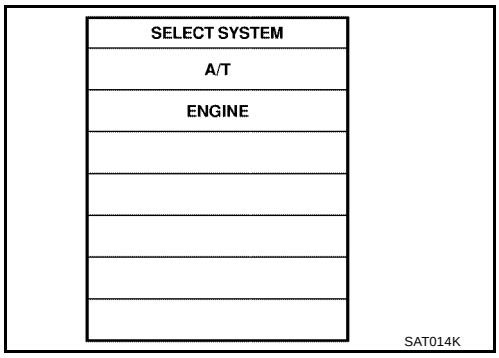
CAUTION:

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

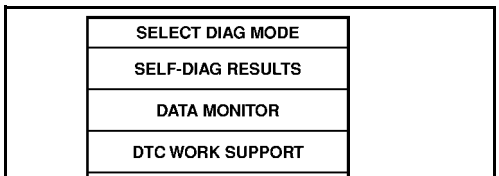
NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Always drive vehicle on a level road to improve the accuracy of test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

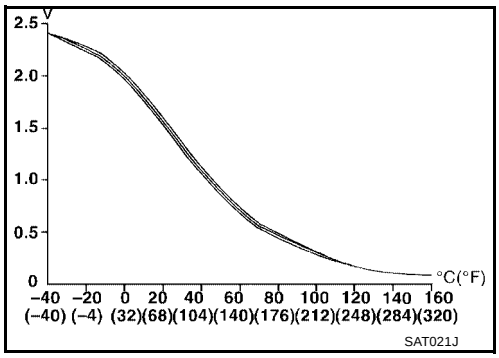
WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
   FLUID TEMP SEN: 0.4 - 1.5V
   If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).
3. Select “2ND GR FNCTN P0732” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.



4. Accelerate vehicle to 45 to 50 km/h (28 to 31 MPH) under the following condition and release the accelerator pedal completely.
   THROTTLE POSI: Less than 1.0/8
   Selector lever: D position (O/D ON)
   - **Check that “GEAR” shows “3” or “4” after releasing pedal.**
5. Depress accelerator pedal to WOT (more than 7.0/8 of “THROTTLE POSI”) quickly from a speed of 45 to 50 km/h (28 to 31 MPH) until “TESTING” changes to “STOP VEHICLE” or “COMPLETE”. (It will take approximately 3 seconds.)
   If the check result NG appears on CONSULT-II screen, go to AT-134, "Diagnostic Procedure" .
   If “STOP VEHICLE” appears on CONSULT-II screen, go to following step.
   - **Check that “GEAR” shows “2” when depressing accelerator pedal to WOT.**
   - **If “TESTING” does not appear on CONSULT-II for a long time, select “SELF-DIAG RESULTS” for “ENGINE”. In case a 1st trip DTC other than P0732 is shown, refer to applicable “TROUBLE DIAGNOSIS FOR DTC”.**
6. Stop vehicle.
7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)





Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 → 2 → 3 → 4
No malfunction exists	1 → 2 → 3 → 4
Malfunction for P0732 exists.	4 → 3 → 3 → 4

8. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-134, "Diagnostic Procedure" .
   Refer to AT-377, "Shift Schedule" .

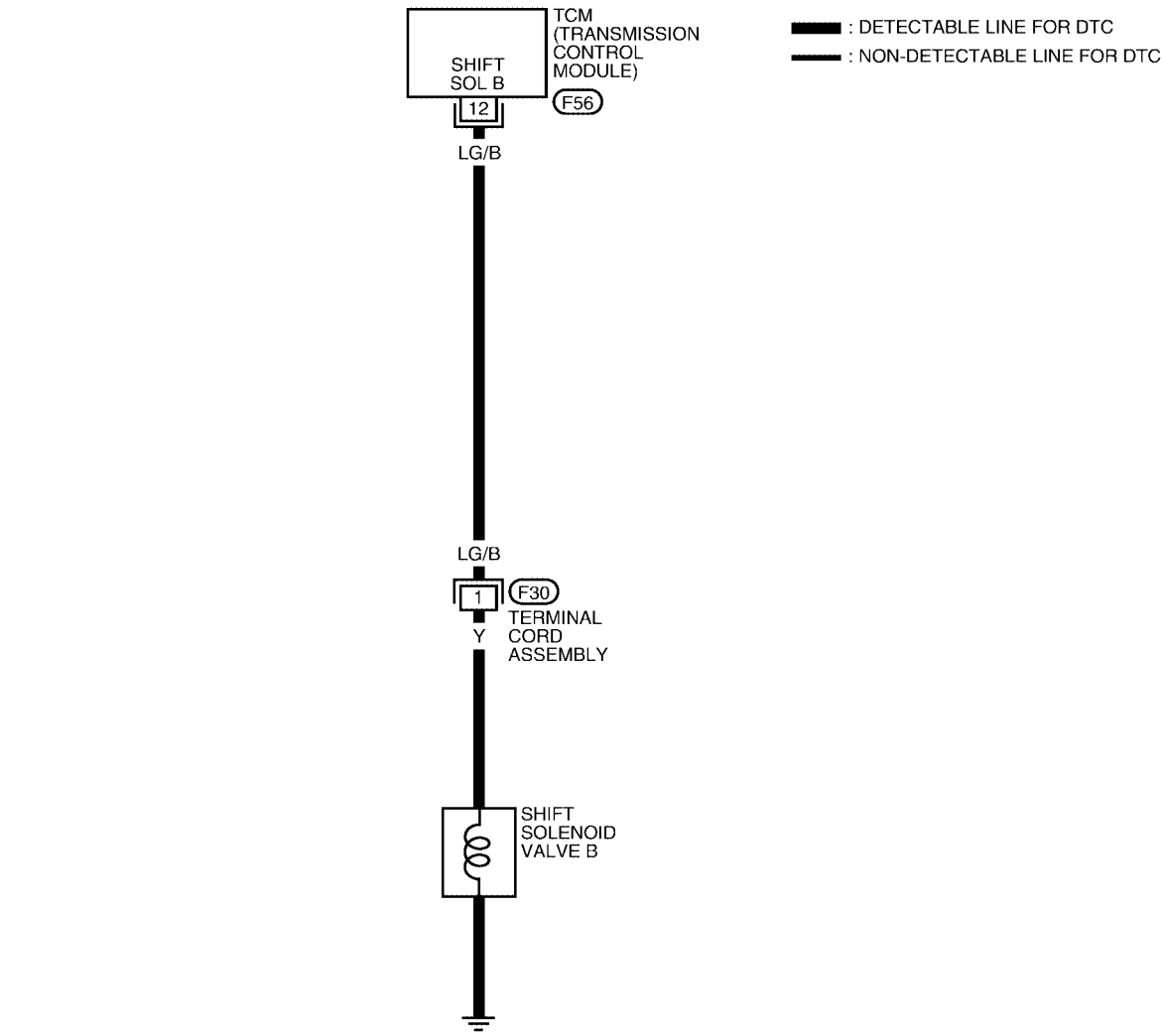
WITH GST

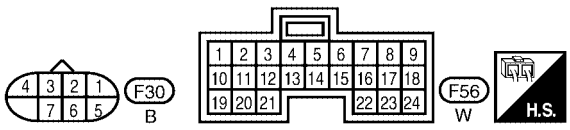
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — 2ND

UCS000O4

AT-2NDSIG-01





LCWA0011E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
12	LG/B	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D_1 OR D_2)	BATTERY VOLTAGE
			WHEN SHIFT SOLENOID VALVE B IS NOT OPERATING (DRIVING IN D_3 OR D_4)	0V

Diagnostic Procedure

UCS000O5

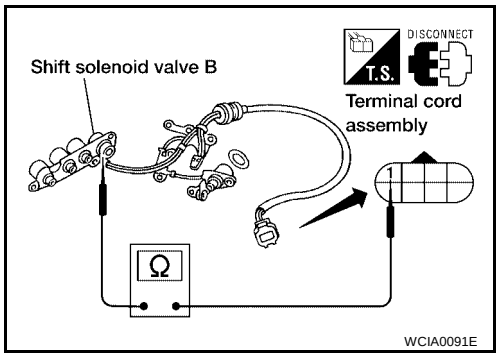
1. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Shift solenoid valve B
2. Check resistance to the terminal and ground.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve B	1	Ground	5 - 20Ω

OK or NG

OK >> GO TO 2.
NG >> Repair or replace shift solenoid valve assembly.

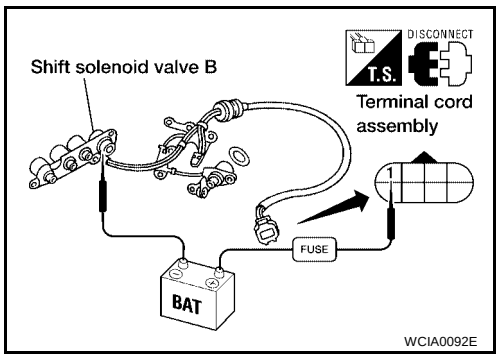


2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Shift solenoid valve B
2. Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

OK >> GO TO 3.
NG >> Repair or replace shift solenoid valve assembly.

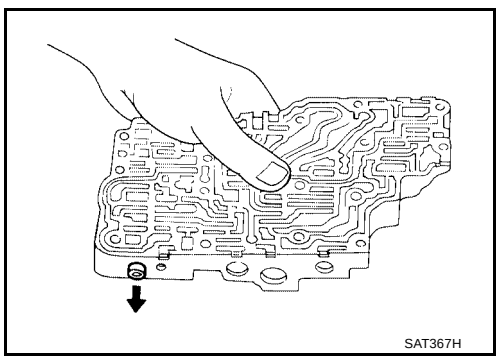


3. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to AT-304, "Control Valve Assembly" .
2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.

OK or NG

OK >> GO TO 4.
NG >> Repair control valve assembly.



4. CHECK DTC

Perform AT-131, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Check control valve again. Repair or replace control valve assembly.

DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

Description

UCS000O6

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into third gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning servo piston or brake band, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

UCS000O7

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:
Torque converter slip ratio = A x C/B
A: Output shaft revolution signal from revolution sensor
B: Engine speed signal from ECM
C: Gear ratio determined as gear position which TCM supposes
If the actual gear position is higher than the position (3rd) supposed by TCM, the slip ratio will be more than normal. In case the ratio exceeds the specified value, TCM judges this diagnosis malfunction.
This malfunction will be caused when shift solenoid valve A is stuck closed.
Gear positions supposed by TCM are as follows.
In case of gear position with no malfunctions: 1, 2, **3** and 4 positions
In case of gear position with shift solenoid valve A stuck closed: 1, 1, **4*** and 4 positions to each gear position above
*: P0733 is detected.
Diagnostic trouble code A/T 3RD GR FNCTN with CONSULT-II or P0733 without CONSULT-II is detected when A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.

Possible Cause

UCS000O8

Check the following items.

- Shift solenoid valve A
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000O9

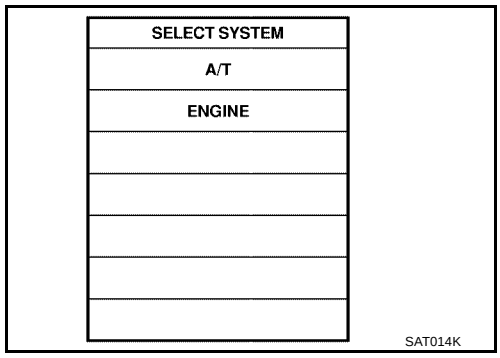
CAUTION:

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

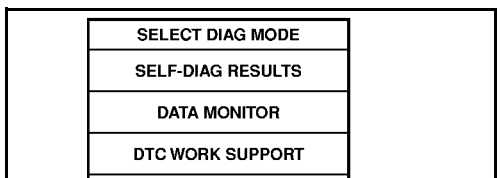
NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch “OFF” and wait at least 10 seconds before conducting the next test.
TESTING CONDITION:
Always drive vehicle on a level road to improve the accuracy of test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

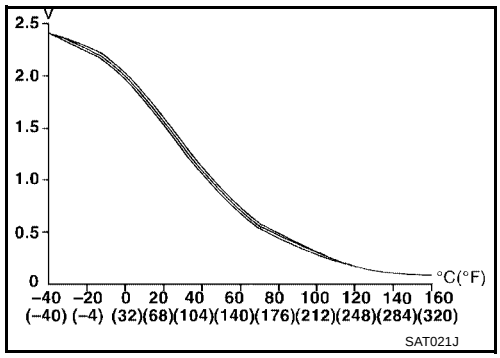
WITH CONSULT-II

1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
   FLUID TEMP SEN: 0.4 - 1.5V
   If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).
3. Select “3RD GR FNCTN P0733” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.



4. Accelerate vehicle to 60 to 75 km/h (37 to 47 MPH) under the following condition and release the accelerator pedal completely.
   THROTTLE POSI: Less than 1.0/8 (at all times during step 4)
   Selector lever: D position
   - **Check that “GEAR” shows “4” after releasing pedal.**
5. Depress accelerator pedal steadily with 3.5/8 - 4.5/8 of “THROTTLE POSI” from a speed of 60 to 75 km/h (37 to 47 MPH) until “TESTING” changes to “STOP VEHICLE” or “COMPLETED”. (It will take approximately 3 seconds.)
   If the check result NG appears on CONSULT-II screen, go to AT-139, "Diagnostic Procedure" .
   If “STOP VEHICLE” appears on CONSULT-II screen, go to following step.
   - **Check that “GEAR” shows “3” when depressing accelerator pedal with 3.5/8 - 4.5/8 of “THROTTLE POSI”.**
   - **If “TESTING” does not appear on CONSULT-II for a long time, select “SELF-DIAG RESULTS” for “ENGINE”. In case a 1st trip DTC other than P0733 is shown, refer to applicable “TROUBLE DIAGNOSIS FOR DTC”.**
6. Stop vehicle.
7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)





Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 → 2 → 3 → 4
No malfunction exists.	1 → 2 → 3 → 4
Malfunction for P0733 exists.	1 → 1 → 4 → 4

8. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-139, "Diagnostic Procedure" .
   Refer to AT-377, "Shift Schedule" .

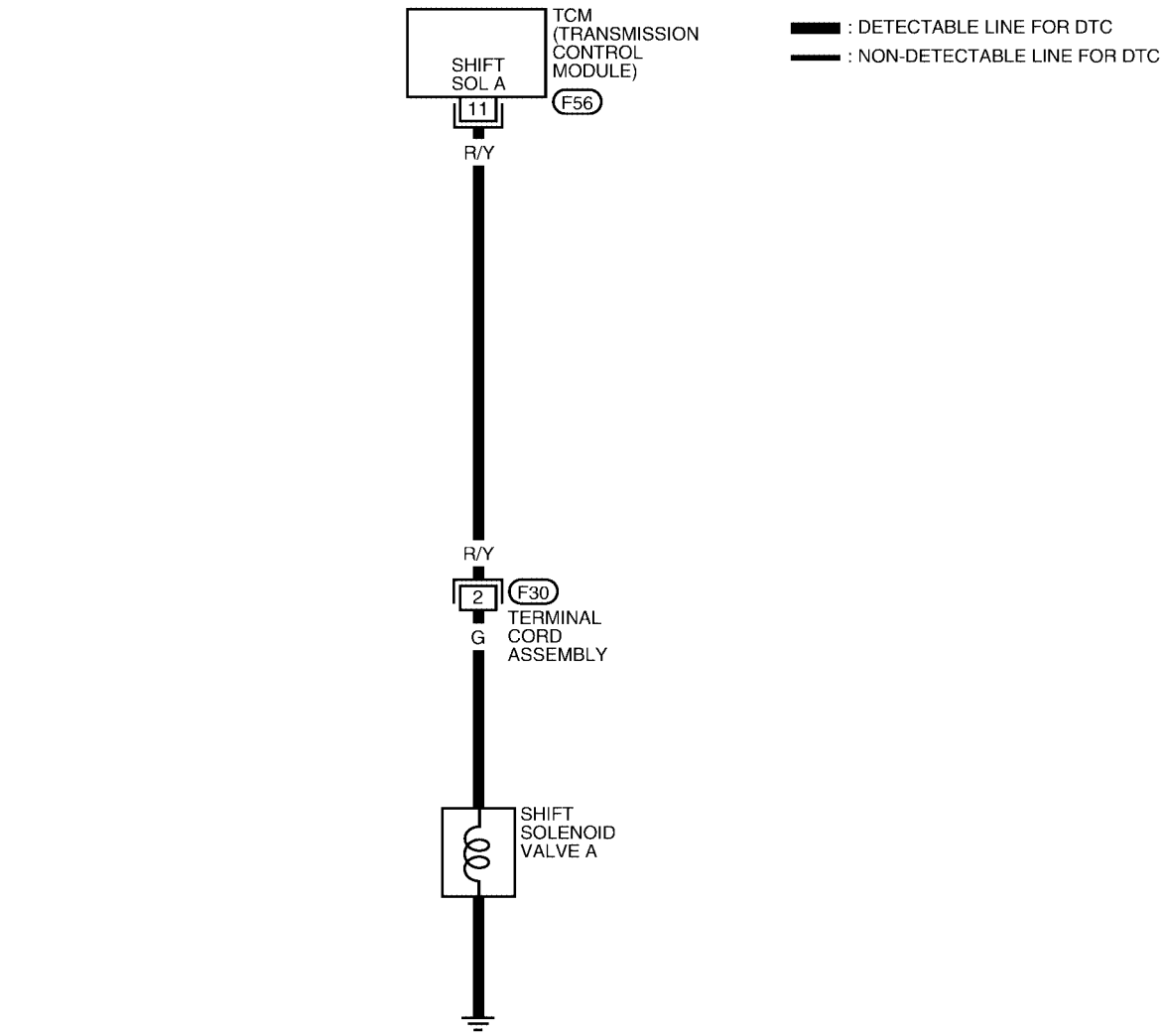
WITH GST

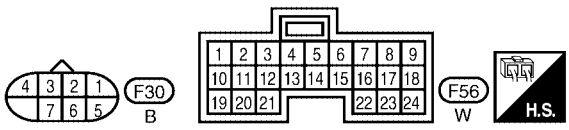
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — 3RD

UCS000OA

AT-3RDSIG-01





LCWA0012E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
11	R/Y	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D_1 OR D_4)	BATTERY VOLTAGE
			WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D_2 OR D_3)	0V

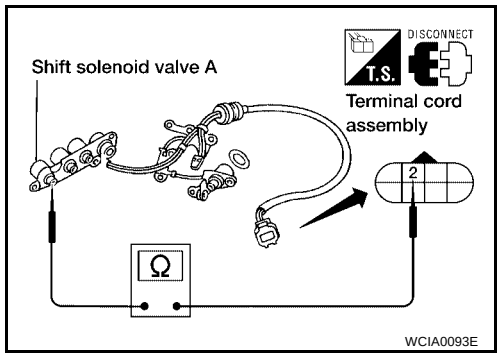
Diagnostic Procedure

UCS000OB

1. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Shift solenoid valve A
2. Check resistance to the terminal and ground.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve A	2	Ground	20 - 30Ω

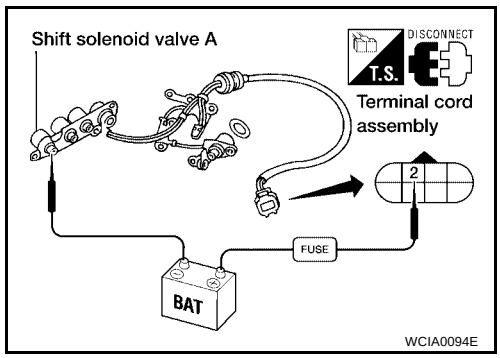


OK or NG

OK >> GO TO 2.
NG >> Repair or replace shift solenoid valve assembly.

2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Shift solenoid valve A
2. Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

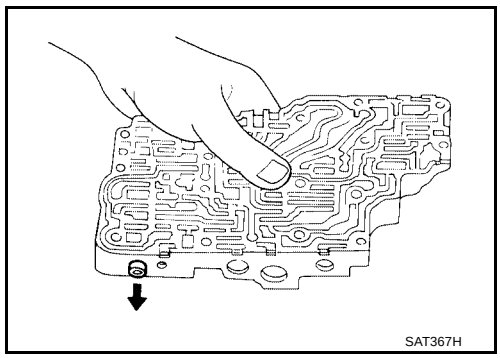


OK or NG

OK >> GO TO 3.
NG >> Repair or replace shift solenoid valve assembly.

3. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to AT-304, "Control Valve Assembly" .
2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.



OK or NG

OK >> GO TO 4.
NG >> Repair control valve assembly.

4. CHECK DTC

Perform AT-136, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Check control valve again. Repair or replace control valve assembly.

DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

Description

UCS000OC

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into fourth gear position or the torque converter clutch does not lock up as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning oil pump or torque converter clutch, etc.

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Torque converter clutch solenoid valve duty	Lock-up OFF ↓ Lock-up ON	Approximately 4% ↓ Approximately 94%
Line pressure solenoid valve duty	Small throttle opening (Low line pressure) ↓ Large throttle opening (High line pressure)	Approximately 24% ↓ Approximately 95%

On Board Diagnosis Logic

UCS000OD

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:
Torque converter slip ratio = A x C/B
A: Output shaft revolution signal from revolution sensor
B: Engine speed signal from ECM
C: Gear ratio determined as gear position which TCM supposes
If the actual gear position is much lower than the position (4th) supposed by TCM, the slip ratio will be much less than normal. In case the ratio does not reach the specified value, TCM judges this diagnosis malfunction. This malfunction will be caused when shift solenoid valve B is stuck closed.
Gear positions supposed by TCM are as follows.
In case of gear position with no malfunctions: 1, 2, 3 and **4** positions
In case of gear position with shift solenoid valve A stuck open: 2, 2, 3 and **3*** position
In case of gear position with shift solenoid valve B stuck closed: 1, 2, 2 and **1*** positions to each gear position above
*: P0734 is detected.
Diagnostic trouble code A/T 4TH GR FNCTN with CONSULT-II or P0734 without CONSULT-II is detected when A/T cannot be shifted to the 4th gear position even if electrical circuit is good.

Possible Cause

UCS000OE

Check the following items.

- Shift solenoid valve A
- Shift solenoid valve B
- Line pressure solenoid valve
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000OF

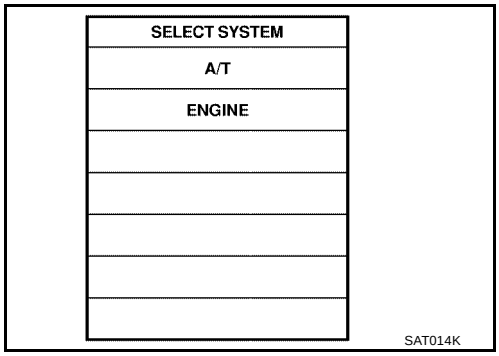
CAUTION:

- **Always drive vehicle at a safe speed.**
- **If conducting this “DTC CONFIRMATION PROCEDURE” again, always turn ignition switch OFF and wait at least 10 seconds before continuing.**
- **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.
TESTING CONDITION:
Always drive vehicle on a level road to improve the accuracy of test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

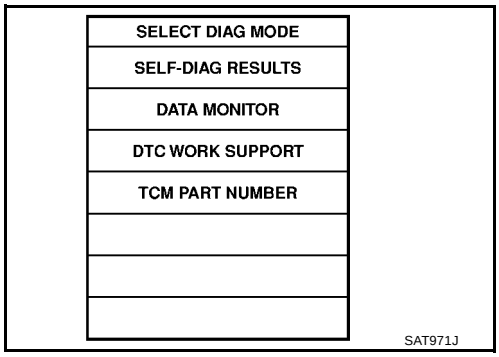
1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
   FLUID TEMP SEN: 0.4 - 1.5V
   If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid).
3. Select “4TH GR FNCTN P0734” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.



4. Accelerate vehicle to 55 to 65 km/h (34 to 40 MPH) under the following condition and release the accelerator pedal completely.
   THROTTLE POSI: Less than 5.5/8 (at all times during step 4)
   Selector lever: D position

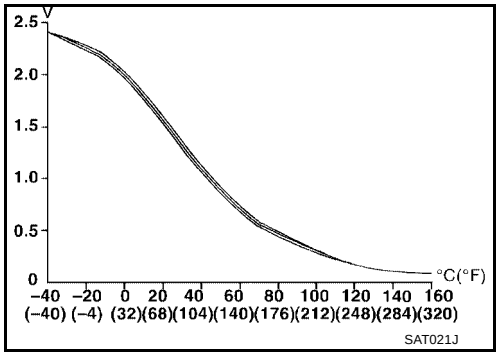
– **Check that “GEAR” shows “3” after releasing pedal.**

5. Depress accelerator pedal steadily with 1.0/8 - 2.0/8 of “THROTTLE POSI” from a speed of 55 to 65 km/h (34 to 40 MPH) until “TESTING” has turned to “STOP VEHICLE” or “COMPLETED”. (It will take approximately 3 seconds.)
   If the check result NG appears on CONSULT-II screen, go to AT-144, "Diagnostic Procedure" .
   If “STOP VEHICLE” appears on CONSULT-II screen, go to following step.



– **Check that “GEAR” shows “4” when depressing accelerator pedal with 1.0/8 - 2.0/8 of “THROTTLE POSI”.**
– **If “TESTING” does not appear on CONSULT-II for a long time, select “SELF-DIAG RESULTS” for “ENGINE”. In case a 1st trip DTC other than P0734 is shown, refer to applicable “TROUBLE DIAGNOSIS FOR DTC”.**

6. Stop vehicle.
7. Follow the instruction displayed. (Check for normal shifting referring to the table below.)



Vehicle condition	Gear on actual transmission shift pattern when screen is changed to 1 → 2 → 3 → 4
No malfunction exists	1 → 2 → 3 → 4
Malfunction for P0734 exists.	2 → 2 → 3 → 3
	1 → 2 → 2 → 1

8. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-144, "Diagnostic Procedure" .
   Refer to AT-377, "Shift Schedule" .

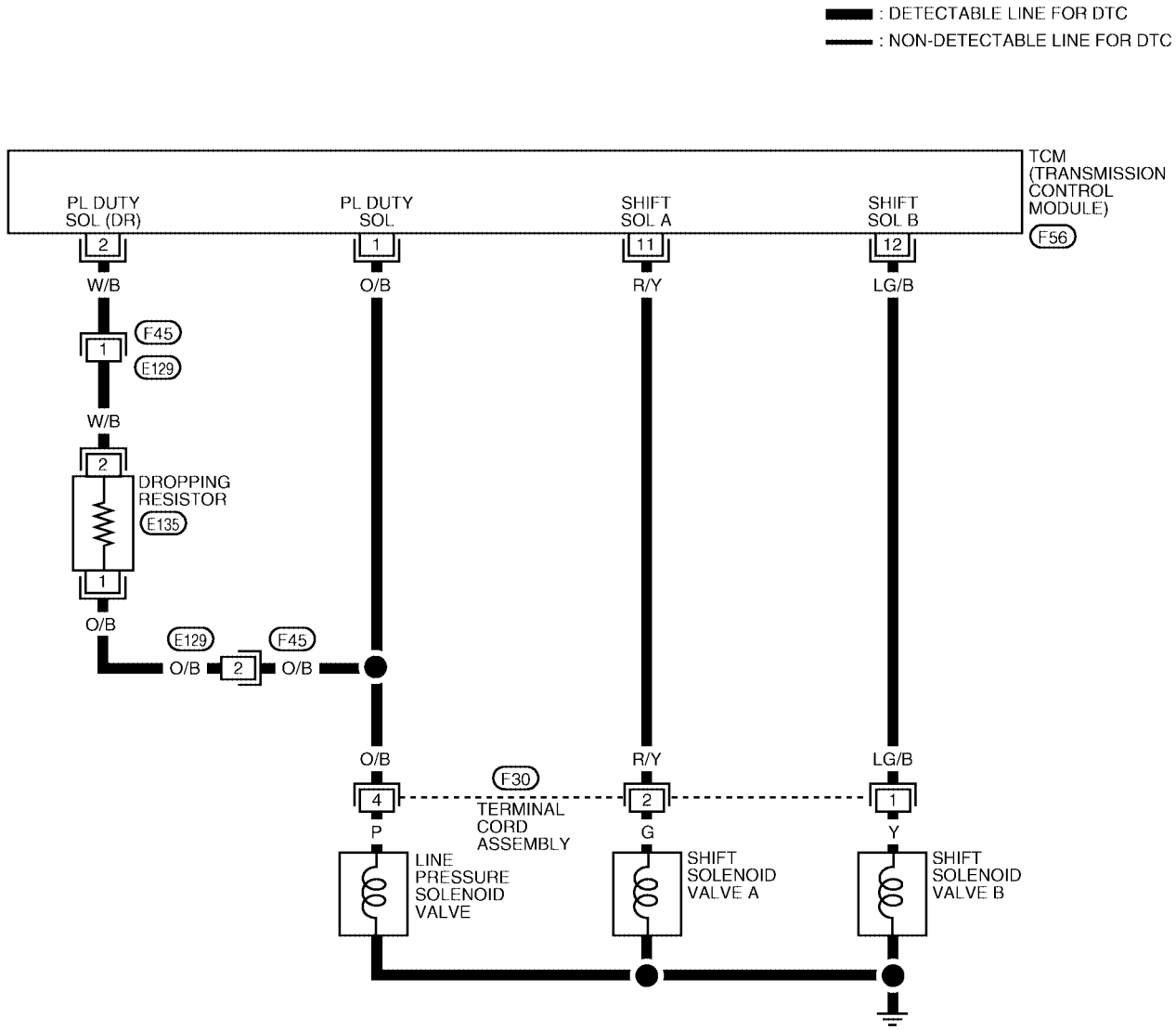
WITH GST

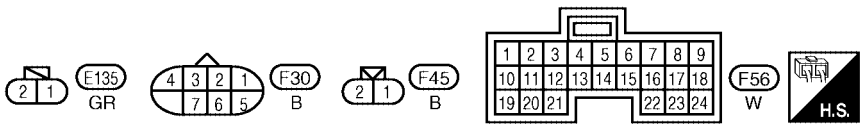
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — 4TH

UCS000OG

AT-4THSIG-01





BBWA0569E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
1	O/B	LINE PRESSURE SOLENOID VALVE	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	1.5 - 3.0V
			WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	0V
2	W/B	LINE PRESSURE SOLENOID VALVE (DROPPING RESISTOR)	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	4 - 14V
			WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	0V
11	R/Y	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D_1 OR D_4)	BATTERY VOLTAGE
			WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D_2 OR D_3)	0V
12	LG/B	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D_1 OR D_2)	BATTERY VOLTAGE
			WHEN SHIFT SOLENOID VALVE BE IS NOT OPERATING (DRIVING IN D_3 OR D_4)	OV

Diagnostic Procedure

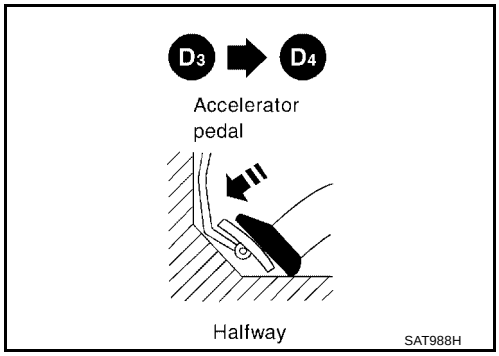
UCS000OH

1. CHECK SHIFT UP (D_3 TO D_4)

During AT-81, "Cruise Test — Part 1" , does A/T shift from D_3 to D_4 at the specified speed?

Yes or No

Yes >> GO TO 11.
No >> GO TO 2.



2. CHECK LINE PRESSURE

Perform line pressure test.

Engine Speed RPM	Line Pressure kPa (kg/cm^2 , psi)	
	D, 3rd, 2nd and 1st Position	R Position
Idle	500 (5.1, 73)	778 (7.9, 113)
Stall	1.223 (12.6, 179)	1.918 (19.6, 278)

Refer to AT-71, "Line Pressure Test" .

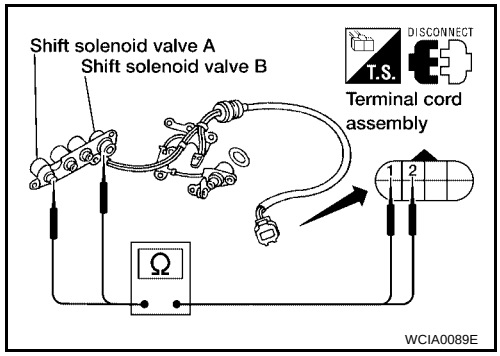
OK or NG

OK >> GO TO 3.
NG >> GO TO 7.

3. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Shift solenoid valve A
- Shift solenoid valve B
2. Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Shift solenoid valve A	2	Ground	20 - 30Ω
Shift solenoid valve B	1		5 - 20Ω

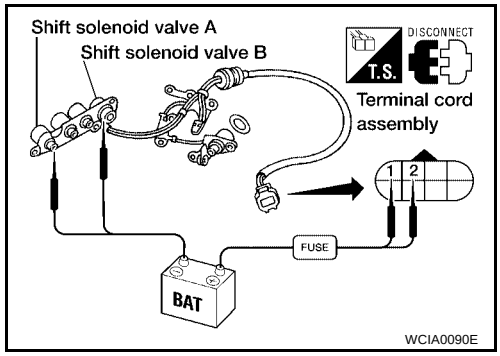


OK or NG

OK >> GO TO 5.
NG >> Replace solenoid valve assembly.

4. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Shift solenoid valve A
- Shift solenoid valve B
2. Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

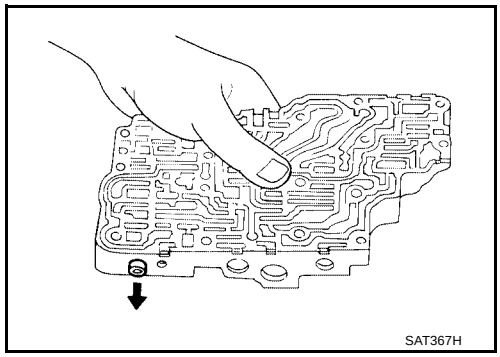


OK or NG

OK >> GO TO 5.
NG >> Replace solenoid valve assembly.

5. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to AT-304, "Control Valve Assembly" .
2. Check to ensure that:
- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.



OK or NG

OK >> GO TO 6.
NG >> Repair control valve.

6. CHECK SHIFT UP (D_3 TO D_4)

Does A/T shift from D_3 to D_4 at the specified speed?

OK or NG

OK >> GO TO 11.
NG >> Check control valve again. Repair or replace control valve assembly.

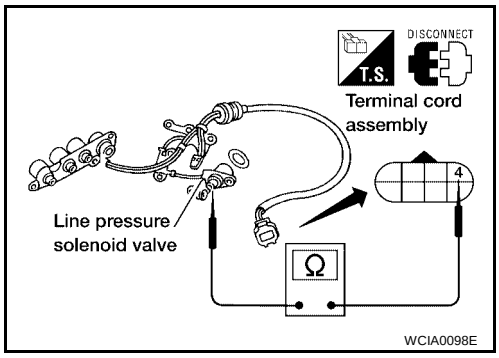
7. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Line pressure solenoid valves
2. Check resistance to the terminal and ground.

Solenoid valve	Terminal No.		Resistance (Approx.)
Line pressure solenoid valve	4	Ground	2.5 - 5Ω

OK or NG

OK >> GO TO 9.
NG >> Replace solenoid valve assembly.

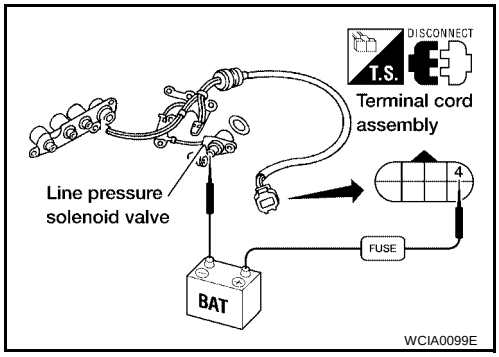


8. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Line pressure solenoid valves
2. Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

OK >> GO TO 9.
NG >> Replace solenoid valve assembly.

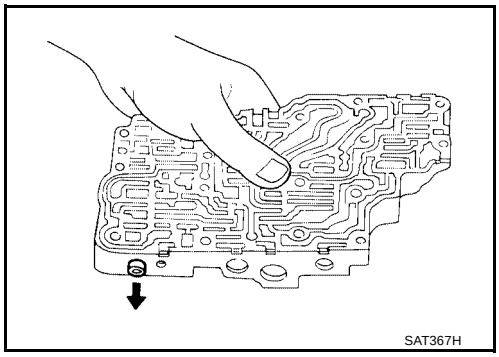


9. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to AT-304, "Control Valve Assembly" .
2. Check line pressure circuit valves for sticking.
- Pressure regulator valve
- Pilot valve
- Pressure modifier valve

OK or NG

OK >> GO TO 10.
NG >> Repair control valve.



10. CHECK SHIFT UP (D_3 TO D_4)

Does A/T shift from D_3 to D_4 at the specified speed?

OK or NG

OK >> GO TO 11.
NG >> Check control valve again. Repair or replace control valve assembly.

11. CHECK DTC

Perform AT-141, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Perform “Cruise test — Part 1” again and return to the start point of this test group.

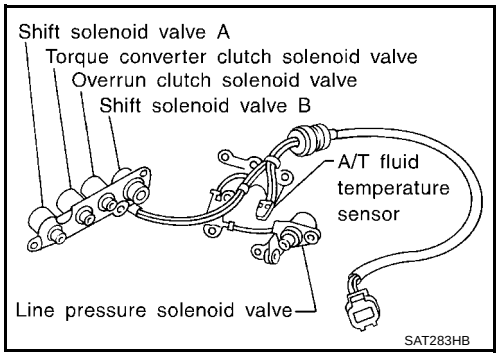
DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

Description

UCS000OI

The torque converter clutch solenoid valve is activated, with the gear in D4 , by the TCM in response to signals sent from the vehicle speed and the ECM (throttle opening). 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 2/8) 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.



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Torque converter clutch solenoid valve duty	Lock-up OFF ↓ Lock-up ON	Approximately 4% ↓ Approximately 94%

On Board Diagnosis Logic

UCS000OJ

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.

Possible Cause

UCS000OK

Check the following items.

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

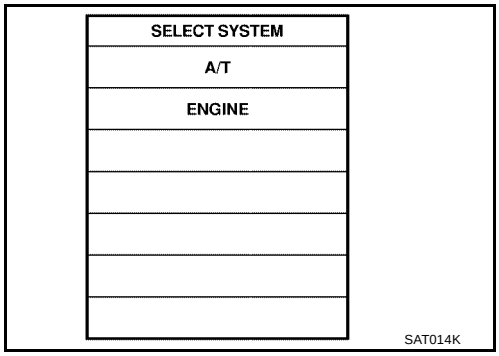
Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000OL

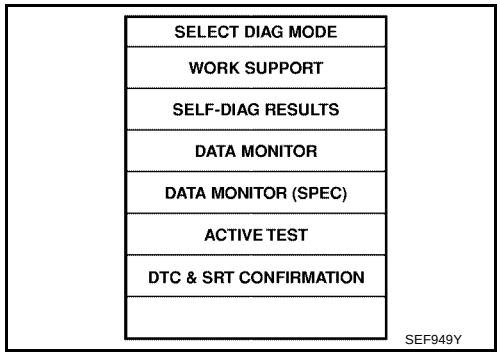
NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch to ON position. (Do not start engine.)



2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II and wait at least 1 second.
3. Start engine and maintain the following condition for at least 5 consecutive seconds.
   VHCL SPEED SE: 80km/h (50 MPH) or more
   THROTTLE POSI: 0.5/8-1.0/8
   Selector lever: D position (O/D ON)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.



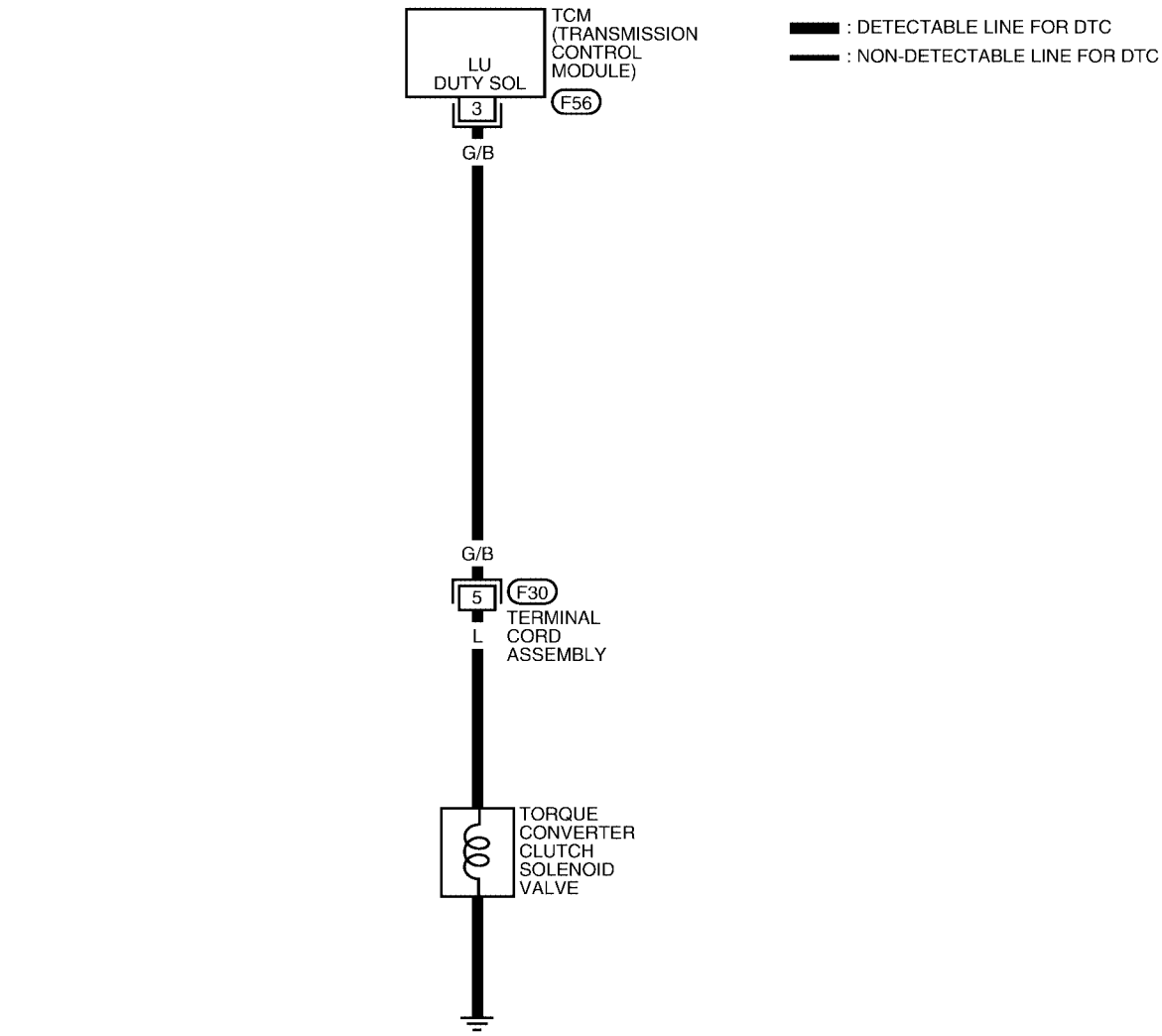
WITH GST

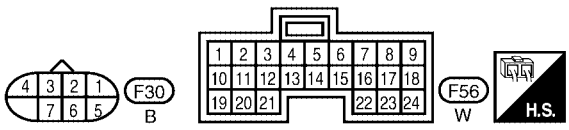
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — TCV

UCS000OM

AT-TCV-01





LCWA0014E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
3	G/B	TORQUE CONVERTER CLUTCH SOLENOID VALVE	WITH TORQUE CONVERTER LOCK-UP	8 - 15V
			WITHOUT TORQUE CONVERTER LOCK-UP	0V

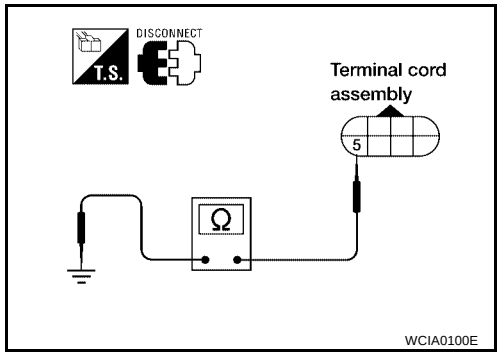
Diagnostic Procedure

UCS000ON

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord assembly harness connector F30 terminal 5(L) and ground.

Resistance : 5 - 20Ω



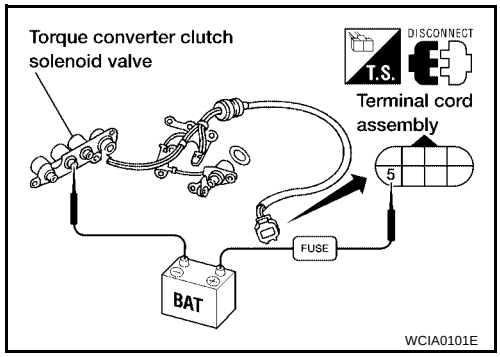
OK or NG

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

2. CHECK VALVE OPERATION

1. Remove oil pan. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

– Torque converter clutch solenoid valve
• Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.
– Harness of terminal cord assembly for short or open



OK or NG

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

3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal cord assembly harness connector F30 terminal 5(L) and TCM harness connector F56 terminal 3(G/B). Refer to AT-150, "Wiring Diagram — AT — TCV" .

Continuity should exist.

4. Reinstall any part removed.

OK or NG

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

4. CHECK DTC

Perform AT-148, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

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

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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 P0744 A/T TCC S/V FUNCTION (LOCK-UP)

PFP:31940

Description

UCS000OO

- This is an OBD-II self-diagnostic item and not available in TCM self-diagnosis.
- This malfunction will not be detected while the A/T check (position) indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into fourth gear position or the torque converter clutch does not lock up as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning oil pump or torque converter clutch, etc.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Torque converter clutch solenoid valve duty	Lock-up OFF ↓ Lock-up ON	Approximately 4% ↓ Approximately 94%

On Board Diagnosis Logic

UCS000OP

This diagnosis monitors actual gear position by checking the torque converter slip ratio calculated by TCM as follows:
Torque converter slip ratio = A x C/B
A: Output shaft revolution signal from revolution sensor
B: Engine speed signal from ECM
C: Gear ratio determined as gear position which TCM supposes
If the actual gear position is much lower than the position (4th) supposed by TCM, the slip ratio will be much less than normal. In case the ratio does not reach the specified value, TCM judges this diagnosis malfunction. This malfunction will be caused when shift solenoid valve B is stuck closed.
Gear positions supposed by TCM are as follows.
In case of gear position with no malfunctions: 1, 2, 3 and 4 positions
In case of gear position with shift solenoid valve B stuck closed: 1, 2, 2 and 1* positions to each gear position above
*: P0744 is detected.
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.

Possible Cause

UCS000OQ

Check the following items.

- Line pressure solenoid valve
- Torque converter clutch solenoid valve
- Each clutch
- Hydraulic control circuit

Diagnostic Trouble Code (DTC) Confirmation Procedure

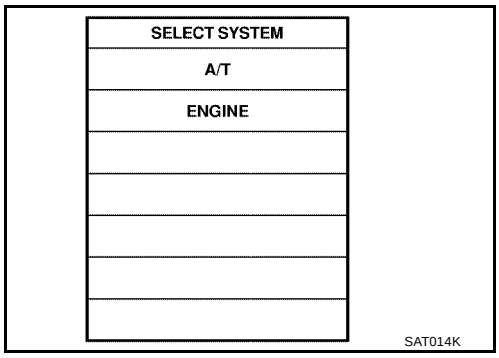
UCS000OR

CAUTION:
Always drive vehicle at a safe speed.

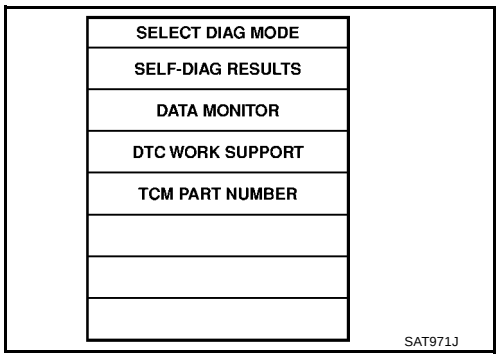
NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

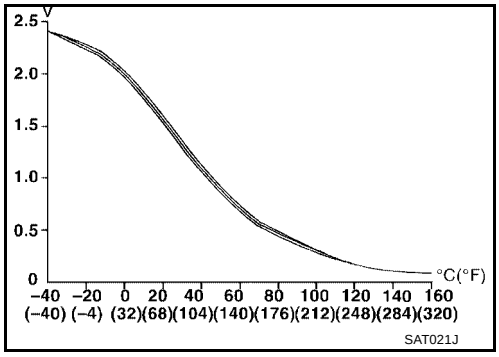
1. Start engine and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Make sure that output voltage of A/T fluid temperature sensor is within the range below.
   FLUID TEMP SEN: 0.4 - 1.5V
   If out of range, drive vehicle to decrease voltage (warm up the fluid) or stop engine to increase voltage (cool down the fluid).
3. Select “TCC S/V FNCTN P0744” of “DTC WORK SUPPORT” mode for “A/T” with CONSULT-II and touch “START”.



4. 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.)
   THROTTLE POSI: 1.0/8 - 2.0/8 (at all times during step 4)
   Selector lever: D position
   TCC S/V DUTY: More than 94%
   VHCL/S SE·A/T: Constant speed of more than 80 km/h (50 MPH)
   - **Check that “GEAR” shows “4”.**
   - **For shift schedule, refer to AT-377, "Shift Schedule" .**
   - **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”.**



5. Make sure that “OK” is displayed. (If “NG” is displayed, refer to “DIAGNOSTIC PROCEDURE”.)
   Refer to AT-156, "Diagnostic Procedure" .
   Refer to AT-377, "Shift Schedule" .



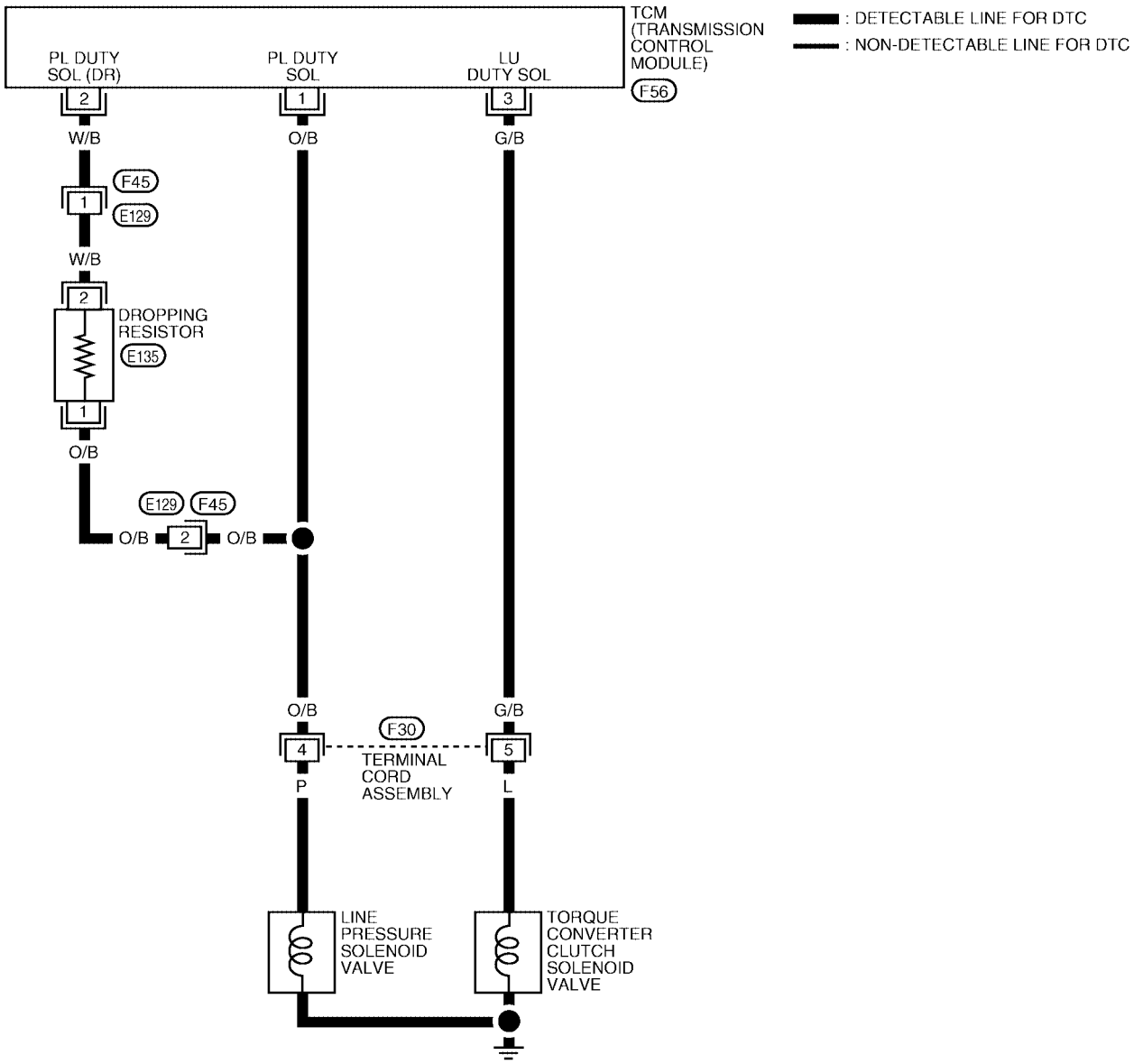
WITH GST

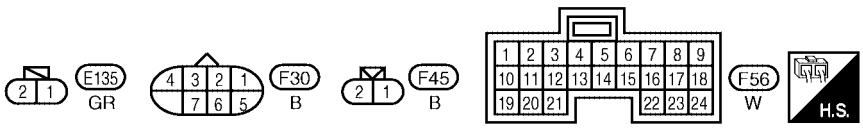
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — TCCSIG

UCS000OS

AT-TCCSIG-01





BBWA0570E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
1	O/B	LINE PRESSURE SOLENOID VALVE	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	1.5 - 3.0V
			WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	0V
2	W/B	LINE PRESSURE SOLENOID VALVE (DROPPING RESISTOR)	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	4 - 14V
			WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	0V
3	G/B	TORQUE CONVERTER CLUTCH SOLENOID VALVE	WITH TORQUE CONVERTER LOCK-UP	8 - 15V
			WITHOUT TORQUE CONVERTER LOCK-UP	0V

Diagnostic Procedure

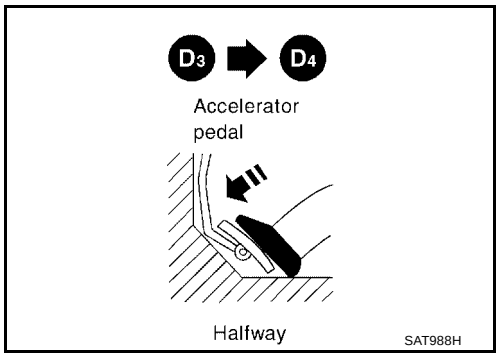
UCS000OT

1. CHECK SHIFT UP (D_3 TO D_4)

During AT-81, "Cruise Test — Part 1" , does A/T shift from D_3 to D_4 at the specified speed?

Yes or No

Yes >> GO TO 11.
No >> GO TO 2.



2. CHECK LINE PRESSURE

Perform line pressure test.

Engine Speed RPM	Line Pressure kPa (kg/cm^2 , psi)	
	D, 3rd, 2nd and 1st Position	R Position
Idle	500 (5.1, 73)	778 (7.9, 113)
Stall	1.223 (12.6, 179)	1.918 (19.6, 278)

Refer to AT-71, "Line Pressure Test" .

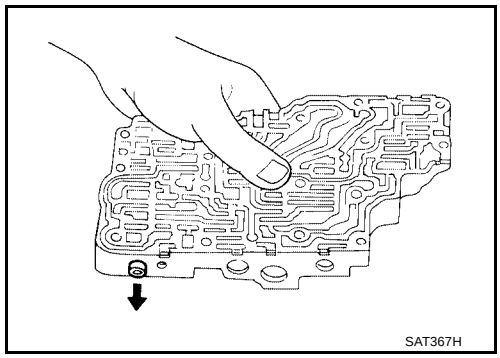
OK or NG

OK >> GO TO 3.
NG >> GO TO 6.

3. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to AT-304, "Control Valve Assembly" .
2. Check to ensure that:

- Valve, sleeve and plug slide along valve bore under their own weight.
- Valve, sleeve and plug are free from burrs, dents and scratches.
- Control valve springs are free from damage, deformation and fatigue.
- Hydraulic line is free from obstacles.



OK or NG

OK >> GO TO 4.
NG >> Repair control valve.

4. CHECK SHIFT UP (D_3 TO D_4)

Does A/T shift from D_3 to D_4 at the specified speed?

OK or NG

OK >> GO TO 5.
NG >> Check control valve again. Repair or replace control valve assembly.

5. CHECK DTC

Perform AT-153, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11. Check for proper lock-up.

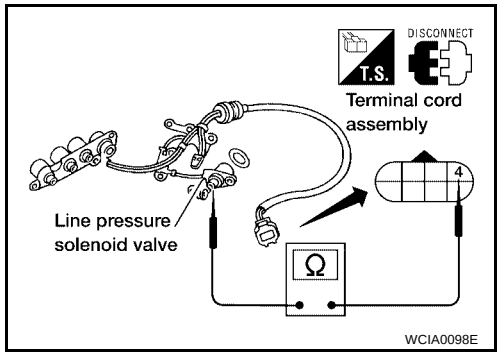
6. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .

- Line pressure solenoid valve

2. Check resistance to the terminal and ground.

Solenoid valve	Terminal No.		Resistance (Approx.)
Line pressure solenoid valve	4	Ground	2.5 - 5Ω



OK or NG

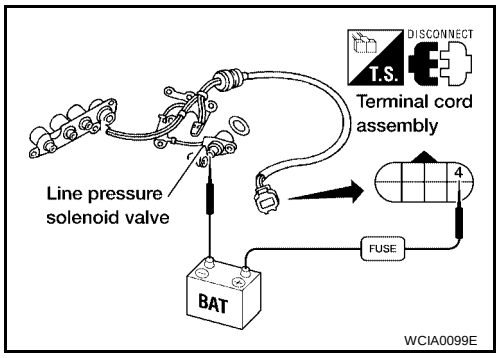
OK >> GO TO 8.
NG >> Replace solenoid valve assembly.

7. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Line pressure solenoid valve
2. Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

OK >> GO TO 8.
NG >> Replace solenoid valve assembly.

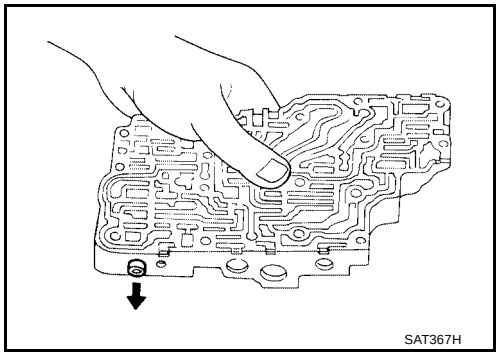


8. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to AT-304, "Control Valve Assembly" .
2. Check line pressure circuit valves for sticking.
- Pressure regulator valve
- Pilot valve
- Pressure modifier valve

OK or NG

OK >> GO TO 9.
NG >> Repair control valve.



9. CHECK SHIFT UP (D_3 TO D_4)

Does A/T shift from D_3 to D_4 at the specified speed?

OK or NG

OK >> GO TO 10.
NG >> Check control valve again. Repair or replace control valve assembly.

10. CHECK DTC

Perform AT-153, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

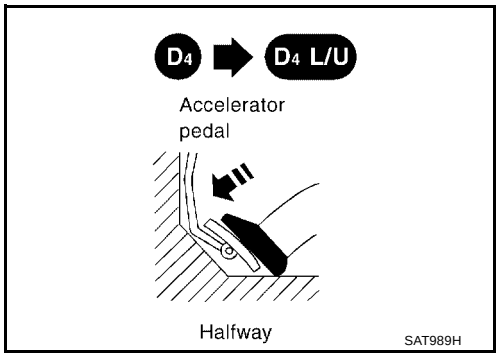
OK >> **INSPECTION END**
NG >> GO TO 11. Check for proper lock-up.

11. CHECK LOCK-UP

During AT-81, "Cruise Test — Part 1" , does A/T perform lock-up at the specified speed?

Yes or No

Yes >> Perform “Cruise test — Part 1” again and return to the start point of this test group.
No >> GO TO 12.



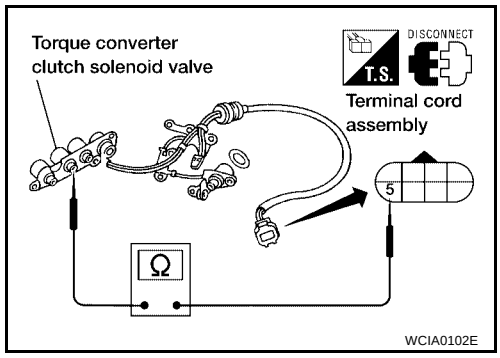
12. CHECK VALVE RESISTANCE

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Torque converter clutch solenoid valve
2. Check resistance to the terminal and ground.

Solenoid valve	Terminal No.		Resistance (Approx.)
Torque converter clutch solenoid valve	5	Ground	5 - 20Ω

OK or NG

OK >> GO TO 14.
NG >> Replace solenoid valve assembly.

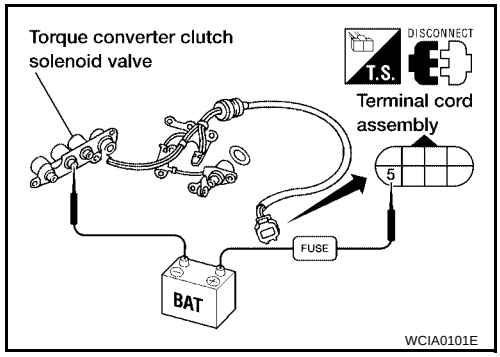


13. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
- Torque converter clutch solenoid valve
2. Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

OK or NG

OK >> GO TO 14.
NG >> Replace solenoid valve assembly.

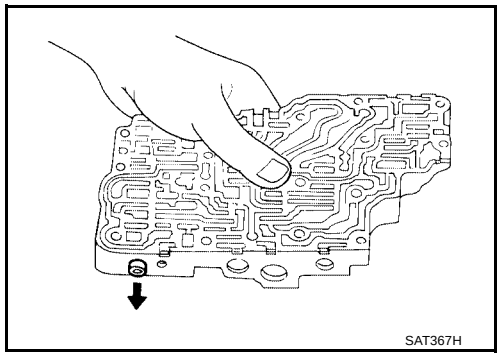


14. CHECK CONTROL VALVE

1. Disassemble control valve assembly. Refer to AT-304, "Control Valve Assembly" .
2. Check control valves for sticking.
- Torque converter clutch control valve
- Torque converter clutch relief valve

OK or NG

OK >> GO TO 15.
NG >> Repair control valve.



15. CHECK LOCK-UP

Does A/T perform lock-up at the specified speed?

Yes or No

Yes >> GO TO 16.
No >> Check control valve again. Repair or replace control valve assembly.

16. CHECK DTC

Perform AT-153, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Perform “Cruise test — Part 1” again and return to the start point of this test group.

DTC P0745 LINE PRESSURE SOLENOID VALVE

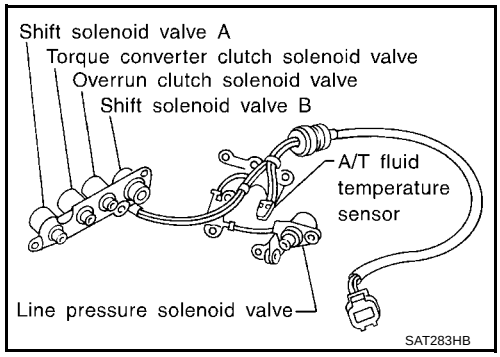
PFP:31940

Description

UCS000OU

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".



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Line pressure solenoid valve duty	Small throttle opening (Low line pressure) ↓ Large throttle opening (High line pressure)	Approximately 24% ↓ Approximately 95%

On Board Diagnosis Logic

UCS000OV

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.

Possible Cause

UCS000OW

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000OX

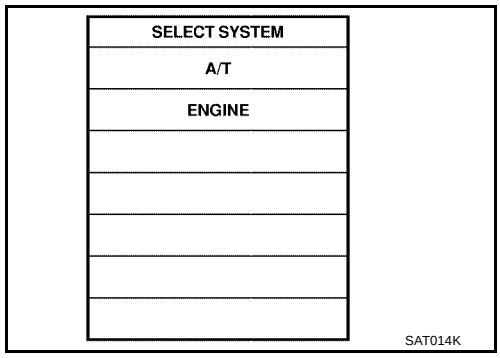
NOTE:

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

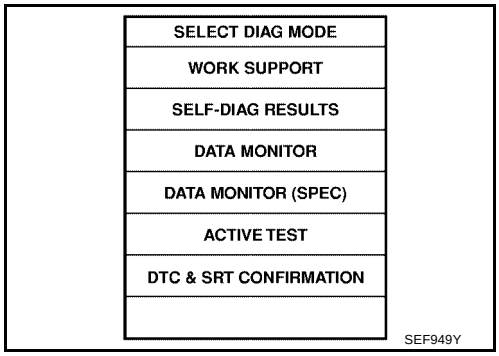
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.



2. Depress accelerator pedal completely and wait at least 1 second.



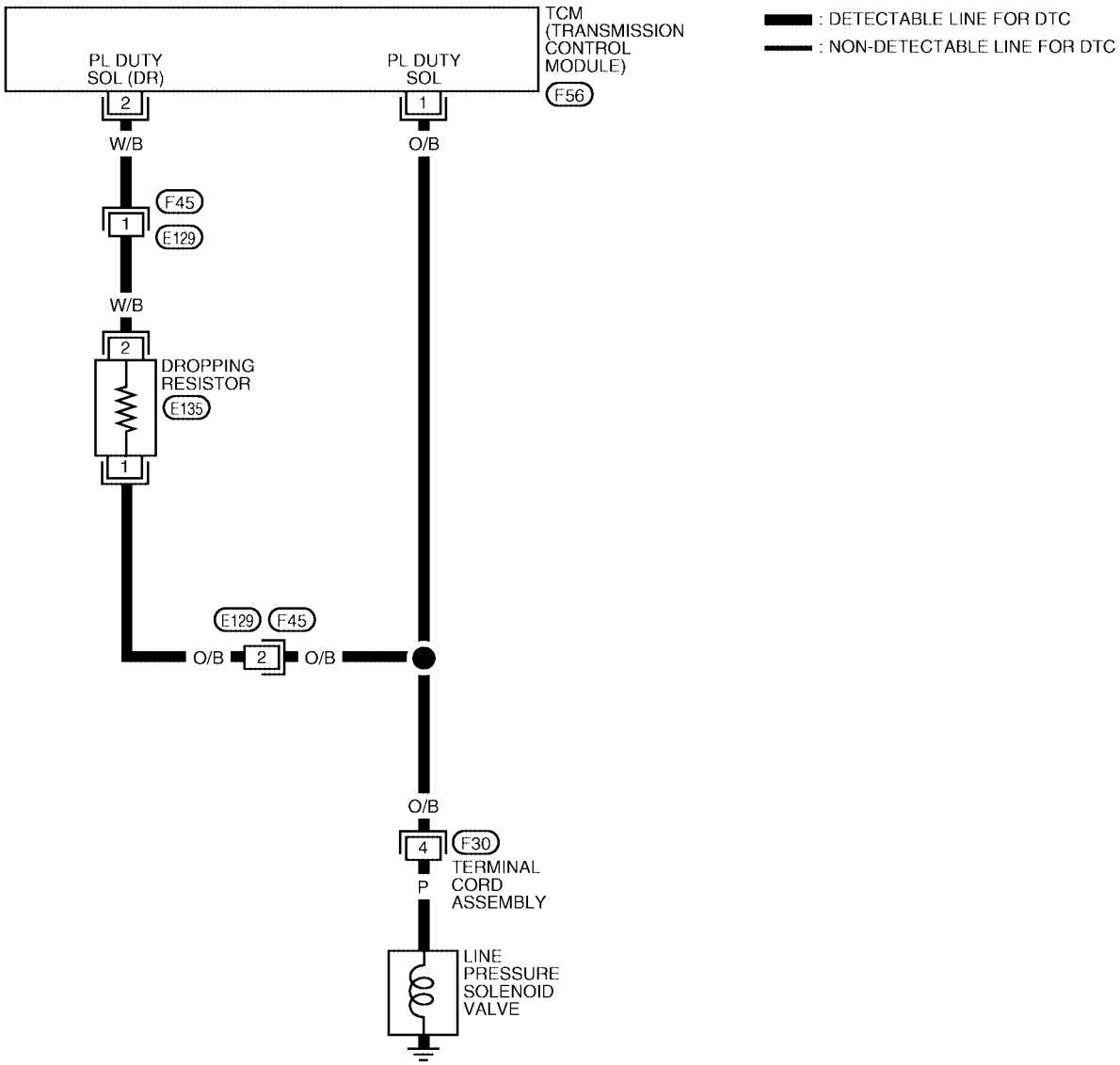
WITH GST

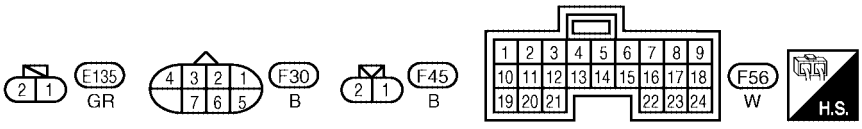
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — LPSV

UCS000OY

AT-LPSV-01





BBWA0571E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
1	O/B	LINE PRESSURE SOLENOID VALVE	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	1.5 - 3.0V
			WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	0V
2	W/B	LINE PRESSURE SOLENOID VALVE (DROPPING RESISTOR)	WHEN ACCELERATOR PEDAL IS RELEASED WHILE DRIVING	4 - 14V
			WHEN ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING	0V

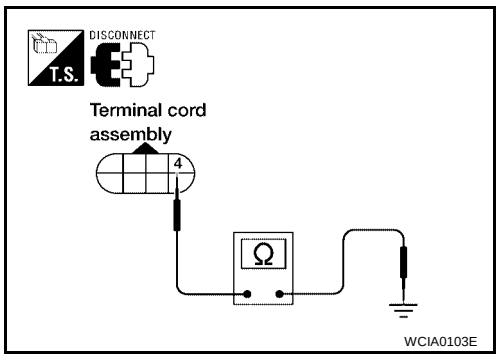
Diagnostic Procedure

UCS000OZ

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord assembly harness connector F30 terminal 4(P) and ground.

Resistance : 2.5 - 5Ω



OK or NG

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

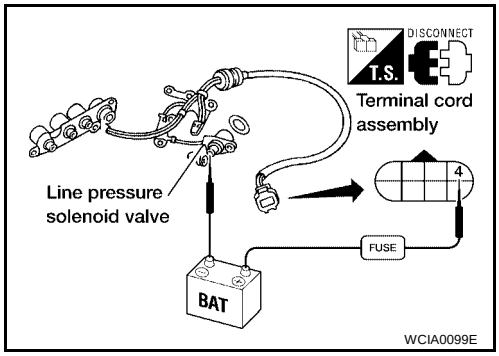
2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

– Line pressure solenoid valve

- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

– Harness of terminal cord assembly for short or open



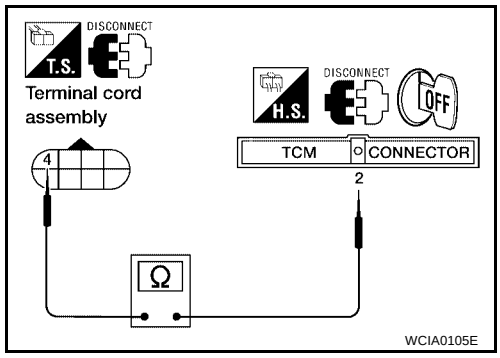
OK or NG

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

3. CHECK POWER SOURCE AND DROPPING RESISTOR CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check resistance between terminal cord assembly harness connector F30 terminal 4 (P) and TCM harness connector F56 terminal 2 (W/B).

Resistance : 10 - 15Ω



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

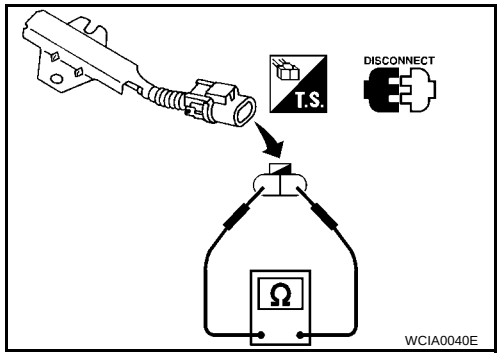
4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Dropping resistor
- Check resistance between two terminals.

Resistance :12Ω

- Harness for short or open between TCM harness connector F56 terminal 2(W/B) and terminal cord assembly



OK or NG

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

5. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Check continuity between terminal cord assembly harness connector F30 terminal 4(P) and TCM harness connector F56 terminal 1(O/B). Refer to AT-163, "Wiring Diagram — AT — LPSV" .

Continuity should exist.

3. Reinstall any part removed.

OK or NG

OK >> GO TO 6.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

6. CHECK DTC

Perform AT-161, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

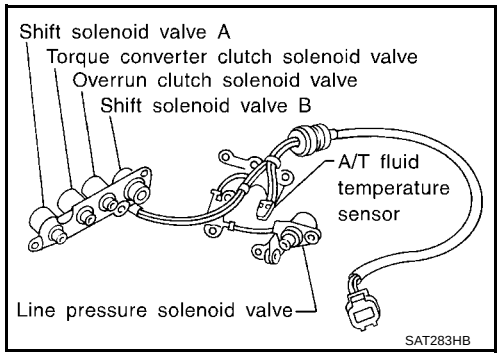
DTC P0750 SHIFT SOLENOID VALVE A

PFP:31940

Description

UCS000P0

Shift solenoid valves A and B are turned ON or OFF by the TCM in response to signals sent from the park/neutral position (PNP) switch, vehicle speed and ECM (throttle opening). Gears will then be shifted to the optimum position.



Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

UCS000P1

Diagnostic trouble code SFT SOL A/CIRC with CONSULT-II or P0750 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

UCS000P2

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve A

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000P3

CAUTION:

Always drive vehicle at a safe speed.

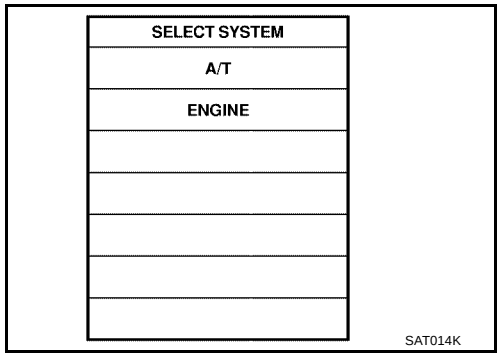
NOTE:

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

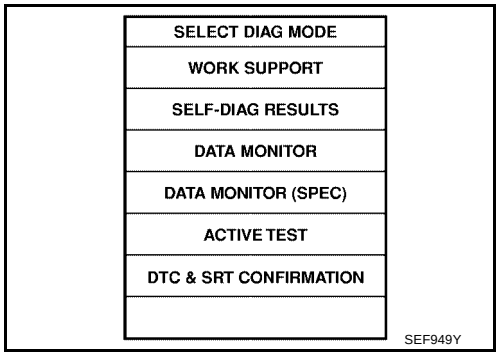
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.



2. Start engine.
3. Drive vehicle in D position and allow the transmission to shift 1 → 2 (“GEAR”).



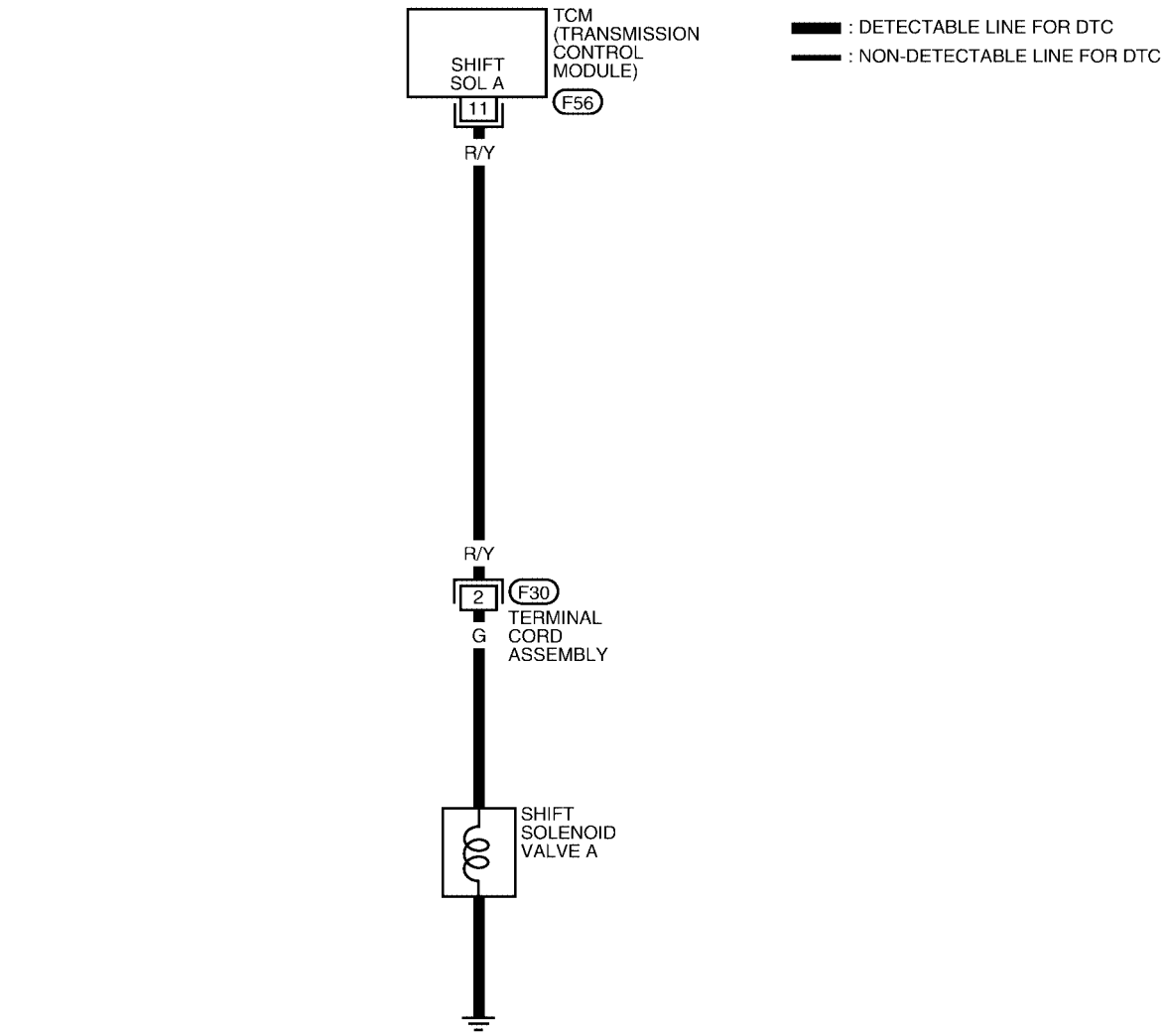
WITH GST

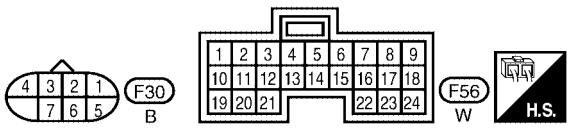
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SSV/A

UCS000P4

AT-SSV/A-01





LCWA0017E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
11	R/Y	SHIFT SOLENOID VALVE A	WHEN SHIFT SOLENOID VALVE A IS OPERATING (DRIVING IN D_1 OR D_4)	BATTERY VOLTAGE
			WHEN SHIFT SOLENOID VALVE A IS NOT OPERATING (DRIVING IN D_2 OR D_3)	0V

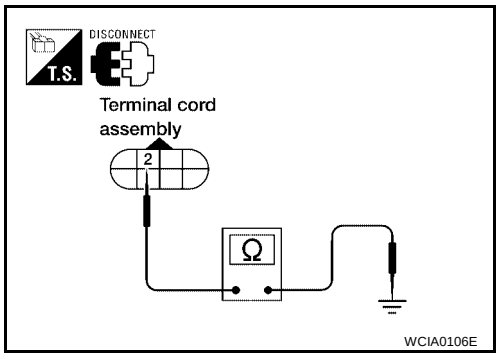
Diagnostic Procedure

UCS000P5

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord assembly harness connector F30 terminal 2(G) and ground.

Resistance : 20 - 30Ω



OK or NG

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

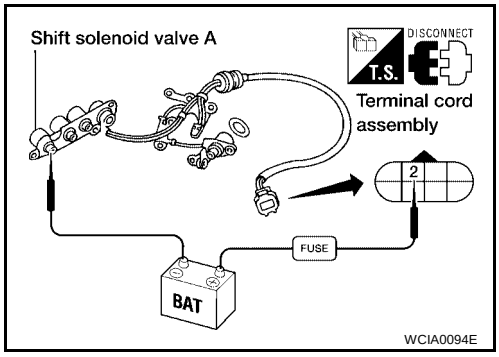
2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift solenoid valve A
- Operation check

• Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

- Harness of terminal cord assembly for short or open



OK or NG

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

3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal cord assembly harness connector F30 terminal 2(G) and TCM harness connector F56 terminal 11(R/Y). Refer to AT-169, "Wiring Diagram — AT — SSV/A" .

Continuity should exist.

4. Reinstall any part removed.

OK or NG

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

4. CHECK DTC

Perform AT-167, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

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

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

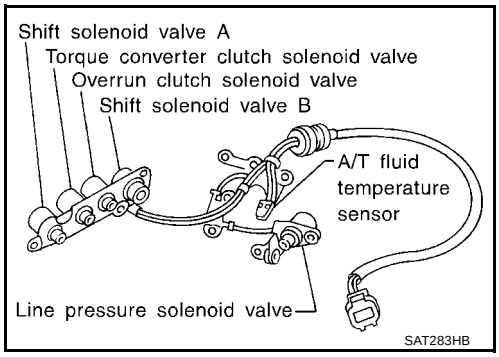
DTC P0755 SHIFT SOLENOID VALVE B

PFP:31940

Description

UCS000P6

Shift solenoid valves A and B are turned ON or OFF by the TCM in response to signals sent from the park/neutral position (PNP) switch, vehicle speed and ECM (throttle opening). Gears will then be shifted to the optimum position.



Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

UCS000P7

Diagnostic trouble code SFT SOL B/CIRC with CONSULT-II or P0755 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

UCS000P8

Check the following items.

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve B

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000P9

CAUTION:

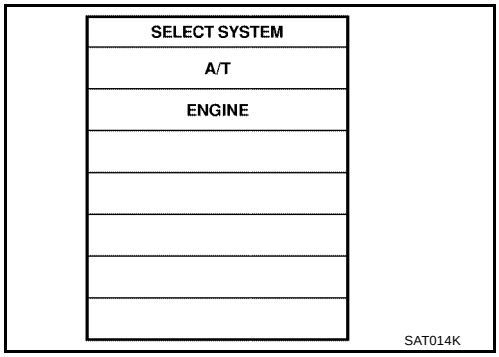
Always drive vehicle at a safe speed.

NOTE:

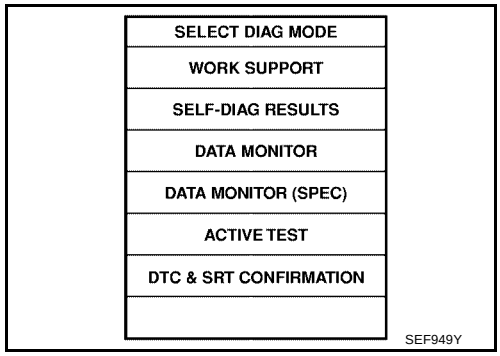
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.



2. Start engine.
3. Drive vehicle in D position and allow the transmission to shift 1 → 2 → 3 (“GEAR”).



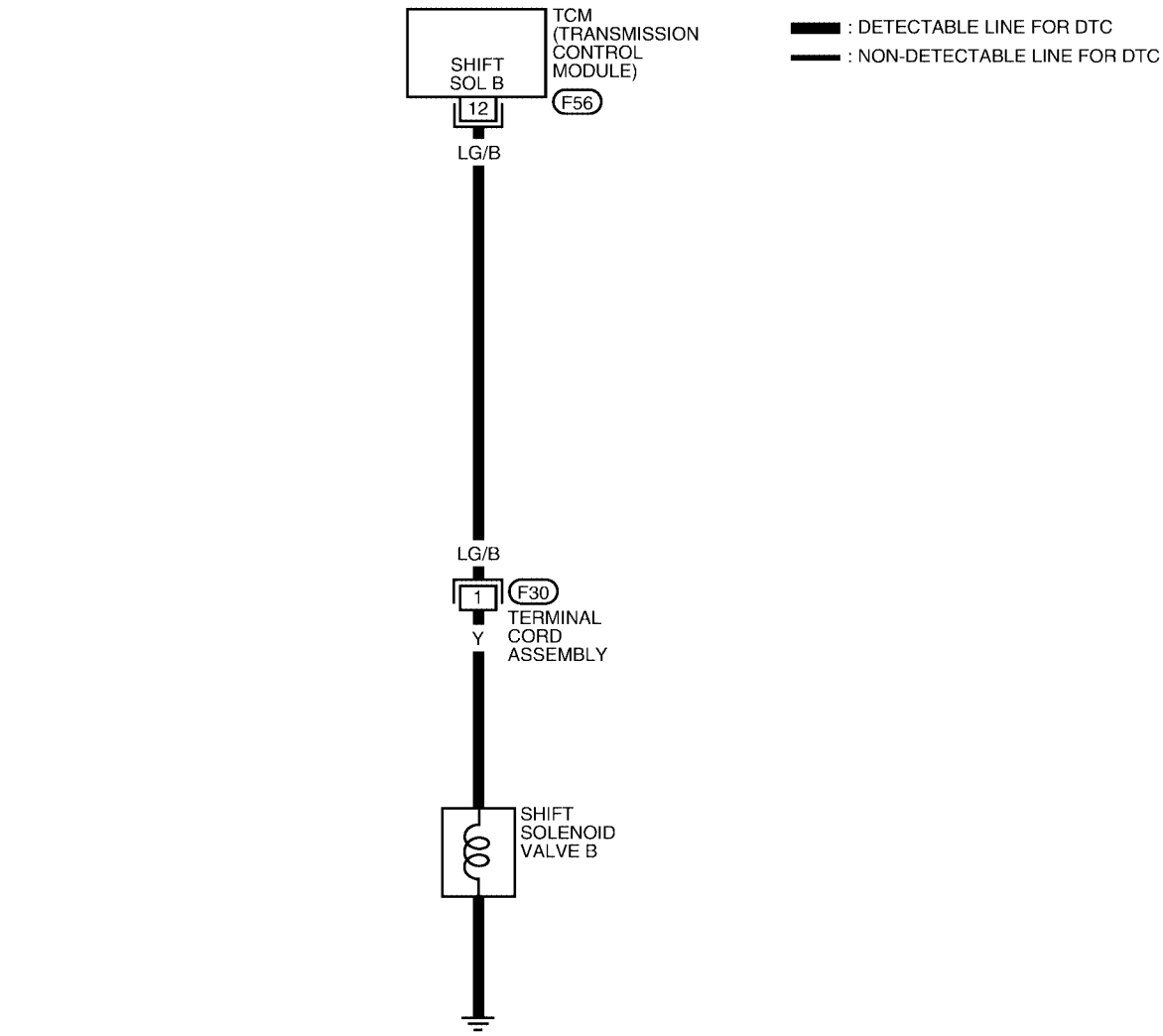
WITH GST

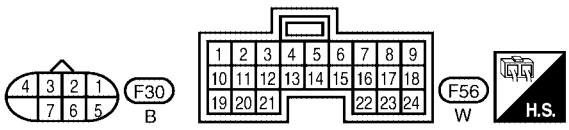
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SSV/B

UCS000PA

AT-SSV/B-01





LCWA0018E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
12	LG/B	SHIFT SOLENOID VALVE B	WHEN SHIFT SOLENOID VALVE B IS OPERATING (DRIVING IN D_1 OR D_2)	BATTERY VOLTAGE
			WHEN SHIFT SOLENOID VALVE BE IS NOT OPERATING (DRIVING IN D_3 OR D_4)	0V

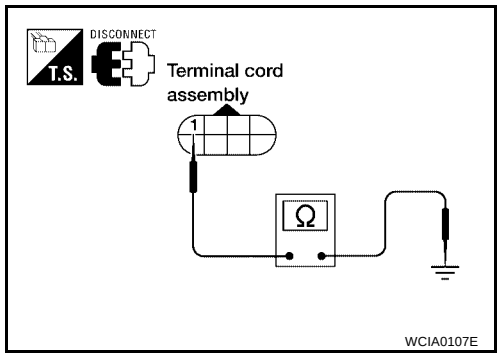
Diagnostic Procedure

UCS000PB

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord assembly harness connector F30 terminal 1(Y) and ground.

Resistance : 5 - 20Ω



OK or NG

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

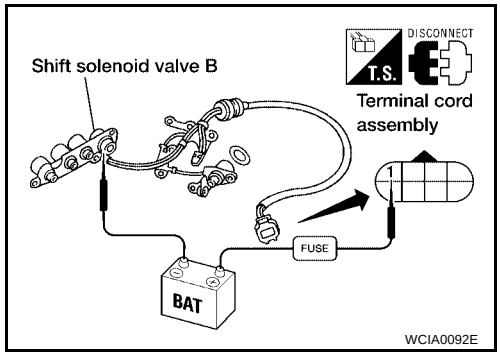
2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

– Shift solenoid valve B
– Operation check

- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.

– Harness of terminal cord assembly for short or open



OK or NG

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

3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal cord harness connector F30 terminal 1(Y) and TCM harness connector F56 terminal 12(LG/B). Refer to AT-174, "Wiring Diagram — AT — SSV/B" .

Continuity should exist.

4. Reinstall any part removed.

OK or NG

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

4. CHECK DTC

Perform AT-172, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

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

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

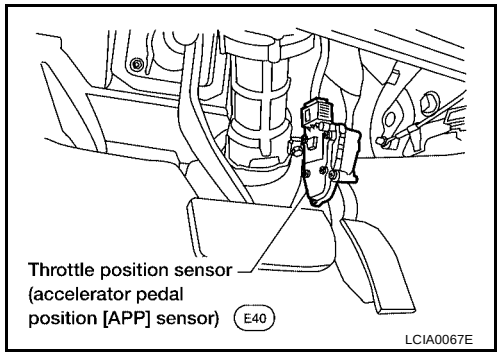
DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

PFP:22560

Description

UCS000PC

The throttle position sensor [accelerator pedal position (APP) sensor] is part of the system that controls throttle position. This system also uses an electric throttle control actuator, which consists of a throttle control motor and throttle position sensors. Accelerator pedal position signal is sent to the ECM.



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Throttle position sensor [accelerator pedal position (APP) sensor]	Fully-closed throttle	Approximately 0.5V
	Fully-open throttle	Approximately 4V

On Board Diagnosis Logic

UCS000PD

Diagnostic trouble code TP SEN/CIRC A/T or P1705 with CONSULT-II, or 3rd judgement flicker without CONSULT-II is detected when TCM receives an excessively low or high voltage from the ECM.

Possible Cause

UCS000PE

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000PF

CAUTION:
Always drive vehicle at a safe speed.

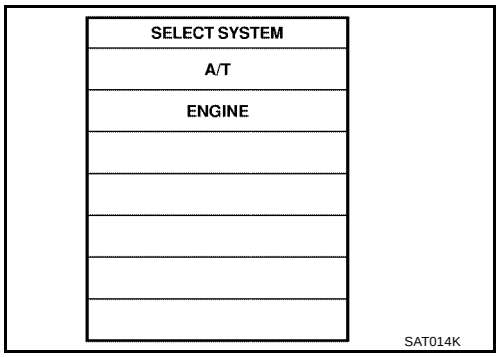
NOTE:
If “DTC Confirmation Procedure” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

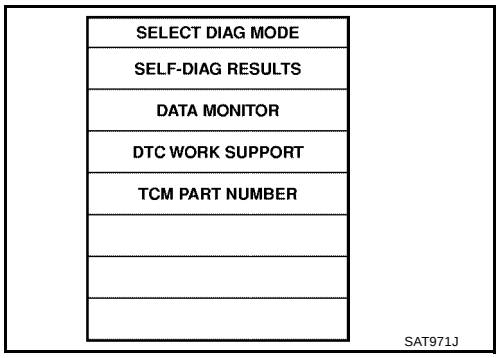
1. Turn ignition switch ON and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Touch "SELECTION FROM MENU".
3. Touch "THRTL POS SEN".
   Touch "START"

Accelerator pedal condition	THRTL POS SEN
Fully released	Approx. 0.5V
Partially depressed	0.5 - 4V
Fully depressed	Approx. 4V

If the check result is NG, go to AT-181, "Diagnostic Procedure" .
If the check result is OK, go to following step.

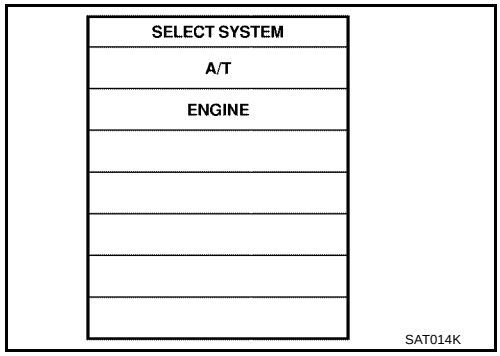


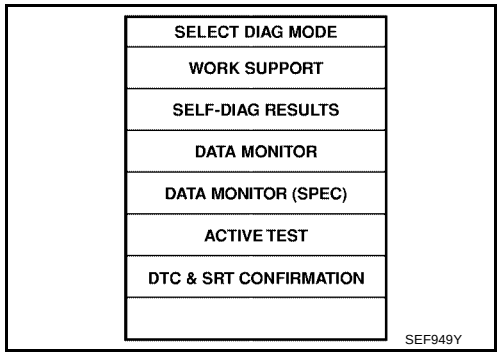
4. Turn ignition switch ON and select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
5. Touch "SELECTION FROM MENU"
6. Touch "VHCL SPEED SE" and "THRTL SEN 1".
   Touch "START".
7. Start engine and maintain the following conditions for at least 3 consecutive seconds. Then release accelerator pedal completely.
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   THRTL POS 1: Approximately 3V or less
   Selector lever: D position
   If the check result is NG, go to AT-181, "Diagnostic Procedure" .
   If the check result is OK, go to following step.



8. Maintain the following conditions for at least 3 consecutive seconds. Then release accelerator pedal completely.
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   Accelerator pedal: Wide open throttle

Selector lever: D position





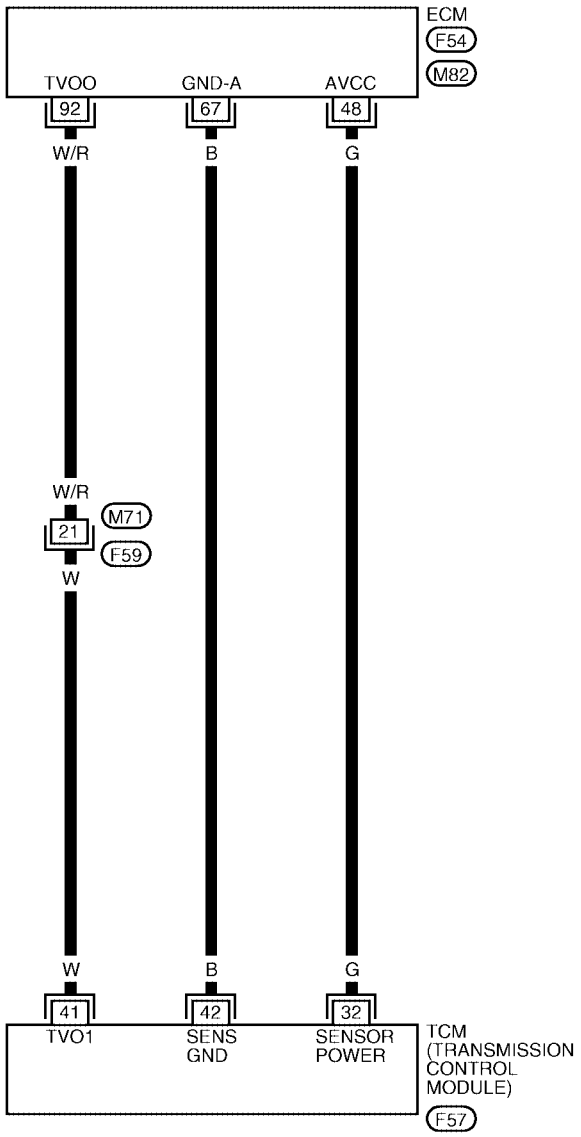
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — TPS

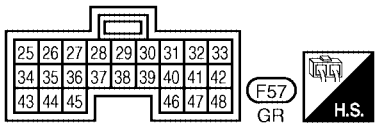
UCS000PG

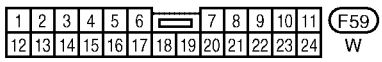
AT-TPS-01



: DETECTABLE LINE FOR DTC

: NON-DETECTABLE LINE FOR DTC





REFER TO THE FOLLOWING.
F54 , M82 - ELECTRICAL UNITS

BBWA0572E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
32	G	SENSOR POWER	IGNITION SWITCH ON	4.5 -5.5V
			IGNITION SWITCH OFF	0V
41	W	THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]	IGNITION ON AND ACCELERATOR PEDAL IS DEPRESSED SLOWLY AFTER WARMING UP ENGINE	FULLY CLOSED THROTTLE: 0.5V FULLY OPEN THROTTLE: 4V
42	B	SENSOR GROUND	Always	0V

Diagnostic Procedure

UCS000PH

1. CHECK DTC WITH ECM

- Check P code with CONSULT-II “ENGINE”.
  Turn ignition switch ON and select “SELF DIAGNOSTIC RESULTS” mode for “ENGINE” with CONSULT-II.

Refer to EC-67, "Malfunction Indicator Lamp (MIL)" .

OK or NG

OK (with CONSULT-II)>> GO TO 2.
NG >> Check accelerator pedal position (APP) sensor circuit for engine control. Refer to EC-589, "DTC P2122, P2123 APP SENSOR" , EC-595, "DTC P2127, P2128 APP SENSOR" , EC-607, "DTC P2138 APP SENSOR" . If CAN communication line is detected, GO TO AT-188, "DTC U1000 CAN COMMUNICATION LINE" .

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

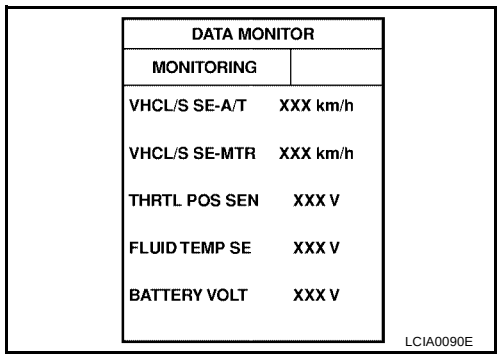
With CONSULT-II

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 the value of “THRTL POS SEN”.

Voltage:

Fully-closed throttle :Approximately 0.5V

Fully-open throttle :Approximately 4V



OK or NG

OK >> GO TO 4.
NG >> Check harness for short or open between ECM and TCM regarding throttle position sensor circuit.

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

Without CONSULT-II

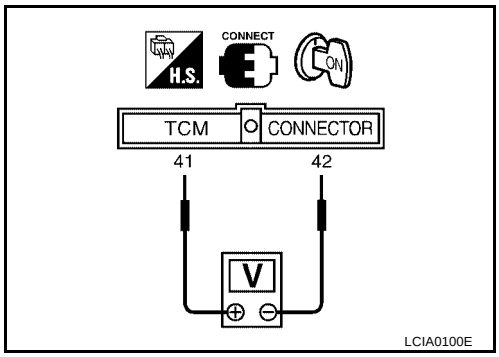
1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCM harness connector F57 terminals 41 (W) and 42 (B) while accelerator pedal is depressed slowly.

Voltage:

Fully-closed throttle valve :Approximately 0.5V

Fully-open throttle valve :Approximately 4V

(Voltage rises gradually in response to throttle position.)



OK or NG

OK >> GO TO 4.

NG >> Check harness for short or open between ECM and TCM regarding throttle position sensor circuit.

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

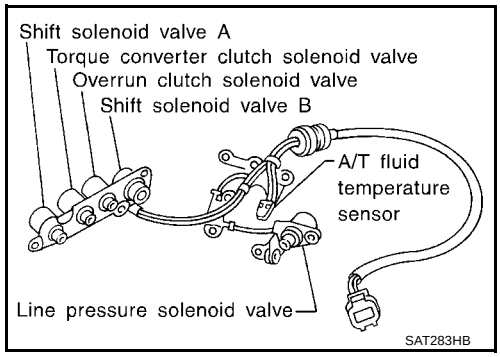
DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

PFP:31940

Description

UCS000PI

The overrun clutch solenoid valve is activated by the TCM in response to signals sent from the park/neutral position (PNP) switch, 3rd position switch, vehicle speed and ECM (throttle opening). The overrun clutch operation will then be controlled.



On Board Diagnosis Logic

UCS000PJ

Diagnostic trouble code O/R CLTCH SOL/CIRC with CONSULT-II or P1760 without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

Possible Cause

UCS000PK

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000PL

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If “DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch OFF and wait at least 10 seconds before conducting the next test.

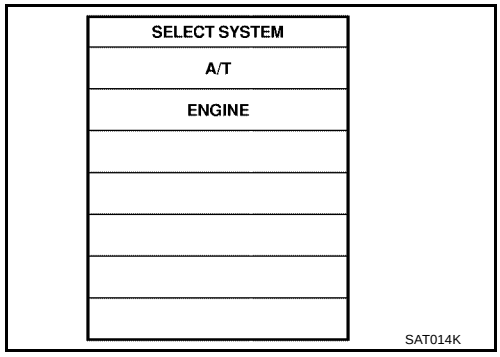
TESTING CONDITION:

Always drive vehicle on a level road to improve accuracy of test.

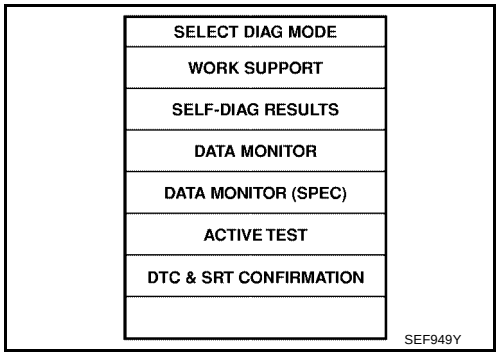
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON and select “DATA MONITOR” mode for “A/T” with CONSULT-II.
2. Start engine.
3. Accelerate vehicle to a speed of more than 10 km/h (6 MPH) with selector lever in D position.



4. Release accelerator pedal completely with selector lever in 3 position.



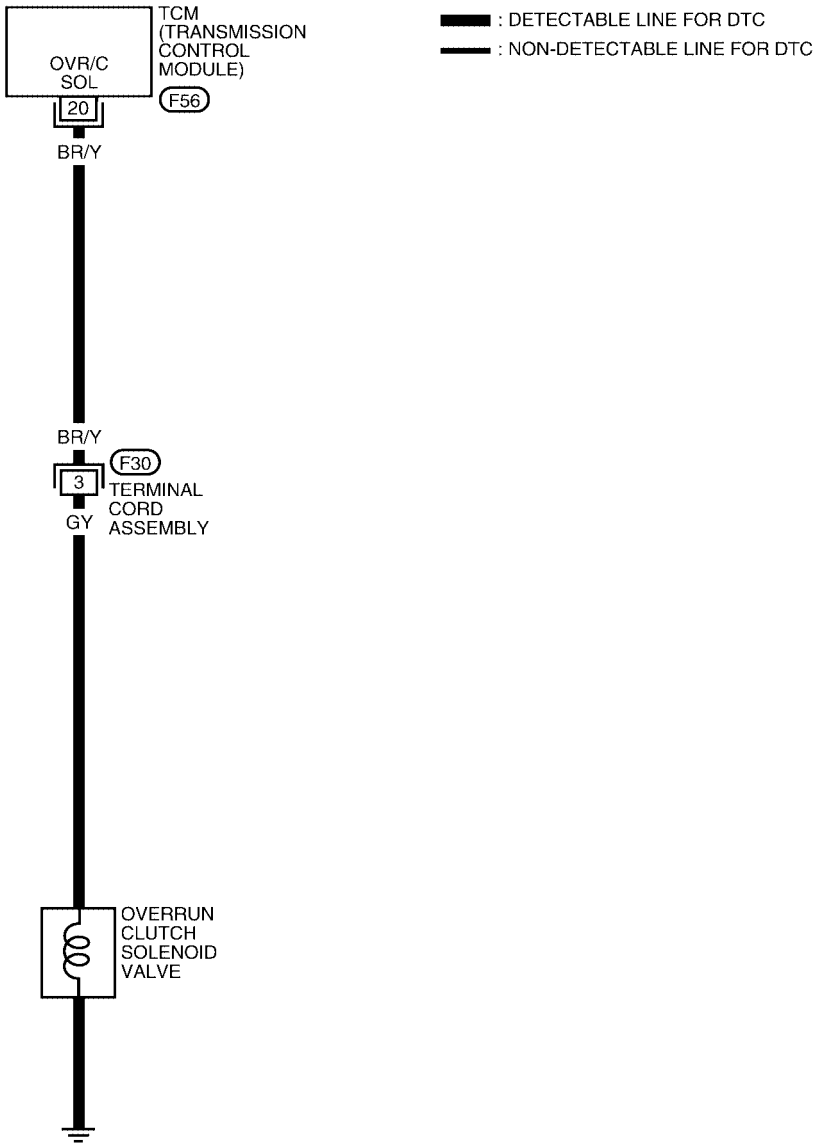
WITH GST

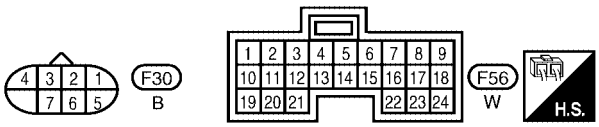
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — OVRCSV

UCS000PM

AT-OVRCSV-01





WCWA0053E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
20	BR/Y	OVERRUN CLUTCH SOLENOID VALVE	WHEN OVERRUN CLUTCH SOLENOID VALVE OPERATES	BATTERY VOLTAGE
			WHEN OVERRUN CLUTCH SOLENOID VALVE DOES NOT OPERATE	0V

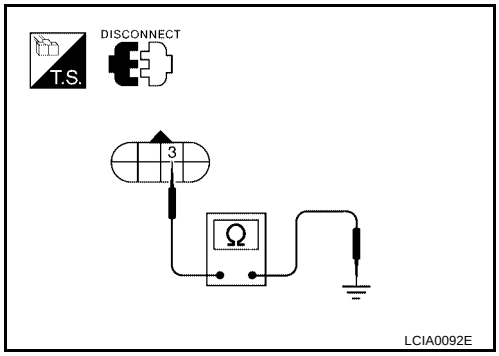
Diagnostic Procedure

UCS000PN

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord assembly F30 terminal 3(GY) and ground.

Resistance : 20 - 30Ω



OK or NG

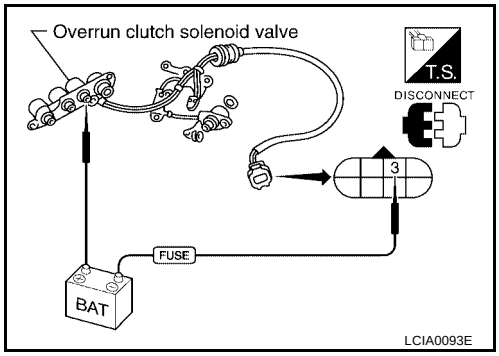
OK >> GO TO 3.
NG >> GO TO 2.

2. CHECK VALVE OPERATION

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Overrun clutch solenoid valve
- Operation check

- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground.
- Harness of terminal cord assembly for short or open



OK or NG

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

3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to OFF position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal cord assembly harness connector F30 terminal 3(GY) and TCM harness connector F56 terminal 20(BR/Y). Refer to AT-185, "Wiring Diagram — AT — OVRCSV" .

Continuity should exist.

4. Reinstall any part removed.

OK or NG

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

4. CHECK DTC

Perform AT-183, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

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

5. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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 U1000 CAN COMMUNICATION LINE

PFP:23710

Description

UCS000PO

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

UCS000PP

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code A/T COMM LINE or U1000 with CONSULT-II and 12th judgement flicker without CONSULT-II is detected when TCM cannot communicate to other control unit.

Possible Cause

UCS000PQ

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

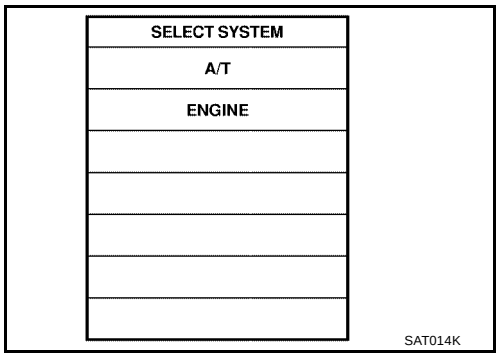
DTC Confirmation Procedure

UCS000PR

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.

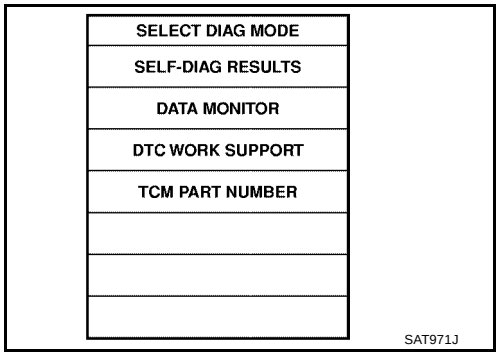
WITH CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
3. Wait at least 6 seconds or start engine and wait for at least 6 seconds.



WITH GST

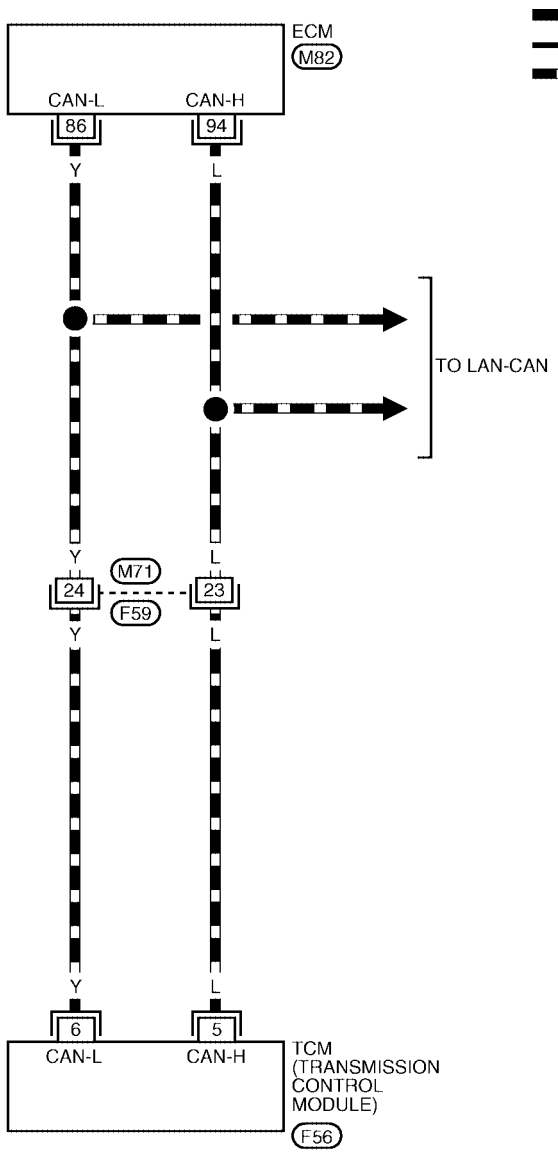
Follow the procedure "WITH CONSULT-II".

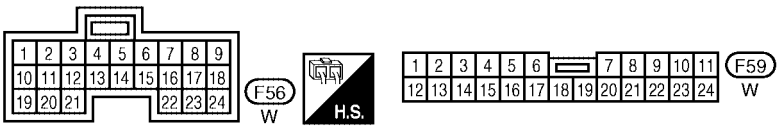


Wiring Diagram — AT — CAN

UCS000PS

AT-CAN-01





REFER TO THE FOLLOWING.
M82 - ELECTRICAL UNITS

BBWA0573E

Diagnostic Procedure

UCS000PT

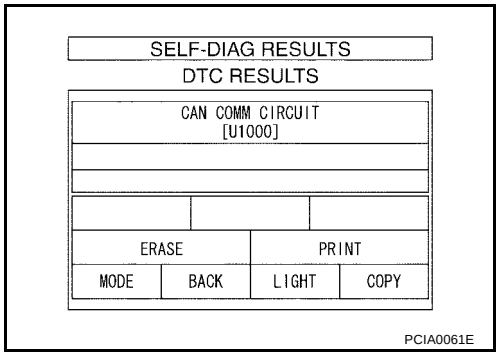
1. CHECK CAN COMMUNICATION CIRCUIT

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.
3. The “CAN COMM CIRCUIT” is detected.

Yes or No

Yes >> Print out CONSULT-II screen, GO TO 2.
No >> INSPECTION END



2. CHECK CAN COMMUNICATION SIGNALS

With CONSULT-II

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

>> Print out CONSULT-II screen, go to LAN-8, "CAN COMMUNICATION" .

CAN Communication Signals

Normal conditions	Abnormal conditions (examples)
CAN COMM : OK	CAN COMM : OK
CAN CIRC 1 : OK	CAN CIRC 1 : UNKWN
CAN CIRC 2 : OK	CAN CIRC 2 : UNKWN
CAN CIRC 3 : OK	CAN CIRC 3 : UNKWN
CAN CIRC 4 : OK	CAN CIRC 4 : UNKWN
CAN CIRC 5 : UNKWN	CAN CIRC 5 : UNKWN

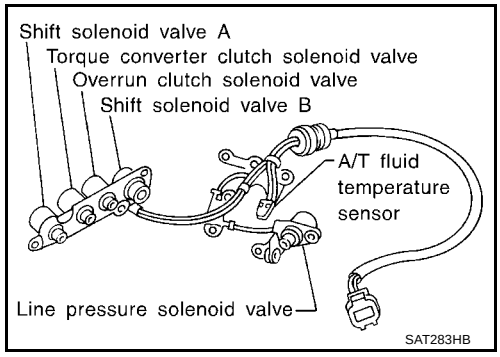
DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

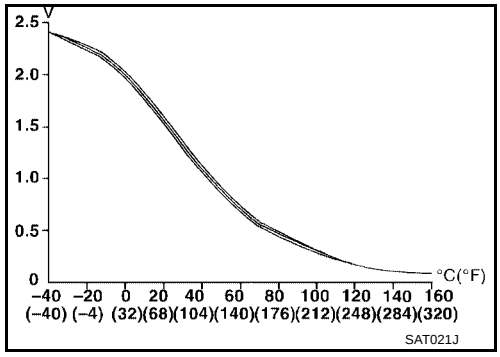
PFP:31940

Description

UCS000PU

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





CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification (Approximately)	
A/T fluid temperature sensor	Cold [20°C (68°F)] ↓ Hot [80°C (176°F)]	1.5V ↓ 0.5V	2.5 kΩ ↓ 0.3 kΩ

On Board Diagnosis Logic

UCS000PV

Diagnostic trouble code BATT/FLUID TEMP SEN with CONSULT-II or 8th judgement flicker without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

UCS000PW

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

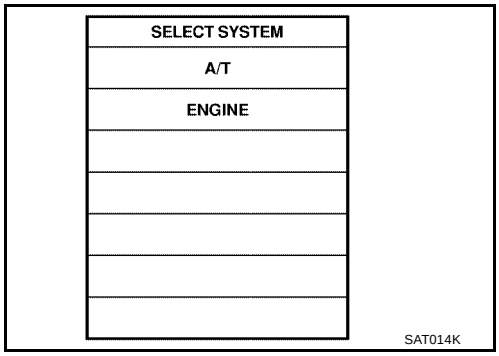
UCS000PX

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

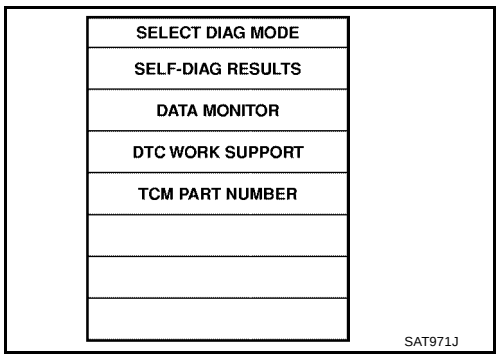
WITH CONSULT-II

1. Start engine.

2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.

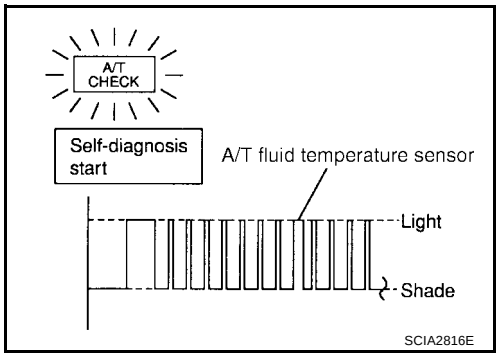


3. Drive vehicle under the following conditions:
   Selector lever in D, vehicle speed higher than 20 km/h (12 MPH).



WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever in D, vehicle speed higher than 20 km/h (12 MPH).
3. Perform self-diagnosis.
   Refer to AT-54, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .

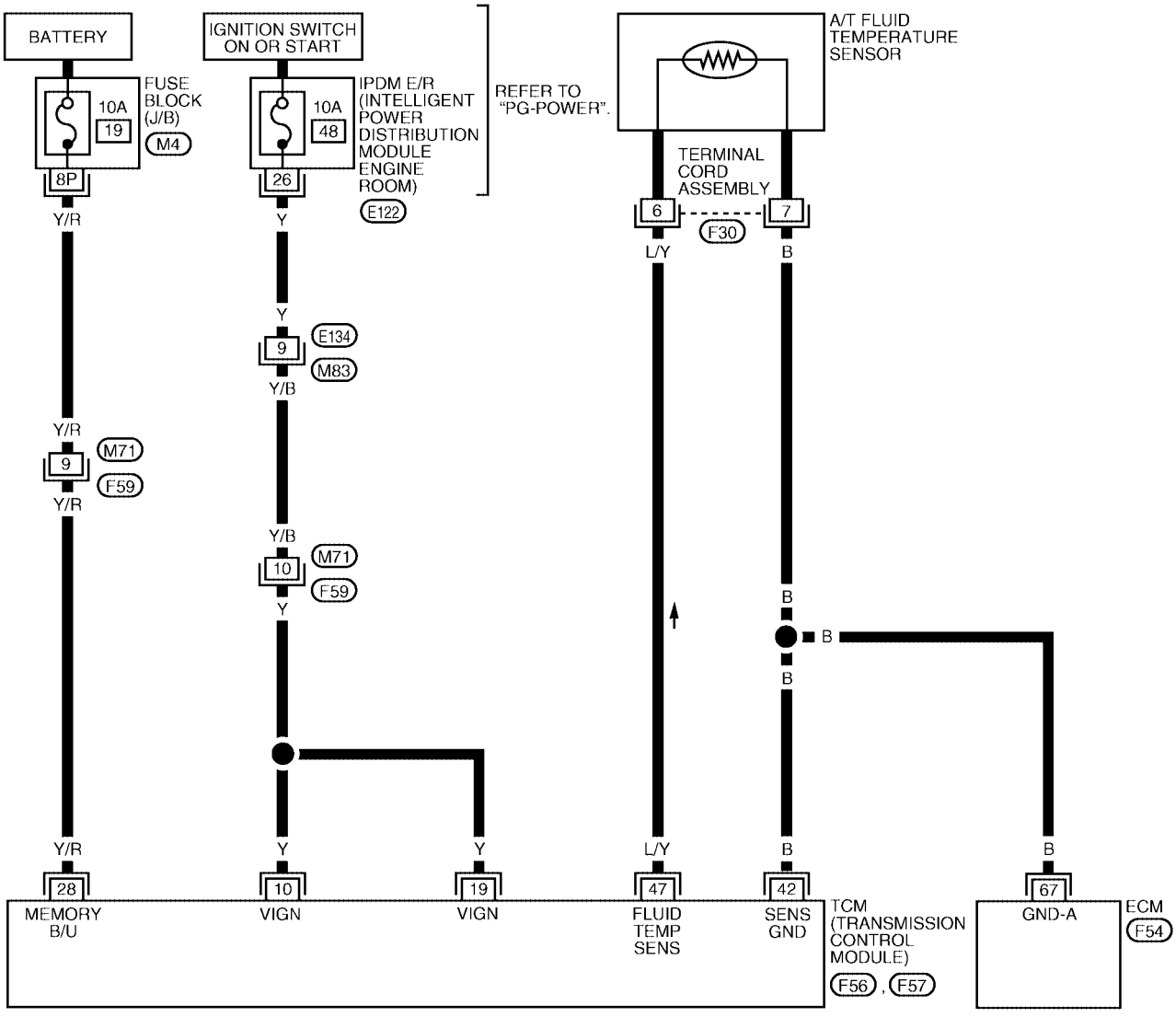


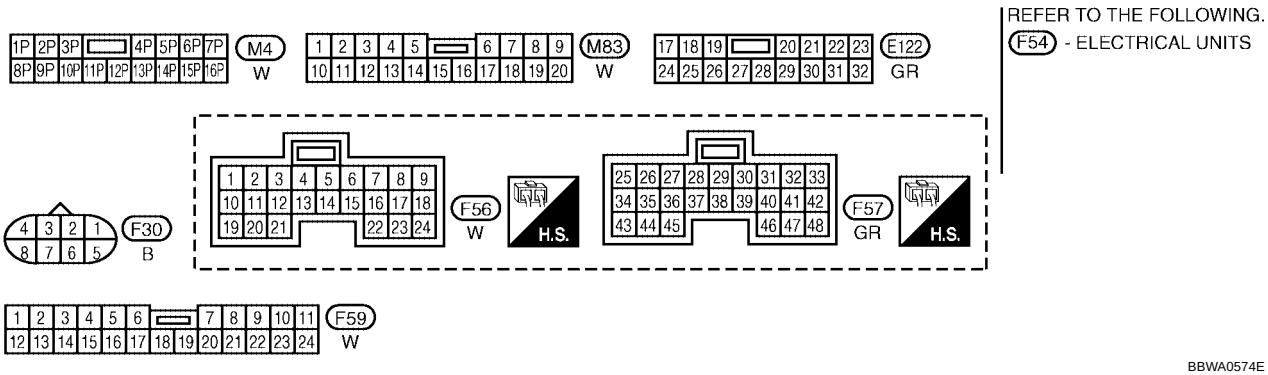
Wiring Diagram — AT — BA/FTS

UCS000PY

AT-BA/FTS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





REFER TO THE FOLLOWING.
F54 - ELECTRICAL UNITS

BBWA0574E

TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
10	Y	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
			IGNITION OFF	0V
19	Y	POWER SOURCE	IGNITION ON	BATTERY VOLTAGE
			IGNITION OFF	0V
28	Y/R	POWER SOURCE (MEMORY BACKUP)	Always	BATTERY VOLTAGE
42	B	SENSOR GROUND	Always	0V
47	L/Y	A/T FLUID TEMPERATURE SENSOR	IGNITION ON WITH ATF TEMPERATURE AT 20°C (68°F)	1.5V
			IGNITION ON WITH ATF TEMPERATURE AT 80°C (176°F)	0.5V

Diagnostic Procedure

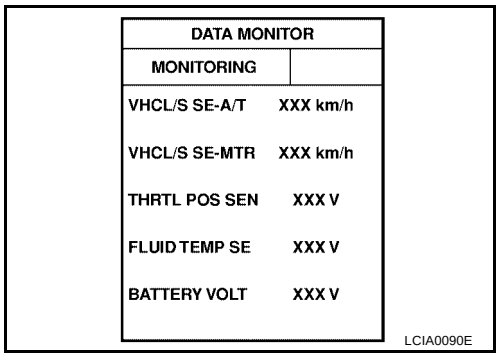
UCS000PZ

1. CHECK INPUT SIGNAL OF A/T 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”.

Voltage :Cold [20°C (68°F)] → Hot [80°C (176°F)]
:Approximately 1.5V → 0.5V



OK or NG

OK >> GO TO 9.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM, ECM and terminal cord assembly
- Ground circuit for ECM
  Refer to EC-138, "POWER SUPPLY CIRCUIT FOR ECM" .

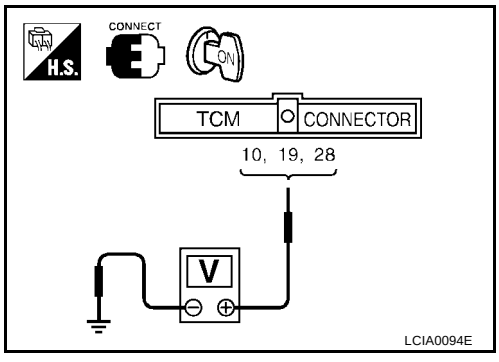
OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

3. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCM harness connectors F56, F57 terminals 10 (Y), 19 (Y), 28 (Y/R) and ground.

Voltage : Battery voltage



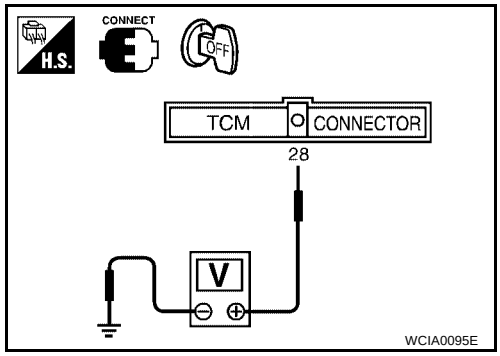
OK or NG

OK >> GO TO 4.
NG >> GO TO 5.

4. CHECK TCM POWER SOURCE STEP 2

1. Turn ignition switch to OFF position.
2. Check voltage between TCM harness connector F57 terminal 28 (Y/R) and ground.

Voltage : Battery voltage



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING ITEM

Check the following items:

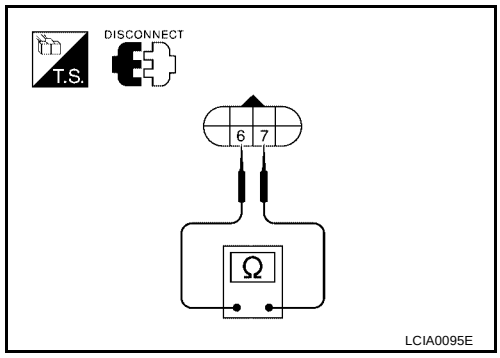
- Harness for short or open between ignition switch and TCM
- Ignition switch and fuse
  Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID TEMPERATURE SENSOR WITH TERMINAL CORD ASSEMBLY

1. Turn ignition switch to OFF position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal cord assembly F30 terminals 6(L/Y) and 7(B) when A/T is cold.



Temperature	Resistance (Approx.)
Cold 20°C (68°F)	2.5kΩ

4. Reinstall any part removed.

OK or NG

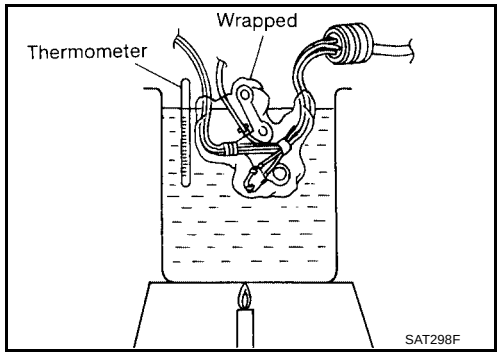
OK (without CONSULT-II) >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING ITEM

1. Remove oil pan. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

– A/T fluid temperature sensor

• Check resistance between two terminals while changing temperature as shown.



Temperature °C (°F)	Resistance (Approx.)
20 (68)	2.5kΩ
80 (176)	0.3kΩ

– Harness of terminal cord assembly for short or open

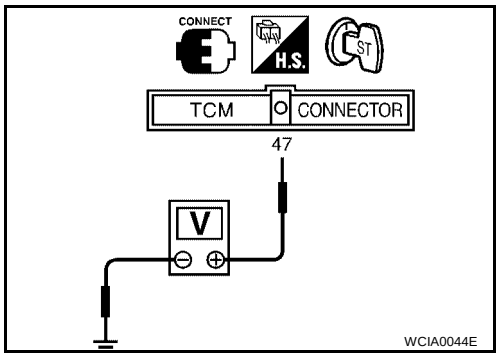
OK or NG

OK (without CONSULT-II) >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK INPUT SIGNAL OF A/T FLUID TEMPERATURE SENSOR (WITHOUT CONSULT-II)

Without CONSULT-II

1. Start engine.
2. Check voltage between TCM harness connector F57 terminal 47(L/Y) and ground while warming up A/T.



Temperature	Voltage (Approx.)
Cold [20°C (68°F)] → Hot [80°C (176°F)]	1.5V → 0.5V

3. Turn ignition switch to OFF position.
4. Disconnect TCM harness connector.
5. Check resistance between TCM harness connector F57 terminal 42(B) and ground. Refer to AT-193, "Wiring Diagram — AT — BA/FTS" .

Continuity should exist.

OK or NG

OK >> GO TO 10.
NG >> GO TO 9.

9. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM, ECM and terminal cord assembly
- Ground circuit for ECM
  Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

OK or NG

OK >> GO TO 10.
NG >> Repair or replace damaged parts.

10. CHECK DTC

Perform AT-191, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 11.

11. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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 VEHICLE SPEED SENSOR MTR

PFP:24814

Description

UCS000Q0

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

UCS000Q1

Diagnostic trouble code VHCL SPEED SEN·MTR with CONSULT-II or 2nd judgement flicker without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.

Possible Cause

UCS000Q2

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000Q3

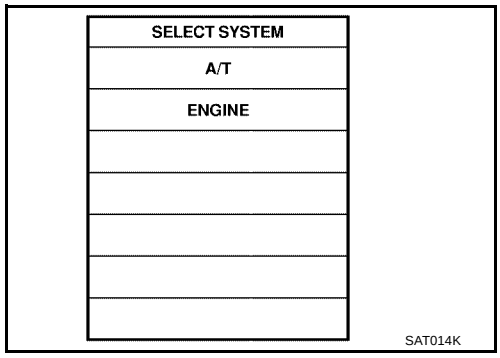
CAUTION:

- **Always drive vehicle at a safe speed.**
- **If conducting this "DTC Confirmation Procedure" again, always turn ignition switch OFF and wait at least 10 seconds before continuing.**

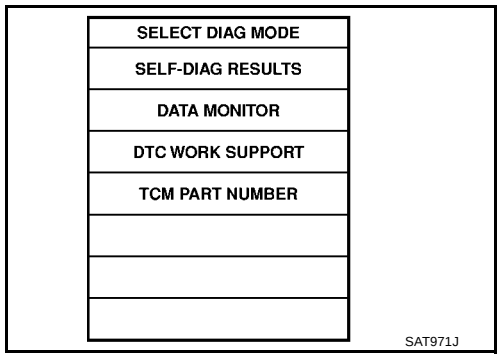
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch ON and select "DATA MONITOR" mode for "A/T" with CONSULT-II.



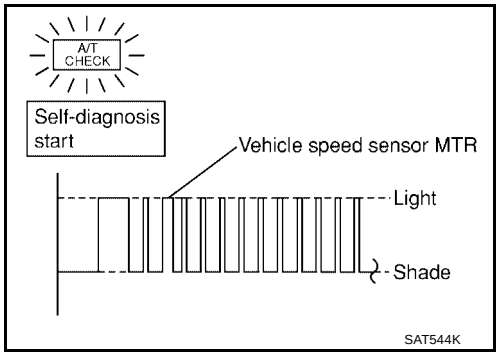
2. Start engine and accelerate vehicle from 0 to 25 km/h (0 to 16 MPH).



WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever in D and vehicle speed higher than 25 km/h (16 MPH).

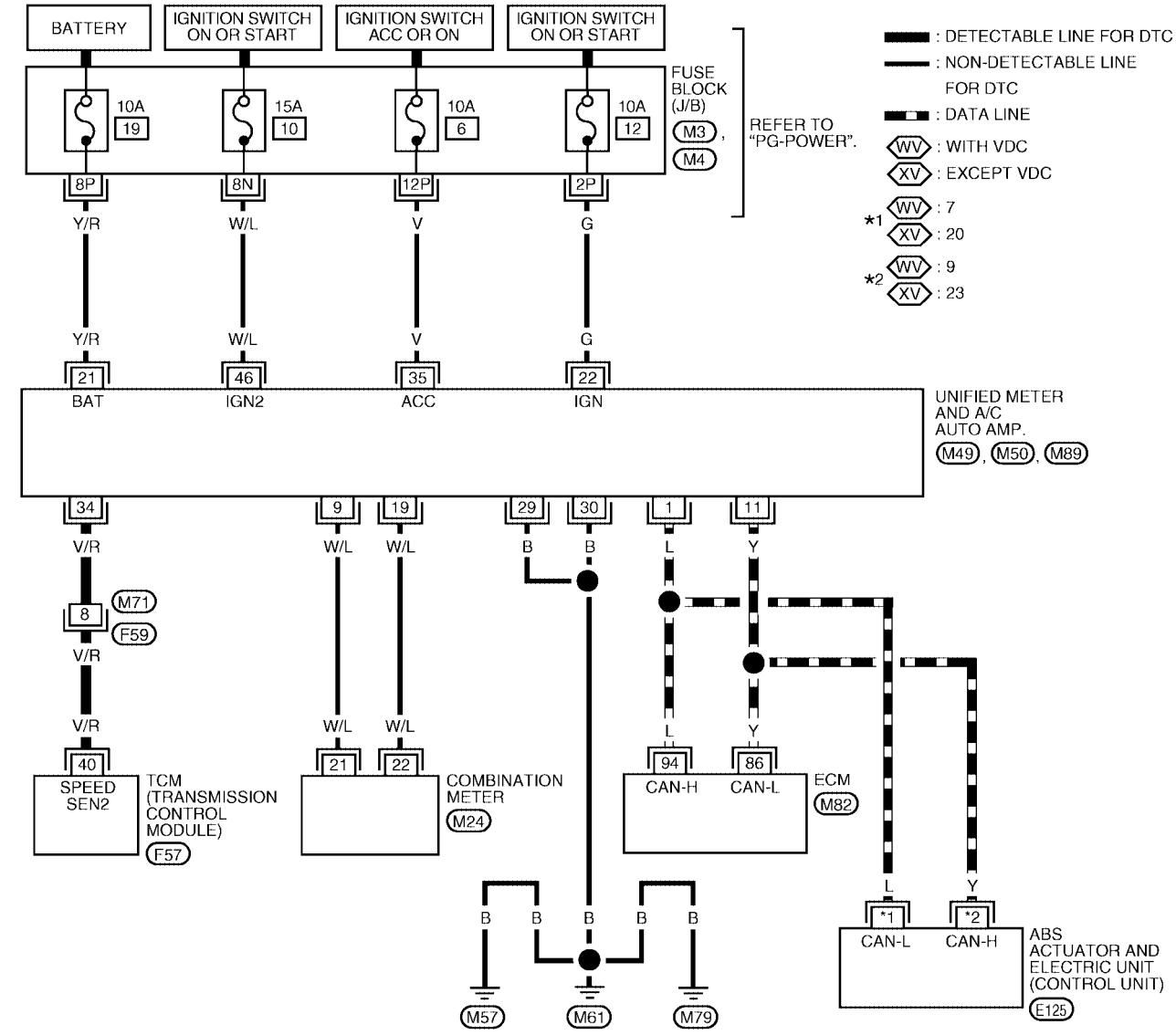
3. Perform self-diagnosis.
   Refer to AT-54, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .



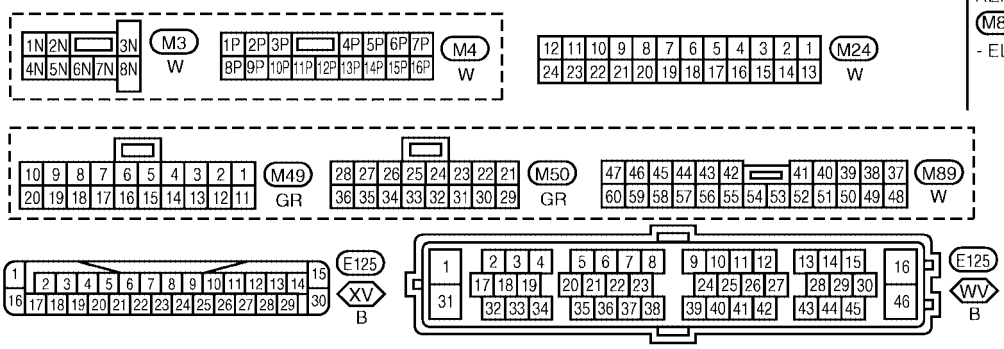
Wiring Diagram — AT — VSSMTR

UCS000Q4

AT-VSSMTR-01



REFER TO THE FOLLOWING.
M82, F57
- ELECTRICAL UNITS



BBWA0575E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
40	V/R	Vehicle speed sensor	When moving vehicle at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.	Voltage varies between less than 1V and more than 4.5V

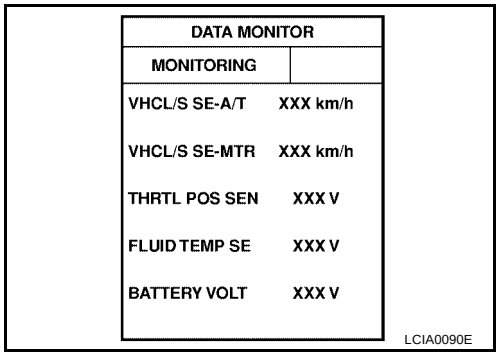
Diagnostic Procedure

UCS000Q5

1. CHECK INPUT SIGNAL

With CONSULT-II

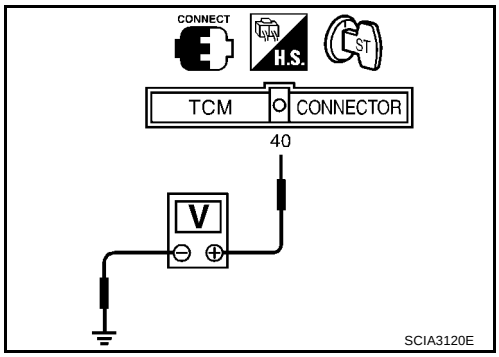
1. Start engine.
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out the value of “VHCL/S SE·MTR” while driving. Check the value changes according to driving speed.



Without CONSULT-II

1. Start engine.
2. Check voltage between TCM harness connector F57 terminal 40(V/R) and ground while driving at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.

Voltage :Voltage varies between less than 1V and more than 4.5V.



OK or NG

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

2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Unified meter and A/C amp. Refer to DI-5, "COMBINATION METERS" .
- Harness for short or open between TCM and unified meter and A/C amp.
- ABS actuator and electric unit (control unit). Refer to BRC-12, "TROUBLE DIAGNOSIS" (without VDC) or BRC-97, "TROUBLE DIAGNOSIS" (with VDC).

OK or NG

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

3. CHECK DTC

Perform AT-197, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

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

4. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

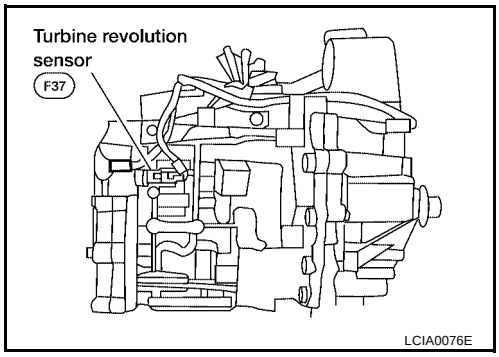
DTC TURBINE REVOLUTION SENSOR

PFP:31935

Description

UCS000Q6

The turbine revolution sensor detects forward clutch drum rpm (revolutions per minute). It is located on the input side of the automatic transaxle. The vehicle speed sensor A/T (Revolution sensor) is located on the output side of the automatic transaxle. With the two sensors, input and output rpms are accurately detected. The result is optimal shift timing during deceleration and improved shifting.



ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when ...	Check items (Possible cause)
: TURBINE REV	TCM does not receive the proper voltage signal from the sensor.	● Harness or connectors (The sensor circuit is open or shorted.) ● Turbine revolution sensor
: 10th judgement flicker		

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

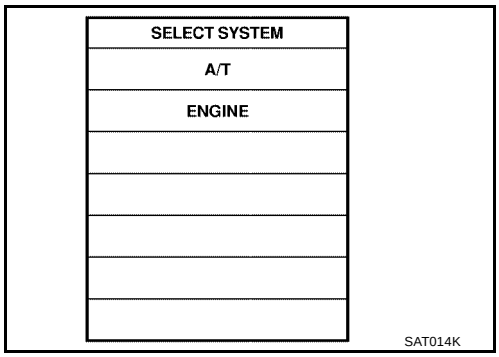
CAUTION:

- **Always drive vehicle at a safe speed.**
- **If conducting this “DTC CONFIRMATION PROCEDURE” again, always turn ignition switch “OFF” and wait at least 5 seconds before continuing.**

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

WITH CONSULT-II

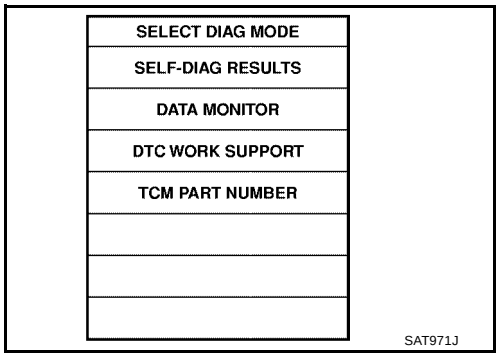
1. Start engine.



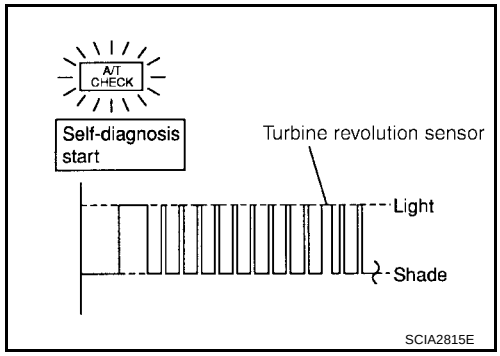
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle under the following conditions:
   Selector lever in D, vehicle speed higher than 40 km/h (25 MPH), engine speed higher than 1,500 rpm, throttle opening greater than 1.0/8 of the full throttle position and driving for more than 5 seconds.

WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever in “D” and vehicle speed higher than 40 km/h (25 MPH), engine speed higher than 1,500 rpm, throttle opening greater than 1/8 of the full throttle position and driving for more than 5 seconds.



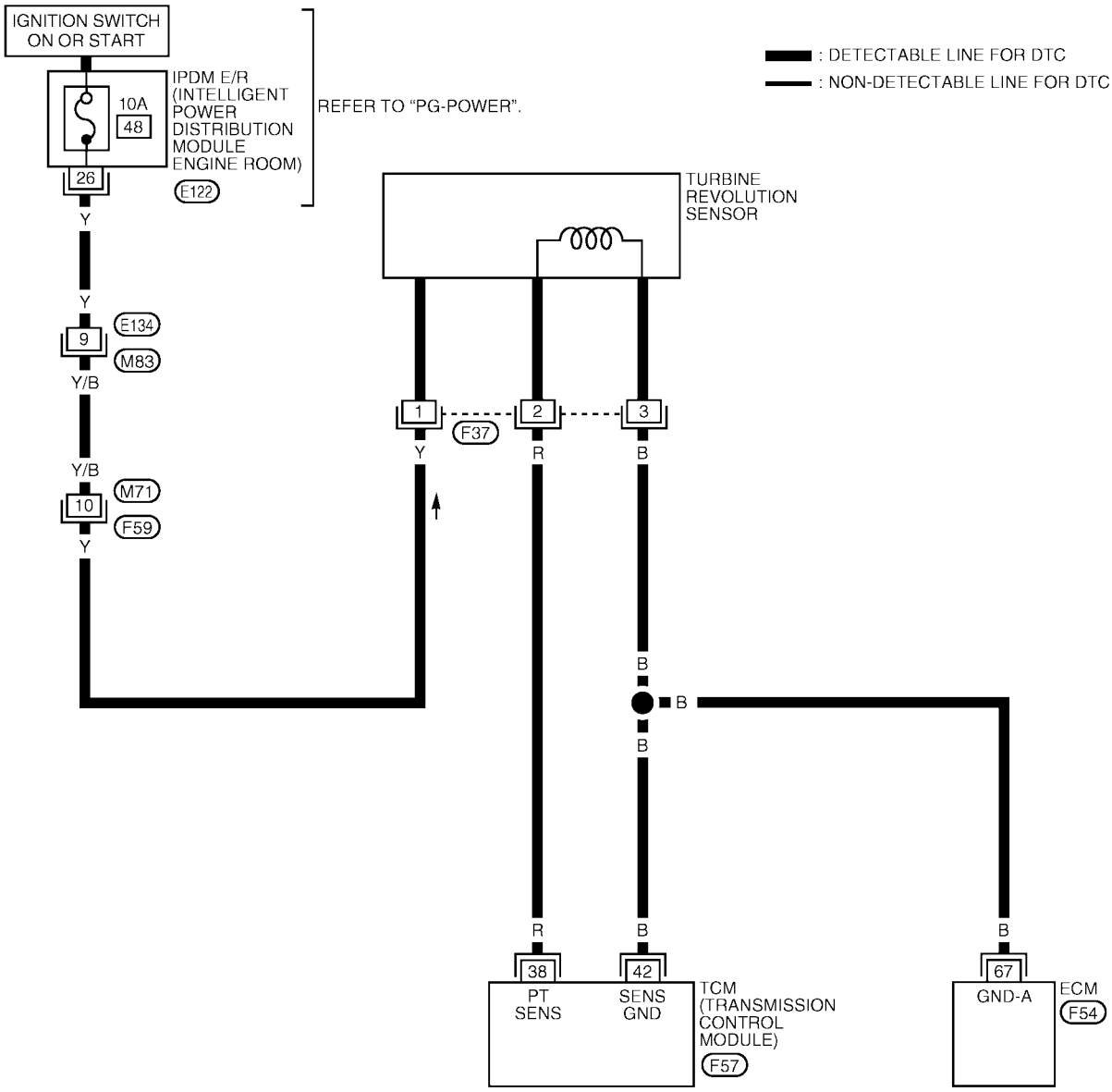
3. Perform self-diagnosis.
Refer to AT-54, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .



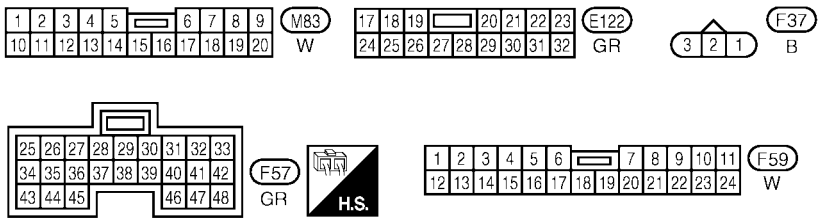
Wiring Diagram — AT — TRSA/T

UCS000Q7

AT-TRSA/T-01



REFER TO THE FOLLOWING.
F54 - ELECTRICAL UNITS



BBWA0576E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
38	R	TURBINE REVOLUTION SENSOR (SIGNAL)	WHEN MOVING AT 20 KM/H (12 MPH), USE THE CONSULT-II PULSE FREQUENCY MEASURING FUNCTION.*1 **CAUTION:** **CONNECT THE DIAGNOSIS DATA LINK CABLE TO THE VEHICLE DIAGNOSIS CONNECTOR.** *1: A CIRCUIT TESTER CANNOT BE USED TO TEST THIS ITEM.	240 Hz
			WHEN VEHICLE IS PARKED.	Under 1.3V or over 4.5V
42	B	SENSOR GROUND	Always	0V

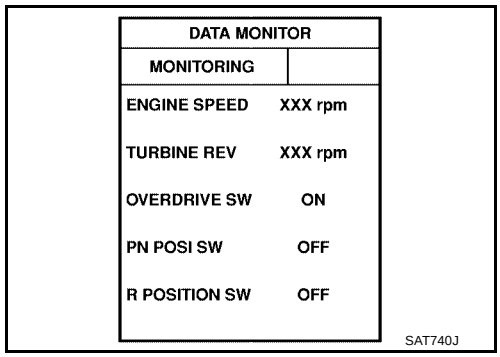
Diagnostic Procedure

UCS000Q8

1. CHECK INPUT SIGNAL

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 “TURBINE REV” while driving.
   Check the value changes according to driving speed.



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

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

With CONSULT-II

1. Start engine.

Condition	Judgement standard (Approx.)
When moving at 20 Km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 **CAUTION:** **Connect the dianosis data link cable to the vehicle diagnosis connector.** *1: A circuit tester cannot be used to test this item.	240 Hz
When vehicle parks.	Under 1.3V or over 4.5V

OK or NG

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

3. CHECK TURBINE REVOLUTION SENSOR (WITHOUT CONSULT-II)

Without CONSULT-II

Check the turbine revolution sensor. Refer to AT-206, "Component Inspection" .

OK or NG

OK >> GO TO 4.
NG >> Replace turbine revolution sensor.

4. DETECT MALFUNCTIONING ITEM

Check harness for short or open between TCM, ECM and turbine revolution sensor.

OK or NG

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

5. CHECK DTC

Perform AT-202, "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE" .

OK or NG

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

6. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
2. If NG, recheck TCM pin terminal for damage or loose connection with harness connector.

OK or NG

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

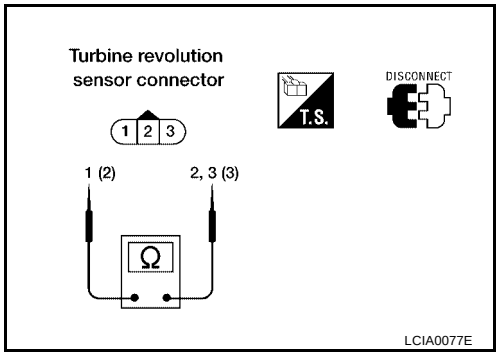
Component Inspection

UCS000Q9

TURBINE REVOLUTION SENSOR

- Check resistance between terminals 1, 2 and 3.

Terminal No.		Resistance (Approx.)
1	2	No continuity
1	3	No continuity
2	3	2.4 - 2.8 kΩ



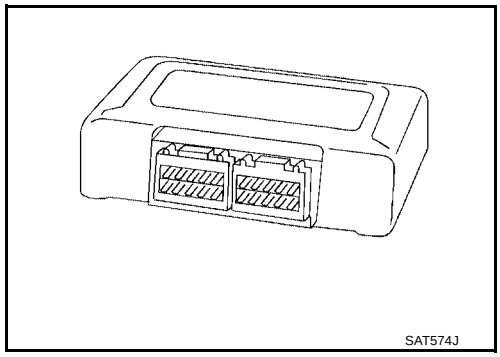
DTC CONTROL UNIT (RAM), CONTROL UNIT (ROM)

PFP:31036

Description

UCS000QA

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


SAT574J

On Board Diagnosis Logic

UCS000QB

Diagnostic trouble code CONTROL UNIT (RAM), CONTROL UNIT (ROM) with CONSULT-II is detected when TCM memory (RAM) or (ROM).

Possible Cause

UCS000QC

Check TCM.

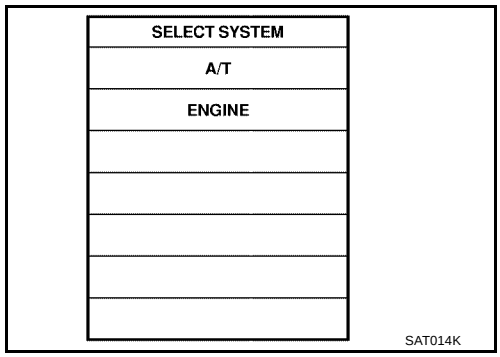
Diagnostic Trouble Code (DTC) Confirmation Procedure

UCS000QD

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.

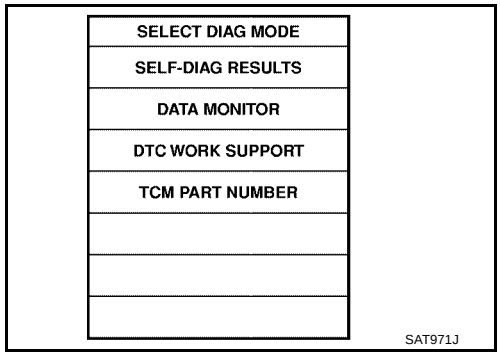
WITH CONSULT-II

1. Turn ignition switch ON and select "DATA MONITOR" mode for A/T with CONSULT-II.
2. Start engine.



SAT014K

3. Run engine for at least 2 seconds at idle speed.



SAT971J

Diagnostic Procedure

UCS000QE

1. INSPECTION START

With CONSULT-II

1. Turn ignition switch ON and select “SELF DIAGNOSIS” mode for A/T with CONSULT-II.
2. Touch “ERASE”.
3. Perform AT-207, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .
4. Is the “CONTROL UNIT (RAM)” or “CONTROL UNIT (ROM)” displayed again?

Yes or No

Yes >> Replace TCM.
No >> **INSPECTION END**

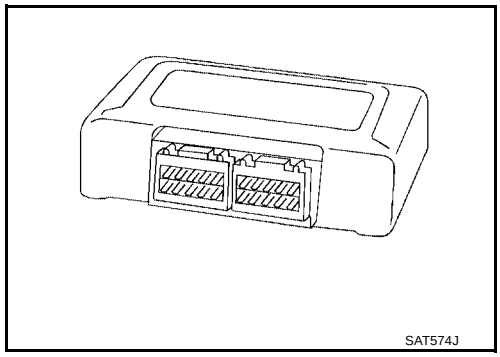
DTC CONTROL UNIT (EEP ROM)

PFP:31036

Description

UCS000QF

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


SAT574J

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code CONTROL UNIT (EEP ROM) with CONSULT-II is detected when TCM memory (EEP ROM) is malfunctioning.

POSSIBLE CAUSE

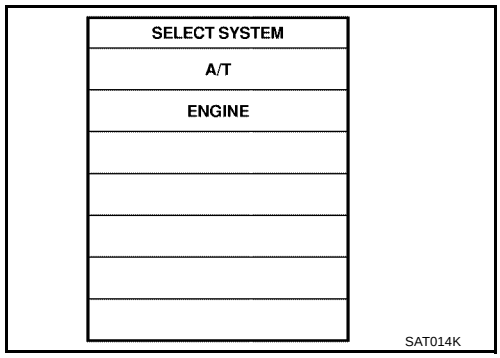
TCM.

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NOTE:
If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.

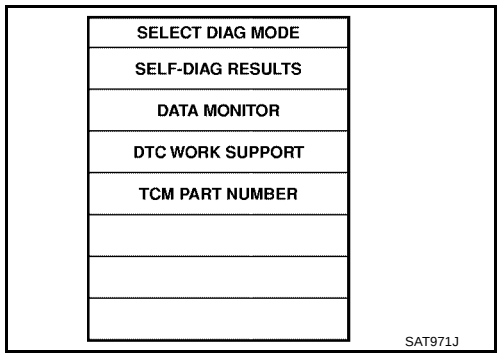
With CONSULT-II

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for A/T with CONSULT-II.
2. Start engine.



SAT014K

3. Run engine for at least 2 seconds at idle speed.



SAT971J

Diagnostic Procedure

UCS000QG

1. CHECK DTC

With CONSULT-II

1. Turn ignition switch “ON” 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 “OFF” position for 10 seconds.

Perform AT-209, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

Is the “CONT UNIT (EEP ROM)” displayed again?

Yes >> Replace TCM.
No >> **INSPECTION END**

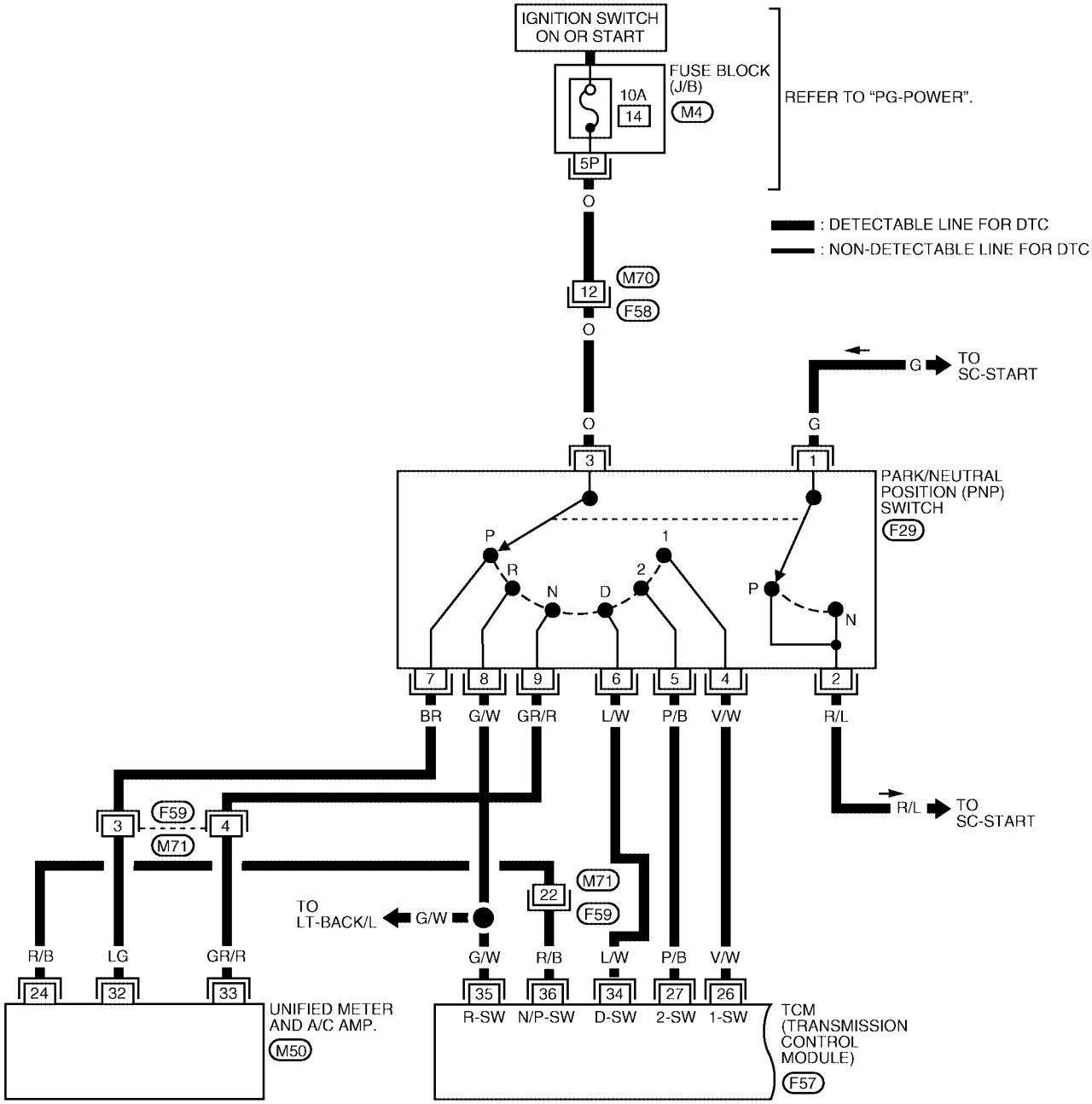
TROUBLE DIAGNOSIS FOR SYMPTOMS

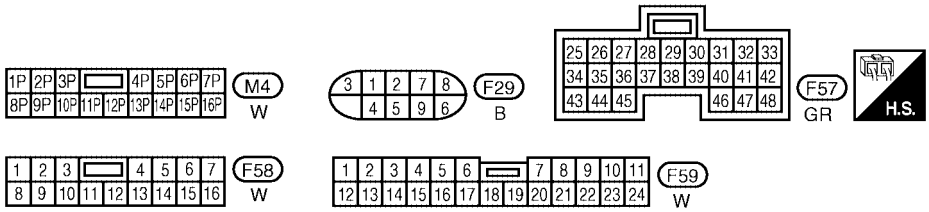
PFP:00007

Wiring Diagram — AT — NONDTC

UCS000QH

AT-NONDTC-01



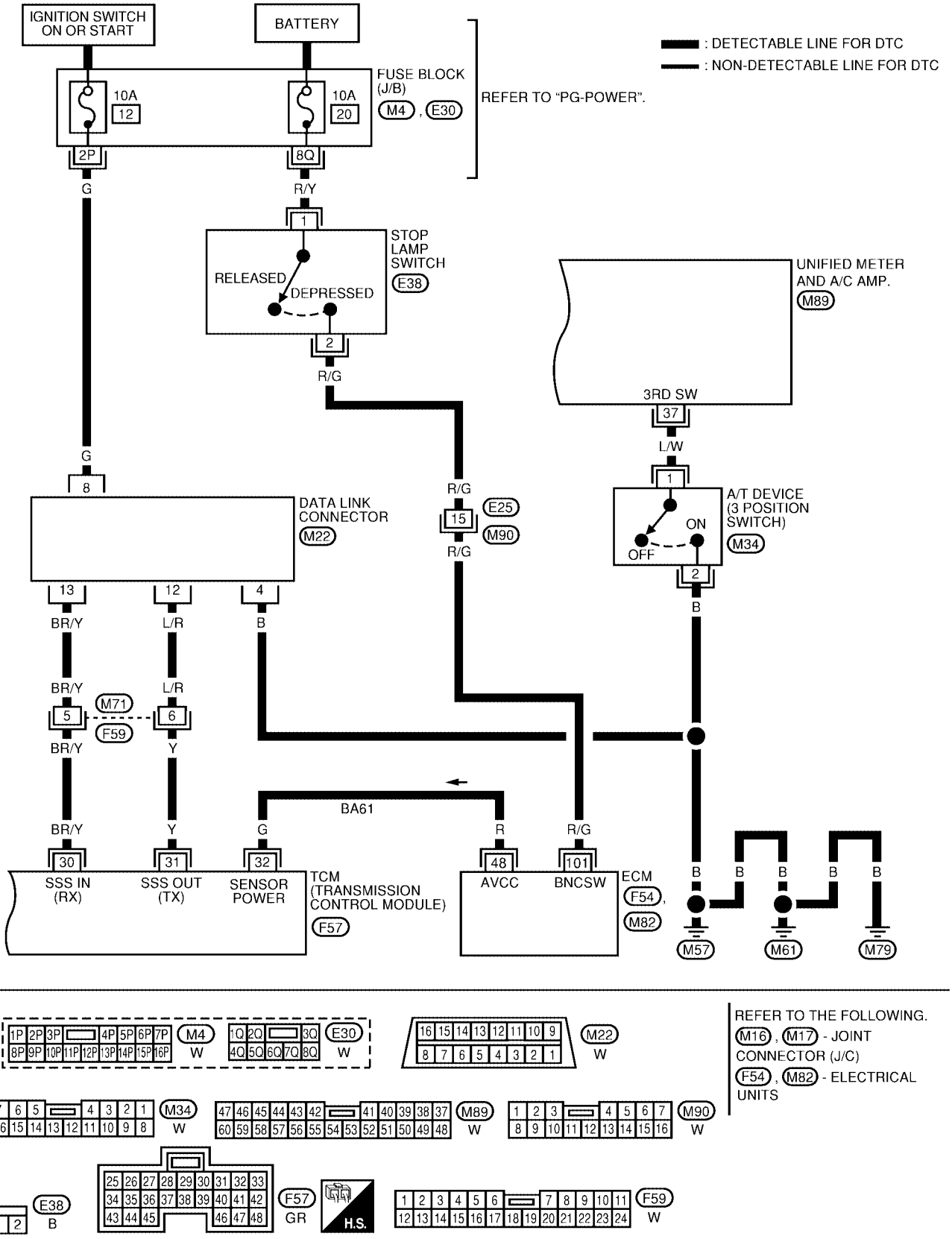


BBWA0577E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
26	V/W	PNP SWITCH 1ST POSITION	IGNITION ON AND SELECTOR LEVER IN 1ST POSITION	BATTERY VOLTAGE
			IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	0V
27	P/B	PNP SWITCH 2ND POSITION	IGNITION ON AND SELECTOR LEVER IN 2ND POSITION	BATTERY VOLTAGE
			IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	0V
34	L/W	PNP SWITCH D POSITION	IGNITION ON AND SELECTOR LEVER IN D POSITION	BATTERY VOLTAGE
			IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	0V
35	G/W	PNP SWITCH R POSITION	IGNITION ON AND SELECTOR LEVER IN R POSITION	BATTERY VOLTAGE
			IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	0V
36	R/B	PNP SWITCH P OR N POSITION	IGNITION ON AND SELECTOR LEVER IN P OR N POSITION	BATTERY VOLTAGE
			IGNITION ON AND SELECTOR LEVER IN OTHER POSITIONS	0V

AT-NONDTC-02



BBWA0578E

TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND 25 OR 48 (TCM GROUND)

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (APPROX.)
30	BR/Y	DATA LINK CONNECTOR	—	—
31	Y	DATA LINK CONNECTOR	—	—
32	G	SENSOR POWER	IGNITION SWITCH ON	4.5 - 5.5V
			IGNITION SWITCH OFF	0V

A/T CHECK Indicator Lamp Does Not Come On

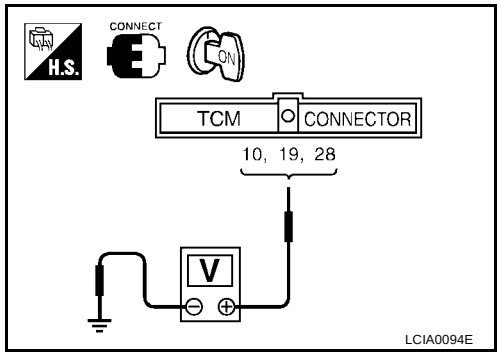
UCS000QI

SYMPTOM:
A/T CHECK indicator lamp does not come on for about 2 seconds when turning ignition switch to ON.

1. CHECK TCM POWER SOURCE

1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCM harness connector F56, F57 terminals 10 (Y), 19 (Y), and 28 (Y/R) and ground.

Voltage : Battery voltage



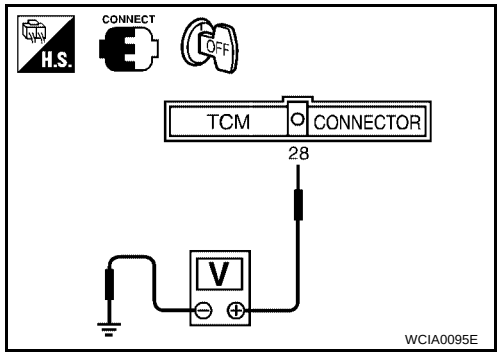
OK or NG

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

2. CHECK POWER SOURCE STEP 2

1. Turn ignition switch to OFF position.
2. Check voltage between TCM harness connector F57 terminal 28 (Y/R) and ground.

Voltage : Battery voltage



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 ignition switch and TCM
  Refer to AT-102, "Wiring Diagram — AT — MAIN" .
- Ignition switch and fuse
  Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

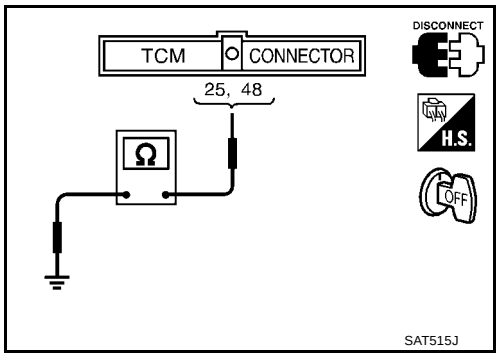
OK or NG

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 harness connector F57 terminals 25(B), 48(B) and ground.

Continuity should exist.



OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors. Refer to AT-102, "Wiring Diagram — AT — MAIN" .

5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness and fuse for short or open between ignition switch and A/T CHECK indicator lamp Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .
- Harness for short or open between A/T CEHCK indicator lamp and TCM

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

7. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

Engine Cannot Be Started In P and N Position

UCS000QJ

SYMPTOM:

- **Engine cannot be started with selector lever in P or N position.**
- **Engine can be started with selector lever in D, 2nd, 1st or R position.**

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to park/neutral position (PNP) switch circuit?

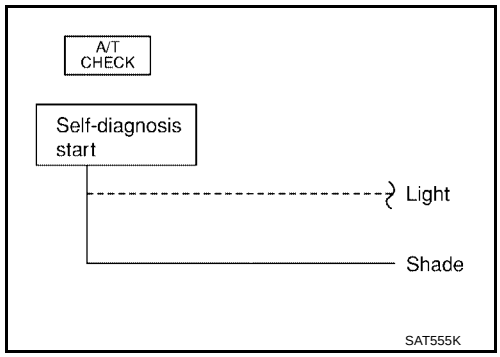
Without CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

No >> GO TO 2.



2. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH

Check for short or open of park/neutral position (PNP) switch harness connector F29 terminals 1(G) and 2(R/L). Refer to AT-107, "Wiring Diagram — AT — PNP/SW" .

OK or NG

OK >> GO TO 3.

NG >> Repair or replace park/neutral position (PNP) switch.

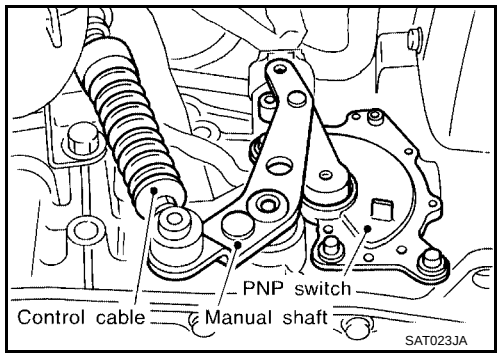
3. ADJUST CONTROL CABLE

Adjust control cable. Refer to AT-272, "Control Cable Adjustment"

OK or NG

OK >> GO TO 4.

NG >> Adjust control cable. Refer to AT-272, "Control Cable Adjustment" .



4. CHECK STARTING SYSTEM

Check starting system. Refer to SC-15, "WORK FLOW" .

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

In P Position, Vehicle Moves Forward or Backward When Pushed

UCS000QK

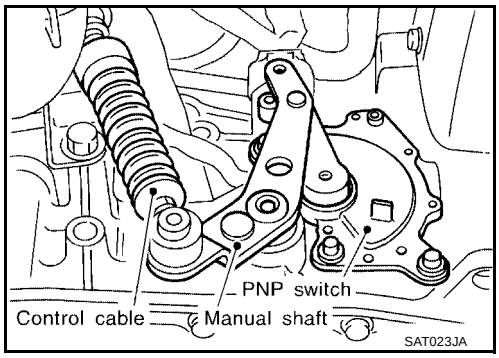
SYMPTOM:
Vehicle moves when it is pushed forward or backward with selector lever in P position.

1. ADJUST CONTROL CABLE

Adjust control cable. Refer to AT-272, "Control Cable Adjustment"

OK or NG

OK >> GO TO 2.
NG >> Adjust control cable. Refer to AT-272, "Control Cable Adjustment" .

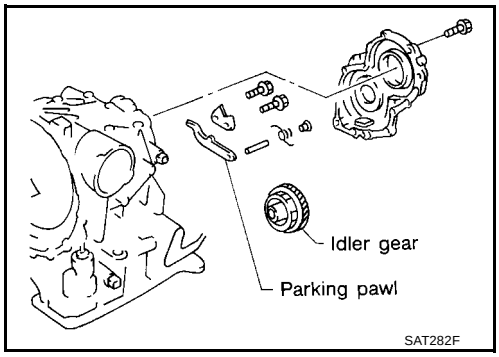


2. CHECK PARKING COMPONENTS

Check parking components. Refer to AT-277, "OVERHAUL" and AT-282, "DISASSEMBLY" .

OK or NG

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



In N Position, Vehicle Moves

UCS000QL

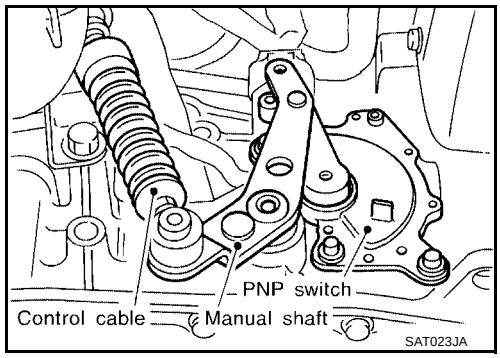
SYMPTOM:
Vehicle moves forward or backward when selecting N position.

1. ADJUST CONTROL CABLE

Adjust control cable. Refer to AT-272, "Control Cable Adjustment"

OK or NG

OK >> GO TO 2.
NG >> Adjust control cable. Refer to AT-272, "Control Cable Adjustment" .

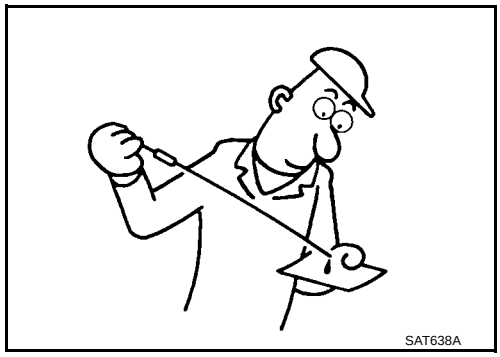


2. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

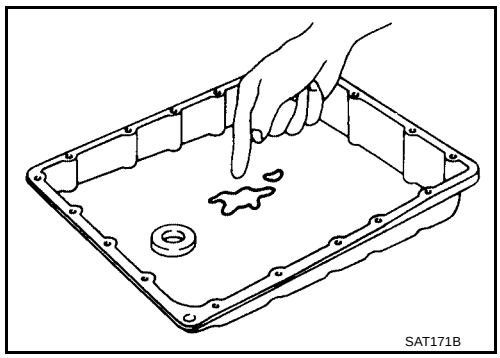


3. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.



4. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T.
2. Check the following items:

- Forward clutch assembly
- Overrun clutch assembly
- Reverse clutch assembly

OK or NG

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

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. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

Large Shock. N → R Position

UCS000QM

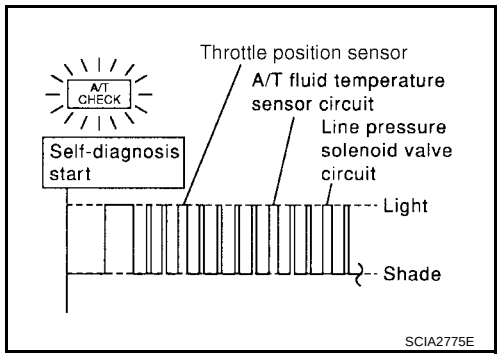
SYMPTOM:
There is large shock when changing from N to R position.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to A/T fluid temperature sensor, line pressure solenoid valve or throttle position sensor [accelerator pedal position (APP) sensor] circuit?

Yes or No

Yes >> GO TO 2.
No >> GO TO 3.



2. CHECK DAMAGED CIRCUIT

Check damaged circuit.

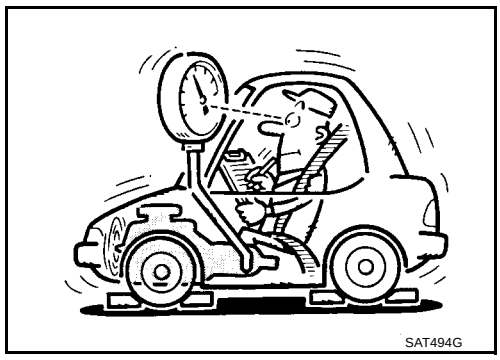
>> Refer to AT-111, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" , AT-161, "DTC P0745 LINE PRESSURE SOLENOID VALVE" or AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .

3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in D position. Refer to AT-71, "Line Pressure Test" .

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.



4. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve
- Oil pump assembly

OK or NG

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

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. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

Vehicle Does Not Creep Backward In R Position

UCS000QN

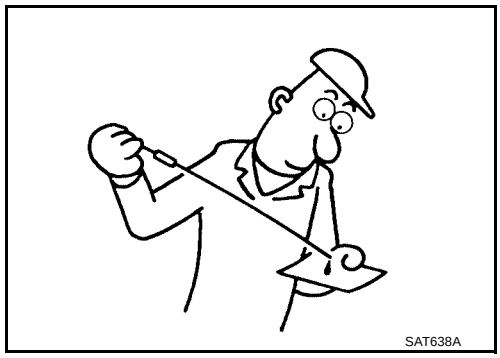
SYMPTOM:
Vehicle does not creep backward when selecting R position.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

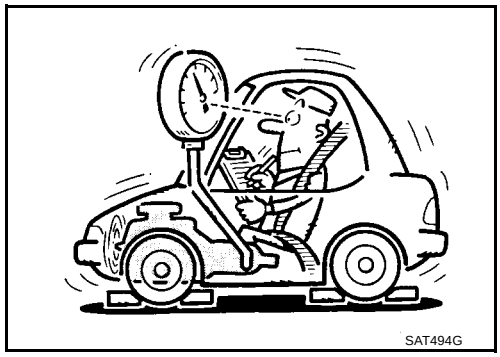

SAT638A

2. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in R position. Refer to AT-71, "Line Pressure Test" .

OK or NG

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


SAT494G

3. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve

3. Disassemble A/T.
4. Check the following item:

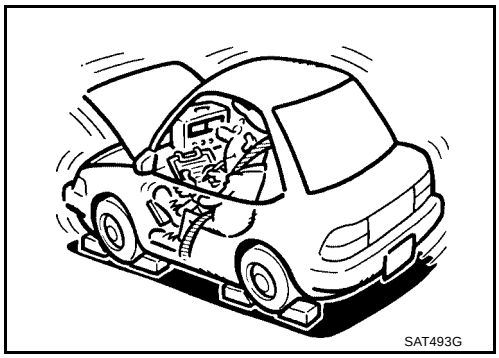
- Oil pump assembly

OK or NG

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

4. CHECK STALL REVOLUTION

Check stall revolution with selector lever in 1 and R positions.


SAT493G

OK or NG

OK >> GO TO 7.
OK in 1 position, NG in R position>> GO TO 5.
NG in both 1 and R positions>> GO TO 6.

5. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T.
2. Check the following items:

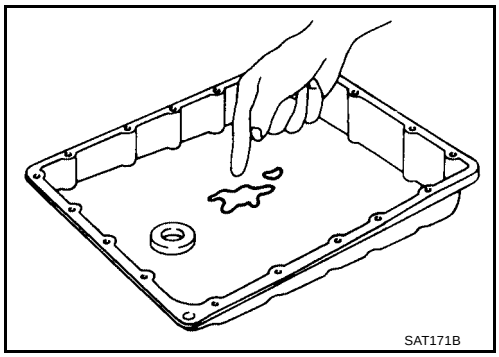
- Low & reverse brake assembly
- Forward clutch assembly
- Overrun clutch assembly
- Reverse clutch assembly
- High clutch assembly

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.


SAT171B

OK or NG

OK >> GO TO 9.
NG >> GO TO 8.

7. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T.
2. Check the following items:

- Reverse clutch assembly
- High clutch assembly
- Low & reverse brake assembly
- Forward clutch assembly
- Overrun clutch assembly

OK or NG

OK >> GO TO 9.
NG >> Repair or replace damaged parts.

8. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 10.

9. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

Vehicle Does Not Creep Forward in D, 2nd or 1st Position

UCS000QO

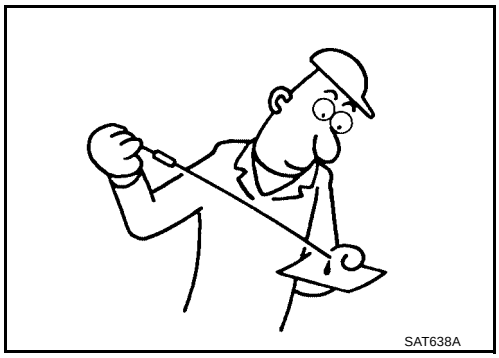
SYMPTOM:
Vehicle does not creep forward when selecting D, 2nd or 1st position.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level again.

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

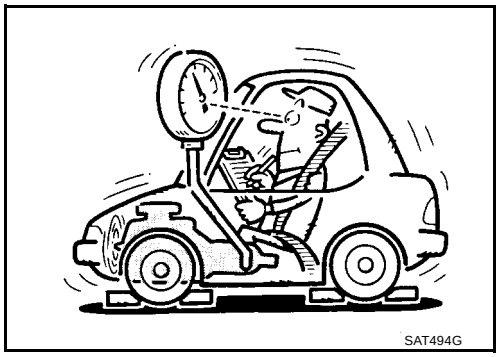

SAT638A

2. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in D position. Refer to AT-71, "Line Pressure Test" .

OK or NG

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


SAT494G

3. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Valves to control line pressure (Pressure regulator valve, pressure modifier valve, pilot valve and pilot filter)
- Line pressure solenoid valve

3. Disassemble A/T.
4. Check the following item:

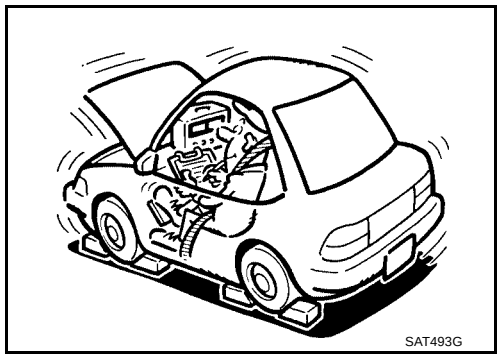
- Oil pump assembly

OK or NG

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

4. CHECK STALL REVOLUTION

Check stall revolution with selector lever in D position. Refer to AT-68, "Stall Test" .


SAT493G

OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T.
2. Check the following items:

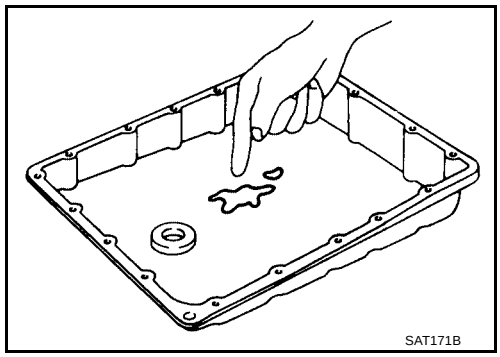
- Reverse clutch assembly
- Forward clutch assembly
- Forward one-way clutch
- Low one-way clutch
- High clutch assembly

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.


SAT171B

OK or NG

OK >> GO TO 8.
NG >> GO TO 7.

7. DETECT MALFUNCTIONING ITEM

1. Disassemble A/T.
2. Check the following items:

- Reverse clutch assembly
- Forward clutch assembly
- Forward one-way clutch
- Low one-way clutch
- High clutch assembly

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

Vehicle Cannot Be Started From D1

UCS000QP

SYMPTOM:
Vehicle cannot be started from D1 on Cruise test — Part 1.

1. CHECK SYMPTOM

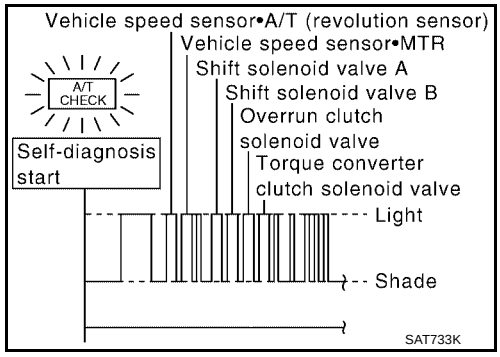
Is “Vehicle Does Not Creep Backward In R Position” OK?

Yes or No

Yes >> GO TO 2.
No >> Go to AT-223, "Vehicle Does Not Creep Backward In R Position" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to vehicle speed sensor·A/T (revolution sensor), overrun clutch solenoid valve, torque converter clutch solenoid valve, shift solenoid valve A, B or vehicle speed sensor·MTR after cruise test?

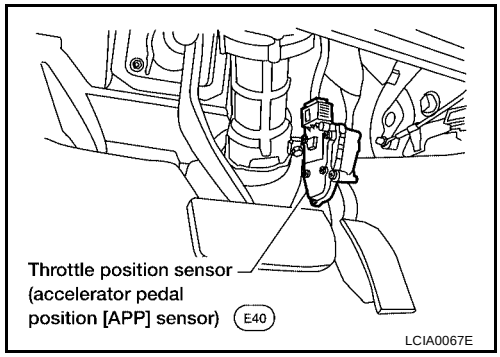


Yes or No

Yes >> Check damaged circuit. Refer to AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" , AT-183, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE" , AT-148, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" , AT-167, "DTC P0750 SHIFT SOLENOID VALVE A" , AT-172, "DTC P0755 SHIFT SOLENOID VALVE B" or AT-197, "DTC VEHICLE SPEED SENSOR MTR" .
No >> GO TO 3.

3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .

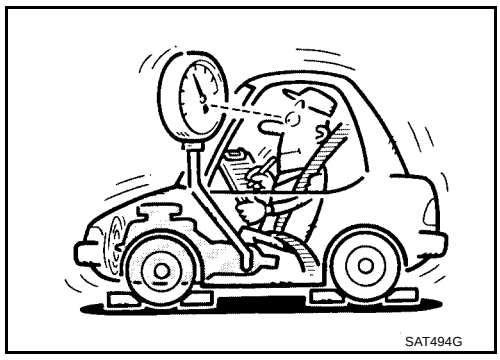


OK or NG

OK >> GO TO 4.
NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

4. CHECK LINE PRESSURE

Check line pressure at stall point with selector lever in D position. Refer to AT-71, "Line Pressure Test" .



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter

3. Disassemble A/T.
4. Check the following items:

- Reverse clutch assembly
- Low & reverse brake assembly
- High clutch assembly
- Torque converter
- Oil pump assembly

OK or NG

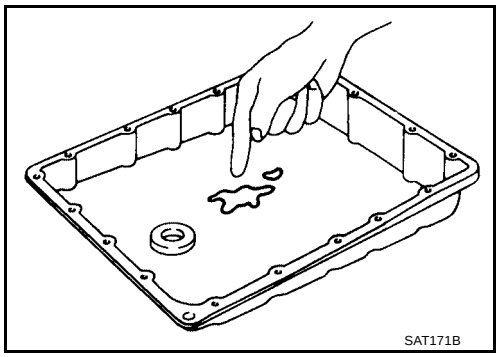
OK >> GO TO 8.
NG >> Repair or replace damaged parts.

6. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

OK >> GO TO 7.
NG >> GO TO 5.



7. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damage parts.

8. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

A/T Does Not Shift: $D_1 \rightarrow D_2$ or Does Not Kickdown: $D_4 \rightarrow D_2$

UCS000QQ

SYMPTOM:
A/T does not shift from D_1 to D_2 at the specified speed.
A/T does not shift from D_4 to D_2 when depressing accelerator pedal fully at the specified speed.

1. CHECK SYMPTOM

Are “Vehicle Does Not Creep Forward In D, 2nd Or 1st Position” and “Vehicle Cannot Be Started From D_1 ” OK?

Yes or No

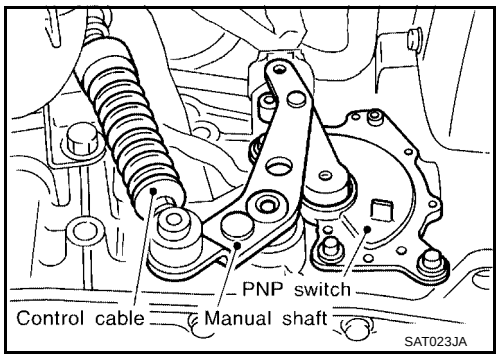
Yes >> GO TO 2.
No >> Go to AT-226, "Vehicle Does Not Creep Forward in D, 2nd or 1st Position" and AT-229, "Vehicle Cannot Be Started From D_1" .

2. ADJUST CONTROL CABLE

Adjust control cable. Refer to AT-272, "Control Cable Adjustment"

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to AT-272, "Control Cable Adjustment" .



3. CHECK VEHICLE SPEED SENSOR·A/T AND VEHICLE SPEED SENSOR·MTR CIRCUIT

Check vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuit. Refer to AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" and AT-197, "DTC VEHICLE SPEED SENSOR MTR" .

OK or NG

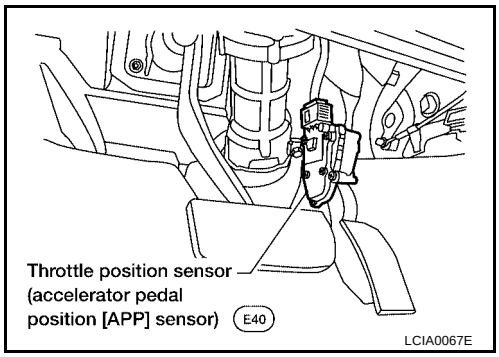
OK >> GO TO 4.
NG >> Repair or replace vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuits.

4. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .

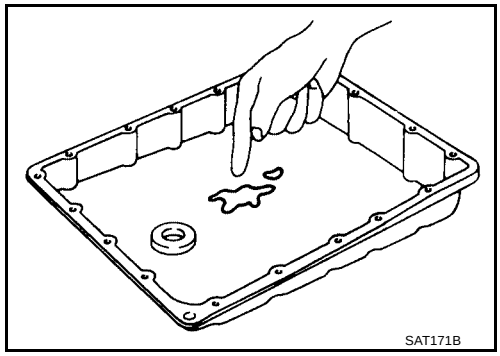
OK or NG

OK >> GO TO 5.
NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



5. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.



OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING ITEM

1. Remove control valve. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter

3. Disassemble A/T.
4. Check the following items:

- Servo piston assembly
- Brake band

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Remove control valve. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve A
- Shift valve B
- Shift solenoid valve A
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

A/T Does Not Shift: $D_2 \rightarrow D_3$

UCS000QR

SYMPTOM:
A/T does not shift from D_2 to D_3 at the specified speed.

1. CHECK SYMPTOM

Are “Vehicle Does Not Creep Forward In D, 2nd Or 1st Position” and “Vehicle Cannot Be Started From D_1” OK?

Yes or No

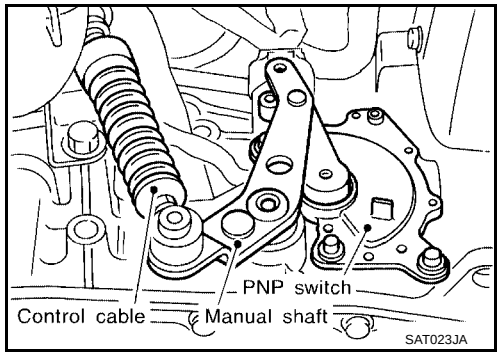
Yes >> GO TO 2.
No >> Go to AT-226, "Vehicle Does Not Creep Forward in D, 2nd or 1st Position" and AT-229, "Vehicle Cannot Be Started From D_1" .

2. ADJUST CONTROL CABLE

Adjust control cable. Refer to AT-272, "Control Cable Adjustment"

OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to AT-272, "Control Cable Adjustment" .



3. CHECK VEHICLE SPEED SENSOR·A/T AND VEHICLE SPEED SENSOR·MTR CIRCUIT

Check vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuit. Refer to AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" and AT-197, "DTC VEHICLE SPEED SENSOR MTR" .

OK or NG

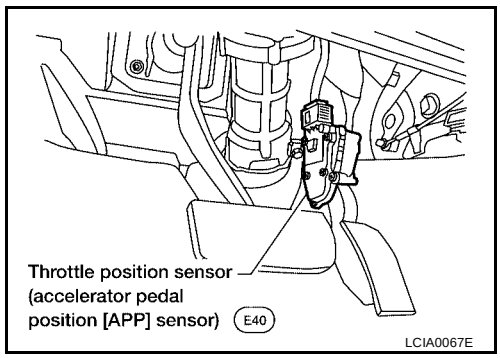
OK >> GO TO 4.
NG >> Repair or replace vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuits.

4. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .

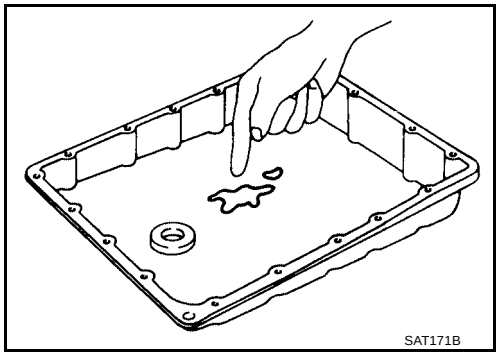
OK or NG

OK >> GO TO 5.
NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



5. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.



OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve B
- Shift solenoid valve B
- Pilot valve
- Pilot filter

3. Disassemble A/T.
4. Check the following items:

- Servo piston assembly
- High clutch assembly
- Brake band

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

7. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve B
- Shift solenoid valve B
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 9.

9. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

A/T Does Not Shift: $D_3 \rightarrow D_4$

UCS000QS

SYMPTOM:

- **A/T does not shift from D_3 to D_4 at the specified speed.**
- **A/T must be warm before D_3 to D_4 shift will occur.**

1. CHECK SYMPTOM

Are “Vehicle Does Not Creep Forward In D, 2nd Or 1st Position” and “Vehicle Cannot Be Started From D_1 ” OK?

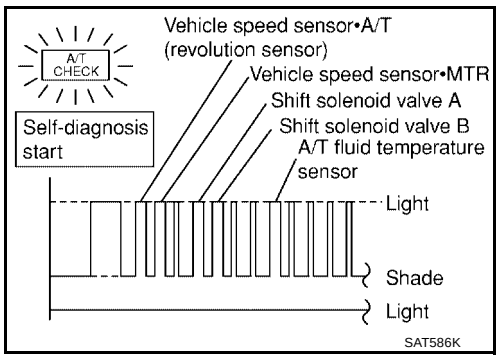
Yes or No

Yes >> GO TO 2.
No >> Go to AT-226, "Vehicle Does Not Creep Forward in D, 2nd or 1st Position" and AT-229, "Vehicle Cannot Be Started From D_1" .

2. CHECK SELF-DIAGNOSTIC RESULTS

With CONSULT-II

Does self-diagnosis show damage to park/neutral position (PNP) switch, 3rd position switch, A/T fluid temperature sensor, vehicle speed sensor·A/T (revolution sensor), shift solenoid valve A or B, vehicle speed sensor·MTR circuits?

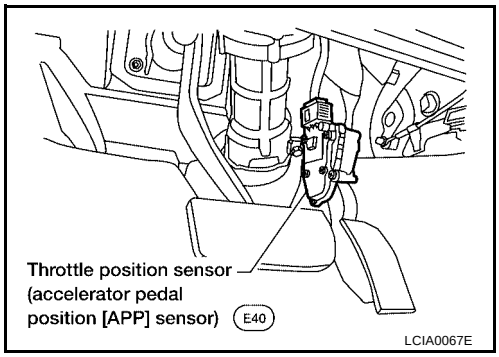


Yes or No

Yes >> Check damaged circuit. Refer to AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" , AT-111, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" , AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" , AT-167, "DTC P0750 SHIFT SOLENOID VALVE A" , AT-172, "DTC P0755 SHIFT SOLENOID VALVE B" or AT-197, "DTC VEHICLE SPEED SENSOR MTR" .
No >> GO TO 3.

3. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .

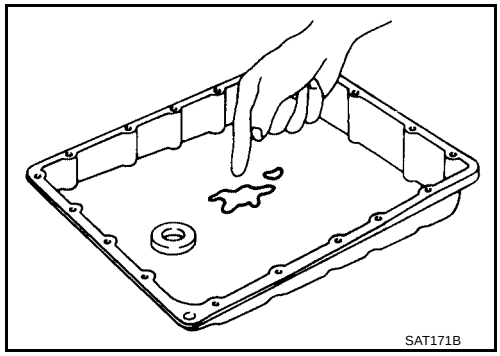


OK or NG

OK >> GO TO 4.
NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

4. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve A
- Shift solenoid valve A
- Pilot valve
- Pilot filter

3. Disassemble A/T.
4. Check the following items:

- Servo piston assembly
- Brake band

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve A
- Overrun clutch control valve
- Shift solenoid valve A
- Pilot valve
- Pilot filter

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 8.

8. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

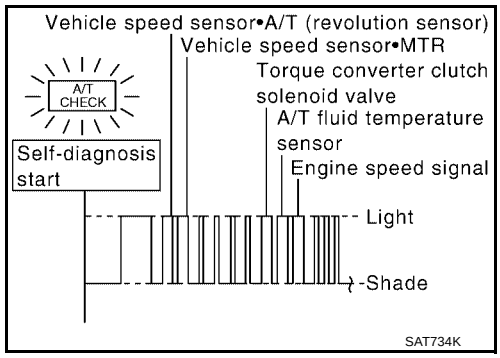
A/T Does Not Perform Lock-up

UCS000QT

SYMPTOM:
A/T does not perform lock-up at the specified speed.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to Vehicle speed sensor·A/T (revolution sensor), A/T fluid temperature sensor, Vehicle speed sensor·MTR, engine speed signal, torque converter clutch solenoid valve circuit after cruise test?



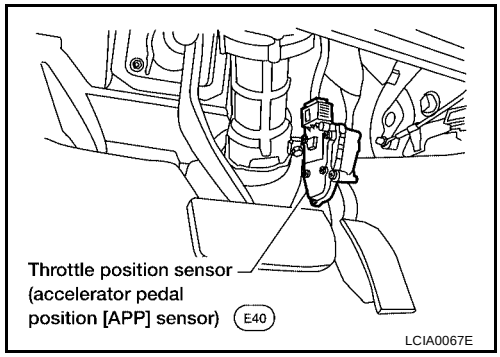
Yes or No

Yes >> Check torque converter clutch solenoid valve circuit. Refer to AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" , AT-111, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT" , AT-197, "DTC VEHICLE SPEED SENSOR MTR" , AT-122, "DTC P0725 ENGINE SPEED SIGNAL" , AT-148, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" .

No >> GO TO 2.

2. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .



OK or NG

OK >> GO TO 3.

NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].

3. DETECT MALFUNCTIONING ITEM

1. Remove control valve. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check following items:

- Torque converter clutch control valve
- Torque converter relief valve
- Pilot valve
- Pilot filter

3. Disassemble A/T.
4. Check the following items:

- Torque converter

OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

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. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

A/T Does Not Hold Lock-up Condition

UCS000QU

SYMPTOM:
A/T does not hold lock-up condition for more than 30 seconds.

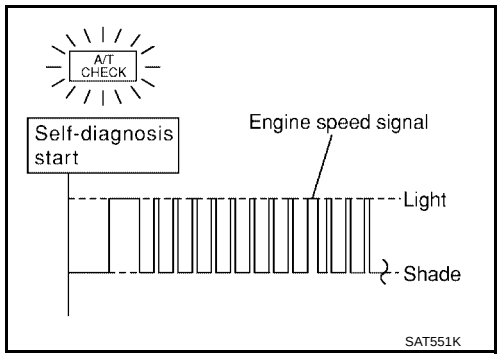
1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to engine speed signal circuit after cruise test?

Yes or No

Yes >> Check engine speed signal circuit. Refer to AT-122, "DTC P0725 ENGINE SPEED SIGNAL" .

No >> GO TO 2.



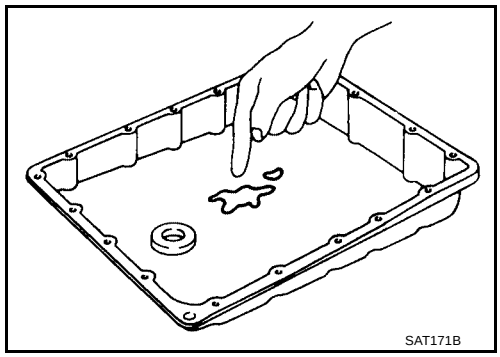
2. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.



3. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Torque converter clutch control valve
- Pilot valve
- Pilot filter

3. Disassemble A/T.
4. Check torque converter and oil pump assembly.

OK or NG

OK >> GO TO 5.

NG >> Repair or replace damaged parts.

4. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Torque converter clutch control valve
- Pilot valve
- Pilot filter

OK or NG

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

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. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

Lock-up Is Not Released

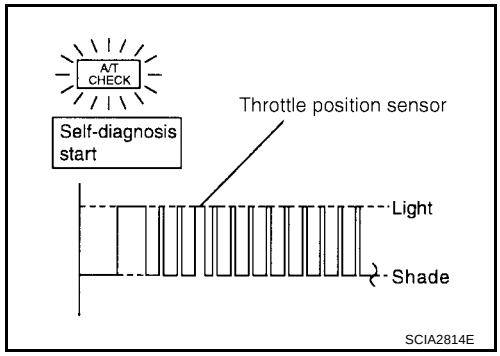
UCS000QV

SYMPTOM:
Lock-up is not released when accelerator pedal is released.

1. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR] CIRCUIT

With CONSULT-II
Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to throttle position sensor [accelerator pedal position (APP) sensor] circuit?

Without CONSULT-II
Does self-diagnosis show damage to throttle position sensor [accelerator pedal position (APP) sensor] circuit?



Yes or No

Yes >> Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .
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. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

Engine Speed Does Not Return To Idle (Light Braking D4 → D3)

UCS000QW

SYMPTOM:

- **Engine speed does not smoothly return to idle when A/T shifts from D4 to D3 .**
- **Vehicle does not decelerate by engine brake when A/T selector lever is in 3rd position.**
- **Vehicle does not decelerate by engine brake when shifting A/T from D to 2nd position.**

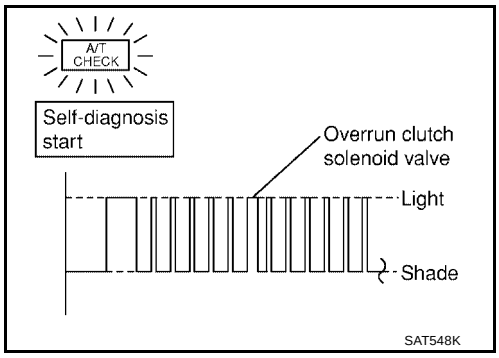
1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to overrun clutch solenoid valve circuit after cruise test?

Yes or No

Yes >> Check overrun clutch solenoid valve circuit. Refer to AT-183, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE" .

No >> GO TO 2.



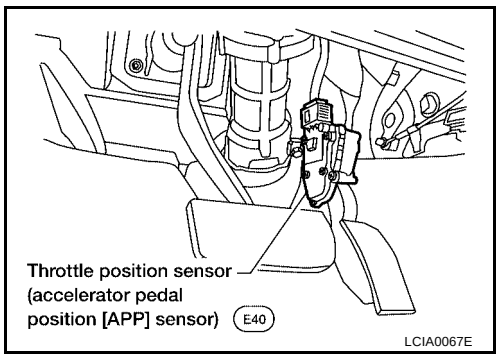
2. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

Check throttle position sensor [accelerator pedal position (APP) sensor]. Refer to AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .

OK or NG

OK >> GO TO 3.

NG >> Repair or replace throttle position sensor [accelerator pedal position (APP) sensor].



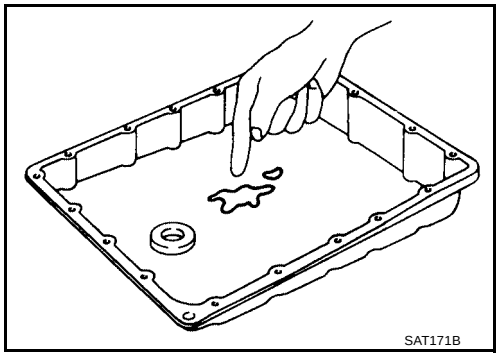
3. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.

OK or NG

OK >> GO TO 5.

NG >> GO TO 4.



4. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Overrun clutch control valve
- Overrun clutch reducing valve
- Overrun clutch solenoid valve

3. Disassemble A/T.
4. Check the following items:

- Overrun clutch assembly

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Overrun clutch control valve
- Overrun clutch reducing valve
- Overrun clutch solenoid valve

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

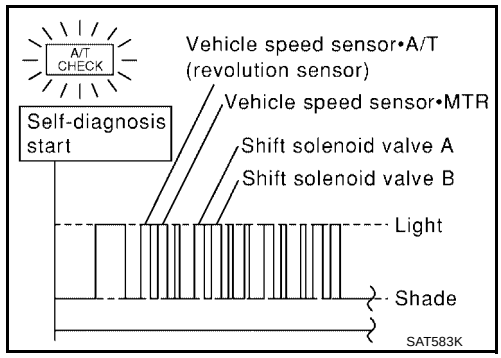
Vehicle Does Not Start From D1

UCS000QX

SYMPTOM:
Vehicle does not start from D1 on Cruise test — Part 2.

1. CHECK SELF-DIAGNOSTIC RESULTS

Does self-diagnosis show damage to vehicle speed sensor·A/T (revolution sensor), shift solenoid valve A, B or vehicle speed sensor·MTR after cruise test?



Yes or No

Yes >> Check damaged circuit. Refer to AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" , AT-167, "DTC P0750 SHIFT SOLENOID VALVE A" , AT-172, "DTC P0755 SHIFT SOLENOID VALVE B" or AT-197, "DTC VEHICLE SPEED SENSOR MTR" .

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG

OK >> Go to AT-229, "Vehicle Cannot Be Started From D1" .

NG >> GO TO 3.

3. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

A/T Does Not Shift: $D_4 \rightarrow D_3$, When A/T Selector Lever D $\rightarrow$ 3rd

UCS000QY

SYMPTOM:
A/T does not shift from D_4 to D_3 when changing A/T selector lever from D $\rightarrow$ 3rd position.

1. CHECK 3RD POSITION SWITCH CIRCUIT

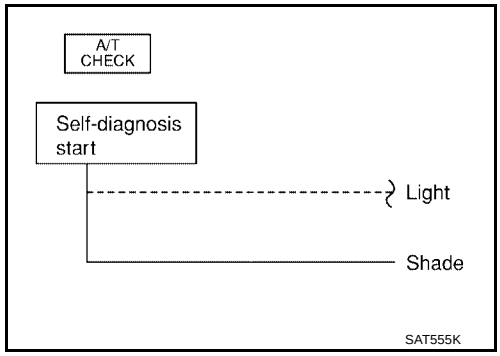
With CONSULT-II
Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to 3rd position switch circuit?

Without CONSULT-II
Does self-diagnosis show damage to 3rd position switch circuit?

Yes or No

Yes >> Check 3rd position switch circuit. Refer to AT-255, "TCM Self-diagnosis Does Not Activate (PNP & 3rd Position Switches Circuit Checks), and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor] Circuit Check" .

No >> Go to AT-235, "A/T Does Not Shift: $D_2 \rightarrow D_3$" .



A/T Does Not Shift: $D_3 \rightarrow 2_2$, When Selector Lever D $\rightarrow$ 2nd Position

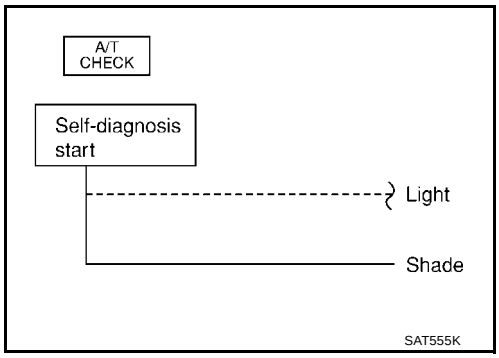
UCS000QZ

SYMPTOM:
A/T does not shift from D_3 to 2_2 when changing selector lever from D to 2nd position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II
Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to park/neutral position (PNP) switch circuit?

Without CONSULT-II
Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?



Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

No >> Go to AT-232, "A/T Does Not Shift: $D_1 \rightarrow D_2$ or Does Not Kickdown: $D_4 \rightarrow D_2$" .

A/T Does Not Shift: $2_2 \rightarrow 1_1$, When Selector Lever 2nd → 1st Position

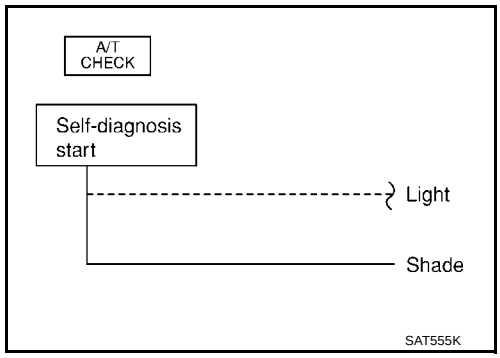
UCS000R0

SYMPTOM:
A/T does not shift from 2_2 to 1_1 when changing selector lever from 2nd to 1st position.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II
Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to park/neutral position (PNP) switch circuit?

Without CONSULT-II
Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

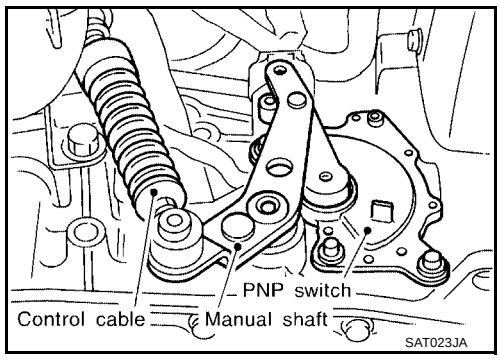


Yes or No

Yes >> Check park/neutral position (PNP) switch circuit. Refer to AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
No >> GO TO 2.

2. ADJUST CONTROL CABLE

Adjust control cable. Refer to AT-272, "Control Cable Adjustment"



OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to AT-272, "Control Cable Adjustment" .

3. CHECK VEHICLE SPEED SENSOR·A/T AND VEHICLE SPEED SENSOR·MTR CIRCUIT

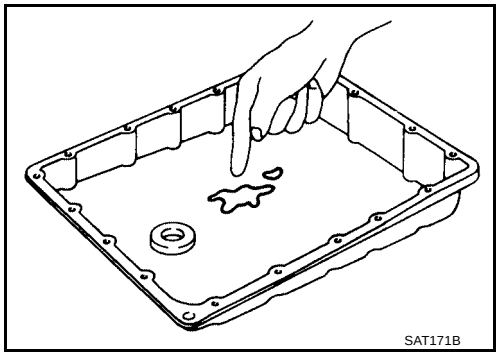
Check vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuit. Refer to AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" and AT-197, "DTC VEHICLE SPEED SENSOR MTR" .

OK or NG

OK >> GO TO 4.
NG >> Repair or replace vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuits.

4. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:
- Shift solenoid valve A
- Overrun clutch solenoid valve
3. Disassemble A/T.
4. Check the following items:
- Servo piston assembly
- Brake band

OK or NG

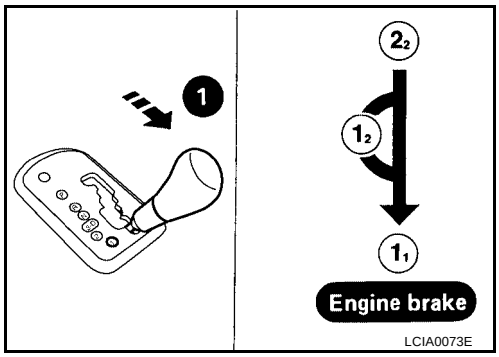
OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.



7. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
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.

Vehicle Does Not Decelerate By Engine Brake

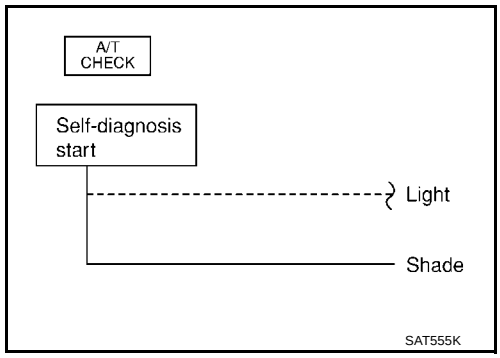
UCS000R1

SYMPTOM:
Vehicle does not decelerate by engine brake when shifting from 2_2 (1_2) to 1_1.

1. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT

With CONSULT-II
Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to park/neutral position (PNP) switch circuit?

Without CONSULT-II
Does self-diagnosis show damage to park/neutral position (PNP) switch circuit?

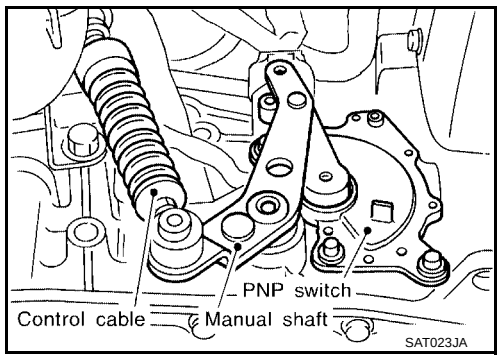


Yes or No

Yes >> Check park/neutral position (PNP) switch. Refer to AT-105, "DTC P0705 PARK/NEUTRAL POSITION SWITCH".
No >> GO TO 2.

2. ADJUST CONTROL CABLE

Adjust control cable. Refer to AT-272, "Control Cable Adjustment"



OK or NG

OK >> GO TO 3.
NG >> Adjust control cable. Refer to AT-272, "Control Cable Adjustment".

3. CHECK VEHICLE SPEED SENSOR·A/T AND VEHICLE SPEED SENSOR·MTR CIRCUIT

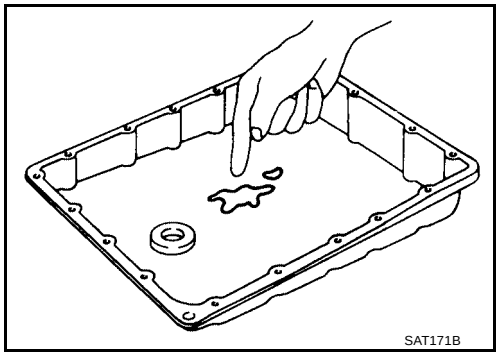
Check vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuit. Refer to AT-117, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVOLUTION SENSOR)" and AT-197, "DTC VEHICLE SPEED SENSOR MTR".

OK or NG

OK >> GO TO 4.
NG >> Repair or replace vehicle speed sensor·A/T (revolution sensor) and vehicle speed sensor·MTR circuits.

4. CHECK A/T FLUID CONDITION

1. Remove oil pan.
2. Check A/T fluid condition.



OK or NG

OK >> GO TO 6.
NG >> GO TO 5.

5. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-267, "Control Valve Assembly and Accumulators" .
2. Check the following items:

- Shift valve A
- Overrun clutch solenoid valve

3. Disassemble A/T.
4. Check the following items:

- Overrun clutch assembly
- Low & reverse brake assembly

OK or NG

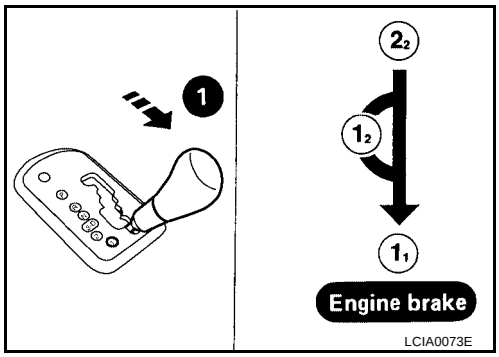
OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK SYMPTOM

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.



7. CHECK TCM INSPECTION

1. Perform TCM input/output signal inspection. Refer to AT-98, "TCM Terminals and Reference Value" .
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

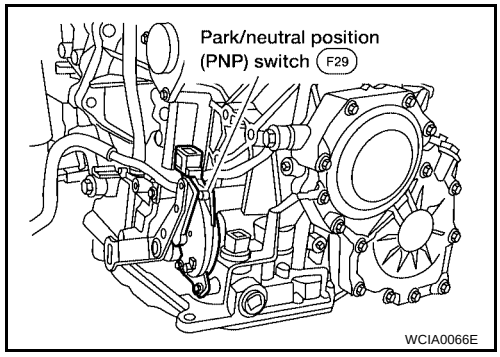
OK or NG

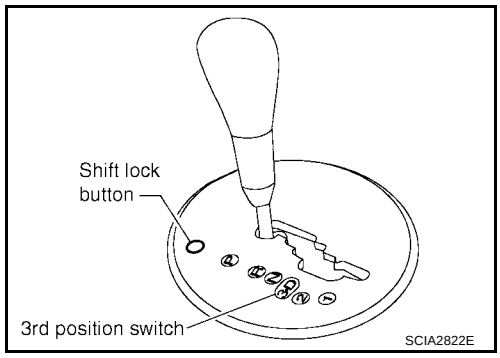
OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

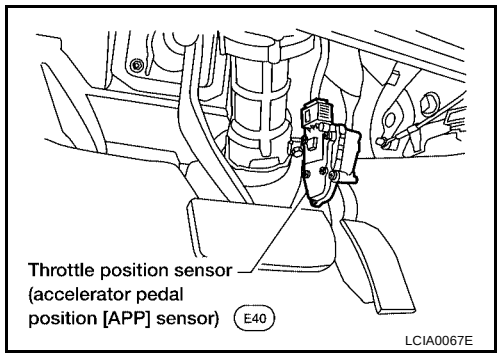
TCM Self-diagnosis Does Not Activate (PNP & 3rd Position Switches Circuit Checks), and Throttle Position Sensor [Accelerator Pedal Position (APP) Sensor] Circuit Check

UCS000R2

SYMPTOM:
A/T CHECK indicator lamp does not come on in TCM self-diagnostic procedure even if the lamp circuit is good.







DESCRIPTION

- Park/neutral position (PNP) switch
  The park/neutral (PNP) switch assembly includes a transmission range switch. The transmission range switch detects the selector lever position and sends a signal to the TCM.
- 3rd position switch
  Detects the A/T selector lever in 3rd position and sends a signal to the TCM.
- Throttle position sensor [accelerator pedal position (APP) sensor]
  The throttle position sensor [accelerator pedal position (APP) sensor] is part of the system that controls the throttle position. This system also uses an electric throttle control actuator, which consists of a throttle control motor and throttle position sensors. Accelerator pedal position signal is sent to the ECM.

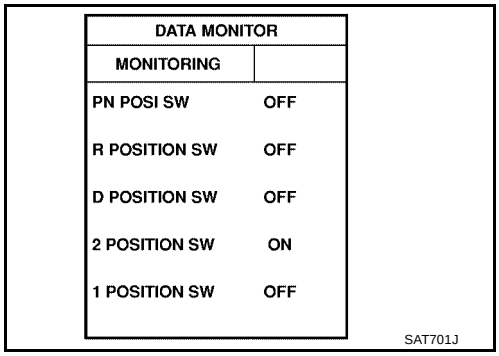
DIAGNOSTIC PROCEDURE

NOTE:
The diagnostic procedure includes inspection for the 3rd position switch closed throttle position signal and wide open throttle position signal circuit.

1. CHECK PARK/NEUTRAL POSITION (PNP) 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 P/N, R, D, 2nd and 1st position switches moving selector lever to each position. Check that the signal of the selector lever position is indicated properly.



OK or NG

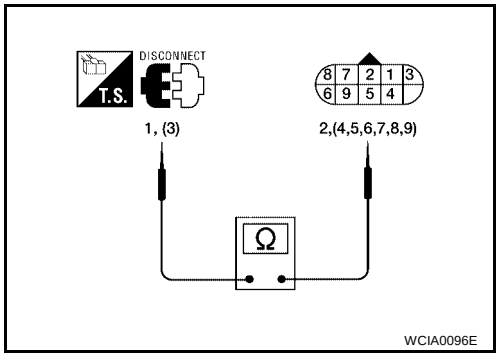
OK >> GO TO 5.
NG >> GO TO 2.

2. DETECT MALFUNCTIONING ITEM

Check the following items:

- Park/neutral position (PNP) switch

– Check continuity between park/neutral position (PNP) switch harness connector F29 terminals 1 (G) and 2 (R/L) and between terminals 3 (O) and 4 (V/W), 5 (P/B), 6 (L/W), 7 (BR), 8 (G/W) and 9 (GR/R) while moving manual shaft through each position.



Lever position	Terminal No.	
P	3 - 7	1 - 2
R	3 - 8	
N	3 - 9	1 - 2
D	3 - 6	
2	3 - 5	
1	3 - 4	

– If NG, check again with manual control cable disconnected from manual shaft of A/T assembly. Refer to step a.
– If OK on step b, adjust manual control cable. Refer to AT-272, "Control Cable Adjustment" .
– If NG on step b, remove park/neutral position (PNP) switch from A/T and check continuity of park/neutral position (PNP) switch terminals. Refer to step a.
– If OK on step d, adjust park/neutral position (PNP) switch. Refer to AT-269, "Park/Neutral Position (PNP) Switch Adjustment" .
– If NG on step d, replace park/neutral position (PNP) switch.

- Harness for short or open between ignition switch and park/neutral position (PNP) switch
- Harness for short or open between park/neutral position (PNP) switch and TCM

OK or NG

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

3. CHECK PARK/NEUTRAL POSITION (PNP) SWITCH CIRCUIT (WITHOUT CONSULT-II)

Without CONSULT-II

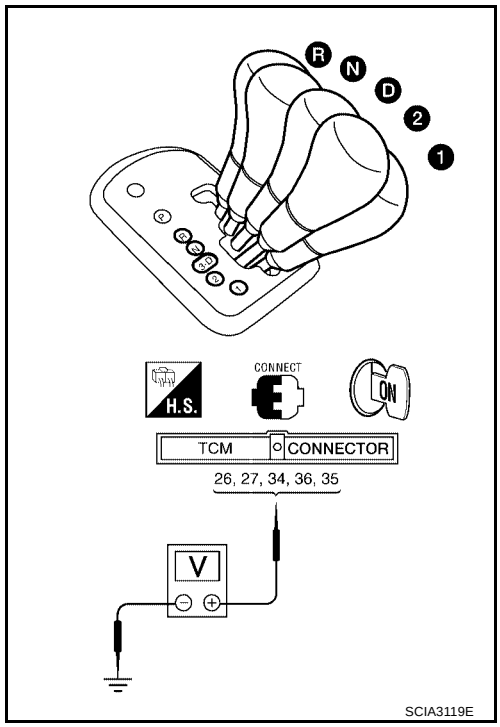
1. Turn ignition switch to ON position. (Do not start engine.)
2. Check voltage between TCM harness connector F57 terminals 26 (V/W), 27 (P/B), 34 (L/W), 35 (G/W), 36 (R/B) and ground while moving selector lever through each position.

Lever Position	Terminal No.				
	36	35	34	27	26
P, N	B	0	0	0	0
R	0	B	0	0	0
D	0	0	B	0	0
2	0	0	0	B	0
1	0	0	0	0	B

Voltage:

B : Battery voltage

0 : 0V



OK or NG

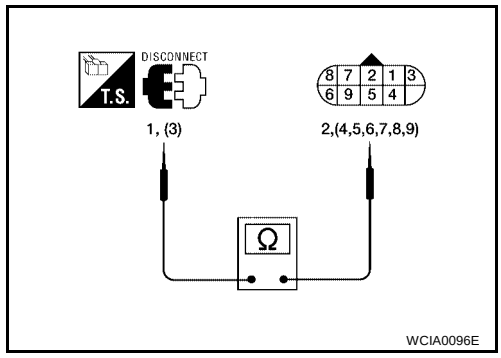
OK >> GO TO 6.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

Check the following items:

- Park/neutral position (PNP) switch

– Check continuity between park/neutral position (PNP) switch harness connector F29 terminals 1 (G) and 2 (R/L), and between terminals 3 (O) and 4 (V/W), 5 (P/B), 6 (L/W), 7 (BR), 8 (G/W) and 9 (GR/R) while moving manual shaft through each position.



Lever position	Terminal No.	
P	3 - 7	1 - 2
R	3 - 8	
N	3 - 9	1 - 2
D	3 - 6	
2	3 - 5	
1	3 - 4	

– If NG, check again with manual control cable disconnected from manual shaft of A/T assembly. Refer to step a.

– If OK on step b, adjust manual control cable. Refer to AT-272, "Control Cable Adjustment" .

– If NG on step b, remove park/neutral position (PNP) switch from A/T and check continuity of park/neutral position (PNP) switch terminals. Refer to step a.

– If OK on step d, adjust park/neutral position (PNP) switch. Refer to AT-269, "Park/Neutral Position (PNP) Switch Adjustment" .

– If NG on step d, replace park/neutral position (PNP) switch.

- Harness for short or open between ignition switch and park/neutral position (PNP) switch
- Harness for short or open between park/neutral position (PNP) switch and TCM

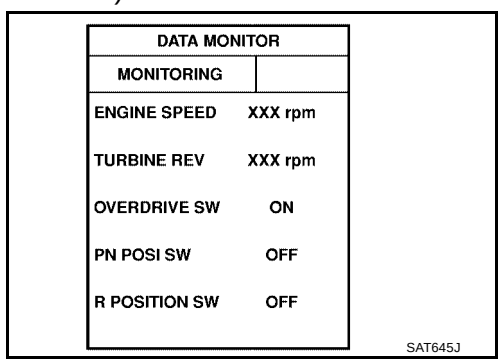
OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

5. CHECK 3RD POSITION 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 “OVERDRIVE SW”.
   Check the signal of the overdrive control switch is indicated properly.
   (Overdrive switch “ON” displayed on CONSULT-II means overdrive “OFF”.)
   *: “OVERDRIVE SW” means 3rd position switch



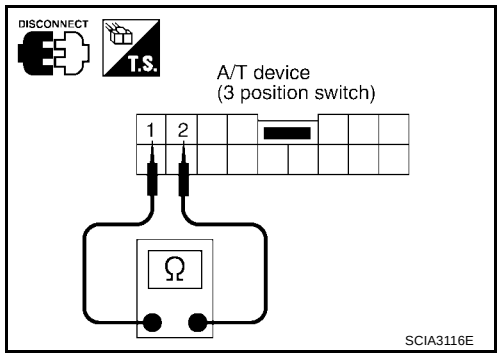
OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING ITEM

Check the following items:

- 3rd position switch M34.
  - Check continuity between A/T device (3rd position switch) harness connector M34 terminals 1 (L/W) and 2 (B) with selector lever in 3rd position.
- Harness for short or open between meter and 3rd position switch
- Harness of ground circuit for 3rd position switch for short or open



OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

- Perform throttle position sensor [accelerator pedal position (APP) sensor] inspection. Refer to AT-177, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK TCM INSPECTION

1. Perform TCM input/output inspection. Refer to AT-98, "TCM Terminals and Reference Value" .

OK or NG

OK >> **INSPECTION END**
NG >> Inspect TCM terminals and related wiring harnesses for damage or loose connections. Repair or replace damaged parts.

A/T SHIFT LOCK SYSTEM

PFP:34950

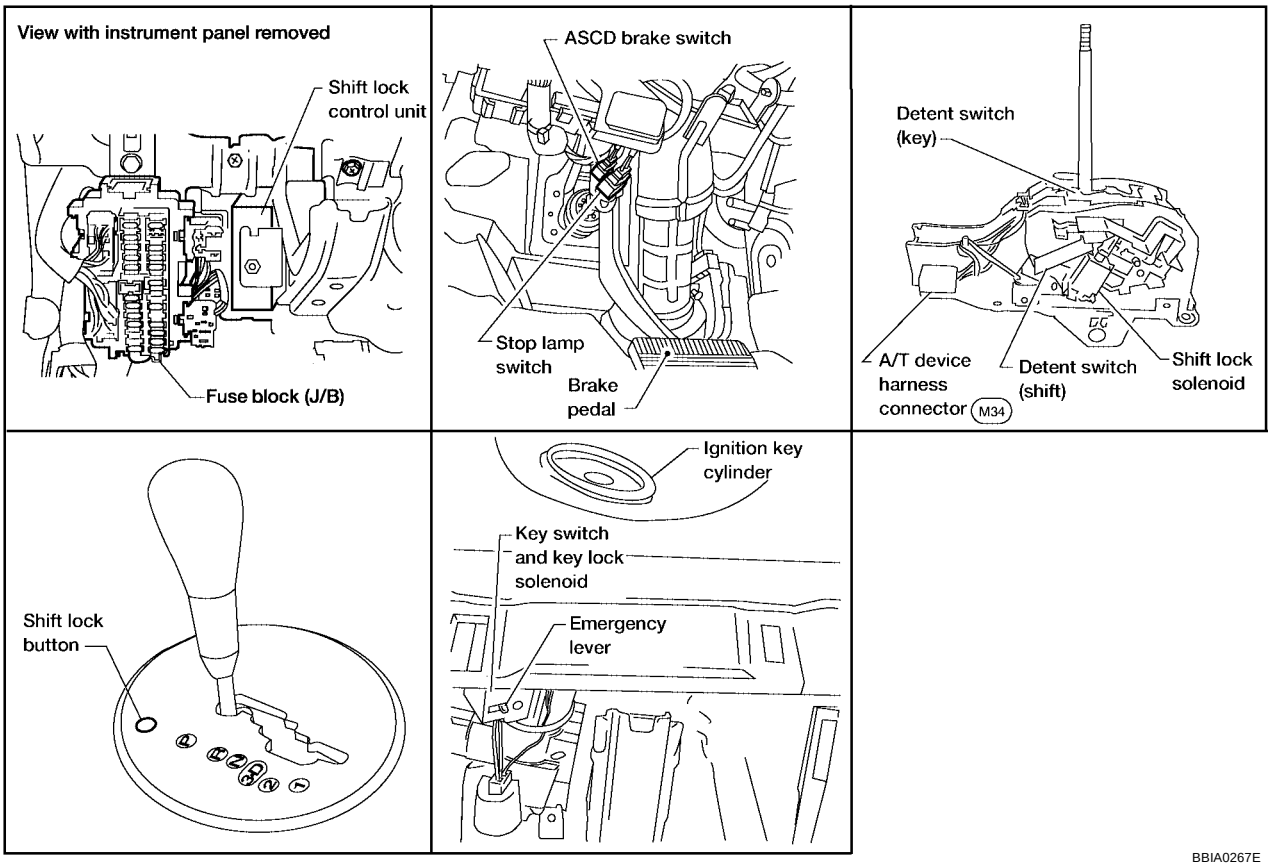
Description

UCS000R3

- The electrical key interlock mechanism also operates as a shift lock:
  With the key switch turned to ON, the selector lever cannot be shifted from “P” (parking) 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.

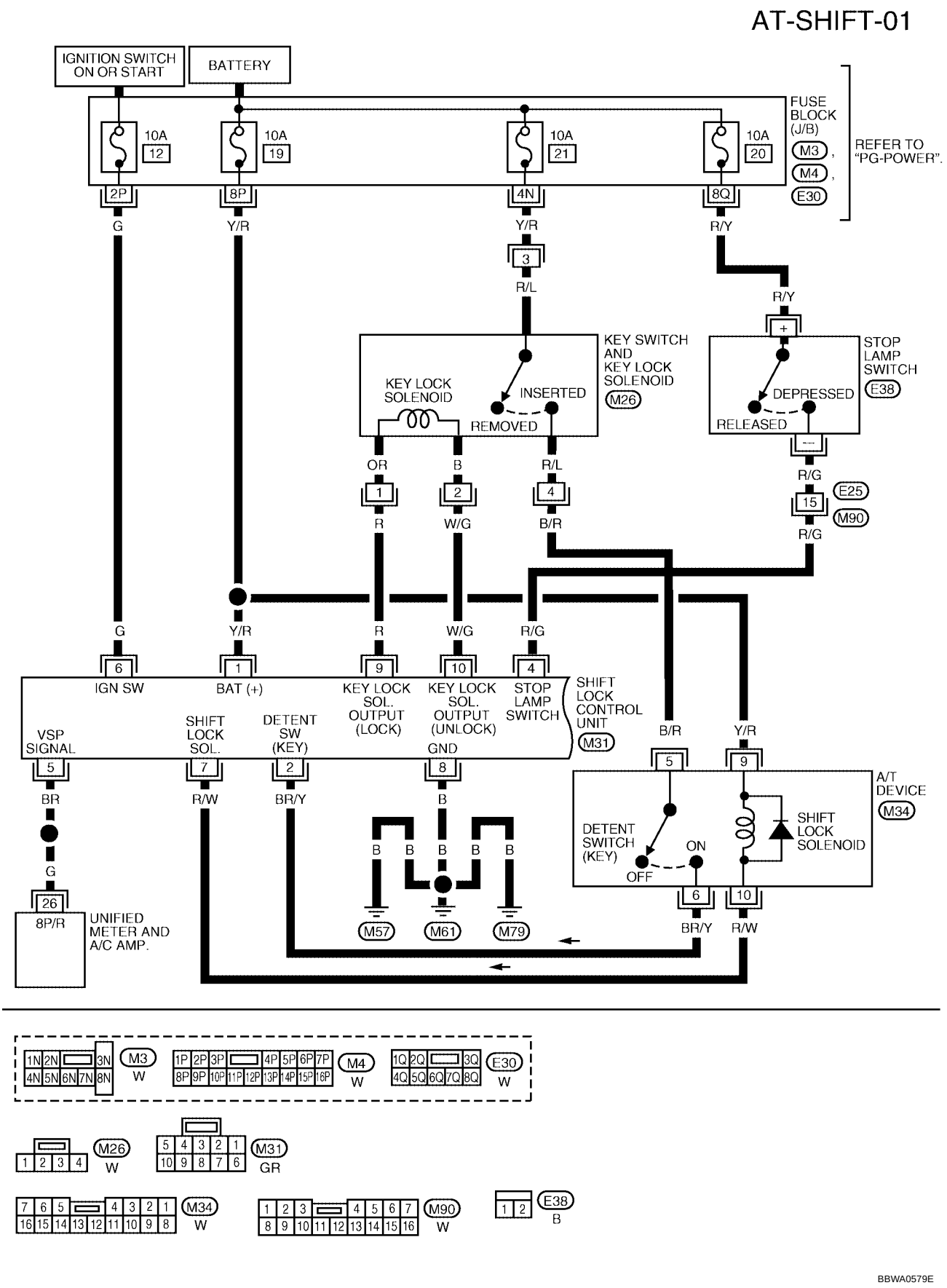
Shift Lock System Electrical Parts Location

UCS000R4



Wiring Diagram — SHIFT —

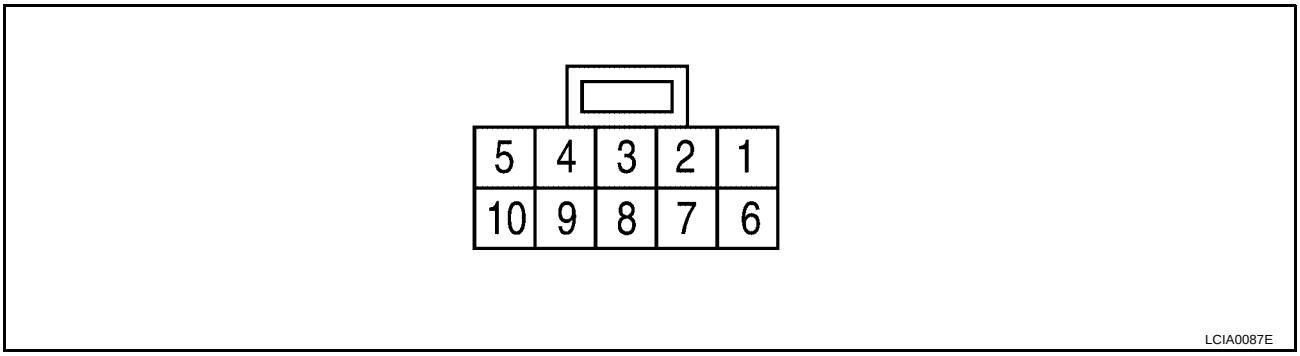
UCS000R5



Shift Lock Control Unit Reference Values

UCS000R6

SHIFT LOCK HARNESS CONNECTOR TERMINAL LAYOUT



SHIFT LOCK CONTROL UNIT INSPECTION TABLE

Data are reference values.

Terminal No. (Wire color)		Item	Condition	Judgement standard
(+)	(-)			
1 (Y/R)	8 (B)	Power source	Always	Battery voltage
2 (BR/Y)	8 (B)	Detent switch (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
4 (R/G)	8 (B)	Stop lamp switch	When brake pedal is depressed	Battery voltage
			When brake pedal is released	Approx. 0V
5 (BR)	8 (B)	Vehicle speed signal	—	—
6 (G)	8 (B)	Ignition signal	Ignition switch: “ON”	Battery voltage
			Ignition switch: “OFF”	Approx. 0V
7 (R/W)	8 (B)	Shift lock solenoid	When the brake pedal is depressed	Battery voltage
			Ignition switch: "ON" and vehicle speed is less than 8 km/h (5 MPH)	Approx. 0V
8 (B)	–	Ground	Always	Approx. 0V
9 (R)	8 (B)	Key lock signal	When the selector lever is set to a position other than the “P” position	Battery voltage for approx. 0.1 sec. (Note)
			Except the above	Approx. 0V
10 (W/G)	8 (B)	Key unlock signal	When the selector lever is set to the“ P” position	Battery voltage for approx. 0.1 sec. (Note)
			Except the above	Approx. 0V

NOTE:

Make sure 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

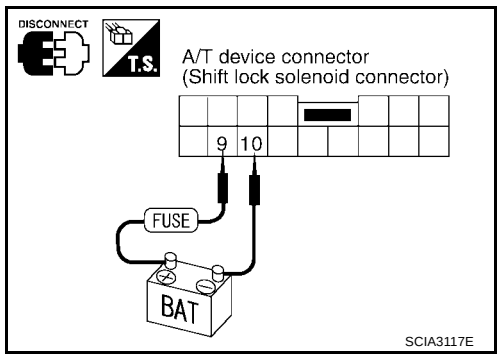
UCS000R7

SHIFT LOCK SOLENOID

- Check operation by applying battery voltage to A/T device connector.

CAUTION:
Be sure to apply the voltage of the correct polarity to the respective terminals. Otherwise, the part may be damaged.

Connector	Terminal
M34	9 (Battery voltage) - 10 (Ground)

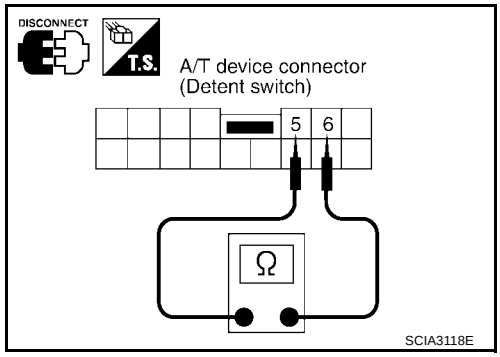


DETENT SWITCH

For Key:

- Check continuity between terminals of the A/T device connector.

Condition	Connector	Terminal	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	M34	5 - 6	Yes
Except the above			No



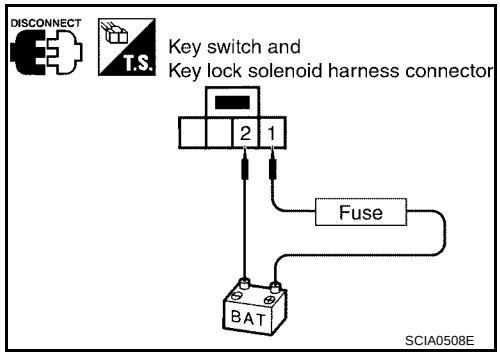
KEY LOCK SOLENOID

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	Terminal
M26	1 (Battery voltage) - 2 (Ground)

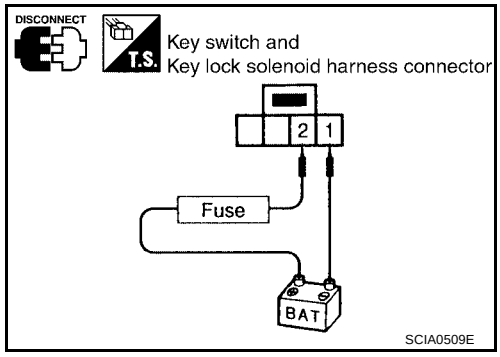


Key Unlock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:
Be careful not to cause burnout of the harness.

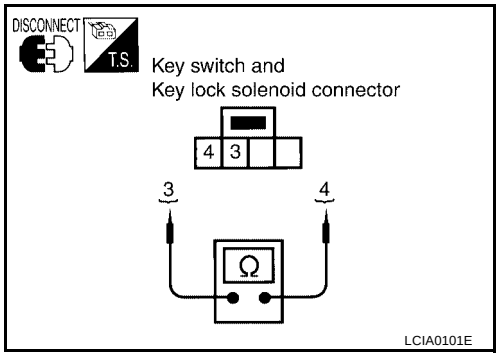
Connector	Terminal
M26	2 (Battery voltage) - 1 (Ground)



KEY SWITCH

- Check continuity between terminals of the key switch and key lock solenoid connector.

Condition	Connector	Terminal	Continuity
Key inserted	M26	3 - 4	Yes
Key removed			No

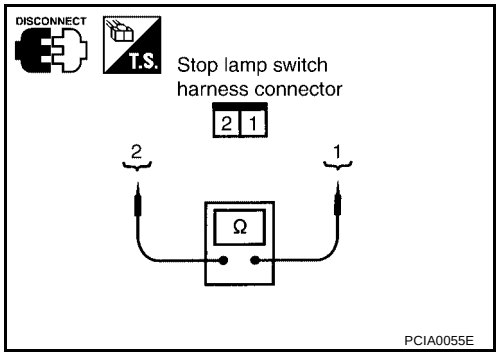


STOP LAMP SWITCH

- Check continuity between terminals of the stop lamp switch connector.

Condition	Connector	Terminal	Continuity
When brake pedal is depressed	E38	1 - 2	Yes
When brake pedal is released			No

Check stop lamp switch after adjusting brake pedal. Refer to BR-6, "Inspection and Adjustment"



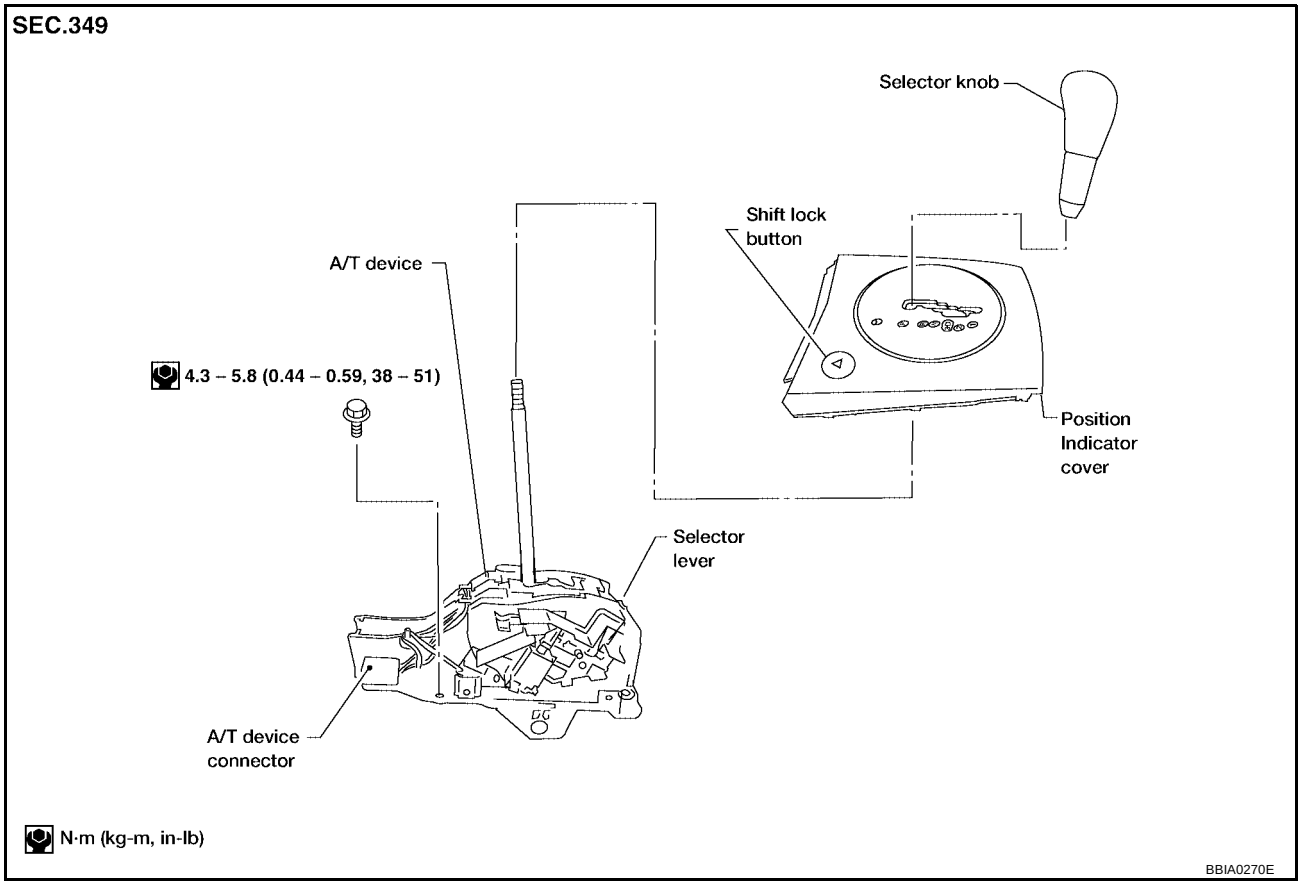
SHIFT CONTROL SYSTEM

PFP:34901

Control Device

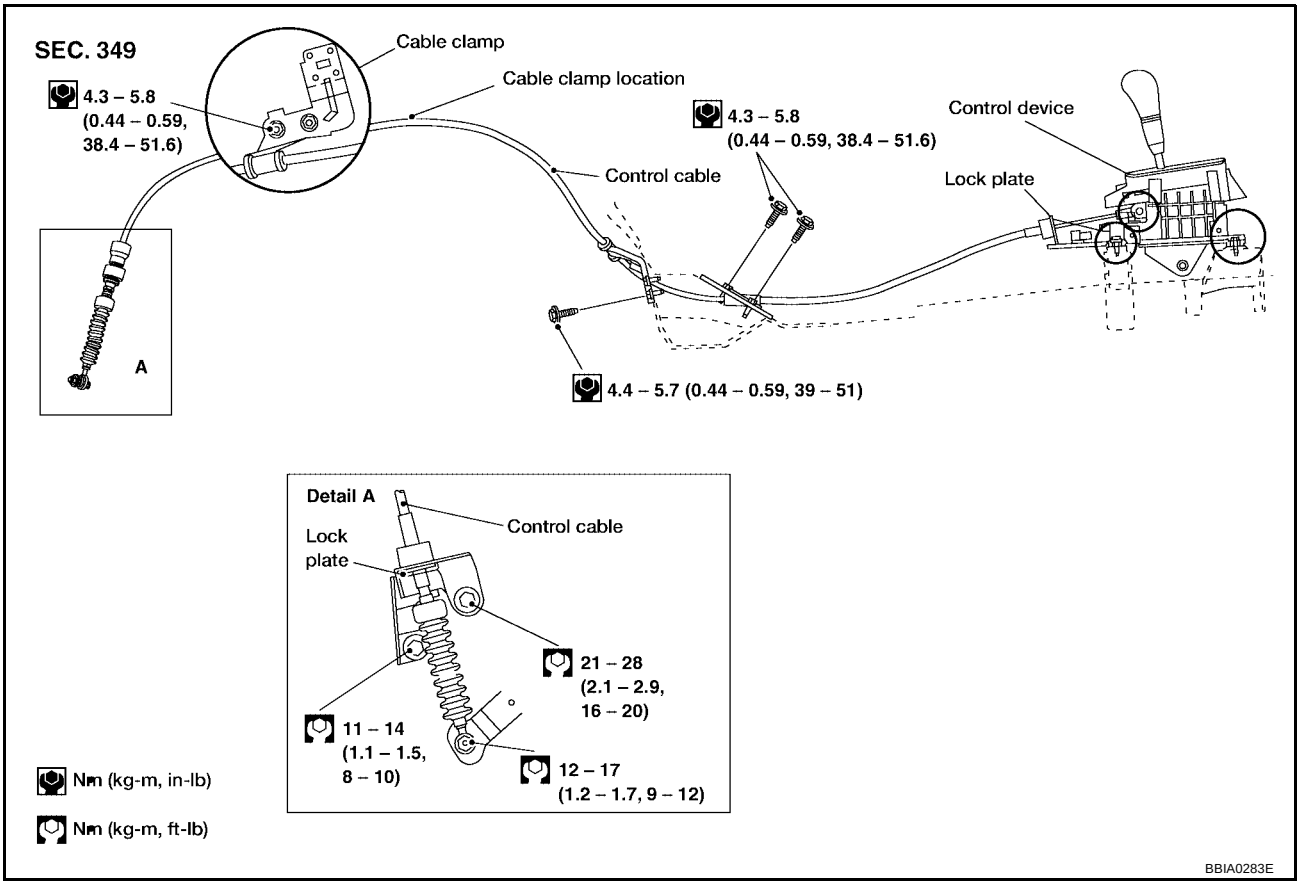
UCS000R8

SEC.349



Control Cable

UCS000R9



ON-VEHICLE SERVICE

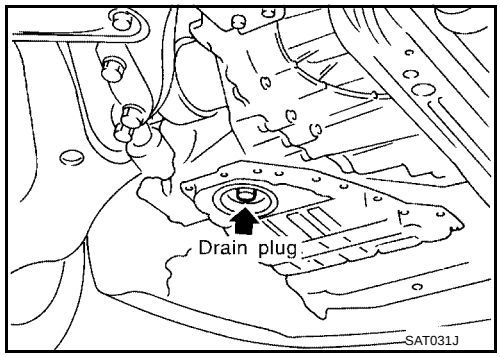
PFP:00000

Control Valve Assembly and Accumulators

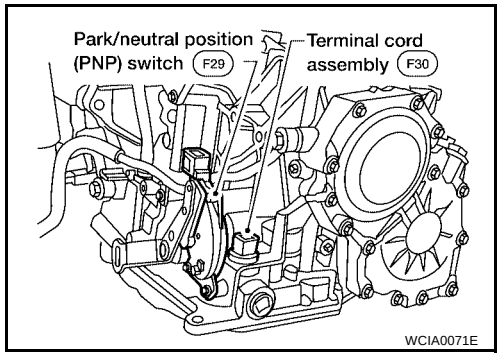
UCS000RA

REMOVAL

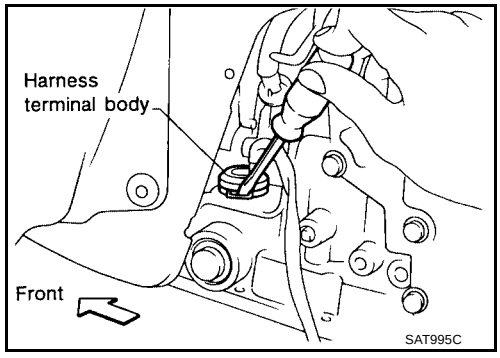
1. Drain ATF from transaxle.
2. Remove oil pan using power tools, and gasket.
   - Do not reuse oil pan bolts.



3. Disconnect terminal cord assembly harness connector.



4. Remove stopper ring from terminal cord assembly harness terminal body.
5. Remove terminal cord assembly harness from transmission case by pushing on terminal body.

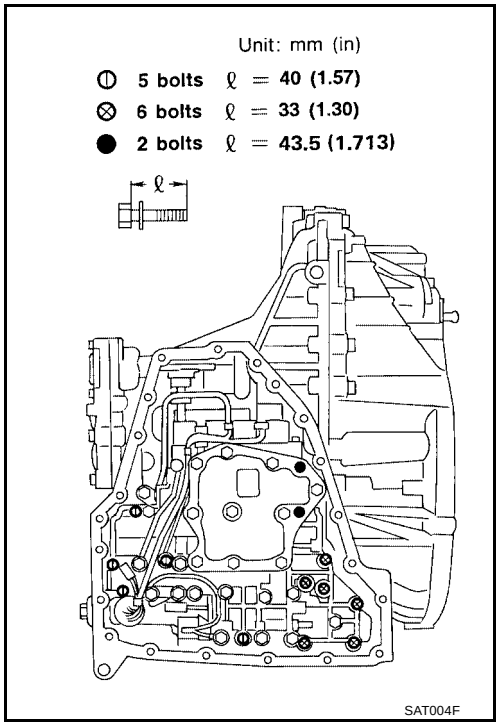


6. Remove control valve assembly by removing fixing bolts **I** , **X** and ●.

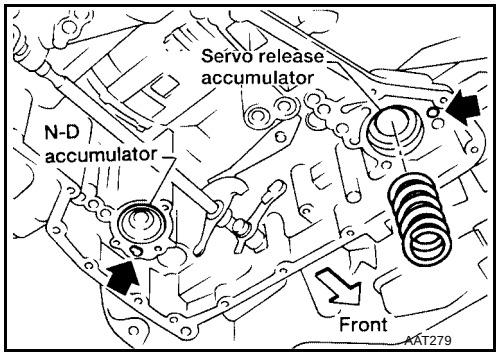
Bolt length, number and location are shown in the illustration.

- **Be careful not to drop manual valve and servo release accumulator return spring.**

7. Disassemble and inspect control valve assembly if necessary. Refer to AT-304, "Control Valve Assembly" .

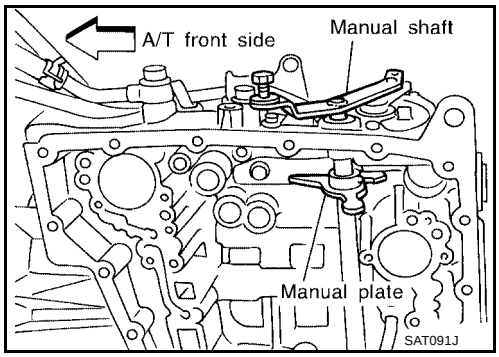


8. Remove servo release and N-D accumulators by applying compressed air if necessary.
   - **Hold each piston with a rag.**



INSTALLATION

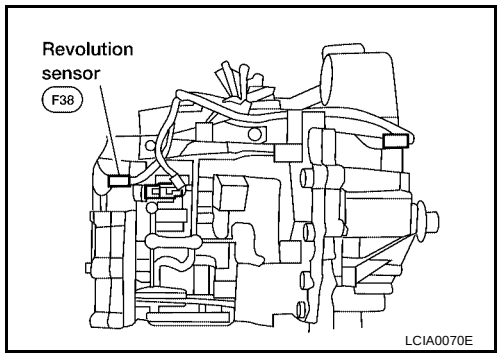
- **Set manual shaft in Neutral, then align manual plate with groove in manual valve.**
- **After installing control valve assembly, make sure that selector lever can be moved to all positions.**



Revolution Sensor Replacement

UCS000RB

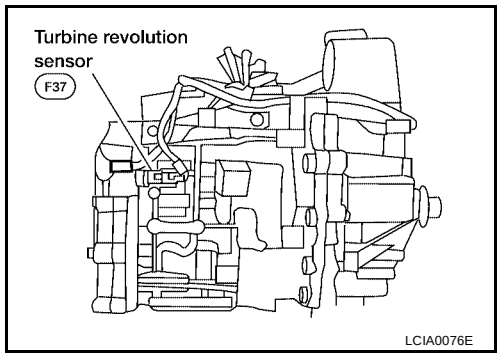
1. Disconnect electrical connector.
2. Remove revolution sensor from A/T.
3. Reinstall any part removed.
   - **Always use new sealing parts.**



Turbine Revolution Sensor Replacement

UCS000RC

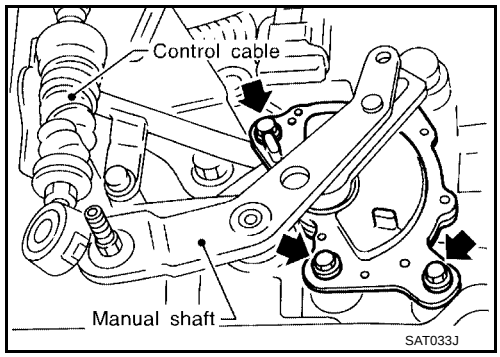
1. Disconnect electrical connector.
2. Remove bolt, and turbine revolution sensor from A/T.
3. Reinstall any part removed.
   - **Always use new sealing parts.**



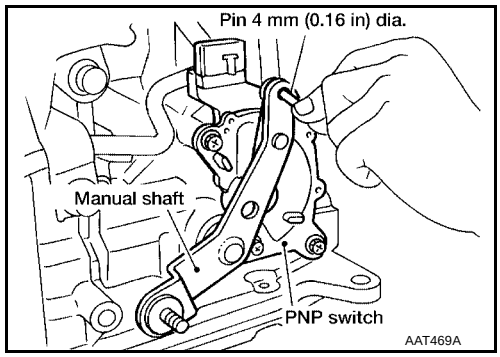
Park/Neutral Position (PNP) Switch Adjustment

UCS000RD

1. Remove control cable from manual shaft.
2. Set manual shaft in N position.
3. Loosen park/neutral position (PNP) switch fixing bolts.



4. Insert pin into adjustment holes in both park/neutral position (PNP) switch and manual shaft as near vertical as possible.
5. Reinstall any part removed.
6. Check continuity of park/neutral position (PNP) switch. Refer to AT-108, "Diagnostic Procedure" .



ATF Cooler

UCS0010W

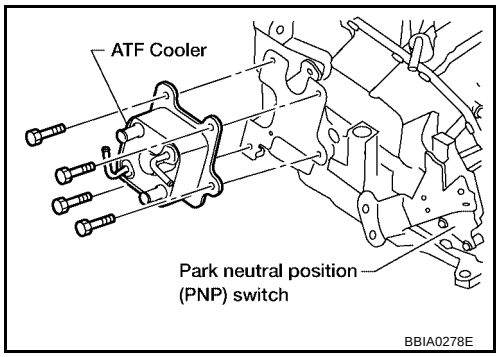
REMOVAL

1. Drain ATF.
2. Drain engine coolant, refer to MA-14, "Changing Engine Coolant" .
3. Remove hose clamps and hoses from ATF cooler.
4. Remove four bolts from ATF cooler and remove ATF cooler.

INSTALLATION

Installation is the reverse order of removal.

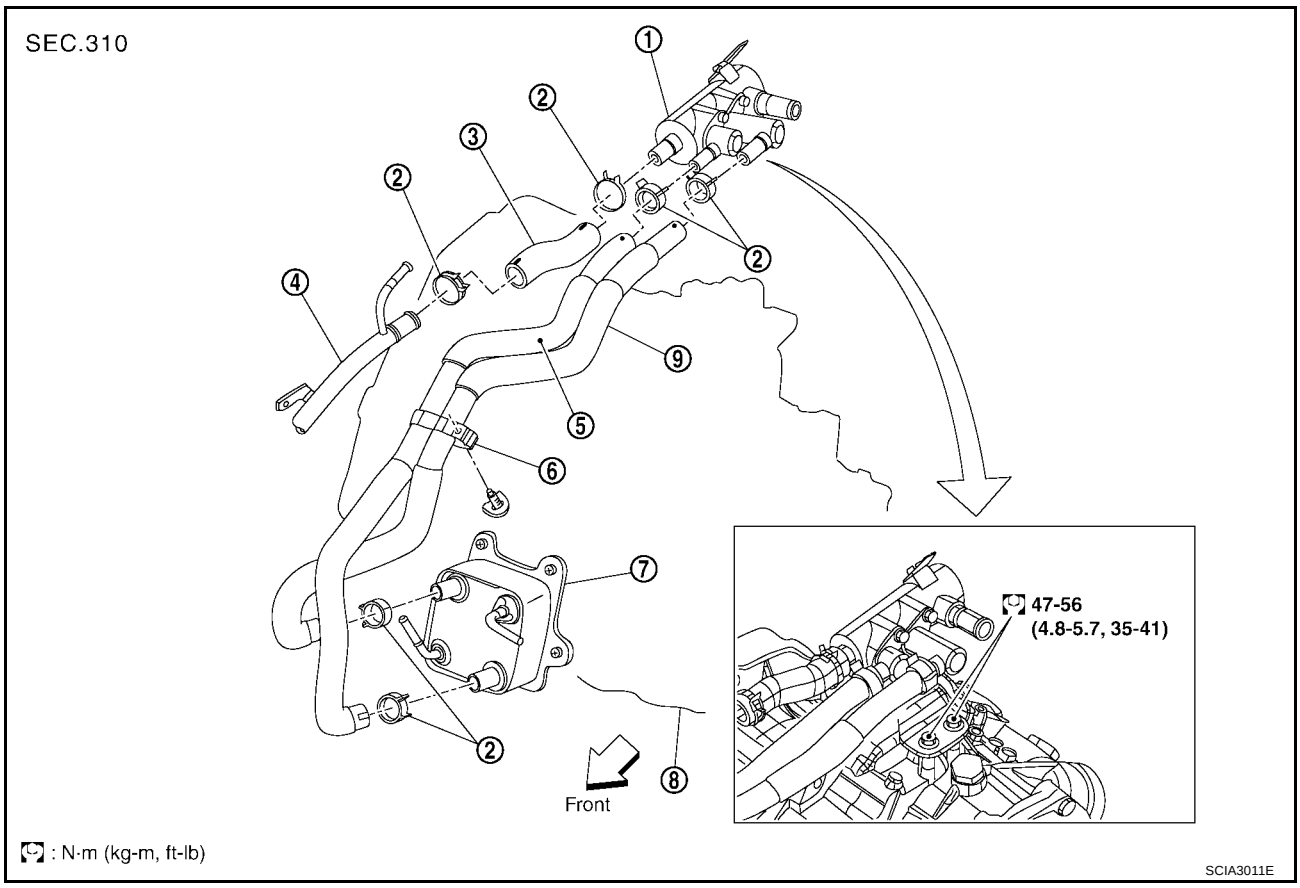
: 3.73 - 4.71 N-m (0.38 - 0.48 kg-m, 33 - 41 in-lb)



ATF Cooler Valve

UCS0015L

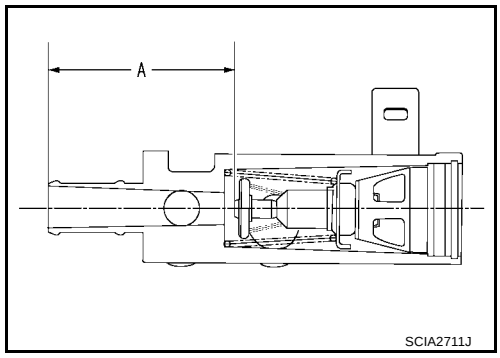
Refer to the figure for ATF cooler valve and hoses removal and installation information.



1. ATF cooler valve assembly
2. Hose clamp
3. Heater hose
4. Heater pipe
5. Outlet water hose
6. Hose clip
7. ATF cooler
8. Transaxle assembly
9. Inlet water hose

COMPONENT INSPECTION

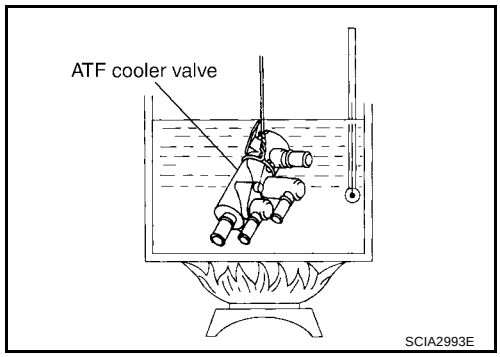
1. Make sure that ATF cooler valve is fully opened at room temperature.



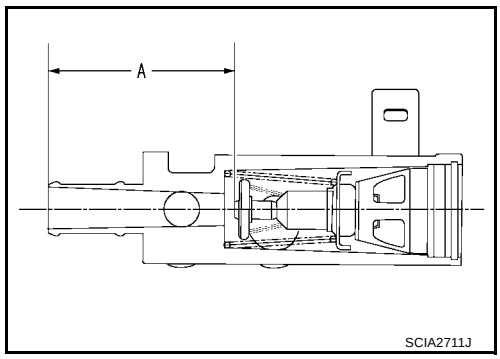
Dimension "A": More than 72.0 mm (2.835 in)

A: Distance between ATF cooler valve port end face and valve shaft end face.

2. Submerge ATF cooler valve in a water-filled container, and then heat it up with temperature of over 82°C (180°F) for 10 minutes more.



3. Make sure that ATF cooler valve is fully closed.



Dimension "A": Less than 66.5 mm (2.618 in)

A: Distance between ATF cooler valve port end face and valve shaft end face.

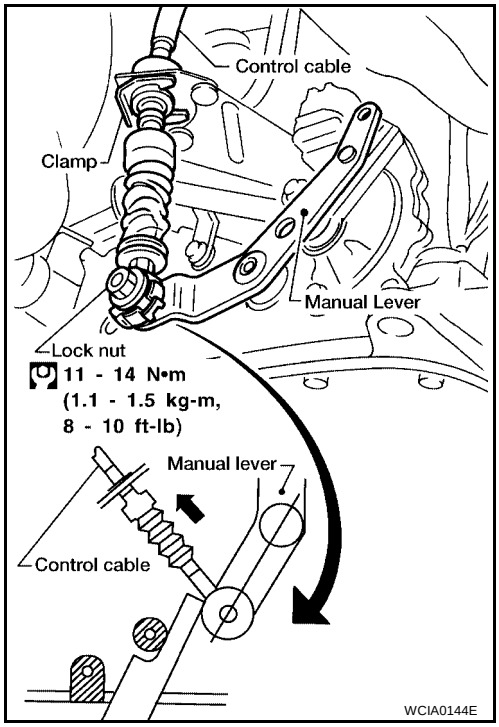
Control Cable Adjustment

UCS000RE

Move selector lever from the P position to the 1 position. You should be able to feel the detent in each position. If the detent cannot be felt or the pointer indicating the position is improperly aligned, the control cable needs adjustment.

1. Place selector lever in the P position.
   CAUTION:
   Turn wheels more than 1/4 turn and apply the parking brake.
2. Loosen control cable lock nut.
3. Secure the manual lever.
4. Using the specified force, push control cable in the direction of the arrow shown in the illustration.

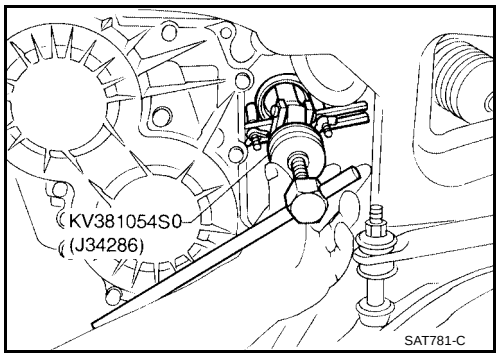
   Specified force : 9.8 N (1.0 kg, 2.2 lb)
5. Tighten control cable lock nut.
6. Move selector lever from P to 1 position. Make sure that selector lever moves smoothly.
   - **Make sure that the starter operates when the selector lever is placed in the N or P position.**
   - **Make sure that the transmission is locked properly when the selector lever is placed in the P position.**



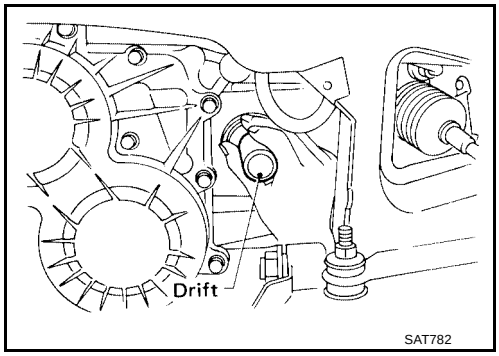
Differential Side Oil Seal Replacement

UCS000RF

1. Remove drive shaft assembly. Refer to FAX-11, "Removal and Installation" .
2. Remove oil seal.



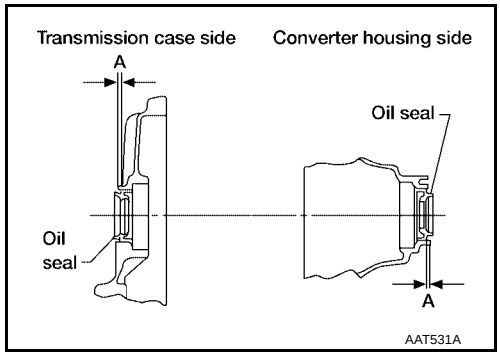
3. Install oil seal.
   - **Apply ATF before installing.**



- **Install oil seals so dimension A is within specification**

  A : −0.5 mm (−0.02 in) to 0.5 mm (0.02 in)

4. Reinstall any part removed.



REMOVAL AND INSTALLATION

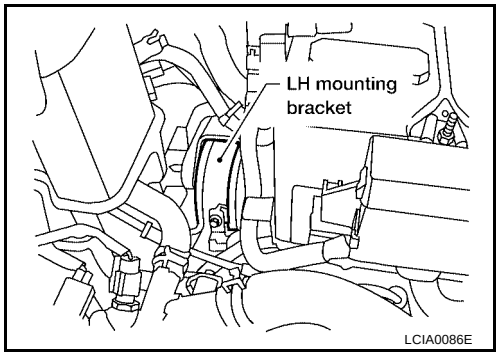
PFP:00000

Removal

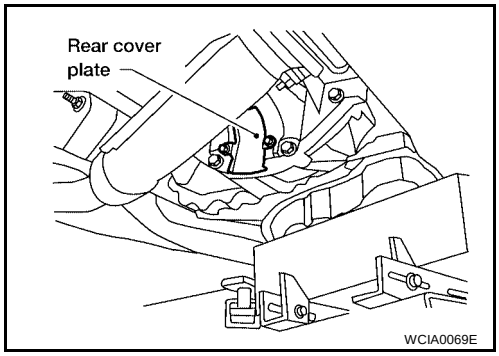
UCS000RG

CAUTION:
When removing the transaxle assembly from engine, first remove the crankshaft position sensor from the assembly.
Be careful not to damage sensor edge.

1. Remove battery and bracket.
2. Remove air cleaner assembly. Refer to EM-15, "Removal and Installation" .
3. Disconnect terminal cord assembly harness connector and park/neutral position (PNP) switch harness connectors.
4. Disconnect harness connectors of revolution sensor, ground, vehicle speed sensor, mass air flow sensor, and turbine revolution sensor.
5. Remove crankshaft position sensor from transaxle.
6. Remove LH mounting bracket from transaxle and body.
7. Disconnect control cable at transaxle side.
8. Remove drive shafts. Refer to FAX-11, "Removal and Installation" .
9. Drain ATF.
10. Drain engine coolant. Refer to MA-14, "Changing Engine Coolant" .
11. Remove push clips and engine undercover.
12. Disconnect ATF fluid cooler piping.
13. Disconnect engine coolant hoses to cooler on transaxle.
14. Remove starter motor from transaxle. Refer to SC-18, "Removal and Installation" .



15. Support engine.
16. Remove upper transaxle to engine bolts.
17. Remove front suspension member. Refer to FSU-15, "Removal and Installation" .
18. Remove rear cover plate and bolts securing torque converter to drive plate.
    - **Rotate crankshaft for access to securing bolts.**



19. Support transaxle with a jack.
20. Remove lower transaxle to engine bolts.
21. Lower transaxle while supporting it with a jack.

Installation

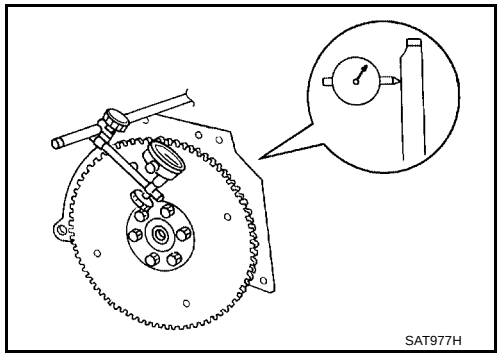
UCS000RH

- Drive plate runout

CAUTION:
Do not allow any magnetic materials to contact the ring gear teeth.

Maximum allowable runout:

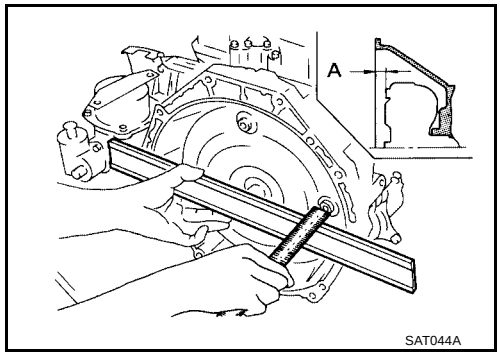
Refer to EM-144, "DRIVE PLATE RUNOUT (A/T)" .



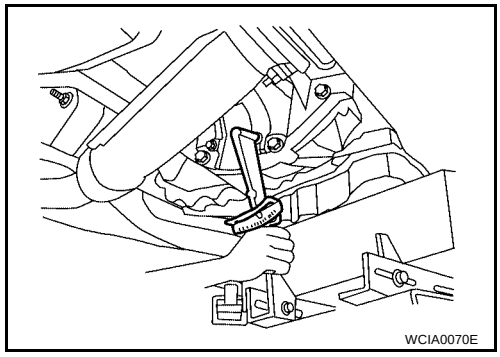
- If this runout is out of allowance, replace drive plate and ring gear.

- When connecting torque converter to transaxle, measure distance “A” to be certain that they are correctly assembled.

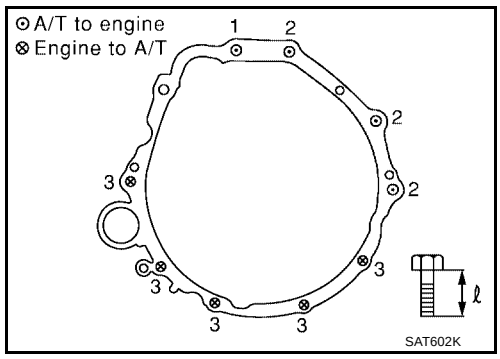
Distance “A” : 14 mm (0.55 in) or more



- Install bolts fixing converter to drive plate.
- **With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.**



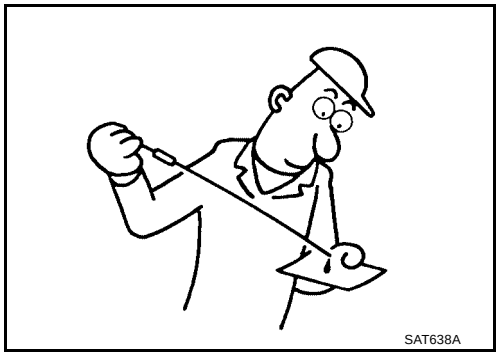
- Tighten bolts securing transaxle.
- Tighten LH mounting bracket bolts to the specified torque. Refer to EM-113, "Removal and Installation" .
- Tighten front suspension member bolts to the specified torque. Refer to FSU-15, "Removal and Installation" .
- Tighten rear plate cover bolts to the specified torque. Refer to EM-31, "Removal and Installation" .



Bolt No.	Tightening torque N·m (kg-m, ft-lb)	l mm (in)
1	70 - 79 (7.1 - 8.1, 52 - 58)	65 (2.56)
2	70 - 79 (7.1 - 8.1, 52 - 58)	52 (2.05)
3	41.2 - 52.0 (4.2 - 5.3, 31 - 38)	40 (1.57)

- Reinstall any part removed.
- Reconnect electrical connectors.

- Check fluid level in transaxle.
- Move selector lever through all positions to be sure that transaxle operates correctly.
  With parking brake applied, rotate engine at idling. Move selector lever through N to D, to 2, to 1 and to R position. A slight shock should be felt by hand gripping selector each time transaxle is shifted.
- Perform road test. Refer to AT-72, "Road Test" .

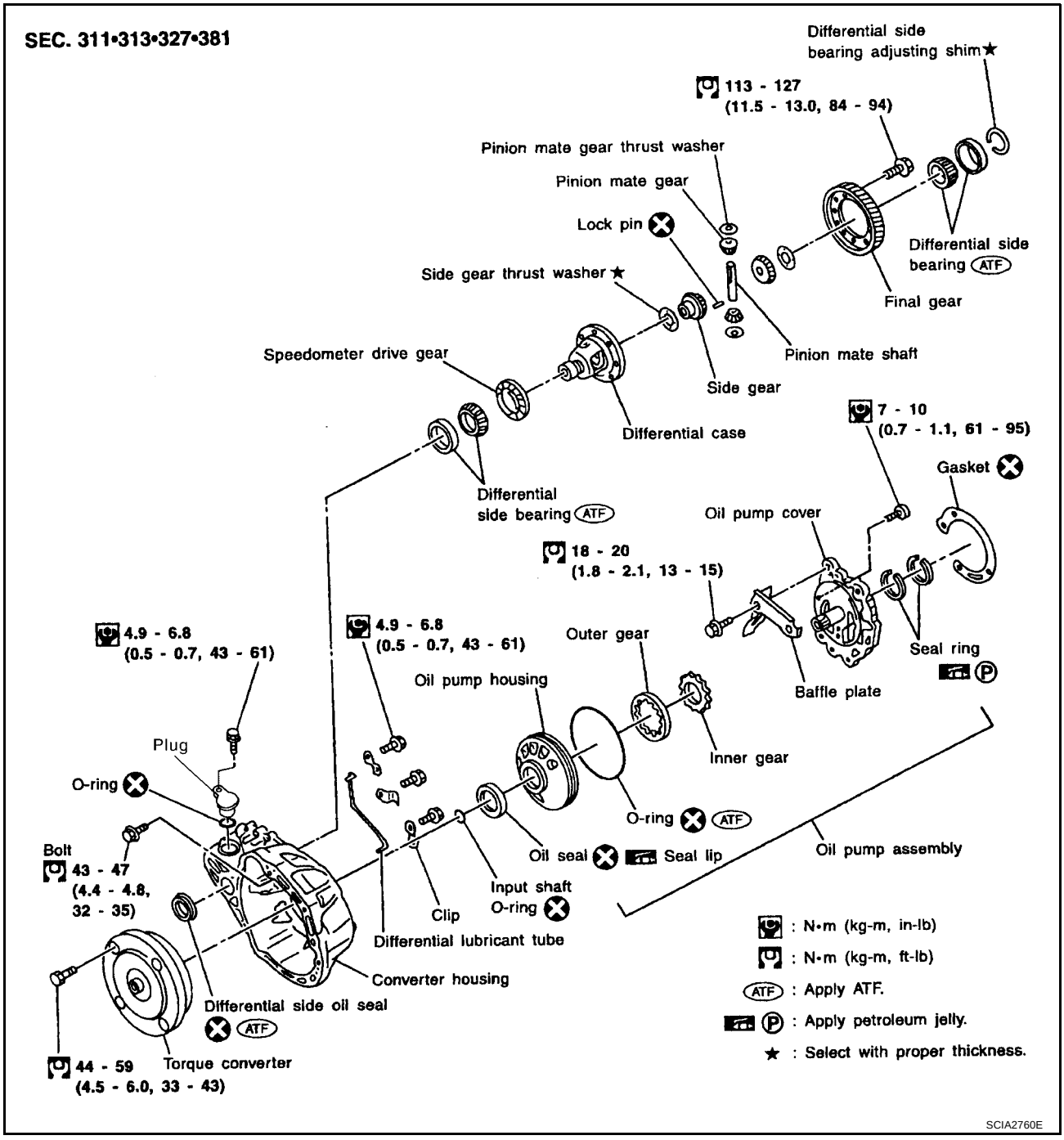


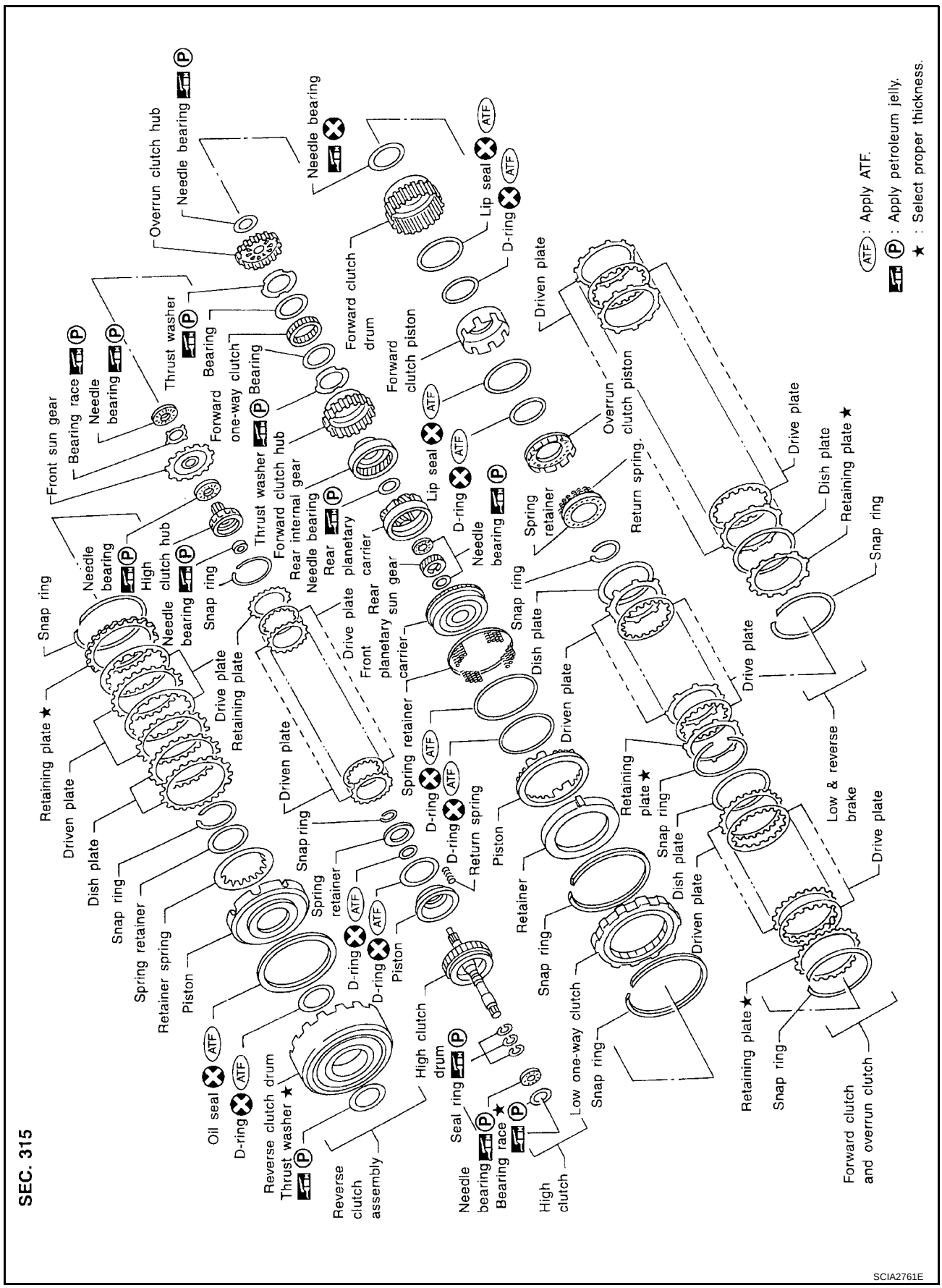
OVERHAUL

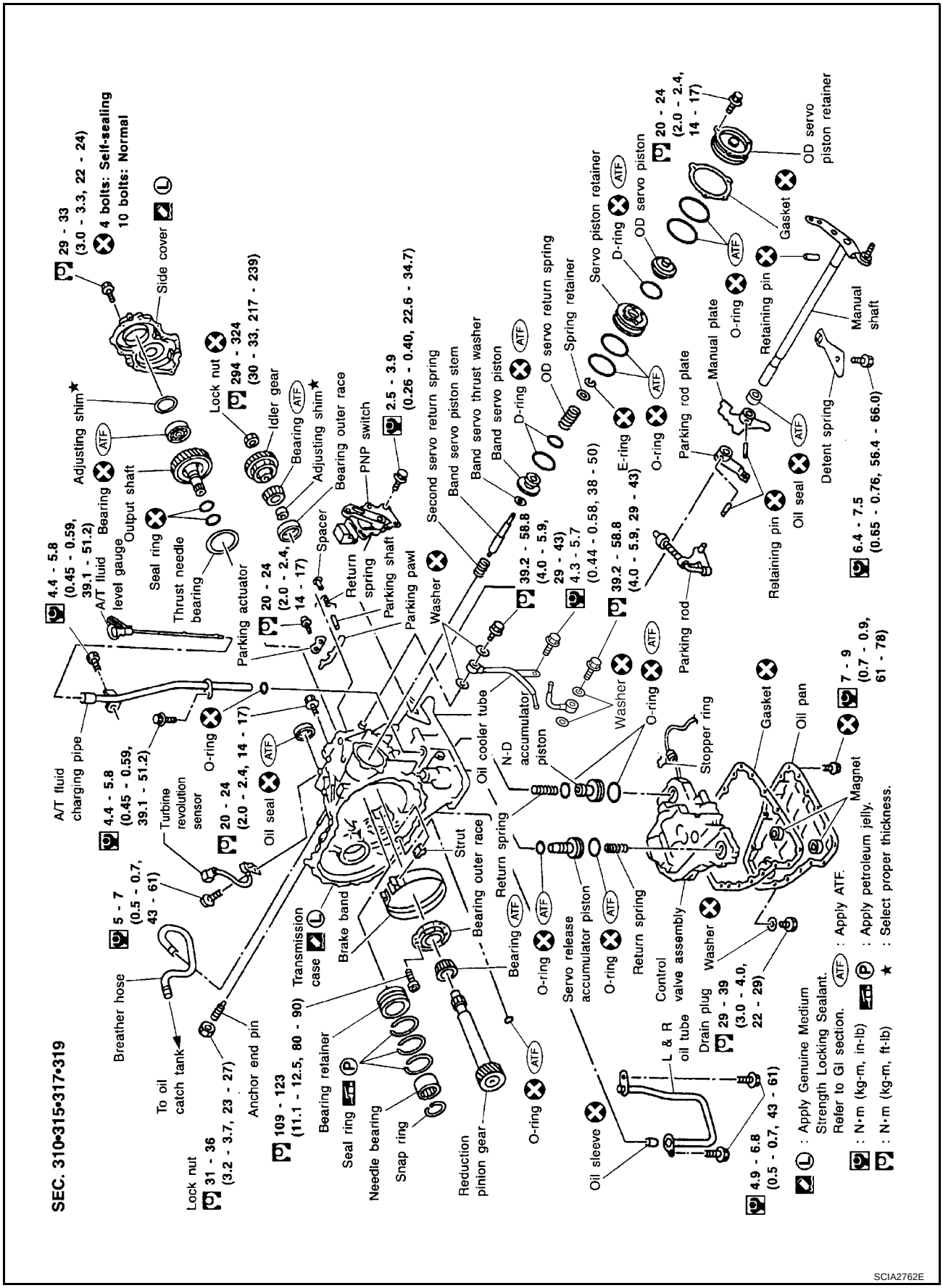
PFP:00000

Components

UCS000RI

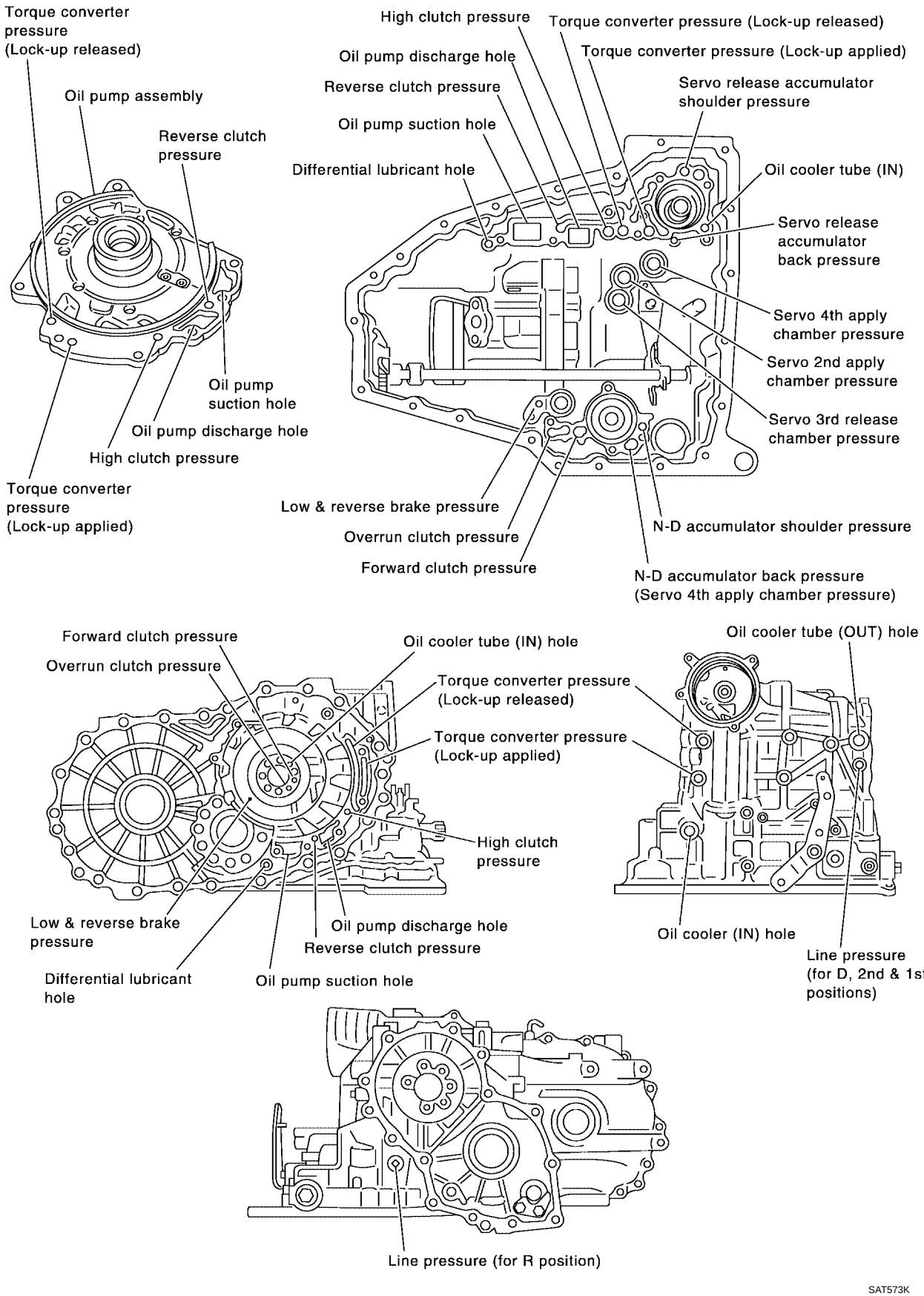



SEC. 315
Front sun gear
Bearing race
Needle bearing
Thrust washer
Overrun clutch hub
Needle bearing
Needle bearing
Forward clutch drum
Forward one-way clutch
Bearing
Thrust washer
Forward clutch hub
Rear internal gear
Needle bearing
Rear planetary carrier
Lip seal
D-ring
Driven plate
Forward clutch piston
Lip seal
D-ring
Needle bearing
Spring retainer
Return spring
Overrun clutch piston
Snap ring
Needle bearing
High clutch hub
Needle bearing
Snap ring
Drive plate
Retaining plate
Front planetary carrier
Rear sun gear
Snap ring
Dish plate
Driven plate
Drive plate
Drive plate
Dish plate
Retaining plate
Snap ring
Retaining plate
Driven plate
Dish plate
Snap ring
Spring retainer
Retainer spring
Piston
Spring retainer
Snap ring
D-ring
D-ring
Return spring
Piston
Retainer
Snap ring
Low one-way clutch
Snap ring
Retaining plate
Snap ring
Dish plate
Driven plate
Low & reverse brake
Drive plate
Oil seal
D-ring
Reverse clutch drum
Thrust washer
Reverse clutch assembly
D-ring
D-ring
Piston
High clutch drum
Seal ring
Needle bearing
Bearing race
High clutch
Retaining plate
Snap ring
Forward clutch and overrun clutch
ATF : Apply ATF.
P : Apply petroleum jelly.
★ : Select proper thickness.
SCIA2761E


SEC. 310•315•317•319
29 - 33 (3.0 - 3.3, 22 - 24)
4 bolts: Self-sealing
10 bolts: Normal
Side cover
Adjusting shim
Bearing
Output shaft
Seal ring
Thrust needle bearing
Parking actuator
Lock nut
294 - 324 (30 - 33, 217 - 239)
Idler gear
Bearing
Adjusting shim
Spacer
Bearing outer race
PNP switch
2.5 - 3.9 (0.26 - 0.40, 22.6 - 34.7)
Return spring
Parking shaft
Parking pawl
Washer
Second servo return spring
Band servo piston stem
Band servo thrust washer
Band servo piston
D-ring
OD servo return spring
Spring retainer
Servo piston retainer
D-ring
OD servo piston
20 - 24 (2.0 - 2.4, 14 - 17)
OD servo piston retainer
Gasket
Manual plate
O-ring
Retaining pin
Manual shaft
Detent spring
Oil seal
Retaining pin
Parking rod plate
Parking rod
E-ring
O-ring
4.4 - 5.8 (0.45 - 0.59, 39.1 - 51.2)
A/T fluid level gauge
A/T fluid charging pipe
O-ring
20 - 24 (2.0 - 2.4, 14 - 17)
Oil seal
Turbine revolution sensor
4.4 - 5.8 (0.45 - 0.59, 39.1 - 51.2)
5 - 7 (0.5 - 0.7, 43 - 61)
Breather hose
To oil catch tank
Lock nut
31 - 36 (3.2 - 3.7, 23 - 27)
Anchor end pin
109 - 123 (11.1 - 12.5, 80 - 90)
Transmission case
Bearing retainer
Seal ring
Needle bearing
Snap ring
Reduction pinion gear
Brake band
Strut
Bearing outer race
Return spring
Bearing
O-ring
Oil cooler tube
N-D accumulator piston
39.2 - 58.8 (4.0 - 5.9, 29 - 43)
4.3 - 5.7 (0.44 - 0.58, 38 - 50)
Washer
O-ring
Servo release accumulator piston
O-ring
Return spring
Control valve assembly
Stopper ring
Parking rod
39.2 - 58.8 (4.0 - 5.9, 29 - 43)
Gasket
Oil pan
7 - 9 (0.7 - 0.9, 61 - 78)
Magnet
6.4 - 7.5 (0.65 - 0.76, 56.4 - 66.0)
Oil sleeve
L & R oil tube
Drain plug
29 - 39 (3.0 - 4.0, 22 - 29)
Washer
4.9 - 6.8 (0.5 - 0.7, 43 - 61)
: Apply Genuine Medium Strength Locking Sealant. Refer to GI section.
: Apply ATF.
: Apply petroleum jelly.
: Select proper thickness.
: N•m (kg-m, in-lb)
: N•m (kg-m, ft-lb)
SCIA2762E

Oil Channel

UCS000RJ



Locations of Adjusting Shims, Needle Bearings, Thrust Washers and Snap Rings

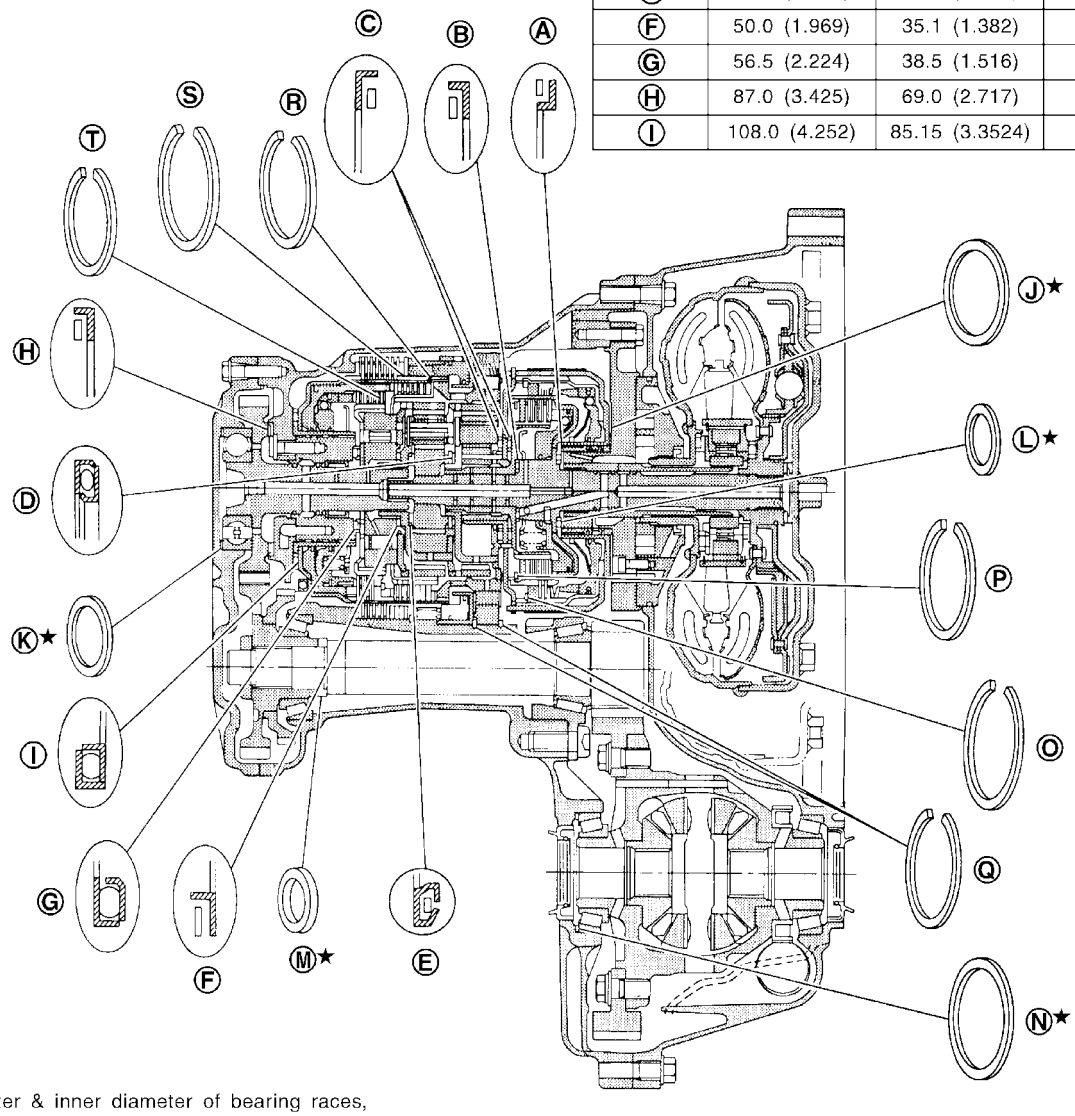
UCS000RK

Outer diameter of thrust washers

Item number	Outer diameter mm (in)	Parts number*
Ⓙ★	76.0 (2.992)	31508 80X13 - 31508 80X20
Ⓚ★	80.0 (3.150)	31438 80X60 - 31438 80X70

Outer and inner diameter of needle bearings

Item number	Outer diameter mm (in)	Inner diameter mm (in)	Parts number*
Ⓐ	50.0 (1.969)	35.1 (1.382)	31407 80X10
Ⓑ	42.0 (1.654)	23.7 (0.933)	31407 80X01
Ⓒ	70.0 (2.756)	50.0 (1.969)	31407 80X09
Ⓓ	51.0 (2.008)	33.1 (1.303)	31407 80X02
Ⓔ	48.0 (1.890)	30.0 (1.181)	31407 80X03
Ⓕ	50.0 (1.969)	35.1 (1.382)	31407 80X10
Ⓖ	56.5 (2.224)	38.5 (1.516)	31407 80X08
Ⓗ	87.0 (3.425)	69.0 (2.717)	31407 80X07
Ⓘ	108.0 (4.252)	85.15 (3.3524)	31407 80X06



Outer & inner diameter of bearing races, adjusting shims and adjusting spacer

Item number	Outer diameter mm (in)	Inner diameter mm (in)	Parts number*
Ⓛ★	51.0 (2.008)	36.0 (1.417)	31435 80X00 - 31439 80X14
Ⓜ★	38.0 (1.496)	28.1 (1.106)	31439 85X01 - 31439 85X06 31439 83X11 - 31439 83X24 31439 81X00 - 31439 81X24 31439 81X46 - 31439 81X49 31439 81X60 - 31439 81X74
Ⓝ★	75.0 (2.953)	67.0 (2.638)	31438 80X00 - 31439 80X11

★ : Select proper thickness.

* : Always check with the Parts Department for the latest parts information.

Outer diameter of snap rings

Item number	Outer diameter mm (in)	Parts number*
Ⓞ	150 (5.91)	31506 80X13
Ⓟ	119.1 (4.689)	31506 80X06
Ⓠ	182.8 (7.197)	31506 80X08
Ⓡ	144.8 (5.701)	31506 80X03
Ⓢ	173.8 (6.843)	31506 80X09
Ⓣ	133.9 (5.272)	31506 80X01

SAT565K

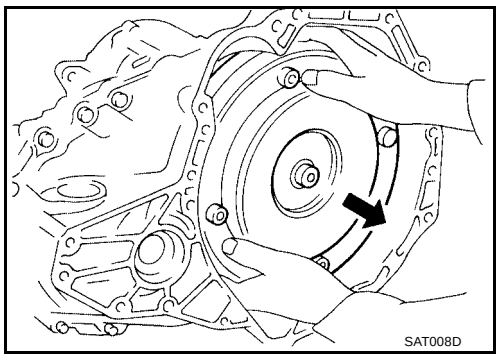
DISASSEMBLY

PFP:31020

Disassembly

UCS000RL

1. Drain ATF through drain plug.
2. Remove torque converter.

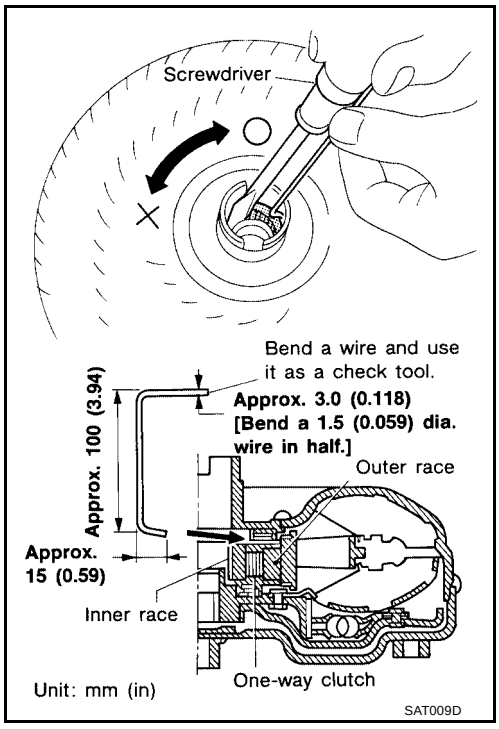


3. Check torque converter one-way clutch using check tool as shown at left.

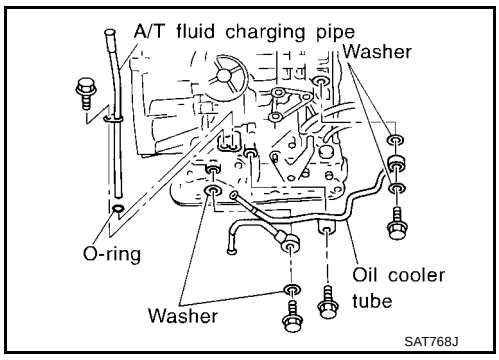
a. Insert check tool into the groove of bearing support built into one-way clutch outer race.

b. When fixing bearing support with check tool, rotate one- way clutch spline using screwdriver.

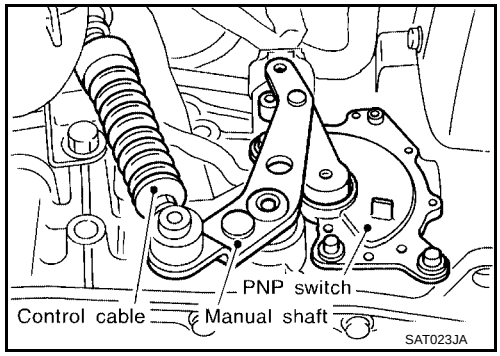
c. Check that inner race rotates clockwise only. If not, replace torque converter assembly.



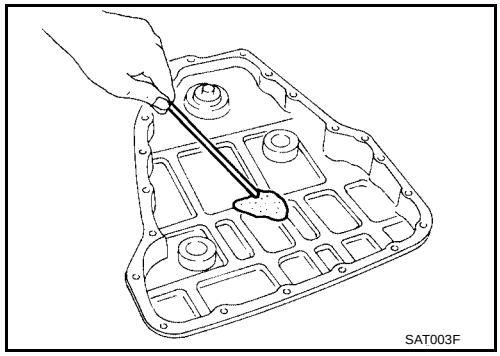
4. Remove A/T fluid charging pipe and fluid cooler tube.



5. Set manual shaft to position P.
6. Remove park/neutral position (PNP) switch.

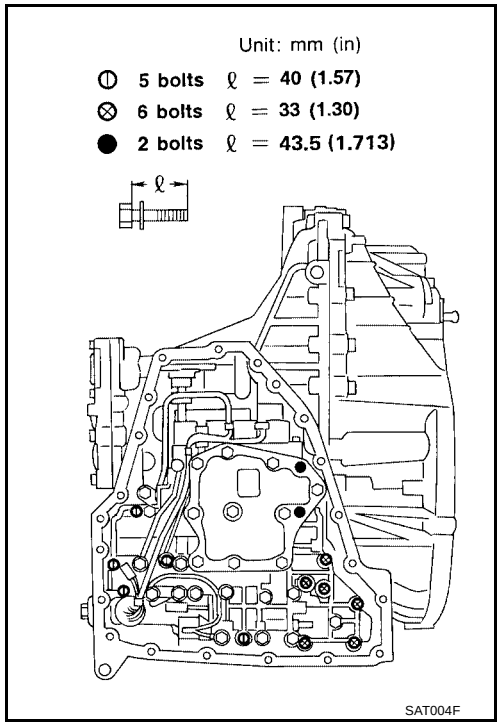


7. Remove oil pan using power tools, and oil pan gasket.
   - **Do not reuse oil pan bolts.**
8. Check foreign materials in oil pan to help determine causes of malfunction. If the fluid is very dark, smells burned, or contains foreign particles, the frictional material (clutches, band) may need replacement. A tacky film that will not wipe clean indicates varnish build up. Varnish can cause valves, servo, and clutches to stick and can inhibit pump pressure.
   - **If frictional material is detected, replace radiator after repair of A/T. Refer to CO-10, "RADIATOR" .**

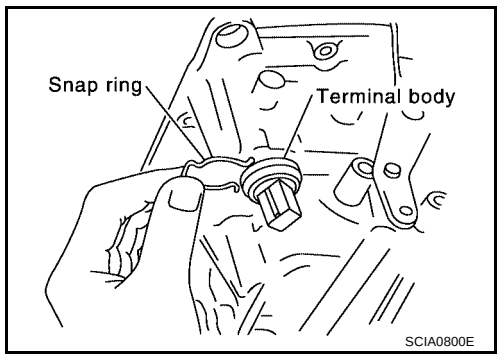


9. Remove control valve assembly according to the following procedures.

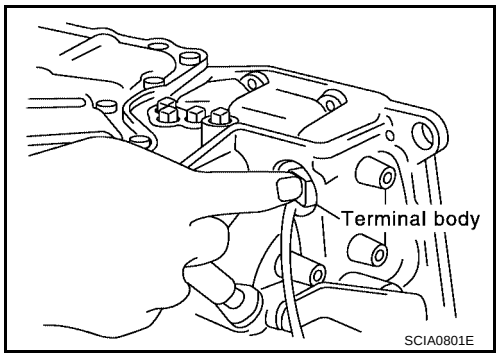
a. Remove control valve assembly mounting bolts **I** , **X** and ●.



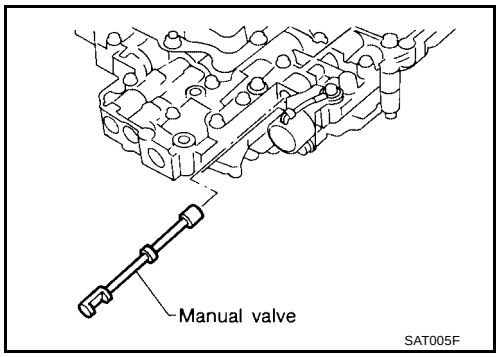
b. Remove snap ring from terminal body.
   - **Do not expand snap ring excessively.**



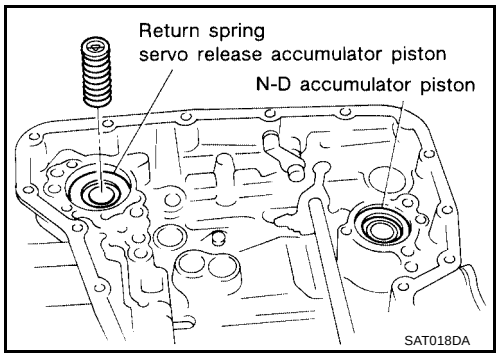
c. Push terminal body into transmission case and draw out terminal cord assembly.



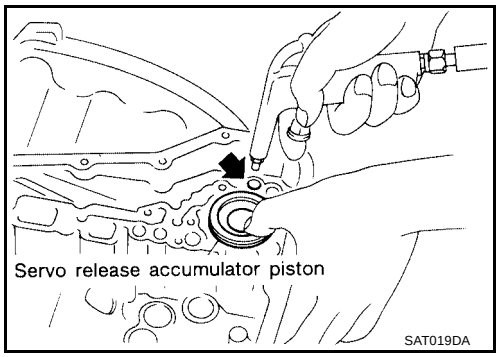
10. Remove manual valve from control valve assembly.



11. Remove return spring from servo release accumulator piston.

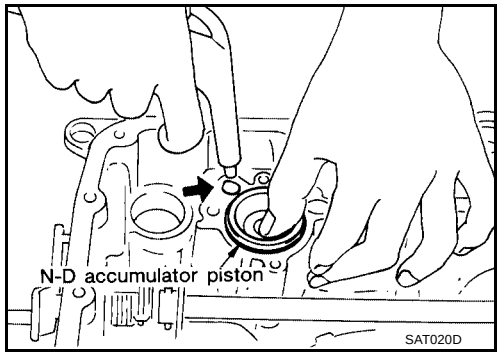


12. Remove servo release accumulator piston with compressed air.

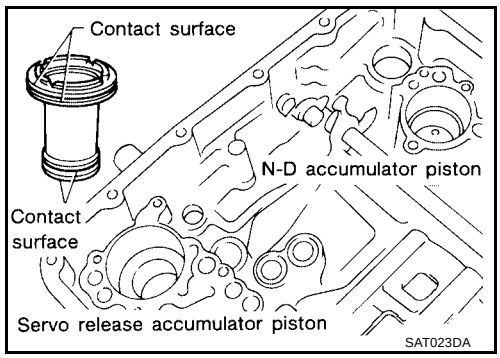


13. Remove O-rings from servo release accumulator piston.

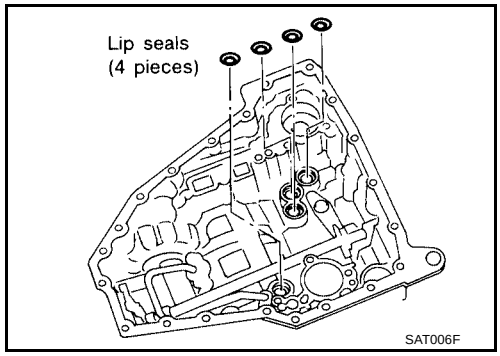
14. Remove N-D accumulator piston and return spring with compressed air.



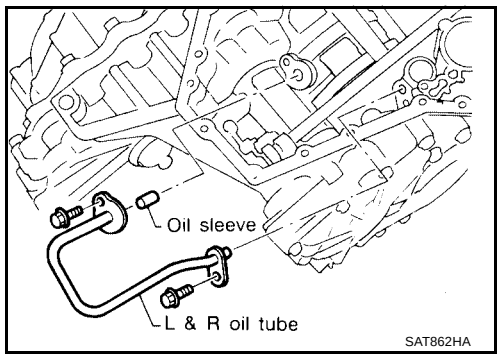
15. Remove O-rings from N-D accumulator piston.
16. Check accumulator pistons and contact surface of transmission case for damage.



17. Check accumulator return springs for damage and free length.
18. Remove lip seals.



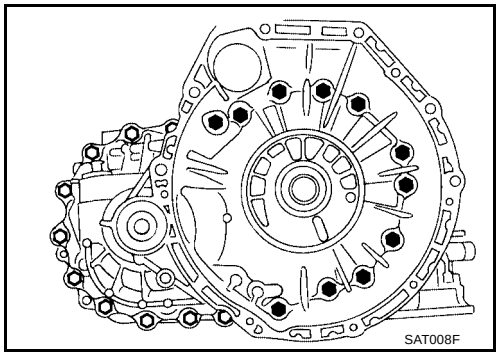
19. Remove L & R oil tube and oil sleeve.



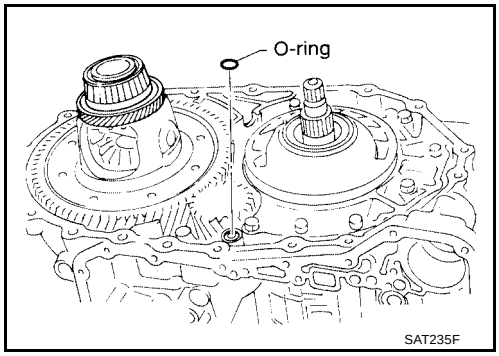
20. Remove converter housing according to the following procedures.

a. Remove converter housing mounting bolts using power tools.

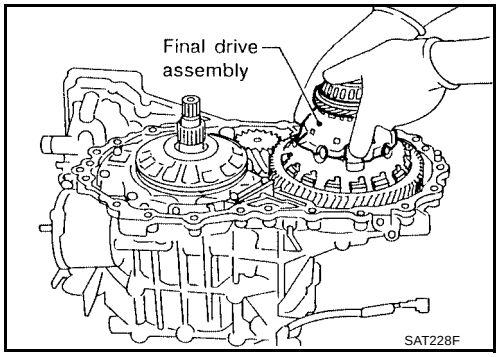
b. Remove converter housing by tapping it lightly.



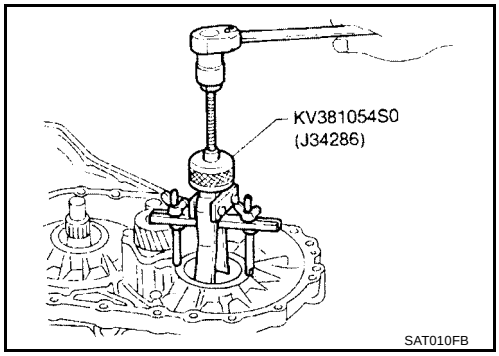
c. Remove O-ring from differential oil port.



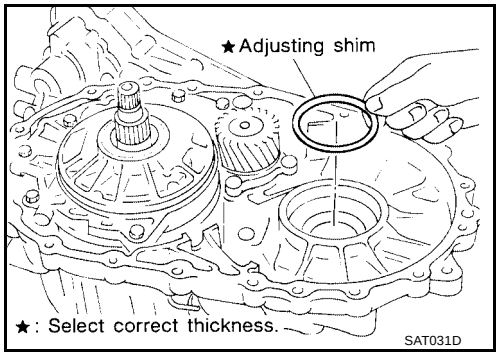
21. Remove final drive assembly from transmission case.



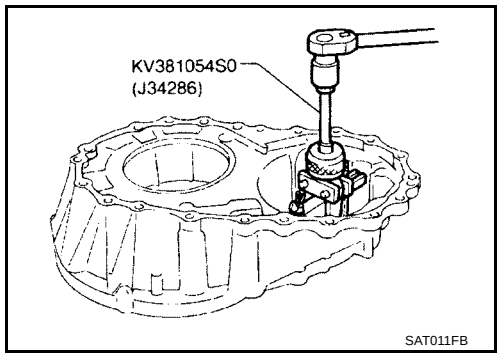
22. Remove differential side bearing outer race and side bearing adjusting shim from transmission case.



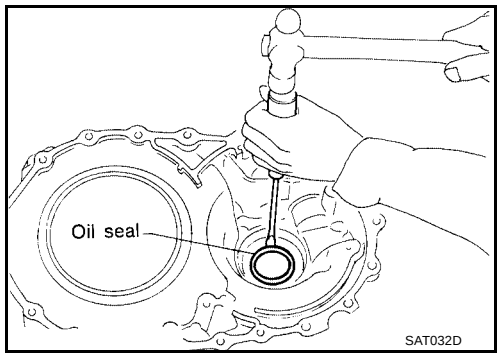
23. Remove differential side bearing adjusting shim from transmission case.



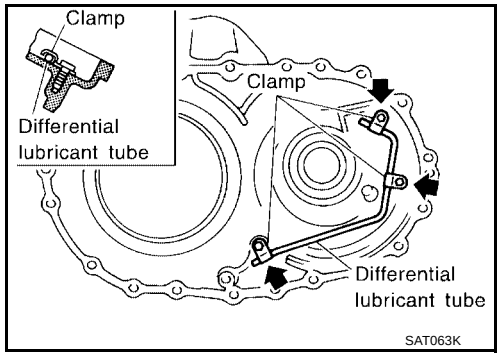
24. Remove differential side bearing outer race from converter housing.



25. Remove oil seal with screwdriver from converter housing.
    - **Be careful not to damage case.**

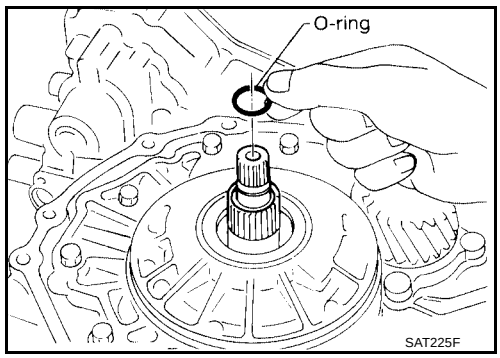


26. Remove differential lubricant tube from converter housing.

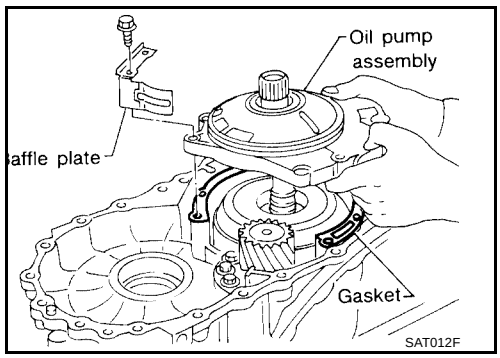


27. Remove oil pump according to the following procedures.

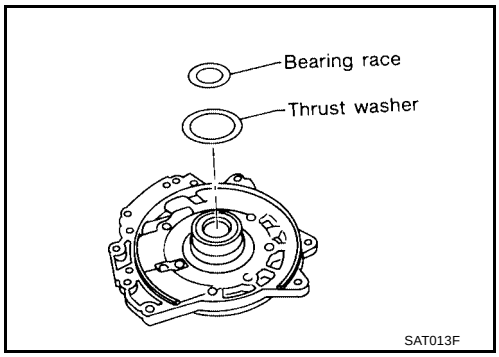
a. Remove O-ring from input shaft.



b. Remove oil pump assembly, baffle plate and gasket from transmission case.



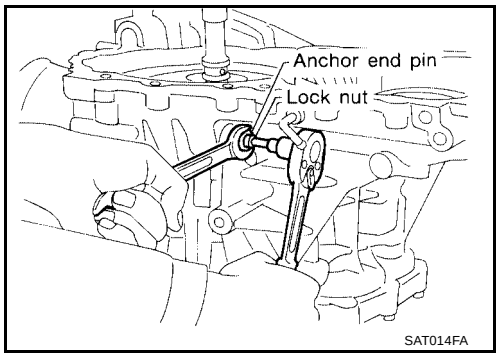
c. Remove thrust washer and bearing race from oil pump assembly.



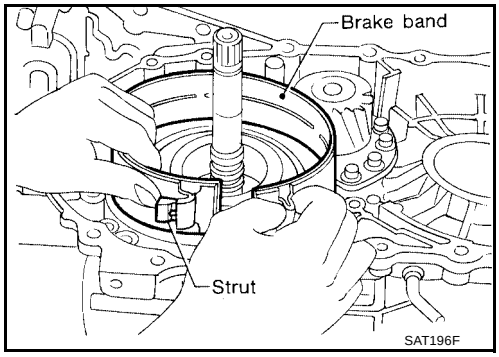
28. Remove brake band according to the following procedures.

a. Loosen lock nut, then back off anchor end pin.

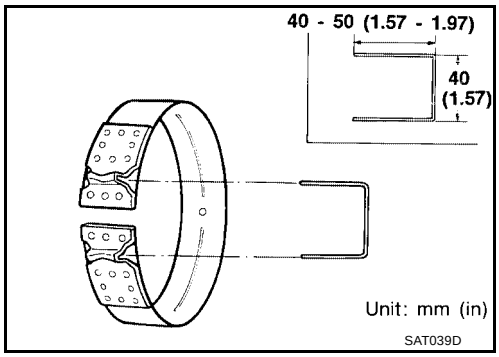
- **Do not reuse anchor end pin.**



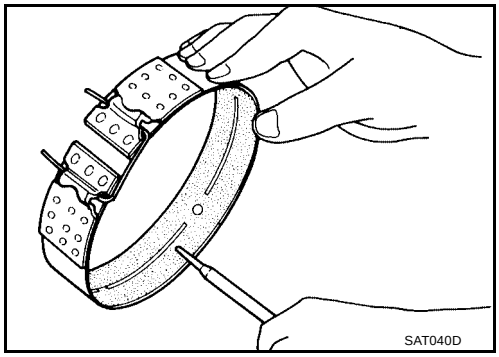
b. Remove brake band and strut from transmission case.



- **To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown in the figure at left.**
  Leave the clip in position after removing the brake band.

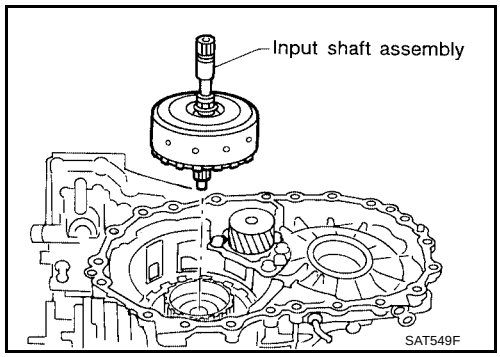


c. Check brake band facing for damage, cracks, wear or burns.

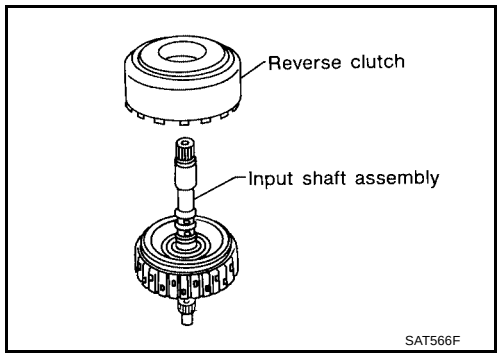


29. Remove input shaft assembly (high clutch) and reverse clutch according to the following procedures.

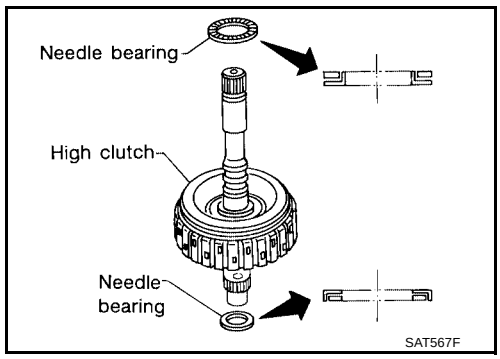
a. Remove input shaft assembly (high clutch) with reverse clutch.



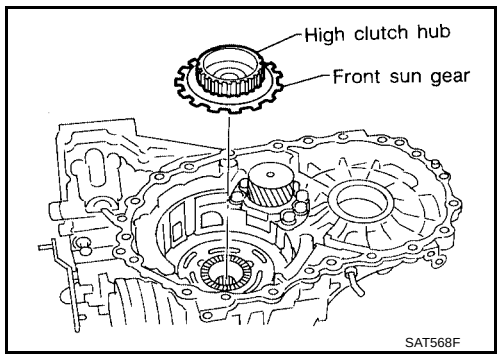
b. Remove input shaft assembly (high clutch) from reverse clutch.



c. Remove needle bearings from high clutch drum and check for damage or wear.

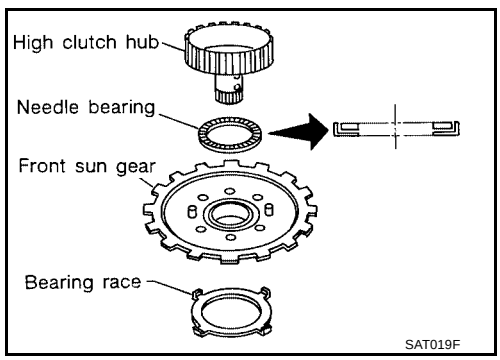


d. Remove high clutch hub and front sun gear from transmission case.

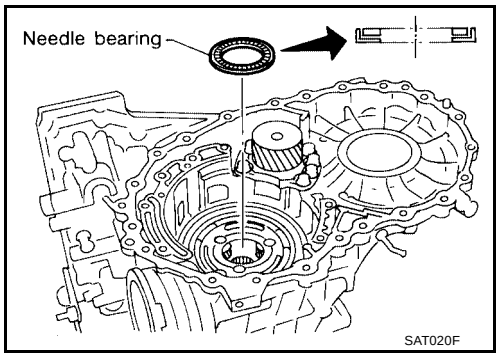


e. Remove front sun gear and needle bearing from high clutch hub and check for damage or wear.

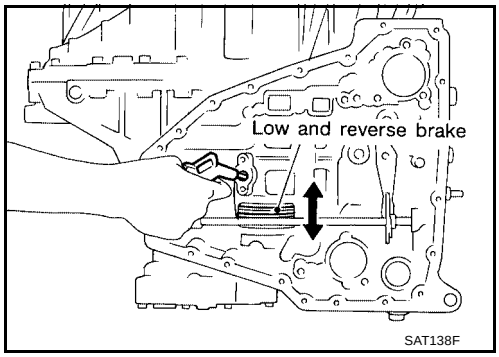
f. Remove bearing race from front sun gear and check for damage or wear.



30. Remove needle bearing from transmission case and check for damage or wear.



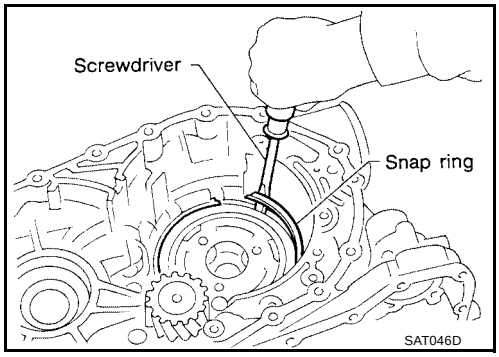
31. Apply compressed air and check to see that low and reverse brake operates.



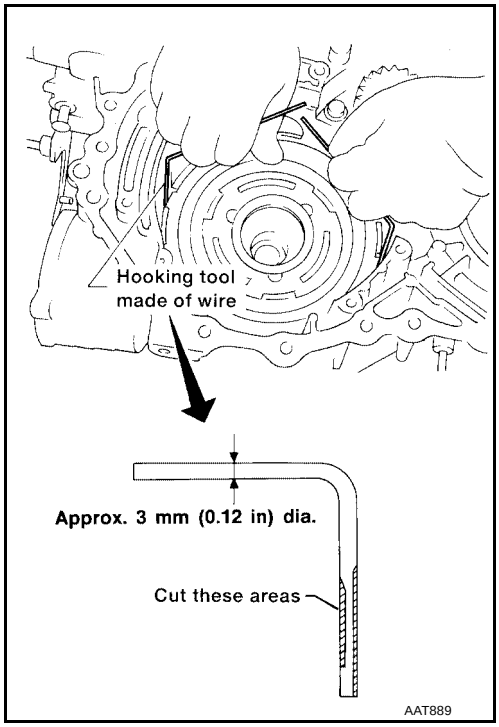
32. Remove low one-way clutch and front planetary carrier assembly according to the following procedures.

a. Remove snap ring with flat-bladed screwdriver.

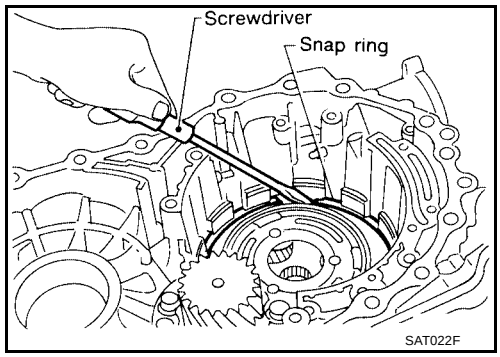
- **Do not expand snap ring excessively.**



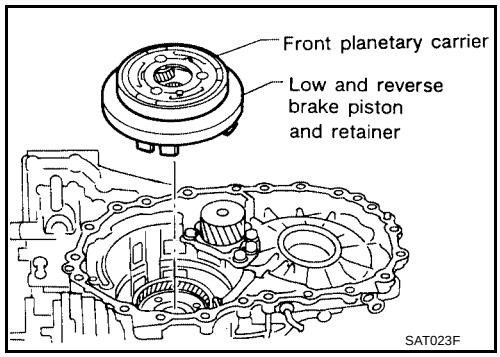
b. Remove low one-way clutch with a hook made of wire.



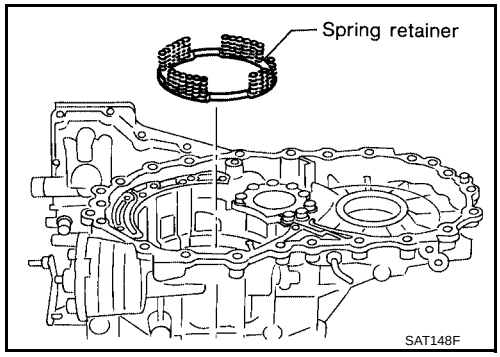
c. Remove snap ring with flat-bladed screwdriver.
   - **Do not expand snap ring excessively.**



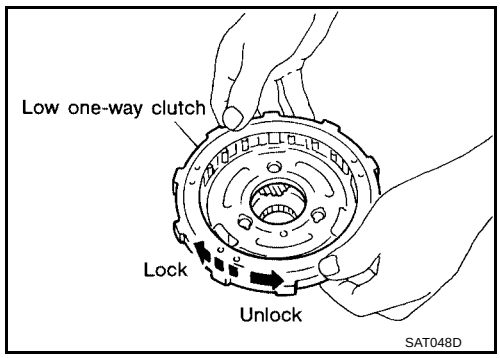
d. Remove front planetary carrier with low and reverse brake piston and retainer.



e. Remove low and reverse brake spring retainer.
   - **Do not remove return springs from spring retainer.**

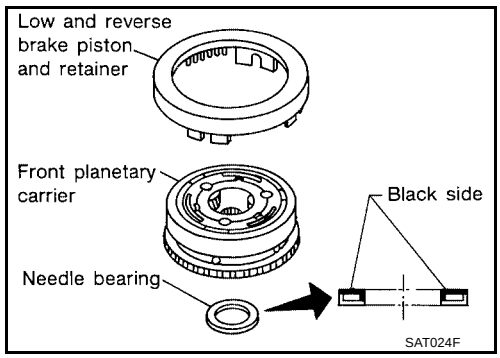


f. Check that low one-way clutch rotates in the direction of the clockwise arrow and locks in the opposite direction.



g. Remove needle bearing, low and reverse brake piston and retainer from front planetary carrier.

h. Check front planetary carrier, low one-way clutch and needle bearing for damage or wear.

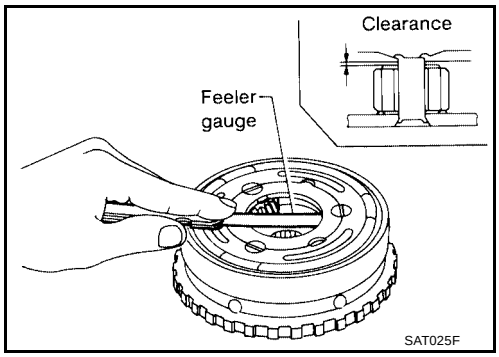


i. Check clearance between planetary gears and planetary carrier with feeler gauge.

Standard clearance : 0.20 - 0.70 mm (0.0079 - 0.0276 in)

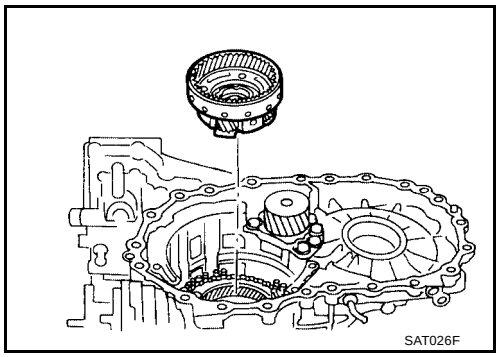
Allowable limit : 0.80 mm (0.0315 in)

Replace front planetary carrier if the clearance exceeds allowable limit.

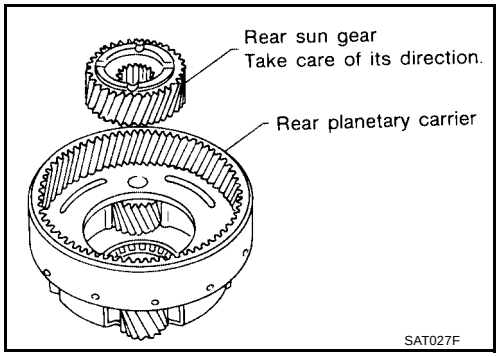


33. Remove rear planetary carrier assembly and rear sun gear according to the following procedures.

a. Remove rear planetary carrier assembly from transmission case.

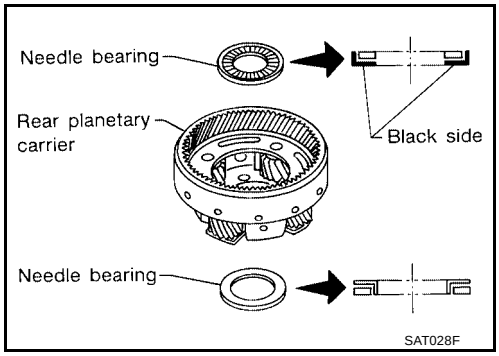


b. Remove rear sun gear from rear planetary carrier.



c. Remove needle bearings from rear planetary carrier assembly.

d. Check rear planetary carrier, rear sun gear and needle bearings for damage or wear.

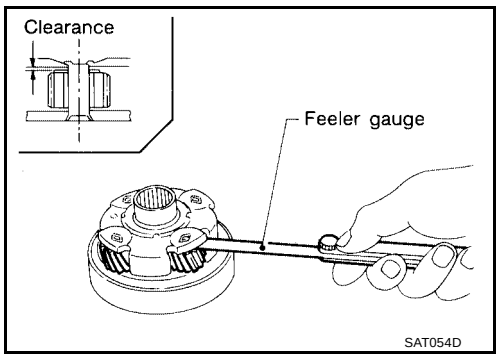


e. Check clearance between pinion washer and rear planetary carrier with feeler gauge.

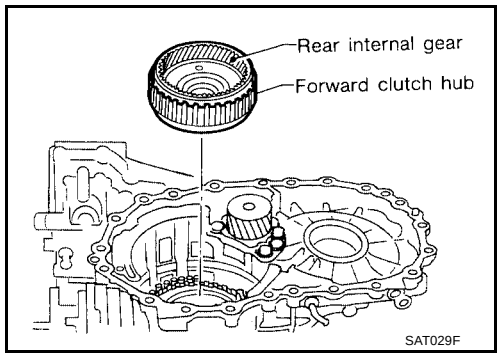
Standard clearance : 0.20 - 0.70 mm (0.0079 - 0.0276 in)

Allowable limit : 0.80 mm (0.0315 in)

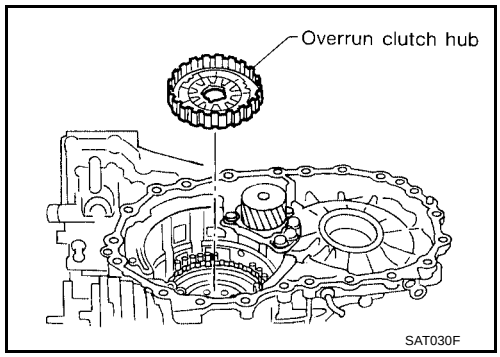
Replace rear planetary carrier if the clearance exceeds allowable limit.



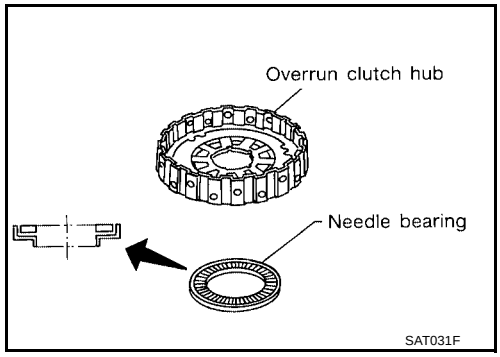
34. Remove rear internal gear and forward clutch hub from transmission case.



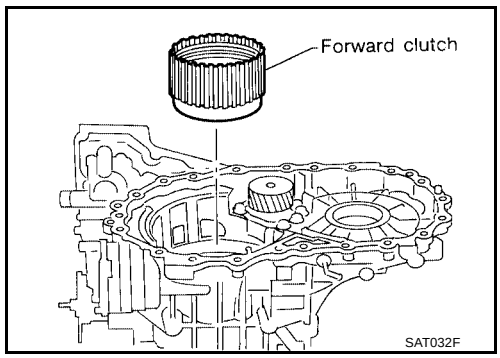
35. Remove overrun clutch hub from transmission case.



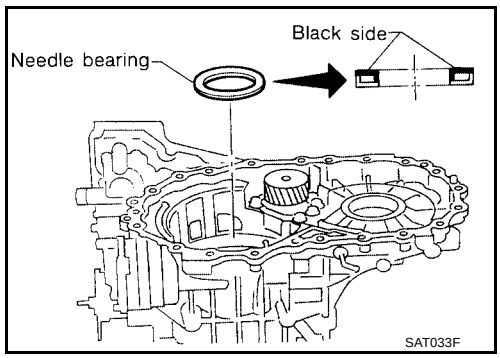
36. Remove needle bearing from overrun clutch hub and check for damage or wear.



37. Remove forward clutch assembly from transmission case.



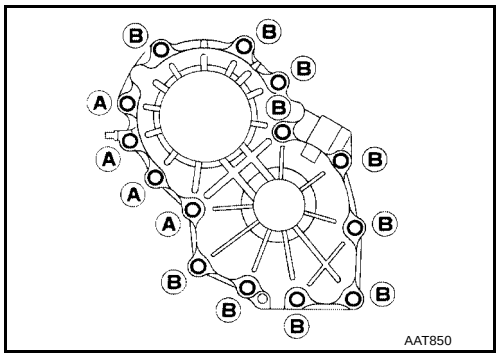
38. Remove needle bearing from transmission case.



39. Remove output shaft assembly according to the following procedures.

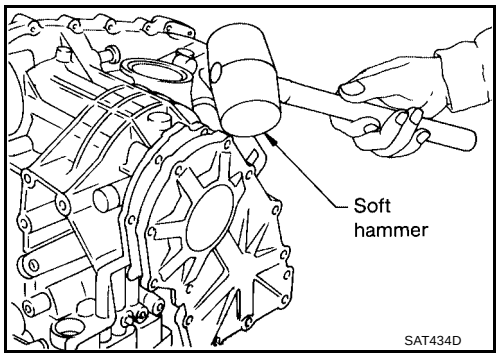
a. Remove side cover bolts.

- **Do not mix bolts A and B.**
- **Always replace bolts A as they are self-sealing bolts.**

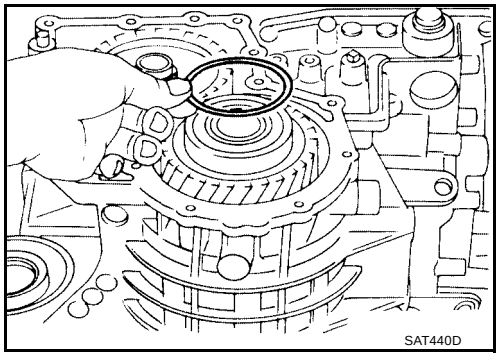


b. Remove side cover by lightly tapping it with a soft hammer.

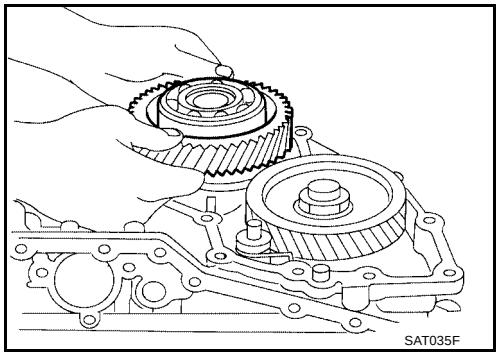
- **Be careful not to drop output shaft assembly. It might come out when removing side cover.**



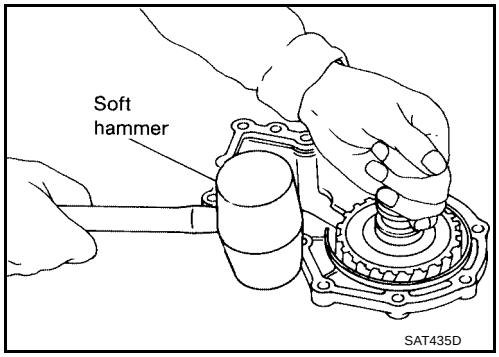
c. Remove adjusting shim.



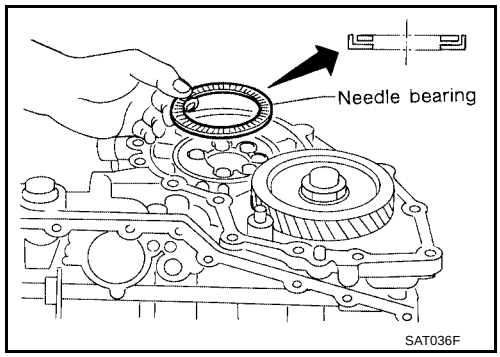
d. Remove output shaft assembly.



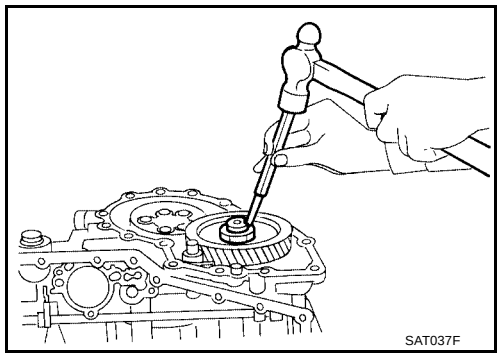
- If output shaft assembly came off with side cover, tap cover with a soft hammer to separate.



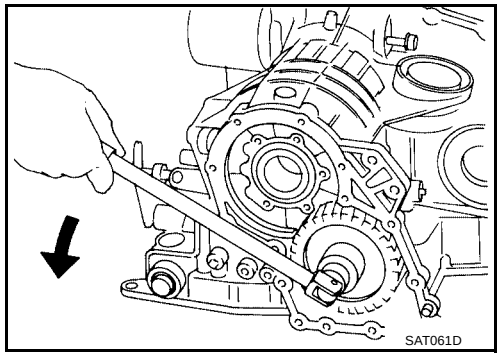
e. Remove needle bearing.



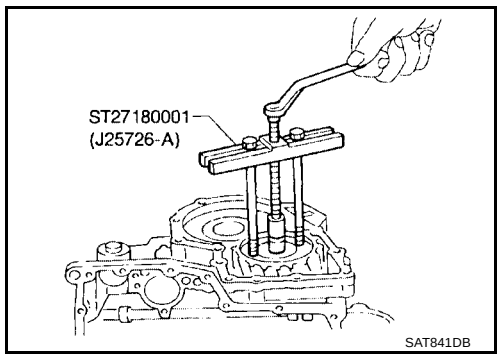
40. Disassemble reduction pinion gear according to the following procedures.
a. Set manual shaft to position P to fix idler gear.
b. Unlock idler gear lock nut using a pin punch.



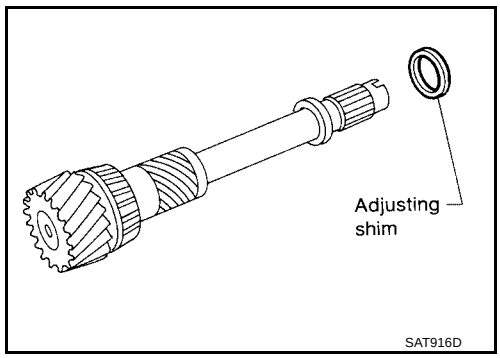
c. Remove idler gear lock nut.
- **Do not reuse idler gear lock nut.**



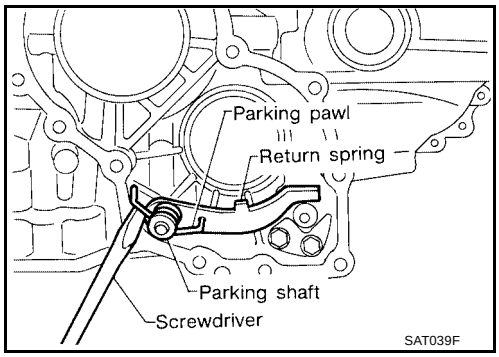
d. Remove idler gear with puller.



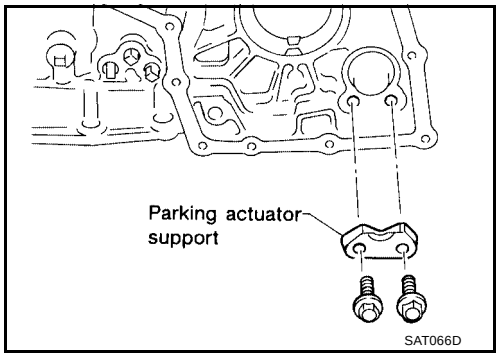
e. Remove reduction pinion gear.
f. Remove adjusting shim from reduction pinion gear.



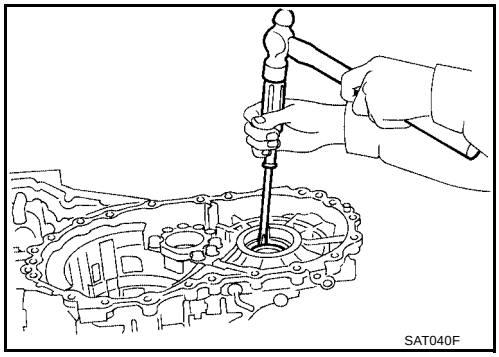
41. Remove return spring from parking shaft with screwdriver.
42. Draw out parking shaft and remove parking pawl from transmission case.
43. Check parking pawl and shaft for damage or wear.



44. Remove parking actuator support from transmission case.
45. Check parking actuator support for damage or wear.



46. Remove side oil seal with screwdriver from transmission case.



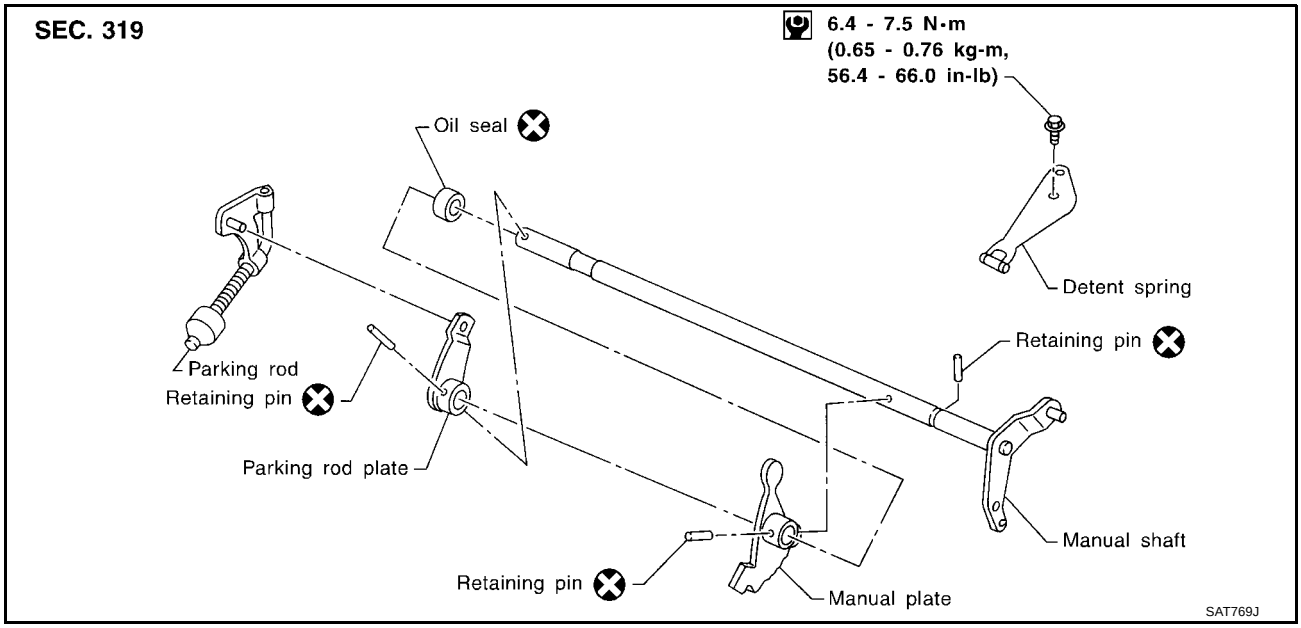
REPAIR FOR COMPONENT PARTS

PFP:00000

Manual Shaft

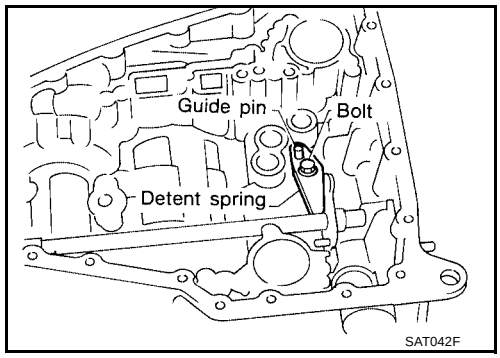
UCS000RM

COMPONENTS

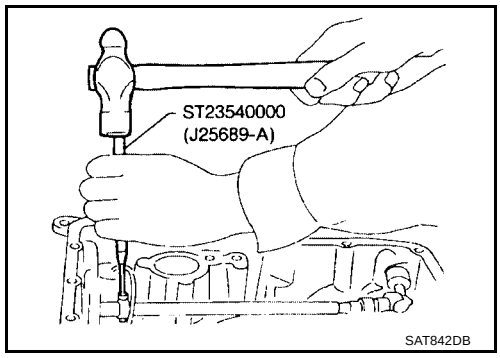


REMOVAL

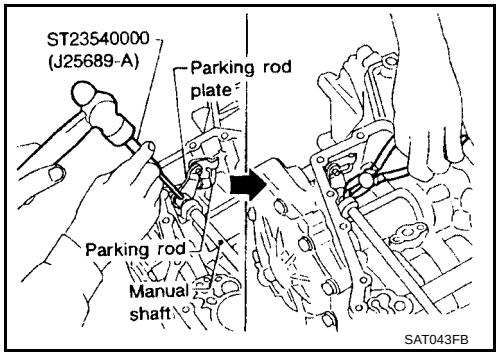
1. Remove detent spring from transmission case.



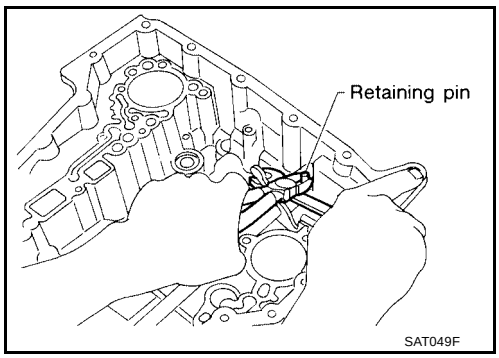
2. Drive out manual plate retaining pin.



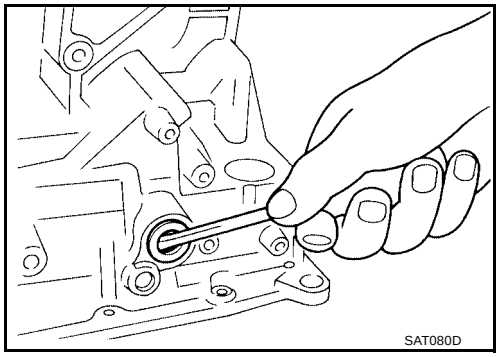
3. Drive and pull out parking rod plate retaining pin.
4. Remove parking rod plate from manual shaft.
5. Draw out parking rod from transmission case.



6. Pull out manual shaft retaining pin.
7. Remove manual shaft and manual plate from transmission case.



8. Remove manual shaft oil seal.

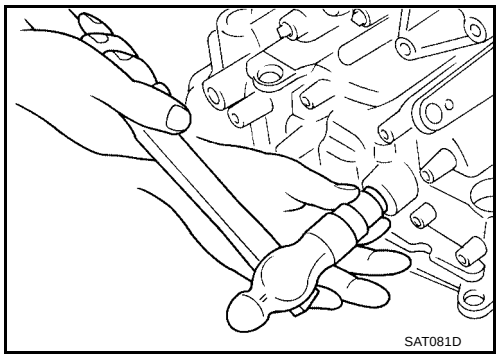


INSPECTION

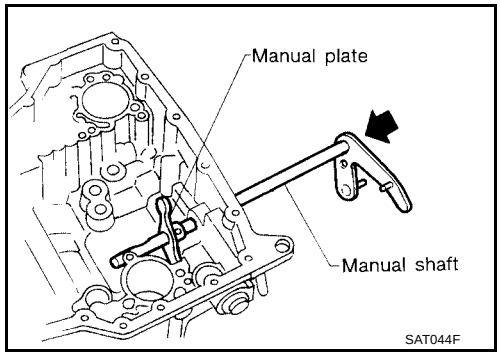
- Check component parts for wear or damage. Replace if necessary.

INSTALLATION

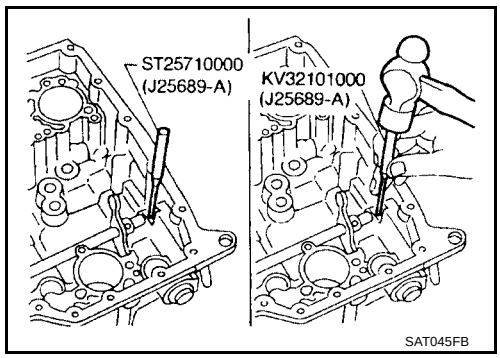
1. Install manual shaft oil seal.
   - **Apply ATF to outer surface of oil seal.**



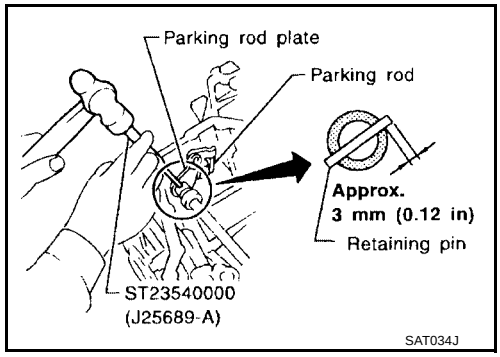
2. Install manual shaft and manual plate.



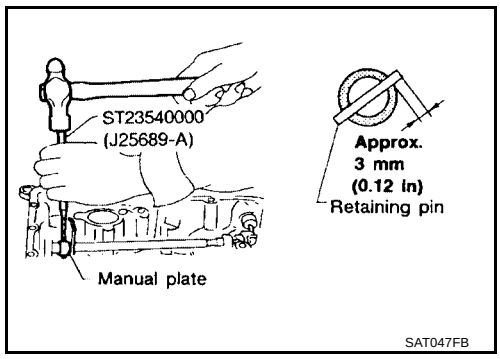
3. Align groove of manual shaft and hole of transmission case.
4. Install manual shaft retaining pin up to bottom of hole.



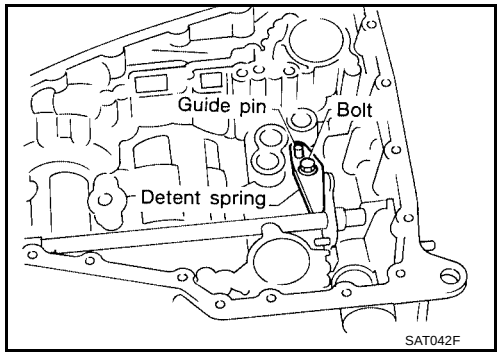
5. Install parking rod to parking rod plate.
6. Set parking rod assembly onto manual shaft and drive retaining pin.
   - **Both ends of pin should protrude.**



7. Drive manual plate retaining pin.
   - **Both ends of pin should protrude.**



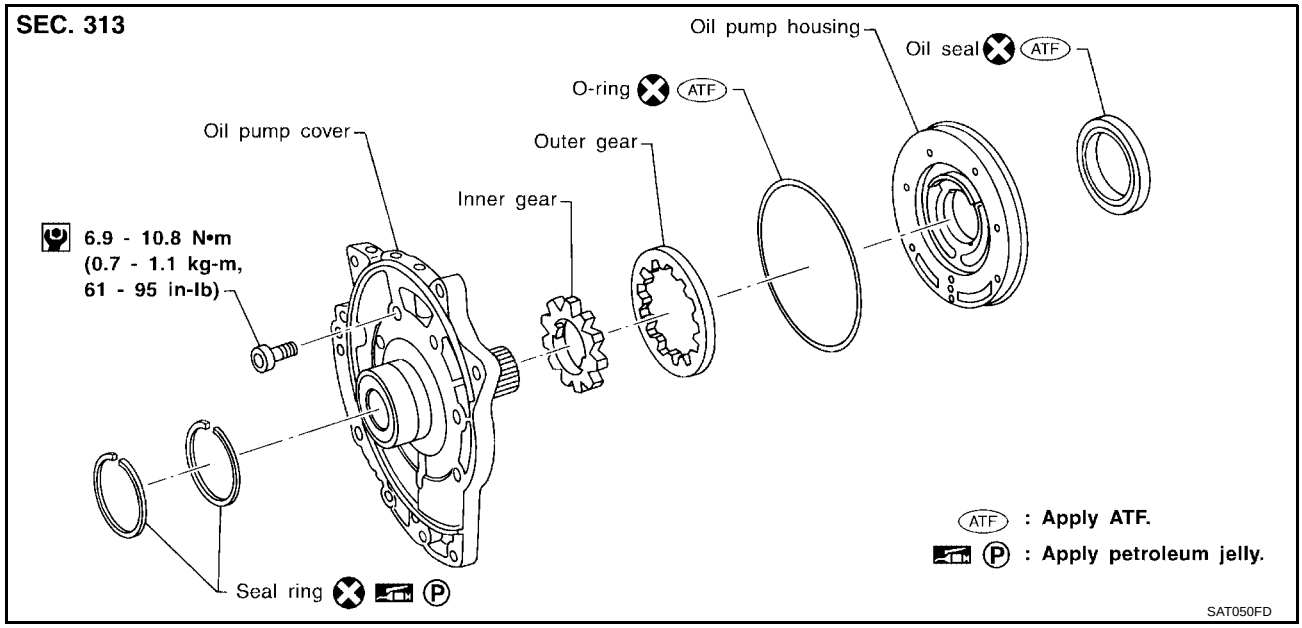
8. Install detent spring. Tighten detent spring bolts to the specified torque. Refer to AT-297, "COMPONENTS" .



Oil Pump

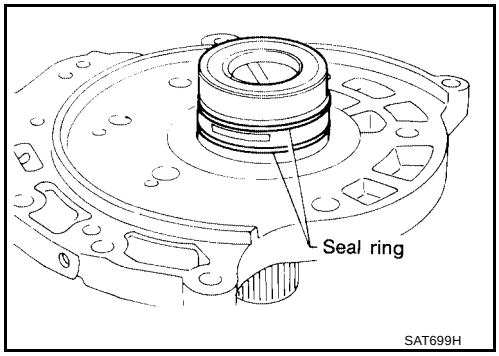
UCS000RN

COMPONENTS

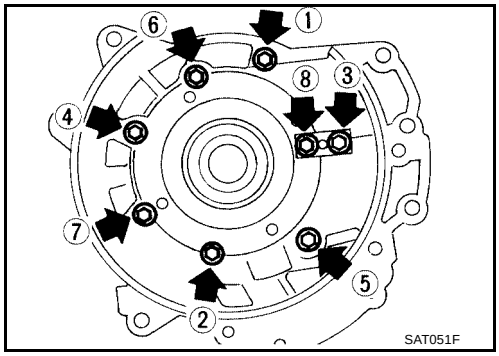


DISASSEMBLY

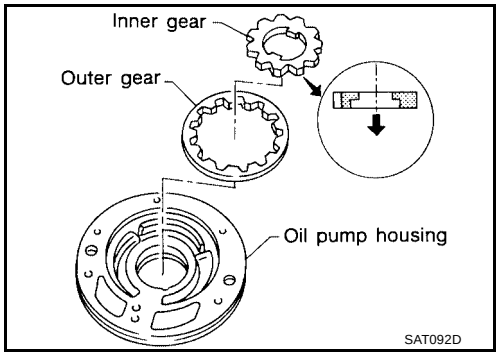
1. Remove seal rings.



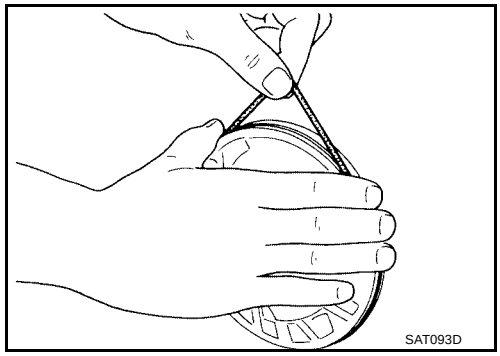
2. Loosen bolts in a crisscross pattern and remove oil pump cover.



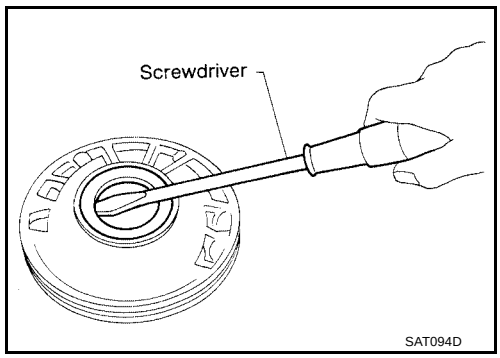
3. Remove inner and outer gear from oil pump housing.



4. Remove O-ring from oil pump housing.



5. Remove oil pump housing oil seal.



INSPECTION

Oil Pump Housing, Oil Pump Cover, Inner Gear and Outer Gear

- Check for wear or damage.

Side Clearances

- Measure side clearance of inner and outer gears in at least four places around each outside edge. Maximum measured values should be within specified positions.

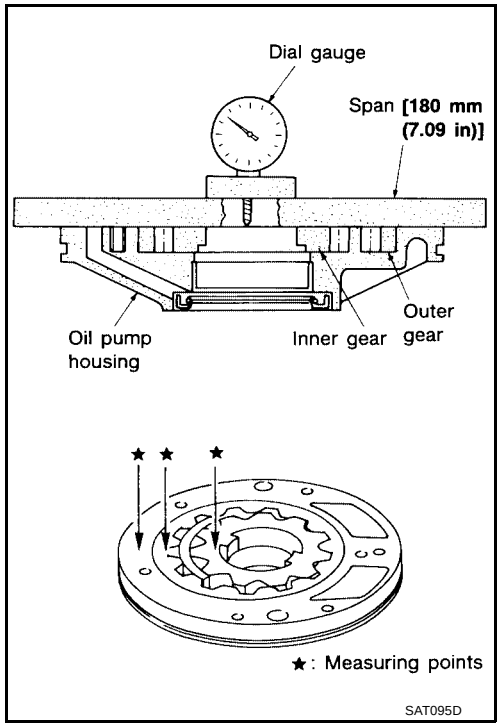
  Standard clearance : 0.030 - 0.050 mm (0.0012 - 0.0020 in)

- If clearance is less than standard, select inner and outer gear as a set so that clearance is within specifications.

  Inner and outer gear:

  Refer to AT-377, "SERVICE DATA AND SPECIFICATIONS (SDS)" .

- If clearance is more than standard, replace whole oil pump assembly except oil pump cover.

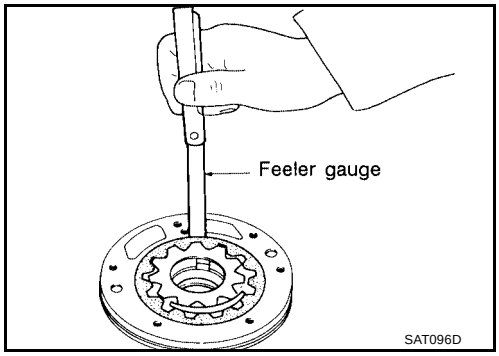


- Measure clearance between outer gear and oil pump housing.

  Standard clearance : **0.111 - 0.181 mm (0.0044 - 0.0071 in)**

  Allowable limit : **0.181 mm (0.0071 in)**

- If not within allowable limit, replace whole oil pump assembly except oil pump cover.



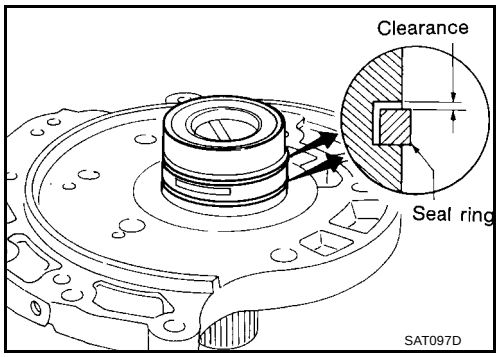
Seal Ring Clearance

- Measure clearance between seal ring and ring groove.

  Standard clearance : **0.1 - 0.25 mm (0.0039 - 0.0098 in)**

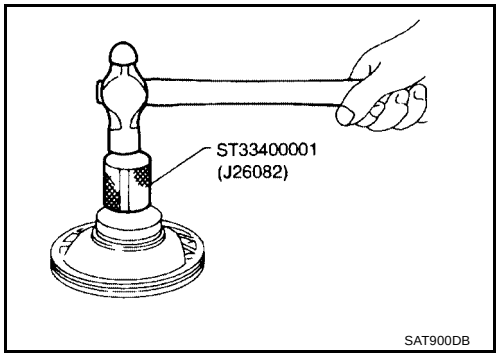
  Allowable limit : **0.25 mm (0.0098 in)**

- If not within allowable limit, replace oil pump cover assembly.

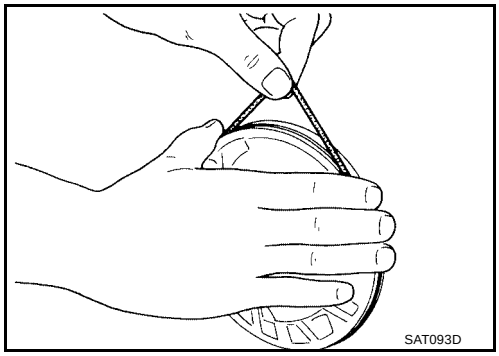


ASSEMBLY

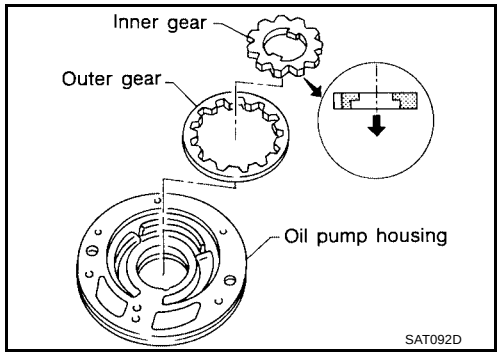
1. Install oil seal on oil pump housing.



2. Install O-ring on oil pump housing.
   - **Apply ATF to O-ring.**



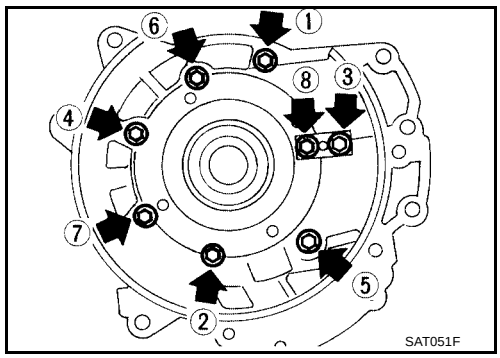
3. Install inner and outer gears on oil pump housing.
   - **Be careful of direction of inner gear.**



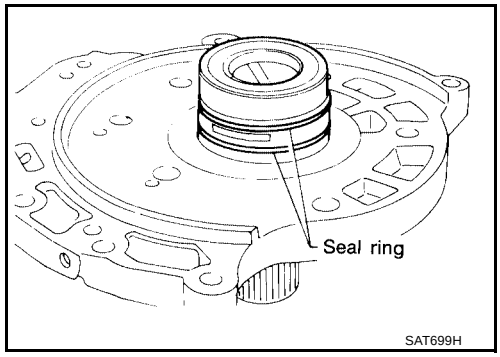
4. Install oil pump cover on oil pump housing.

a. Wrap masking tape around splines of oil pump cover assembly to protect seal. Position oil pump cover assembly on oil pump housing assembly, then remove masking tape.

b. Tighten bolts in a crisscross pattern. Tighten oil pump cover bolts to the specified torque. Refer to AT-300, "COMPONENTS" .



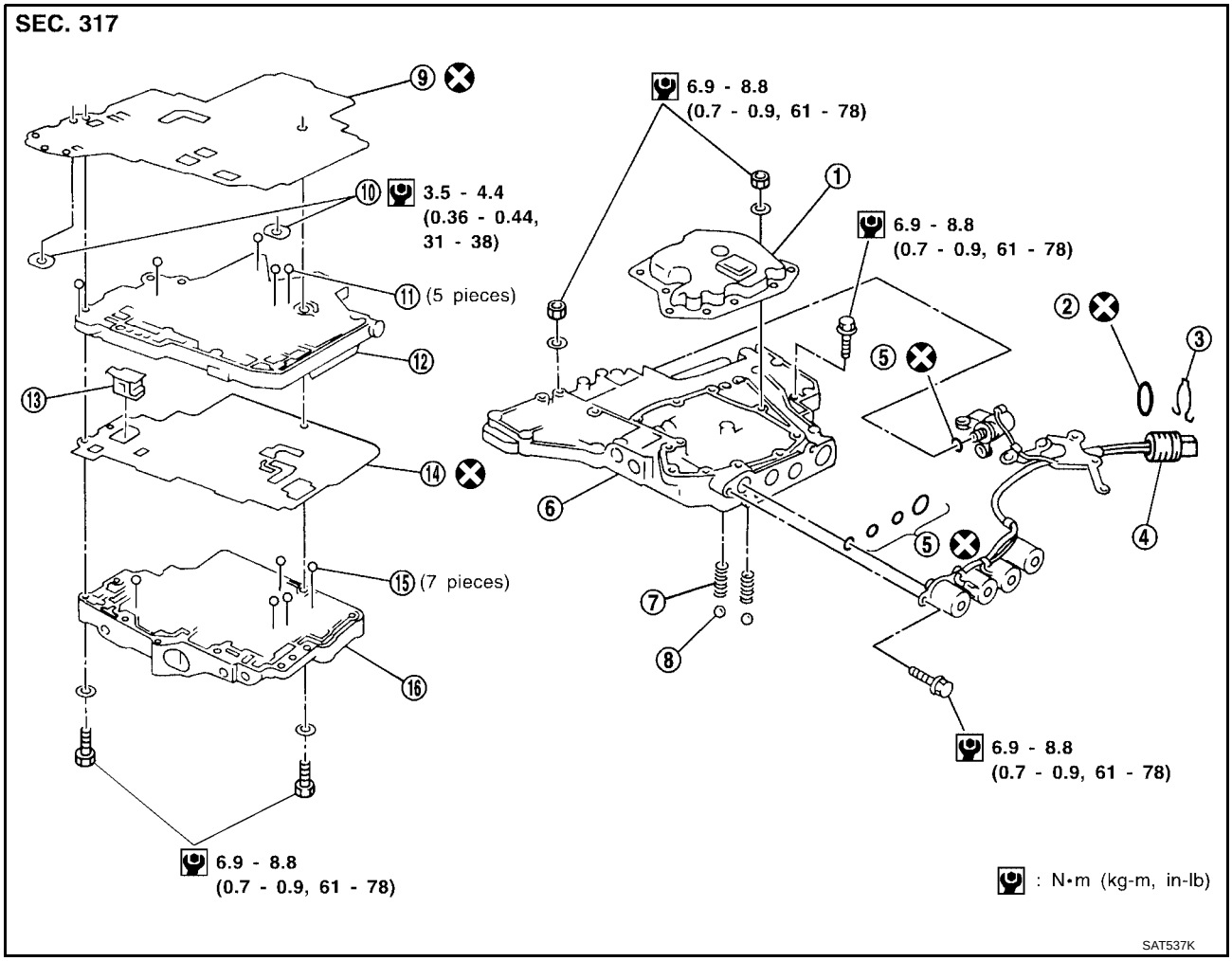
5. Install new seal rings carefully after packing ring groove with petroleum jelly.
   - **Do not spread gap of seal ring excessively while installing. The ring may be deformed.**



Control Valve Assembly

UCS000RO

COMPONENTS



1. Oil strainer
2. O-ring
3. Snap ring
4. Terminal body
5. O-rings
6. Control valve lower body
7. Oil cooler relief valve spring
8. Check ball
9. Separating plate
10. Support plate
11. Steel ball
12. Control valve inter body
13. Pilot filter
14. Separating plate
15. Steel ball
16. Control valve upper body

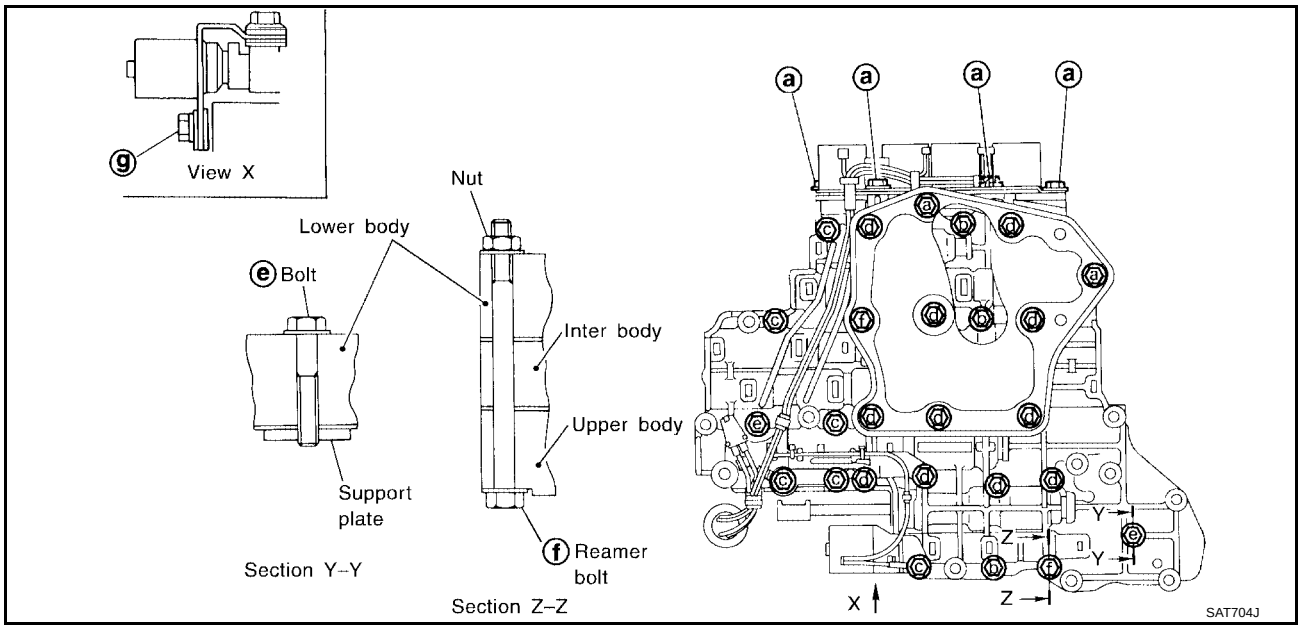
DISASSEMBLY

Disassemble upper, inter and lower bodies.

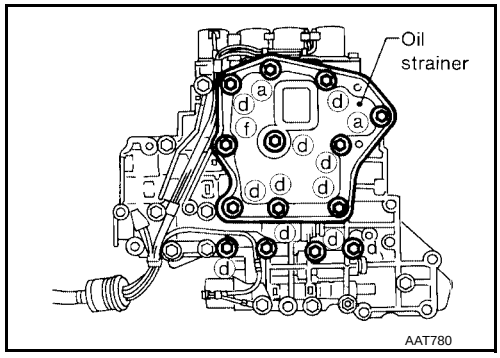
Bolt length, number and location:

Bolt symbol	a	b	c	d	e	f	g
Bolt length "ℓ" mm (in) 	13.5 (0.531)	58.0 (2.283)	40.0 (1.575)	66.0 (2.598)	33.0 (1.299)	78.0 (3.071)	18.0 (0.709)
Number of bolts	6	3	6	11	2	2	1

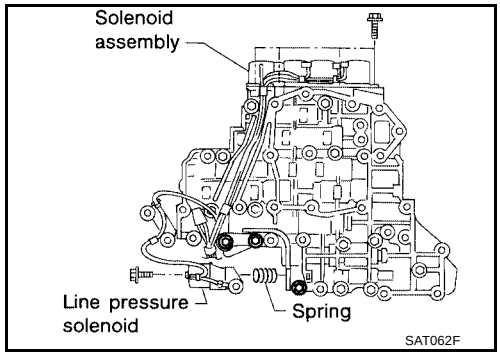
f: Reamer bolt and nut.



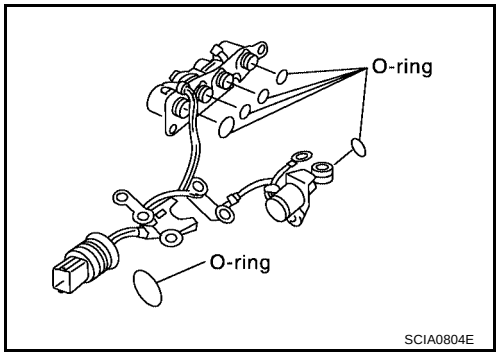
1. Remove bolts **a** , **d** and nut **f** and remove oil strainer from control valve assembly.



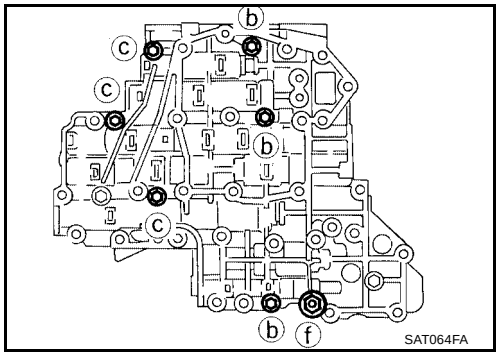
2. Remove solenoid valve assembly and line pressure solenoid valve from control valve assembly.



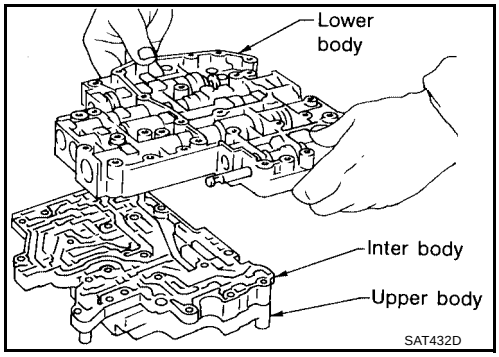
3. Remove O-rings from solenoid valves and terminal body.



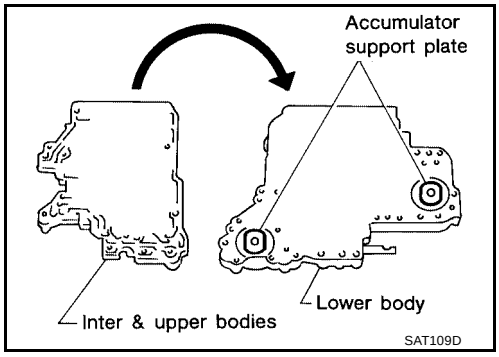
4. Place upper body facedown, and remove bolts **b** , **c** and nut **f** .



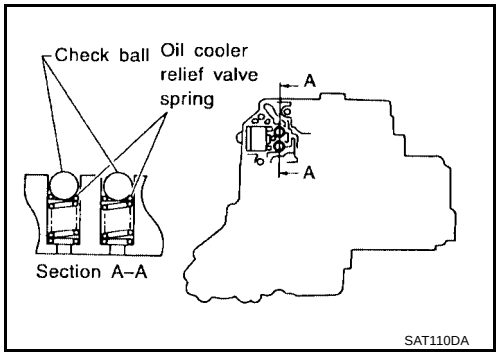
5. Remove inter body from lower body.



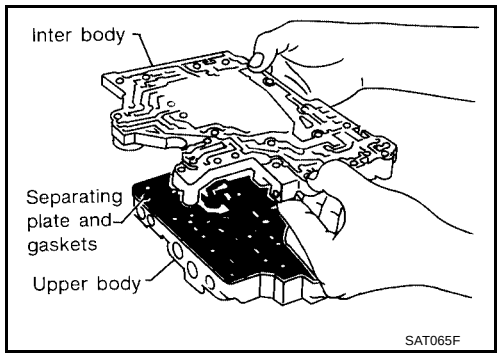
6. Turn over lower body, and remove accumulator support plate.



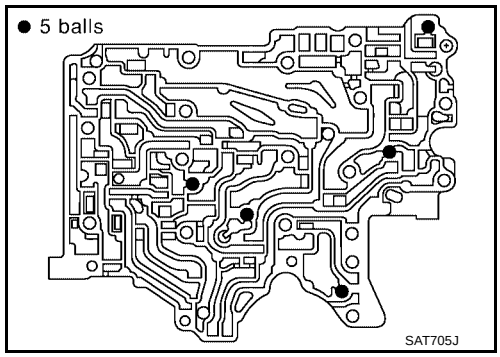
7. Remove bolts **e** , separating plate and separating gasket from lower body.
8. Remove check balls and oil cooler relief valve springs from lower body.
   - **Be careful not to lose check balls and oil cooler relief valve springs.**



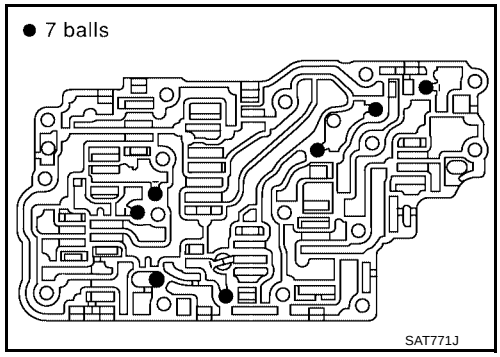
9. Remove inter body from upper body.



10. Check to see that steel balls are properly positioned in inter body and then remove them.
    - **Be careful not to lose steel balls.**



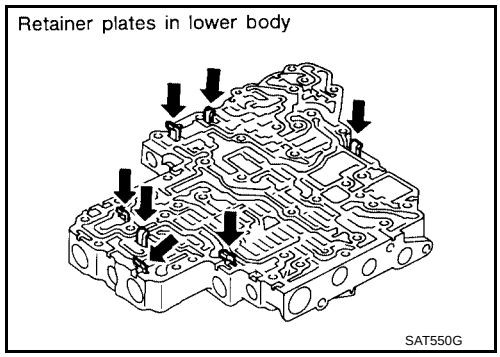
11. Check to see that steel balls are properly positioned in upper body and then remove them.
    - **Be careful not to lose steel balls.**



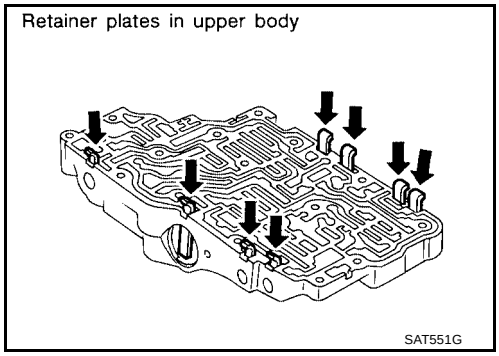
INSPECTION

Lower and Upper Bodies

- Check to see that retainer plates are properly positioned in lower body.



- Check to see that retainer plates are properly positioned in upper body.
- **Be careful not to lose these parts.**

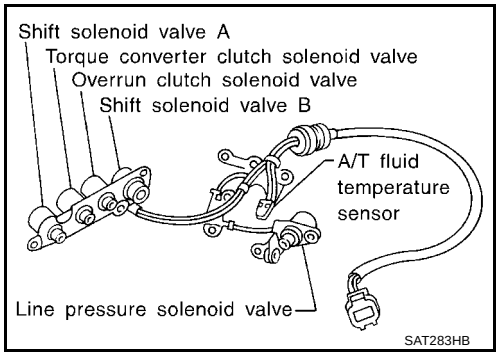


Oil Strainer

- Check wire netting of oil strainer for damage.

Shift Solenoid Valves “A” and “B”, Line Pressure Solenoid Valve, Torque Converter Clutch Solenoid Valve and Overrun Clutch Solenoid Valve

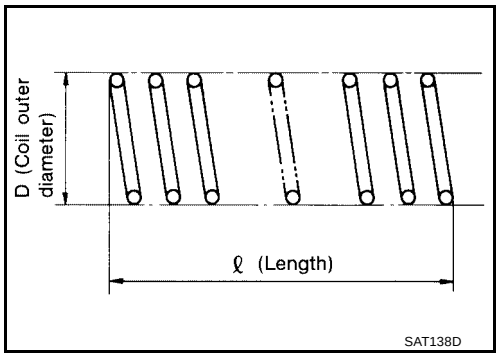
- Measure resistance.
- For shift solenoid valve A, refer to AT-170, "Diagnostic Procedure" .
- For shift solenoid valve B, refer to AT-175, "Diagnostic Procedure" .
- For line pressure solenoid valve, refer to AT-164, "Diagnostic Procedure" .
- For torque converter clutch solenoid valve, refer to AT-151, "Diagnostic Procedure" .
- For overrun clutch solenoid valve, refer to AT-186, "Diagnostic Procedure" .



Oil Cooler Relief Valve Spring

- Check springs for damage or deformation.
- Measure free length and outer diameter.

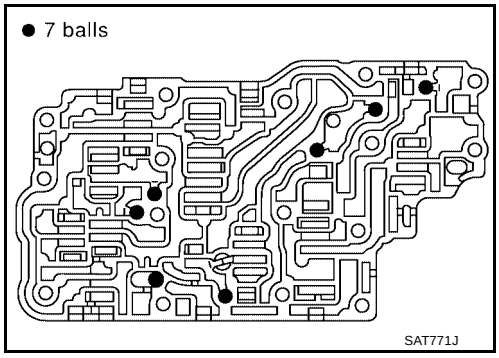
Inspection standard **: Refer to AT-378, "Control Valves" .**



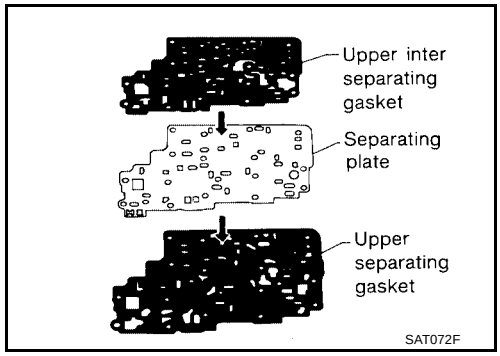
ASSEMBLY

1. Install upper, inter and lower body.

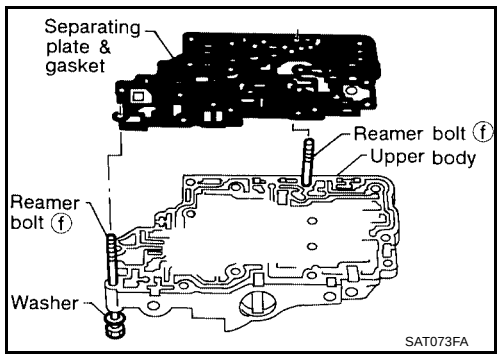
a. Place oil circuit of upper body face up. Install steel balls in their proper positions.



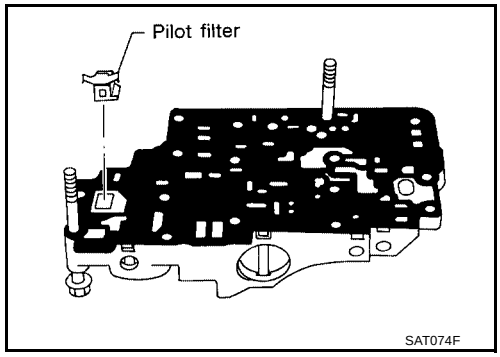
b. Install upper separating gasket, upper inter separating gasket and upper separating plate in order shown in illustration.



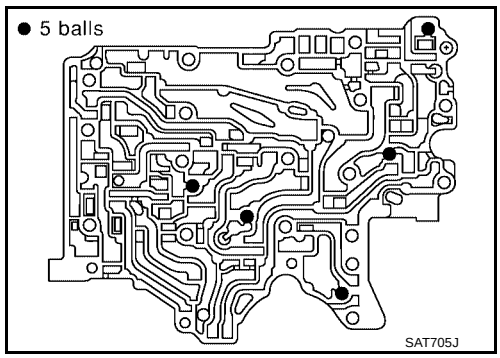
c. Install reamer bolts **f** from bottom of upper body. Using reamer bolts as guides, install separating plate and gaskets as a set.



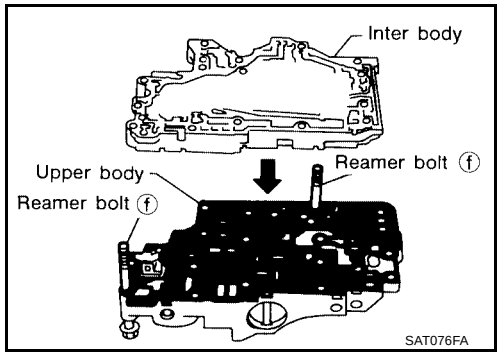
d. Install pilot filter.



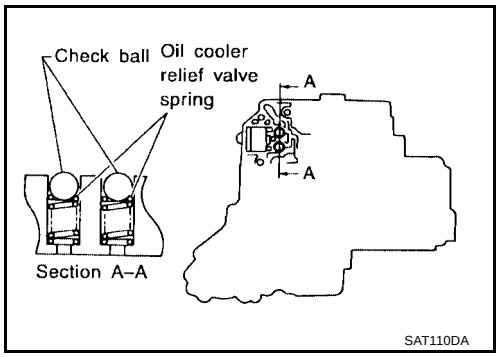
e. Place lower body as shown in illustration (side of inter body face up). Install steel balls in their proper positions.



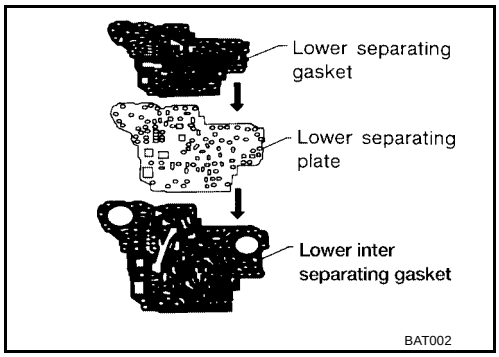
f. Install inter body on upper body using reamer bolts **f** as guides.
- **Be careful not to dislocate or drop steel balls.**



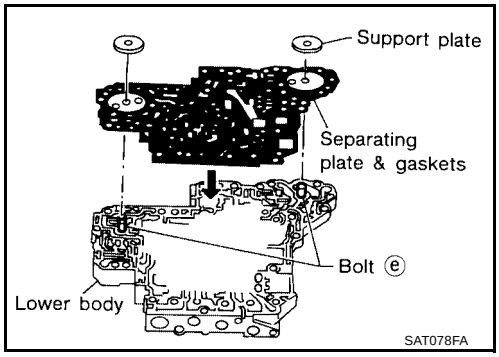
g. Install check balls and oil cooler relief valve springs in their proper positions in lower body.



h. Install lower separating gasket, lower inter separating gasket and lower separating plate in order shown in illustration.

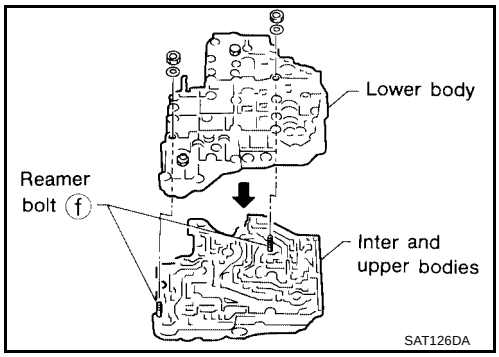


i. Install bolts **e** from bottom of lower body. Using bolts **e** as guides, install separating plate and gaskets as a set.

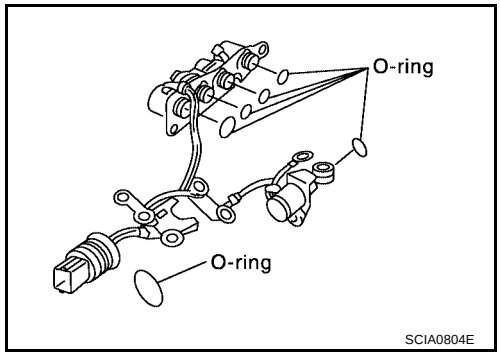


j. Temporarily install support plates on lower body.

k. Install lower body on inter body using reamer bolts **f** as guides and tighten reamer bolts **f** slightly.



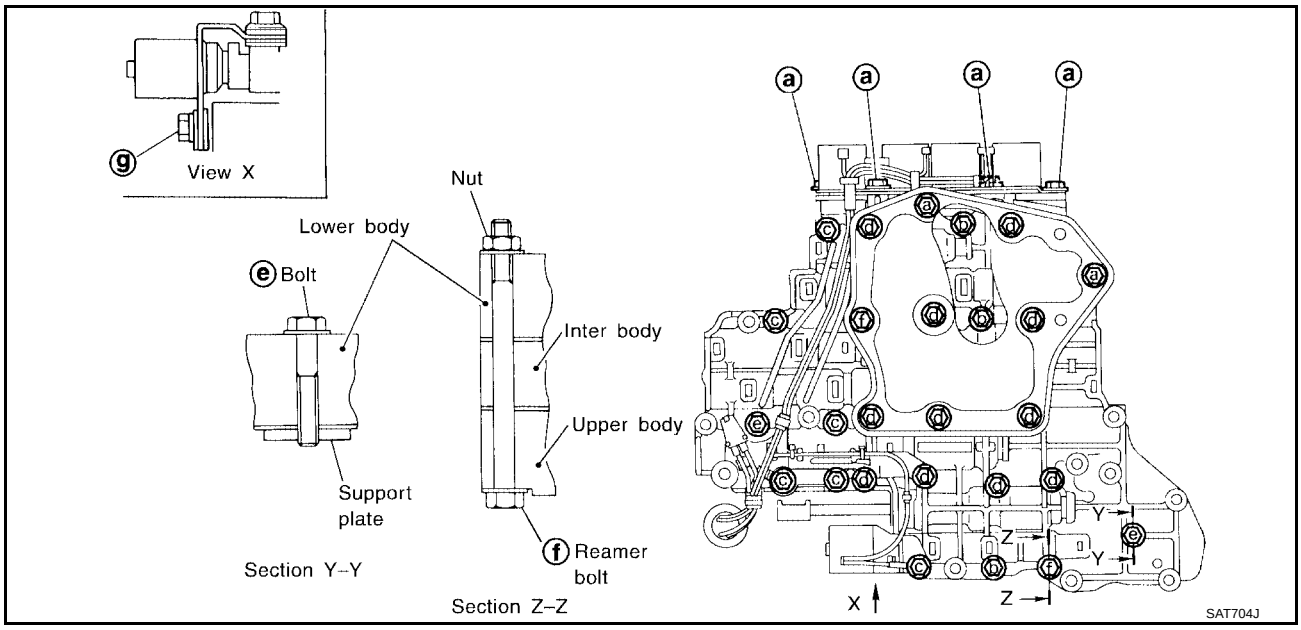
2. Install O-rings to solenoid valves and terminal body.
   - **Apply ATF to O-rings.**



3. Install and tighten bolts.

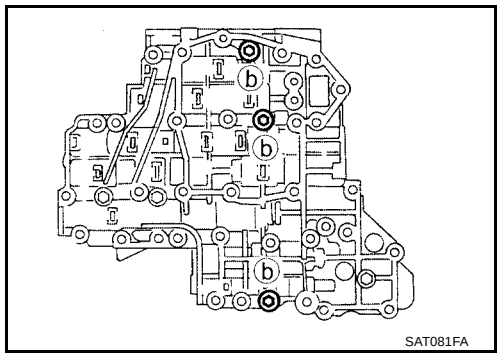
Bolt length, number and location:

Bolt symbol	a	b	c	d	e	f	g
Bolt length "ℓ" mm (in) 	13.5 (0.531)	58.0 (2.283)	40.0 (1.575)	66.0 (2.598)	33.0 (1.299)	78.0 (3.071)	18.0 (0.709)
Number of bolts	6	3	6	11	2	2	1

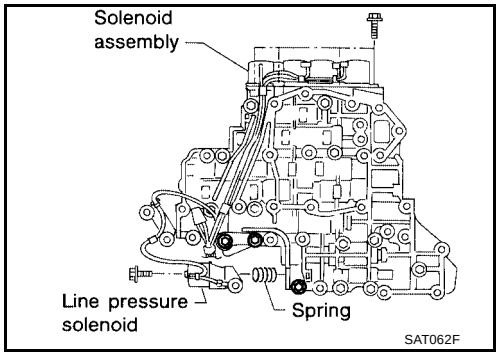


a. Install and tighten bolts **b** to specified torque.

: **7 - 9 N-m (0.7 - 0.9 kg-m, 61 - 78 in-lb)**

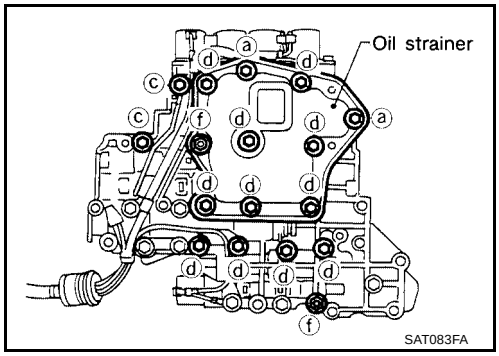


b. Install solenoid valve assembly and line pressure solenoid valve to lower body.



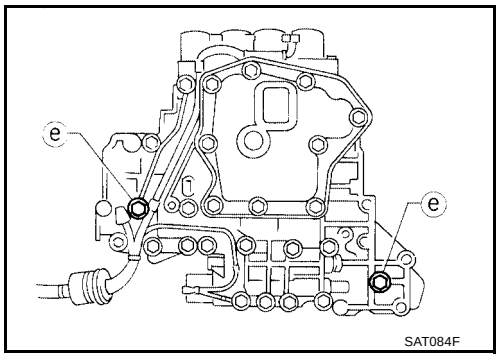
c. Set oil strainer, then tighten bolts **a** , **c** , **d** and nuts **f** to specified torque.

: 7 - 9 N-m (0.7 - 0.9 kg-m, 61 - 78 in-lb)



d. Tighten bolts **e** to specified torque.

: 3.4 - 4.4 N-m (0.35 - 0.45 kg-m, 30.4 - 39.1 in-lb)



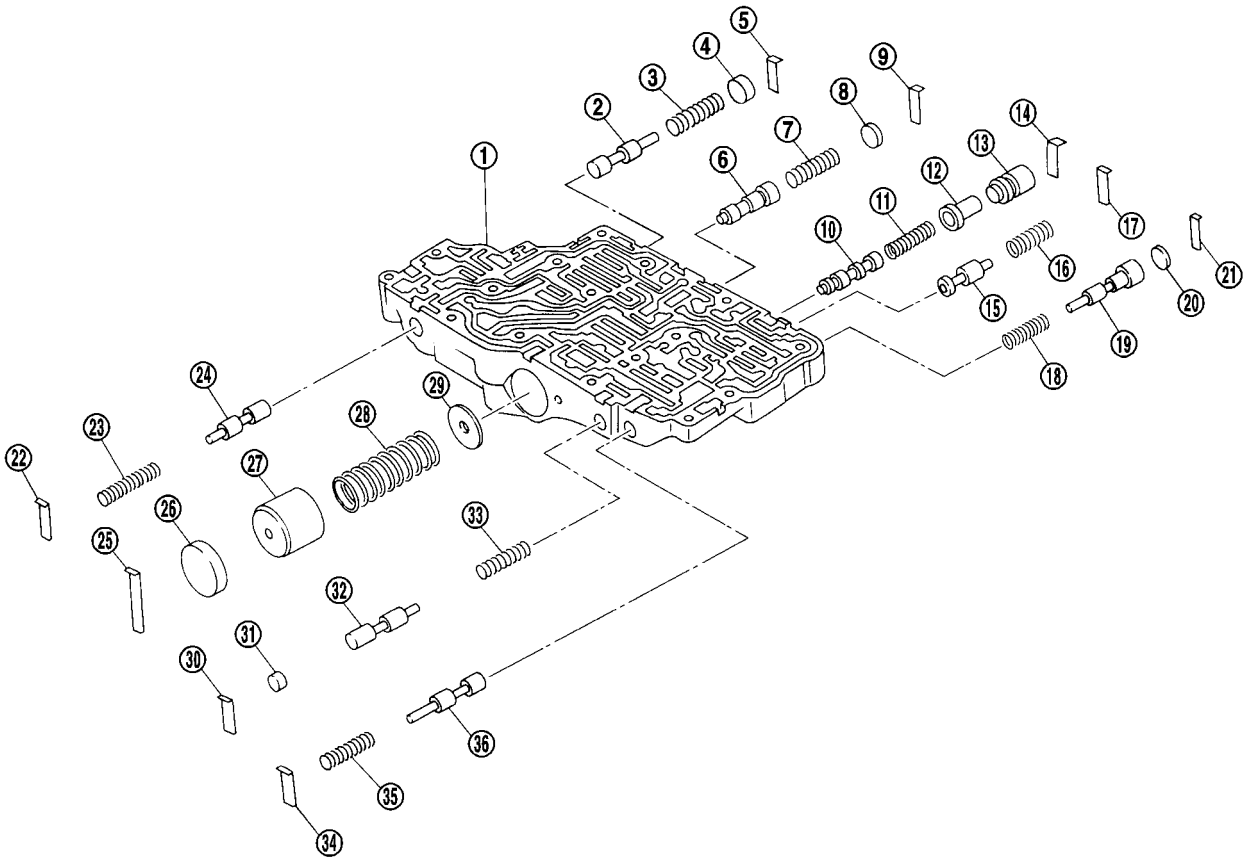
Control Valve Upper Body

UCS000RP

COMPONENTS

Apply ATF to all components before installation.

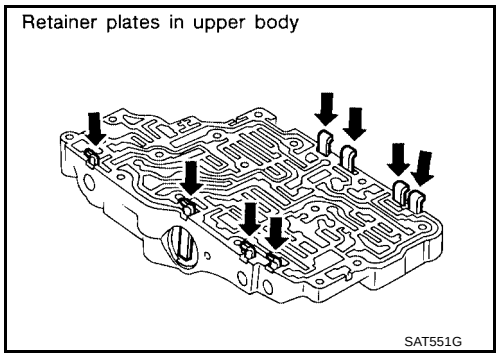
SEC. 317



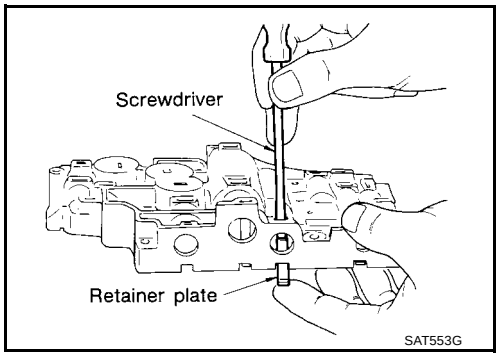
1. Upper body	2. Cooler check valve	3. Return spring
4. Plug	5. Retainer plate	6. 1-2 accumulator valve
7. Return spring	8. Plug	9. Retainer plate
10. Torque converter clutch control valve	11. Return spring	12. Torque converter clutch control plug
13. Torque converter clutch control sleeve	14. Retainer plate	15. Torque converter relief valve
16. Return spring	17. Retainer plate	18. Return spring
19. Overrun clutch reducing valve	20. Plug	21. Retainer plate
22. Retainer plate	23. Return spring	24. Pilot valve
25. Retainer plate	26. Plug	27. 1-2 accumulator piston
28. Return spring	29. 1-2 accumulator retainer plate	30. Retainer plate
31. Plug	32. 1st reducing valve	33. Return spring
34. Retainer plate	35. Return spring	36. 3-2 timing valve

DISASSEMBLY

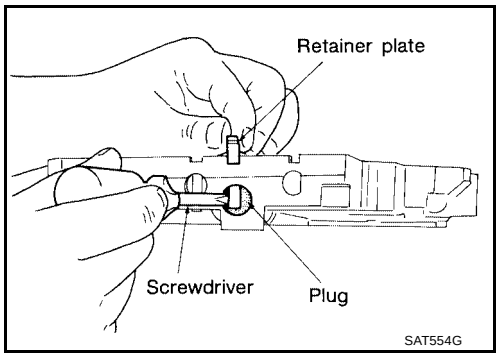
1. Remove valves at retainer plates.
   - **Do not use a magnetic pick-up tool.**



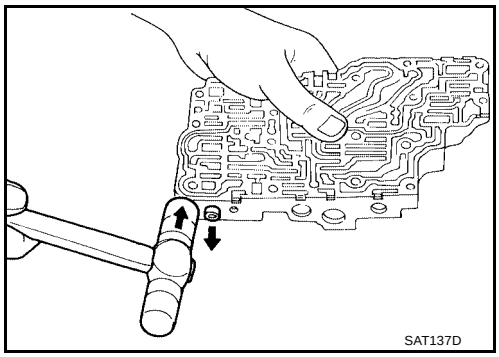
a. Use a screwdriver to remove retainer plates.



b. Remove retainer plates while holding spring, plugs or sleeves.
   - **Remove plugs slowly to prevent internal parts from jumping out.**



c. Place mating surface of valve body face down, and remove internal parts.
   - **If a valve is hard to remove, place valve body face down and lightly tap it with a soft hammer.**
   - **Be careful not to drop or damage valves and sleeves.**

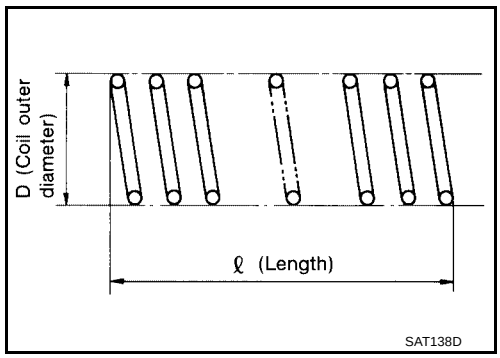


INSPECTION

Valve Spring

- Measure free length and outer diameter of each valve spring. Also check for damage or deformation.

Inspection standard **: Refer to AT-378, "Control Valves" .**



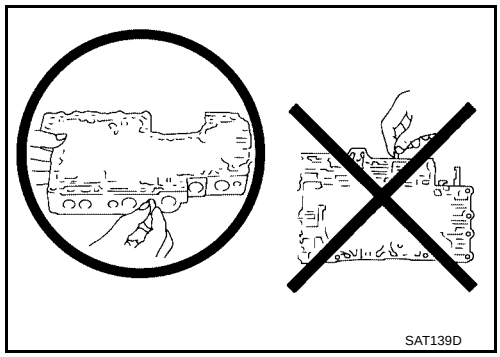
- Replace valve springs if deformed or fatigued.

Control Valves

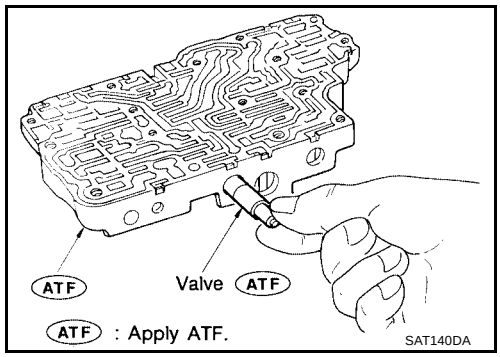
- Check sliding surfaces of valves, sleeves and plugs.

ASSEMBLY

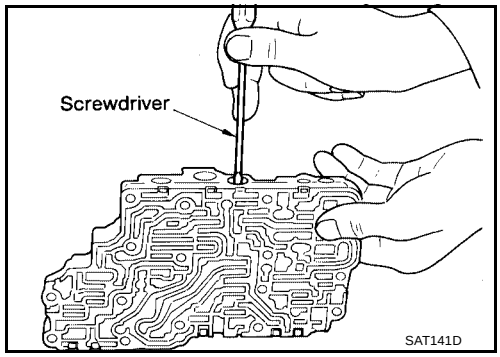
- **Lay control valve body down when installing valves. Do not stand the control valve body upright.**



1. Lubricate the control valve body and all valves with ATF. Install control valves by sliding them carefully into their bores.
   - **Be careful not to scratch or damage valve body.**

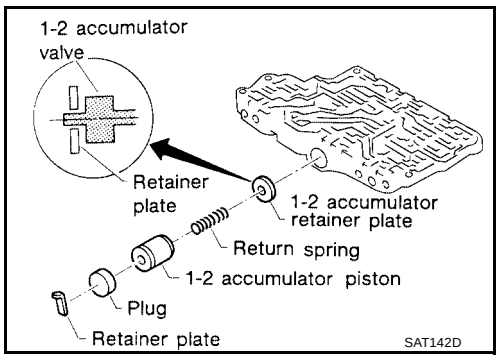


   - Wrap a small screwdriver with vinyl tape and use it to insert the valves into their proper positions.

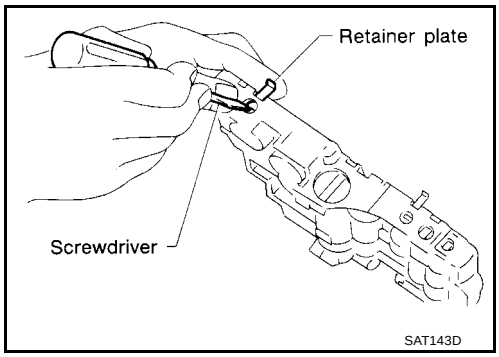


1-2 Accumulator Valve

- Install 1-2 accumulator valve. Align 1-2 accumulator retainer plate from opposite side of control valve body.
- Install return spring, 1-2 accumulator piston and plug.



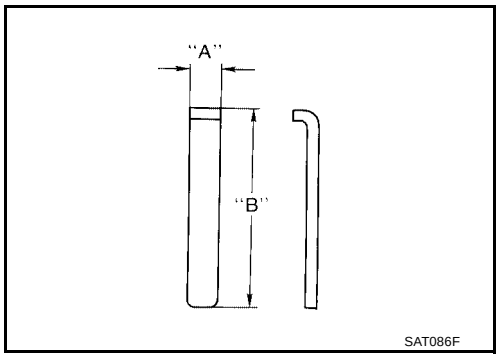
1. Install retainer plates.
   - While pushing plug or return spring, install retainer plate.



Retainer Plate (Upper Body)

Unit: mm (in)

No.	Name of control valve	Width A	Length B
22	Pilot valve	6.0 (0.236)	21.5 (0.846)
30	1st reducing valve		
34	3-2 timing valve		
17	Torque converter relief valve		
9	1-2 accumulator valve		38.5 (1.516)
25	1-2 accumulator piston valve		
21	Overrun clutch reducing valve		24.0 (0.945)
5	Cooler check valve		
14	Torque converter clutch control valve		28.0 (1.102)



- Install proper retainer plates.
  Refer to AT-312, "COMPONENTS" .

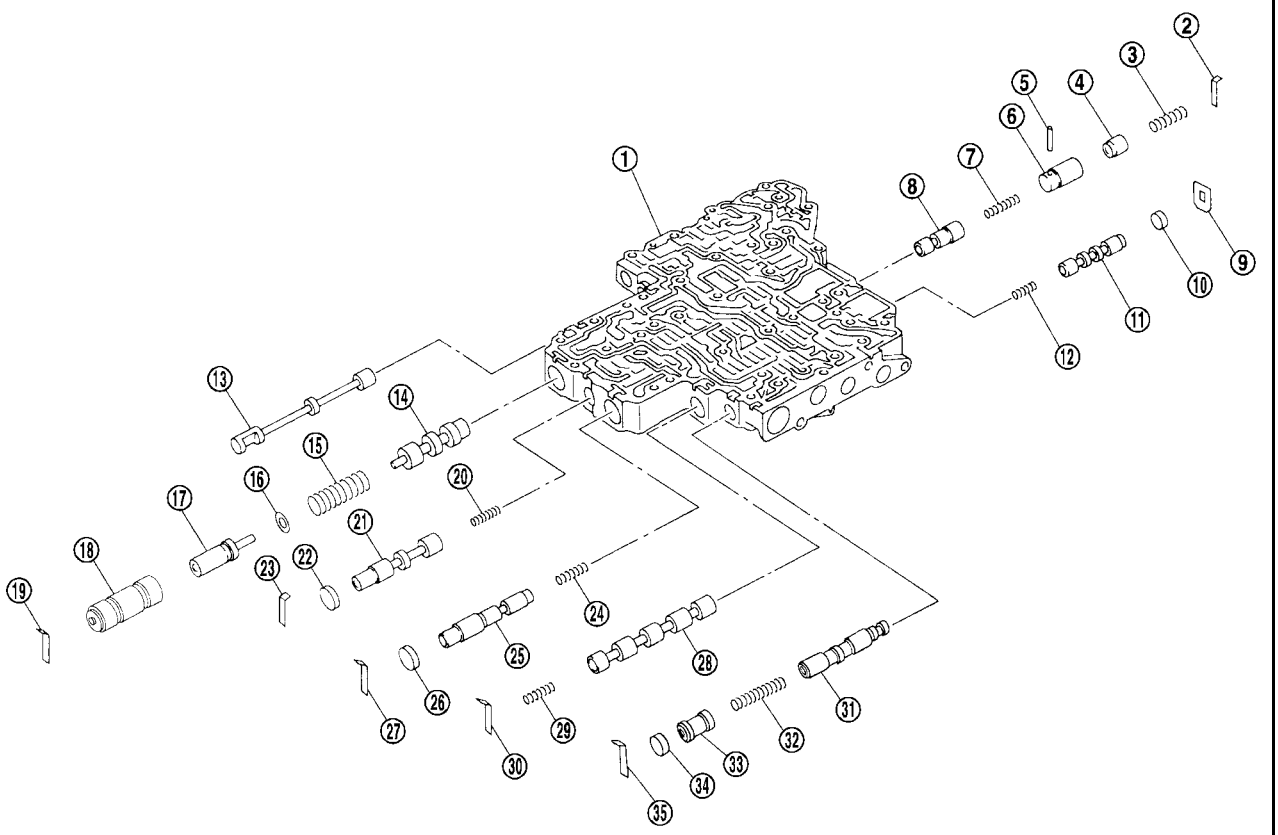
Control Valve Lower Body

UCS000RQ

COMPONENTS

Apply ATF to all components before installation.

SEC. 317

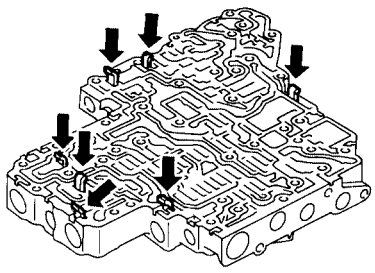


1. Lower body	2. Retainer plate	3. Return spring
4. Piston	5. Parallel pin	6. Sleeve
7. Return spring	8. Pressure modifier valve	9. Retainer plate
10. Plug	11. Shift valve B	12. Return spring
13. Manual valve	14. Pressure regulator valve	15. Return spring
16. Spring seat	17. Plug	18. Sleeve
19. Retainer plate	20. Return spring	21. Overrun clutch control valve
22. Plug	23. Retainer plate	24. Return spring
25. Accumulator control valve	26. Plug	27. Retainer plate
28. Shift valve A	29. Return spring	30. Retainer plate
31. Shuttle valve	32. Return spring	33. Plug
34. Plug	35. Retainer plate	

DISASSEMBLY

- Remove valves at retainer plate.
  For removal procedures, refer to AT-316, "COMPONENTS" .

Retainer plates in lower body

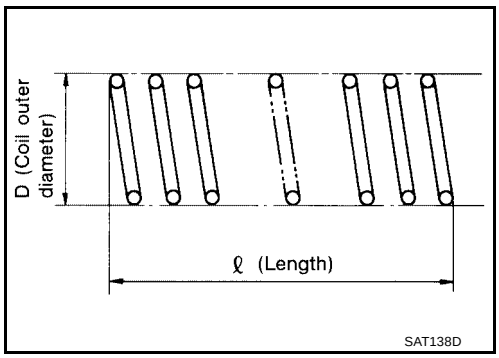


INSPECTION

Valve Springs

- Check each valve spring for damage or deformation. Also measure free length and outer diameter.

Inspection standard : Refer to AT-378, "Control Valves" .



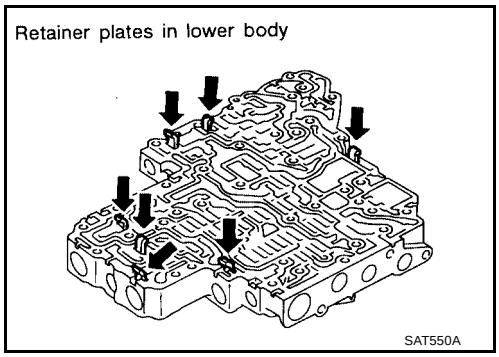
- Replace valve springs if deformed or fatigued.

Control Valves

- Check sliding surfaces of control valves, sleeves and plugs for damage.

ASSEMBLY

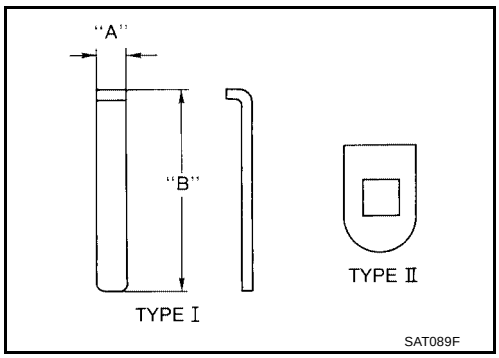
- Install control valves.
  For installation procedures, refer to AT-316, "COMPONENTS" .



Retainer Plate (Lower Body)

Unit: mm (in)

No.	Name of control valve and plug	Width A	Length B	Type
19	Pressure regulator valve	6.0 (0.236)	28.0 (1.102)	I
27	Accumulator control valve			
30	Shift valve A			
23	Overrun clutch control valve			
2	Pressure modifier valve			
35	Shuttle valve			
9	Shift valve B	—	—	II

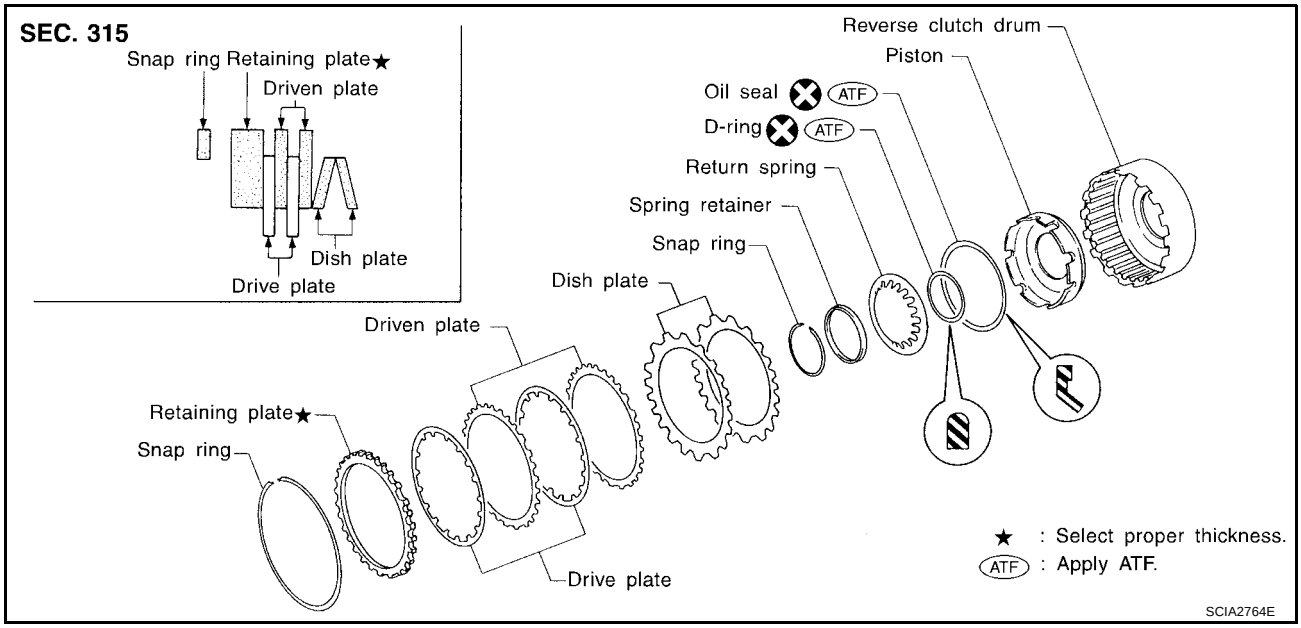


- Install proper retainer plates.
  Refer to AT-316, "COMPONENTS" .

Reverse Clutch

UCS000RR

COMPONENTS



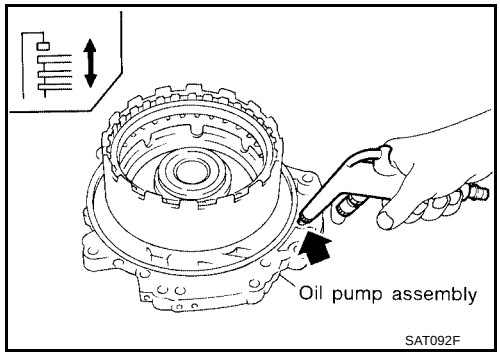
DISASSEMBLY

1. Check operation of reverse clutch

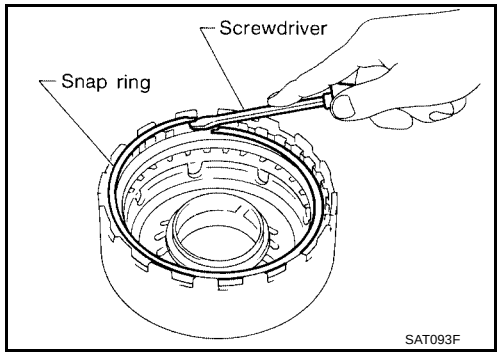
a. Install seal ring onto drum support of oil pump cover and install reverse clutch assembly. Apply compressed air to oil hole.

b. Check to see that retaining plate moves to snap ring.

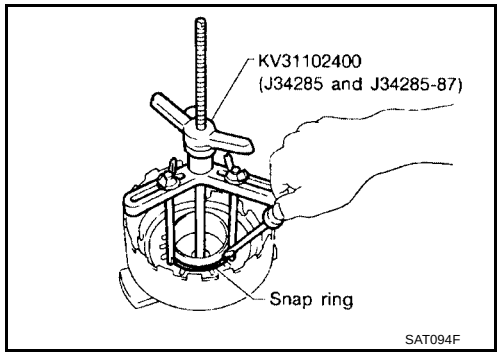
c. If retaining plate does not contact snap ring:
   - D-ring might be damaged.
   - Oil seal might be damaged.
   - Fluid might be leaking past piston check ball.



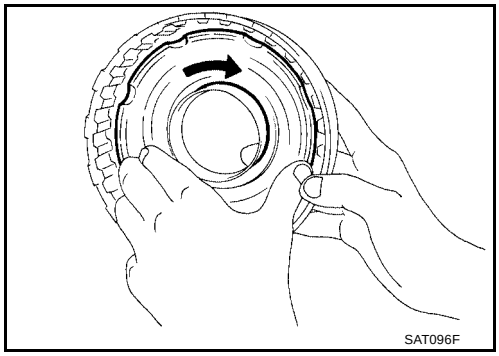
2. Remove snap ring.
   - **Do not expand snap ring excessively.**
3. Remove drive plates, driven plates, retaining plate, and dish plates.



4. Set Tool on spring retainer and remove snap ring from reverse clutch drum while compressing return springs.
   - **Set Tool directly over springs.**
   - **Do not expand snap ring excessively.**
5. Remove spring retainer and return springs.



6. Remove piston from reverse clutch drum by turning it.
7. Remove D-ring and oil seal from piston.


SAT096F

INSPECTION

Reverse Clutch Snap Ring, Spring Retainer and Return Springs

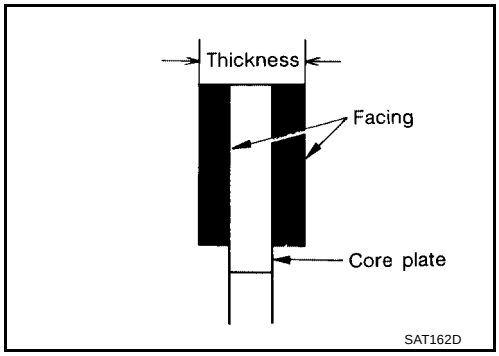
- Check for deformation, fatigue or damage.
  If necessary, replace.

Reverse Clutch Drive Plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:
Standard value : 1.6 mm (0.063 in)
Wear limit : 1.4 mm (0.055 in)

- If not within wear limit, replace.



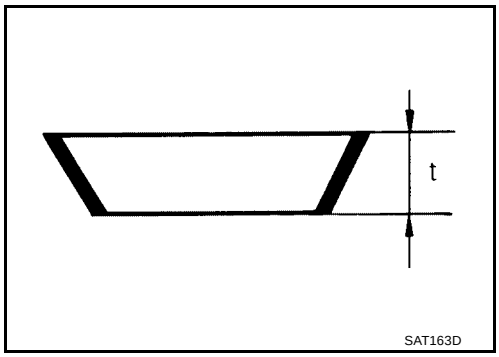
SAT162D

Reverse Clutch Dish Plates

- Check for deformation or damage.
- Measure thickness of dish plate.

Thickness of dish plate : 3.08 mm (0.1213 in)

- If deformed or fatigued, replace.



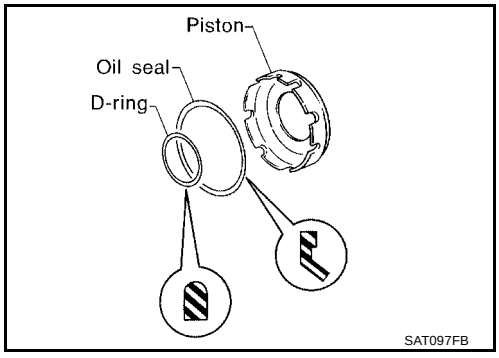
SAT163D

Reverse Clutch Piston

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure that air leaks past ball.

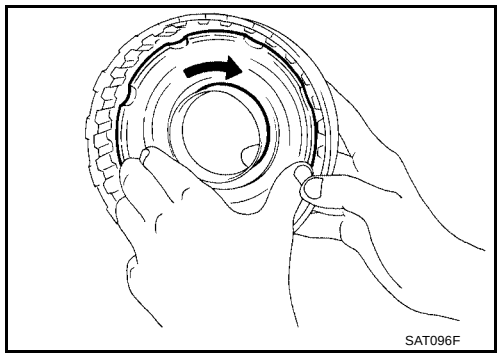
ASSEMBLY

1. Install D-ring and oil seal on piston.
   - **Take care with the direction of oil seal.**
   - **Apply ATF to both parts.**

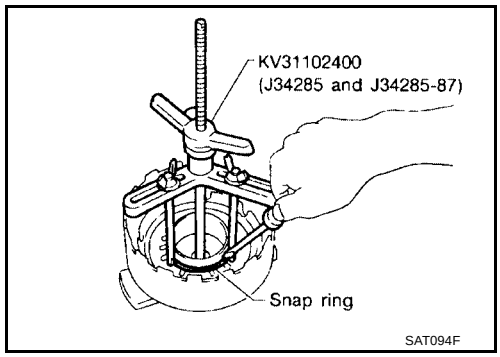


SAT097FB

2. Install piston assembly by turning it slowly.
   - **Apply ATF to inner surface of drum.**

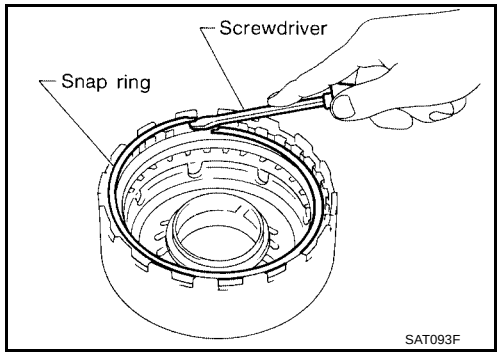

SAT096F

3. Install return springs and spring retainer on piston.
   - **Do not expand snap ring excessively.**



SAT094F

4. Set Tool on spring retainer and install snap ring while compressing return springs.
   - **Set Tool directly over return springs.**
5. Install drive plates, driven plates, retaining plate and dish plates.
   - **Take care with order of plates.**
6. Install snap ring.
   - **Do not expand snap ring excessively.**

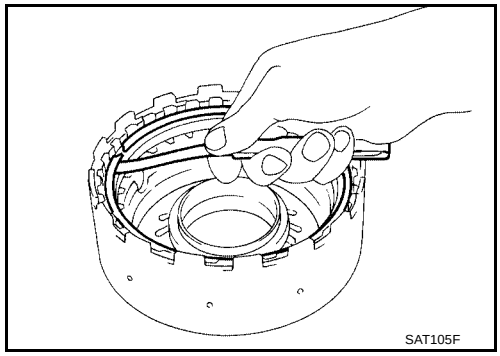


SAT093F

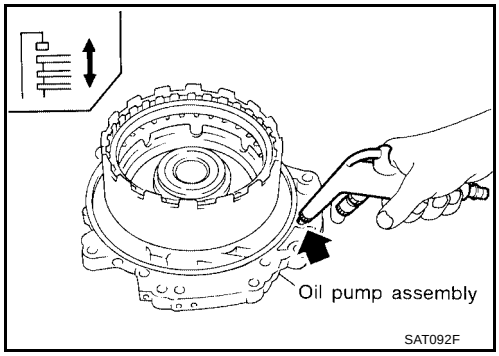
7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

Specified clearance

Standard	**: 0.5 - 0.8 mm (0.020 - 0.031 in)**
Allowable limit	**: 1.2 mm (0.047 in)**
Retaining plate	**: Refer to AT-379, "REVERSE CLUTCH" .**


SAT105F

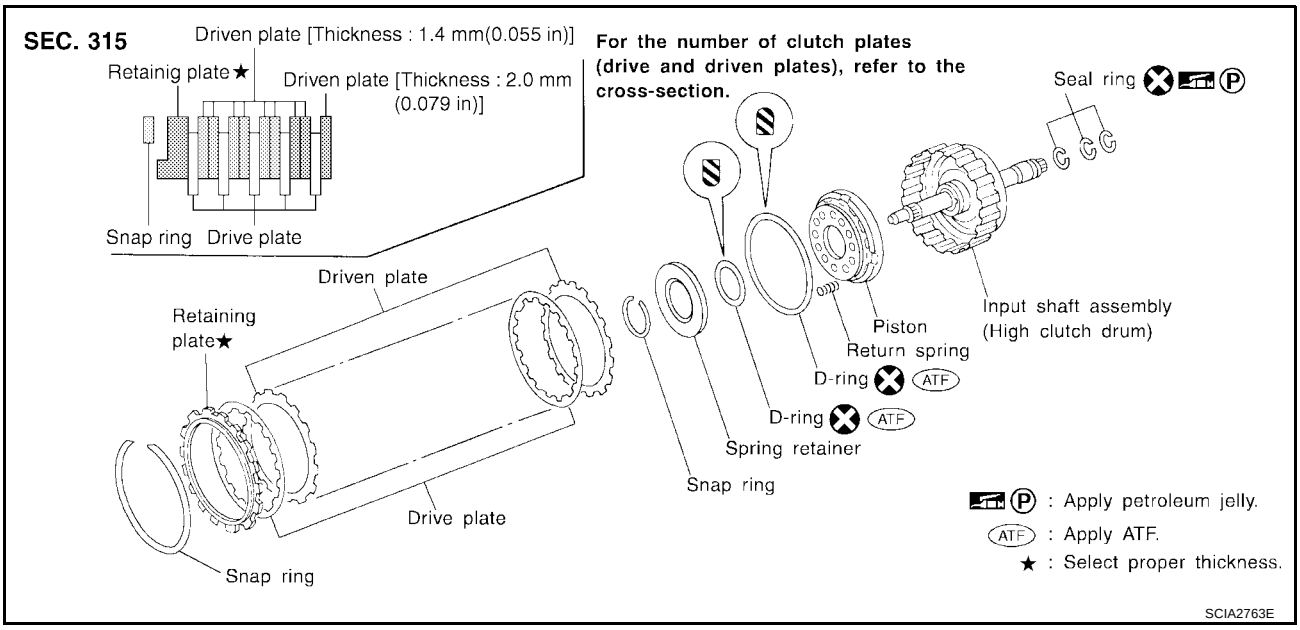
8. Check operation of reverse clutch.



High Clutch

UCS000RS

COMPONENTS



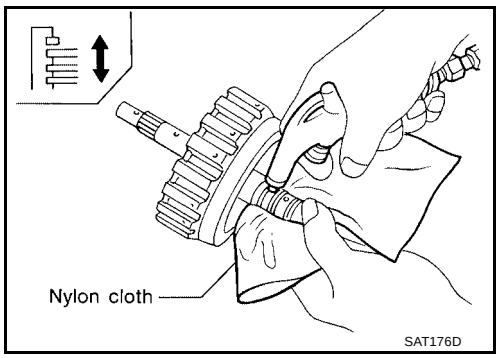
DISASSEMBLY

1. Check operation of high clutch.

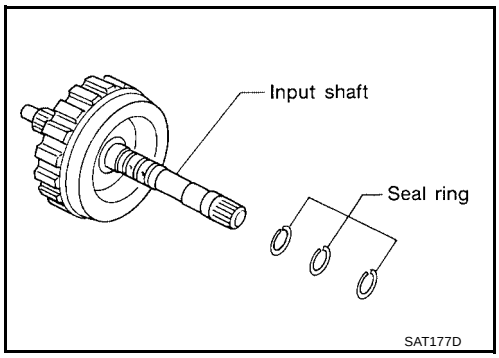
a. Apply compressed air to oil hole of input shaft with nylon cloth.
   - **Stop up hole on opposite side of input shaft with nylon cloth.**

b. Check to see that retaining plate moves to snap ring.

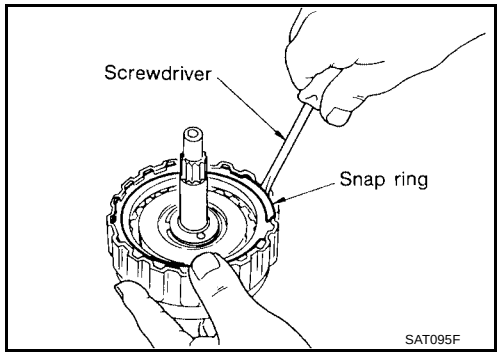
c. If retaining plate does not contact snap ring:
   - D-ring might be damaged.
   - Oil seal might be damaged.
   - Fluid might be leaking past piston check ball.



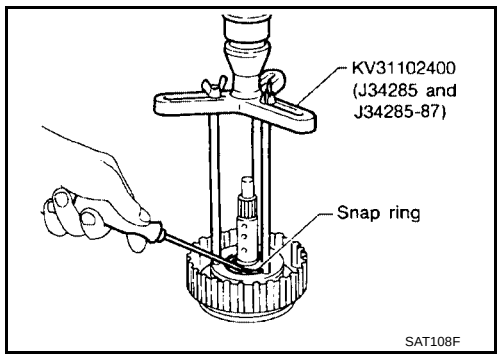
2. Remove seal rings from input shaft.
   - **Always replace when removed.**



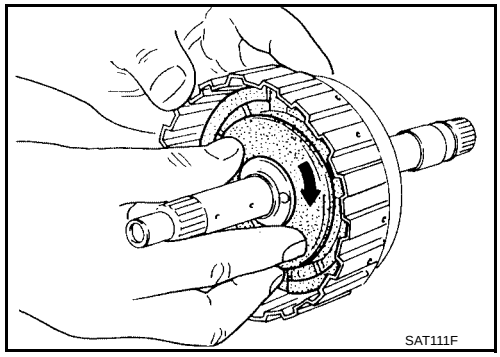
3. Remove snap ring.
   - **Do not expand snap ring excessively.**
4. Remove drive plates, driven plates and retaining plate.



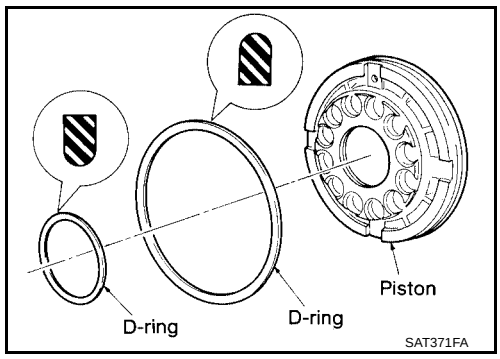
5. Set Tool on spring retainer and remove snap ring from high clutch drum while compressing return springs.
   - **Set Tool directly over springs.**
   - **Do not expand snap ring excessively.**
6. Remove spring retainer and return springs.



7. Remove piston from high clutch drum by turning it.



8. Remove D-rings from piston.



INSPECTION

High Clutch Snap Ring, Spring Retainer and Return Springs

- Check for deformation, fatigue or damage.
  If necessary, replace.
- **When replacing spring retainer and return springs, replace them as a set.**

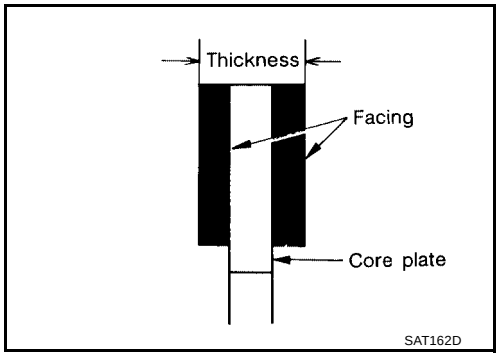
High Clutch Drive Plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

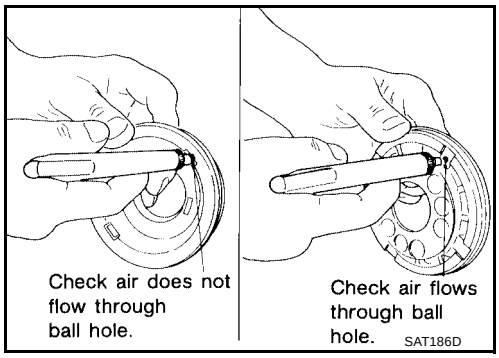
Standard value	**: 1.6 mm (0.063 in)**
Wear limit	**: 1.4 mm (0.055 in)**

- If not within wear limit, replace.



High Clutch Piston

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure that air leaks past ball.

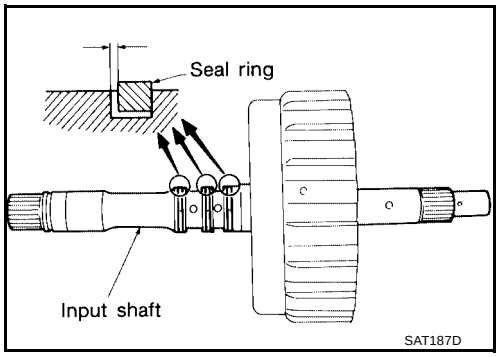


Seal Ring Clearance

- Install new seal rings onto input shaft.
- Measure clearance between seal ring and ring groove.

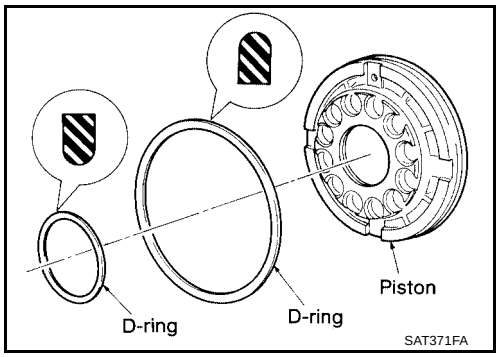
Standard clearance	**: 0.08 - 0.23 mm (0.0031 - 0.0091 in)**
Allowable limit	**: 0.23 mm (0.0091 in)**

- If not within allowable limit, replace input shaft assembly.

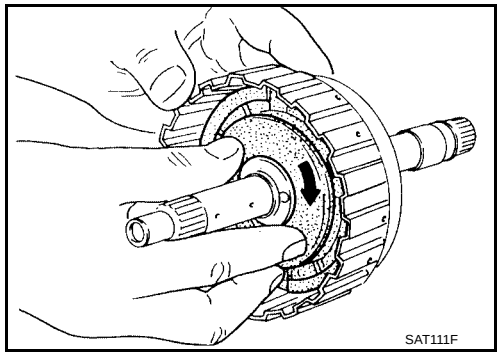


ASSEMBLY

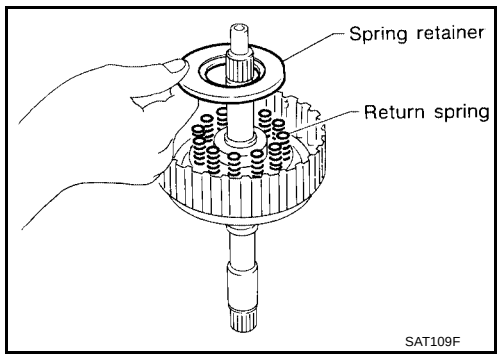
1. Install D-rings on piston.
   - **Apply ATF to both parts.**



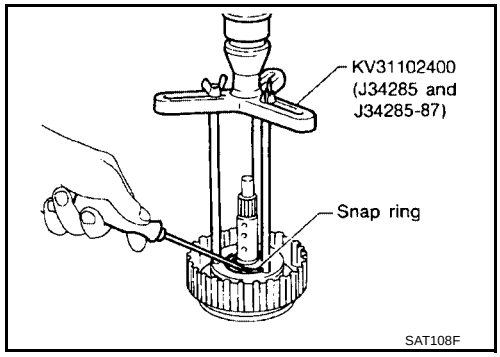
2. Install piston assembly by turning it slowly.
   - **Apply ATF to inner surface of drum.**



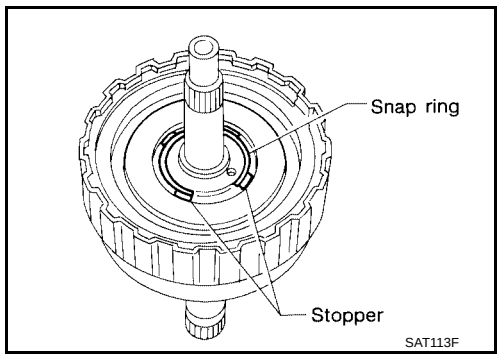
3. Install return springs and spring retainer on piston.



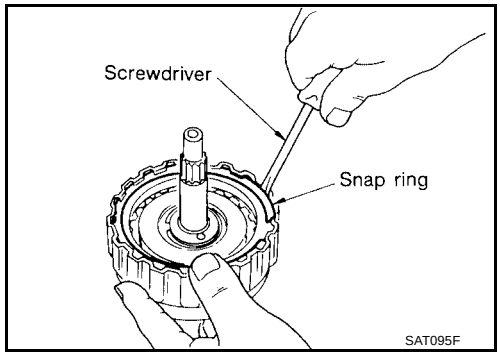
4. Set Tool on spring retainer and install snap ring while compressing return springs.
   - **Set Tool directly over return springs.**
   - **Do not expand snap ring excessively.**



   - **Do not align snap ring gap with spring retainer stopper.**



5. Install drive plates, driven plates and retaining plate.
   - **Take care with the order and direction of plates.**
6. Install snap ring.
   - Do not expand snap ring excessively.



7. Measure clearance between retaining plate and snap ring. If not within allowable limit, select proper retaining plate.

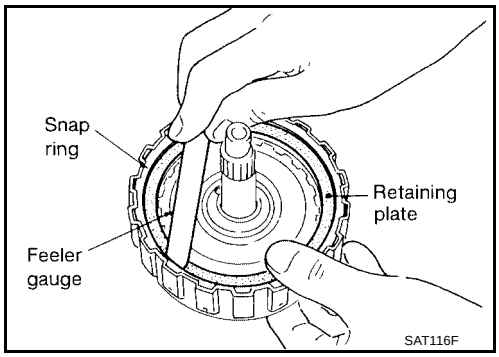
Specified clearance

Standard : 1.8 - 2.2 mm (0.071 - 0.087 in)

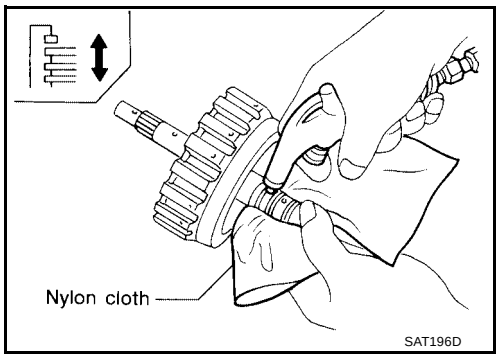
Allowable limit : 2.8 mm (0.110 in)

Retaining plate

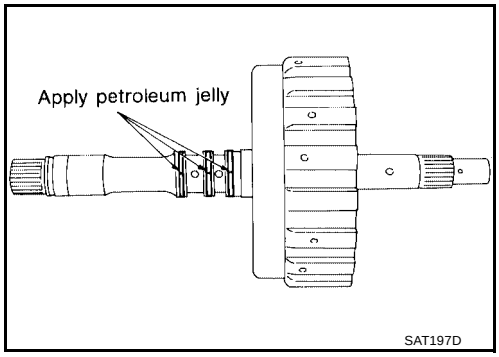
: Refer to AT-379, "HIGH CLUTCH" .



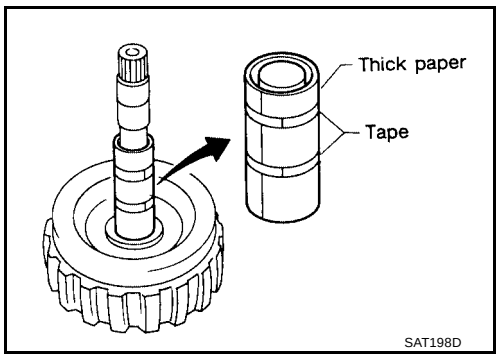
8. Check operation of high clutch.



9. Install seal rings to input shaft.
   - **Apply petroleum jelly to seal rings.**
   - **Always replace when removed.**



   - **Roll paper around seal rings to prevent seal rings from spreading.**

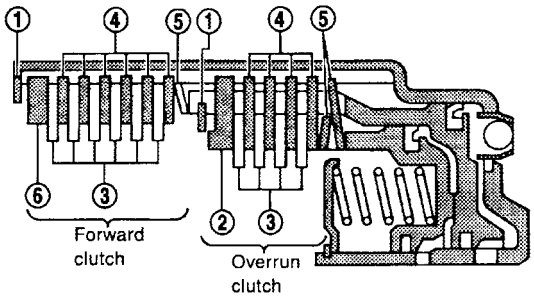


Forward and Overrun Clutches

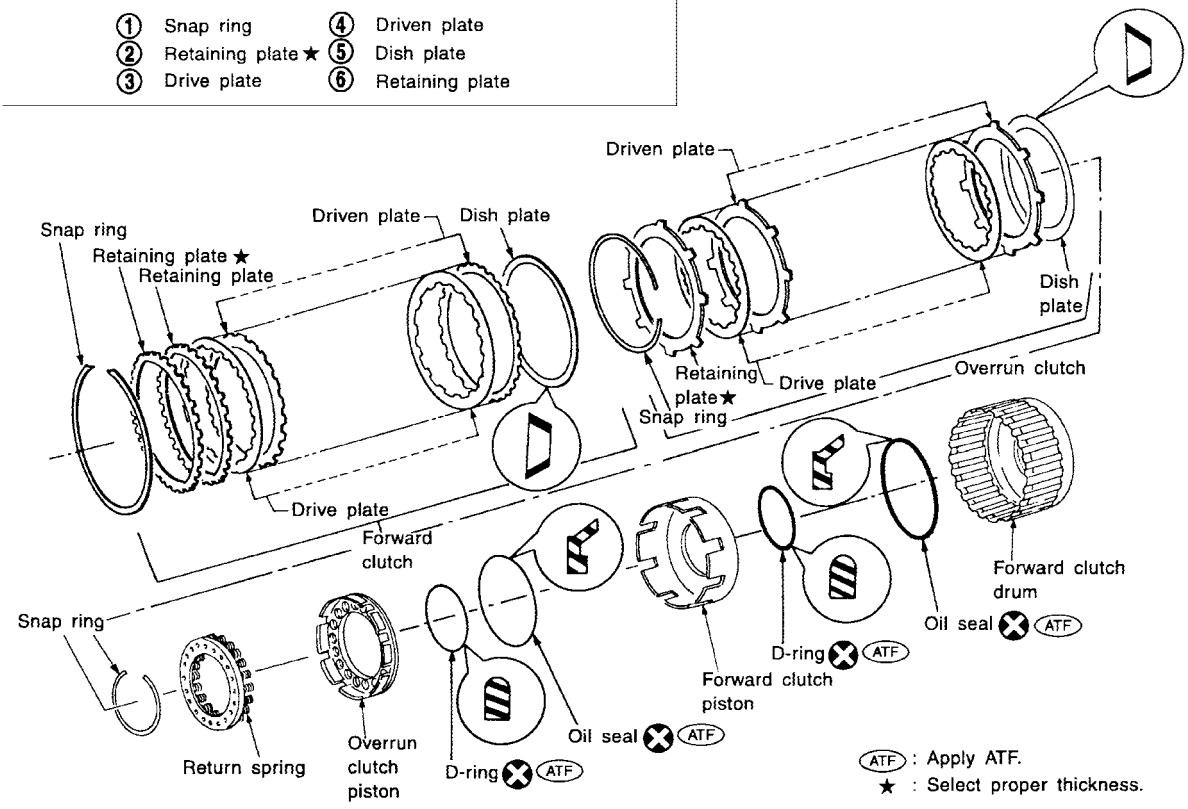
UCS000RT

COMPONENTS

SEC.315



① Snap ring
② Retaining plate ★
③ Drive plate
④ Driven plate
⑤ Dish plate
⑥ Retaining plate

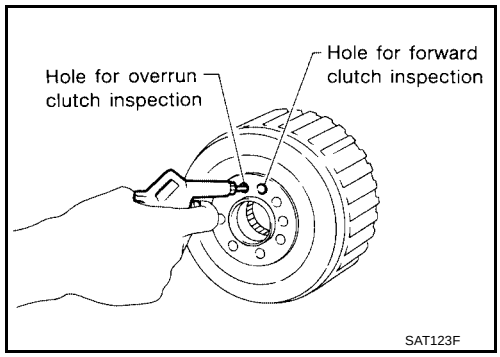


SCIA2765E

DISASSEMBLY

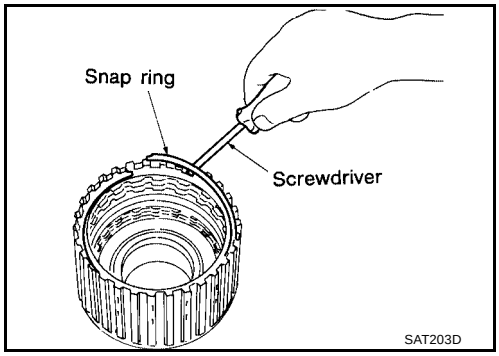
1. Check operation of forward clutch and overrun clutch.

a. Install bearing retainer on forward clutch drum.
b. Apply compressed air to oil hole of forward clutch drum.
c. Check to see that retaining plate moves to snap ring.
d. If retaining plate does not contact snap ring:
   - D-ring might be damaged.
   - Oil seal might be damaged.
   - Fluid might be leaking past piston check ball.

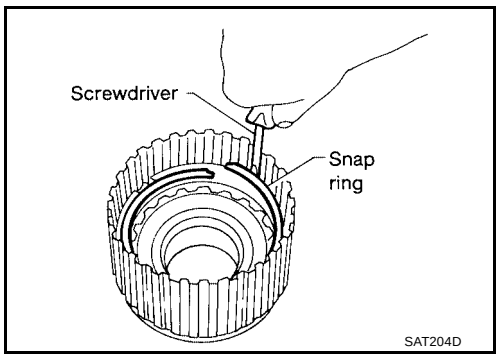


SAT123F

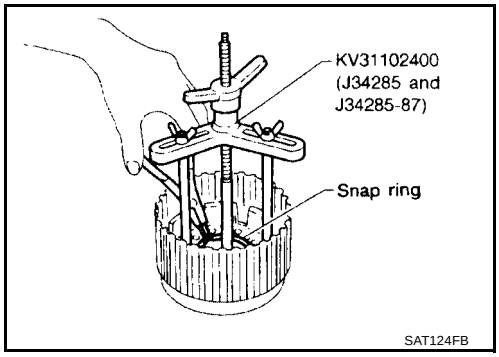
2. Remove snap ring for forward clutch.
   - **Do not expand snap ring excessively.**
3. Remove drive plates, driven plates, retaining plate and dish plate for forward clutch.



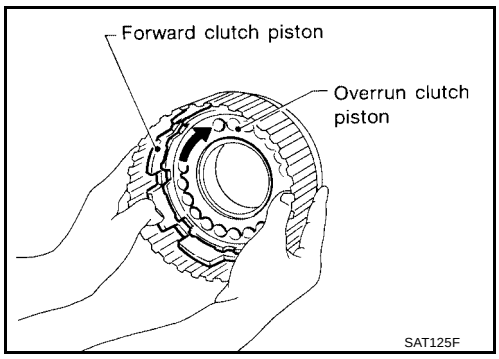
4. Remove snap ring for overrun clutch.
   - **Do not expand snap ring excessively.**
5. Remove drive plates, driven plates, retaining plate and dish plate for overrun clutch.



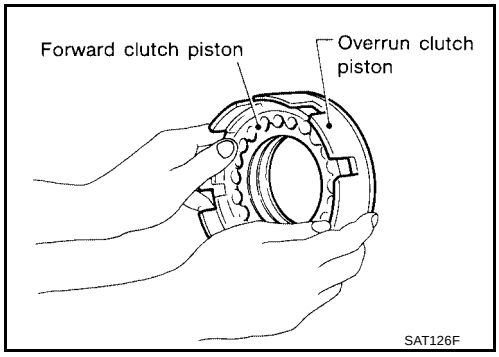
6. Set Tool on spring retainer and remove snap ring from forward clutch drum while compressing return springs.
   - **Set Tool directly over return springs.**
   - **Do not expand snap ring excessively.**
7. Remove spring retainer and return springs.
   - **Do not remove return springs from spring retainer.**



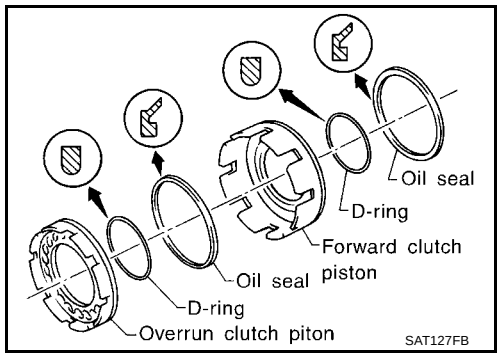
8. Remove forward clutch piston with overrun clutch piston from forward clutch drum by turning it.



9. Remove overrun clutch piston from forward clutch piston by turning it.



10. Remove D-rings and oil seals from forward clutch piston and overrun clutch piston.



INSPECTION

Snap Rings, Spring Retainer and Return Springs

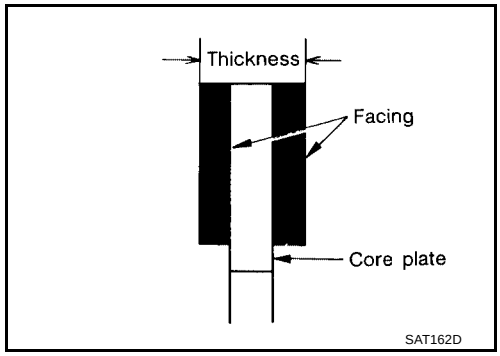
- Check for deformation, fatigue or damage.
- Replace if necessary.
- **When replacing spring retainer and return springs, replace them as a set.**

Forward Clutch and Overrun Clutch Drive Plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

Forward clutch	
Standard value	**: 1.6 mm (0.063 in)**
Wear limit	**: 1.4 mm (0.055 in)**
Overrun clutch	
Standard value	**: 1.6 mm (0.063 in)**
Wear limit	**: 1.4 mm (0.055 in)**



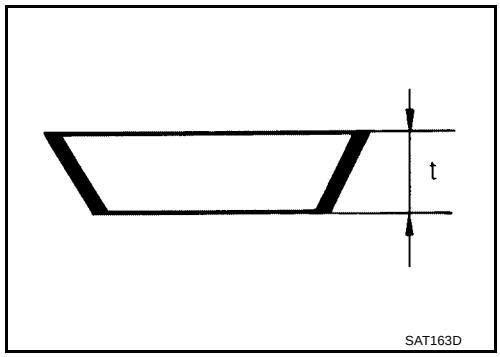
- If not within wear limit, replace.

Forward Clutch and Overrun Clutch Dish Plates

- Check for deformation or damage.
- Measure thickness of dish plate.

Thickness of dish plate

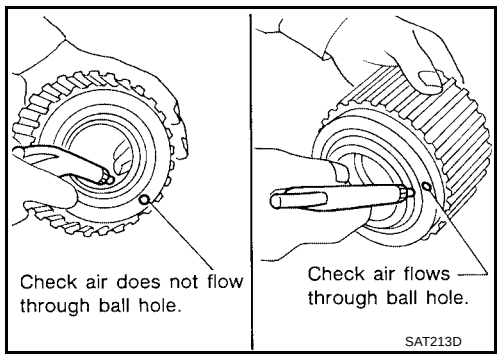
Forward clutch	**: 2.7 mm (0.106 in)**
Overrun clutch	**: 2.7 mm (0.106 in)**



- If deformed or fatigued, replace.

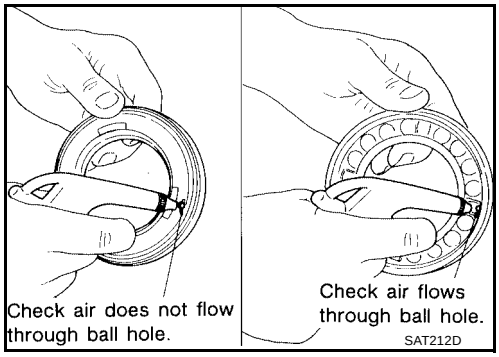
Forward Clutch Drum

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole from outside of forward clutch drum. Make sure air leaks past ball.
- Apply compressed air to oil hole from inside of forward clutch drum. Make sure there is no air leakage.



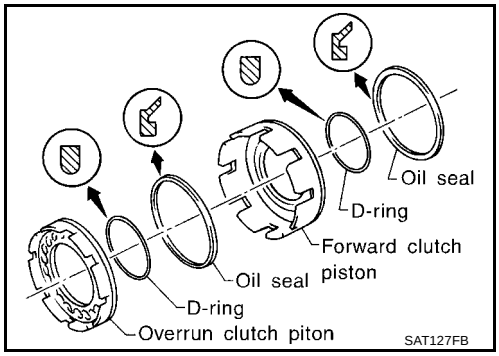
Overrun Clutch Piston

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side. Make sure that air leaks past ball.

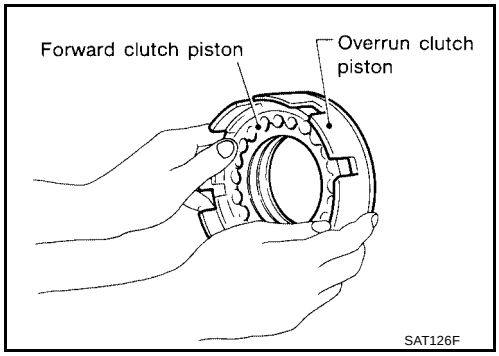


ASSEMBLY

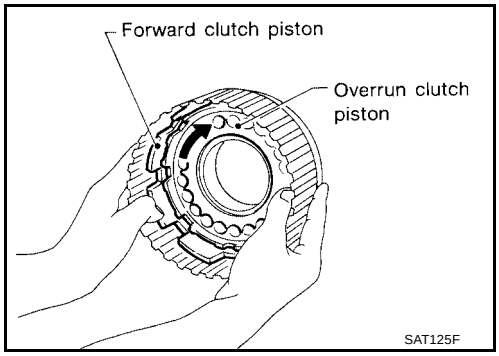
1. Install D-rings and oil seals on forward clutch piston and overrun clutch piston.
   - **Take care with direction of oil seal.**
   - **Apply ATF to both parts.**



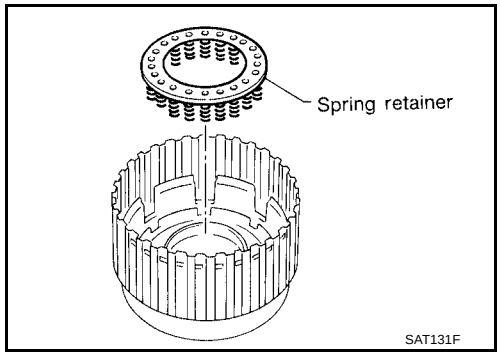
2. Install overrun clutch piston assembly on forward clutch piston by turning it slowly.
   - **Apply ATF to inner surface of forward clutch piston.**



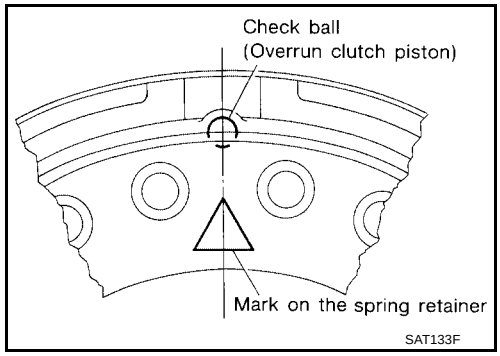
3. Install forward clutch piston assembly on forward clutch drum by turning it slowly.
   - **Apply ATF to inner surface of drum.**



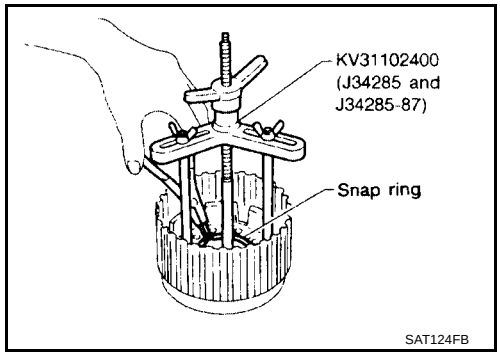
4. Install return spring on overrun clutch piston.



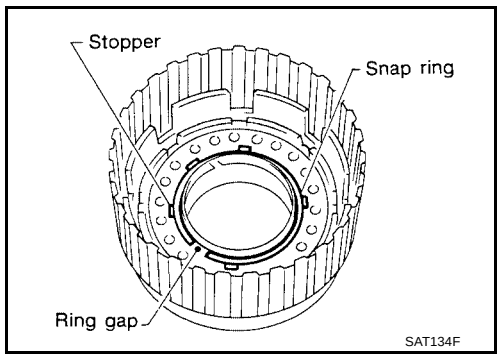
- Align the mark on spring retainer with check ball in overrun clutch piston.



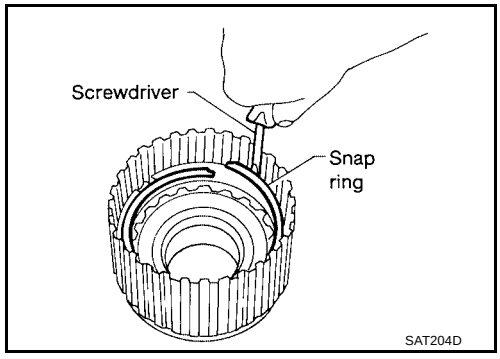
5. Set Tool on spring retainer and install snap ring while compressing return springs.
   - **Set Tool directly over return springs.**
   - **Do not expand snap ring excessively.**



- **Do not align snap ring gap with spring retainer stopper.**

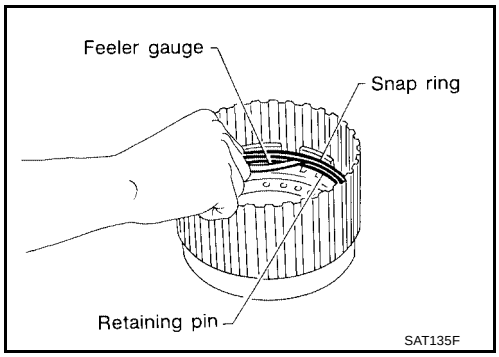


6. Install drive plates, driven plates, retaining plate and dish plate for overrun clutch.
   - **Take care with order of plates.**
7. Install snap ring for overrun clutch.
   - Do not expand snap ring excessively.

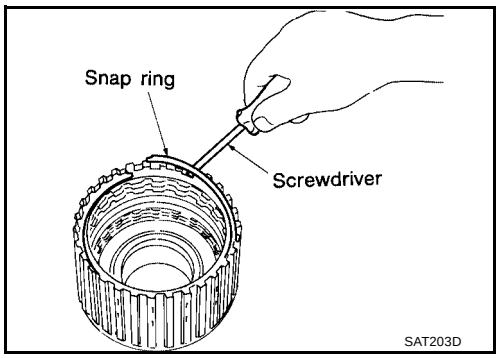


8. Measure clearance between overrun clutch retaining plate and snap ring.
If not within allowable limit, select proper retaining plate.

Specified clearance	
Standard	: 0.7 - 1.1 mm (0.028 - 0.043 in)
Allowable limit	: 1.7 mm (0.067 in)
Overrun clutch retaining plate	Refer to AT-380, "OVERRUN CLUTCH" .

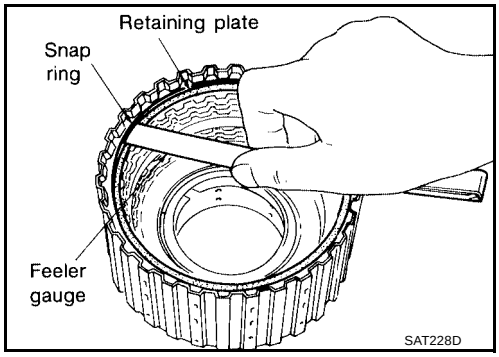


9. Install drive plates, driven plates, retaining plate and dish plate for forward clutch.
   - **Take care with order of plates.**
10. Install snap ring for forward clutch.
    - Do not expand snap ring excessively.

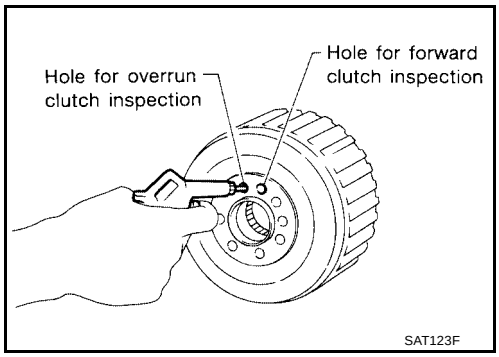


11. Measure clearance between forward clutch retaining plate and snap ring.
If not within allowable limit, select proper retaining plate.

Specified clearance	
Standard	: 0.45 - 0.85 mm (0.0177 - 0.0335 in)
Allowable limit	: 1.85 mm (0.0728 in)
Forward clutch retaining plate	: Refer to AT-380, "FORWARD CLUTCH" .



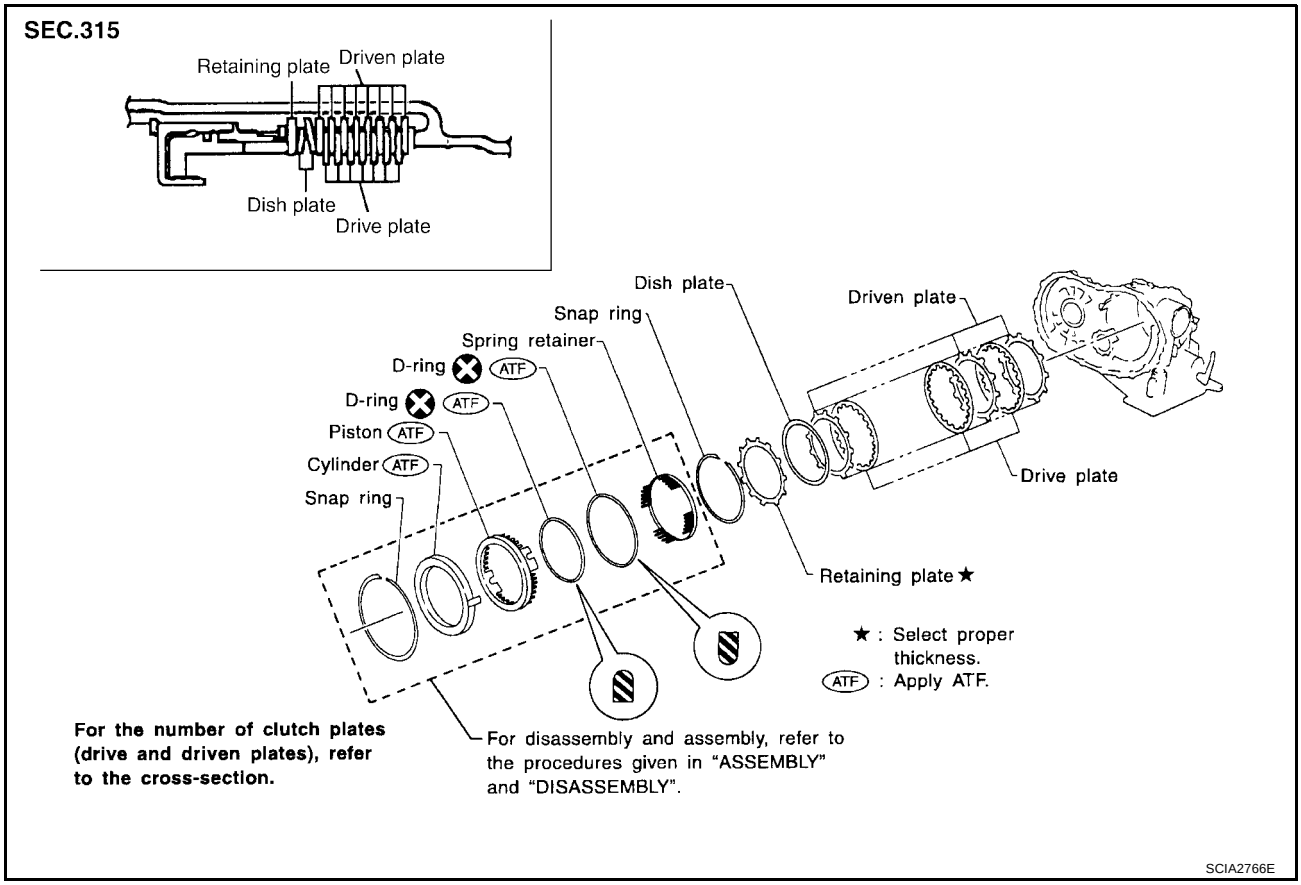
12. Check operation of forward clutch.
13. Check operation of overrun clutch.



Low & Reverse Brake

UCS000RU

COMPONENTS



DISASSEMBLY

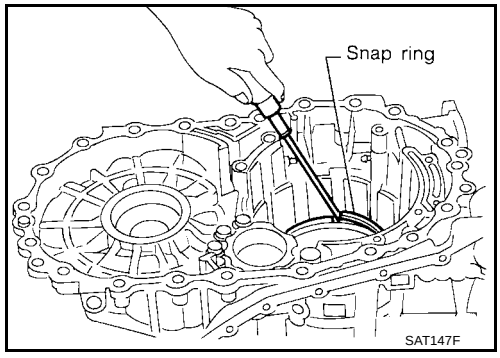
1. Check operation of low & reverse brake.

a. Apply compressed air to oil hole of transmission case.

b. Check to see that retaining plate moves to snap ring.

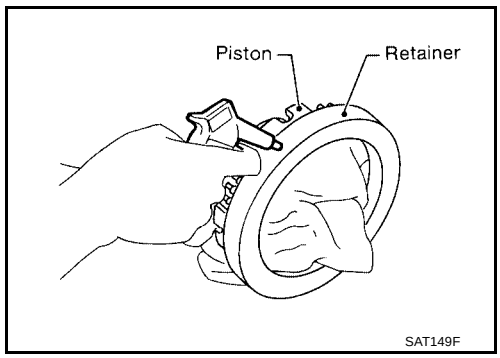
c. If retaining plate does not contact snap ring:

- **D-ring might be damaged.**
- **Fluid might be leaking past piston check ball.**
- **Do not expand snap ring excessively.**

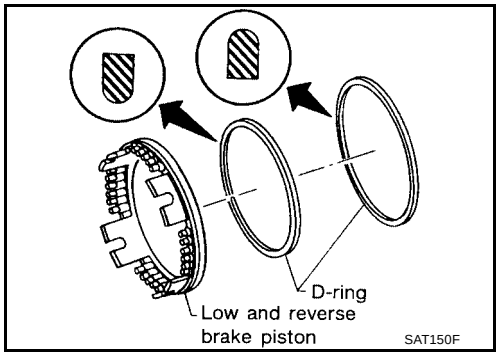


2. In order to remove piston, apply compressed air to oil hole of retainer while holding piston.

- **Apply air gradually and allow piston to come out evenly.**



3. Remove D-rings from piston.



INSPECTION

Low and Reverse Brake Snap Ring, Spring Retainer and Return Springs

- Check for deformation, fatigue or damage.
  If necessary, replace.
- **When replacing spring retainer and return springs, replace them as a set.**

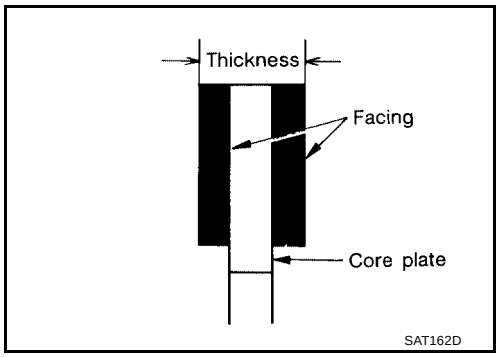
Low and Reverse Brake Drive Plate

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate

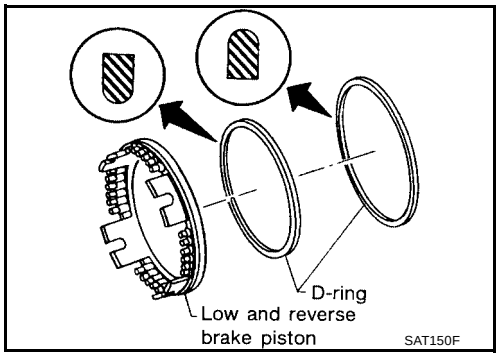
Standard value	**: 1.8 mm (0.071 in)**
Wear limit	**: 1.6 mm (0.063 in)**

- If not within wear limit, replace.

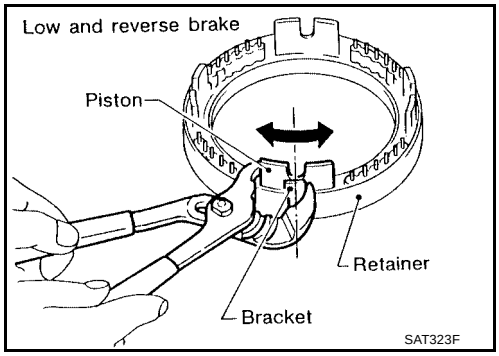


ASSEMBLY

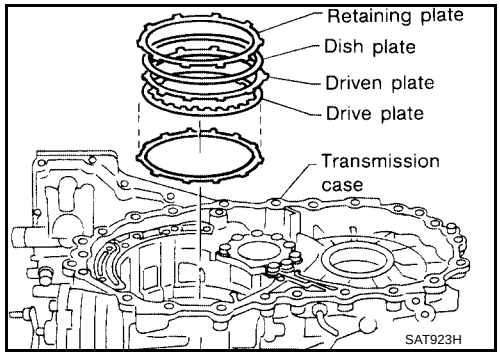
1. Install D-rings on piston.
   - **Apply ATF to both parts.**



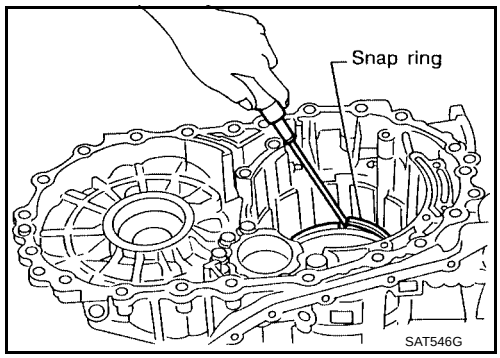
2. Set and align piston with retainer.
   - **This operation is required in order to engage the protrusions of piston to return springs correctly.**
     Further procedures are given in "ASSEMBLY".



3. Install driven plates, drive plates, retaining plate and dish plate on transmission case.
   - **Take care with order of plates and direction of dish plate.**



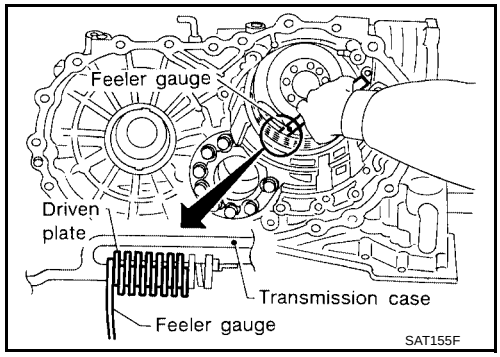
4. Install snap ring.
   - Do not expand snap ring excessively



5. Measure clearance between driven plate and transmission case. If not within allowable limit, select proper retaining plate. (front side)

Specified clearance

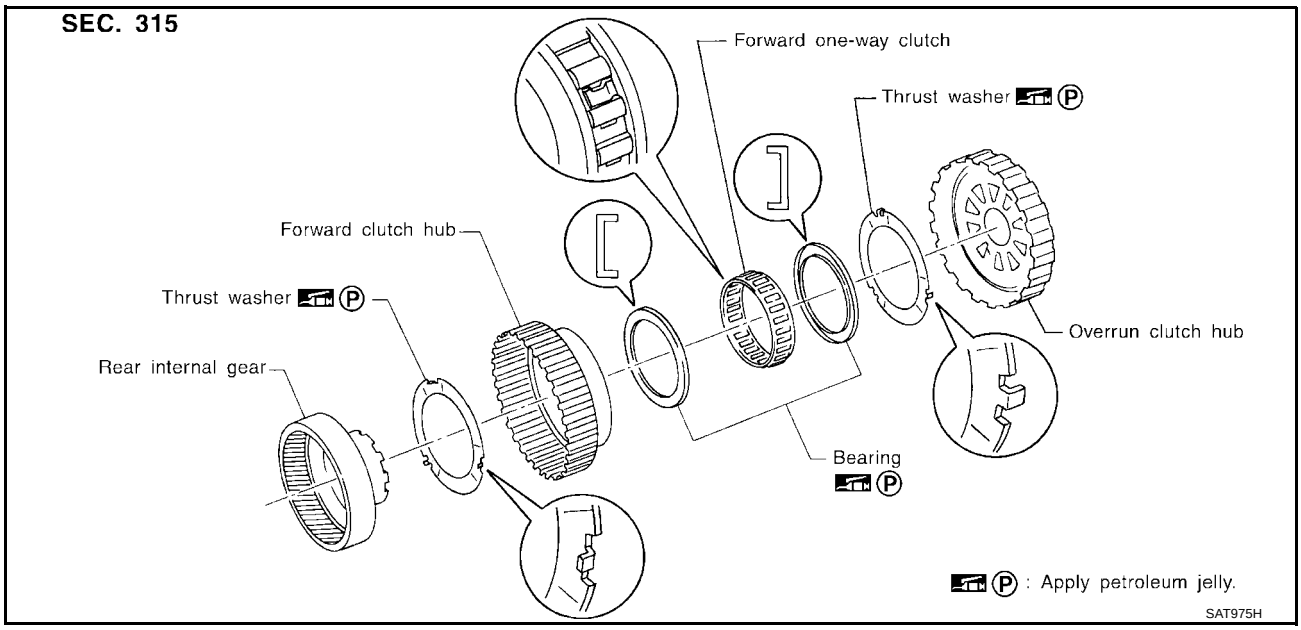
Standard	**: 1.7 - 2.1 mm (0.067 - 0.083 in)**
Allowable limit	**: 3.3 mm (0.130 in)**
Retaining plate	**Refer to AT-380, "LOW & REVERSE BRAKE" .**



Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub

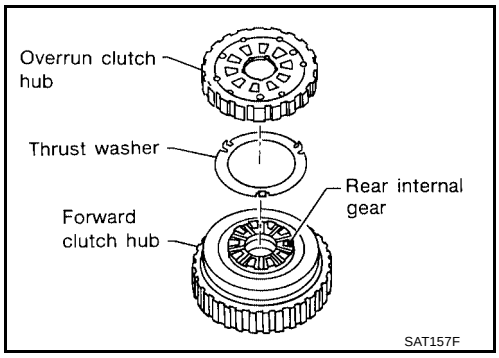
UCS000RV

COMPONENTS

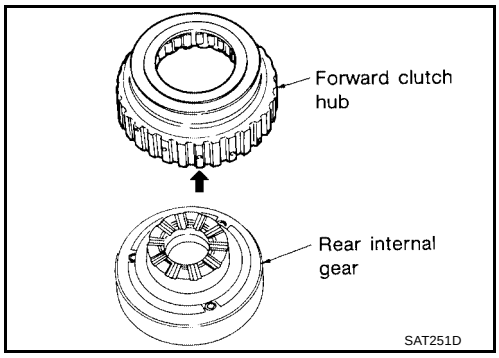


DISASSEMBLY

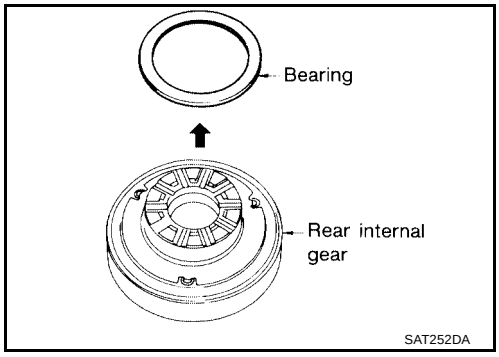
1. Remove overrun clutch hub and thrust washer from forward clutch hub.



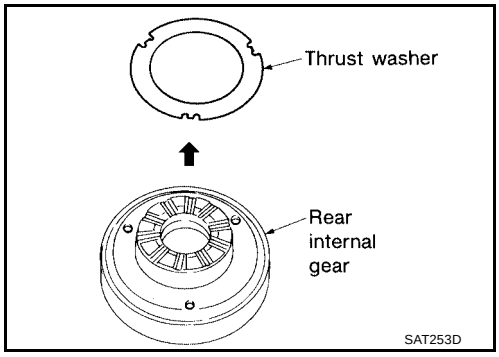
2. Remove forward clutch hub from rear internal gear.



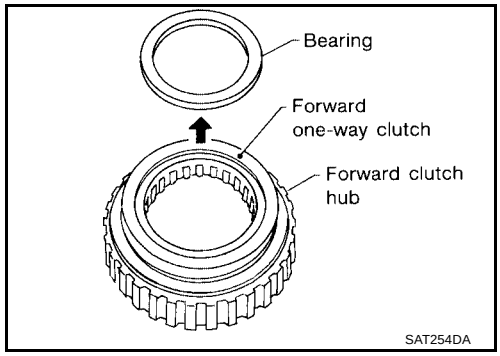
3. Remove bearing from rear internal gear.



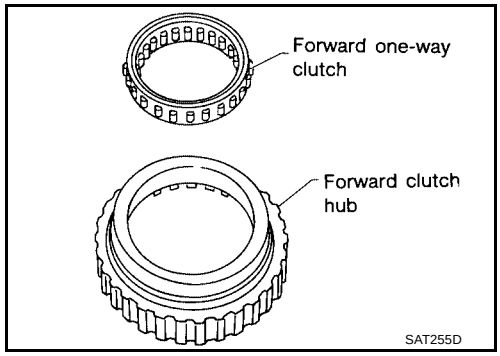
4. Remove thrust washer from rear internal gear.



5. Remove bearing from forward one-way clutch.



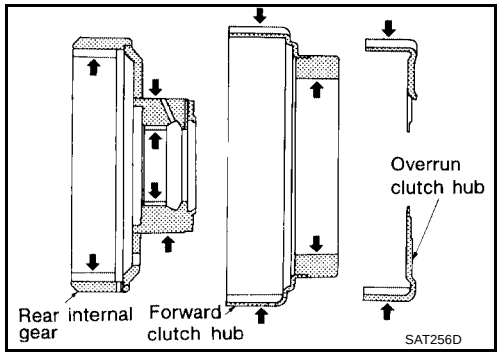
6. Remove forward one-way clutch from forward clutch hub.



INSPECTION

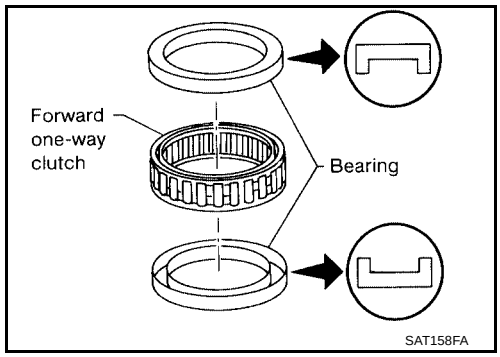
Rear Internal Gear, Forward Clutch Hub and Overrun Clutch Hub

- Check rubbing surfaces for wear or damage.



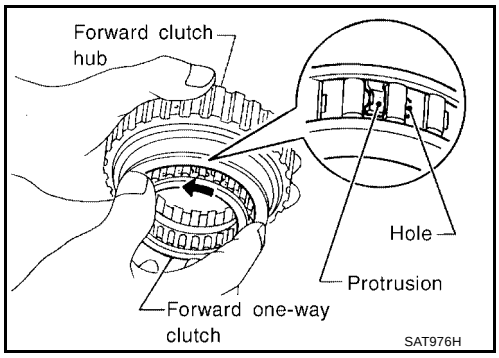
Bearings and Forward One-Way Clutch

- Check bearings for deformation and damage.
- Check forward one-way clutch for wear and damage.

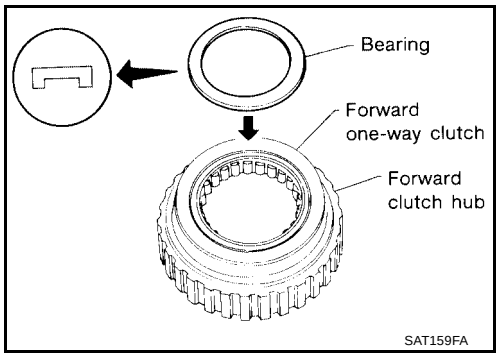


ASSEMBLY

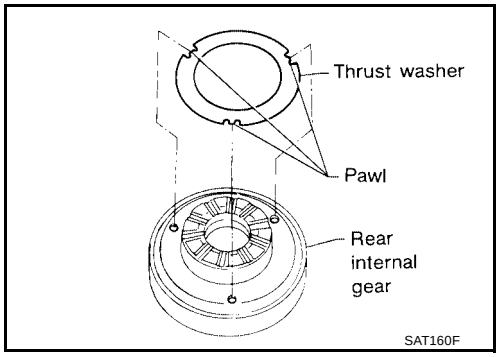
1. Install forward one-way clutch on forward clutch.
   - **Take care with the direction of forward one-way clutch.**



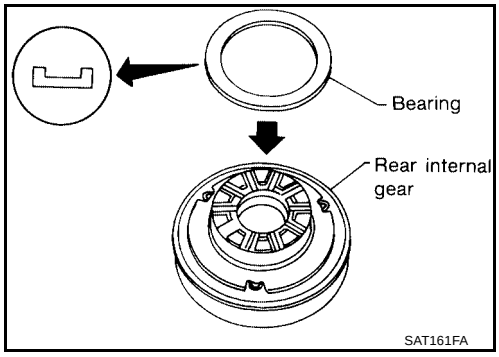
2. Install bearing on forward one-way clutch.
   - **Apply petroleum jelly to bearing.**



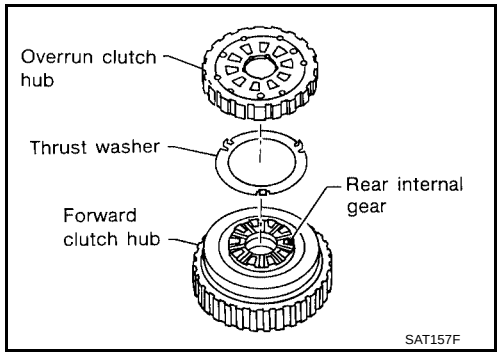
3. Install thrust washer on rear internal gear.
   - **Apply petroleum jelly to thrust washer.**
   - **Align hooks of thrust washer with holes of rear internal gear.**



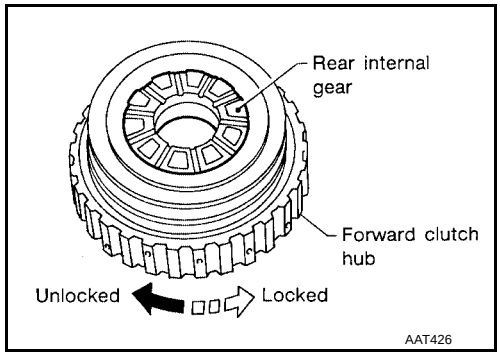
4. Install bearing on rear internal gear.
   - **Apply petroleum jelly to bearing.**



5. Install thrust washer and overrun clutch hub.
   - **Apply petroleum jelly to thrust washer.**
   - **Align hooks of thrust washer with holes of overrun clutch hub.**
   - **Align projections of rear internal gear with holes of overrun clutch hub.**



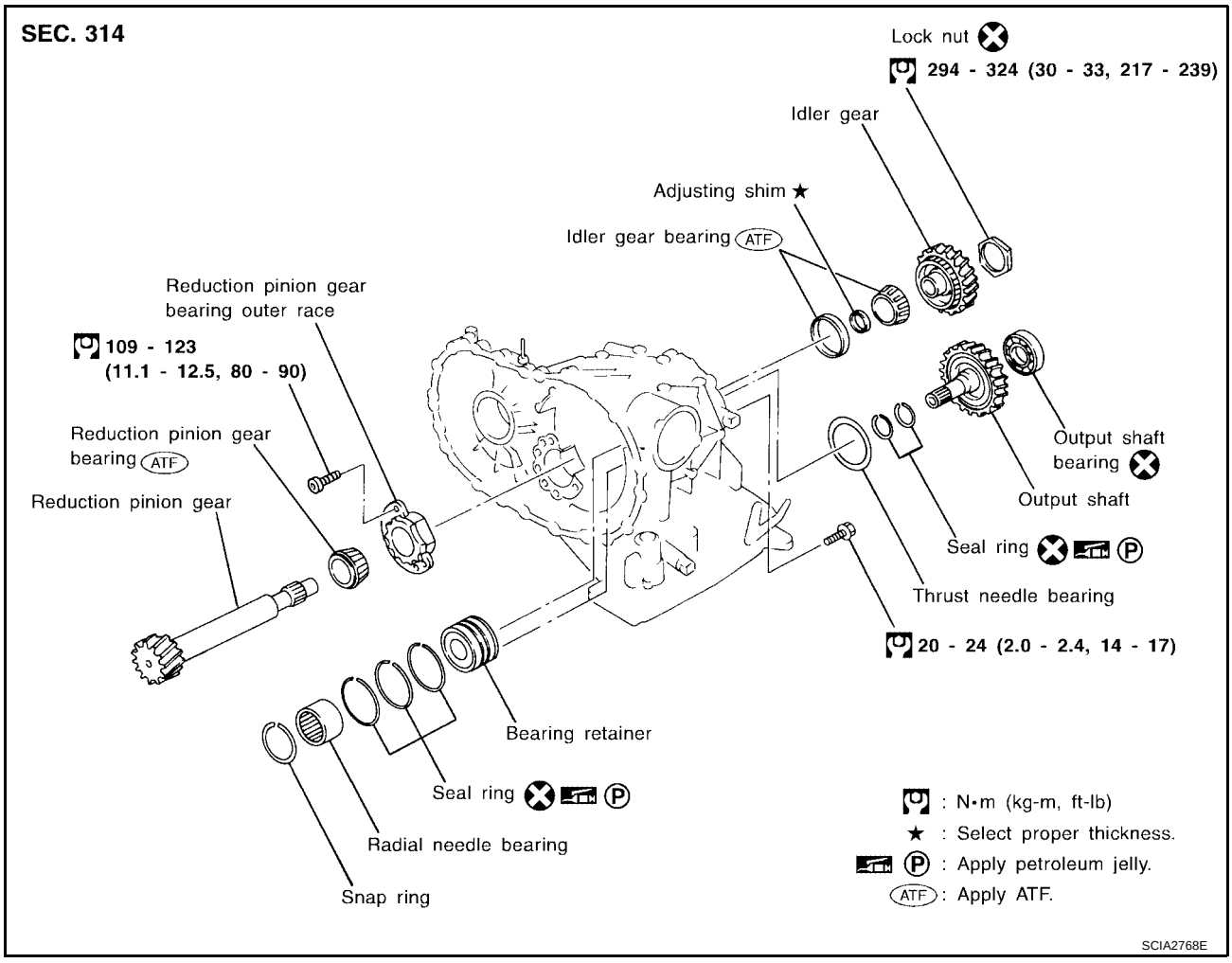
6. Install forward clutch hub on rear internal gear.
   - **Check operation of forward one-way clutch.**
     Hold rear internal gear and turn forward clutch hub.
     Check forward clutch hub for correct locking and unlocking directions.
   - **If not as shown in illustration, check installation direction of forward one-way clutch.**



Output Shaft, Idler Gear, Reduction Pinion Gear and Bearing Retainer

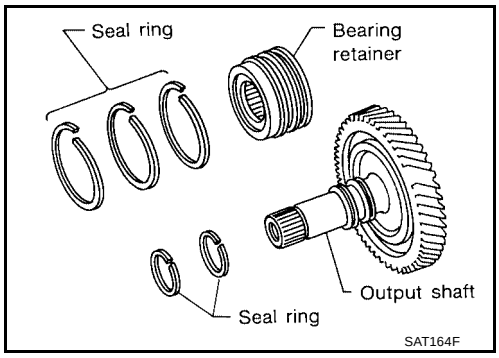
UCS000RW

COMPONENTS

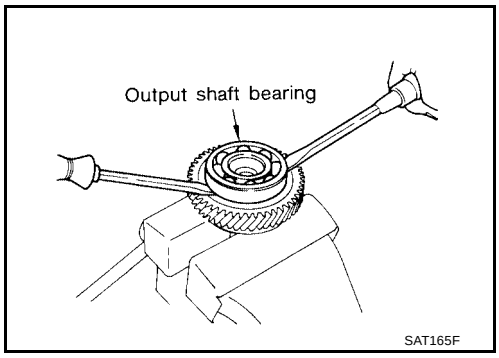


DISASSEMBLY

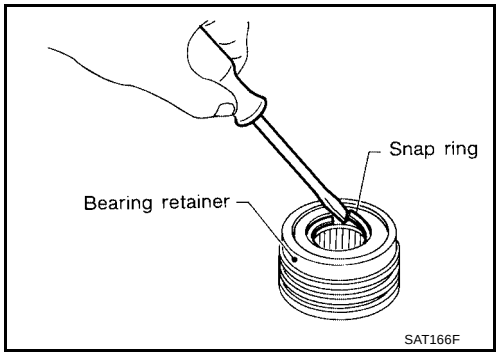
1. Remove seal rings from output shaft and bearing retainer.



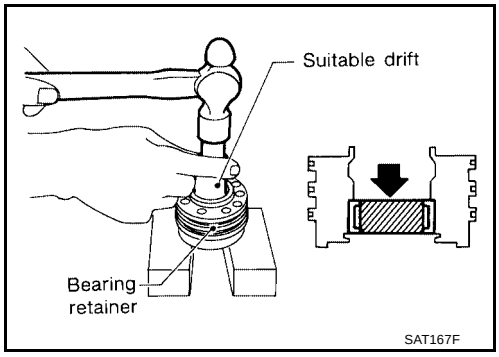
2. Remove output shaft bearing with screwdrivers.
   - **Always replace bearing with a new one when removed.**
   - **Do not damage output shaft.**



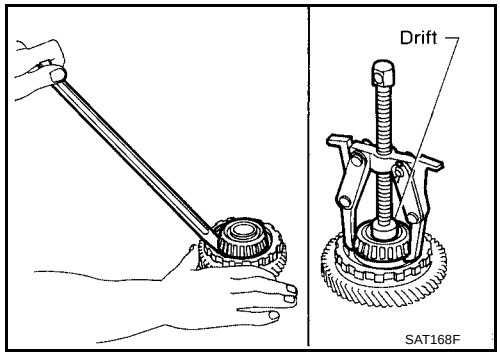
3. Remove snap ring from bearing retainer.
   - **Do not expand snap ring excessively.**



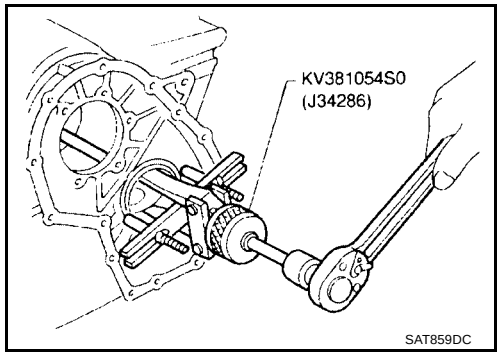
4. Remove needle bearing from bearing retainer.



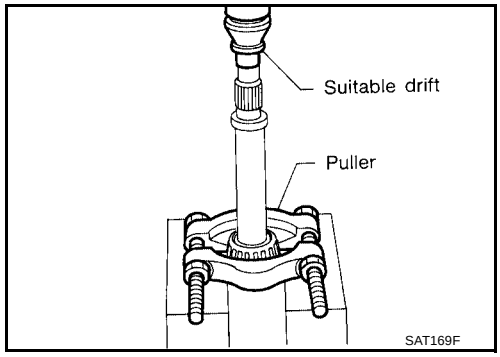
5. Remove idler gear bearing inner race from idler gear.



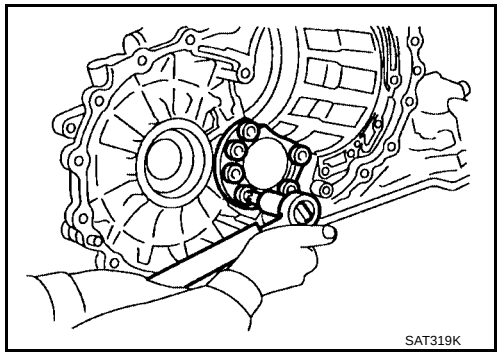
6. Remove idler gear bearing outer race from transmission case.



7. Press out reduction pinion gear bearing inner race from reduction pinion gear.



8. Remove reduction pinion gear bearing outer race from transmission case.



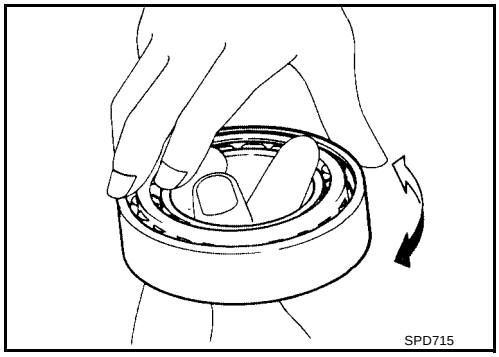
INSPECTION

Output Shaft, Idler Gear and Reduction Pinion Gear

- Check shafts for cracks, wear or bending.
- Check gears for wear, chips and cracks.

Bearing

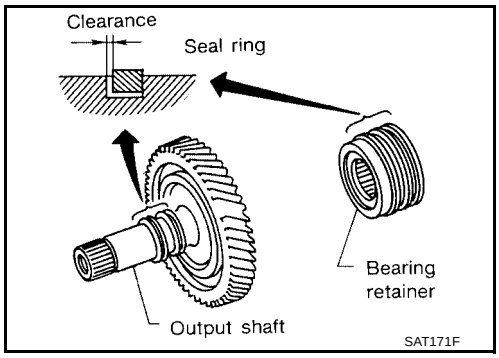
- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing taper roller bearing, replace outer and inner race as a set.**



Seal Ring Clearance

- Install new seal rings to output shaft.
- Measure clearance between seal ring and ring groove of output shaft.

Standard clearance : 0.10 - 0.25 mm (0.0039 - 0.0098 in)
Allowable limit : 0.25 mm (0.0098 in)



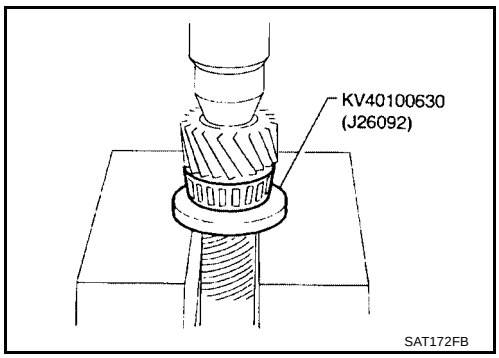
- If not within allowable limit, replace output shaft.
- Install new seal rings to bearing retainer.
- Measure clearance between seal ring and ring groove of bearing retainer.

Standard clearance : 0.10 - 0.30 mm (0.0039 - 0.0118 in)
Allowable limit : 0.30 mm (0.0118 in)

- If not within allowable limit, replace bearing retainer.

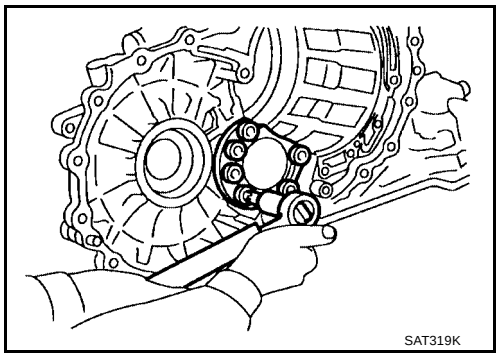
ASSEMBLY

1. Press reduction pinion gear bearing inner race on reduction pinion gear.

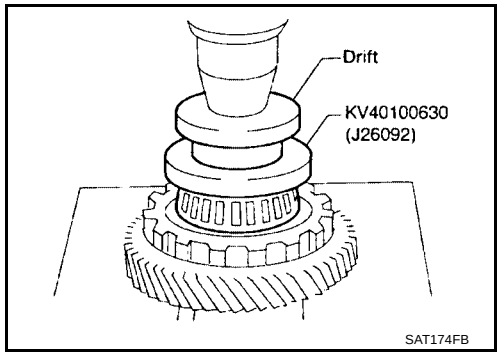


2. Install reduction pinion gear bearing outer race on transmission case.

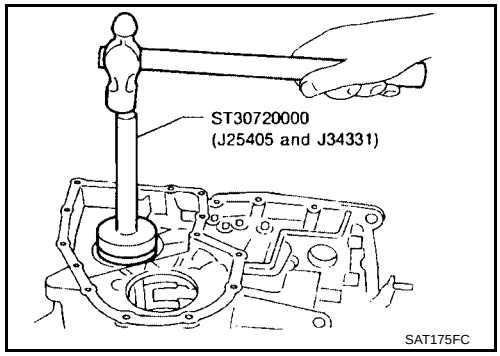
: 109 - 123 N-m (11.1 - 12.5 kg-m, 80 - 90 ft-lb)



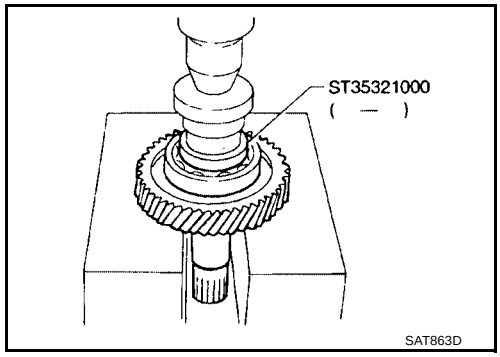
3. Press idler gear bearing inner race on idler gear.



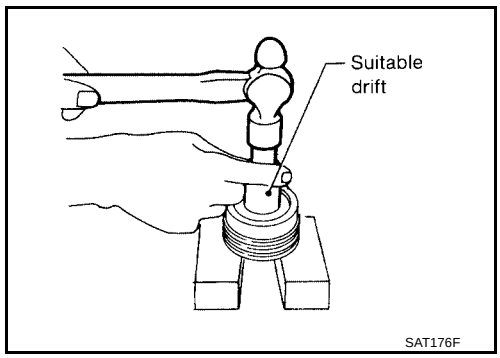
4. Install idler gear bearing outer race on transmission case.



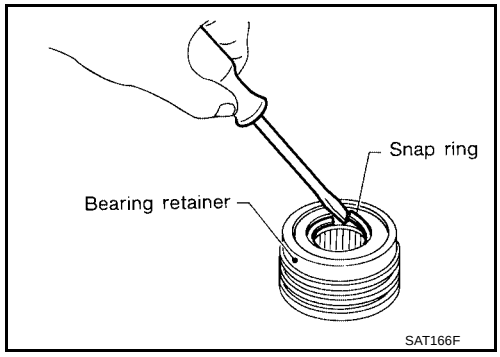
5. Press output shaft bearing on output shaft.



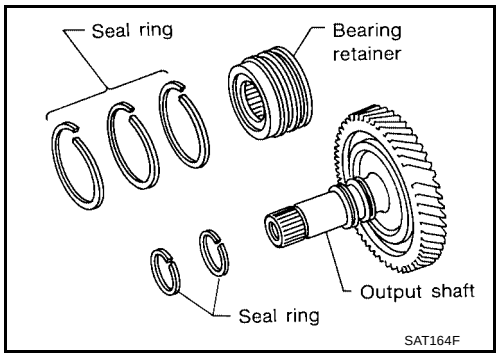
6. Press needle bearing on bearing retainer.



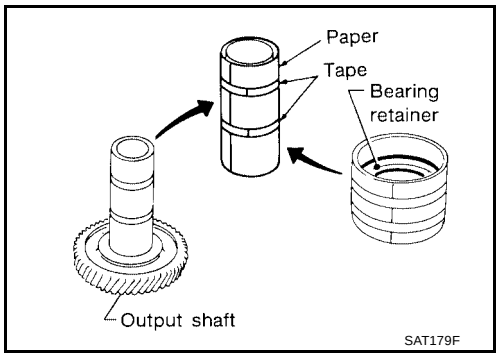
7. Install snap ring to bearing retainer.
   - **Do not expand snap ring excessively.**



8. After packing ring grooves with petroleum jelly, carefully install new seal rings on output shaft and bearing retainer.



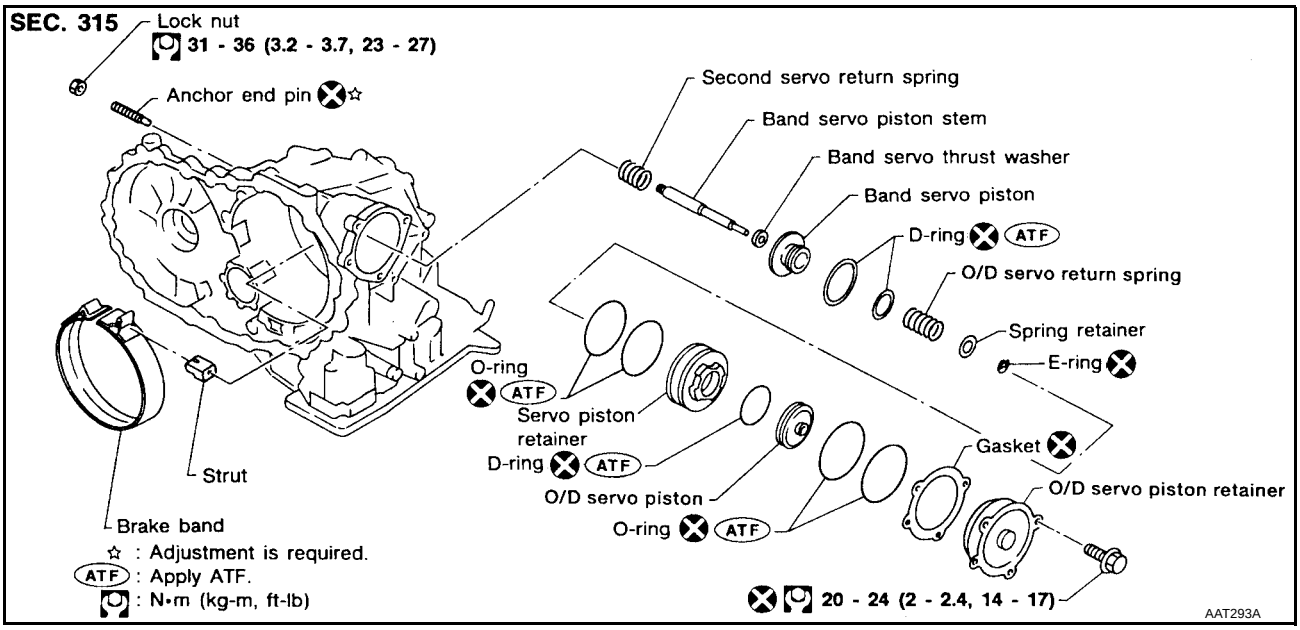
- **Roll paper around seal rings to prevent seal rings from spreading.**



Band Servo Piston Assembly

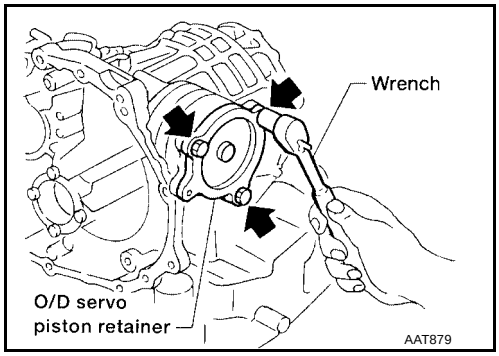
UCS000RX

COMPONENTS

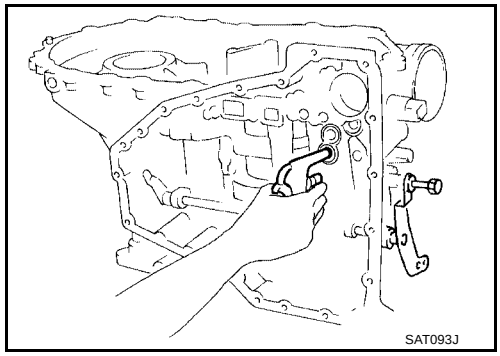


DISASSEMBLY

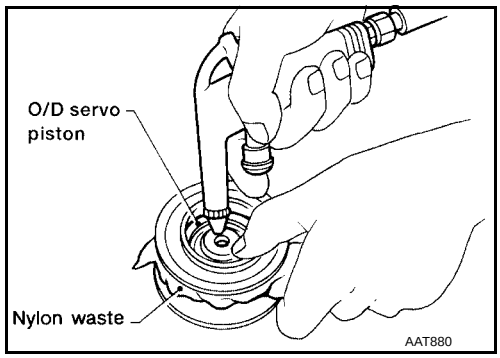
1. Remove band servo piston fixing bolts.



2. Apply compressed air to oil hole in transmission case to remove O/D servo piston retainer and band servo piston assembly.
   - **Hold band servo piston assembly with a rag or nylon waste.**

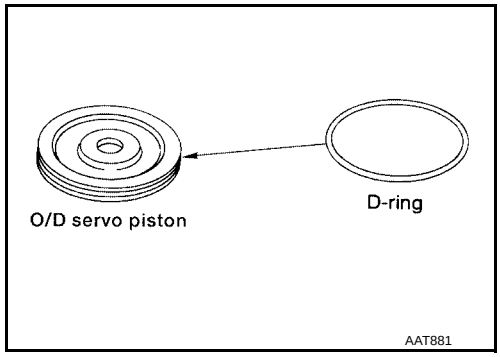

SAT093J

3. Apply compressed air to oil hole in O/D servo piston retainer to remove O/D servo piston from retainer.
   - **Hold O/D band servo piston while applying compressed air.**



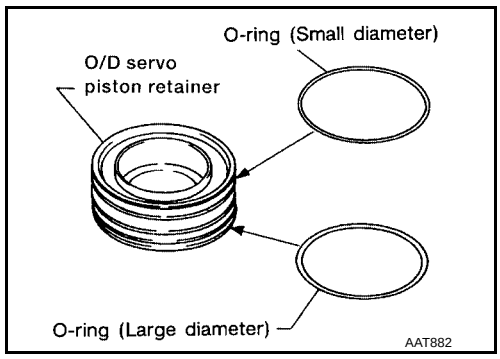
AAT880

4. Remove D-ring from O/D servo piston.



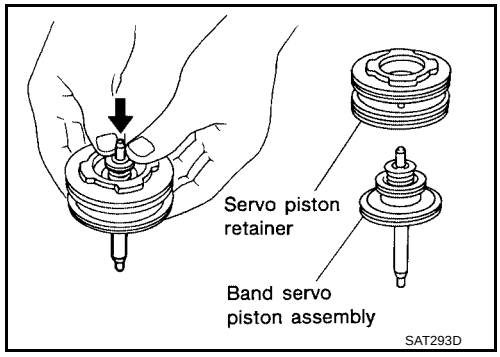
AAT881

5. Remove O-rings from O/D servo piston retainer.



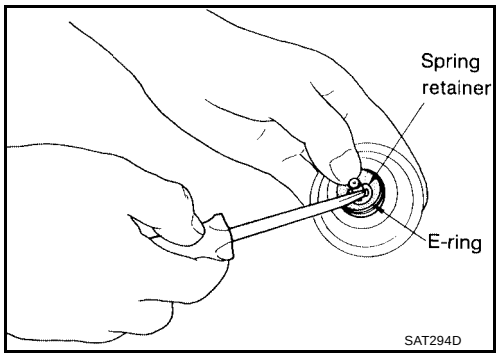
AAT882

6. Remove band servo piston assembly from servo piston retainer by pushing it forward.

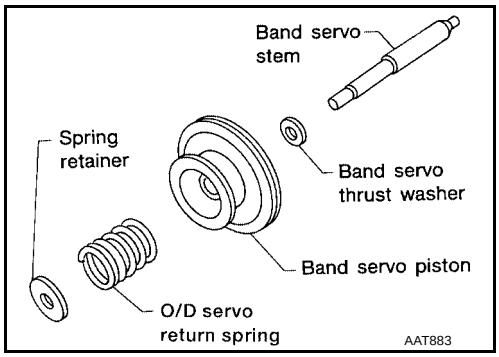


SAT293D

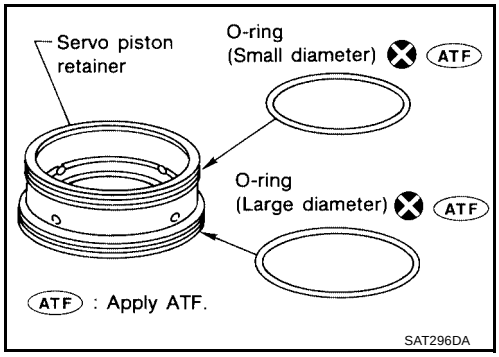
7. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, remove E-ring.



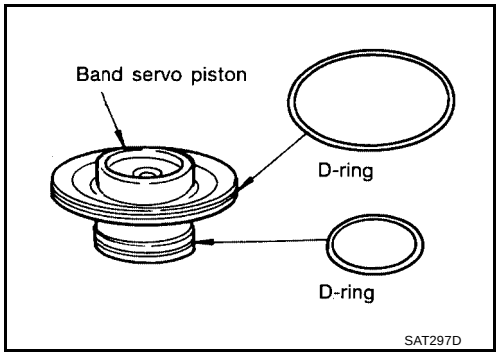
8. Remove O/D servo return spring, band servo thrust washer and band servo piston stem from band servo piston.



9. Remove O-rings from servo piston retainer.



10. Remove D-rings from band servo piston.



INSPECTION

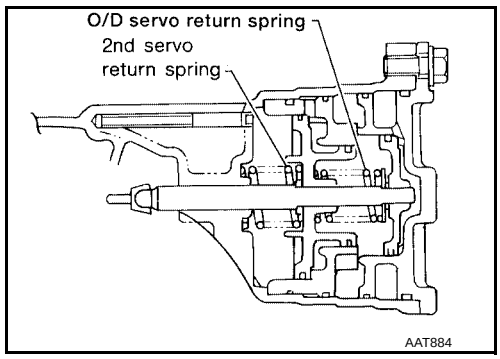
Pistons, Retainers and Piston Stem

- Check frictional surfaces for abnormal wear or damage.

Return Springs

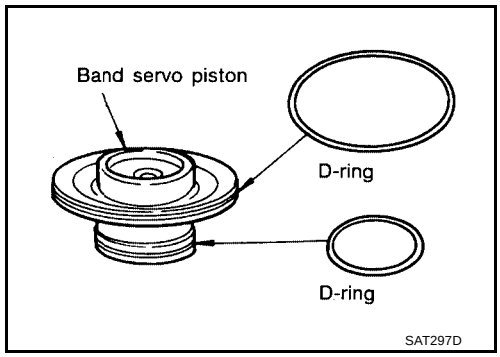
- Check for deformation or damage.
- Measure free length and outer diameter.

Inspection standard : Refer to AT-383, "Band Servo"

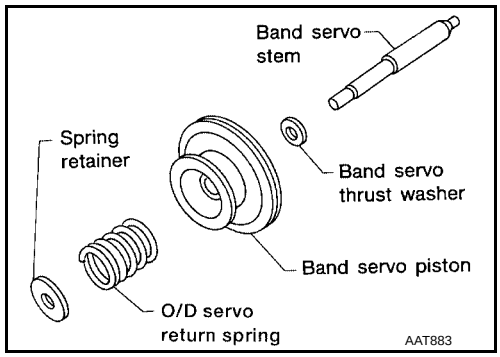


ASSEMBLY

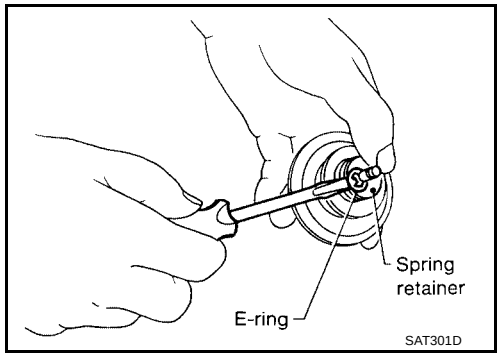
1. Install D-rings to servo piston retainer.
   - **Apply ATF to D-rings.**
   - **Pay attention to position of each O-ring.**



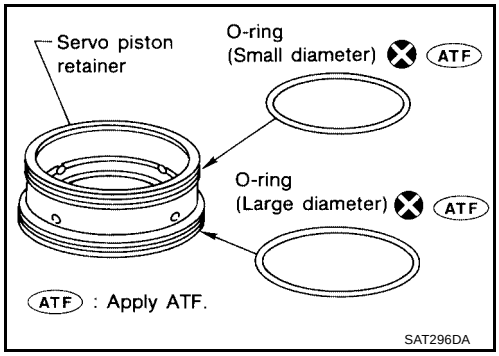
2. Install band servo piston stem, band servo thrust washer, O/D servo return spring and spring retainer to band servo piston.



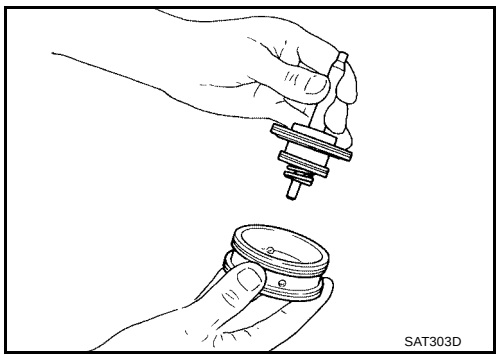
3. Place piston stem end on a wooden block. While pushing servo piston spring retainer down, install E-ring.



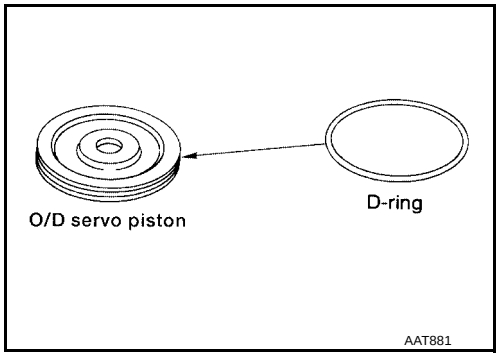
4. Install O-rings to servo piston retainer.
   - **Apply ATF to O-rings.**
   - **Pay attention to position of each O-ring.**



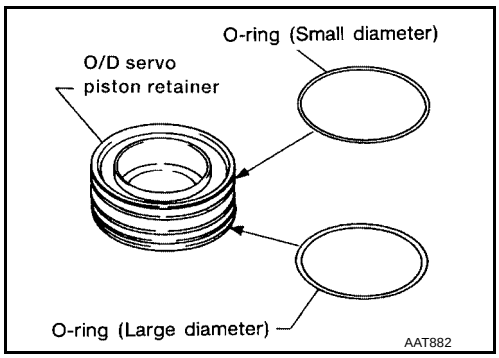
5. Install band servo piston assembly to servo piston retainer by pushing it inward.



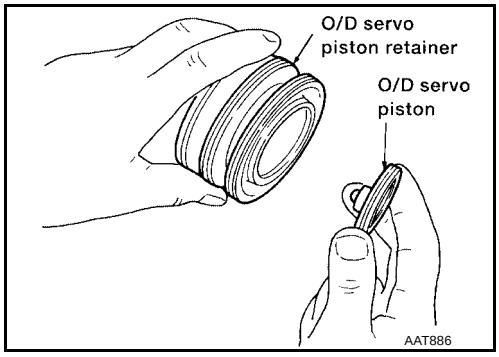
6. Install D-ring to O/D servo piston.
   - **Apply ATF to D-ring.**



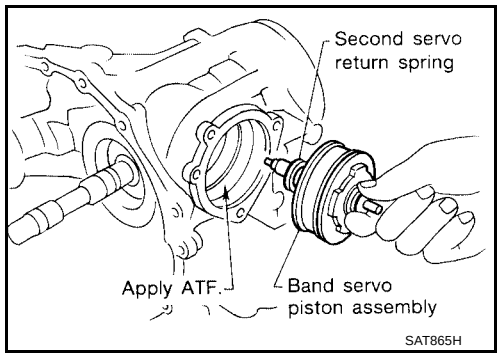
7. Install O-rings to O/D servo piston retainer.
   - **Apply ATF to O-rings.**
   - **Pay attention to position of each O-ring.**



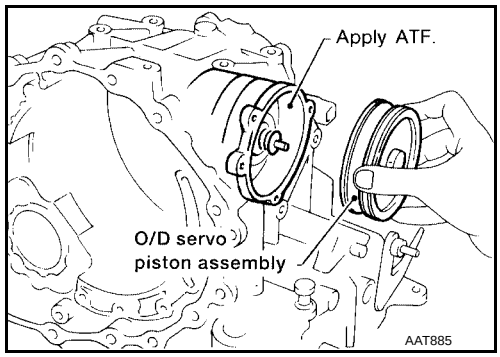
8. Install O/D servo piston to O/D servo piston retainer.



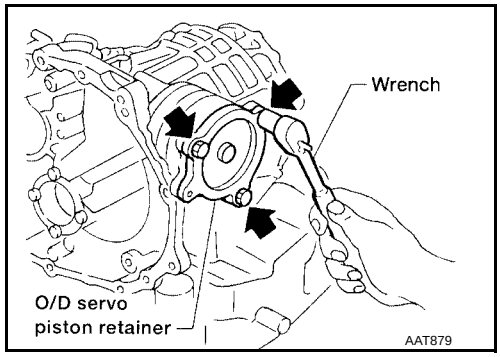
9. Install band servo piston assembly and 2nd servo return spring to transmission case.
   - **Apply ATF to O-ring of band servo piston and transmission case.**



10. Install O/D servo piston assembly to transmission case.
    - **Apply ATF to O-ring of band servo piston and transmission case.**

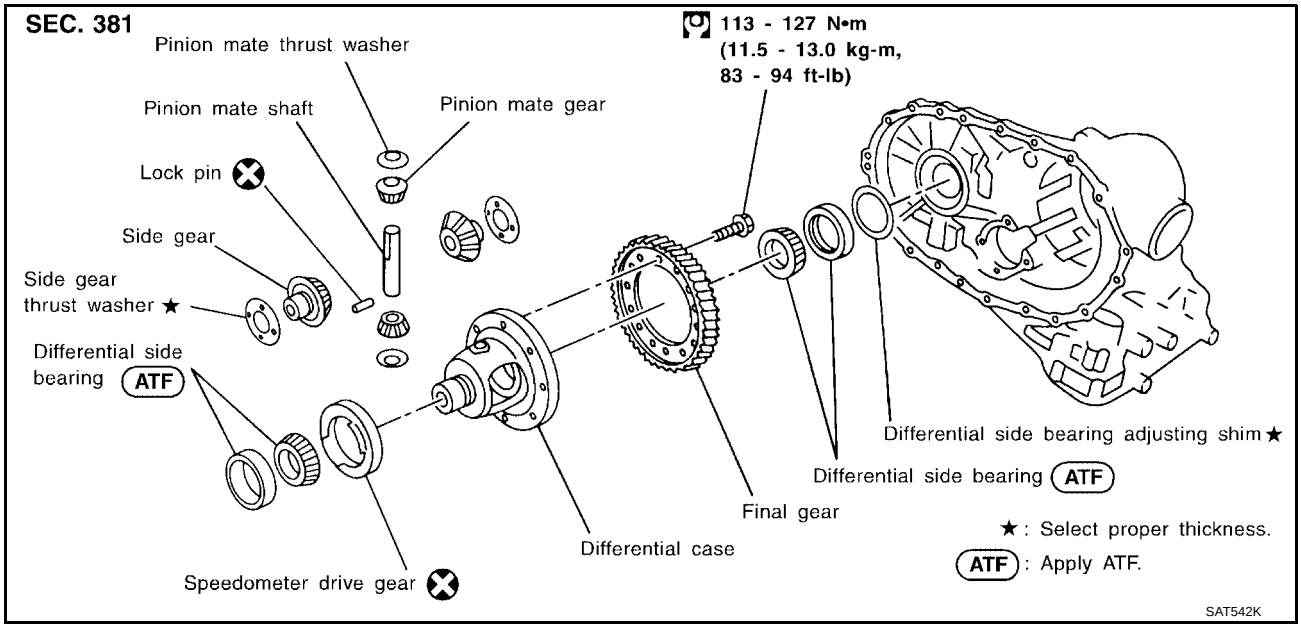


11. Install O/D servo piston retainer to transmission case. Refer to AT-344, "COMPONENTS" .



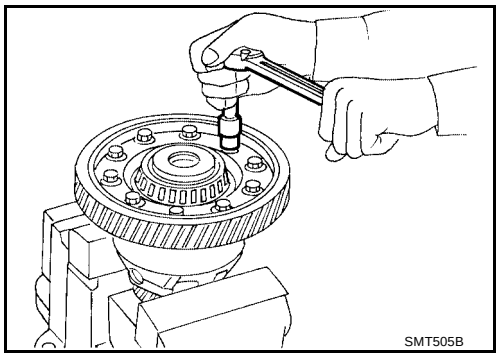
Final Drive
COMPONENTS

UCS000RY

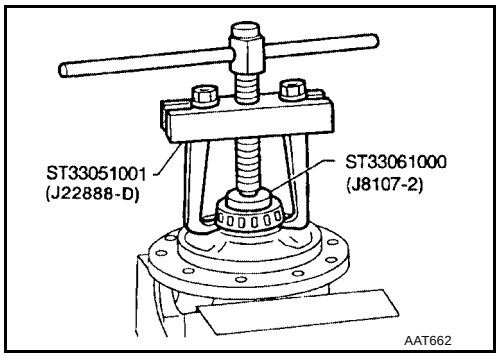


DISASSEMBLY

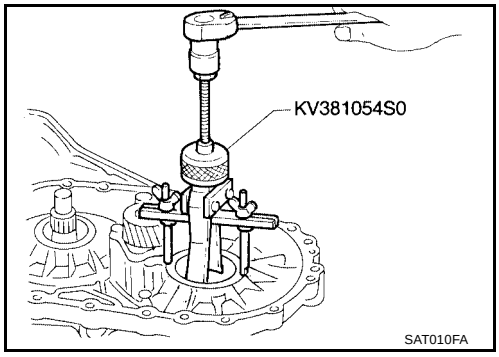
1. Remove final gear.



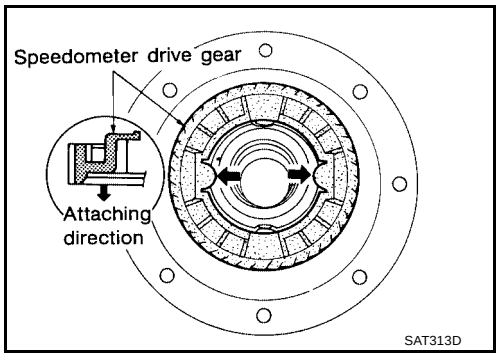
2. Press out differential side bearings.
   - **Be careful not to mix up the right and left bearings.**



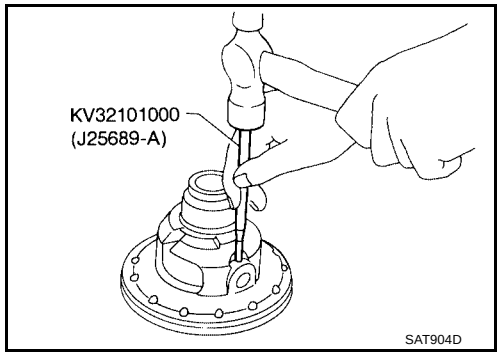
3. Remove differential side bearing outer race and side bearing adjusting shim from transmission case.



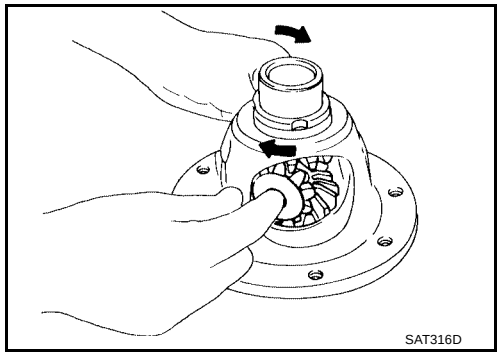
4. Remove speedometer drive gear.



5. Drive out pinion mate shaft lock pin.



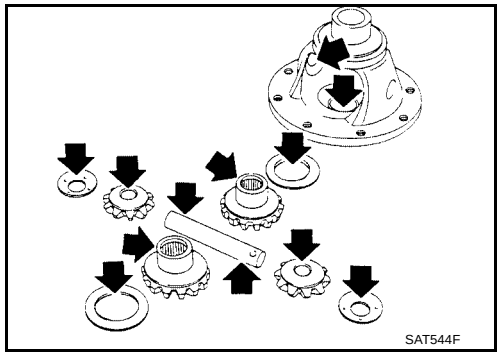
6. Draw out pinion mate shaft lock pin.
7. Remove pinion mate gears and side gears.



INSPECTION

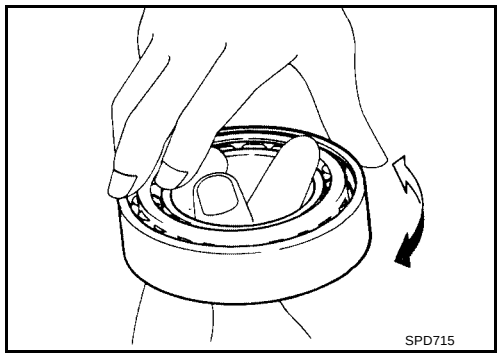
Gear, Washer, Shaft and Case

- Check mating surfaces of differential case, side gears and pinion mate gears.
- Check washers for wear.



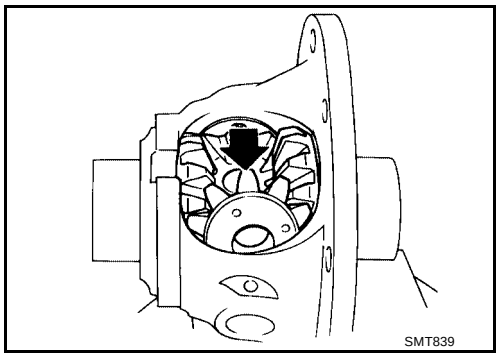
Bearings

- Make sure bearings roll freely and are free from noise, cracks, pitting or wear.
- **When replacing taper roller bearing, replace outer and inner race as a set.**

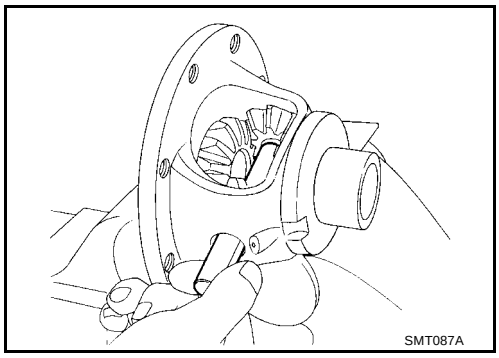


ASSEMBLY

1. Attach side gear thrust washers to side gears, then install pinion mate thrust washers and pinion mate gears in place.
   - **Apply ATF to any parts.**

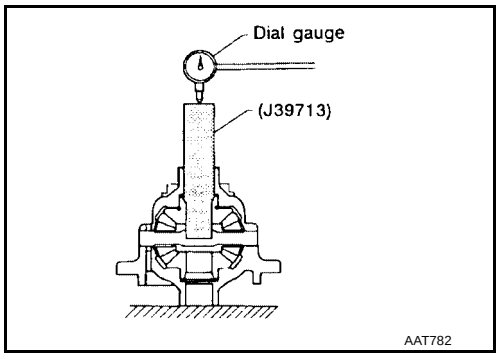


2. Insert pinion mate shaft.
   - **When inserting, be careful not to damage pinion mate thrust washers.**



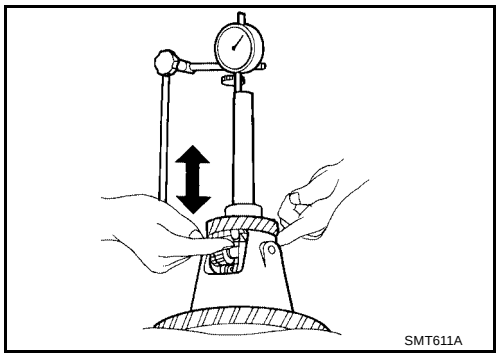
3. Measure clearance between side gear and differential case with washers following the procedure below:

a. Set Tool and dial indicator on side gear.



b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

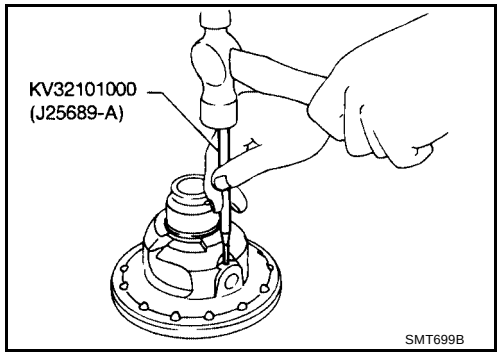
Clearance between side gear and differential case with washer	**: 0.1 - 0.2 mm (0.004 - 0.008 in)**



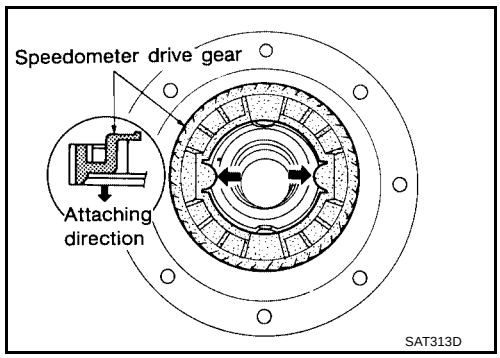
c. If not within specification, adjust clearance by changing thickness of differential side gear thrust washers.

Differential side gear thrust washers	**: Refer to AT-381, "DIFFERENTIAL SIDE GEAR THRUST WASHERS" .**

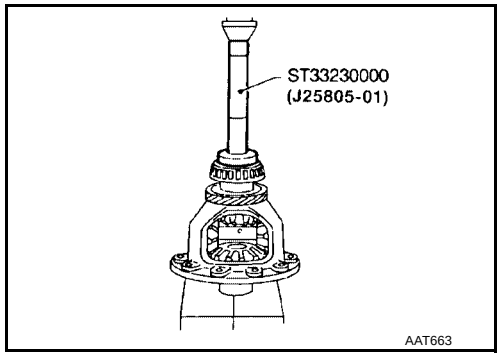
4. Install lock pin.
   - **Make sure that lock pin is flush with case.**



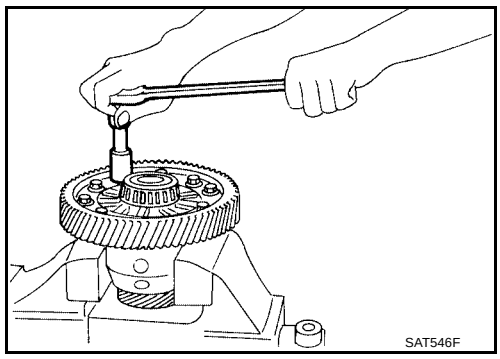
5. Install speedometer drive gear on differential case.
   - **Align the projection of speedometer drive gear with the groove of differential case.**



6. Press on differential side bearings.



7. Install final gear and tighten fixing bolts in a crisscross pattern. Tighten final gear bolts to the specified torque. Refer to AT-349, "COMPONENTS" .



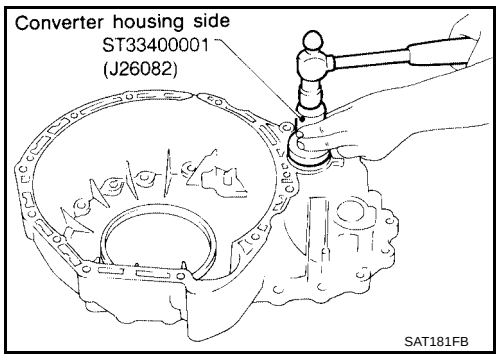
ASSEMBLY

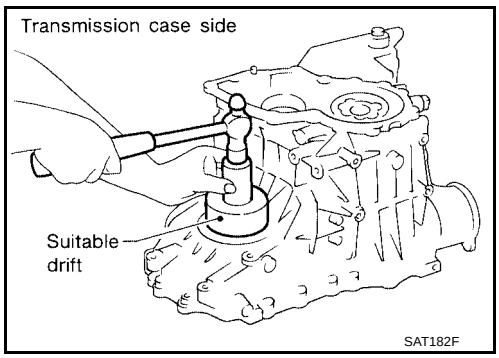
PFP:00000

Assembly (1)

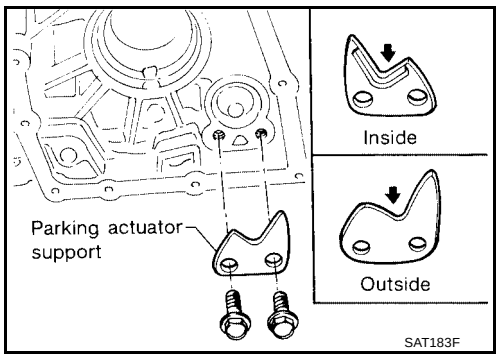
UCS000RZ

1. Install differential side oil seals on transmission case and converter housing.

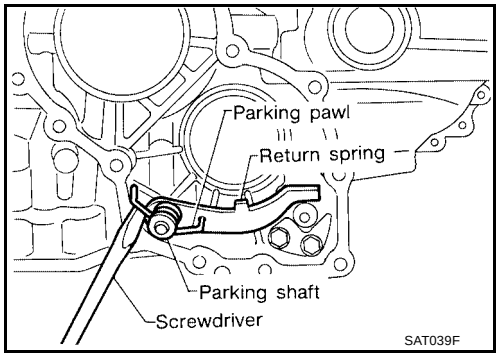




2. Install parking actuator support to transmission case. Tighten parking actuator support bolts to the specified torque. Refer to AT-277, "OVERHAUL" .
   - **Pay attention to direction of parking actuator support.**



3. Install parking pawl on transmission case and fix it with parking shaft.
4. Install return spring.

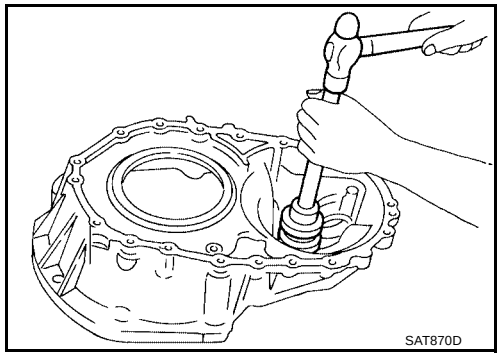


Adjustment (1)

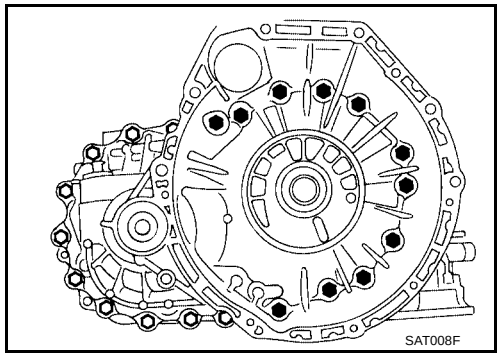
UCS000S0

DIFFERENTIAL SIDE BEARING PRELOAD

1. Install differential side bearing outer race without adjusting shim on transmission case.
2. Install differential side bearing outer race on converter housing.



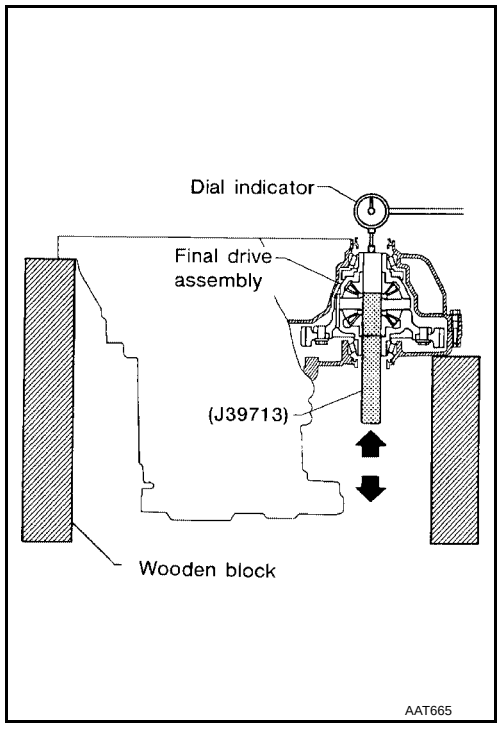
3. Place final drive assembly on transmission case.
4. Install transmission case on converter housing. Tighten transmission case fixing bolts to the specified torque. Refer to AT-277, "OVERHAUL" .



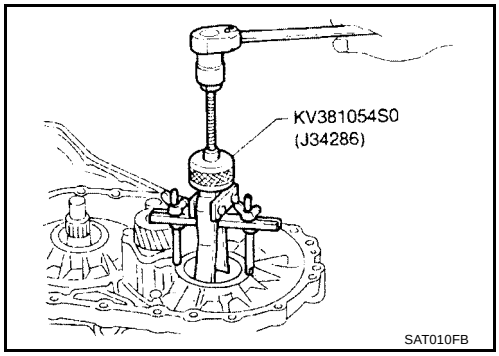
5. Attach dial indicator on differential case at converter housing side.
6. Insert Tool into differential side gear from transmission case side.
7. Move Tool up and down and measure dial indicator deflection.
8. Select proper thickness of differential side bearing adjusting shim(s).

Suitable shim thickness = Dial indicator deflection + Specified bearing preload

Differential side bearing preload adjusting shim	**: Refer to AT-381, "DIFFERENTIAL SIDE BEARING PRELOAD ADJUSTING SHIMS" .**
Bearing preload	**: 0.05 - 0.09 mm (0.0020 - 0.0035 in)**



9. Remove converter housing from transmission case.
10. Remove final drive assembly from transmission case.
11. Remove differential side bearing outer race from transmission case.
12. Reinstall differential side bearing outer race and shim(s) selected from SDS table on transmission case.
13. Reinstall converter housing on transmission case and tighten transmission case fixing bolts to the specified torque. Refer to AT-277, "OVERHAUL" .

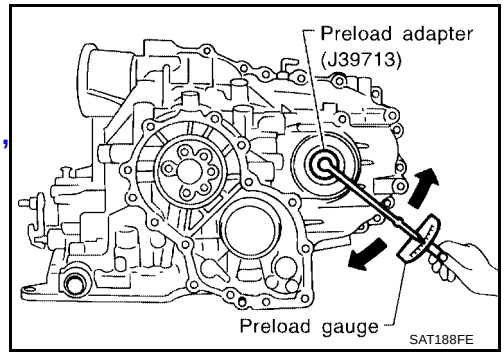


14. Insert Tool and measure turning torque of final drive assembly.
    - **Turn final drive assembly in both directions several times to seat bearing rollers correctly.**

      Turning torque of final drive assembly (New bearing) : **0.78 - 1.37 N-m (8.0 - 14.0 kg-cm, 6.9 - 12.2 in-lb)**

    - **When old bearing is used again, turning torque will be slightly less than the above.**
    - **Make sure torque is close to the specified range.**

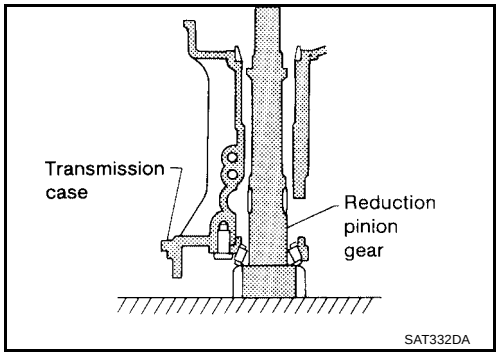
      Preload adapter : **RE4F04B-(J39713)**



REDUCTION PINION GEAR BEARING PRELOAD

1. Remove transmission case and final drive assembly from converter housing.
2. Select proper thickness of reduction pinion gear bearing adjusting shim using the following procedures.

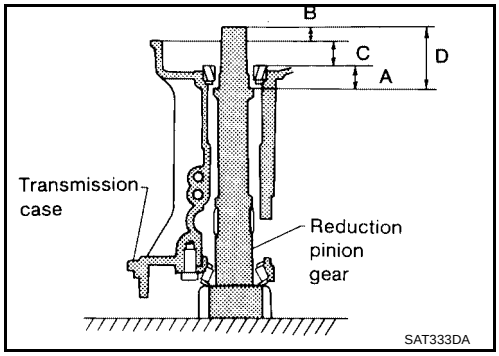
a. Place reduction pinion gear on transmission case as shown.



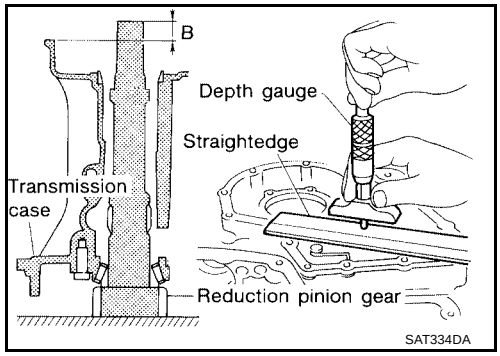
b. Place idler gear bearing on transmission case.
c. Measure dimensions “B” “C” and “D” and calculate dimension “A”.

A = D – (B + C)

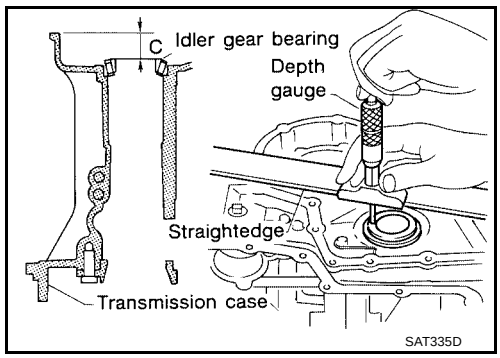
“A” : **Distance between the surface of idler gear bearing inner race and the adjusting shim mating surface of reduction pinion gear.**



- Measure dimension “B” between the end of reduction pinion gear and the surface of transmission case.
- **Measure dimension “B” in at least two places.**

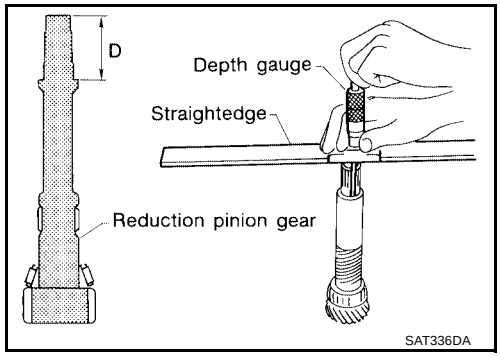


- Measure dimension “C” between the surface of idler gear bearing inner race and the surface of transmission case.
- **Measure dimension “C” in at least two places.**



- Measure dimension “D” between the end of reduction pinion gear and the adjusting shim mating surface of reduction pinion gear.
- **Measure dimension “D” in at least two places.**
- Calculate dimension “A”.

A = D – (B + C)



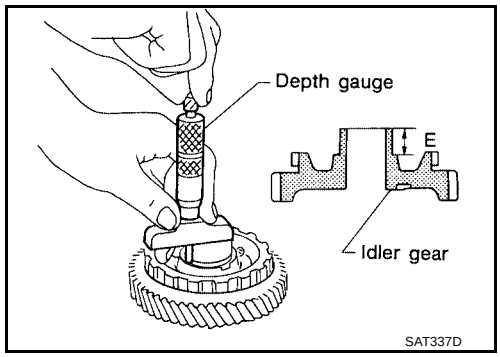
d. Measure dimension “E” between the end of idler gear and the idler gear bearing inner race mating surface of idler gear.
   - **Measure dimension “E” in at least two places.**

e. Select proper thickness of reduction pinion gear bearing adjusting shim.

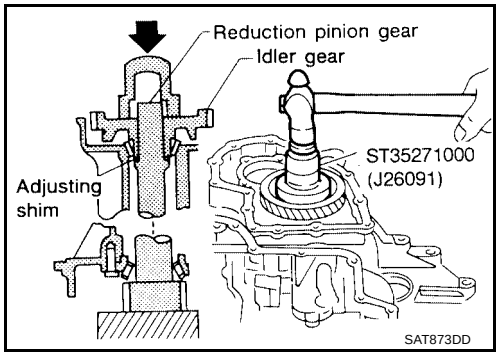
Proper shim thickness = A – E – 0.05 mm (0.0020 in)*

(*: Bearing preload)

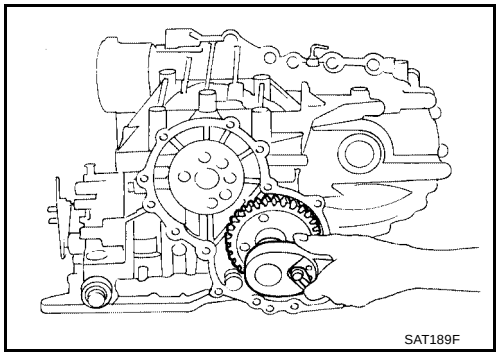
Reduction pinion gear bearing adjusting shim **: Refer to AT-382, "REDUCTION PINION GEAR BEARING ADJUSTING SHIMS" .**



3. Install reduction gear and reduction gear bearing adjusting shim selected in step 2-e on transmission case.
4. Press idler gear bearing inner race on idler gear.
5. Press idler gear on reduction gear.
   - **Press idler gear until idler gear fully contacts adjusting shim.**



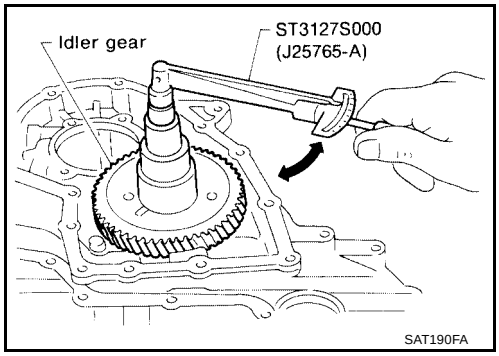
6. Tighten idler gear lock nut to the specified torque. Refer to AT-277, "OVERHAUL" .
   - **Lock idler gear with parking pawl when tightening lock nut.**



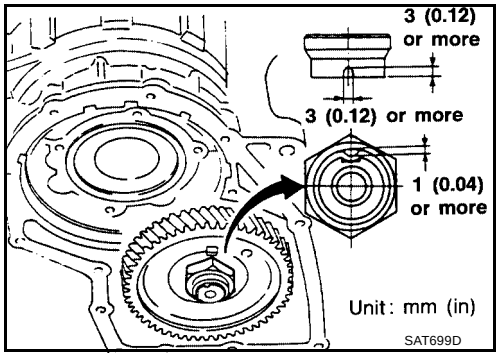
7. Measure turning torque of reduction pinion gear.
   - **When measuring turning torque, turn reduction pinion gear in both directions several times to seat bearing rollers correctly.**

     Turning torque of reduction pinion gear : 0.05 - 0.39 N-m (0.5 - 4.0 kg-cm, 0.43 - 3.47 in-lb)

   - **If turning torque is out of specification, decrease or increase thickness of reduction pinion gear bearing adjusting shim.**

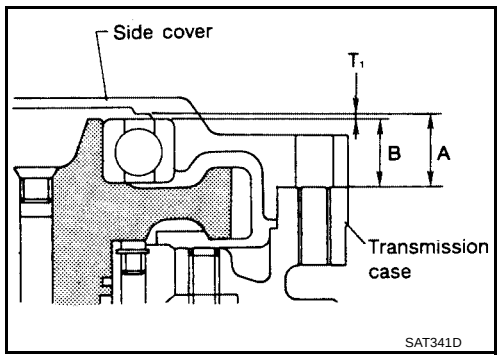


8. After properly adjusting turning torque, clinch idler gear lock nut as shown.

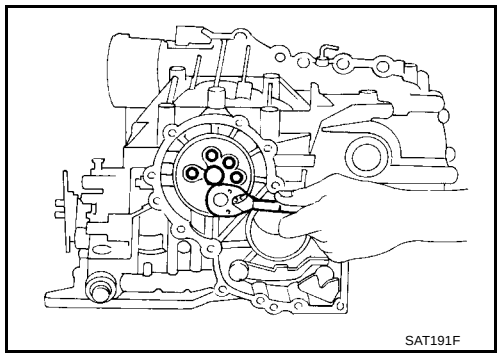


OUTPUT SHAFT END PLAY

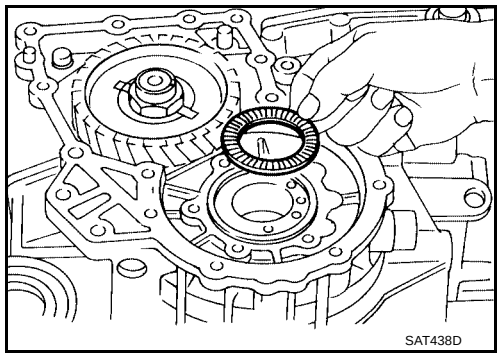
- Measure clearance between side cover and the end of the output shaft bearing.
- Select proper thickness of adjusting shim so that clearance is within specifications.



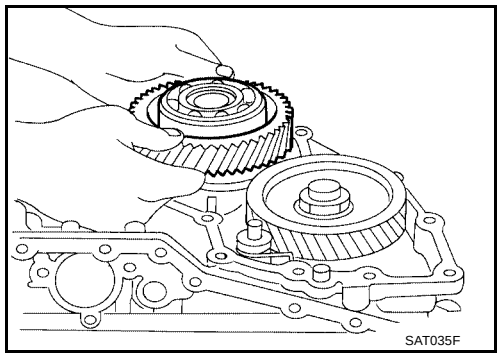
1. Install bearing retainer for output shaft.



2. Install output shaft thrust needle bearing on bearing retainer.



3. Install output shaft on transmission case.

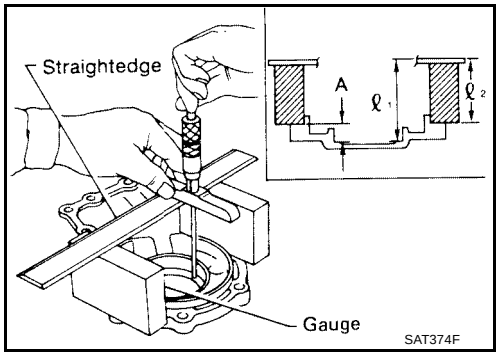


4. Measure dimensions "$\ell 1$" and "$\ell 2$" at side cover and then calculate dimension "A".
   - Measure dimension "**$\ell 1$**" **and "$\ell 2$" in at least two places.**

   "A" : **Distance between transmission case fitting surface and adjusting shim mating surface.**

   $A = \ell 1 - \ell 2$

   $\ell 2$: **Height of gauge**

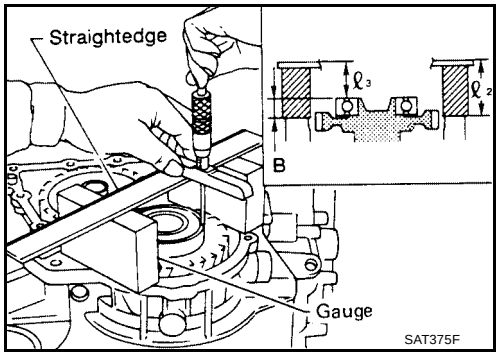


5. Measure dimensions "$\ell 2$" and "$\ell 3$" and then calculate dimension "B".
   - Measure "**$\ell 2$**" **and "$\ell 3$" in at least two places.**

   "B" : **Distance between the end of output shaft bearing outer race and the side cover fitting surface of transmission case.**

   $B = \ell 2 - \ell 3$

   $\ell 2$: **Height of gauge**

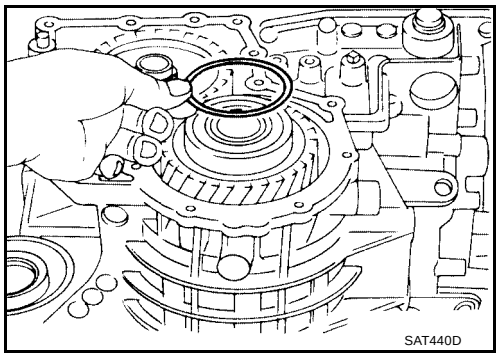


6. Select proper thickness of adjusting shim so that output shaft end play (clearance between side cover and output shaft bearing) is within specifications.

   Output shaft end play (A – B) : **0 - 0.15 mm (0 - 0.0059 in)**

   Output shaft end play adjusting shims : **Refer to AT-384, "OUTPUT SHAFT ADJUSTING SHIMS" .**

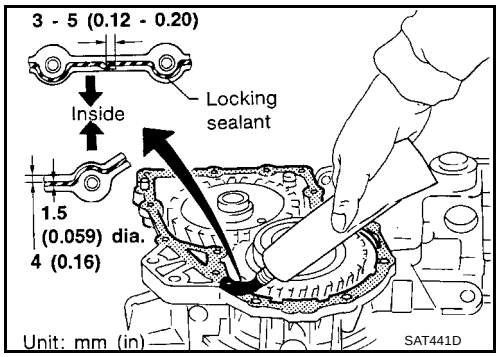
7. Install adjusting shim on output shaft bearing.



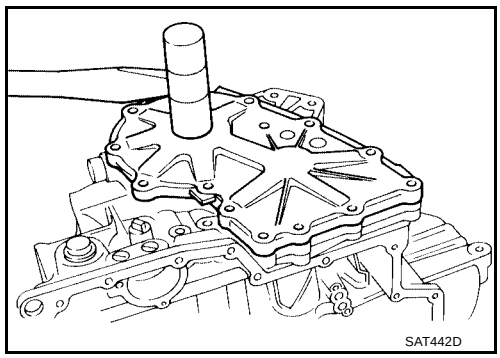
Assembly (2)

UCS000S1

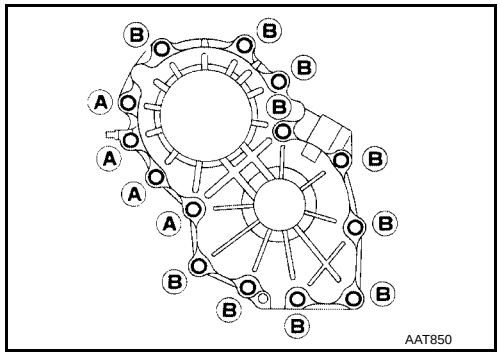
1. Apply anaerobic liquid gasket to transmission case as shown in illustration. Refer to GI-43, "Recommended Chemical Products and Sealants" .



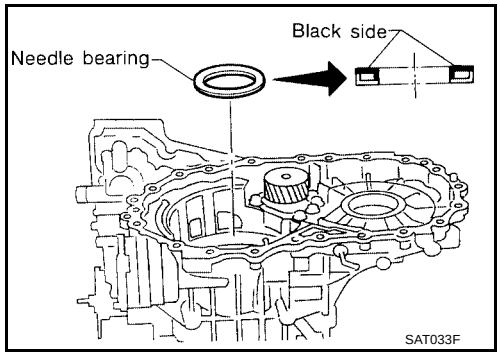
2. Set side cover on transmission case.
   - **Apply locking sealant to the mating surface of transmission case.**



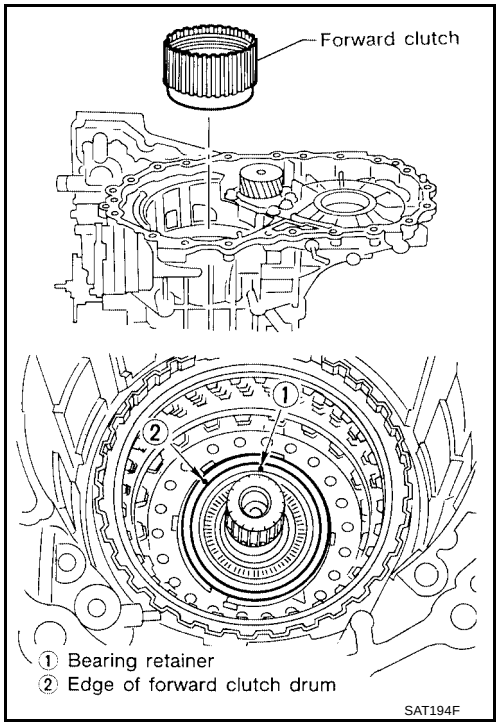
3. Tighten side cover fixing bolts to specified torque. Refer to AT-277, "OVERHAUL" .
   - **Do not mix bolts A and B.**
   - **Always replace bolts A as they are self-sealing bolts.**



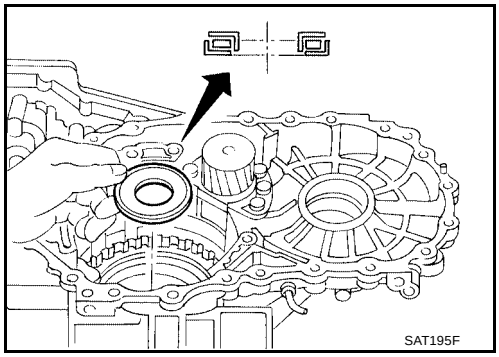
4. Remove paper rolled around bearing retainer.
5. Install thrust washer on bearing retainer.
   - **Apply petroleum jelly to thrust washer.**



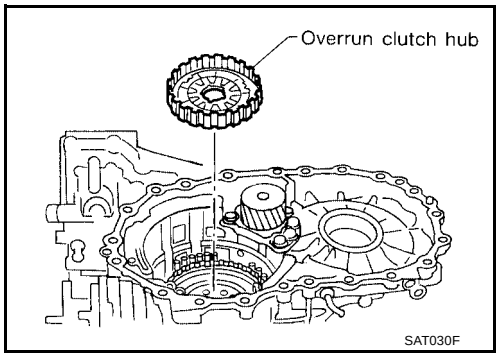
6. Install forward clutch assembly.
   - **Align teeth of low & reverse brake drive plates before installing.**
   - **Make sure that bearing retainer seal rings are not spread.**
   - **If forward clutch assembly is correctly seated, points 1 and 2 are at almost same level.**



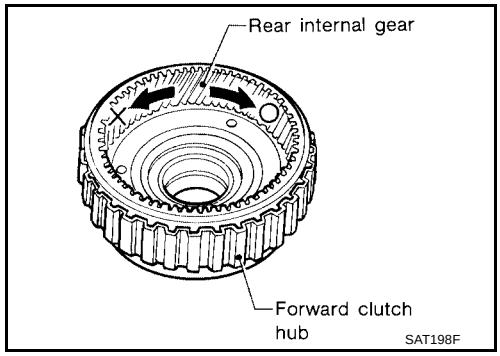
7. Install thrust needle bearing on bearing retainer.
   - **Apply petroleum jelly to thrust needle bearing.**
   - **Pay attention to direction of thrust needle bearing.**



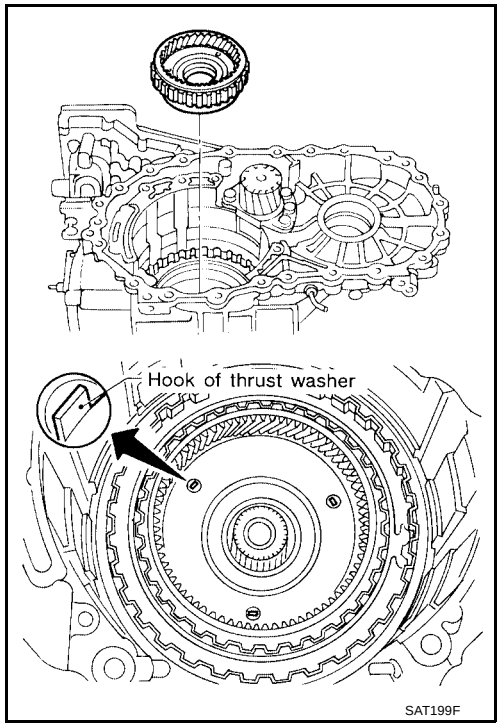
8. Install overrun clutch hub.
   - **Apply petroleum jelly to thrust washers.**
   - **Align teeth of overrun clutch drive plates before installing.**



9. Hold forward clutch hub and turn rear internal gear.
Check overrun clutch hub for correct directions of lock and unlock.
   - **If not shown as illustrated, check installed direction of forward one-way clutch.**

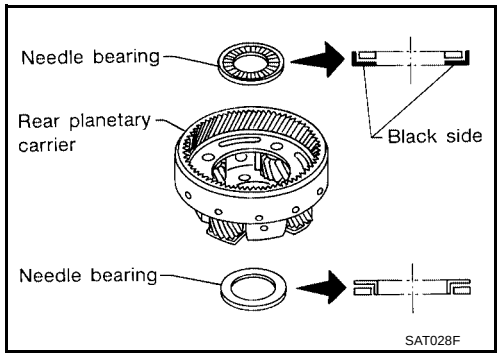


10. Install forward clutch hub and rear internal gear assembly.
   - **Align teeth of forward clutch drive plates before installing.**
   - **Check that three hooks of thrust washer are correctly aligned after installing.**

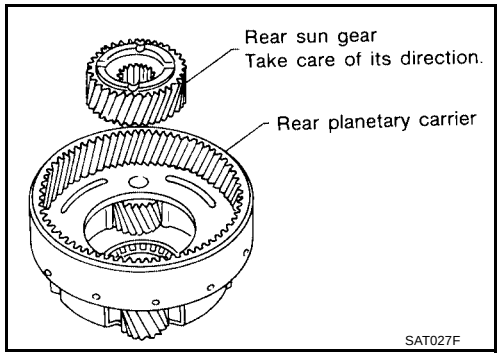


11. Install rear planetary carrier assembly and rear sun gear according to the following procedures.

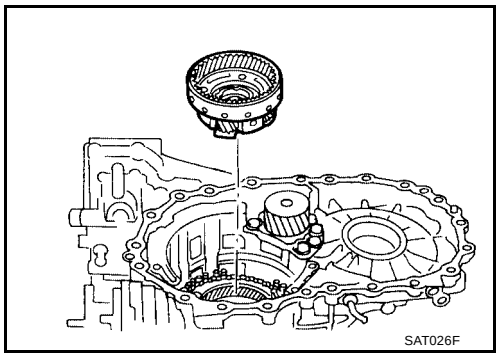
a. Install needle bearings on rear planetary carrier.
   - **Apply petroleum jelly to needle bearings.**
   - **Pay attention to direction of needle bearings.**



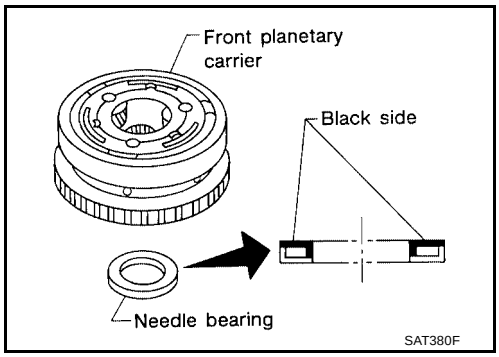
b. Install rear sun gear on rear planetary carrier.
   - **Pay attention to direction of rear sun gear.**



c. Install rear planetary carrier on transmission case.

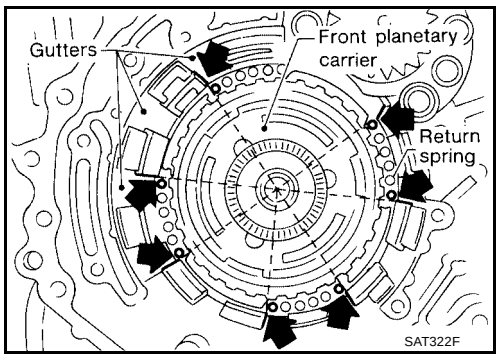


12. Install thrust needle bearing on front planetary carrier, then install them together on transmission case.
    - **Apply petroleum jelly to thrust needle bearing.**
    - **Pay attention to direction of thrust needle bearing.**

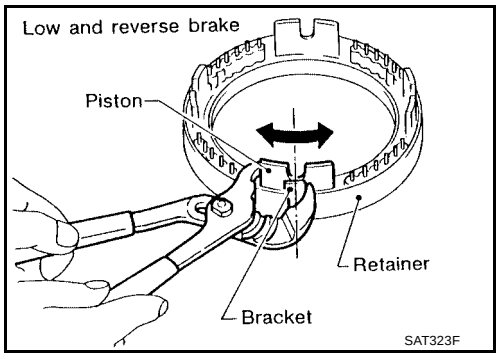


13. Install low and reverse brake piston according to the following procedures.

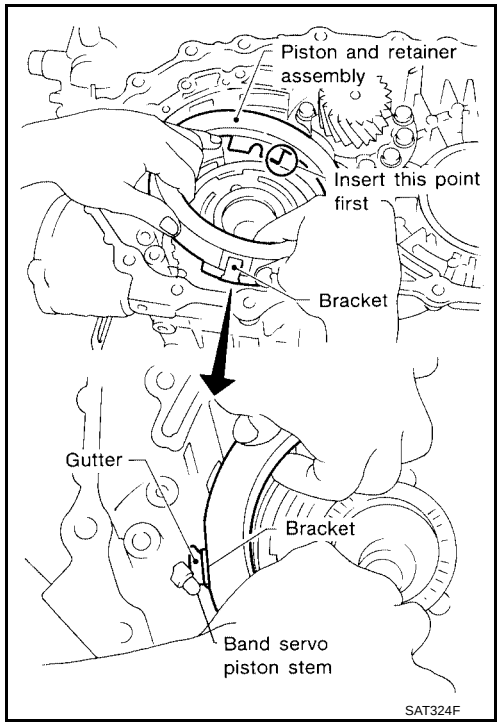
a. Set and align return springs to transmission case gutters as shown in illustration.



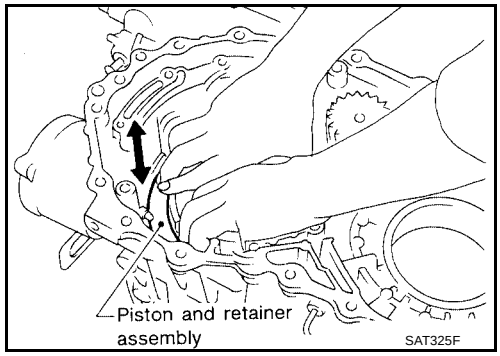
b. Set and align piston with retainer.



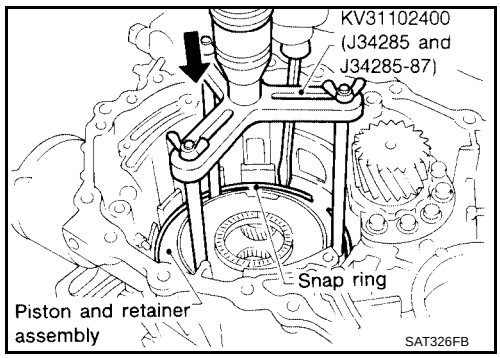
c. Install piston and retainer assembly on the transmission case.
   - **Align bracket to specified gutter as indicated in illustration.**



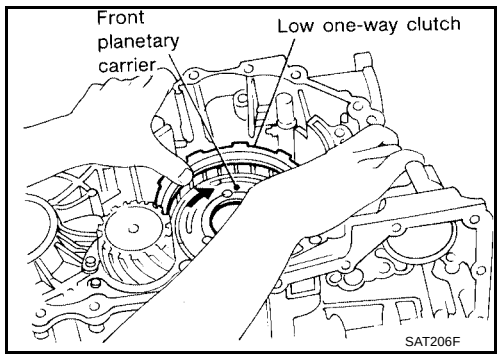
d. Check that each protrusion of piston is correctly set to corresponding return spring as follows.
   - **Push piston and retainer assembly evenly and confirm they move smoothly.**
   - **If they can not move smoothly, remove piston and retainer assembly and align return spring correctly as instructed in step “a”.**



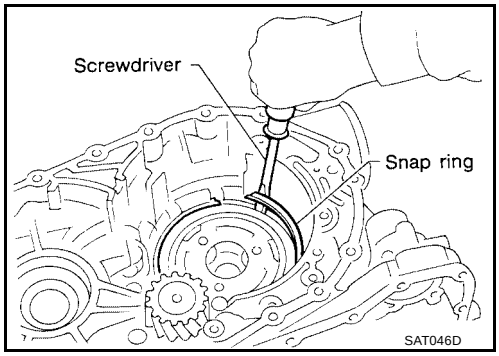
e. Push down piston and retainer assembly and install snap ring.



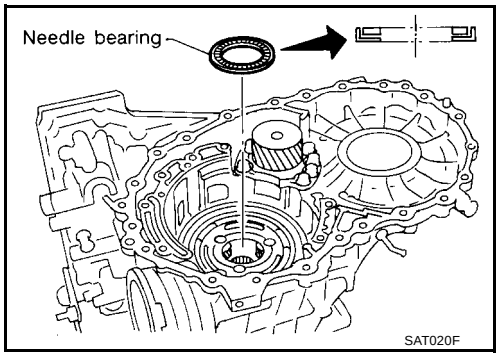
14. Install low one-way clutch to front planetary carrier by turning carrier in the direction of the arrow shown.



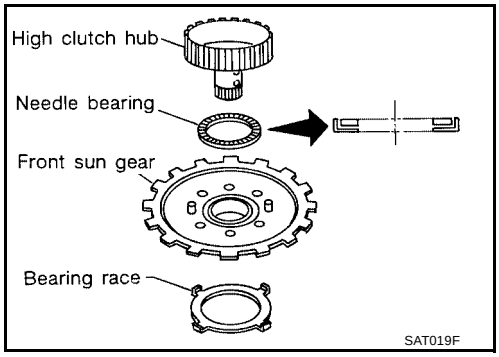
15. Install snap ring with screwdriver.
    - **Forward clutch and bearing must be correctly installed for snap ring to fit into groove of transmission case.**
    - **Do not expand snap ring excessively.**



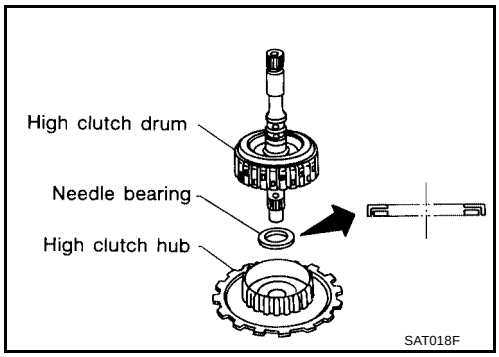
16. Install needle bearing on transmission case.
    - **Apply petroleum jelly to needle bearing.**
    - **Pay attention to direction of needle bearing.**



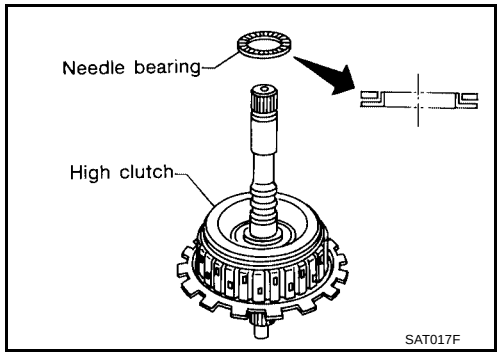
17. Install bearing race, needle bearing and high clutch hub on front sun gear.
    - **Apply petroleum jelly to needle bearing.**
    - **Pay attention to direction of needle bearing.**



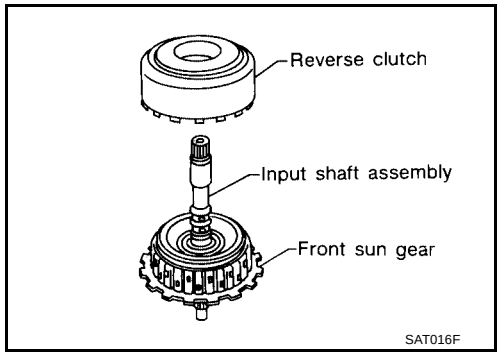
18. Install needle bearing and high clutch drum on high clutch hub.



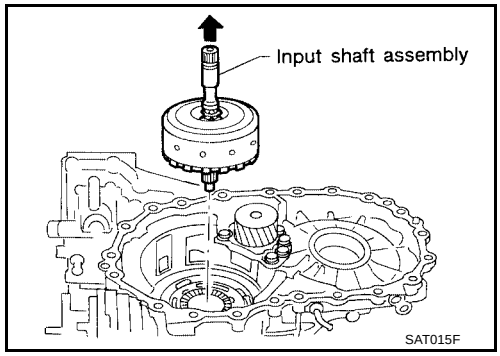
19. Install needle bearing on high clutch drum.
    - **Apply petroleum jelly to needle bearing.**
    - **Pay attention to direction of needle bearing.**



20. Remove paper rolled around input shaft.
21. Install input shaft assembly in reverse clutch.
    - **Align teeth of reverse clutch drive plates before installing.**



22. Install reverse clutch assembly on transmission case.
    - **Align teeth of high clutch drive plates before installing.**



Adjustment (2)

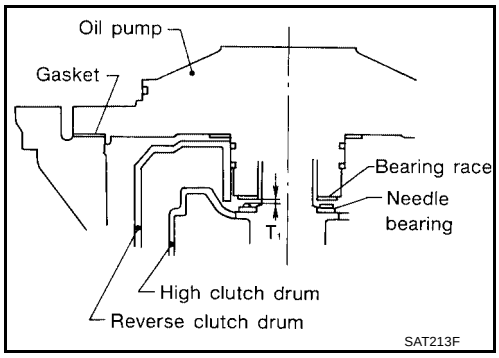
UCS000S2

When any parts listed below are replaced, adjust total end play and reverse clutch end play.

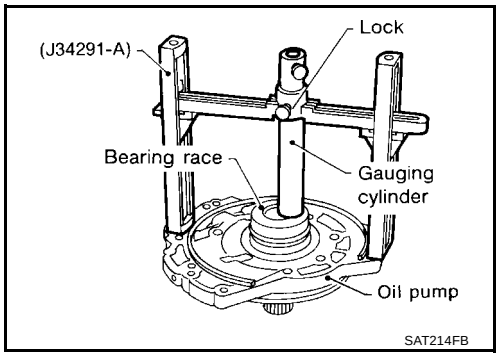
Part name	Total end play	Reverse clutch end play
Transmission case	●	●
Overrun clutch hub	●	●
Rear internal gear	●	●
Rear planetary carrier	●	●
Rear sun gear	●	●
Front planetary carrier	●	●
Front sun gear	●	●
High clutch hub	●	●
High clutch drum	●	●
Oil pump cover	●	●
Reverse clutch drum	—	●

TOTAL END PLAY

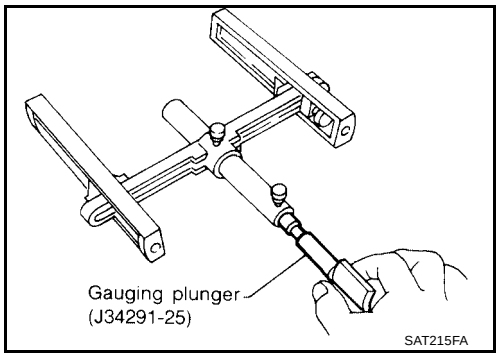
1. Adjust total end play “T_1 ”.



a. With original bearing race installed, place Tool onto oil pump. The long ends of legs should be placed firmly on machined surface of oil pump assembly. The gauging cylinder should rest on top of bearing race. Lock gauging cylinder in place with set screw.



b. Install gauging plunger into cylinder.



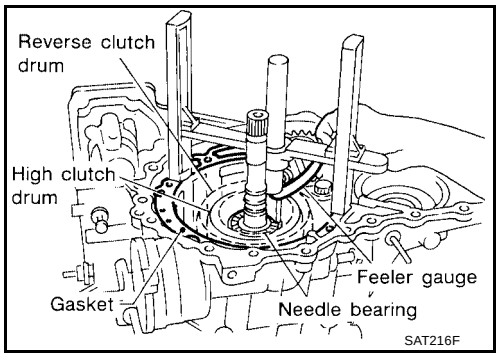
c. With needle bearing installed on high clutch drum, place Tool legs on machined surface of transmission case (with gasket). Then allow plunger to rest on needle bearing.

d. Measure gap between cylinder and plunger. This measurement should give exact total end play.

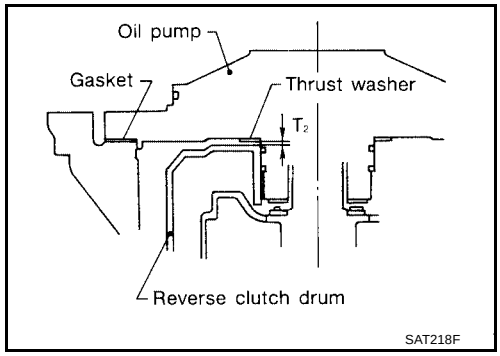
Total end play “T_1 ” : 0.25 - 0.55 mm (0.0098 - 0.0217 in)

- If end play is out of specification, decrease or increase thickness of bearing race as necessary.

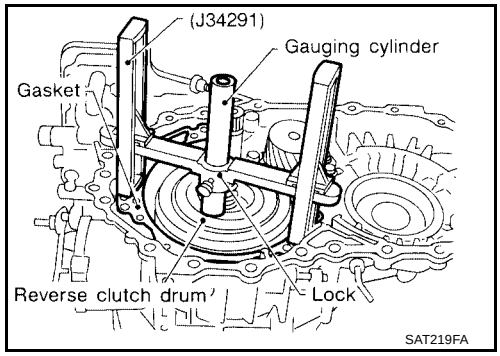
Available bearing race for adjusting total end play : Refer to AT-384, "BEARING RACE FOR ADJUSTING TOTAL END PLAY" .



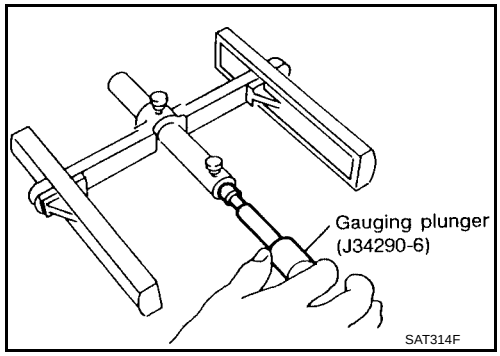
2. Adjust reverse clutch drum end play “T_2 ”.



a. Place Tool on machined surface of transmission case (with gasket). Then allow gauging cylinder to rest on reverse clutch drum. Lock cylinder in place with set screw.

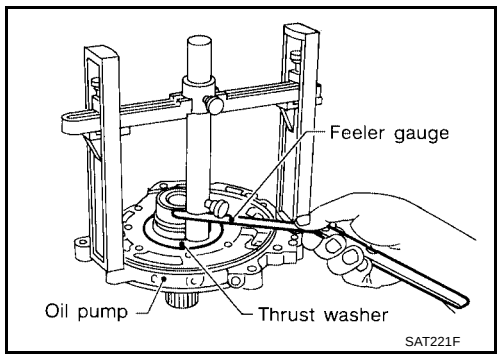


b. Install gauging plunger into cylinder.



c. With original thrust washer installed on oil pump, place Tool legs onto machined surface of oil pump assembly. Then allow plunger to rest on thrust washer.

d. Measure gap between cylinder and plunger with feeler gauge. This measurement should give exact reverse clutch drum end play.



Reverse clutch drum end play “T_2 ” **: 0.61 - 1.00 mm (0.0240 - 0.0394 in)**

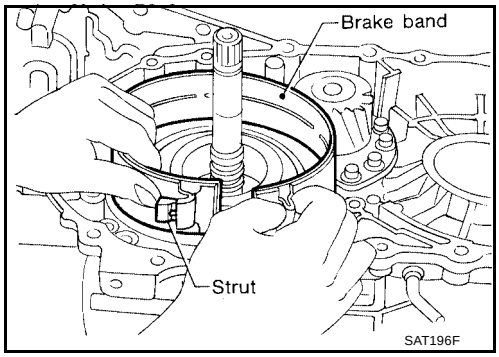
- If end play is out of specification, decrease or increase thickness of thrust washer as necessary.

Available thrust washer for adjusting reverse clutch drum end play **: Refer to AT-384, "THRUST WASHERS FOR ADJUSTING REVERSE CLUTCH DRUM END PLAY" .**

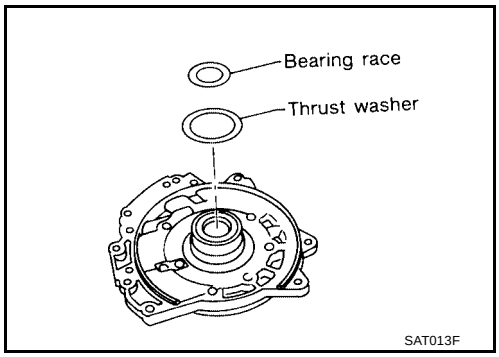
Assembly (3)

UCS000S3

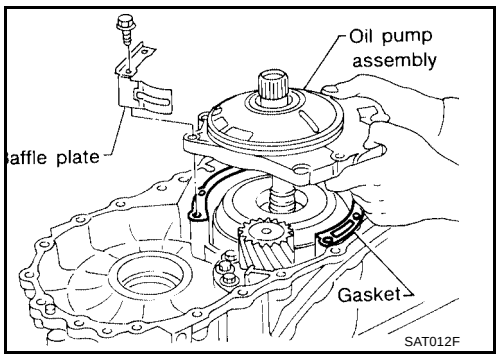
1. Install anchor end pin and lock nut on transmission case.
2. Place brake band on outside of reverse clutch drum. Tighten anchor end pin just enough so that brake band is evenly fitted on reverse clutch drum.



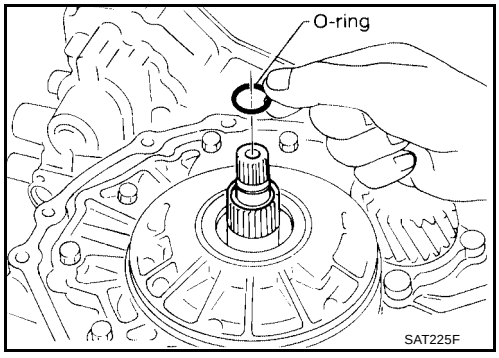
3. Place bearing race selected in total end play adjustment step on oil pump cover.
   - **Apply petroleum jelly to bearing race.**
4. Place thrust washer selected in reverse clutch end play step on reverse clutch drum.
   - **Apply petroleum jelly to thrust washer.**



5. Install oil pump assembly, baffle plate and gasket on transmission case.
6. Tighten oil pump fixing bolts to the specified torque.



7. Install O-ring to input shaft.
   - **Apply ATF to O-ring.**



8. Adjust brake band.

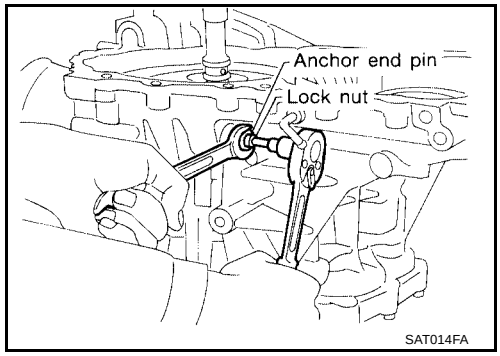
a. Tighten anchor end pin to the specified torque.

Anchor end pin : Refer to AT-381, "BRAKE BAND" .

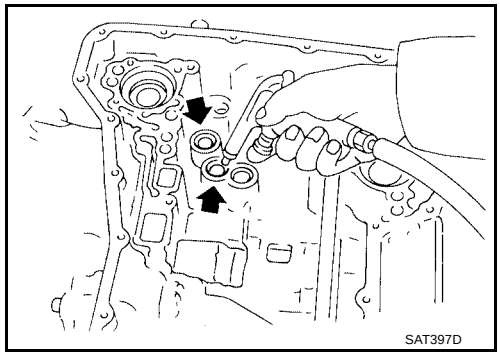
b. Back off anchor end pin two and a half turns.

c. While holding anchor end pin, tighten lock nut.

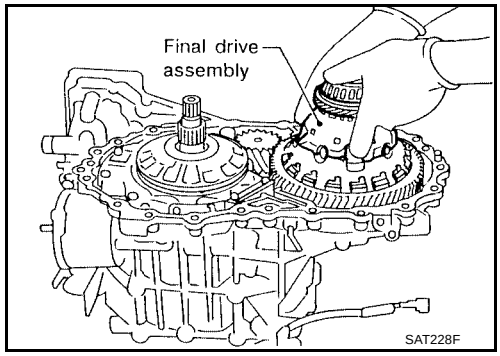
Lock nut : Refer to AT-381, "BRAKE BAND" .



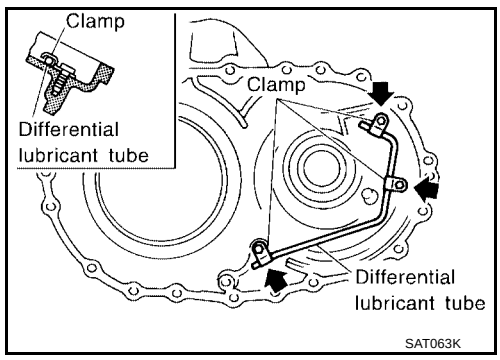
9. Apply compressed air to oil holes of transmission case and check operation of brake band.



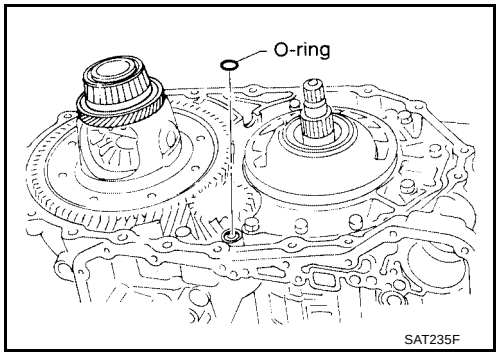
10. Install final drive assembly on transmission case.



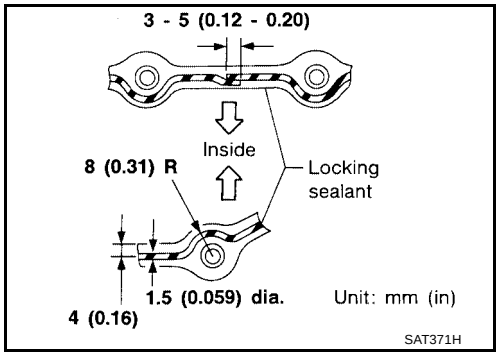
11. Install differential lubricant tube on converter housing. Tighten differential lubricant tube bolts to the specified torque. Refer to AT-277, "OVERHAUL" .



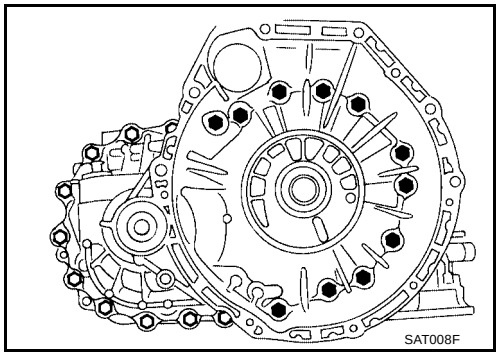
12. Install O-ring on differential oil port of transmission case.



13. Install converter housing on transmission case.
    - **Apply locking sealant to mating surface of converter housing.**

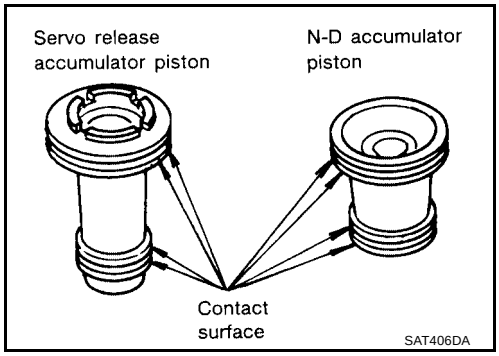


    - **Tighten converter housing bolts to the specified torque. Refer to AT-277, "OVERHAUL" .**



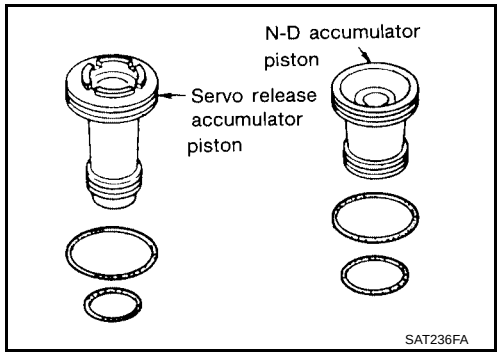
14. Install accumulator piston.

a. Check contact surface of accumulator piston for damage.



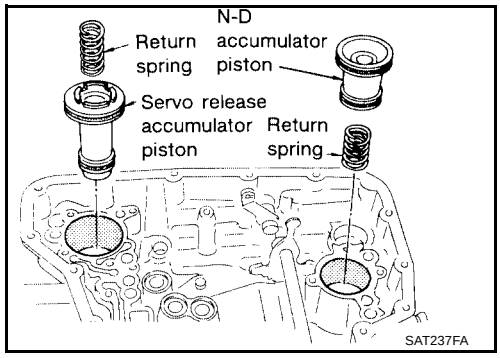
b. Install O-rings on accumulator piston.
- **Apply ATF to O-rings.**

Accumulator piston O-rings : Refer to AT-378, "O-RING"

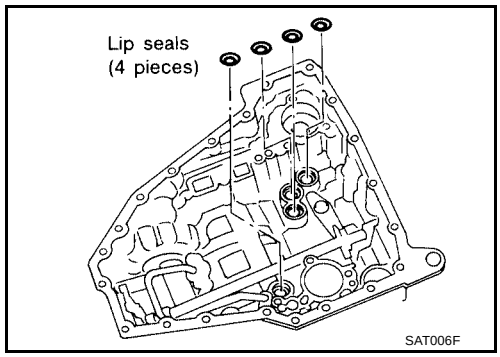


c. Install accumulator pistons and return springs on transmission case.
- **Apply ATF to inner surface of transmission case.**

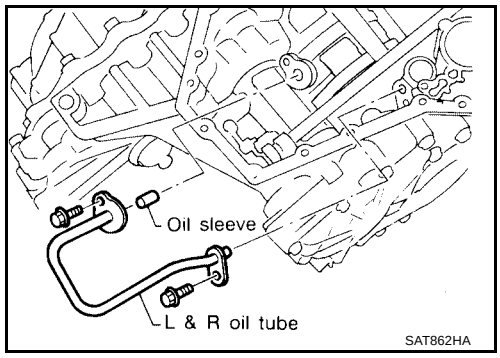
Return springs : Refer to AT-379, "RETURN SPRING" .



15. Install lip seals for band servo oil holes on transmission case.
- **Apply petroleum jelly to lip seals.**



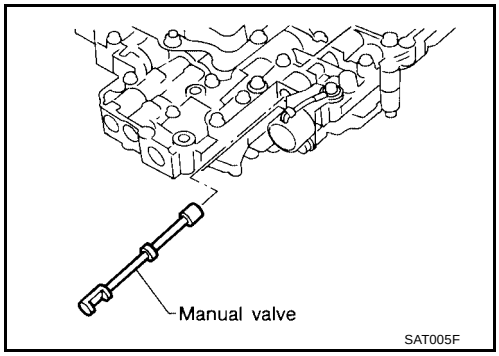
16. Install L & R oil tube and oil sleeve. Tighten L & R oil tube bolts to the specified torque. Refer to AT-277, "OVERHAUL" .



17. Install control valve assembly.

a. Insert manual valve into control valve assembly.

- **Apply ATF to manual valve.**

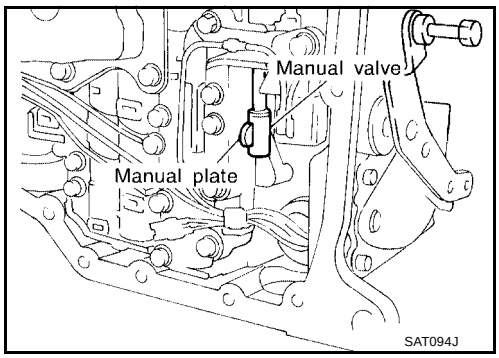


b. Set manual shaft in Neutral position.

c. Install control valve assembly on transmission case while aligning manual valve with manual plate.

d. Pass solenoid harness through transmission case and install terminal body on transmission case by pushing it.

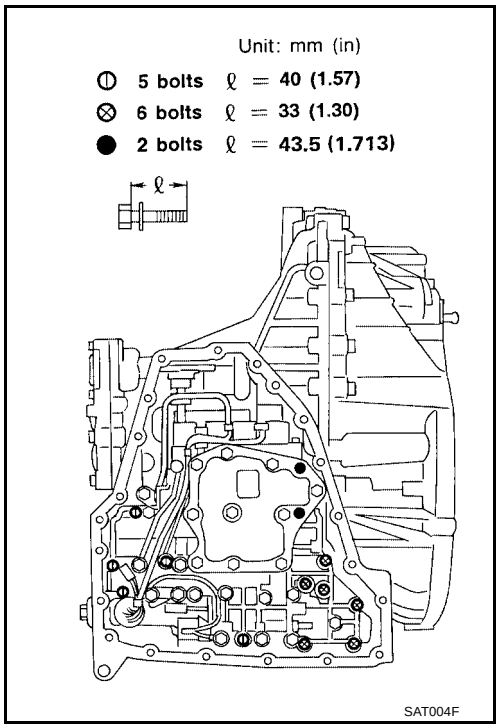
e. Install stopper ring to terminal body.



f. Tighten bolts **I** , **X** and ●.

Bolt length, number and location:

Bolt symbol	I	X	●
Bolt length " ℓ " mm (in)	40 (1.57)	33 (1.30)	43.5 (1.713)
Number of bolts	5	6	2



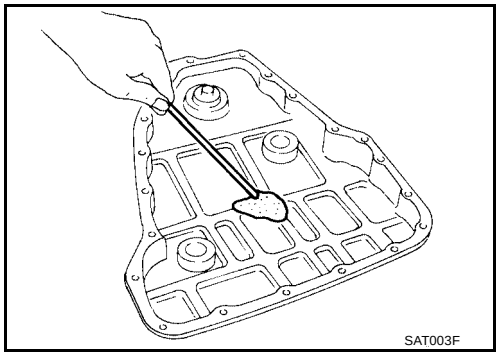
18. Install oil pan.

a. Attach a magnet to oil pan.

b. Install new oil pan gasket on transmission case.

c. Install oil pan on transmission case.

- **Always replace oil pan bolts as they are self-sealing bolts.**
- **Tighten four bolts in a crisscross pattern to prevent dislocation of gasket.**



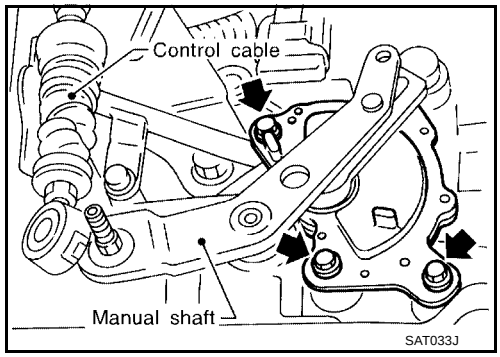
d. Tighten oil pan bolts and drain plug to the specified torque. Refer to AT-277, "OVERHAUL" .

19. Install park/neutral position (PNP) switch.

a. Set manual shaft in P position.

b. Temporarily install park/neutral position (PNP) switch on manual shaft.

c. Move selector lever to N position.



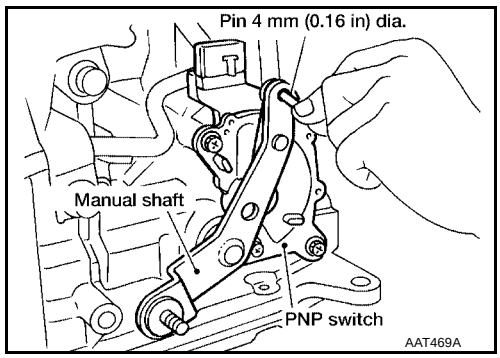
d. Use a 4 mm (0.16 in) pin for this adjustment.

i. Insert the pin straight into the manual shaft adjustment hole.

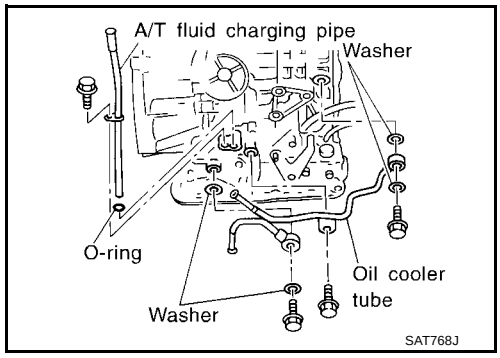
ii. Rotate park/neutral position (PNP) switch until the pin can also be inserted straight into hole in park/neutral position (PNP) switch.

e. Tighten park/neutral position (PNP) switch fixing bolts. Refer to AT-277, "OVERHAUL" .

f. Remove pin from adjustment hole after adjusting park/neutral position (PNP) switch.



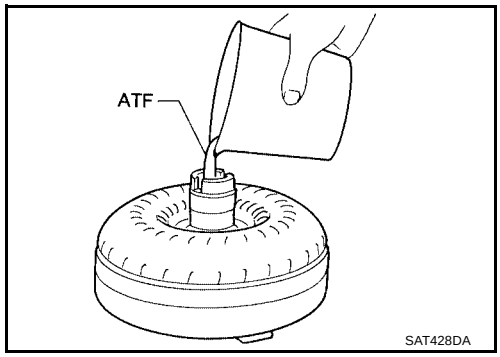
20. Install A/T fluid charging pipe and fluid cooler tube to transmission case. Tighten A/T fluid charging pipe and fluid cooler tube bolts to the specified torque. Refer to AT-277, "OVERHAUL" .



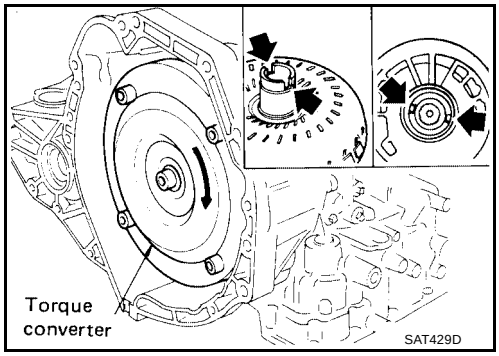
21. Install torque converter.

a. Pour ATF into torque converter.

- **Approximately 1 liter (1-1/8 US qt, 7/8 Imp qt) of fluid is required for a new torque converter.**
- **When reusing old torque converter, add the same amount of fluid as was drained.**

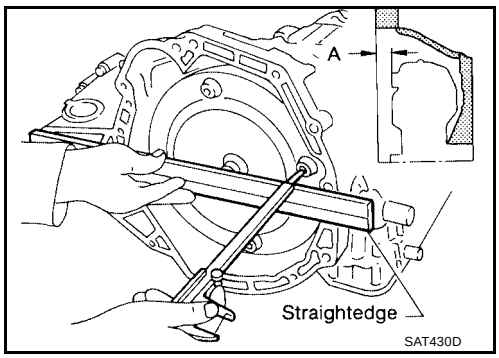


b. Install torque converter while aligning notches of torque converter with notches of oil pump.



c. Measure distance “A” to check that torque converter is in proper position.

Distance A : 14 mm (0.55 in) or more



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

UCS000S4

Engine		VQ35DE
Automatic transaxle model		RE4F04B
Automatic transaxle assembly	Model code number	89X00
Transaxle gear ratio	1st	2.785
	2nd	1.545
	3rd	1.000
	4th	0.694
	Reverse	2.272
	Final drive	3.789
Recommended fluid		Nissan Matic “D” (Continental U.S. and Alaska) or Canada Nissan Automatic Transmission Fluid*
Fluid capacity ℓ (US qt, Imp qt)		8.5 (9, 7-1/2)

*: Refer to MA-10, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Shift Schedule

UCS000S5

VEHICLE SPEED WHEN SHIFTING GEARS THROTTLE POSITION

Throttle position	Shift pattern	Vehicle speed km/h (MPH)					
		$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	Comfort	63 - 71 (39 - 44)	117 - 125 (73 - 78)	179 - 187 (111 - 116)	175 - 183 (109 - 114)	107 - 115 (66 - 71)	41 - 49 (25 - 30)
	Auto power	63 - 71 (39 - 44)	117 - 125 (73 - 78)	179 - 187 (111 - 116)	175 - 183 (109 - 114)	107 - 115 (66 - 71)	41 - 49 (25 - 30)
Half throttle	Comfort	53 - 61 (33 - 38)	90 - 98 (56 - 61)	148 - 156 (92 - 97)	110 - 118 (68 - 73)	76 - 84 (47 - 52)	29 - 37 (18 - 23)
	Auto power	53 - 61 (33 - 38)	90 - 98 (56 - 61)	149 - 157 (93 - 98)	135 - 143 (84 - 89)	76 - 84 (47 - 52)	31 - 39 (19 - 24)

VEHICLE SPEED WHEN PERFORMING AND RELEASING LOCK-UP

Throttle position	Selector lever position	Shift pattern	Vehicle speed km/h (MPH)	
			Lock-up "ON"	Lock-up "OFF"
2.0/8	D position	Comfort	137 - 145 (85 - 90)	74 - 82 (46 - 51)
		Auto power	137 - 145 (85 - 90)	74 - 82 (46 - 51)
	3rd position	Comfort	86 - 94 (53 - 58)	83 - 91 (52 - 57)
		Auto power	86 - 94 (53 - 58)	83 - 91 (52 - 57)

NOTE:

- Lock-up vehicle speed indicates the speed in D_4 position.
- Perform lock-up inspection after warming up engine.
- Lock-up vehicle speed may vary depending on the driving conditions and circumstances.

Stall Revolution

UCS000S6

Stall revolution rpm	2,550 - 3,050

Line Pressure

UCS000S7

Engine speed rpm	Line pressure kPa (kg/cm^2 , psi)	
	D, 3rd, 2nd and 1st positions	R position
Idle	500 (5.1, 73)	778 (7.9, 113)
Stall	1,223 (12.6, 179)	1,918 (19.6, 278)

Control Valves

UCS000S8

CONTROL VALVE AND PLUG RETURN SPRINGS

Unit: mm (in)

Parts			Item		
			Part No.*	Free length	Outer diameter
Upper body	23	Pilot valve spring	31742-3AX03	38.98 (1.535)	8.9 (0.350)
	7	1-2 accumulator valve spring	31742-3AX00	20.5 (0.807)	6.95 (0.274)
	28	1-2 accumulator piston spring	31742-3AX09	55.68 (2.141)	19.6 (0.772)
	33	1st reducing valve spring	31742-85X05	26.0 (1.024)	7.0 (0.276)
	35	3-2 timing valve spring	31736-01X00	23.0 (0.906)	6.65 (0.262)
	18	Overrun clutch reducing valve spring	31742-80X15	37.5 (1.476)	6.9 (0.272)
	16	Torque converter relief valve spring	31742-80X07	31.0 (1.220)	9.0 (0.354)
	11	Torque converter clutch control valve	31742-85X00	56.98 (2.243)	6.5 (0.256)
	3	Cooler check valve spring	31742-85X01	29.4 (1.157)	6.0 (0.236)
Lower body	15	Pressure regulator valve spring	31742-80X13	45.0 (1.772)	15.0 (0.591)
	20	Overrun clutch control valve spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	24	Accumulator control valve spring	31742-80X02	22.0 (0.866)	6.5 (0.256)
	29	Shift valve A spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	32	Shuttle valve spring	31762-41X04	51.0 (2.008)	5.65 (0.222)
	12	Shift valve B spring	31762-80X00	21.7 (0.854)	7.0 (0.276)
	7	Pressure modifier valve spring	31742-80X16	32.0 (1.260)	6.9 (0.272)
	3	Pressure modifier piston spring	31742-41X15	30.5 (1.201)	9.8 (0.386)
	—	Oil cooler relief valve spring	31872-31X00	17.02 (0.670)	8.0 (0.315)

*: Always check with the Parts Department for the latest parts information.

Accumulator

UCS000S9

O-RING

Unit: mm (in)

Accumulator	Part No.*	Inner diameter (Small)	Part No.*	Inner diameter (Large)
Servo release accumulator	31526-41X03	26.9 (1.059)	31526-41X02	44.2 (1.740)
N-D accumulator	31526-31X08	34.6 (1.362)	31672-21X00	39.4 (1.551)

*: Always check with the Parts Department for the latest parts information.

RETURN SPRING

Unit: mm (in)

Accumulator	Part number*	Free length	Outer diameter
Servo release accumulator	31605-85X00	52.5 (2.067)	20.1 (0.791)
N-D accumulator	31605-31X02	43.5 (1.713)	27.0 (1.063)

*: Always check with the Parts Department for the latest parts information.

Clutch and Brakes

UCS000SA

REVERSE CLUTCH

Number of drive plates		2	
Number of driven plates		2	
Drive plate thickness mm (in)	Standard	1.6 (0.063)	
	Allowable limit	1.4 (0.055)	
Driven plate thickness mm (in)	Standard	1.8 (0.070)	
Clearance mm (in)	Standard	0.5 - 0.8 (0.020 - 0.031)	
	Allowable limit	1.2 (0.047)	
Thickness of retaining plates		Thickness mm (in)	Part number*
		6.6 (0.260)	31537-89X00
		6.8 (0.268)	31537-89X01
		7.0 (0.276)	31537-89X02
		7.2 (0.283)	31537-89X03
		7.4 (0.291)	31537-89X04
		7.6 (0.299)	31537-89X05
		7.8 (0.307)	31537-89X06

*: Always check with the Parts Department for the latest parts information.

HIGH CLUTCH

Number of drive plates		5	
Number of driven plates		8^{*1} + 1^{*2}	
Drive plate thickness mm (in)	Standard	1.6 (0.063)	
	Allowable limit	1.4 (0.055)	
Driven plate thickness mm (in)	Standard	*1	*2
		1.4 (0.055)	2.0 (0.079)
Clearance mm (in)	Standard	1.8 - 2.2 (0.071 - 0.087)	
	Allowable limit	2.8 (0.110)	
Thickness of retaining plates		Thickness mm (in)	Part number*
		2.8 (0.110)	31537-89X07
		3.0 (0.118)	31537-81X10
		3.2 (0.126)	31537-81X11
		3.4 (0.134)	31537-81X12
		3.6 (0.142)	31537-81X13

*: Always check with the Parts Department for the latest parts information.

FORWARD CLUTCH

Number of drive plates		6	
Number of driven plates		6	
Drive plate thickness mm (in)	Standard	1.6 (0.063)	
	Allowable limit	1.4 (0.055)	
Driven plate thickness mm (in)	Standard	1.8 (0.071)	
Clearance mm (in)	Standard	0.45 - 0.85 (0.0177 - 0.0335)	
	Allowable limit	1.85 (0.0728)	
Thickness of retaining plates		Thickness mm (in)	Part number*
		3.2 (0.126)	31537-80X76
		3.4 (0.134)	31537-80X75
		3.6 (0.142)	31537-80X70
		3.8 (0.150)	31537-80X71
		4.0 (0.157)	31537-80X72
		4.2 (0.165)	31537-80X73
		4.4 (0.173)	31537-80X74

*: Always check with the Parts Department for the latest parts information.

OVERRUN CLUTCH

Number of drive plates		4	
Number of driven plates		4	
Drive plate thickness mm (in)	Standard	1.6 (0.063)	
	Allowable limit	1.4 (0.055)	
Driven plate thickness mm (in)	Standard	1.8 (0.071)	
Clearance mm (in)	Standard	0.7 - 1.1 (0.028 - 0.043)	
	Allowable limit	1.7 (0.067)	
Thickness of retaining plates		Thickness mm (in)	Part number*
		3.0 (0.118)	31537-80X65
		3.2 (0.126)	31537-80X66
		3.4 (0.134)	31537-80X67
		3.6 (0.142)	31537-80X68
		3.8 (0.150)	31537-80X69

*: Always check with the Parts Department for the latest parts information.

LOW & REVERSE BRAKE

Number of drive plates		7	
Number of driven plates		7 + 1	
Drive plate thickness mm (in)	Standard	1.8 (0.071)	
	Allowable limit	1.6 (0.063)	
Driven plate thickness mm (in)	Standard	1.8 (0.071)	
Clearance mm (in)	Standard	1.7 - 2.1 (0.067 - 0.083)	
	Allowable limit	3.3 (0.130)	
Thickness of retaining plates		Thickness mm (in)	Part number*
		2.0 (0.079)	31667-80X00
		2.2 (0.087)	31667-80X01
		2.4 (0.094)	31667-80X02
		2.6 (0.102)	31667-80X03
		2.8 (0.110)	31667-80X04
		3.0 (0.118)	31667-80X05
		3.2 (0.126)	31667-80X06
		3.4 (0.134)	31667-80X07

*: Always check with the Parts Department for the latest parts information.

CLUTCH AND BRAKE RETURN SPRINGS

Unit: mm (in)

Parts	Part number*	Free length	Outer diameter
Forward clutch (Overrun clutch) (22 pcs)	31505-80X02	21.4 (0.843)	10.3 (0.406)
High clutch (18 pcs)	31505-89X04	20.0 (0.787)	8.3 (0.327)
Low & reverse brake (24 pcs)	31505-89X02	21.6 (0.850)	6.6 (0.260)

*: Always check with the Parts Department for the latest parts information.

BRAKE BAND

Anchor end pin tightening torque N-m (kg-m, in-lb)	4.0 - 5.8 (0.4 - 0.6, 36 - 52)
Number of returning revolutions for anchor end pin	2.5
Lock nut tightening torque N-m (kg-m, ft-lb)	32 - 36 (3.2 - 3.7, 23 - 27)

Final Drive

UCS000SB

DIFFERENTIAL SIDE GEAR CLEARANCE

Clearance between side gear and differential case with washer mm (in)	0.1 - 0.2 (0.004 - 0.008)

DIFFERENTIAL SIDE GEAR THRUST WASHERS

Thickness mm (in)	Part number*
0.75 (0.0295)	38424-81X00
0.80 (0.0315)	38424-81X01
0.85 (0.0335)	38424-81X02
0.90 (0.0354)	38424-81X03
0.95 (0.0374)	38424-81X04

*: Always check with the Parts Department for the latest parts information.

DIFFERENTIAL SIDE BEARING PRELOAD ADJUSTING SHIMS

Thickness mm (in)	Part number*
0.48 (0.0189)	31438-80X00
0.52 (0.0205)	31438-80X01
0.56 (0.0220)	31438-80X02
0.60 (0.0236)	31438-80X03
0.64 (0.0252)	31438-80X04
0.68 (0.0268)	31438-80X05
0.72 (0.0283)	31438-80X06
0.76 (0.0299)	31438-80X07
0.80 (0.0315)	31438-80X08
0.84 (0.0331)	31438-80X09
0.88 (0.0346)	31438-80X10
0.92 (0.0362)	31438-80X11

*: Always check with the Parts Department for the latest parts information.

BEARING PRELOAD

Differential side bearing preload mm (in)	0.05 - 0.09 (0.0020 - 0.0035)

TURNING TORQUE

Turning torque of final drive assembly N-m (kg-cm, in-lb)	0.78 - 1.37 (8.0 - 14.0, 6.9 - 12.2)

Planetary Carrier and Oil Pump

UCS000SC

PLANETARY CARRIER

Clearance between planetary carrier and pinion washer mm (in)	Standard	0.20 - 0.70 (0.0079 - 0.0276)
	Allowable limit	0.80 (0.0315)

OIL PUMP

Oil pump side clearance mm (in)		0.030 - 0.050 (0.0012 - 0.0020)	
Thickness of inner gears and outer gears		Inner gear	
		Thickness mm (in)	Part number*
		11.99 - 12.0 (0.4720 - 0.4724) 11.98 - 11.99 (0.4717 - 0.4720) 11.97 - 11.98 (0.4713 - 0.4717)	31346-80X00 31346-80X01 31346-80X02
		Outer gear	
		Thickness mm (in)	Part number*
		11.99 - 12.0 (0.4720 - 0.4724) 11.98 - 11.99 (0.4717 - 0.4720) 11.97 - 11.98 (0.4713 - 0.4717)	31347-80X00 31347-80X01 31347-80X02
Clearance between oil pump housing and outer gear mm (in)	Standard	0.111 - 0.181 (0.0044 - 0.0071)	
	Allowable limit	0.181 (0.0071)	
Oil pump cover seal ring clearance mm (in)	Standard	0.1 - 0.25 (0.0039 - 0.0098)	
	Allowable limit	0.25 (0.0098)	

*: Always check with the Parts Department for the latest parts information.

Input Shaft

UCS000SD

SEAL RING CLEARANCE

Input shaft seal ring clearance mm (in)	Standard	0.08 - 0.23 (0.0031 - 0.0091)
	Allowable limit	0.23 (0.0091)

SEAL RING

Outer diameter mm (in)	Inner diameter mm (in)	Width mm (in)	Part number*
26 (1.024)	22.4 (0.882)	1.971 (0.078)	31525-80X02

*: Always check with the Parts Department for the latest parts information.

Reduction Pinion Gear

UCS000SE

TURNING TORQUE

Turning torque of reduction pinion gear N-m (kg-cm, in-lb)	0.05 - 0.39 (0.5 - 4.0, 0.43 - 3.47)

REDUCTION PINION GEAR BEARING ADJUSTING SHIMS

Thickness mm (in)	Part number	Thickness mm (in)	Part number*
4.60 (0.1811)	31439-85X01	5.24 (0.2063)	31439-81X12
4.62 (0.1819)	31439-85X02	5.26 (0.2071)	31439-81X13
4.64 (0.1827)	31439-85X03	5.28 (0.2079)	31439-81X14
4.66 (0.1835)	31439-85X04	5.30 (0.2087)	31439-81X15
4.68 (0.1843)	31439-85X05	5.32 (0.2094)	31439-81X16
4.70 (0.1850)	31439-83X06	5.34 (0.2102)	31439-81X17
4.72 (0.1858)	31439-83X11	5.36 (0.2110)	31439-81X18
4.74 (0.1866)	31439-83X12	5.38 (0.2118)	31439-81X19
4.76 (0.1874)	31439-83X13	5.40 (0.2126)	31439-81X20
4.78 (0.1882)	31439-83X14	5.42 (0.2134)	31439-81X21
4.80 (0.1890)	31439-83X15	5.44 (0.2142)	31439-81X22
4.82 (0.1898)	31439-83X16	5.46 (0.2150)	31439-81X23
4.84 (0.1906)	31439-83X17	5.48 (0.2157)	31439-81X24
4.86 (0.1913)	31439-83X18	5.50 (0.2165)	31439-81X46
4.88 (0.1921)	31439-83X19	5.52 (0.2173)	31439-81X47

Thickness mm (in)	Part number	Thickness mm (in)	Part number*
4.90 (0.1929)	31439-83X20	5.54 (0.2181)	31439-81X48
4.92 (0.1937)	31439-83X21	5.56 (0.2189)	31439-81X49
4.94 (0.1945)	31439-83X22	5.58 (0.2197)	31439-81X60
4.96 (0.1953)	31439-83X23	5.60 (0.2205)	31439-81X61
4.98 (0.1961)	31439-83X24	5.62 (0.2213)	31439-81X62
5.00 (0.1969)	31439-81X00	5.64 (0.2220)	31439-81X63
5.02 (0.1976)	31439-81X01	5.66 (0.2228)	31439-81X64
5.04 (0.1984)	31439-81X02	5.68 (0.2236)	31439-81X65
5.06 (0.1992)	31439-81X03	5.70 (0.2244)	31439-81X66
5.08 (0.2000)	31439-81X04	5.72 (0.2252)	31439-81X67
5.10 (0.2008)	31439-81X05	5.74 (0.2260)	31439-81X68
5.12 (0.2016)	31439-81X06	5.76 (0.2268)	31439-81X69
5.14 (0.2024)	31439-81X07	5.78 (0.2276)	31439-81X70
5.16 (0.2031)	31439-81X08	5.80 (0.2283)	31439-81X71
5.18 (0.2039)	31439-81X09	5.82 (0.2291)	31439-81X72
5.20 (0.2047)	31439-81X10	5.84 (0.2299)	31439-81X73
5.22 (0.2055)	31439-81X11	5.86 (0.2307)	31439-81X74

*: Always check with the Parts Department for the latest parts information.

Band Servo

UCS000SF

RETURN SPRING

Unit: mm (in)

Return spring	Part number*	Free length	Outer diameter
2nd servo return spring	31605-31X20	32.5 (1.280)	25.9 (1.020)
OD servo return spring	31605-80X07	62.6 (2.465)	21.7 (0.854)

*: Always check with the Parts Department for the latest parts information.

Output Shaft

UCS000SG

SEAL RING CLEARANCE

Output shaft seal ring clearance mm (in)	Standard	0.10 - 0.25 (0.0039 - 0.0098)
	Allowable limit	0.25 (0.0098)

SEAL RING

Outer diameter mm (in)	Inner diameter mm (in)	Width mm (in)	Part number*
33.71 (1.327)	30.25 (1.191)	1.95 (0.077)	31525-80X09

*: Always check with the Parts Department for the latest parts information.

END PLAY

Output shaft end play mm (in)	0 - 0.15 (0 - 0.0059)

OUTPUT SHAFT ADJUSTING SHIMS

Thickness mm (in)	Part number*
0.80 (0.0315)	31438-80X60
0.84 (0.0331)	31438-80X61
0.88 (0.0346)	31438-80X62
0.92 (0.0362)	31438-80X63
0.96 (0.0378)	31438-80X64
1.00 (0.0394)	31438-80X65
1.04 (0.0409)	31438-80X66
1.08 (0.0425)	31438-80X67
1.12 (0.0441)	31438-80X68
1.16 (0.0457)	31438-80X69
1.20 (0.0472)	31438-80X70

*: Always check with the Parts Department for the latest parts information.

Bearing Retainer

UCS000SH

SEAL RING CLEARANCE

Bearing retainer seal ring clearance mm (in)	Standard	0.10 - 0.30 (0.0039 - 0.0118)
	Allowable limit	0.30 (0.0118)

Total End Play

UCS000SI

Total end play mm (in)	0.25 - 0.55 (0.0098 - 0.0217)

BEARING RACE FOR ADJUSTING TOTAL END PLAY

Thickness mm (in)	Part number*
0.8 (0.031)	31435-80X00
1.0 (0.039)	31435-80X01
1.2 (0.047)	31435-80X02
1.4 (0.055)	31435-80X03
1.6 (0.063)	31435-80X04
1.8 (0.071)	31435-80X05
2.0 (0.079)	31435-80X06
0.9 (0.035)	31435-80X09
1.1 (0.043)	31435-80X10
1.3 (0.051)	31435-80X11
1.5 (0.059)	31435-80X12
1.7 (0.067)	31435-80X13
1.9 (0.075)	31435-80X14

*: Always check with the Parts Department for the latest parts information.

Reverse Clutch End Play

UCS000SJ

Reverse clutch end play mm (in)	0.55 - 0.90 (0.0217 - 0.0354)

THRUST WASHERS FOR ADJUSTING REVERSE CLUTCH DRUM END PLAY

Thickness mm (in)	Part number*
0.80 (0.0315)	31508-80X13
0.95 (0.0374)	31508-80X14
1.10 (0.0433)	31508-80X15
1.25 (0.0492)	31508-80X16
1.40 (0.0551)	31508-80X17
1.55 (0.0610)	31508-80X18
1.70 (0.0669)	31508-80X19
1.85 (0.0728)	31508-80X20

*: Always check with the Parts Department for the latest parts information.

Removal and Installation

UCS000SK

Unit: mm (in)

Distance between end of converter housing and torque converter	14 (0.55)

Shift Solenoid Valves

UCS000SL

Gear position	1	2	3	4
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	ON (Closed)
Shift solenoid valve B	ON (Closed)	ON (Closed)	OFF (Open)	OFF (Open)

Solenoid Valves

UCS000SM

Solenoid valves	Resistance (Approx.) Ω	Terminal No.
Shift solenoid valve A	20 - 30	2
Shift solenoid valve B	5 - 20	1
Overrun clutch solenoid valve	20 - 30	3
Line pressure solenoid valve	2.5 - 5	4
Torque converter clutch solenoid valve	5 - 20	5

A/T Fluid Temperature Sensor

UCS000SN

Remarks: Specification data are reference values.

Monitor item	Condition	Specification (Approximately)	
A/T fluid temperature sensor	Cold [20°C (68°F)] ↓ Hot [80°C (176°F)]	1.5V ↓ 0.5V	2.5 kΩ ↓ 0.3 kΩ

Revolution Sensor

UCS000SO

Condition	Judgement standard
When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 **CAUTION:** **Connect the diagnosis data link cable to the vehicle diagnosis connector.** *1: A circuit tester cannot be used to test this item.	450 Hz (Approx.)
When vehicle parks.	0V

Dropping Resistor

UCS000SP

Resistance	12Ω

Turbine Revolution Sensor

UCS000SQ

Condition	Judgement standard
When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function.*1 **CAUTION:** **Connect the diagnosis data link cable to the vehicle diagnosis connector.** *1: A circuit tester cannot be used to test this item.	240 Hz (Approx.)
When vehicle parks.	Under 1.3V or over 4.5V

INDEX FOR DTC

PFP:00024

Alphabetical Index

UCS000SR

NOTE:
If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-459 .

Items (CONSULT-II screen terms)	DTC		Reference page
	OBD-II	Except OBD-II	
	CONSULT-II GST*1	CONSULT-II only "TRANSMIS-SION"	
A/T 1ST GR FNCTN	P0731	P0731	AT-491
A/T 2ND GR FNCTN	P0732	P0732	AT-494
A/T 3RD GR FNCTN	P0733	P0733	AT-499
A/T 4TH GR FNCTN	P0734	P0734	AT-503
A/T 5TH GR FNCTN	P0735	P0735	AT-507
A/T TCC S/V FNCTN	P0744	P0744	AT-511
ATF TEMP SEN/CIRC	P0710	P0710	AT-471
CAN COMM CIRCUIT	U1000	U1000	AT-459
ELEC TH CONTROL	—	P1726	AT-571
ENG SPD INP PERFOR	—	P0726	AT-489
FLUID TEMP SEN	P0711	P0711	AT-476
MANUAL MODE SWITCH	—	P0826	AT-560
PC SOL A(L/PRESS)	P0745	P0745	AT-514
PC SOL B(SFT/PRS)	P0775	P0775	AT-545
PC SOL C(TCC&SFT)	P0795	P0795	AT-552
PC SOL C STC ON	P0797	P0797	AT-556
PNP SW/CIRC	P0705	P0705	AT-466
SHIFT	P0780	P0780	AT-549
SHIFT SOL A	P0750	P0750	AT-518
SHIFT SOL B	P0755	P0755	AT-522
SHIFT SOL C	P0760	P0760	AT-526
SHIFT SOL D	P0765	P0765	AT-536
SHIFT SOL E	P0770	P0770	AT-541
SFT SOL C STUCK ON	P0762	P0762	AT-531
TCM POWER INPT SIG	P0882	P0882	AT-566
TCM PROCESSOR	—	P0613	AT-464
TURBINE SENSOR	P0717	P0717	AT-481
VEH SPD SE/CIR-MTR	—	P0500	AT-462
VHCL SPEED SEN-A/T	P0722	P0722	AT-485

*1: These numbers are prescribed by SAE J2012.

DTC No. Index

UCS000SS

NOTE:
If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-459 .

DTC		Items (CONSULT-II screen terms)	Reference page
OBD-II	Except OBD-II		
CONSULT-II GST*1	CONSULT-II only "TRANSMISSION"		
—	P0500	VEH SPD SE/CIR-MTR	AT-462
—	P0613	TCM PROCESSOR	AT-464
P0705	P0705	PNP SW/CIRC	AT-466
P0710	P0710	ATF TEMP SEN/CIRC	AT-471
P0711	P0711	FLUID TEMP SEN	AT-476
P0717	P0717	TURBINE SENSOR	AT-481
P0722	P0722	VHCL SPEED SEN-A/T	AT-485
—	P0726	ENG SPD INP PERFOR	AT-489
P0731	P0731	A/T 1ST GR FNCTN	AT-491
P0732	P0732	A/T 2ND GR FNCTN	AT-494
P0733	P0733	A/T 3RD GR FNCTN	AT-499
P0734	P0734	A/T 4TH GR FNCTN	AT-503
P0735	P0735	A/T 5TH GR FNCTN	AT-507
P0744	P0744	A/T TCC S/V FNCTN	AT-511
P0745	P0745	PC SOL A(L/PRESS)	AT-514
P0750	P0750	SHIFT SOL A	AT-518
P0755	P0755	SHIFT SOL B	AT-522
P0760	P0760	SHIFT SOL C	AT-526
P0762	P0762	SFT SOL C STUCK ON	AT-531
P0765	P0765	SHIFT SOL D	AT-536
P0770	P0770	SHIFT SOL E	AT-541
P0775	P0775	PC SOL B(SFT/PRS)	AT-545
P0780	P0780	SHIFT	AT-549
P0795	P0795	PC SOL C(TCC&SFT)	AT-552
P0797	P0797	PC SOL C STC ON	AT-556
—	P0826	MANUAL MODE SWITCH	AT-560
P0882	P0882	TCM POWER INPT SIG	AT-566
—	P1726	ELEC TH CONTROL	AT-571
U1000	U1000	CAN COMM CIRCUIT	AT-459

*1: These numbers are prescribed by SAE J2012.

PRECAUTIONS

PFP:00001

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

UCS000ST

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. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
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

UCS000SU

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 cable 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 or TCM Replacement

UCS000SV

- When replacing A/T assembly or TCM, refer to the pattern table below and initialize TCM if necessary.

TCM INITIALIZATION PATTERNS

TCM	A/T assembly	Erasing EEPROM in TCM	Remarks
Replaced with new one	Not replaced	Not required	Not required because the EEPROM in TCM is in the default state.
	Replaced with new or old one		
Not replaced	Replaced with new or old one	Required	Required because data connot be conformed to previous data written in the EEPROM in TCM.
Replaced with old one	Not replaced		
	Replaced with new or old one		

NOTE:
"Old one" is the TCM or A/T assembly that has been used on other vehicles.

METHOD FOR TCM INITIALIZATION

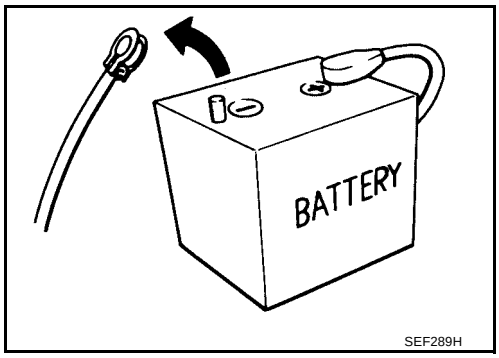
1. Perform "CONSULT-II SETTING PROCEDURE". Refer to AT-451, "CONSULT-II SETTING PROCEDURE" .
2. Set the vehicle following the items listed below.
   - Ignition switch "ON".
   - Selector lever "P" or "N" position.
   - Engine not running.
   - Vehicle speed is 0km/h (0 MPH).
   - Ignition voltage is more than 10.5V.
   - Malfunction was not detected.
3. Touch "WORK SUPPORT".
4. Touch "INITIALIZATION".
5. Initialize TCM following the direction in display.

Precautions

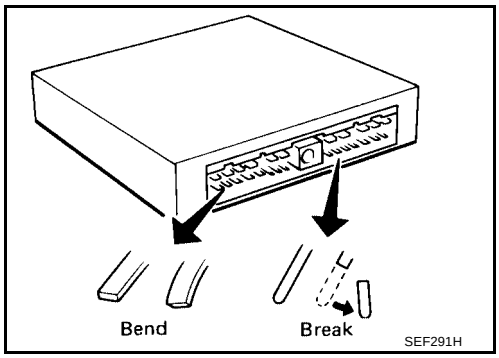
UCS000SW

NOTE:
Do not remove or disassemble any RE5F22A model transaxle parts unless specified to do so in AT section.

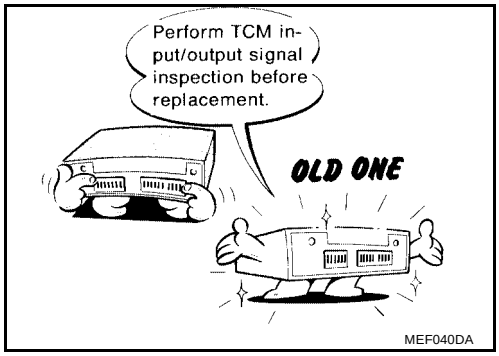
- **Before connecting or disconnecting the TCM harness connector, turn ignition switch “OFF” and disconnect negative battery cable. Because battery voltage is applied to TCM even if ignition switch is turned “OFF”.**



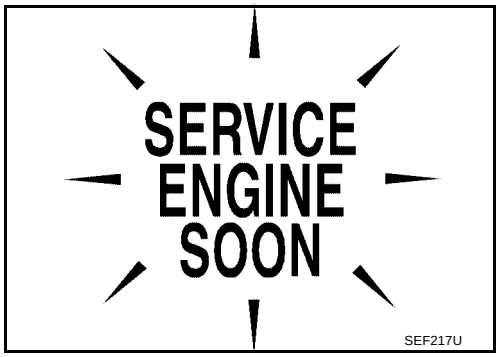
- **When connecting or disconnecting pin connectors into or from TCM, take care not to damage pin terminals (bend or break).**
  Make sure that there are not any bends or breaks on TCM pin terminal, when connecting pin connectors.



- **Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not.** **AT-448, "TCM INSPECTION TABLE"**.



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



- 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.

Service Notice or Precautions

UCS000SX

ATF COOLER SERVICE

If A/T fluid contains frictional material (clutches, bands, etc.), or if an A/T is repaired, overhauled, or replaced, inspect and clean the A/T oil cooler mounted in the radiator or replace the radiator. Flush cooler lines using cleaning solvent and compressed air after repair. Check Service Bullitens for latest A/T oil cooler cleaning procedure. For radiator replacement, refer to CO-10, "RADIATOR"

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-452, "SELF-DIAG RESULT 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-419, "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-61, "HARNESS CONNECTOR" .**

Wiring Diagrams and Trouble Diagnosis

UCS000SY

When you read wiring diagrams, refer to the following:

- GI-12, "How to Read Wiring Diagrams".
- PG-3, "POWER SUPPLY ROUTING CIRCUIT" for power distribution circuit.

When you perform trouble diagnosis, refer to the following:

- GI-9, "How to Follow Trouble Diagnoses".
- GI-25, "How to Perform Efficient Diagnosis for an Electrical Incident".

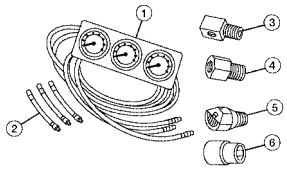
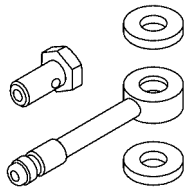
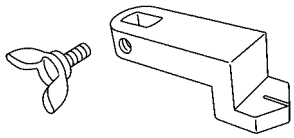
PREPARATION

PFP:00002

Special Service Tools

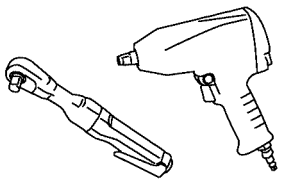
UCS000SZ

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
(J34301-C) Oil pressure gauge set 1 (J34301-1) Oil pressure gauge 2 (J34301-2) Hoses 3 (J34298) Adapter 4 (J34282-2) Adapter 5 (790-301-1230-A) 60° Adapter 6 (J34301-15) Square socket  AAT896	Measuring line pressure
(J45542) Adapter  SCIA3019E	Measuring line pressure
(J45404) Alignment tool  SCIA3018E	Adjusting park/neutral position (PNP) switch

Commercial Service Tools

UCS000T0

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

A/T FLUID

PFP:KLE40

Changing A/T Fluid

UCS000T1

Refer to MA-22, "Changing A/T Fluid" .

Checking A/T Fluid

UCS000T2

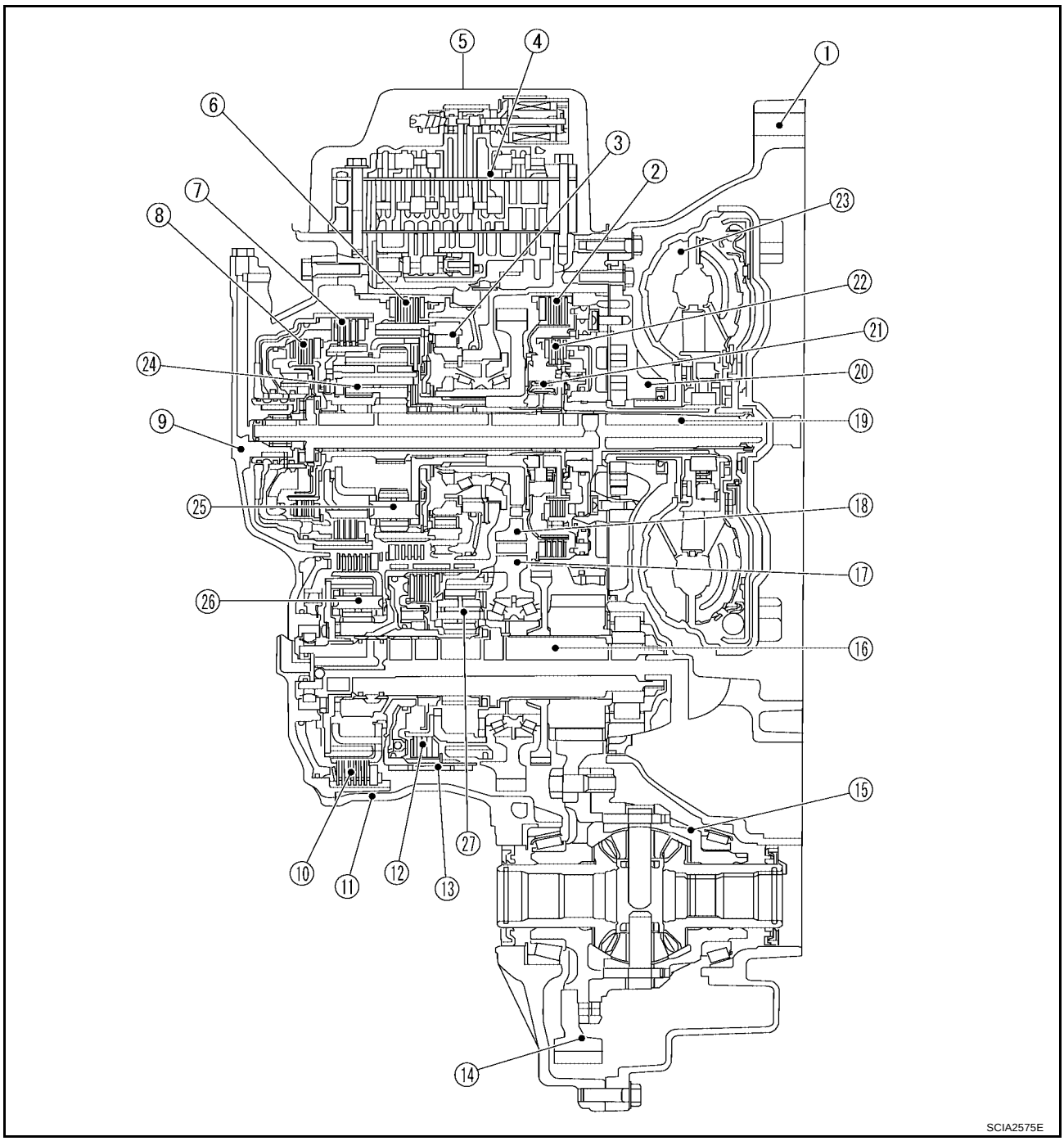
Refer to MA-21, "Checking A/T Fluid" .

A/T CONTROL SYSTEM

PFP:31036

Cross-Sectional View

UCS000T3

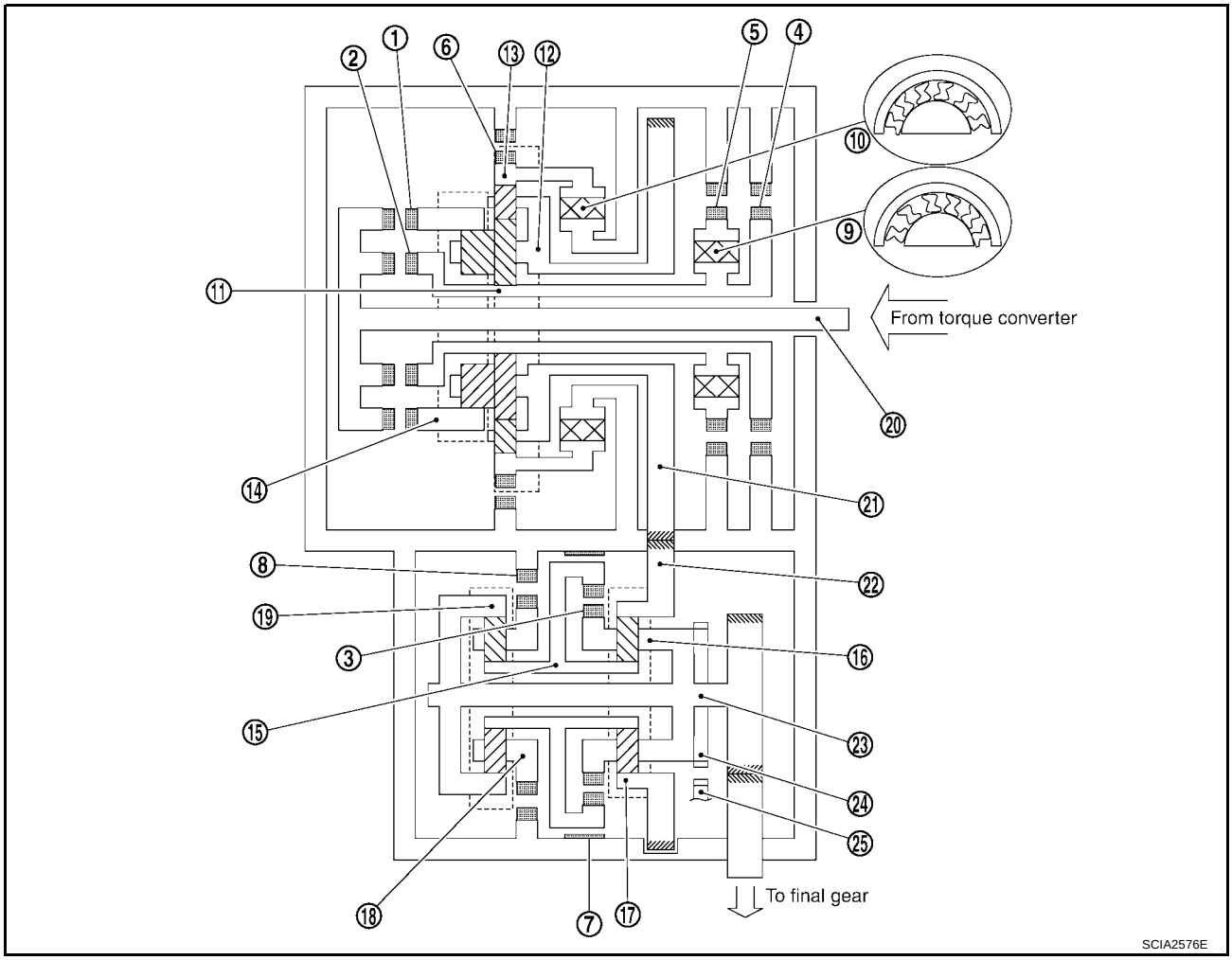


1. Converter housing
2. 2nd brake
3. One-way clutch No. 2
4. Control valve assembly
5. Side cover
6. 1st and reverse brake
7. Forward clutch
8. Direct clutch
9. Transaxle case cover
10. B5 brake
11. Transaxle case
12. U/D clutch
13. U/D brake
14. Final gear
15. Differential case
16. Output shaft
17. Counter driven gear
18. Counter drive gear
19. Input shaft
20. Oil pump
21. One-way clutch No. 1
22. 2nd coast brake
23. Torque converter
24. Main rear planetary gear
25. Main front planetary gear
26. U/D rear planetary gear
27. U/D front planetary gear

Shift Mechanism

UCS000T4

CONSTRUCTION



1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

FUNCTION OF CLUTCH AND BRAKE

Clutch and brake components	Abbr.	Function
Forward clutch **1**	F/C	Connect input shaft **20** to main rear internal gear **10** .
Direct clutch **2**	D/C	Connect input shaft **20** to main sun gear **11** .
U/D clutch **3**	U/D.C	Connect U/D sun gear **15** to U/D front planetary carrier **16** .
2nd coast brake **4**	2nd C/B	Lock main sun gear **11** .
2nd brake **5**	2nd/B	Lock counterclockwise rotation of main sun gear **11** .
1st and reverse brake **6**	1st & R/B	Lock main front internal gear **13** .
U/D brake **7**	U/D.B	Lock U/D sun gear **15** .
B5 brake **8**	B5/B	Lock U/D rear planetary carrier **18** .
One-way clutch No. 1 **9**	O.C1	Lock counterclockwise rotation of main sun gear **11** , when 2nd brake **5** operations.
One-way clutch No. 2 **10**	O.C2	Lock counterclockwise rotation of main front internal gear **13** .

CLUTCH AND BAND CHART

Shift position		Clutch			Brake					One-way clutch		Remarks
		F/C **1**	D/C **2**	U/D.C **3**	2nd C/B **4**	2nd/B **5**	1st & R/B **6**	U/D.B **7**	B5/B **8**	O.C1 **9**	O.C2 **10**	
P									○			PARK POSITION
R			○				○		○			REVERSE POSITION
N									○			NEUTRAL POSITION
D	1st	○							○		○	Automatic shift 1 ⇔ 2 ⇔ 3 ⇔ 4 ⇔ 5
	1 ⇔ 2	○			△	△			○	△	△	
	2nd	○			○	○			○	○		
	2 ⇔ 3	○			○	○		△	△	○		
	3rd	○			○	○		○		○		
	3 ⇔ 4	○		△	○	○		△		○		
	4th	○		○	○	○				○		
	4 ⇔ 5	○	△	○	△	○				△		
	5th	○	○	○		○						
M5	5th	○	○	○		○						Locks in 5th gear*
M4	4th	○		○	○	○				○		Locks in 4th gear*
M3	3rd	○			○	○		○		○		Locks in 3rd gear*
M2	2nd	○			○	○			○	○		Locks in 2nd gear*
M1	1st	○					○		○		○	Locks in 1st gear*

○: Operates

△: In transition between applied and released.

*: Except when automated up/down shift control and up/down shift permission control are activated. Refer to AT-415, "MANUAL MODE"

.

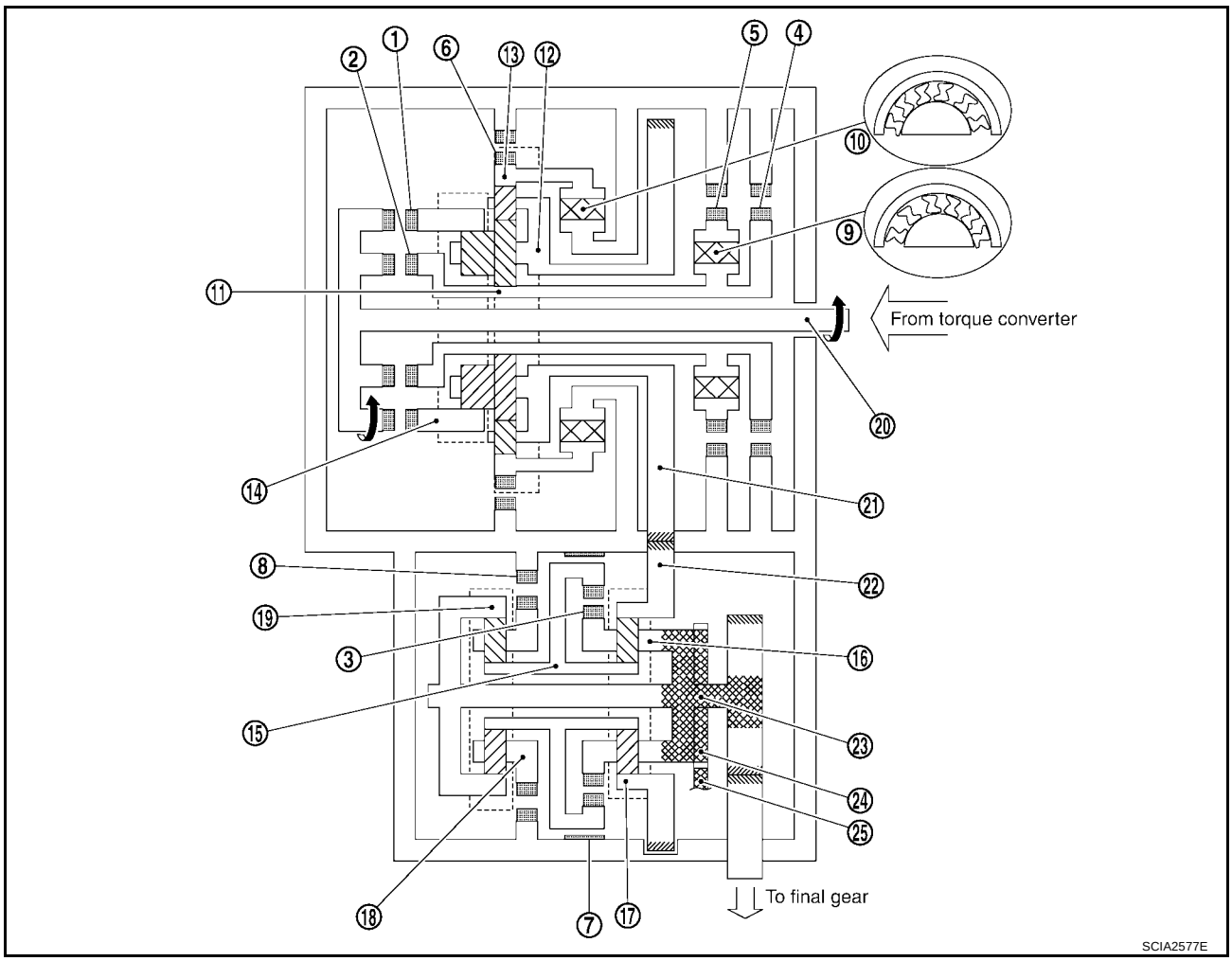
POWER TRANSMISSION

“N” position

Since both the forward clutch and the direct clutch 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 clutch and the direct clutch are released, so torque from the input shaft drive is not transmitted to the output shaft.
- The parking pole linked with the selector lever meshes with the parking gear and fastens the output shaft mechanically.

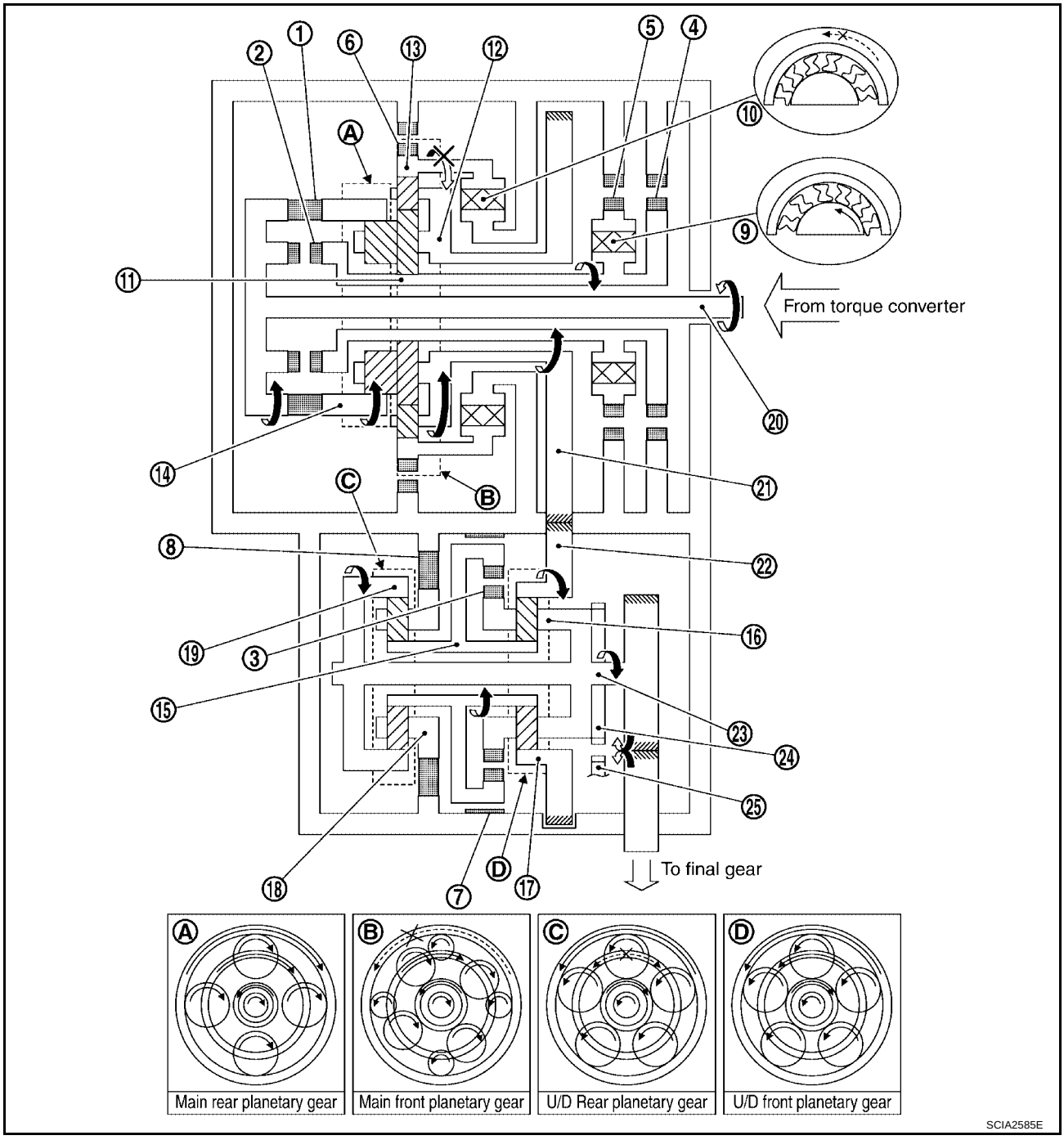


1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D” position 1st gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
6. Main front small planetary pinion gear rotates itself counterclockwise.
7. Main front internal gear is going to rotates counterclockwise.
8. One-way clutch No. 2 operates. (Lock counterclockwise rotation of main front internal gear.)
9. Main planetary carrier revolves clockwise due to reaction force of front small planetary pinion gear.
10. Counter drive gear rotates clockwise for main planetary carrier and one.
11. Counter driven gear rotates counterclockwise.
12. U/D front internal gear rotates counterclockwise for counter driven gear and one.
13. U/D front planetary pinion gear rotates itself counterclockwise.
14. U/D sun gear rotates clockwise.
15. U/D rear planetary pinion gear rotates itself counterclockwise.
16. B5 brake operate. (Lock rotation of U/D rear planetary carrier.)
17. U/D rear internal gear rotates counterclockwise.
18. U/D front planetary carrier and output shaft rotates counterclockwise for U/D rear internal gear and one.
19. Final gear clockwise.

- During deceleration, main front internal gear clockwise due to rotation itself clockwise of main front small planetary pinion gear, but driving force loses due to free of one-way clutch No. 2. Therefore, engine brake does not operate.

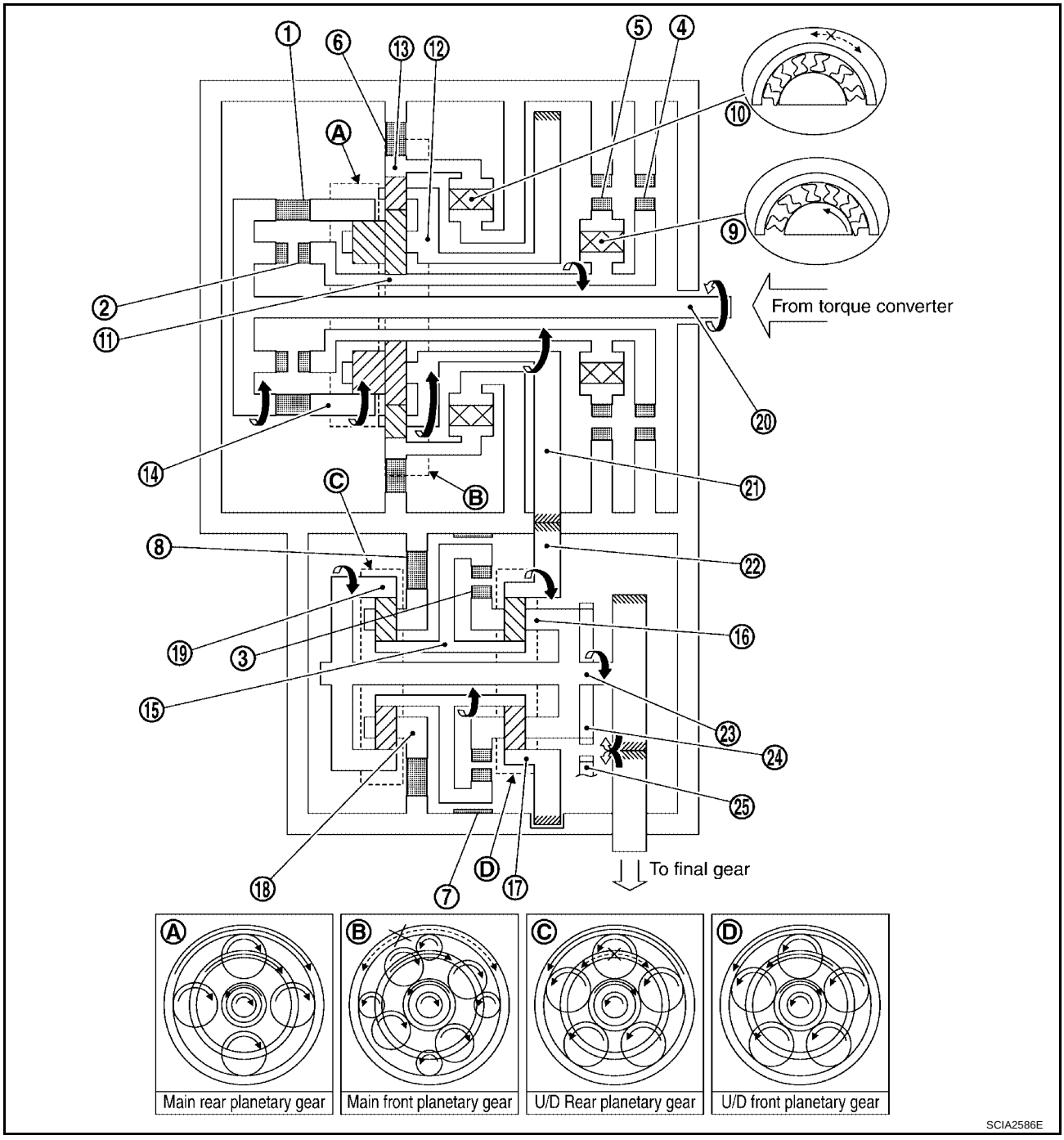


1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“M1” position 1st gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion gear and one.
6. Main front small planetary pinion gear rotates itself counterclockwise.
7. Main front internal gear is going to rotates counterclockwise.
8. 1st and reverse brake operates. (Lock rotation of main front internal gear.)
9. Main planetary carrier revolves clockwise due to reaction force of front small planetary pinion gear.
10. Counter drive gear rotates clockwise for main planetary carrier and one.
11. Counter driven gear rotates counterclockwise.
12. U/D front internal gear rotates counterclockwise for counter driven gear and one.
13. U/D front planetary pinion gear rotates itself counterclockwise.
14. U/D sun gear rotates clockwise.
15. U/D rear planetary pinion gear rotates itself counterclockwise.
16. B5 brake operate. (Lock rotation of U/D rear planetary carrier.)
17. U/D rear internal gear rotates counterclockwise.
18. U/D front planetary carrier and output shaft rotates counterclockwise for U/D rear internal gear and one.
19. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.

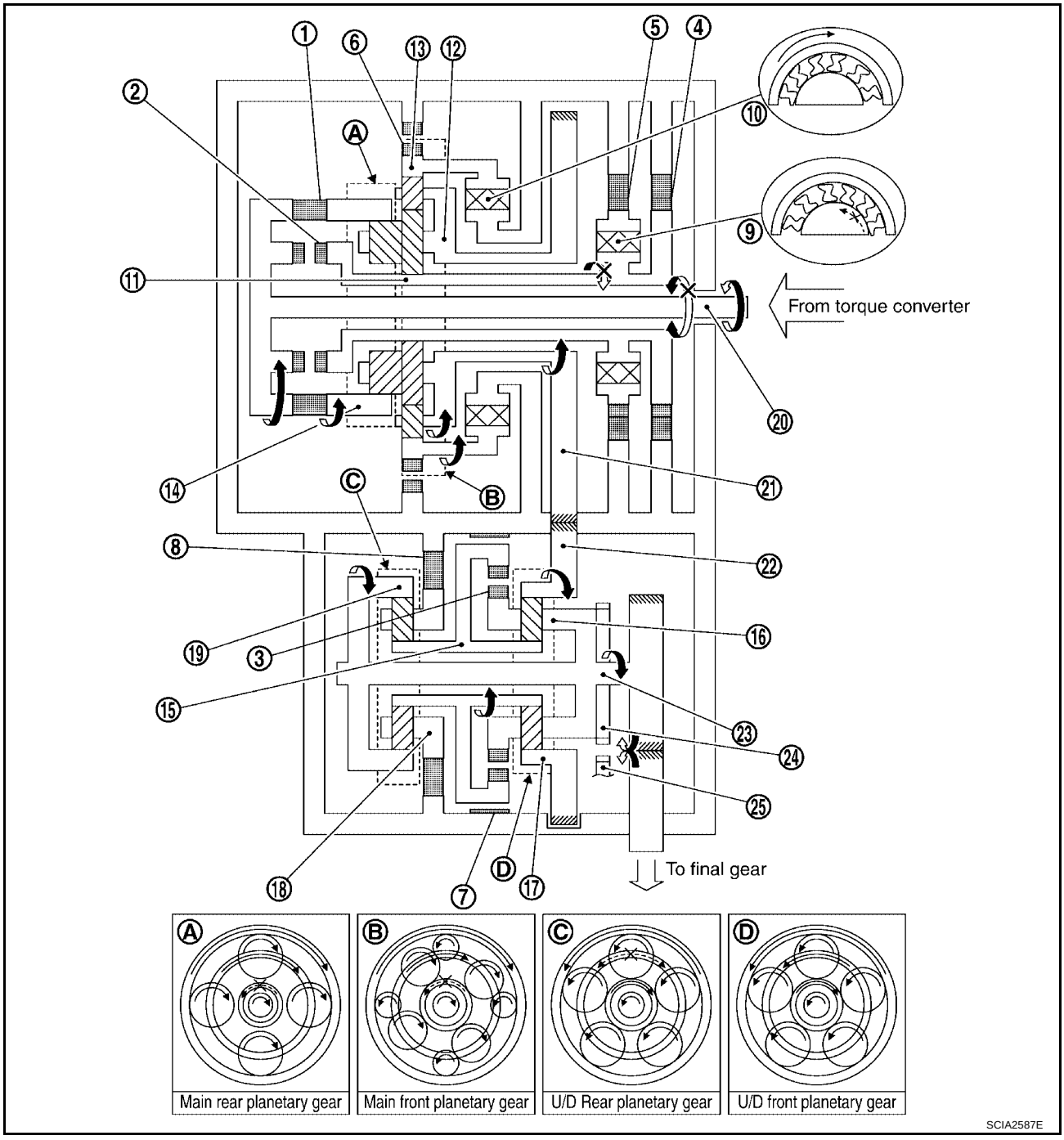


1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D”, “M2” positions 2nd gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
6. 2nd brake and 2nd coast brake operates.
7. One-way clutch No. 1 operates. (Lock rotation of main sun gear.)
8. Main planetary carrier revolves clockwise due to reaction force of front large planetary pinion gear.
9. Counter drive gear rotates clockwise for main planetary carrier and one.
10. Counter driven gear rotates counterclockwise.
11. U/D front internal gear rotates counterclockwise for counter driven gear and one.
12. U/D front planetary pinion gear rotates itself counterclockwise.
13. U/D sun gear rotates clockwise.
14. U/D rear planetary pinion gear rotates itself counterclockwise.
15. B5 brake operate. (Lock rotation of U/D rear planetary carrier.)
16. U/D rear internal gear rotates counterclockwise.
17. U/D front planetary carrier and output shaft rotates counterclockwise for U/D rear internal gear and one.
18. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.

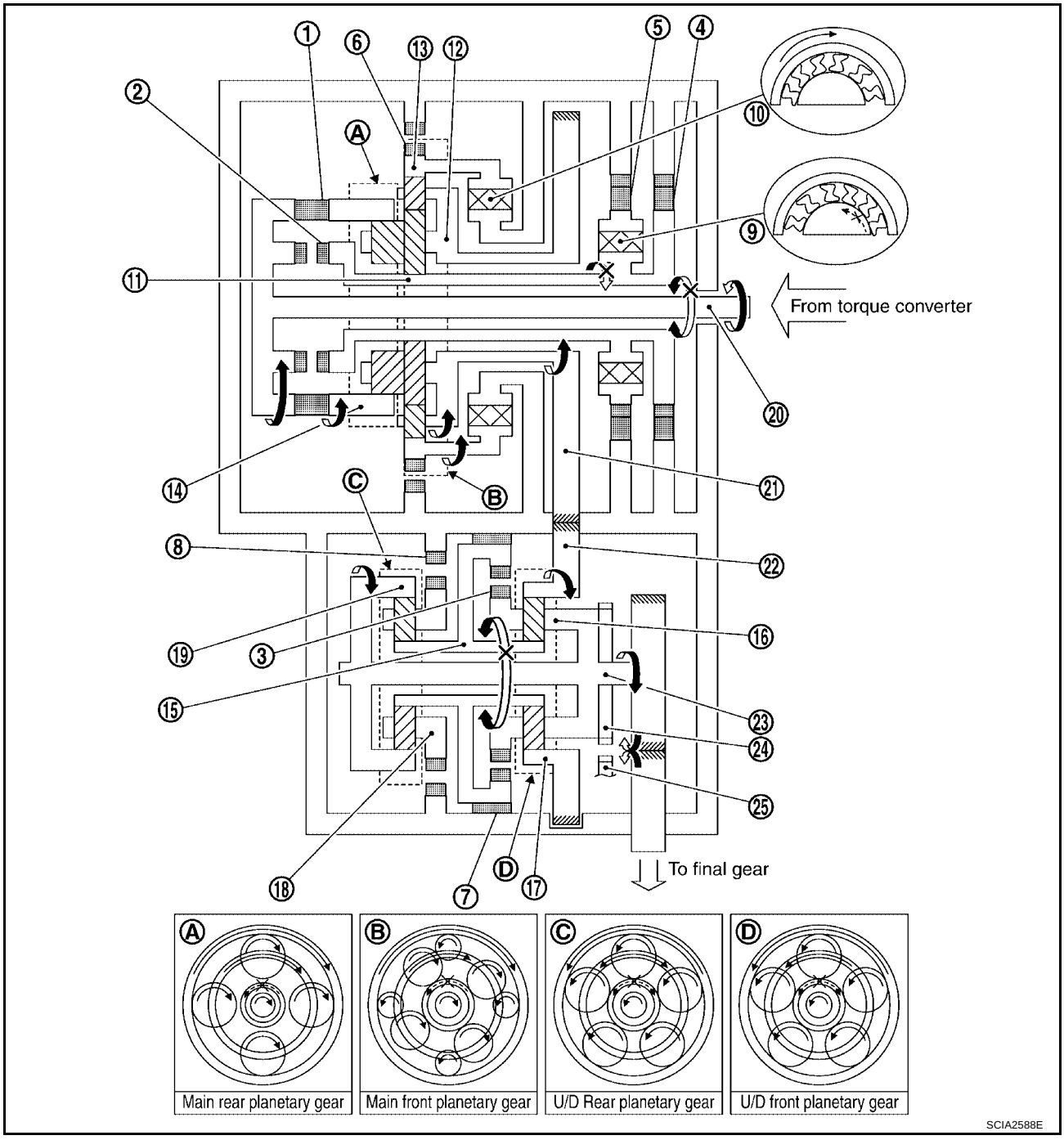


1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D”, “M3” positions 3rd gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
6. 2nd brake and 2nd coast brake operates.
7. One-way clutch No. 1 operates. (Lock rotation of main sun gear.)
8. Main planetary carrier revolves clockwise due to reaction force of front large planetary pinion gear.
9. Counter drive gear rotates clockwise for main planetary carrier and one.
10. Counter driven gear rotates counterclockwise.
11. U/D front internal gear rotates counterclockwise for counter driven gear and one.
12. U/D front planetary pinion gear rotates itself counterclockwise.
13. U/D brake operate. (Lock rotation of U/D sun gear.)
14. U/D front planetary carrier revolves counterclockwise due to reaction force of U/D front planetary pinion gear.
15. U/D rear internal gear and output shaft rotates counterclockwise for U/D front planetary carrier and one.
16. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.

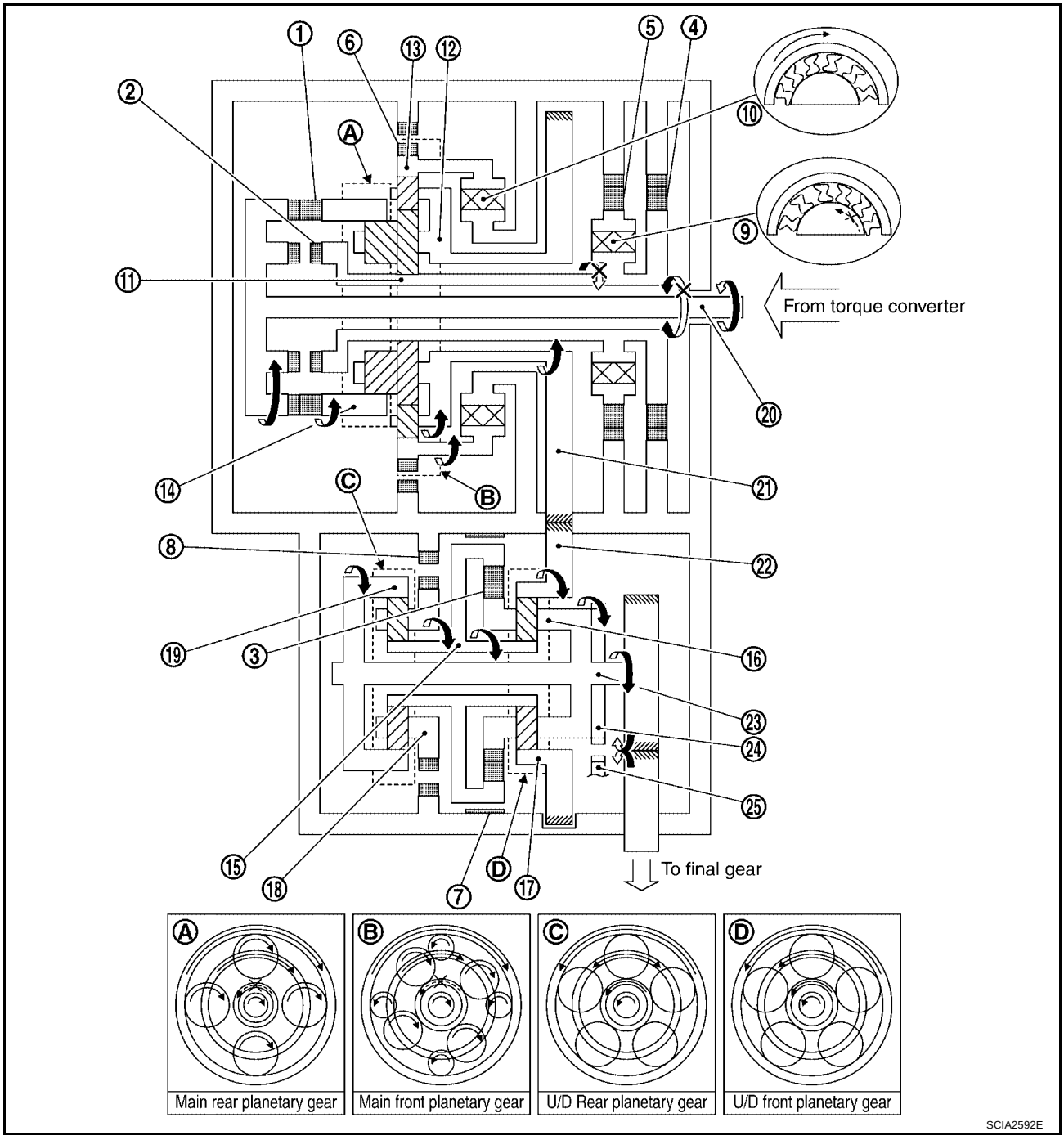


1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D”, “M4” positions 4th gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Main rear internal gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself clockwise for rear planetary pinion and one.
6. 2nd brake and 2nd coast brake operates.
7. One-way clutch No. 1 operates. (Lock rotation of main sun gear.)
8. Main planetary carrier revolves clockwise due to reaction force of front large planetary pinion gear.
9. Counter drive gear rotates clockwise for main planetary carrier and one.
10. Counter driven gear rotates counterclockwise.
11. U/D front internal gear rotates counterclockwise for counter driven gear and one.
12. U/D clutch operate. (Connect U/D sun gear to U/D front planetary carrier.)
13. U/D front planetary pinion gear cannot rotate itself, and U/D unit rotates counterclockwise as one.
14. Output shaft rotates counterclockwise for U/D unit and one.
15. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.

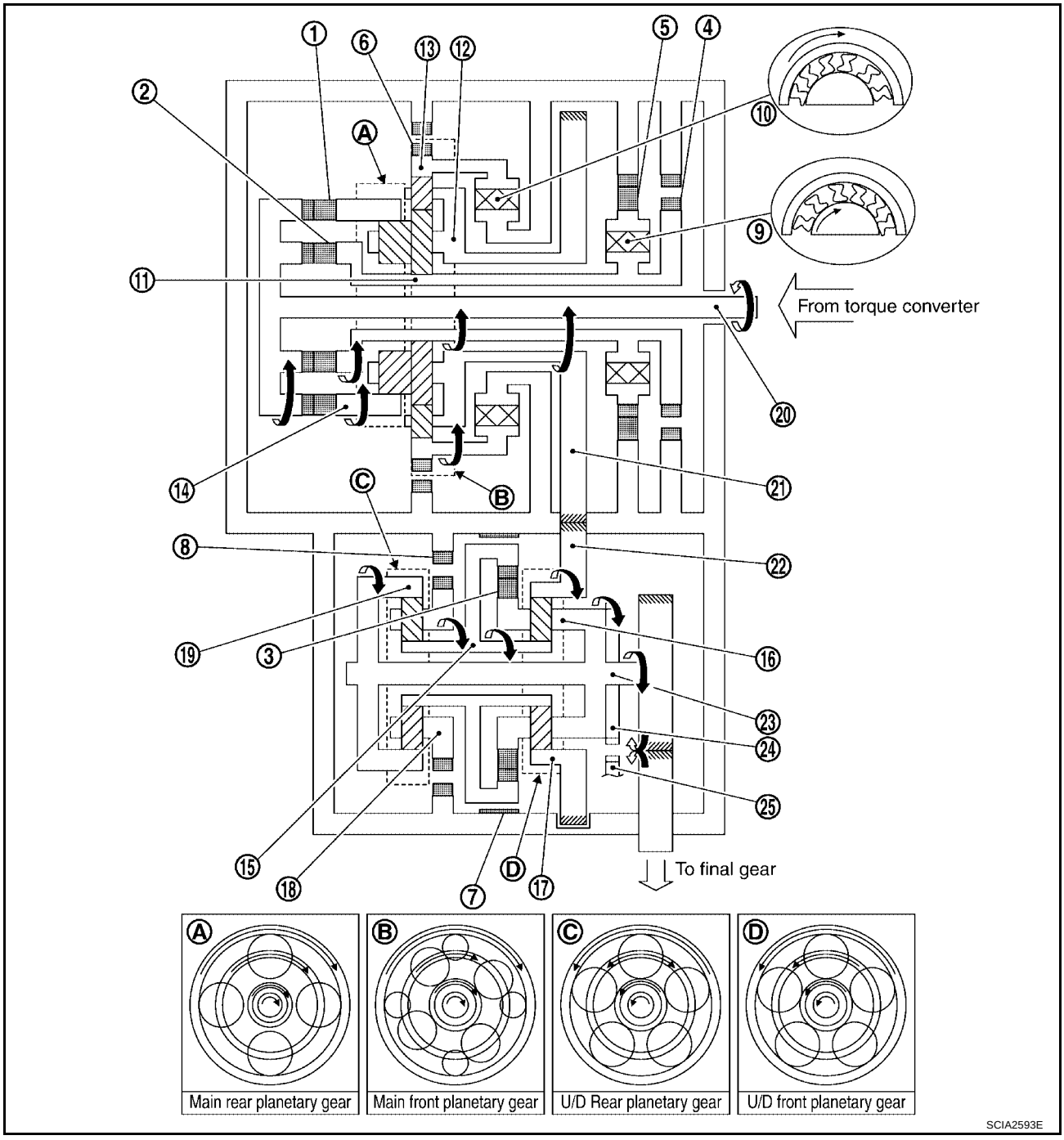


1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“D”, “M5” positions 5th gear

1. Input shaft rotates clockwise.
2. Forward clutch operates. (Connect input shaft to main rear internal gear.)
3. Direct clutch operates. (Connect input shaft to main sun gear.)
4. Main rear planetary pinion gear cannot rotate itself, and main rear planetary unit rotates clockwise as one.
5. Main front large planetary pinion gear cannot rotate itself for main rear planetary pinion gear and one, and main front planetary unit rotates clockwise as one.
6. Counter drive gear rotates clockwise for main front planetary unit and one.
7. Counter driven gear rotates counterclockwise.
8. U/D front internal gear rotates counterclockwise for counter driven gear and one.
9. U/D clutch operate. (Connect U/D sun gear to U/D front planetary carrier.)
10. U/D front planetary pinion gear cannot rotate itself, and U/D unit rotates counterclockwise as one.
11. Output shaft rotates counterclockwise for U/D unit and one.
12. Final gear clockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.

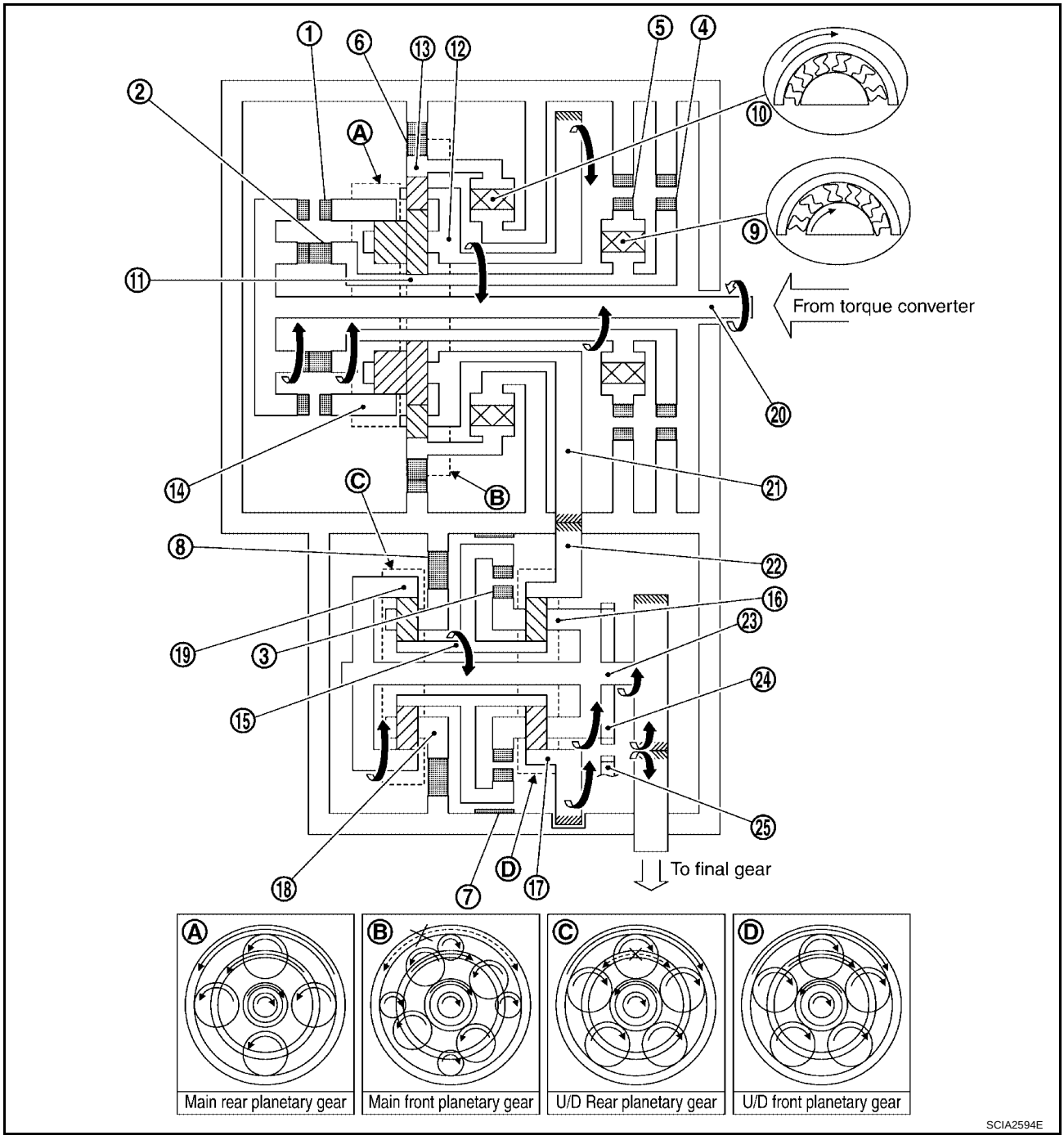


1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

“R” position

1. Input shaft rotates clockwise.
2. Direct clutch operates. (Connect input shaft to main sun gear.)
3. Main sun gear rotates clockwise.
4. Main rear planetary pinion gear rotates itself clockwise.
5. Main front large planetary pinion gear rotates itself counterclockwise for rear planetary pinion gear and one.
6. Main front small planetary pinion gear rotates itself clockwise.
7. 1st and reverse brake operates. (Lock rotation of main front internal gear.)
8. Main planetary carrier revolves counterclockwise due to reaction force of front small planetary pinion gear.
9. Counter drive gear rotates counterclockwise for main planetary carrier and one.
10. Counter driven gear rotates clockwise.
11. U/D front internal gear rotates clockwise for counter driven gear and one.
12. U/D front planetary pinion gear rotates itself clockwise.
13. U/D sun gear rotates counterclockwise.
14. U/D rear planetary pinion gear rotates itself clockwise.
15. B5 brake operate. (Lock rotation of U/D rear planetary carrier.)
16. U/D rear internal gear rotates clockwise.
17. U/D front planetary carrier and output shaft rotates clockwise for U/D rear internal gear and one.
18. Final gear counterclockwise.

- During deceleration, driving force is connected to input shaft directly without one-way clutch. Therefore, engine brake operates.



1. Forward clutch
2. Direct clutch
3. U/D clutch
4. 2nd coast brake
5. 2nd brake
6. 1st and reverse brake
7. U/D brake
8. B5 brake
9. One-way clutch No. 1
10. One-way clutch No. 2
11. Main sun gear
12. Main planetary carrier
13. Main front internal gear
14. Main rear internal gear
15. U/D sun gear
16. U/D front planetary carrier
17. U/D front internal gear
18. U/D rear planetary carrier
19. U/D rear internal gear
20. Input shaft
21. Counter drive gear
22. Counter driven gear
23. Output shaft
24. Parking gear
25. Parking pawl

TCM Function

UCS000T5

The function of the TCM is to:

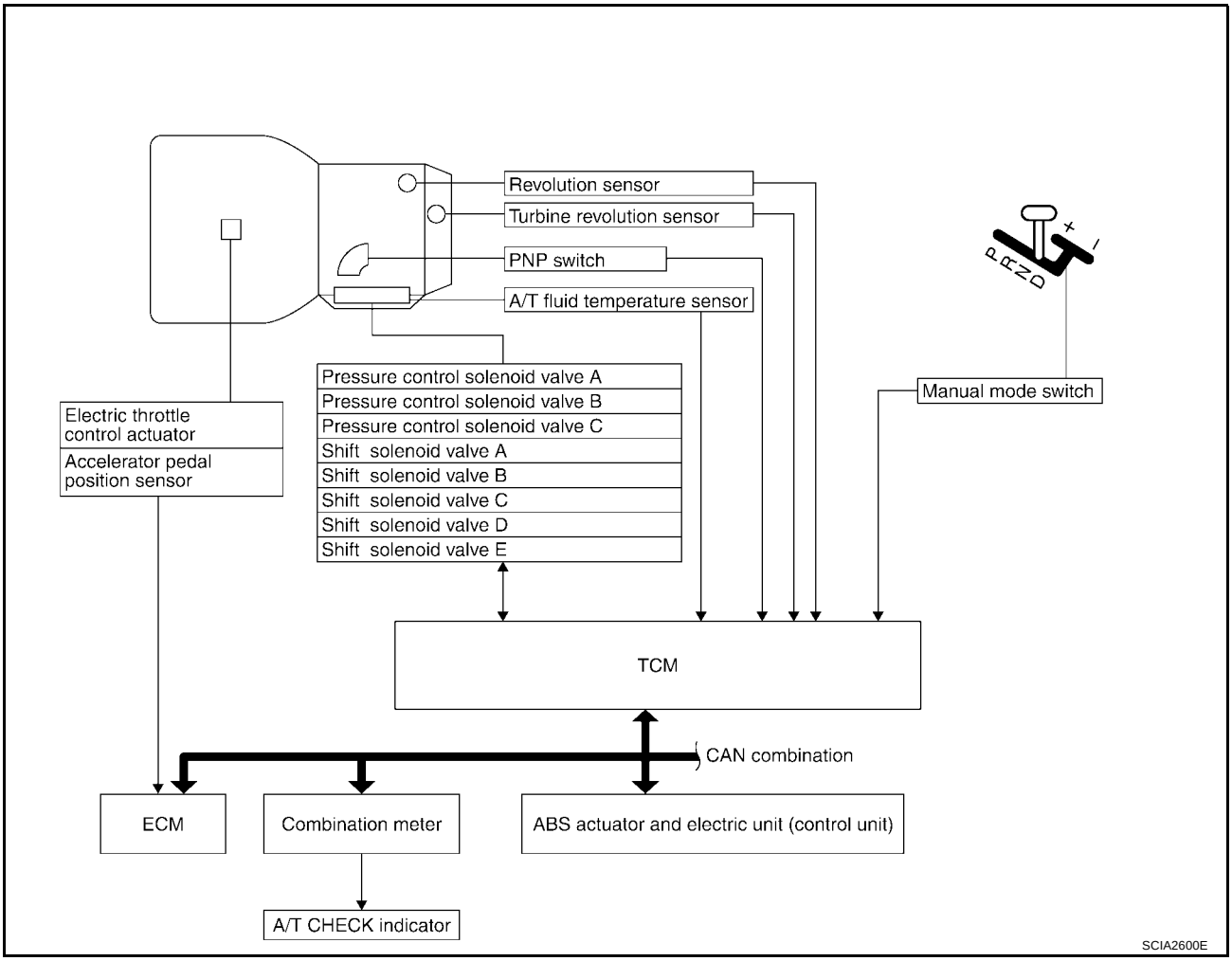
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids.

CONTROL SYSTEM OUTLINE

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

SENSORS (or SIGNAL)		TCM		ACTUATORS
PNP switch Throttle angle signal Throttle position signal Engine speed signal Engine torque signal A/T fluid temperature sensor Revolution sensor Turbine revolution sensor Vehicle speed signal Manual mode switch signal Stop lamp switch signal	⇒	Shift control Line pressure control Lock-up control Engine brake control Timing control Fail-safe control Self-diagnosis CONSULT-II communication line CAN communication line On board diagnosis	⇒	Shift solenoid valve A Shift solenoid valve B Shift solenoid valve C Shift solenoid valve D Shift solenoid valve E Pressure control solenoid valve A Pressure control solenoid valve B Pressure control solenoid valve C A/T CHECK indicator lamp

CONTROL SYSTEM DIAGRAM



Input/Output Signal of TCM

UCS000T7

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 angle signal(*5)		X	X	X	X	X	X	X
	Throttle position signal(*5)		X(*2)	X(*2)		X	X(*2)		X(*4)
	Revolution sensor		X	X	X	X	X	X	X
	Turbine revolution sensor		X	X	X		X	X	X
	Vehicle speed signal MTR(*1) (*5)		X	X	X	X		X	X
	Engine speed signals(*5)			X	X	X		X	X
	Engine torque signals(*5)		X	X	X	X	X		X
	PNP switch		X	X	X	X	X	X	X(*4)
	Manual mode switch			X	X		X	X	X
	Stop lamp switch signal(*5)			X		X	X		X(*4)
	A/T fluid temperature sensor			X	X	X	X	X	X
	ASCD	Operation signal(*5)		X		X	X		
		Overdrive cancel signal(*5)		X		X	X		
	TCM power supply voltage signal		X	X	X	X	X	X	X
Output	Shift solenoid valve A/B/C/D/E			X	X			X	X
	Pressure control solenoid valve A		X	X	X	X	X	X	X
	Pressure control solenoid valve B			X	X		X	X	X
	Pressure control solenoid valve C				X	X		X	X
	Self-diagnostics table(*5)								X

*1: Spare for revolution sensor
*2: Spare for throttle angle signal
*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.
*5: CAN communications.

CAN Communication

UCS000T6

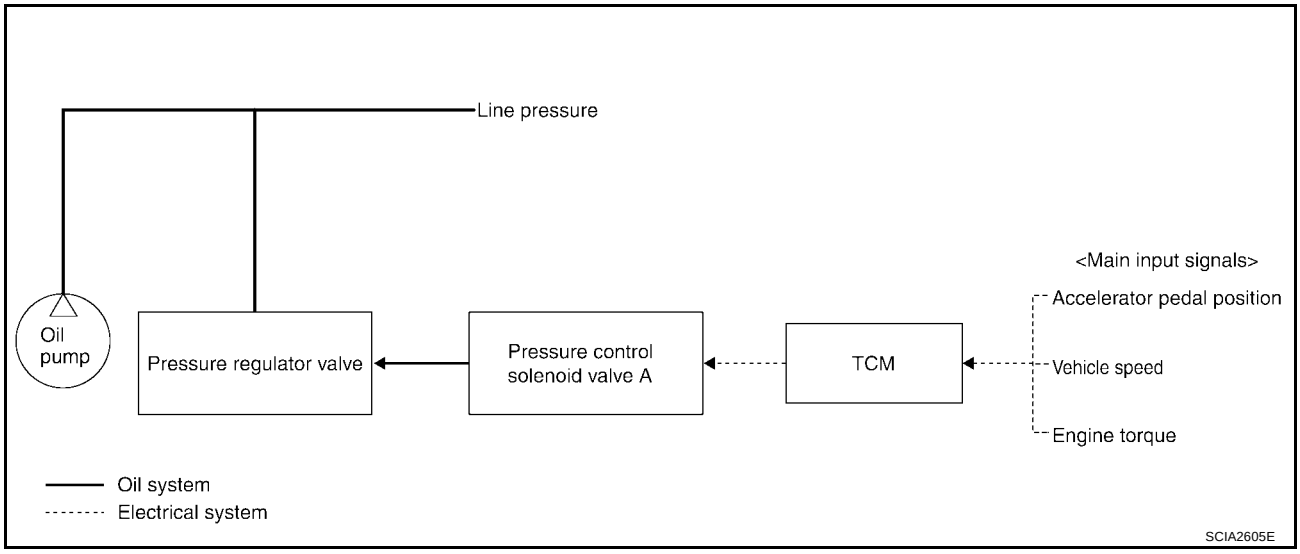
SYSTEM DESCRIPTION

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) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.
For details, refer to LAN-8, "CAN COMMUNICATION" .

Line Pressure Control

UCS000T8

- The pressure control solenoid A controls linear line pressure by control signal from TCM and line pressure for clutches and brakes to reduce shift shock.
- This pressure control solenoid A 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.



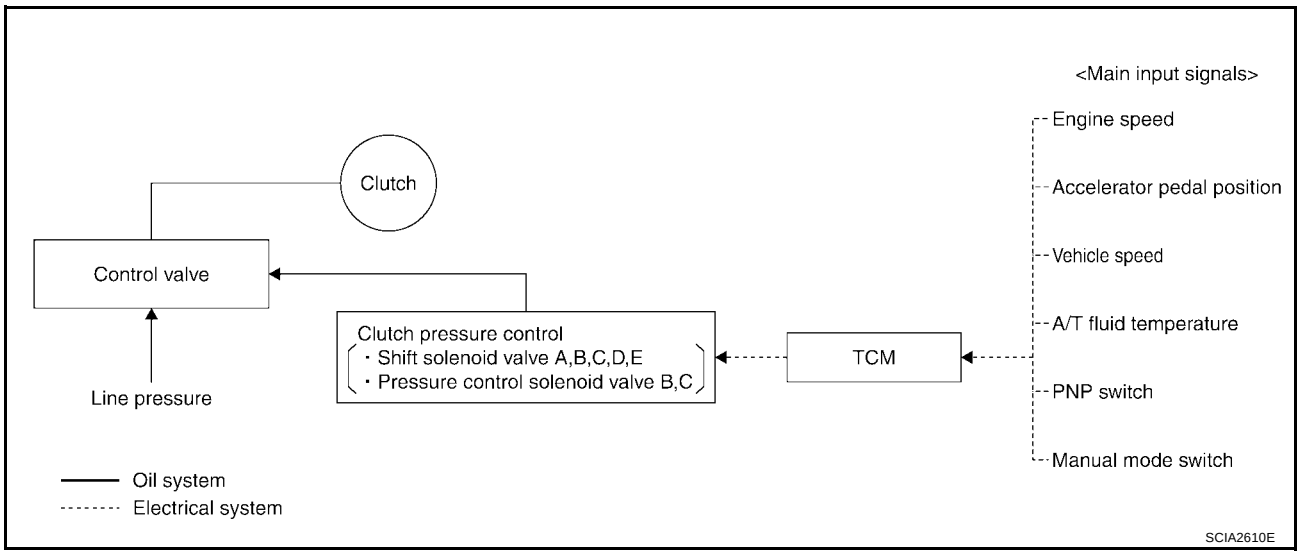
LINE PRESSURE CONTROL IS BASED ON THE TCM LINE PRESSURE CHARACTERISTIC PATTERN

In order to obtain the most appropriate line pressure characteristic to meet the current driving state, the TCM controls the pressure control solenoid A current valve and thus controls the line pressure.

Shift Control

UCS000T9

The clutch pressure control solenoid is controlled by the signals from the switches and sensors. Thus, 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 shift change characteristic is attained.



Basically TCM programmed for economy mode, but TCM changes to several shift schedule automatically according to specified condition.

SPECIAL SHIFT MODE

Upslope Mode

When TCM detects upslope from load of engine torque and decrease of acceleration, this mode changes shift points in high-speed side according to the upslope degree and avoids busy shift of A/T.

Downslope Mode

When TCM detects downslope from increase of acceleration with accelerator full close, this mode operates moderate engine brake by changing shift points in high-speed side.

Hot Mode Control

This control lowers ATF temperature by changing shift points when the temperature is extremely high.

MANUAL MODE

Driver oneself can select favorite gear and enjoy sports driving of manual transmission sense by shifting lever from D position to manual mode position and + (up shift) / - (down shift). But lock-up control is operated automatically. Shift control is operated again by shifting from manual gear position to D position. Following control is operated when manual mode.

Automated Up Shift Control

In order to avoid the over speed of the engine, up shift operate automatically, if it becomes over a constant vehicle speed.

Automated Down Shift Control

In order to avoid the stall of the engine, down shift operate automatically, if it becomes under a constant vehicle speed.

Up Shift Permission Control

In order to avoid the stall of the engine, up shift is done only at over a constant vehicle speed.

Down Shift Permission Control

In order to avoid the over speed of the engine, down shift is done only at under a constant vehicle speed.

UP/DOWN SHIFT LEARNING CONTROL

This control learns the pressure to each clutch or brake in order to reduce shifting shock at each shifting (Up, Down, Manual down, Coast down).

N-D SHIFT CONTROL

This control improves the N-D shift quality due to controlling line pressure solenoid valve according to forward clutch piston stroke learned in N-D shift learning control and applying best hydraulic pressure to forward clutch at N-D shift.

N-D SHIFT LEARNING CONTROL

This control learns the forward clutch hydraulic pressure due to monitoring a forward clutch engaging time and a rotation change rate.

N-R SHIFT CONTROL

This control improves the N-R shift quality due to controlling shift pressure solenoid valve according to direct clutch piston stroke learned in N-R shift learning control and applying best hydraulic pressure to direct clutch at N-R shift.

N-R SHIFT LEARNING CONTROL

This control learns the direct clutch hydraulic pressure due to monitoring a direct clutch engaging time and a rotation change rate.

TORQUE REDUCTION CONTROL

This control improves the shift quality due to sending torque reduction request signal from TCM to ECM and cutting engine torque increase of shift at N-D shift, N-R shift and 1 $\Leftrightarrow$ 2 $\Leftrightarrow$ 3 $\Leftrightarrow$ 4 $\Leftrightarrow$ 5.
If accelerator pedal is depressed rapidly, this control establishes the upper limit value of engine torque and avoids engine flare at 2 $\Leftrightarrow$ 3, 3 $\Leftrightarrow$ 4 and 4 $\Rightarrow$ 2 of clutch to clutch shift.

Lock-Up Control

UCS000TA

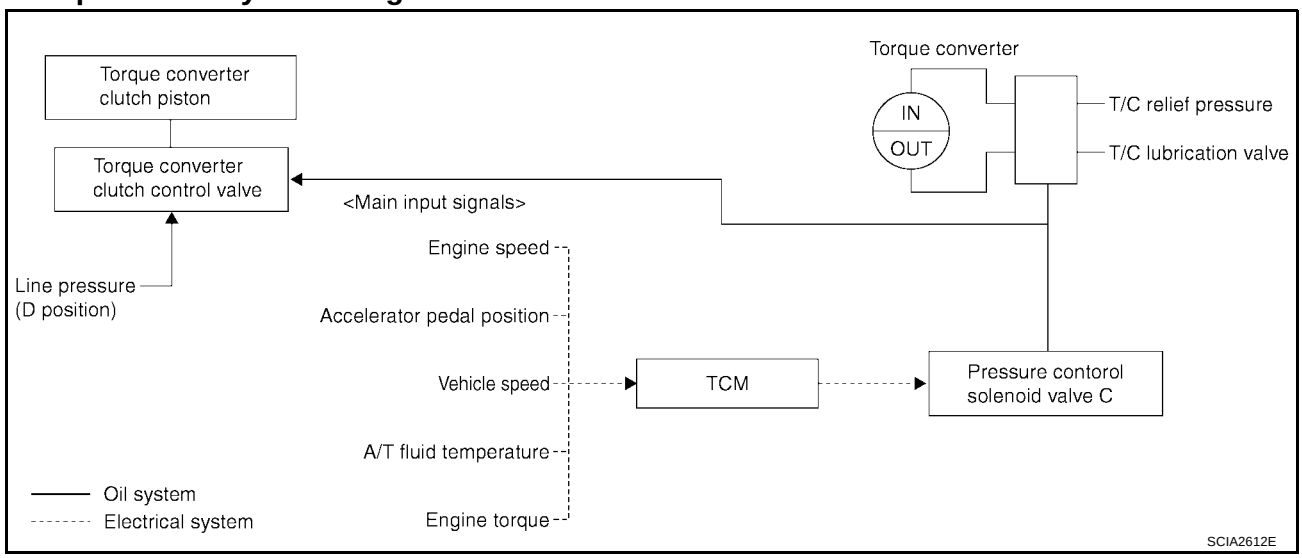
The torque converter clutch piston in the torque converter is engaged to eliminate torque converter slip to increase power transmission efficiency.
The torque converter clutch control valve operation is controlled by the pressure control solenoid valve C, which is controlled by a signal from TCM, and the torque converter clutch control valve engages or releases the torque converter clutch piston.

Lock-up Operation Condition Table

Selector lever	D position		M5 position	M4 position	M3 position
Gear position	5	4	5	4	3
Lock-up	×	–	×	×	×
Slip lock-up	×	×	–	–	–

TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

Lock-up Control System Diagram



Lock-up Released

- In the lock-up released state, the torque converter clutch control valve is set into the unlocked state by the pressure control solenoid valve C and the lock-up apply pressure is drained.
  In this way, the torque converter clutch piston is not coupled.

Lock-up Applied

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

SMOOTH LOCK-UP CONTROL

When shifting from the lock-up released state to the lock-up applied state, the current output to the pressure control solenoid valve C is controlled with the TCM. In this way, when shifting to the lock-up applied state, the torque converter clutch is temporarily set to the half-clutched state to reduce the shock.

Half-Clutched State

- The current output from the TCM to the pressure control solenoid valve C is varied to steadily increase the pressure control solenoid valve C pressure.
  In this way, the lock-up apply pressure gradually rises and while the torque converter clutch piston is put into half-clutched status, the torque converter clutch piston operating pressure is increased and the coupling is completed smoothly.

Slip Lock-up Control

- In the slip region, the pressure control solenoid valve C 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 4th and 5th gears at both low speed and when the accelerator has a low degree of opening.

ON BOARD DIAGNOSTIC (OBD) SYSTEM

PFP:00028

Introduction

UCS000TD

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-452, "SELF-DIAG RESULT MODE" .

OBD-II Function for A/T System

UCS000TE

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

UCS000TF

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. — 1st Trip
If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — 2nd 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)

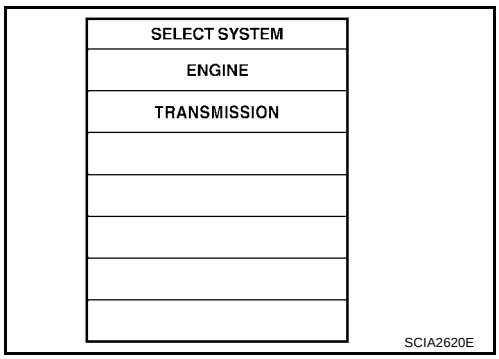
UCS000TG

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, P0710 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-56, "FREEZE FRAME DATA AND 1ST TRIP FREEZE FRAME DATA" .
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 cable 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" .

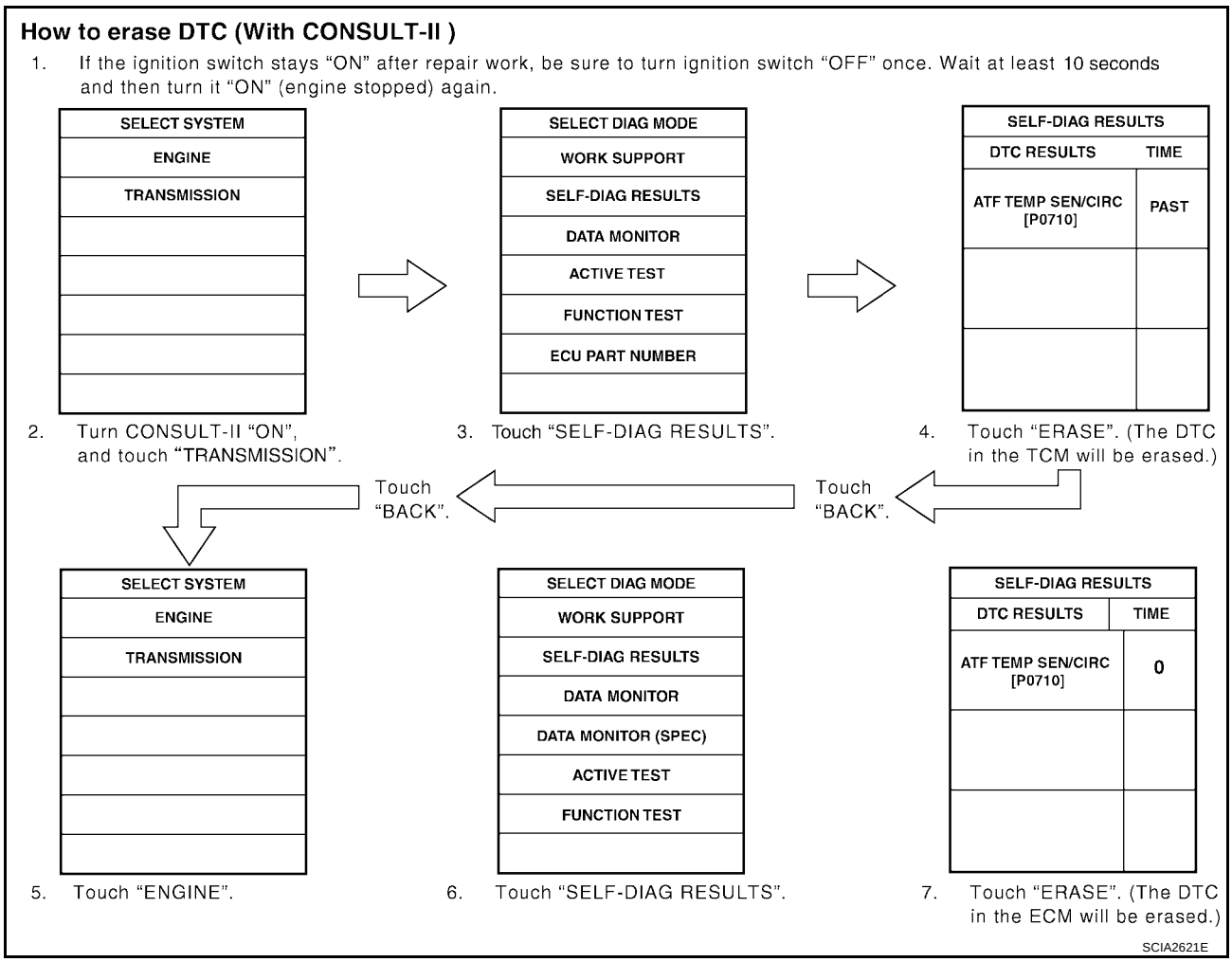
- **Diagnostic trouble codes (DTC)**
- **1st trip diagnostic trouble codes (1st trip DTC)**
- **Freeze frame data**

- **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 “TRANSMISSION”.
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. Erase DTC with TCM. Refer to AT-458, "Erase self-diagnosis" . (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-124, "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. Erase DTC with TCM. Refer to AT-458, "Erase self-diagnosis" . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Erase DTC with ECM. Refer to EC-65, "How to Erase DTC" .

Malfunction Indicator Lamp (MIL)

UCS000TH

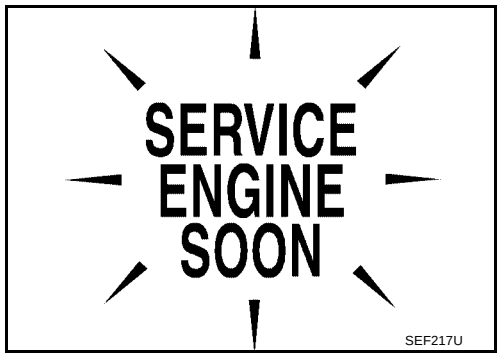
DESCRIPTION

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-45, "WARNING LAMPS" , or see EC-669, "MIL AND DATA LINK CONNECTOR" .

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.



TROUBLE DIAGNOSIS

PFP:00004

DTC Inspection Priority Chart

UCS000TI

If some DTCs 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 DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-459 .

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

Fail-Safe

UCS000TJ

The TCM has an electrical fail-safe mode. This mode makes it possible to operate even if there is a malfunction in a main electronic control input/output signal circuit.
In fail-safe mode, a driving condition is selected according to the malfunctioning location, and line pressure is set at the maximum. For this reason, the customer will be subjected to uncomfortable “slipping” or “poor acceleration” of the vehicle.
In that case, handle according to the “diagnostics flow” (Refer to AT-426).

FAIL-SAFE FUNCTION

If any malfunction occurs in a sensor or solenoid, this function controls the A/T to make driving possible.

NOTE:
Line pressure is set at the maximum in fail-safe mode. Although gear position differs depending on the type of fail-safe modes, CONSULT-II indicates “5th”.

DTC	Malfunction items	Fail-safe*
P0500	Vehicle speed signal	No learning control.
P0613	TCM processor	Fail-safe mode 4
P0705	PNP switch	Fail-safe mode 4
P0710	ATF temperature sensor circuit	Sets ATF temperature data at 111°C (232°F) after 15 minutes. Inhibits lock-up control.
P0711	ATF temperature sensor function	Sets ATF temperature data at 111°C (232°F) after 15 minutes. Inhibits lock-up control.
P0717	Turbine revolution sensor	Fail-safe mode 1
P0722	Revolution sensor	Uses vehicle speed signal from combination meter as a substitute. Inhibits learning control.
P0726	Engine speed signal input circuit performance	Fail-safe mode 1
P0731	1st gear function	No 1st gear, no control for N-D shift.
P0732	2nd gear function	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.
P0733	3rd gear function	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.
P0734	4th gear function	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.
P0735	5th gear function	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.
P0744	Lock-up function	Fail-safe mode 1
P0745	Pressure control solenoid valve A	Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping.

DTC	Malfunction items	Fail-safe*
P0750	Shift solenoid valve A	Any one of fail-safe modes ● Fail-safe mode 1 ● Fail-safe mode 7. Also, ECM restricts input torque to prevent clutch slipping.
P0755	Shift solenoid valve B	Any one of fail-safe modes ● Fail-safe mode 1 ● Fail-safe mode 8
P0760	Shift solenoid valve C	Any one of fail-safe modes ● Fail-safe mode 2 ● Fail-safe mode 5 ● Fail-safe mode 9
P0762	Shift solenoid valve C stuck ON	Fail-safe mode 2. Also, ECM restricts engine torque to prevent clutch slipping.
P0765	Shift solenoid valve D	Any one of fail-safe modes ● Fail-safe mode 1 ● Fail-safe mode 10. Also, ECM restricts input torque to prevent clutch slipping.
P0770	Shift solenoid valve E	Any one of fail-safe modes ● Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping. ● Fail-safe mode 6. Also, ECM restricts engine torque to prevent clutch slipping.
P0775	Pressure control solenoid valve B	Fail-safe mode 3
P0780	Shift function	Fail-safe mode 1. Also, ECM restricts input torque to prevent clutch slipping.
P0795	Pressure control solenoid valve C	Fail-safe mode 1
P0797	Pressure control solenoid valve C stuck ON	Fail-safe mode 1
P0826	Manual mode switch	No manual mode control.
P0882	TCM power input signal	Fail-safe mode 1
P1726	Electric throttle control	● The accelerator opening angle is controlled by ECM according to a pre-determined accelerator angle to make driving possible. ● No lock-up, no learning control.
U1000	CAN communication circuit	Any one of fail-safe modes ● Fail-safe mode 1 ● Fail-safe mode 1. Also, ECM restricts engine torque to prevent clutch slipping. ● No learning control. ● No lock-up, no learning control, no special shift mode control.

*: For fail-safe modes 1 to 10, refer to AT-423, "Fail-safe mode list" .

Fail-safe mode list

Fail-safe mode	Selector lever	Gear position*1	Shift solenoid valve					Pressure control solenoid valve		
			A	B	C	D	E	A	B	C
Fail-safe mode 1	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF

Fail-safe mode	Selector lever	Gear position*1	Shift solenoid valve					Pressure control solenoid valve		
			A	B	C	D	E	A	B	C
Fail-safe mode 2 (CONSULT-II displays “8”)	D position	3rd	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
Fail-safe mode 3	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Fail-safe mode 4	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
Fail-safe mode 5	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Fail-safe mode 6	D position	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
Fail-safe mode 7	D position	4th	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	2nd	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse*2	ON	OFF	ON	ON	OFF	OFF	OFF	OFF
Fail-safe mode 8 (CONSULT-II displays “1”)	D position	5th	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	(2nd)*3	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
Fail-safe mode 9 (CONSULT-II displays “8”)	D position	4th	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	4th	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
	R position	Reverse	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
Fail-safe mode 10 (CONSULT-II displays “6”)	D position	4th	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
	Manual mode: + (up shift)									
	Manual mode: - (down shift)	3rd	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
	R position	Reverse*2	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF

*1: CONSULT-II indicates “5th”.

*2: Reverse gear ratio difference (Gear ratio: 3.342)

*3: 3rd gear ratio difference (Gear ratio: 2.301)

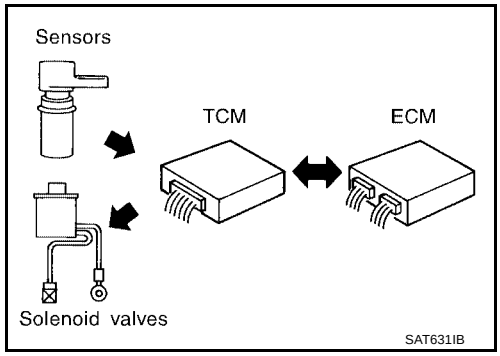
How To Perform Trouble Diagnosis For Quick and Accurate Repair

UCS000TK

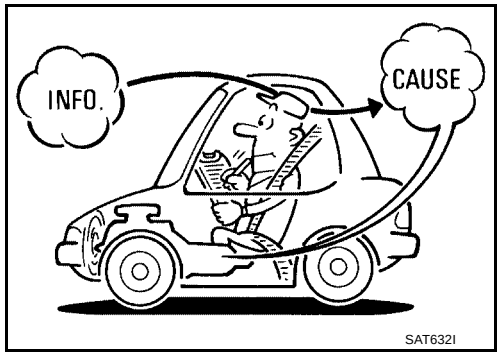
INTRODUCTION

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

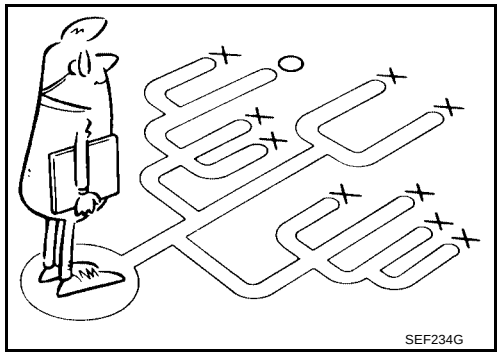
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.
Input and output signals 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 an error that occurs intermittently rather than continuously. Most intermittent errors 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 errors. A road test with CONSULT-II (or GST) or a circuit tester connected should be performed. Follow the AT-426, "WORK FLOW" .



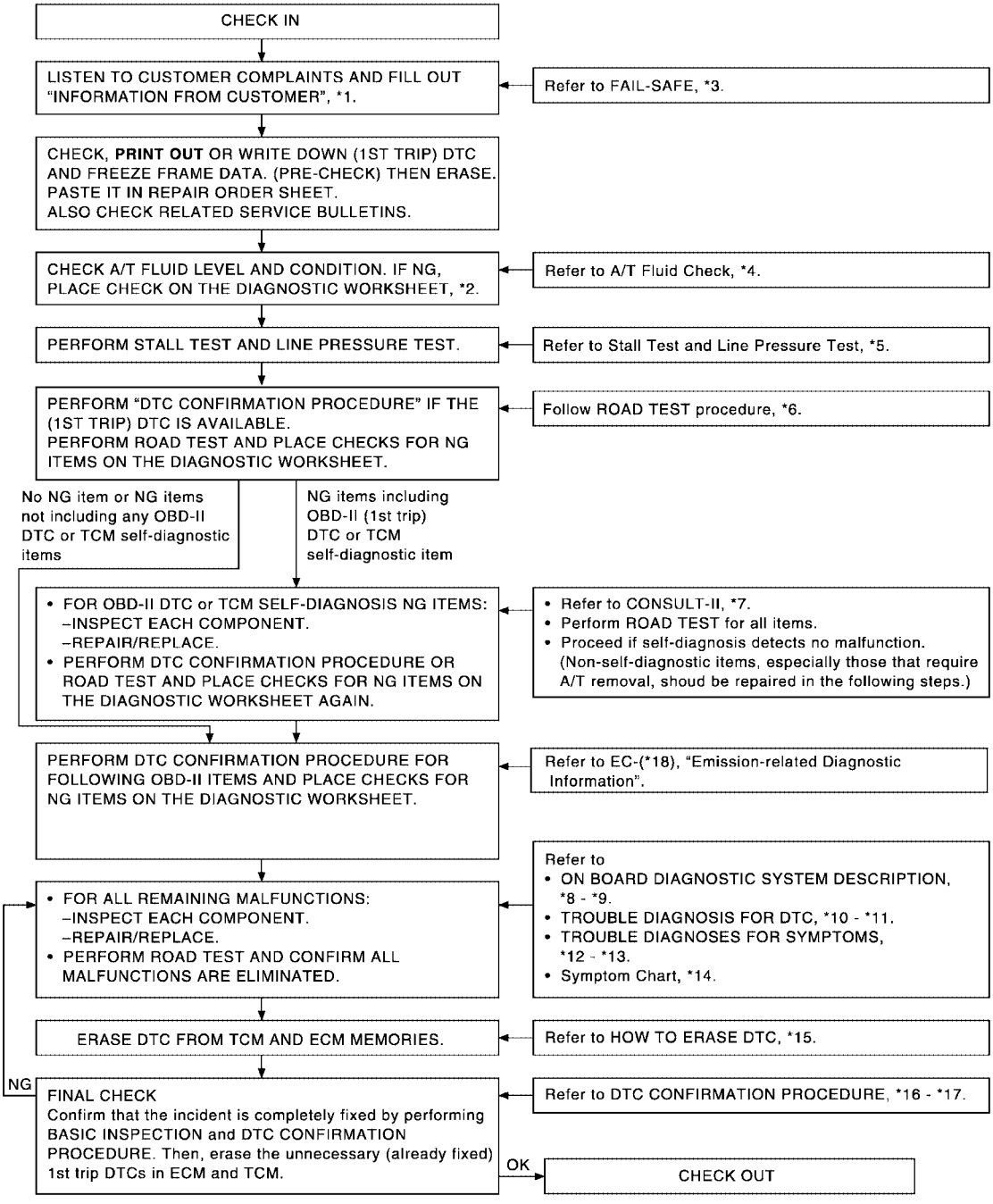
Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such errors, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A “Diagnostic Worksheet” as shown on the example (Refer to AT-427) should be used.
Start your diagnosis by looking for “conventional” errors first. This will help troubleshoot driveability errors 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 malfunction. 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-427) and “Diagnostic Worksheet” (Refer to AT-427), to perform the best troubleshooting possible.

Work Flow Chart



SCIA0501E

*1. AT-427
*2. AT-427
*3. AT-422
*4. AT-432
*5. AT-432, AT-434
*6. AT-435
*7. AT-450
*8. AT-418
*9. AT-421
*10. AT-459
*11. AT-571
*12. AT-572
*13. AT-588
*14. AT-442
*15. AT-419
*16. AT-459
*17. AT-571
*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 ( )	
Malfunction indicator lamp (MIL)	❏ Continuously lit	❏ Not lit

Diagnostic Worksheet Chart

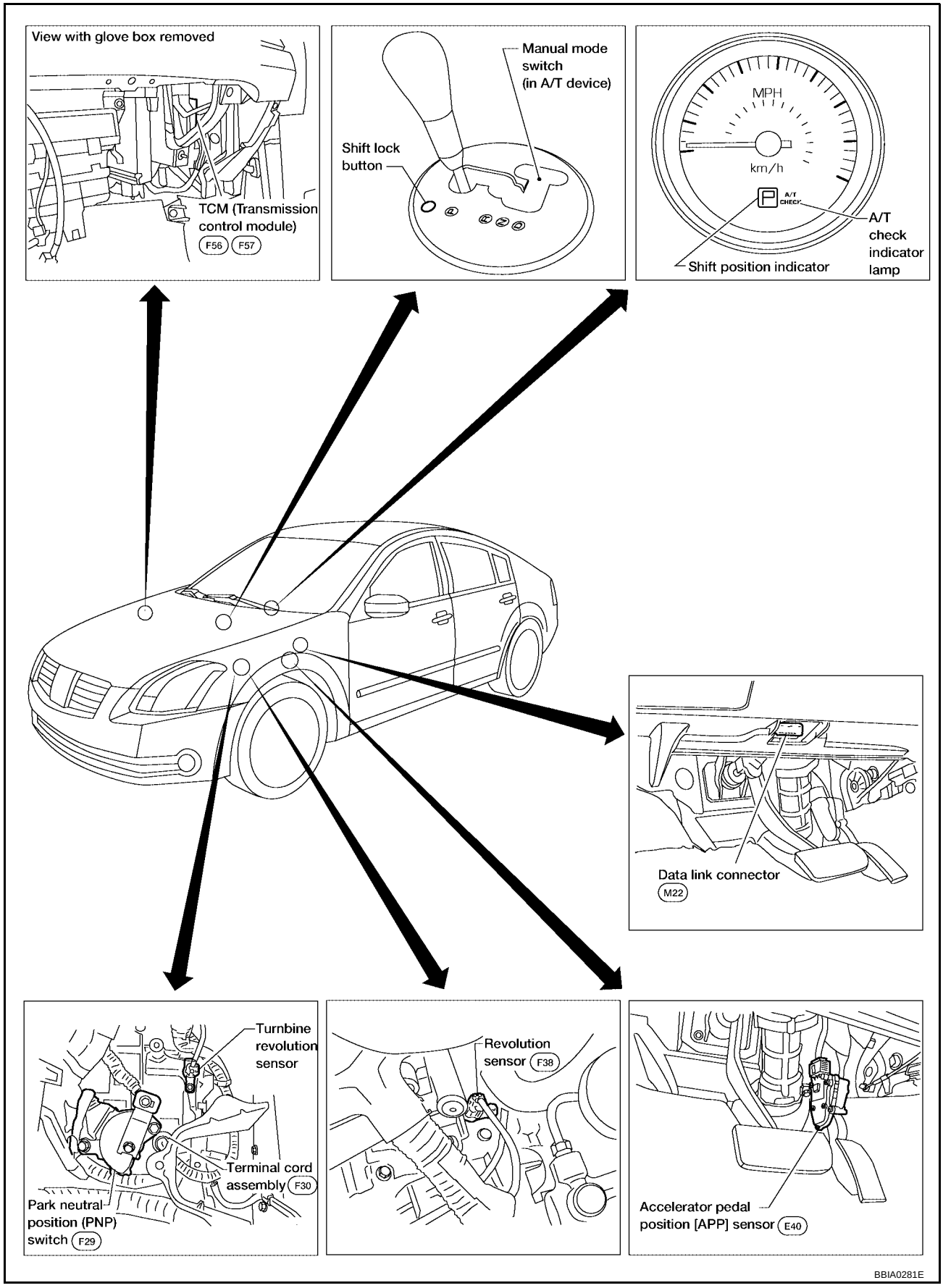
1	❏ Read the item on cautions concerning fail-safe and understand the customer's complaint.			AT-422
2	❏ A/T fluid inspection			AT-432
		❏ Leak (Repair leak location.) ❏ State ❏ Amount		
3	❏ Stall test, time lag test and line pressure test			AT-432, AT-434
		❏ Stall test		
			❏ Engine ❏ Torque converter one-way clutch ❏ Line pressure is low ❏ Forward clutch ❏ Direct clutch ❏ 1st and reverse brake	❏ B5 brake ❏ One-way clutch No. 2 ❏ Oil pump ❏ Oil strainer ❏ Oil leak for each range circuit
		❏ Time lag test		
			❏ Line pressure is low ❏ Forward clutch ❏ Direct clutch ❏ 1st and reverse brake ❏ One-way clutch No. 2	❏ Oil pump ❏ Oil strainer ❏ Oil leak for “D” position circuit ❏ Oil leak for “R” position circuit
		❏ Line pressure inspection - Suspected part:		

4	❑ Perform all road tests and enter checks in required inspection items.			AT-435
	4-1.	Check before engine is started		AT-436
		❑ The A/T CHECK Indicator Lamp does come on. AT-572 . ❑ Perform self-diagnostics. Enter checks for detected items.		
			❑ Vehicle speed sensor·MTR. AT-462 . ❑ TCM processor. AT-464 . ❑ PNP switch. AT-466 . ❑ A/T fluid temperature sensor circuit. AT-471 . ❑ A/T fluid temperature sensor performance. AT-476 . ❑ Turbine revolution sensor circuit. AT-481 . ❑ Vehicle speed sensor·A/T (revolution sensor) circuit. AT-485 . ❑ Engine speed input circuit performance. AT-489 . ❑ 1st gear function. AT-491 . ❑ 2nd gear function. AT-494 . ❑ 3rd gear function. AT-499 . ❑ 4th gear function. AT-503 . ❑ 5th gear function. AT-507 . ❑ Lock-up function. AT-511 . ❑ Shift function. AT-549 . ❑ Pressure control solenoid valve A. AT-514 . ❑ Pressure control solenoid valve B. AT-545 . ❑ Pressure control solenoid valve C. AT-552 . ❑ Shift solenoid valve A. AT-518 . ❑ Shift solenoid valve B. AT-522 . ❑ Shift solenoid valve C. AT-526 . ❑ Shift solenoid valve D. AT-536 . ❑ Shift solenoid valve E. AT-541 . ❑ Pressure control solenoid valve C stuck ON. AT-556 . ❑ Shift solenoid valve C stuck ON. AT-531 . ❑ Manual mode switch circuit. AT-560 . ❑ TCM power input signal. AT-566 . ❑ Electric throttle control system. AT-571 . ❑ CAN communication. AT-459 . ❑ Battery ❑ Other	
	4-2.	Idle inspection		AT-436
		❑ Engine Cannot Be Started in “P” and “N” Position. AT-573 . ❑ In “ P” Position, Vehicle Moves When Pushed. AT-574 . ❑ In “N” Position Vehicle Moves. AT-574 . ❑ Large Shock “N” to “D” Position. AT-575 . ❑ Vehicle Does Not Creep Backward In “R” Position. AT-576 . ❑ Vehicle does Not Creep Forward In “D” Position. AT-576 .		
	4-3.	Driving tests		AT-438
		Part 1		
		❑ Vehicle Cannot Be Started From D1. AT-578 . ❑ A/T Does Not Shift: D1 → D2. AT-578 . ❑ A/T Does Not Shift: D2 → D3. AT-579 . ❑ A/T Does Not Shift: D3 → D4. AT-580 . ❑ A/T Does Not Shift: D4 → D5. AT-581 . ❑ A/T Does Not Perform Lock-up. AT-582 ❑ A/T Does Not Hold Lock-up Condition. AT-582 . ❑ Lock-up Is Not Released. AT-583 .		

4	4-3	Part 2		AT-439
		❏ Vehicle Cannot Be Started From D1. AT-578 . ❏ A/T Does Not Shift: D1 → D2. AT-578 . ❏ A/T Does Not Shift: D2 → D3. AT-579 . ❏ A/T Does Not Shift: D3 → D4. AT-580 .		
		Part 3		AT-440
		❏ Cannot Be Changed To Manual Mode. AT-584 . ❏ A/T Does Not Shift: 5th gear → 4th gear. AT-584 . ❏ A/T Does Not Shift: 4th gear → 3rd gear. AT-585 . ❏ A/T Does Not Shift: 3rd gear → 2nd gear. AT-586 . ❏ A/T Does Not Shift: 2nd gear → 1st gear. AT-586 . ❏ Vehicle Does Not Decelerate By Engine Brake. AT-587 . ❏ Perform self-diagnostics Enter checks for detected items.		
			❏ Vehicle speed sensor·MTR. AT-462 . ❏ TCM processor. AT-464 . ❏ PNP switch. AT-466 . ❏ A/T fluid temperature sensor circuit. AT-471 . ❏ A/T fluid temperature sensor performance. AT-476 . ❏ Turbine revolution sensor circuit. AT-481 . ❏ Vehicle speed sensor·A/T (revolution sensor) circuit. AT-485 . ❏ Engine speed input circuit performance. AT-489 . ❏ 1st gear function. AT-491 . ❏ 2nd gear function. AT-494 . ❏ 3rd gear function. AT-499 . ❏ 4th gear function. AT-503 . ❏ 5th gear function. AT-507 . ❏ Lock-up function. AT-511 . ❏ Shift function. AT-549 . ❏ Pressure control solenoid valve A. AT-514 . ❏ Pressure control solenoid valve B. AT-545 . ❏ Pressure control solenoid valve C. AT-552 . ❏ Shift solenoid valve A. AT-518 . ❏ Shift solenoid valve B. AT-522 . ❏ Shift solenoid valve C. AT-526 . ❏ Shift solenoid valve D. AT-536 . ❏ Shift solenoid valve E. AT-541 . ❏ Pressure control solenoid valve C stuck ON. AT-556 . ❏ Shift solenoid valve C stuck ON. AT-531 . ❏ Manual mode switch circuit. AT-560 . ❏ TCM power input signal. AT-566 . ❏ Electric throttle control system. AT-571 . ❏ CAN communication. AT-459 . ❏ Battery ❏ Other	
5	❏ Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunction parts.			
6	❏ Perform all road tests and enter the checks again for the required items.			AT-435
7	❏ For any remaining NG items, perform the “diagnostics procedure” and repair or replace the malfunction parts. See the chart for diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)			AT-442
8	❏ Erase the results of the self-diagnostics from the TCM.			AT-458

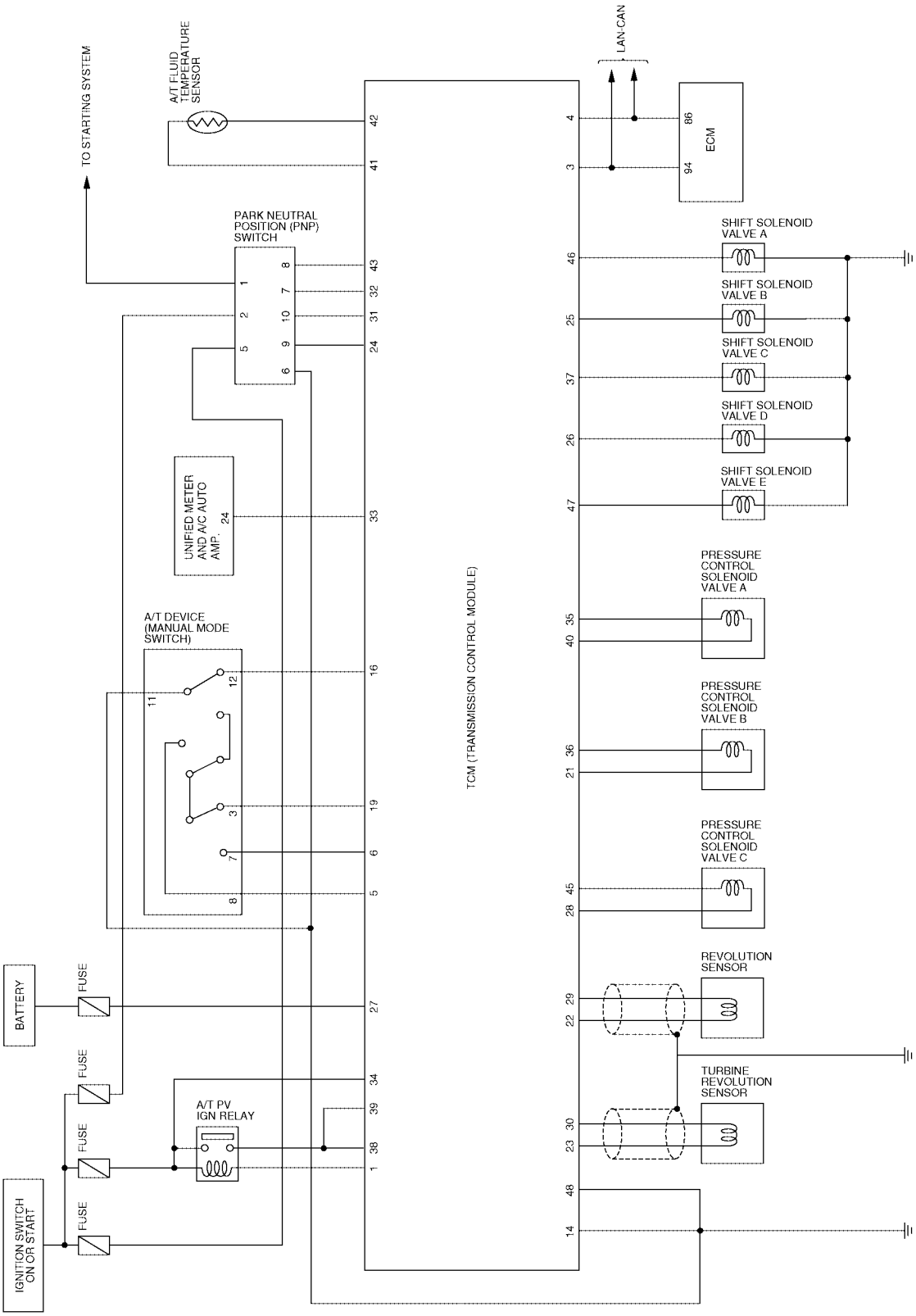
A/T Electrical Parts Location

UCS000TL



Circuit Diagram

UCS000TM



BBWA0581E

Inspections Before Trouble Diagnosis

UCS000TN

A/T FLUID CHECK

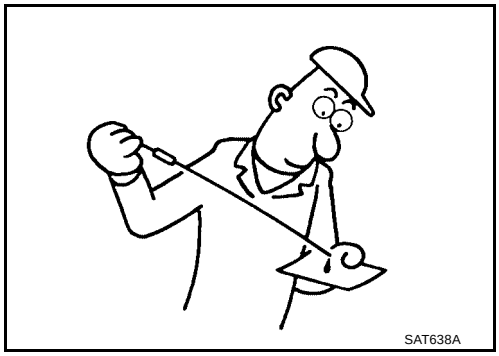
Fluid leakage and fluid level check

- Inspect for fluid leakage and check the fluid level. Refer to MA-21, "Checking A/T Fluid" .

Fluid condition check

Inspect the fluid condition.

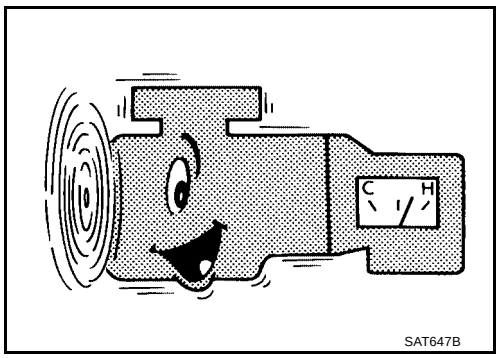
Fluid status	Conceivable Cause	Required Operation
Varnished (viscous varnish state)	Clutch, brake scorched	Replace the A/T fluid and check the A/T main unit and the vehicle for malfunctions (wire harnesses, cooler pipes, etc.)
Milky white or cloudy	Water in the fluid	Replace the A/T fluid and check for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


SAT638A

STALL TEST

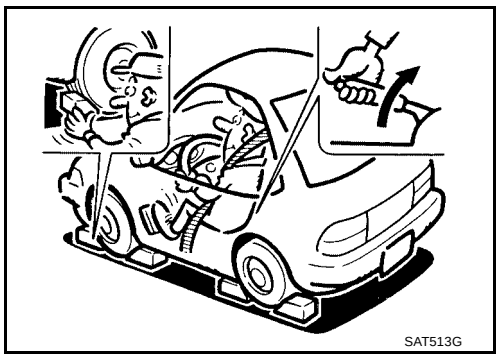
Stall test procedure

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.
3. Switch of A/C and light etc. are off.



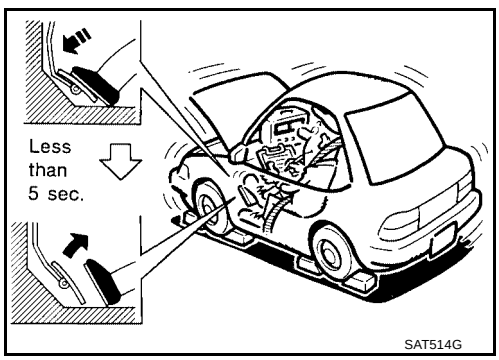
SAT647B

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


SAT513G

5. Engine start, apply foot brake, and place selector lever in “D” position.
6. While holding down the foot brake, gradually press down the accelerator pedal.
7. 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.
8. Move the selector lever to the “N” position.
9. Cool down the A/T fluid.



SAT514G

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

10. Repeat step 5 through 9 with selector lever in “manual mode” and “R” positions.

Stall speed: 2,430 - 2,730 rpm

Judgement stall test

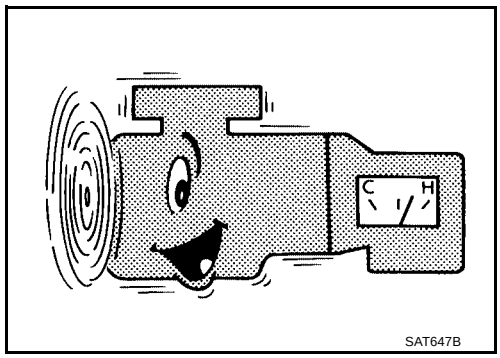
	Selector lever position		Possible cause
	D, M	R	
Stall rotation	H	O	● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● Forward clutch (slipping) ● One-way clutch No. 2
	O	H	● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● Direct clutch (slipping) ● 1st and reverse brake (slipping)
	L	L	● Engine or torque converter one-way clutch
	H	H	● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● B5 brake (slipping) ● Oil pump ● Oil strainer (clogging) ● Oil leak for each range circuit

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

TIME LAG TEST

Time lag test procedure

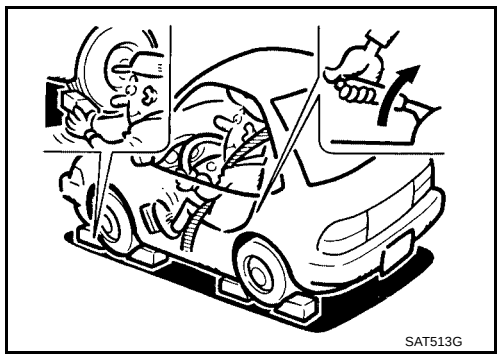
1. Inspect the amount of engine oil. Replenish the engine oil if necessary.
2. Drive for about 10 minutes to warm up the vehicle so that the A/T fluid temperature is 50 to 80°C (122 to 176°F). Check the amount of A/T fluid. Replenish if necessary.
3. Switch of A/C and light etc. are off.



SAT647B

4. Securely engage the parking brake so that the tires do not turn.
5. Engine start, apply foot brake.
6. Measure time lag by using stopwatch from moment when shift lever is shifted in “N” to “D” position and “N” to “R” position until moment slightly shock can be felt.

CAUTION:
- **Make sure to take 3 measurement and take the average value.**
- **Make sure to keep interval for more than one minute between time lag tests.**
  (That purpose is to remove clutch/brake pressure was left unfinished.)


SAT513G

Time lag:

"N" to "D" position: Less than 0.7 sec.

"N" to "R" position: Less than 1.2 sec.

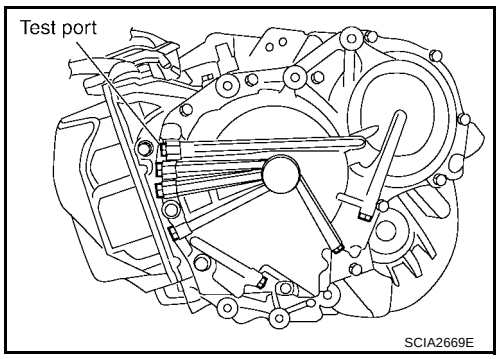
Judgement time lag test

Result of time lag test	Possible cause
Longer than standards "N" to "D" position	● Line pressure is low (pressure control solenoid valve A malfunction, primary regulator valve malfunction) ● Forward clutch (slipping) ● One-way clutch No. 2 ● Oil leak for "D" range circuit
Longer than standards "N" to "R" position	● Line pressure is low ● Direct clutch (slipping) ● 1st and reverse brake (slipping) ● Oil leak for "R" range circuit ● Oil pump ● Oil strainer (clogging)

LINE PRESSURE TEST

Line pressure test port

Location of line pressure test port is show in the figure.

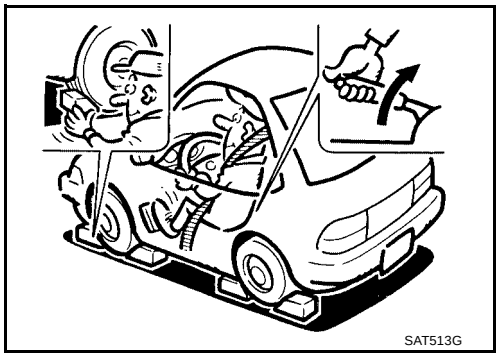


Line pressure test procedure

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. Switch of A/C and light etc. are off.
4. After warming up A/T, remove the oil pressure detection plug and install the oil pressure gauge [SST: (J34301-C)] and adapter [SST: (J45542)].

   CAUTION:
   Make sure to check no oil leak after installing oil pressure gage.
5. Securely engage the parking brake so that the tires do not turn.



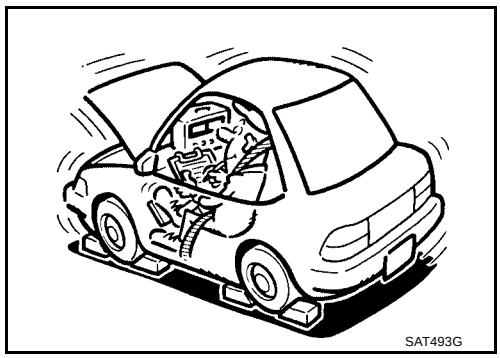
6. Start the engine, then measure the line pressure at both idle and the stall speed.

CAUTION:

- **Keep the brake pedal pressed all the way down during measurement.**
- **When measuring the line pressure at the stall speed, refer to AT-432, "STALL TEST" .**

7. After the measurements are complete, install the oil pressure detection plug and tighten to the specified torque.

:5.9 - 8.8 N·m (0.61 - 0.89 kg-m, 53 - 77 in-lb)



CAUTION:
Do not reuse O-ring.

Line pressure

Engine speed	Line pressure kPa (kg/cm^2 , psi)	
	D, M positions	R position
At idle speed	333 - 392 (3.4 - 4.0, 48 - 57)	500 - 608 (5.1 - 6.2, 73 - 88)
At stall speed	1,285 - 1,393 (13.1 - 14.2, 186 - 202)	1,706 - 1,981 (17.4 - 20.2, 247 - 287)

Judgement of line pressure test

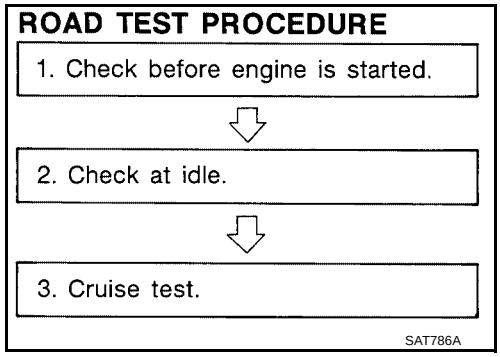
Judgement	Possible cause
Higher than standards both “D”, “M” and “R” positions	● Pressure control solenoid valve A malfunction ● Primary regulator valve malfunction
Lower than standards both “D”, “M” and “R” positions	● Pressure control solenoid valve A malfunction ● Primary regulator valve malfunction ● Oil pump malfunction ● B5 bake malfunction ● Oil leak for each range circuit malfunction
Lower than standards only “D” position	● Oil leak for “D” range circuit malfunction ● Forward clutch malfunction
Lower than standards only “R” position	● Oil leak for “R” range circuit malfunction ● Direct clutch malfunction ● 1st and reverse brake malfunction

ROAD TEST

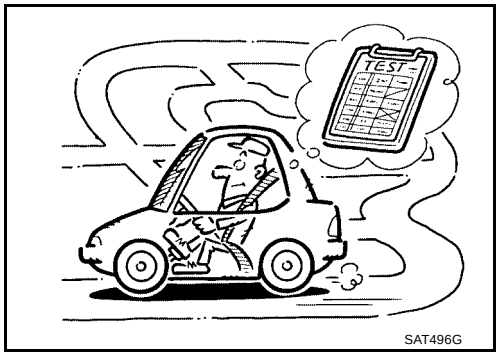
Description

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

1. Check before engine is started. Refer to AT-436 .
2. Check at idle. Refer to AT-436 .
3. Cruise test
   - Inspect all the items from Part 1 to Part 3. Refer to AT-438 , AT-439 , AT-440 .



- 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

UCS000TO

1. CHECK A/T CHECK INDICATOR LAMP

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

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

Yes >> 1. Turn ignition switch “OFF”.
2. Perform the self-diagnostics and record all NG items on the diagnostics worksheet. Refer to AT-452 , AT-457 .
3. Go to AT-436, "Check at Idle" .

No >> Stop the road test and go to AT-572, "A/T CHECK Indicator Lamp does not come on" .

Check at Idle

UCS000TP

1. CHECK STARTING THE ENGINE

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

Does the engine start?

Yes >> GO TO 2.
No >> Stop the road test and go to AT-573, "Engine Cannot Be Started In “P” or “N” Position" .

2. CHECK STARTING THE ENGINE

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

Does the engine start in either position?

Yes >> Stop the road test and go to AT-573, "Engine Cannot Be Started In “P” or “N” Position" .
No >> GO TO 3.

3. CHECK “P” POSITION FUNCTIONS

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

When you push the vehicle with disengaging the parking brake, does it move?

Yes >> Enter a check mark at “Vehicle moves when pushed in “P” position” on the diagnostics worksheet, then continue the road test.
No >> GO TO 4.

4. CHECK “N” POSITION FUNCTIONS

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

Does vehicle move forward or backward?

Yes >> Enter a check mark at “Vehicle moves in “N” position” on the diagnostics worksheet, then continue the road test.
No >> GO TO 5.

5. CHECK SHIFT SHOCK

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

When the transaxle 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 worksheet, then continue the road test.
No >> GO TO 6.

6. CHECK “R” POSITION FUNCTIONS

1. Engage the brake.
2. Move selector lever to “R” position.
3. 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 worksheet, then continue the road test.

7. CHECK “D” POSITION FUNCTIONS

Inspect whether the vehicle moves forward when the transaxle is put into the “D” position.

Does the vehicle move forward in the “D” positions?

Yes >> Go to AT-438, "Cruise Test - Part 1" , AT-439, "Cruise Test - Part 2" , and AT-440, "Cruise Test - Part 3" .
No >> Enter a check mark at “Vehicle does not move forward in D positions” on the diagnostics worksheet, then continue the road test.

Cruise Test - Part 1

UCS000TQ

1. CHECK STARTING OUT FROM D1

1. Drive the vehicle for about 10 minutes to warm up the engine oil and A/T fluid.
   Appropriate temperature for the A/T fluid: 50 - 80°C (122 - 176°F)
2. Park the vehicle on a level surface.
3. Move selector lever to “P” position.
4. Start 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 cannot be started from D1” on the diagnostics worksheet, then continue the road test.

2. CHECK 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.

- Refer to AT-441 .

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” on the diagnostics worksheet, then continue the road test.

3. CHECK 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.

- Refer to AT-441 .

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 worksheet, then continue the road test.

4. CHECK 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.

- Refer to AT-441 .

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 worksheet, then continue the road test.

5. CHECK 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.

- Refer to AT-441 .

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 worksheet, then continue the road test.

6. CHECK LOCK-UP

When releasing accelerator pedal from D5, check lock-up from D5 to L/U.

- Refer to AT-441 .

With CONSULT-II

Read the lock-up status.

Does it lock-up?

Yes >> GO TO 7.

No >> Enter a check mark at “A/T does not perform lock-up” on the diagnostics worksheet, then continue the road test.

7. CHECK LOCK-UP HOLD

Does it maintain lock-up status?

Yes >> GO TO 8.

No >> Enter a check mark at “A/T hold does not lock-up condition” on the diagnostics worksheet, then continue the road test.

8. CHECK LOCK-UP RELEASE

Check lock-up cancellation by depressing brake pedal lightly to decelerate.

With CONSULT-II

Read the lock-up status.

Does lock-up cancel?

Yes >> 1. Stop the vehicle.
2. Go to Cruise test - Part 2 (Refer to AT-439).

No >> Enter a check mark at “Lock-up is not released” on the diagnostics worksheet, then continue the road test. Go to Cruise test - Part 2 (Refer to AT-439).

Cruise Test - Part 2

UCS000TR

1. CHECK 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 cannot be started from D1” on the diagnostics worksheet, then continue the road test.

2. CHECK SHIFT-UP D1 → D2

Press the accelerator pedal down all the way and inspect whether or not the transaxle shifts up (D1 → D2) at the correct speed.

- Refer to AT-441 .

With CONSULT-II

Read the gear position, accelerator angle 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 “Vehicle does not shift D1 → D2” on the diagnostics worksheet, then continue the road test.

3. CHECK SHIFT-UP D2 → D3

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

- Refer to AT-441 .

With CONSULT-II

Read the gear position, accelerator angle 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 worksheet, then continue the road test.

4. CHECK SHIFT-UP D3 → D4 AND ENGINE BRAKE

When the transaxle 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. Go to Cruise test - Part 3 (Refer to AT-440).
No >> Enter a check mark at “Vehicle does not shift D3 → D4” on the diagnostics worksheet, then continue the road test.

Cruise Test - Part 3

UCS000TS

1. MANUAL MODE FUNCTION

Move to manual mode from D position.

Does it switch to manual mode?

Yes >> GO TO 2.
No >> Continue road test and add check mark to “Cannot be changed to manual mode” on diagnostics worksheet.

2. CHECK SHIFT-DOWN

During manual mode driving, is downshift from M5 → M4 → M3 → M2 → M1 performed?

With CONSULT-II

Read the gear position.

Is downshifting correctly performed?

Yes >> GO TO 3.
No >> Enter a check mark at “Vehicle does not shift” at the corresponding position (5th → 4th, 4th → 3rd, 3rd → 2nd, 2nd → 1st) on the diagnostics worksheet, then continue the road test.

3. CHECK ENGINE BRAKE

Does engine braking effectively reduce speed in M1 position?

Yes >> 1. Stop the vehicle.
2. Perform the self-diagnostics. Refer to AT-452, "SELF-DIAG RESULT MODE" , AT-457, "Diagnostic Procedure Without CONSULT-II" .

No >> Enter a check mark at “Vehicle does not decelerate by engine brake” on the diagnostics worksheet, then continue trouble diagnosis.

Shift Schedule

UCS000TT

VEHICLE SPEED WHEN SHIFTING GEARS

Accelerator angle	Vehicle speed km/h (MPH) (Approx.)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
100 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
90 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
80 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
70 %	59 (37)	95 (59)	147 (91)	217 (135)	197 (122)	141 (88)	81 (50)	41 (25)
60 %	59 (37)	95 (59)	147 (91)	217 (135)	190 (118)	135 (84)	76 (47)	41 (25)
50 %	59 (37)	90 (56)	137 (85)	202 (126)	176 (109)	123 (76)	69 (43)	41 (25)
40 %	50 (31)	82 (51)	117 (73)	172 (107)	148 (92)	92 (57)	54 (34)	32 (20)
30 %	37 (23)	62 (39)	87 (54)	127 (79)	105 (65)	59 (37)	35 (22)	19 (12)
20 %	27 (17)	44 (27)	59 (37)	87 (54)	60 (37)	40 (25)	22 (14)	8 (5)
10 %	19 (12)	27 (17)	35 (22)	55 (34)	44 (27)	32 (20)	22 (14)	8 (5)

VEHICLE SPEED WHEN PERFORMING AND RELEASING COMPLETE LOCK-UP

Accelerator angle	Vehicle speed km/h (MPH) (Approx.)	
	Lock-up “ON”	Lock-up “OFF”
50 %	217 (135)	195 (121)
15%	108 (67)	70 (43)
0 - 8 %	66 (41)	63 (39)

- Lock-up vehicle speed indicates the speed in D position.
- Perform lock-up inspection after warming up engine.
- Lock-up vehicle speed may vary depending on the driving conditions and circumstances.

VEHICLE SPEED WHEN PERFORMING AND RELEASING SLIP LOCK-UP

Accelerator angle	Gear position	Vehicle speed km/h (MPH) (Approx.)	
		Slip lock-up “ON”	Slip lock-up “OFF”
0 - 10 %	4th	41 (25)	38 (24)
	5th	53 (33)	50 (31)

- Slip lock-up vehicle speed indicates the speed in D position.
- Perform slip lock-up inspection after warming up engine.

- Slip lock-up vehicle speed may vary depending on the driving conditions and circumstances.

Symptom Chart

UCS000TW

Numbers are arranged in order of inspection.
Perform inspections starting with number one and work up.

CAUTION:

- **Do not remove or disassemble any RE5F22A model transaxle parts unless specified to do so in AT section.**
- **Condition for “on vehicle” only.**

Symptom	Diagnostic Item	Reference page
With selector lever in D position, driving is not possible.	1. Fluid level and state	AT-432
	2. Control linkage and PNP switch adjustment	AT-599, AT-597
	3. TCM	AT-447
	4. Pressure control solenoid valve A	AT-514
	5. Torque converter	AT-600
	6. Transaxle inner parts	AT-600
With selector lever in R position, driving is not possible.	1. Fluid level and state	AT-432
	2. Control linkage and PNP switch adjustment	AT-599, AT-597
	3. TCM	AT-447
	4. Shift solenoid valve A	AT-518
	5. Shift solenoid valve B	AT-522
	6. Pressure control solenoid valve A	AT-514
	7. Torque converter	AT-600
	8. Transaxle inner parts	AT-600
No shock at all or the clutch slips when vehicle changes speed.	1. Fluid level and state	AT-432
	2. Control linkage and PNP switch adjustment	AT-599, AT-597
	3. TCM	AT-447
	4. Shift solenoid valve A	AT-518
	5. Shift solenoid valve B	AT-522
	6. Shift solenoid valve E	AT-541
	7. Pressure control solenoid valve A	AT-514
	8. Pressure control solenoid valve C	AT-552
	9. Transaxle inner parts	AT-600
Time lag is large. (“N” →“ D” position)	1. Fluid level and state	AT-432
	2. Actual engine torque signal	AT-489
	3. Turbine revolution sensor	AT-481
	4. TCM	AT-447
	5. Transaxle inner parts	AT-600
Time lag is large. (“N” →“ R” position)	1. Fluid level and state	AT-432
	2. Actual engine torque signal	AT-489
	3. Turbine revolution sensor	AT-481
	4. TCM	AT-447
	5. Shift solenoid valve E	AT-541
	6. Transaxle inner parts	AT-600
Engine does not start in “N”, “P” position.	1. Ignition switch and starter	PG-3, SC-10
	2. Control linkage adjustment	AT-599
	3. PNP switch	AT-466

Symptom	Diagnostic Item	Reference page
Engine starts in positions other than “N” or “P”.	1. Ignition switch and starter	PG-3, SC-10
	2. Control linkage adjustment	AT-599
	3. PNP switch	AT-466
Engine stalls when selector lever shifted “N” → “D”, “R”.	1. Fluid level and state	AT-432
	2. TCM	AT-447
	3. Shift solenoid valve D	AT-536
	4. Pressure control solenoid valve C	AT-552
	5. Transaxle inner parts	AT-600
Engine stall when vehicle slow down.	1. Fluid level and state	AT-432
	2. TCM	AT-447
	3. Shift solenoid valve D	AT-536
	4. Shift solenoid valve E	AT-541
	5. Pressure control solenoid valve C	AT-552
	6. Transaxle inner parts	AT-600
Acceleration is extremely poor.	1. Fluid level and state	AT-432
	2. Control linkage and PNP switch adjustment	AT-599, AT-597
	3. Engine speed signal	AT-489
	4. Electric throttle control signal	AT-571
Gear does not change from D_1 → D_2 or from M_1 → M_2 .	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. TCM	AT-447
	4. Electric throttle control signal	AT-571
	5. Shift solenoid valve A	AT-518
	6. Shift solenoid valve B	AT-522
	7. Shift solenoid valve C	AT-526
	8. Shift solenoid valve D	AT-536
	9. Transaxle inner parts	AT-600
Gear does not change from D_2 → D_3 or from M_2 → M_3 .	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. TCM	AT-447
	4. Electric throttle control signal	AT-571
	5. Shift solenoid valve B	AT-522
	6. Shift solenoid valve C	AT-526
	7. Shift solenoid valve D	AT-536
	8. Pressure control solenoid valve A	AT-514
	9. Transaxle inner parts	AT-600
Gear does not change from D_3 → D_4 or from M_3 → M_4 .	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. TCM	AT-447
	4. Electric throttle control signal	AT-571
	5. Shift solenoid valve B	AT-522
	6. Shift solenoid valve C	AT-526
	7. Shift solenoid valve D	AT-536
	8. Transaxle inner parts	AT-600

Symptom	Diagnostic Item	Reference page
Gear does not change from $D_4 \rightarrow D_5$ or from $M_4 \rightarrow M_5$.	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. TCM	AT-447
	4. Electric throttle control signal	AT-571
	5. Shift solenoid valve B	AT-522
	6. Shift solenoid valve C	AT-526
	7. Transaxle inner parts	AT-600
In D or M range, does not downshift to 1st gear.	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. TCM	AT-447
	4. Electric throttle control signal	AT-571
	5. Shift solenoid valve A	AT-518
	6. Shift solenoid valve B	AT-522
	7. Shift solenoid valve C	AT-526
	8. Shift solenoid valve D	AT-536
	9. Transaxle inner parts	AT-600
In D or M range, does not downshift to 2nd gear.	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. TCM	AT-447
	4. Electric throttle control signal	AT-571
	5. Shift solenoid valve B	AT-522
	6. Shift solenoid valve C	AT-526
	7. Shift solenoid valve D	AT-536
	8. Pressure control solenoid valve A	AT-514
	9. Transaxle inner parts	AT-600
In D or M range, does not downshift to 3rd gear.	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. TCM	AT-447
	4. Electric throttle control signal	AT-571
	5. Shift solenoid valve B	AT-522
	6. Shift solenoid valve C	AT-526
	7. Shift solenoid valve D	AT-536
	8. Transaxle inner parts	AT-600
In D or M range, does not downshift to 4th gear.	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. TCM	AT-447
	4. Electric throttle control signal	AT-571
	5. Shift solenoid valve B	AT-522
	6. Shift solenoid valve C	AT-526
	7. Transaxle inner parts	AT-600

Symptom	Diagnostic Item	Reference page
Does not lock-up or lock-up is not released.	1. Fluid level and state	AT-432
	2. Stop lamp switch signal	AT-588
	3. ATF temperature sensor	AT-471
	4. TCM	AT-447
	5. Shift solenoid valve C	AT-526
	6. Shift solenoid valve D	AT-536
	7. Pressure control solenoid valve C	AT-552
	8. Torque converter	AT-600
	9. Transaxle inner parts	AT-600
Engine brake does not work.	1. Fluid level and state	AT-432
	2. TCM	AT-447
	3. Shift solenoid valve E	AT-541
	4. Electric throttle control signal	AT-571
	5. Transaxle inner parts	AT-600
Shift point is high or low.	1. Pressure control solenoid valve A	AT-514
	2. Engine speed signal	AT-489
	3. Electric throttle control signal	AT-571
	4. PNP switch	AT-466
	5. Revolution sensor	AT-485
	6. TCM	AT-447
	7. Transaxle inner parts	AT-600
Large shock. (“N” →“ D” position)	1. Fluid level and state	AT-432
	2. Actual engine torque signal	AT-489
	3. Turbine revolution sensor	AT-481
	4. PNP switch	AT-466
	5. ATF temperature sensor	AT-471
	6. Shift solenoid valve A	AT-518
	7. Shift solenoid valve B	AT-522
	8. Pressure control solenoid valve A	AT-514
	9. TCM	AT-447
	10. Transaxle inner parts	AT-600
Large shock. (“N” →“ R” position)	1. Fluid level and state	AT-432
	2. Actual engine torque signal	AT-489
	3. Turbine revolution sensor	AT-481
	4. PNP switch	AT-466
	5. ATF temperature sensor	AT-471
	6. Shift solenoid valve E	AT-541
	8. Pressure control solenoid valve B	AT-545
	9. TCM	AT-447
	10. Transaxle inner parts	AT-600

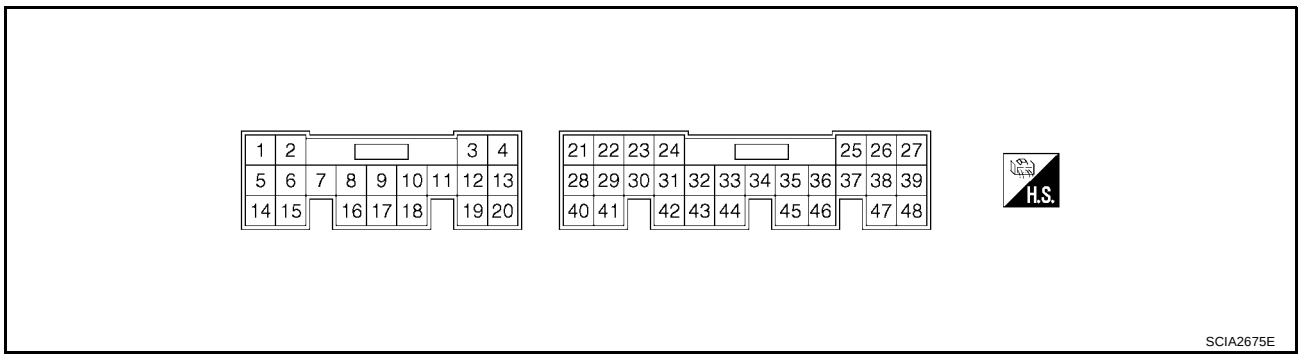
Symptom	Diagnostic Item	Reference page
Shock is too large when shift up.	1. Fluid level and state	AT-432
	2. Actual engine torque signal	AT-489
	3. Turbine revolution sensor	AT-481
	4. ATF temperature sensor	AT-471
	5. TCM power input signal	AT-566
	6. Shift solenoid valve A	AT-518
	7. Shift solenoid valve B	AT-522
	8. Shift solenoid valve C	AT-526
	9. Shift solenoid valve D	AT-536
	10. Shift solenoid valve E	AT-541
	11. Pressure control solenoid valve A	AT-514
	12. Pressure control solenoid valve B	AT-545
	13. Pressure control solenoid valve C	AT-552
	14. TCM	AT-447
	15. Transaxle inner parts	AT-600
Shock is too large for coast down.	1. Fluid level and state	AT-432
	2. Actual engine torque signal	AT-489
	3. Turbine revolution sensor	AT-481
	4. ATF temperature sensor	AT-471
	5. TCM power input signal	AT-566
	6. Shift solenoid valve A	AT-518
	7. Shift solenoid valve B	AT-522
	8. Shift solenoid valve C	AT-526
	9. Shift solenoid valve D	AT-536
	10. Shift solenoid valve E	AT-541
	11. Pressure control solenoid valve A	AT-514
	12. Pressure control solenoid valve B	AT-545
	13. Pressure control solenoid valve C	AT-552
	14. TCM	AT-447
	15. Transaxle inner parts	AT-600

Symptom	Diagnostic Item	Reference page
Shock is too large for kick down.	1. Fluid level and state	AT-432
	2. Actual engine torque signal	AT-489
	3. Turbine revolution sensor	AT-481
	4. ATF temperature sensor	AT-471
	5. TCM power input signal	AT-566
	6. Shift solenoid valve A	AT-518
	7. Shift solenoid valve B	AT-522
	8. Shift solenoid valve C	AT-526
	9. Shift solenoid valve D	AT-536
	10. Shift solenoid valve E	AT-541
	11. Pressure control solenoid valve A	AT-514
	12. Pressure control solenoid valve B	AT-545
	13. Pressure control solenoid valve C	AT-552
	14. TCM	AT-447
	15. Transaxle inner parts	AT-600
Strange noise in “R”,“N” or“ D” position.	1. Fluid level and state	AT-432
	2. Transaxle inner parts	AT-600
With selector lever in P position, vehicle does not enter parking condition or, with selector lever in another position, parking condition is not cancelled.	1. PNP switch	AT-466
	2. Control linkage adjustment	AT-599
	3. Transaxle inner parts	AT-600
Vehicle runs with transaxle in “ P” position.	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. Control linkage and PNP switch adjustment	AT-599, AT-597
	4. Line pressure test	AT-434
Vehicle runs with transaxle in “N” position.	1. Fluid level and state	AT-432
	2. PNP switch	AT-466
	3. Control linkage and PNP switch adjustment	AT-599, AT-597
	4. Line pressure test	AT-434

TCM Input/Output Signal Reference Values

UCS000TX

TCM TERMINAL CONNECTOR LAYOUT



TCM INSPECTION TABLE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
1	L/B	A/T PV IGN relay		When turning ignition switch ON.	0 - 1.5V
				When turning ignition switch OFF.	0V
3	L	CAN H	–		–
4	Y	CAN L	–		–
5	R/G	Manual mode switch UP (+)		Selector lever: + side	0V
				Other than the above	Battery voltage
6	L/R	Manual mode switch DOWN (-)		Selector lever: - side	0V
				Other than the above	Battery voltage
14	B	Ground	–		0V
16	SB	Manual mode switch AUTO		Selector lever: “P”, “R”, “N” or “D” position	0V
				Selector lever: Manual shift gate position	Battery voltage
19	V/R	Manual mode switch MANUAL		Selector lever: Manual shift gate position (neutral)	0V
				Other than the above	Battery voltage
21	G/B	Pressure control solenoid valve B ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
22	L	Revolution sensor power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
23	G	Turbine revolution sensor power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
24	O/L	PNP switch A		Selector lever: “P” and “R” position	0V
				Other than the above	Battery voltage
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V

Terminal	Wire color	Item	Condition		Data (Approx.)
27	Y/R	Power supply (Memory back-up)		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	Battery voltage
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
29	B/W	Revolution sensor		When moving at 20 km/h (12 MPH) in 1st gear.	119Hz
30	R	Turbine revolution sensor		When moving at 20 km/h (12 MPH) in 1st gear.	371Hz
31	BR	PNP switch B		Selector lever: “R”, “N”, “D” and manual mode position	0V
				Other than the above	Battery voltage
32	P/B	PNP switch C		Selector lever: “D” and manual mode position	0V
				Other than the above	Battery voltage
33	LG	PNP switch PN		Selector lever: “P” and “N” position	Battery voltage
				Other than the above	0V
34	Y	Power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
36	O/B	Pressure control solenoid valve B		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
38	R/Y	Power supply (A/T PV IGN relay)		When turning ignition switch ON.	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
39	R/Y	Power supply (A/T PV IGN relay)		When turning ignition switch ON.	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V

Terminal	Wire color	Item	Condition		Data (Approx.)
41	R/Y	Fluid temperature sensor		When ATF temperature 0°C (32°F)	4.0V
				When ATF temperature 20°C (68°F)	3.0V
				When ATF temperature 80°C (176°F)	0.8V
				When ATF temperature 100°C (212°F)	0.5V
42	LG	Fluid temperature sensor ground	–		0V
43	V/W	PNP switch PA		Selector lever: “P” and “N” position	0V
				Other than the above	Battery voltage
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V
47	BR/Y	Shift solenoid valve E		When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
				When shift solenoid valve E does not operate.	0V
48	B	Ground	–		0V

CONSULT-II

UCS000TY

After performing “SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)” (Refer to AT-452), place check marks for results on the AT-427, "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
Work support	This mode enables a technician to adjust some devices faster and more accurately by following the indications on the CONSULT-II unit.
Self-diagnostic results	Self-diagnostic results such as DTCs and freeze frame data can be read and erased quickly.*1
Data monitor	Input/Output data in the TCM can be read.
Active test	Diagnostic Test Mode in which CONSULT-II drives some actuators apart from the TCM and also shifts some parameters in a specified range.
Function test	This mode is used to inform customers when their vehicle condition requires periodic maintenance.
ECU part number	TCM part number can be read.

*1: The following diagnostic information is cleared when the TCM memory is erased.

- Diagnostic trouble codes
- Freeze frame data
- Others

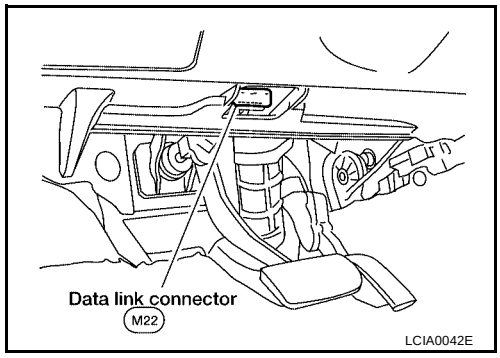
CONSULT-II SETTING PROCEDURE

CAUTION:

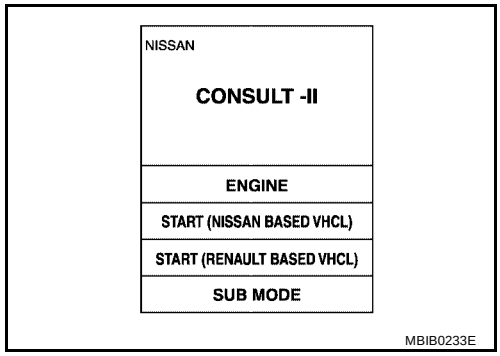
If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

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

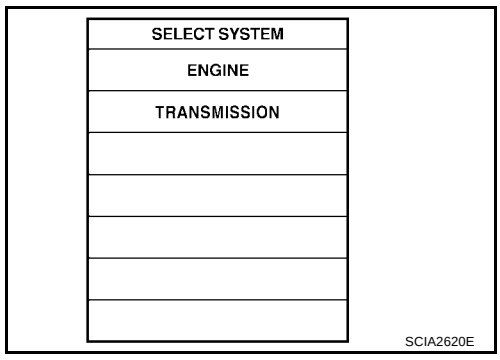
1. Turn ignition switch “OFF”.
2. Connect CONSULT-II and CONSULT-II CONVERTER to data link connector, which is located in driver instrument panel (lower).
3. Turn ignition switch “ON”.



4. Touch “START (NISSAN BASED VHCL)”.



5. Touch “TRANSMISSION”.
   If “TRANSMISSION” is not indicated, go to GI-36, "CONSULT-II Data Link Connector (DLC) Circuit" .
6. Perform each diagnostic test mode according to each service procedure.



WORK SUPPORT MODE

Work item

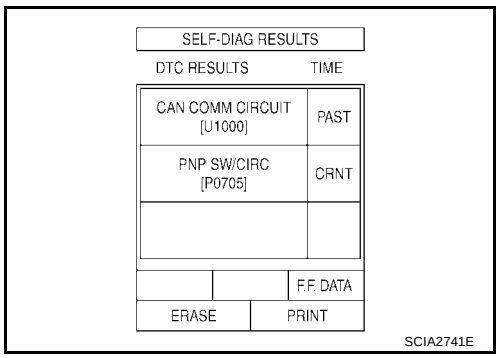
Work item	Condition	Usage
INITIALIZATION	Under the following conditions. ● Ignition switch “ON”. ● Selector lever “P” or “N” position. ● Engine not running. ● Vehicle speed is 0 km/h (0 MPH). ● Ignition voltage is more than 10.5V. ● Malfunction was not detected.	Use to initialize TCM in a case of replacing transaxle or TCM. Refer to AT-389, "Precautions for A/T Assembly or TCM Replacement" .

SELF-DIAG RESULT MODE

Operation procedure

1. Perform “CONSULT-II SETTING PROCEDURE”. Refer to AT-451, "CONSULT-II SETTING PROCEDURE" .
2. Touch “SELF-DIAG RESULTS”.
   Display shows malfunction experienced since the last erasing operation.

   NOTE:
   - **The details for “TIME” are as follow:**
     - **“CRNT”: Error currently detected with TCM.**
     - **“PAST”: Error detected in the past and memorized with TCM.**
   - **Touch “F.F.DATA” on “SELF-DIAG RESULTS” screen to display freeze frame data. Freeze frame data shows driving condition when malfunction is detected.**
     For freeze frame data items, refer to AT-454, "Display item list" .



Display item list

X: Applicable —: Not applicable

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp*3	“TRANSMISSION” with CONSULT-II	MIL indicator lamp*1 , “ENGINE” with CONSULT-II or GST
CAN COMM CIRCUIT	● When a malfunction is detected in CAN communications	X	U1000*4	U1000*4
VEH SPD SE/CIR-MTR	● ECM detects a malfunction in vehicle speed sensor signal, after that TCM inputs the result by CAN communication.	X	P0500	P0500
TCM PROCESSOR	● TCM processor is malfunctioning.	—	P0613	—
PNP SW/CIRC	● PNP switch signals input with impossible pattern	X	P0705	P0705
ATF TEMP SEN/CIRC	● Normal voltage is not applied to ATF temperature sensor due to open, short, and so on. ● During running, the ATF temperature sensor signal voltage is excessively high or low.	X	P0710	P0710
FLUID TEMP SEN	● ATF temperature signal does not change.	—	P0711	P0711*2
TURBINE SENSOR	● Signal from turbine revolution sensor does not input due to open, short, and so on. ● Unexpected signal input during running.	X	P0717	P0717
VHCL SPEED SEN-A/T	● Signal from revolution sensor does not input due to open, short, and so on. ● Unexpected signal input during running.	X	P0722	P0722
ENG SPD INP PERFOR	● Malfunction is detected in engine speed signal, actual engine torque signal or torque reduction signal that is output from ECM through CAN communication.	X	P0726	P0726
A/T 1ST GR FNCTN	● A/T cannot be shifted to the 1st gear position even if electrical circuit is good.	X	P0731	P0731*2
A/T 2ND GR FNCTN	● A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.	X	P0732	P0732*2
A/T 3RD GR FNCTN	● A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.	X	P0733	P0733*2
A/T 4TH GR FNCTN	● A/T cannot be shifted to the 4th gear position even if electrical circuit is good.	X	P0734	P0734*2
A/T 5TH GR FNCTN	● A/T cannot be shifted to the 5th gear position even if electrical circuit is good.	X	P0735	P0735*2

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis		OBD-II (DTC)
		A/T CHECK indicator lamp*3	"TRANSMISSION" with CONSULT-II	MIL indicator lamp*1 , "ENGINE" with CONSULT-II or GST
A/T TCC S/V FNCTN	● A/T cannot perform lock-up even if electrical circuit is good.	X	P0744	P0744*2
PC SOL A(L/PRESS)	● Normal voltage is not applied to solenoid due to open, short, and so on. ● TCM detects as irregular by comparing target value with monitor value.	X	P0745	P0745
SHIFT SOL A		X	P0750	P0750
SHIFT SOL B		X	P0755	P0755
SHIFT SOL C		X	P0760	P0760
SFT SOL C STUCK ON	● Condition of shift solenoid valve C is different from monitor value, and relation between gear position and actual gear ratio is irregular.	X	P0762	P0762*2
SHIFT SOL D	● Normal voltage is not applied to solenoid due to open, short, and so on. ● TCM detects as irregular by comparing target value with monitor value.	X	P0765	P0765
SHIFT SOL E		X	P0770	P0770
PC SOL B(SFT/PRS)		X	P0775	P0775
SHIFT	● No rotation change occurs between input (turbine revolution sensor) and output (revolution sensor) and shifting time is long. ● Shifting ends immediately. ● Condition in malfunction engine revs up usually shifting.	X	P0780	P0780*2
PC SOL C(TCC&SFT)	● Normal voltage is not applied to solenoid due to open, short, and so on. ● TCM detects as irregular by comparing target value with monitor value.	X	P0795	P0795
PC SOL C STC ON	● Condition of pressure control solenoid valve C is different from monitor value, and relation between gear position and actual gear ratio or lock-up status is irregular.	X	P0797	P0797*2
MANUAL MODE SWITCH	● Manual mode switch signal is incorrectly input due to open, short, and so on.	—	P0826	—
TCM POWER INPT SIG	● Voltage supplied to TCM is too low.	—	P0882	P0882
ELEC TH CONTROL	● The electric throttle control system for ECM is in a malfunction, after that TCM inputs the result by CAN commnication.	X	P1726	P1726
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	● No NG item has been detected.	—	X	X

*1: Refer to AT-421, "Malfunction Indicator Lamp (MIL)" .
*2: These malfunctions cannot be displayed MIL if another malfunction is assigned to MIL.
*3: Indicate it when performing TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS). Refer to AT-457, "TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)" .
*4: If DTC U1000 is displayed with other DTCs, first perform the trouble diagnosis for DTC U1000. Refer to AT-459 .

DATA MONITOR MODE

Operation procedure

1. Perform "CONSULT-II SETTING PROCEDURE". Refer to AT-451, "CONSULT-II SETTING PROCEDURE" .
2. Touch "DATA MONITOR".

NOTE:
When malfunction is detected, CONSULT-II performs REAL-TIME DIAGNOSIS.
Also, any malfunction detected while in this mode will be displayed at real time.

Display item list

X: Standard —: Not applicable

Monitored item (Unit)	Monitor item selection				Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	CAN DIAG SUPPORT MNTR	SELECTION FROM MENU	
VHCL/S SE-A/T (km/h)	X	X	—	X	Vehicle speed recognized by the TCM.
VHCL/S SE-MTR* (km/h)	X	—	—	X	
FLUID TEMP SE* (V)	X	—	—	X	
FLUID TEMP* (°C)	—	—	—	X	
COOLAN TEMP* (°C)	—	—	—	X	Displays status of engine coolant temperature. Signal input with CAN communication line.
BATTERY VOLT* (V)	X	—	—	X	
ENGINE SPEED* (rpm)	X	X	—	X	Signal input with CAN communication line.
TURBINE REV* (rpm)	X	—	—	X	Turbine revolution computed from signal of turbine revolution sensor is displayed.
OUTPUT REV* (rpm)	—	—	—	X	Output revolution computed from signal of revolution sensor is displayed.
PNP SW A* (ON/OFF)	X	—	—	X	
PNP SW B* (ON/OFF)	X	—	—	X	
PNP SW C* (ON/OFF)	X	—	—	X	
PNP SW PA* (ON/OFF)	X	—	—	X	
PNP SW PN (ON/OFF)	X	—	—	X	
MANU MODE SW* (ON/OFF)	X	—	—	X	
NON M-MODE SW* (ON/OFF)	X	—	—	X	
UP SW* (ON/OFF)	X	—	—	X	
DOWN SW* (ON/OFF)	X	—	—	X	
RANGE SLCT SW (ON/OFF)	X	—	—	X	Not mounted but displayed.
BRAKE SW* (ON/OFF)	X	—	—	X	This means stop lamp switch signal via CAN communication line.
CLSO THL POS (ON/OFF)	X	—	—	X	Signal input with CAN communication line.
ASCD SIGNAL (ON/OFF)	X	—	—	X	
ASCD OD OFF (ON/OFF)	X	—	—	X	
ABS SIGNAL (ON/OFF)	X	—	—	X	
TCS SIGNAL (ON/OFF)	X	—	—	X	
TCS GEAR HOLD (ON/OFF)	X	—	—	X	
TCS SFT CNG (ON/OFF)	—	—	—	X	Requests TCM for shift schedule change.
LOCK-UP* (ON/OFF)	—	—	—	X	Always “ON” during lock-up, regardless of types.

Monitored item (Unit)	Monitor item selection				Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	CAN DIAG SUPPORT MNTR	SELECTION FROM MENU	
SLCT LVR POSI*	—	—	—	X	Displays “##” in manual mode or when unknown.
MANU GR POSI	—	—	—	X	Displays “##” in non-manual mode or when unknown.
GEAR*	—	—	—	X	Indicates current gear position. Also when setting in P or N position, indicate by shift solenoid valves. Displays “##” in R position or when unknown.
NEXT GR POSI	—	—	—	X	Displays “##” in R position or when unknown.
REDCT DEM SIG (ON/OFF)	—	—	—	X	Displays status of engine torque reduction demand signal.
TC SLIP RATIO	—	—	—	X	
SLIP REV (rpm)	—	—	—	X	Difference between engine speed and torque converter input shaft speed.
ACCELE ANGLE* (%)	X	X	—	X	Degree of opening for accelerator recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
PC SOL A OUT* (A)	—	—	—	X	
PC SOL A MON* (A)	—	X	—	X	
PC SOL B OU*T (A)	—	—	—	X	
PC SOL B MON* (A)	—	X	—	X	
PC SOL C OUT* (A)	—	—	—	X	
PC SOL C MON* (A)	—	X	—	X	
SFT SOL A OUT* (ON/OFF)	—	—	—	X	
SFT SOL B OUT* (ON/OFF)	—	—	—	X	
SFT SOL C OUT* (ON/OFF)	—	—	—	X	
SFT SOL D OUT* (ON/OFF)	—	—	—	X	
SFT SOL E OUT* (ON/OFF)	—	—	—	X	
SFT SOL A MON* (ON/OFF)	—	X	—	X	
SFT SOL B MON* (ON/OFF)	—	X	—	X	
SFT SOL C MON* (ON/OFF)	—	X	—	X	
SFT SOL D MON* (ON/OFF)	—	X	—	X	
SFT SOL E MON* (ON/OFF)	—	X	—	X	
ENGINE TORQUE* (Nm)	—	—	—	X	Signal input with CAN communication line.
TRQ REDCT REQ* (Nm)	—	—	—	X	Torque reduction request
TRQ LIMIT REQ* (Nm)	—	—	—	X	Torque limitation request
WO AT REQ TRQ* (Nm)	—	—	—	X	Engine torque without A/T request
G-RATE (G)	—	—	—	X	
F-SAFE MODE (OK/1 to 10)	—	X	—	X	Numbers indicate types of fail-safe modes. Refer to AT-423, "Fail-safe mode list" .

Monitored item (Unit)	Monitor item selection				Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	CAN DIAG SUPPORT MNTR	SELECTION FROM MENU	
VDC SIGNAL (ON/OFF)	X	—	—	X	Signal input with CAN communication line.
SHIFT SCHDULE	—	—	—	X	The details for data of shift schedule are as follow: NOR: Normal mode UP1: Upslope 1 mode UP2: Upslope 2 mode (steeper then “UP1”) DOWN: Downslope mode HOT1: Hot 1 mode HOT2: Hot 2 mode (higher temperature than “HOT1”)
CAN COMM (OK/NG)	—	—	X	—	
CAN CIRC 1 (OK/UNKWN)	—	—	X	—	
CAN CIRC 2 (OK/UNKWN)	—	—	X	—	
CAN CIRC 3 (OK/UNKWN)	—	—	X	—	
CAN CIRC 4 (OK/UNKWN)	—	—	X	—	
CAN 1 STAT (0/1)	—	—	X	—	Displays CAN communication status in the past. If malfunction existed in the past, it displays “1”.
CAN 2 STAT (0/1)	—	—	X	—	
CAN 3 STAT (0/1)	—	—	X	—	
CAN 4 STAT (0/1)	—	—	X	—	
Voltage (V)	—	—	—	X	Displays the value measured by the voltage probe.
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	

*: Also, the items appear on CONSULT-II screen in freeze frame data mode of self-diagnostic results only if DTC is detected. For details, refer to AT-452, "SELF-DIAG RESULT MODE" .

ACTIVE TEST MODE

Test item

Test item	Condition	Description
SHIFT SOLENOID A	Under the following conditions. ● Ignition switch “ON” ● Selector lever “P” or “N” position ● Engine not running ● Vehicle speed is 0 km/h (0 MPH). ● Ignition voltage is more than 10.5V. ● Malfunction was not detected.*	Each shift solenoid operate ON/OFF by receiving the drive signal.
SHIFT SOLENOID B		
SHIFT SOLENOID C		
SHIFT SOLENOID D		
SHIFT SOLENOID E		
PRESSURE CONTROL SOL A		Each pressure control solenoid is activated by receiving the drive signal.
PRESSURE CONTROL SOL B		
PRESSURE CONTROL SOL C		

*: Except when P0711, P0731, P0732, P0733, P0734, P0735, P0744, P0762, P0780 or P0797 is detected.

NOTE:
Approximately 10 seconds after the operation is begun, “TEST IS STOPPED” will be displayed.

Diagnostic Procedure Without CONSULT-II

UCS000TZ

OBD-II SELF-DIAGNOSTIC PROCEDURE (WITH GST)

Refer to EC-124, "Generic Scan Tool (GST) Function" .

OBD-II SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Refer to EC-67, "Malfunction Indicator Lamp (MIL)" .

TCM SELF-DIAGNOSTIC PROCEDURE (NO TOOLS)

Description

As a method for locating the suspect system, when the self-diagnostics start signal is input, the memory for the malfunction location is output and the A/T CHECK indicator lamp flashes to display the corresponding DTC.

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. Turn ignition switch “ON” and “OFF” at least twice, then leave it in the “OFF” position.
3. Wait 10 seconds.
4. Turn ignition switch “ON”. (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-572, "A/T CHECK Indicator Lamp does not come on" .

2. JUDGEMENT PROCEDURE

NOTE:
After turning ignition switch “ON” (at step 6), perform within 2 seconds (while A/T CHECK indicator lamp come on.).

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. (Stop lamp switch signal “ON”.)
6. Turn ignition switch “ON”.
7. Move the selector lever to the “N” position and release brake pedal. (Stop lamp switch signal “OFF”.)
8. Move the selector lever to “D” position and depress brake pedal. (Stop lamp switch signal “ON”.)
9. Release brake pedal. (Stop lamp switch signal “OFF”.)
10. Depress accelerator pedal fully and release it.

>> GO TO 3.

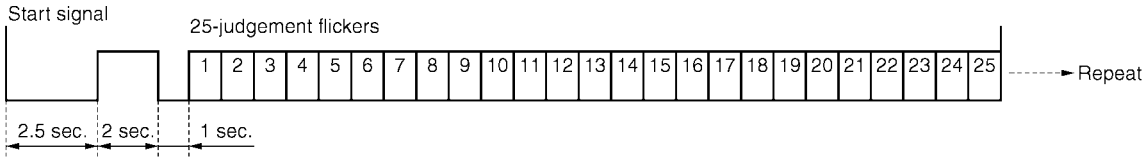
3. CHECK SELF-DIAGNOSIS CODE

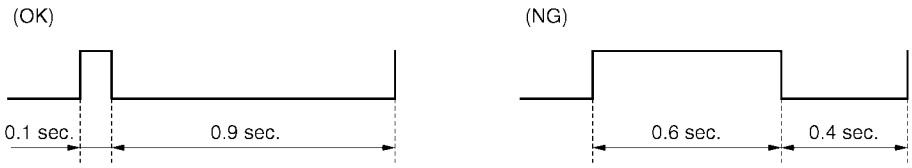
Check A/T CHECK indicator lamp.
Refer to AT-458, "Judgement self-diagnosis code" .
If the system does not go into self-diagnostics, refer to AT-588, "TCM Self-diagnosis Does Not Activate" .

>> **DIAGNOSIS END**

Judgement self-diagnosis code

When a malfunction is detected, the malfunction route is indicated by longer illumination of the indicator lamp.





1	Revolution sensor	14	Engine speed signal
2	Turbine revolution sensor	15	Vehicle speed signal
3	Pressure control solenoid valve A	16	CAN communication
4	Pressure control solenoid valve B	17	1st gear function
5	Pressure control solenoid valve C	18	2nd gear function
6	Shift solenoid valve A	19	3rd gear function
7	Shift solenoid valve B	20	4th gear function
8	Shift solenoid valve C	21	5th gear function
9	Shift solenoid valve D	22	Shift solenoid valve C stuck ON
10	Shift solenoid valve E	23	Shift function
11	PNP switch	24	Lock-up function
12	A/T fluid temperature sensor	25	Pressure contnal solenoid valve C stuck ON
13	Electric throttle control system		

If the lamp flashes at 4Hz frequency, the most likely cause is EEP ROM error (Poor memory back up).

SCIA2758E

Erase self-diagnosis

- In order to make it easier to find the cause of hard-to-duplicate malfunctions, malfunction 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 turned ON and OFF.
- However, this information is erased by turning ignition switch “OFF” after executing self-diagnostics or by erasing the memory using the CONSULT-II.

DTC U1000 CAN COMMUNICATION LINE

PFP:23710

Description

UCS000U0

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 malfunction 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

UCS000U1

- 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 units.

Possible Cause

UCS000U2

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

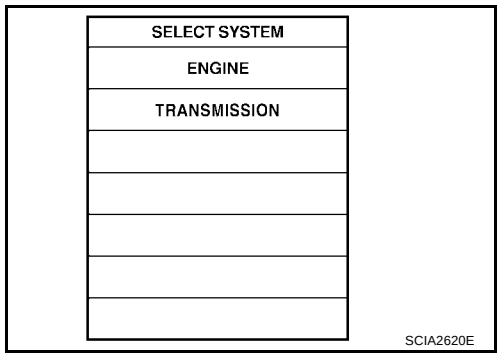
DTC Confirmation Procedure

UCS000U3

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following condition for at least 6 seconds.
   SLCT LVR POSI: “D” position
5. If DTC is detected, go to AT-461, "Diagnostic Procedure" .



WITH GST

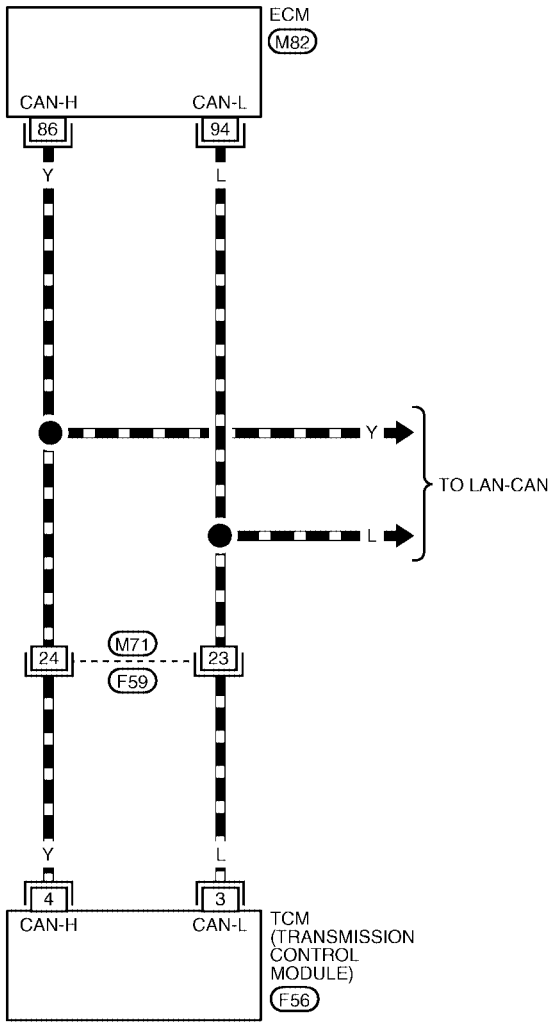
Follow the procedure “WITH CONSULT-II”.

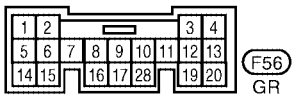
Wiring Diagram — AT — CAN

UCS000U4

AT-CAN-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC
: DATA LINE





REFER TO THE FOLLOWING.
M82 - ELECTRICAL UNITS

BBWA0605E

TCM terminals and data are reference value.

Terminal	Wire color	Item	Condition	Data (Approx.)
3	L	CAN H	–	–
4	Y	CAN L	–	–

Diagnostic Procedure

UCS000U5

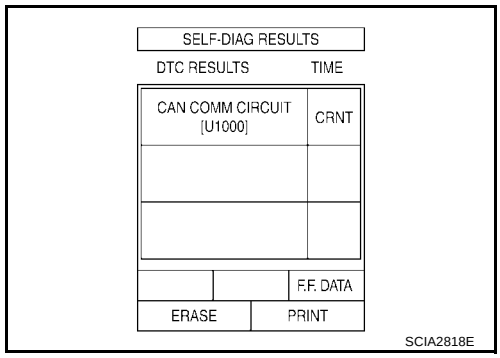
1. CHECK CAN COMMUNICATION CIRCUIT

With CONSULT-II

1. Turn ignition switch “ON” and start engine.
2. Select “TRANSMISSION” with “SELF-DIAG RESULTS” mode in CONSULT-II.
3. The “CAN COMM CIRCUIT” is detected.

Yes or No?

Yes >> Print out CONSULT-II screen, GO TO 2.
No >> **INSPECTION END**



2. CHECK CAN COMMUNICATION SIGNALS

With CONSULT-II

1. Turn ignition switch “ON” and start engine.
2. Select “CAN DIAG SUPPORT MNTR” in “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-II.

>> Print out CONSULT-II screen, go to LAN-8, "CAN COMMUNICATION" .

CAN Communication Signals

Normal condition	Malfunction condition (example)
CAN COMM: OK	CAN COMM: OK
CAN CIRC 1: OK	CAN CIRC 1: UNKWN
CAN CIRC 2: OK	CAN CIRC 2: UNKWN
CAN CIRC 3: OK	CAN CIRC 3: UNKWN
CAN CIRC 4: OK	CAN CIRC 4: UNKWN

NOTE:

“CAN 1 (, 2, 3, 4) STAT” displays stored status of CAN communication.

DTC P0500 VEHICLE SPEED SENSOR MTR

PFP:24814

Description

UCS0015A

The vehicle speed sensor·MTR signal is transmitted from unified meter and A/C amp. to TCM by CAN communication line. The signal functions as an auxiliary device to the revolution sensor when it is malfunctioning. The TCM will then use the vehicle speed sensor·MTR signal.

On Board Diagnosis Logic

UCS0015B

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “VEH SPD SE/CIR-MTR” with CONSULT-II or 15th judgement flicker without CONSULT-II is detected when TCM does not receive the proper vehicle speed sensor MTR signal (input by CAN communication) from unified meter and A/C amp..

Possible Cause

UCS0015C

- Harness or connectors
  (The signal circuit is open or shorted.)
- Unified meter and A/C amp.
- ABS actuator and electric unit (control unit)
- Wheel sensor

DTC Confirmation Procedure

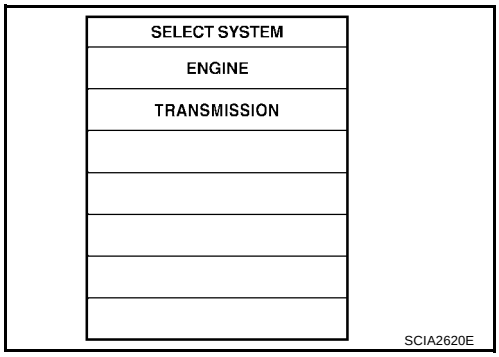
UCS0015D

CAUTION:
Always drive vehicle at a safe speed.

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

WITH CONSULT-II

1. Turn ignition switch “ON” and select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-II.
2. Start engine.
3. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   VHCL/S SE-A/T: 30 km/h (17 MPH) or more
   ACCELE ANGLE: 10 % or less
4. If DTC is detected, go to AT-463, "Diagnostic Procedure" .



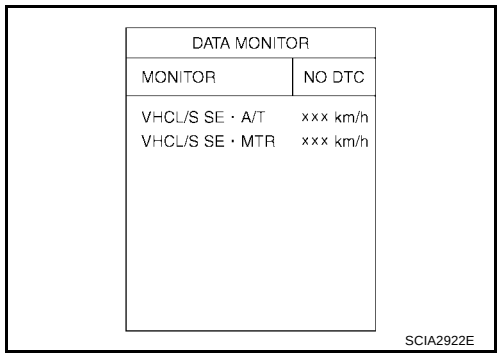
Diagnostic Procedure

UCS0015E

1. CHECK INPUT SIGNALS

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle, and then make sure that the values of “VHCL/S SE-A/T” and “VHCL/S SE-MTR” are same.



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Refer to BRC-12, "TROUBLE DIAGNOSIS" (with ABS), BRC-53, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-97, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

OK >> GO TO 3.
NG >> If NG, recheck pin terminals for damage or loose connection with harness connector.

3. CHECK DTC WITH UNIFIED METER AND A/C AMP.

Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 4.
NG >> If NG, recheck pin terminals for damage or loose connection with harness connector.

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-462, "DTC Confirmation Procedure" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal.
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.

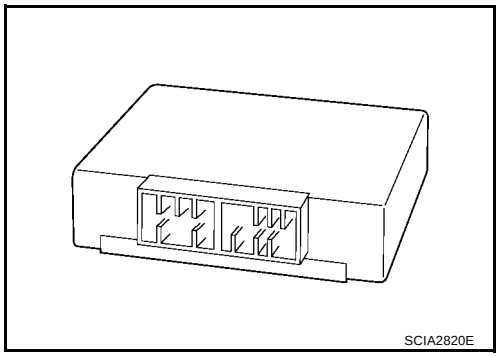
DTC P0613 TCM PROCESSOR

PFP:31036

Description

UCS0011Q

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

UCS0011R

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

Possible Cause

UCS0011S

TCM

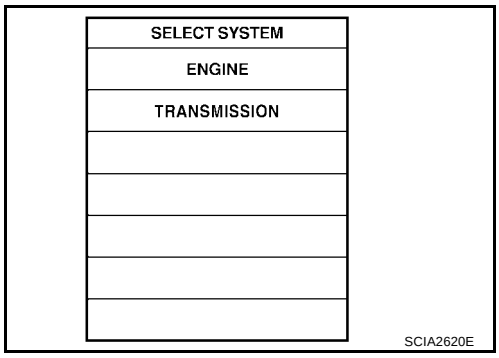
DTC Confirmation Procedure

UCS0011T

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in 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-465, "Diagnostic Procedure" .



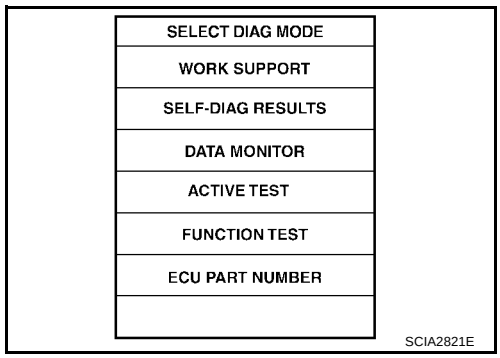
Diagnostic Procedure

UCS0011U

1. CHECK DTC

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “SELF-DIAG RESULTS” mode in CONSULT-II.
3. Touch “ERASE”.
4. Turn ignition switch “OFF” and wait at least 10 seconds.
5. Perform DTC confirmation procedure, AT-464, "DTC Confirmation Procedure" .



Is the “TCM PROCESSOR” displayed again?

YES >> Replace TCM.
NO >> **INSPECTION END**

DTC P0705 PARK/NEUTRAL POSITION SWITCH

PFP:32006

Description

UCS000UC

- 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.
- TCM judges the selector lever position by the park/neutral position (PNP) switch signal.

Selector lever	PNP switch A	PNP switch B	PNP switch C	PNP switch PA	PNP switch PN
P	ON	OFF	OFF	ON	ON
R	ON	ON	OFF	OFF	OFF
N	OFF	ON	OFF	ON	ON
D	OFF	ON	ON	OFF	OFF

On Board Diagnosis Logic

UCS000UD

- 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 PNP switch signals input with impossible pattern.

Possible Cause

UCS000UE

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

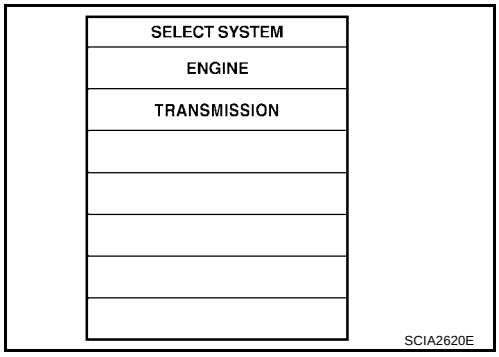
DTC Confirmation Procedure

UCS000UF

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Move selector lever to each position.
   SLCT LVR POSI: “P”, “R”, “N” or “D” position
4. Wait for at least 5 consecutive seconds at each position.
5. If DTC is detected, go to AT-468, "Diagnostic Procedure" .



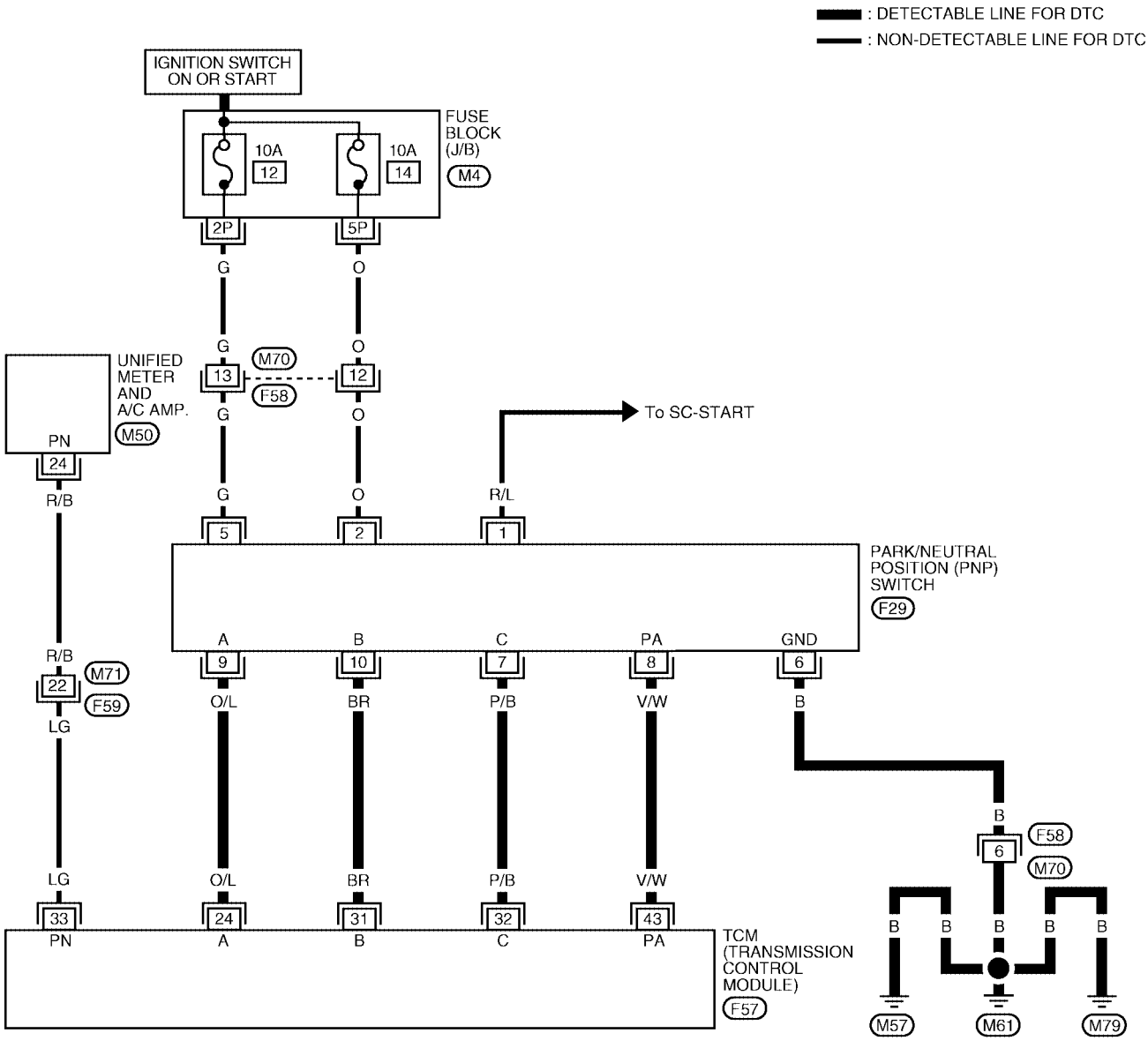
WITH GST

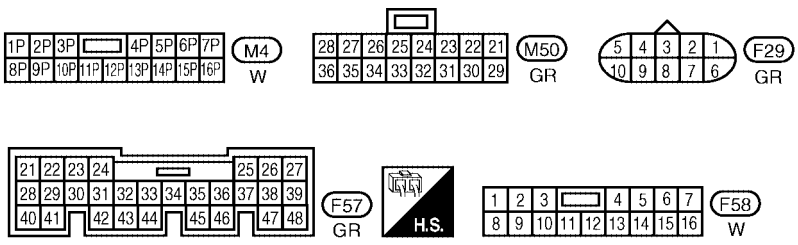
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — PNP/SW

UCS000UG

AT-PNP/SW-01





BBWA0593E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
24	O/L	PNP switch A		Selector lever: “P” and “R” position	0V
				Other than the above	Battery voltage
31	BR	PNP switch B		Selector lever: “R”, “N”, “D” and manual mode position	0V
				Other than the above	Battery voltage
32	P/B	PNP switch C		Selector lever: “D” and manual mode position	0V
				Other than the above	Battery voltage
33	LG	PNP switch PN		Selector lever: “P” and “N” position	Battery voltage
				Other than the above	0V
43	V/W	PNP switch PA		Selector lever: “P” and “N” position	0V
				Other than the above	Battery voltage

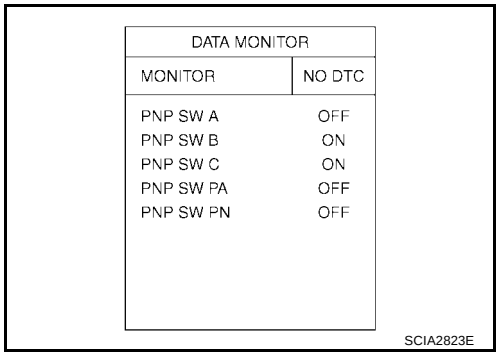
Diagnostic Procedure

UCS000UH

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

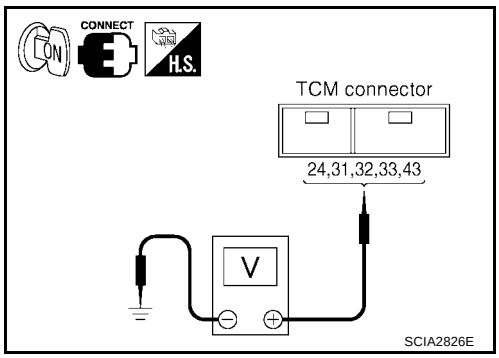
1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-II.
3. Move selector lever to “P”, “N”, “R” and “D” position and check the value of “PNP SW A”, “PNP SW B”, “PNP SW C”, “PNP SW PA” and “PNP SW PN”.



Selector lever	“PNP SW A”	“PNP SW B”	“PNP SW C”	“PNP SW PA”	“PNP SW PN”
P	ON	OFF	OFF	ON	ON
R	ON	ON	OFF	OFF	OFF
N	OFF	ON	OFF	ON	ON
D	OFF	ON	ON	OFF	OFF

Without CONSULT-II

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



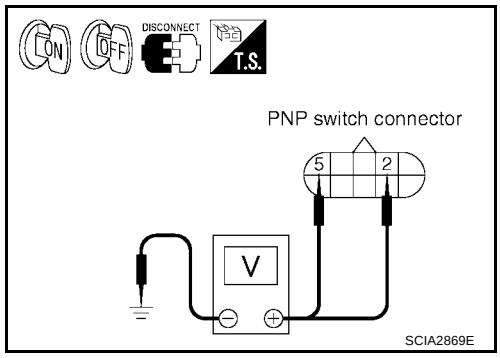
Selector lever	Connector No.	F57			
	Terminal (Wire color)				
	24 (O/L) - Ground	31 (BR) - Ground	32 (P/B) - Ground	33 (LG) - Ground	43 (V/W) - Ground
P	0V	Battery voltage	Battery voltage	Battery voltage	0V
R	0V	0V	Battery voltage	0V	Battery voltage
N	Battery voltage	0V	Battery voltage	Battery voltage	0V
D	Battery voltage	0V	0V	0V	Battery voltage

OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK PNP SWITCH POWER SOURCE CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the PNP switch connector.
3. Turn ignition switch “ON”. (Do not start engine.)
4. Check the voltage between PNP switch connector terminals 2, 5 and ground.



Connector	Terminal (Wire color)	Voltage
F29	2 (O) - Ground	Battery voltage
	5 (G) - Ground	

5. Turn ignition switch “OFF”.
6. Check voltage between PNP switch connector terminals 2, 5 and ground.

Connector	Terminal (Wire color)	Voltage
F29	2 (O) - Ground	0V
	5 (G) - Ground	

7. If OK, check harness for short-circuit to ground or power source.

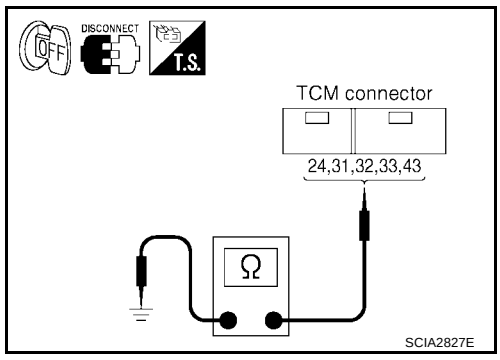
OK or NG

OK >> GO TO 3.
NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- Harness for short or open between ignition switch and PNP switch
- Ignition switch and fuse
  Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .

3. CHECK HARNESS BETWEEN TCM AND PNP SWITCH

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector and PNP switch connector.
3. Check continuity between TCM connector terminals 24, 31, 32, 43 and ground.



Connector	Terminal (Wire color)	Condition	Continuity
F57	24 (O/L) - Ground	Selector lever: “P” and “R” position	Yes
		Other than the above	No
	31 (BR) - Ground	Selector lever: “R”, “N”, “D” and manual mode position	Yes
		Other than the above	No
	32 (P/B) - Ground	Selector lever: “D” and manual mode position	Yes
		Other than the above	No
	43 (V/W) - Ground	Selector lever: “P” and “N” position	Yes
		Other than the above	No

4. If OK, check the following.

– Harness for short-circuit to ground or power source.
– Open or short-circuit in the harness between unified meter and A/C auto amp. and TCM.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING ITEM

Check the following.

- Open or short-circuit in the harness between TCM and PNP switch A, B, C, PA.
- Open or short-circuit in the harness for ground of PNP switch.
- PNP switch. Refer to AT-470, "Component Inspection" .

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-466, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

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

OK or NG

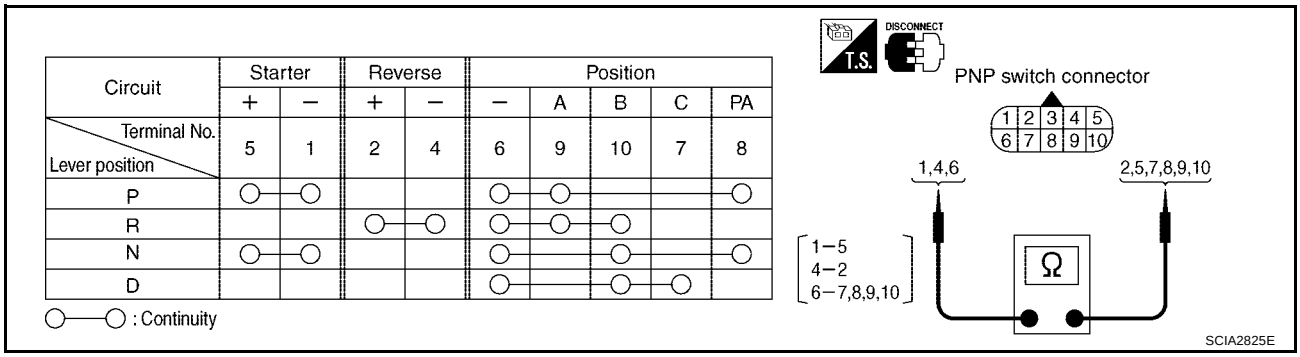
OK >> **INSPECTION END**
NG >> Repair or replace damaged parts.

Component Inspection

UCS000UI

PNP SWITCH

1. Check continuity between PNP switch terminals while moving selector lever. Refer to the following table.



Circuit	Starter		Reverse		Position				
	+	−	+	−	−	A	B	C	PA
Terminal No. / Lever position	5	1	2	4	6	9	10	7	8
P	○	○			○	○			○
R			○	○	○	○	○		
N	○	○			○		○		○
D					○		○	○	

○—○ : Continuity

2. If NG, check again with control cable disconnected. (Refer to Step 1 above.)
3. If OK on step 2, adjust control cable. Refer to AT-599, "Control Cable Adjustment" .
4. If NG on step 2, remove park/neutral position (PNP) switch from A/T and check continuity of park/neutral position (PNP) switch terminals. (Refer to step 1 above.)
5. If OK on step 4, adjust park/neutral position (PNP) switch. Refer to AT-597, "Park/Neutral Position (PNP) Switch Adjustment" .
6. If NG on step 4, replace park/neutral position (PNP) switch.

DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31940

Description

UCS000W4

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

On Board Diagnosis Logic

UCS000W6

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “ATF TEMP SEN/CIRC” with CONSULT-II or P0710 without CONSULT-II is detected under the following conditions.
  - When normal voltage not applied to ATF temperature sensor due to open, short, and so on.
  - When during running, the ATF temperature sensor signal voltage is excessively high or low.

Possible Cause

UCS000W7

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

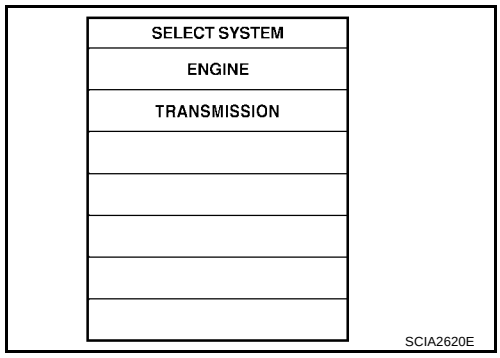
DTC Confirmation Procedure

UCS000W8

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Warm up engine so that engine coolant temperature is more than 50°C (122°F).
   COOLAN TEMP: More than 50°C (122°F)
5. Maintain the following conditions for at least 16 minutes (Total). (It is not necessary to drive vehicle.)
   COOLAN TEMP: More than 50°C (122°F)
   SLCT LVR POSI: “D” position
6. If DTC is detected, go to AT-473, "Diagnostic Procedure" .



WITH GST

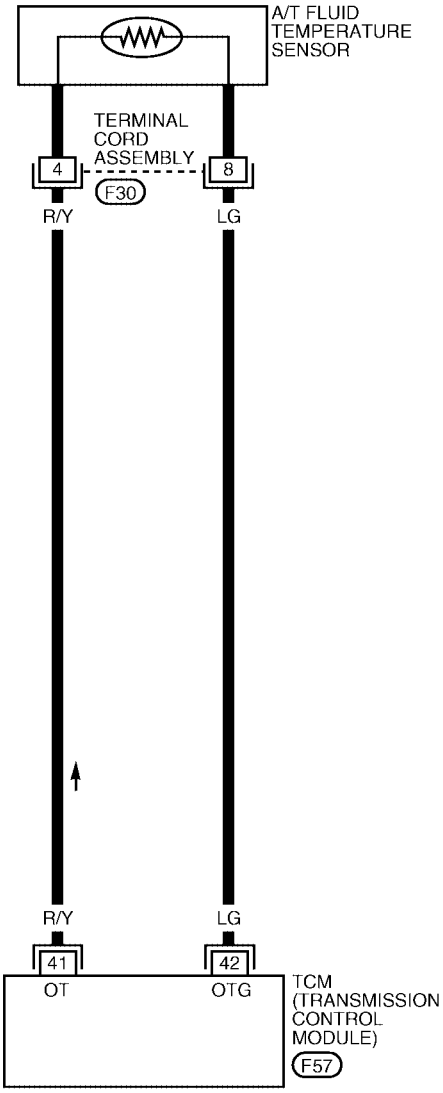
Follow the procedure “With CONSULT-II”.

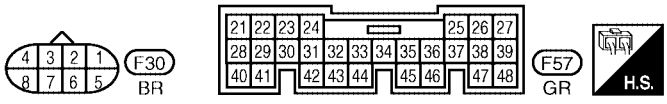
Wiring Diagram — AT — FTS

UCS000W9

AT-FTS-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0594E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
41	R/Y	Fluid temperature sensor		When ATF temperature 0°C (32°F)	4.0V
				When ATF temperature 20°C (68°F)	3.0V
				When ATF temperature 80°C (176°F)	0.8V
				When ATF temperature 100°C (212°F)	0.5V
42	LG	Fluid temperature sensor ground	–		0V

Diagnostic Procedure

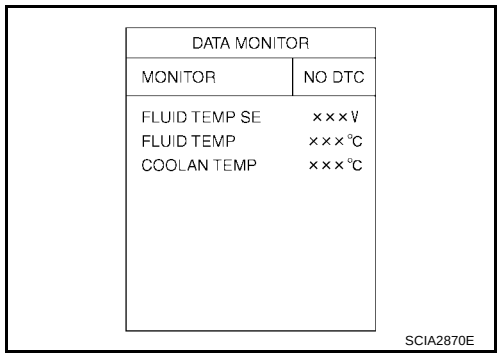
UCS000WA

1. CHECK FLUID TEMPERATURE SENSOR SIGNAL

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Read out the value of “FLUID TEMP SE”.

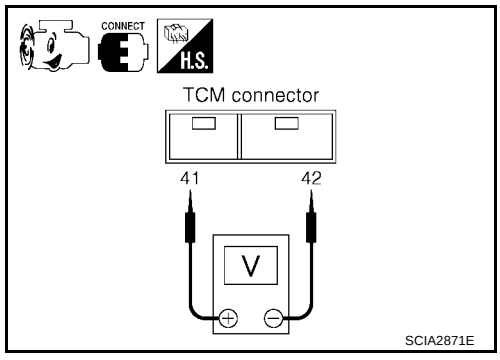
Item name	Condition	Display value (Approx.)
Fluid temperature sensor	0°C (32°F)	4.0V
	20°C (68°F)	3.0V
	80°C (176°F)	0.8V
	100°C (212°F)	0.5V



Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector terminals 41 and 42 while warming up A/T. Refer to AT-472, "Wiring Diagram — AT — FTS" .

Connector	Terminal (Wire color)	Temperature	Voltage (Approx.)
F57	41 (R/Y) - 42 (LG) (ground)	0°C (32°F)	4.0V
		20°C (68°F)	3.0V
		80°C (176°F)	0.8V
		100°C (212°F)	0.5V



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

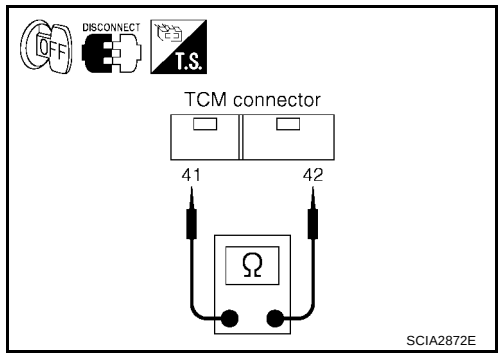
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK FLUID TEMPERATURE SENSOR CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between terminals 41 and 42.

Connector	Terminal (Wire color)	Temperature	Resistance (Approx.)
F57	41 (R/Y) - 42 (LG) (ground)	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. Disconnect the TCM connector.
5. Check if there is continuity between the connector terminal and ground.

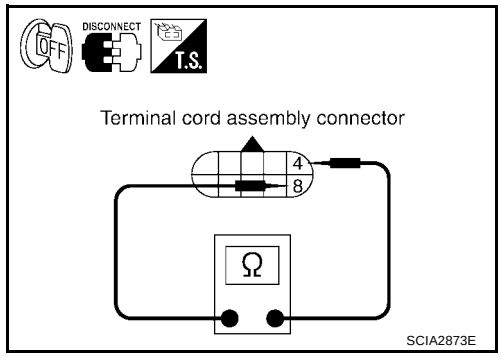
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK FLUID TEMPERATURE SENSOR

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 4 and 8.

Connector	Terminal (Wire color)	Temperature	Resistance (Approx.)
F30	4 (R/Y) - 8 (LG)	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND FLUID TEMPERATURE SENSOR

Check the following.

- Open or short-circuit in the harness between TCM and A/T fluid temperature sensor.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-471, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

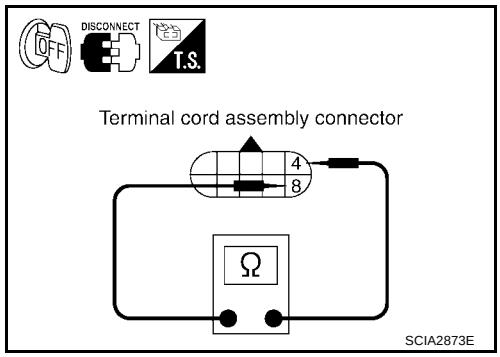
Component Inspection

UCS0014Y

A/T FLUID TEMPERATURE SENSOR

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 4 and 8.

Connector	Terminal (Wire color)	Temperature	Resistance (Approx.)
F30	4 (R/Y) - 8 (LG)	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0711 FLUID TEMPERATURE SENSOR PERFORMANCE

PFP:31940

Description

UCS0011V

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

On Board Diagnosis Logic

UCS0011W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “FLUID TEMP SEN” with CONSULT-II or P0711 without CONSULT-II is detected when ATF temperature signal does not change.

Possible Cause

UCS0011X

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

DTC Confirmation Procedure

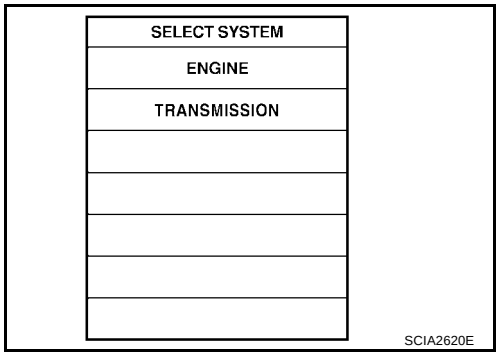
UCS0011Y

CAUTION:
Always drive vehicle at a safe speed.

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 15 minutes (Total). (It is not necessary to maintain continuously.)
   VHCL SPEED SE-A/T: 40 km/h (25 MPH) or more
   SLCT LVR POSI: “D” position
5. If DTC is detected, go to AT-478, "Diagnostic Procedure" .



WITH GST

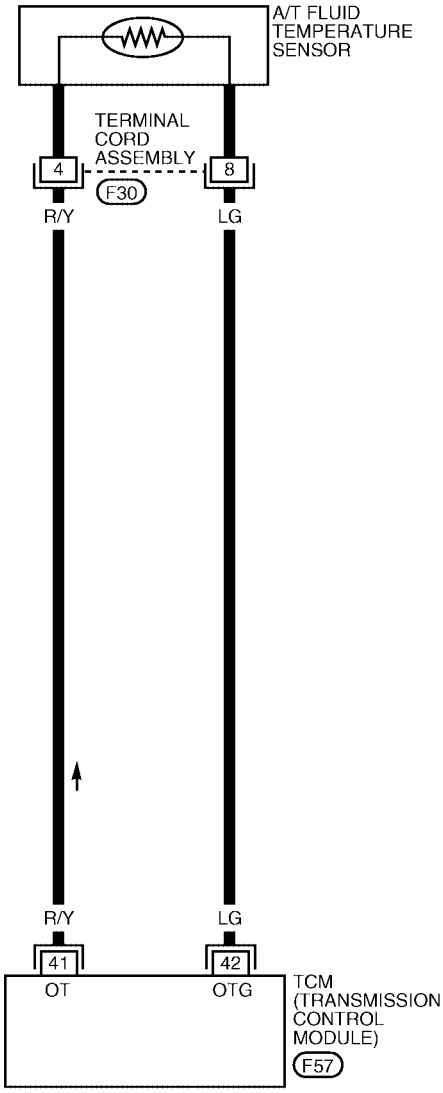
Follow the procedure “With CONSULT-II”.

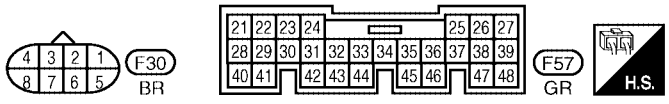
Wiring Diagram — AT — FTSP

UCS0011Z

AT-FTSP-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0595E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
41	R/Y	Fluid temperature sensor		When ATF temperature 0°C (32°F)	4.0V
				When ATF temperature 20°C (68°F)	3.0V
				When ATF temperature 80°C (176°F)	0.8V
				When ATF temperature 100°C (212°F)	0.5V
42	LG	Fluid temperature sensor ground	–		0V

Diagnostic Procedure

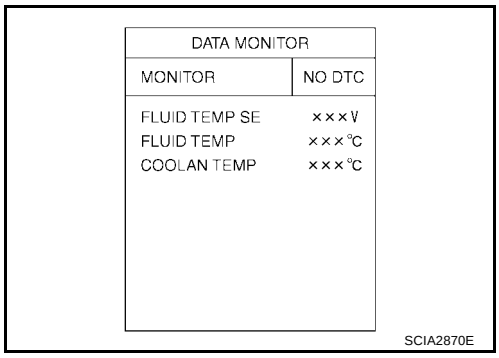
UCS00120

1. CHECK FLUID TEMPERATURE SENSOR SIGNAL

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Read out the value of “FLUID TEMP SE”.

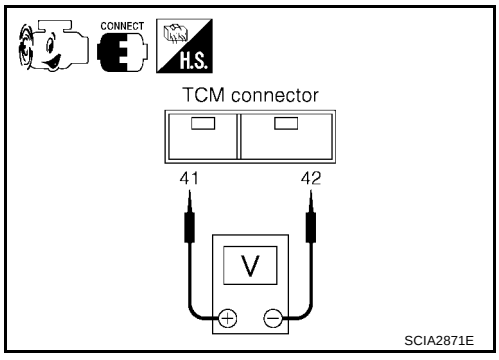
Item name	Condition	Display value (Approx.)
Fluid temperature sensor	0°C (32°F)	4.0V
	20°C (68°F)	3.0V
	80°C (176°F)	0.8V
	100°C (212°F)	0.5V



Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector terminals 41 and 42 while warming up A/T. Refer to AT-477, "Wiring Diagram — AT — FTSP" .

Connector	Terminal (Wire color)	Temperature	Voltage (Approx.)
F57	41 (R/Y) - 42 (LG) (ground)	0°C (32°F)	4.0V
		20°C (68°F)	3.0V
		80°C (176°F)	0.8V
		100°C (212°F)	0.5V



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

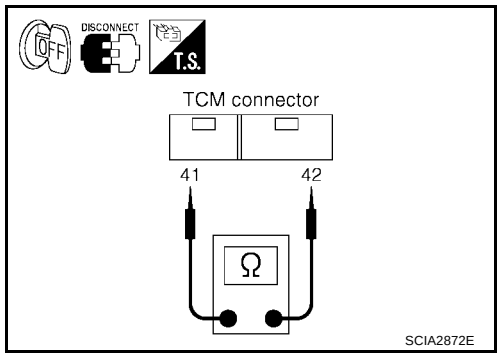
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK FLUID TEMPERATURE SENSOR CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between terminals 41 and 42.

Connector	Terminal (Wire color)	Temperature	Resistance (Approx.)
F57	41 (R/Y) - 42 (LG) (ground)	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. Disconnect the TCM connector.
5. Check if there is continuity between the connector terminal and ground.

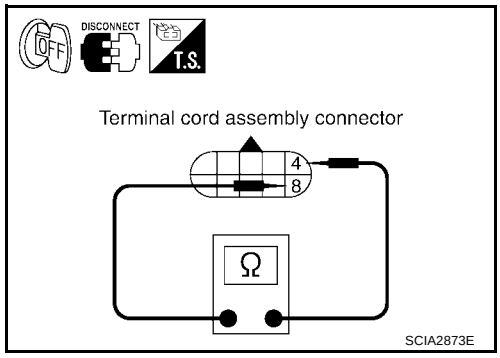
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK FLUID TEMPERATURE SENSOR

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 4 and 8.

Connector	Terminal (Wire color)	Temperature	Resistance (Approx.)
F30	4 (R/Y) - 8 (LG)	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND FLUID TEMPERATURE SENSOR

Check the following.

- Open or short-circuit in the harness between TCM and A/T fluid temperature sensor.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-476, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

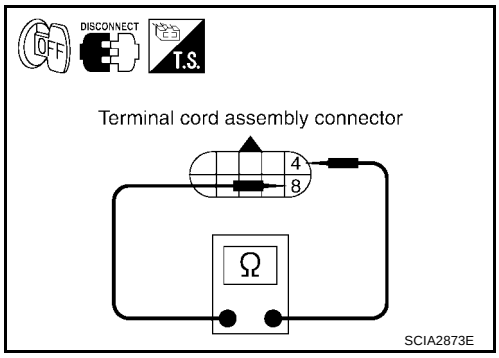
Component Inspection

UCS0014Z

A/T FLUID TEMPERATURE SENSOR

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 4 and 8.

Connector	Terminal (Wire color)	Temperature	Resistance (Approx.)
F30	4 (R/Y) - 8 (LG)	0°C (32°F)	9.8 kΩ
		20°C (68°F)	4.2 kΩ
		80°C (176°F)	0.54 kΩ
		100°C (212°F)	0.31 kΩ



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

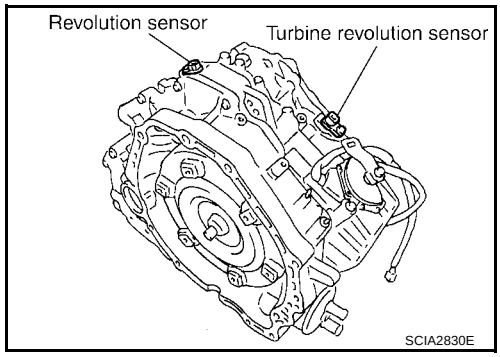
DTC P0717 TURBINE REVOLUTION SENSOR CIRCUIT

PFP:31935

Description

UCS000WB

- The turbine revolution sensor detects forward clutch drum rpm (revolutions per minute). It is located on the input side of the automatic transaxle. The revolution sensor is located on the output side of the automatic transaxle. With the two sensors, input and output rpms are accurately detected. The result is optimal shift timing during deceleration and improved shifting.
- Hall IC is installed in turbine revolution sensor, it itself handles in pulse of rectangular wave signal and transmits it to TCM due to hall effect. TCM recognizes the pulse with input rpm speed. Size of output doesn't depend on a rotation number and is fixed.



On Board Diagnosis Logic

UCS000WC

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TURBINE SENSOR” with CONSULT-II or P0717 without CONSULT-II is detected under the following conditions.
  - When signal from turbine revolution sensor does not input due to open, short, and so on.
  - When unexpected signal input during running.

Possible Cause

UCS000WD

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

DTC Confirmation Procedure

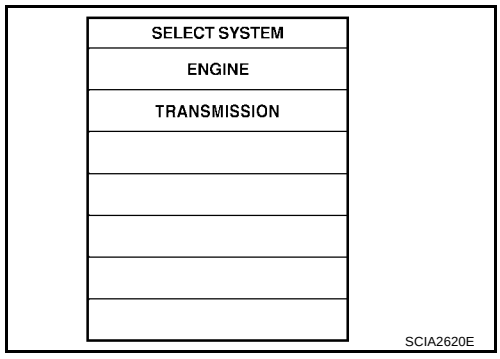
UCS000WE

CAUTION:
Always drive vehicle at a safe speed.

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 1 consecutive minute.
   FLUID TEMP: More than 20°C (68°F)
   VHCL/S SE-A/T: 70 km/h (43 MPH) or more
   SLCT LVR POSI: “D” position
   GEAR: Except 1st position
5. If DTC is detected, go to AT-483, "Diagnostic Procedure" .



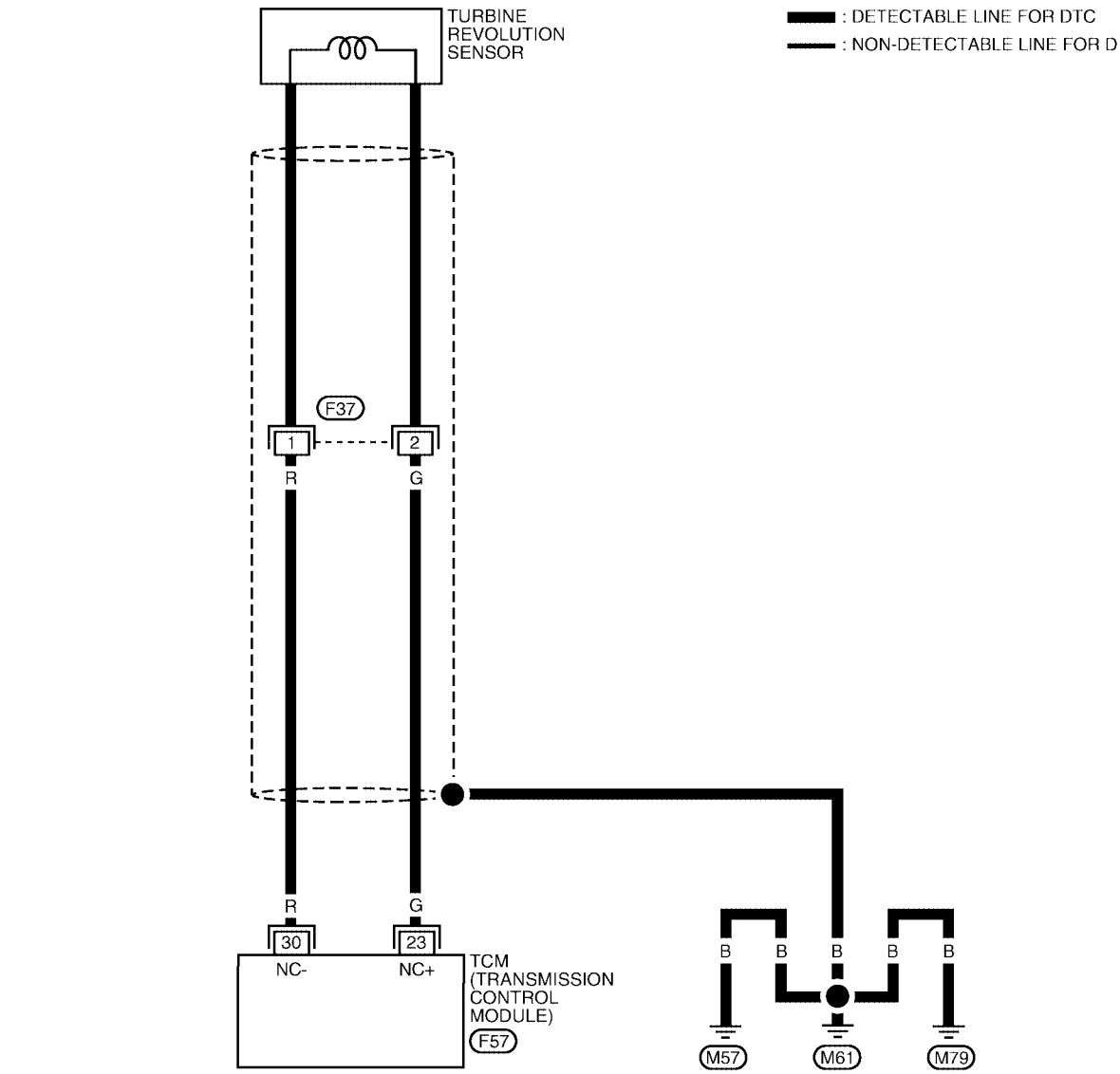
WITH GST

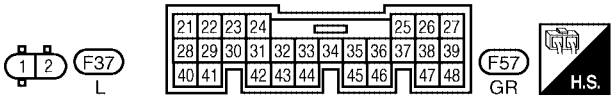
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — TRSC

UCS000WF

AT-TRSC-(





BBWA0592E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
23	G	Turbine revolution sensor power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
30	R	Turbine revolution sensor		When moving at 20 km/h (12 MPH) in 1st gear.	371Hz

Diagnostic Procedure

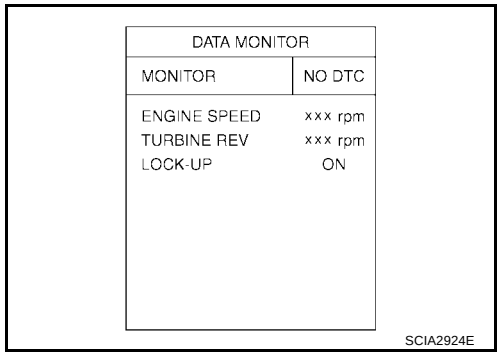
UCS000WG

1. CHECK TURBINE REVOLUTION SENSOR CIRCUIT

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “TURBINE REV”.

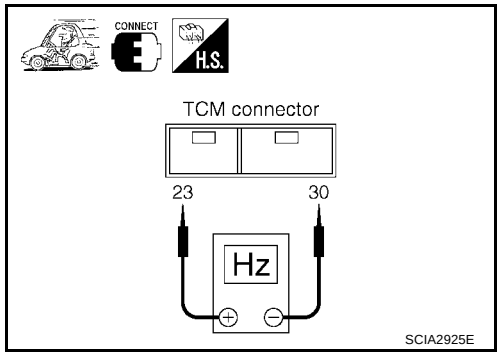
Monitor item	Condition	Specification
TURBINE REV	During driving (lock-up ON)	Approximately matches the engine speed.



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 23 and 30.

Connector	Terminal (Wire color)	Condition	Data (Approx.)
F57	23 (G) - 30 (R) (ground)	When moving at 20 km/h (12 MPH) in 1st gear.	371 Hz



OK or NG

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

2. DETECT MALFUNCTIONING ITEM

Check the following.

- Open or short-circuit in the harness between TCM and turbine revolution sensor.
- Turbine revolution sensor. Refer to AT-484, "Component Inspection" .

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-481, "DTC Confirmation Procedure" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal.
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.

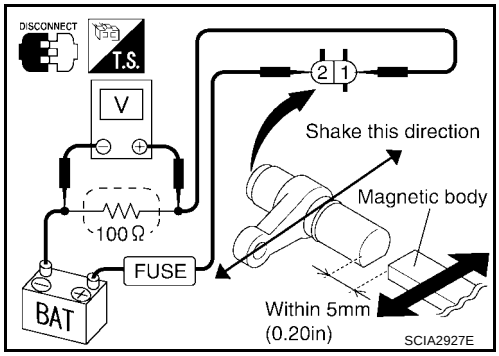
Component Inspection

UCS0015F

TURBINE REVOLUTION SENSOR

1. Remove turbine revolution sensor.
2. Connect 12V power supply and 100 Ω resistance to the terminal. (Do not mistake polarity)
3. Inspect the voltage of HIGH and LOW signal by shaking magnetic body from side to side at turbine revolution sensor tip [gap is within 5 mm (0.20 in)].

   CAUTION:
   Make sure to shake direction from bolt hole to sensor-self when shaking magnetic body. If not, voltage value cannot change.



Signal	Voltage (Approx.)
HIGH	1.2 - 1.6V
LOW	0.4 - 0.8V

4. If NG, replace turbine revolution sensor.

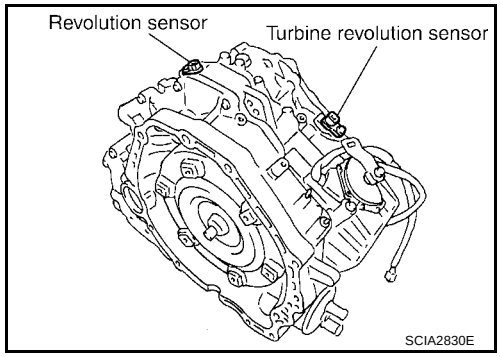
DTC P0722 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR) CIRCUIT

PFP:31935

Description

UCS000UJ

- 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.
- Hall IC is installed in revolution sensor, it itself handles in pulse of rectangular wave signal and transmits it to TCM due to hall effect. TCM recognizes the pulse with vehicle speed. Size of output doesn't depend on a rotation number and is fixed.



On Board Diagnosis Logic

UCS000UK

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “VHCL SPEED SEN-A/T” with CONSULT-II or P0722 without CONSULT-II is detected under the following conditions.
  - When signal from revolution sensor does not input due to open, short, and so on.
  - When unexpected signal input during running.

Possible Cause

UCS000UL

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

DTC Confirmation Procedure

UCS000UM

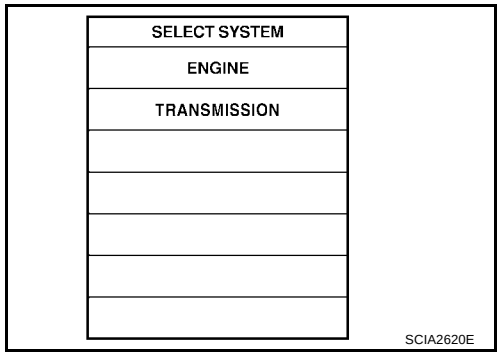
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-II.
3. Start engine.
4. Drive vehicle and check for an increase of “VHCL/S SE-A/T” value in response to “VHCL/S SE-MTR” value.
   If the check result is NG, go to AT-487, "Diagnostic Procedure" .
   If the check result is OK, go to following step.
5. Maintain the following conditions for at least 2 consecutive minutes.
   FLUID TEMP: More than 20°C (68°F)
   VHCL/S SE-A/T: 70 km/h (43 MPH) or more
   SLCT LVR POSI: “D” position
   If the check result is NG, go to AT-487, "Diagnostic Procedure" .



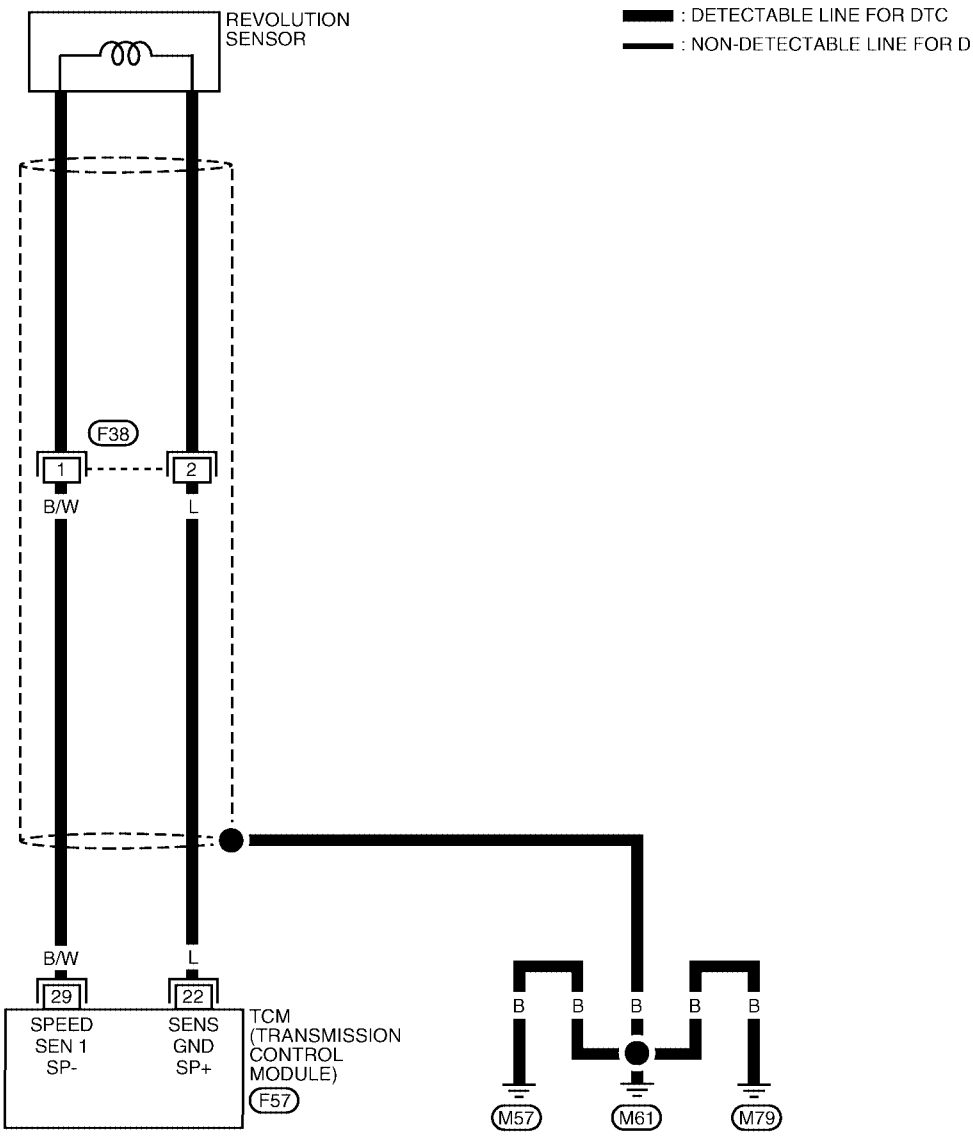
WITH GST

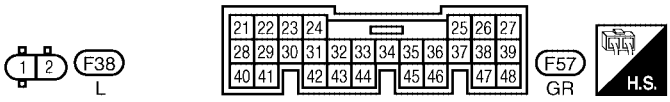
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — VSSATC

UCS000UN

AT-VSSATC-0





BBWA0591E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
22	L	Revolution sensor power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
29	B/W	Revolution sensor		When moving at 20 km/h (12 MPH) in 1st gear.	119Hz

Diagnostic Procedure

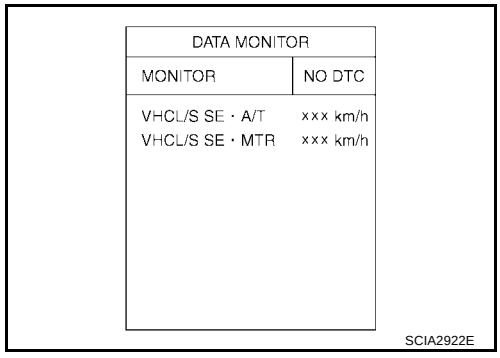
UCS000UO

1. CHECK REVOLUTION SENSOR CIRCUIT

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “VHCL/S SE-AT”.

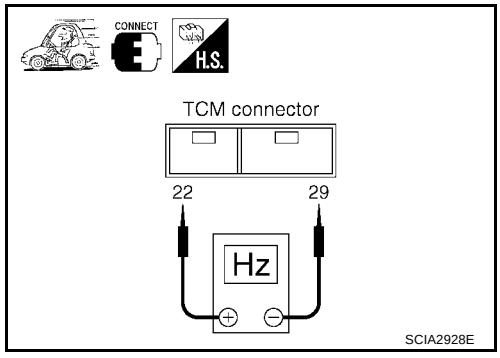
Monitor item	Condition	Specification
VHCL/S SE-AT	During driving	Approximately matches the speedometer reading.



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 22 and 29.

Connector	Terminal (Wire color)	Condition	Data (Approx.)
F57	22 (L) - 29 (B/W) (ground)	When moving at 20 km/h (12 MPH) in 1st gear.	119 Hz



OK or NG

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

2. DETECT MALFUNCTIONING ITEM

Check the following.

- Open or short-circuit in the harness between TCM and revolution sensor.
- Revolution sensor. Refer to AT-488, "Component Inspection" .

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-485, "DTC Confirmation Procedure" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal.
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.

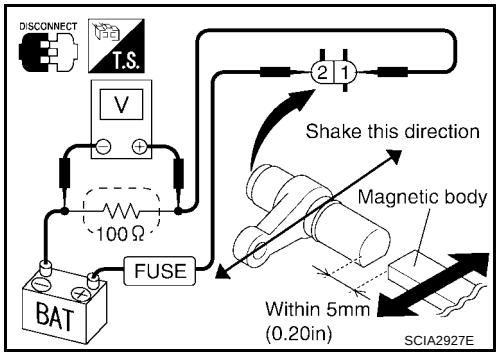
Component Inspection

UCS0015G

REVOLUTION SENSOR

1. Remove revolution sensor.
2. Connect 12V power supply and 100 Ω resistance to the terminal. (Do not mistake polarity)
3. Inspect the voltage of HIGH and LOW signal by shaking magnetic body from side to side at revolution sensor tip [gap is within 5mm (0.20 in)].

   CAUTION:
   Make sure to shake direction from bolt hole to sensor-self when shaking magnetic body. If not, voltage value cannot change.



Signal	Voltage (Approx.)
HIGH	1.2 - 1.6V
LOW	0.4 - 0.8V

4. If NG, replace revolution sensor.

DTC P0726 ENGINE SPEED INPUT CIRCUIT PERFORMANCE

PFP:31036

Description

UCS000UP

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

On Board Diagnosis Logic

UCS000UQ

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “ENG SPD INP PERFOR” with CONSULT-II or 14th judgement flicker without CONSULT-II is detected when malfunction is detected in engine speed signal, actual engine torque signal or torque reduction signal that is output from ECM through CAN communication.

Possible Cause

UCS000UR

- Harness or connectors
  (The signal circuit is open or shorted.)
- ECM

DTC Confirmation Procedure

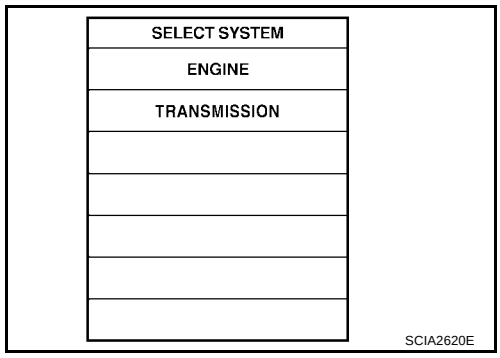
UCS000US

CAUTION:
Always drive vehicle at a safe speed.

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

WITH CONSULT-II

1. Turn ignition switch “ON” and select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
2. Start engine.
3. Drive vehicle and maintain the following conditions for at least 10 consecutive seconds.
   VHCL/S SE-A/T: 10 km/h (6 MPH) or more
   ACCELE ANGLE: More than 10 %
   SLCT LVR POSI: “D” position
4. If DTC is detected, go to AT-489, "Diagnostic Procedure" .



Diagnostic Procedure

UCS000UT

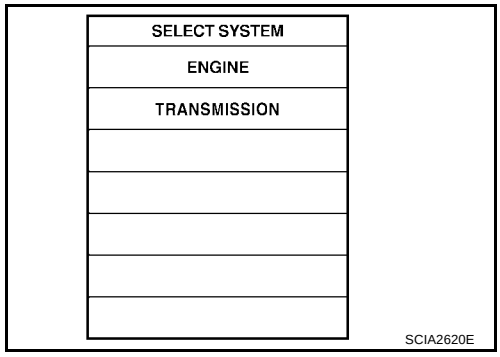
1. CHECK DTC WITH ECM

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “ENGINE” with “SELF-DIAG RESULTS” mode in CONSULT-II. Refer to EC-110, "CONSULT-II Function" .

OK or NG

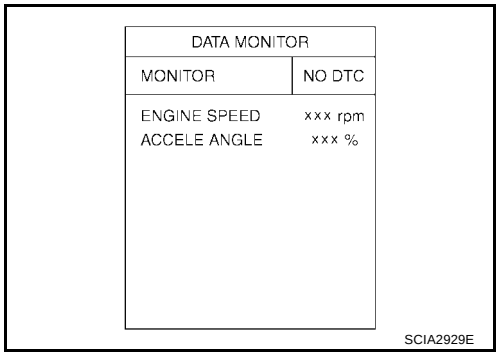
OK >> GO TO 2.
NG >> Check the DTC detected item, go to EC-8, "INDEX FOR DTC" .
- If CAN communication line is detected, go to AT-459, "DTC U1000 CAN COMMUNICATION LINE" .



2. CHECK DTC WITH TCM

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. While monitoring “ENGINE SPEED”, check for engine speed change corresponding to “ACCELE ANGLE”.



OK or NG

OK >> GO TO 3.
NG >> Check the ignition signal circuit.
- Refer to EC-613, "IGNITION SIGNAL" .

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-489, "DTC Confirmation Procedure" .

OK or NG

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

4. CHECK TCM

1. Check TCM input/output signal.
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 P0731 A/T 1ST GEAR FUNCTION

PFP:31940

Description

UCS00121

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into first gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position		Shift solenoid valve				
		A	B	C	D	E
1st	D	ON (Closed)	ON (Open)	ON (Open)	OFF (Open)	OFF (Closed)
	M1	ON (Closed)	ON (Open)	ON (Open)	OFF (Open)	ON (Open)

On Board Diagnosis Logic

UCS00122

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 1ST GR FNCTN” with CONSULT-II or P0731 without CONSULT-II is detected when A/T cannot be shifted to the 1st gear position even if electrical circuit is good.

Possible Cause

UCS00123

- Shift solenoid valve A
  (Off stick.)
- Hydraulic control circuit

DTC Confirmation Procedure

UCS00124

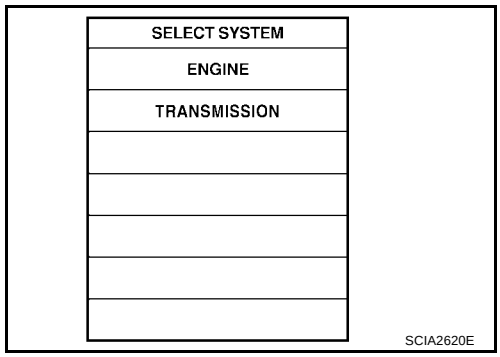
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 1st position
   [Vehicle speed and accelerator angle: 1st gear position retainable condition. (Refer to AT-603, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
   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-493, "Diagnostic Procedure" .

WITH GST

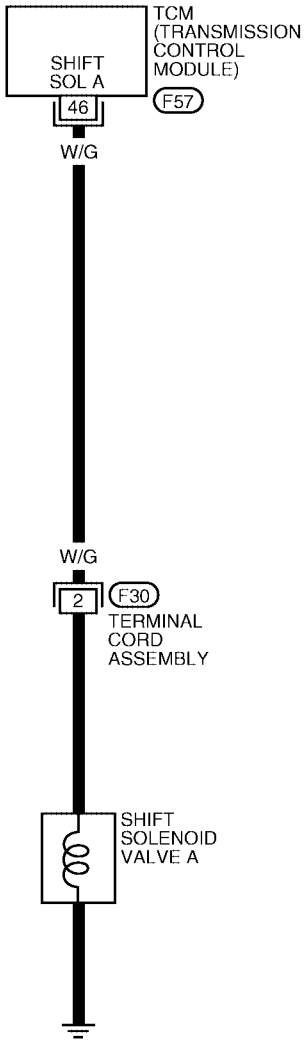
Follow the procedure “With CONSULT-II”.

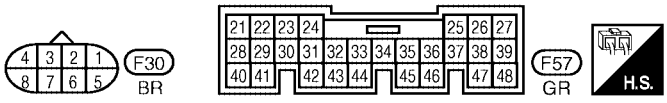
Wiring Diagram — AT — 1STSIG

UCS00125

AT-1STSIG-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0598E

TCM terminal and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

UCS00126

1. CHECK SHIFT SOLENOID VALVE A CIRCUIT

Perform “Diagnostic Procedure” for DTC P0750. Refer to AT-520, "Diagnostic Procedure" .

OK or NG

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

2. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-491, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0732 A/T 2ND GEAR FUNCTION

PFP:31940

Description

UCS00127

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into second gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position		Shift solenoid valve				
		A	B	C	D	E
2nd	D	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)
	M2	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)

On Board Diagnosis Logic

UCS00128

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 2ND GR FNCTN” with CONSULT-II or P0732 without CONSULT-II is detected when A/T cannot be shifted to the 2nd gear position even if electrical circuit is good.

Possible Cause

UCS00129

- Shift solenoid valve A
(On stick.)
- Shift solenoid valve B
(On stick.)
- Shift solenoid valve C
(Off stick.)
- Shift solenoid valve D
(On stick.)
- Pressure control solenoid valve A
(On stick.)
- Pressure control solenoid valve C
(On stick.)
- Forward clutch
- 2nd coast brake
- 2nd brake
- B5 brake
- Hydraulic control circuit

DTC Confirmation Procedure

UCS0014N

CAUTION:

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

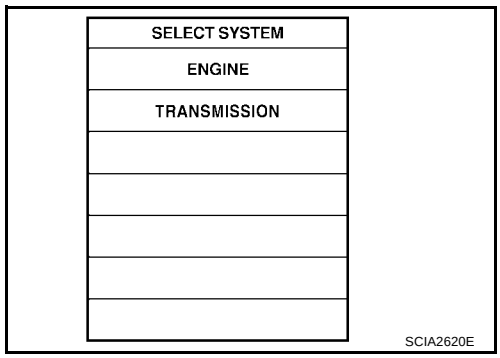
NOTE:

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

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

WITH CONSULT-II

1. Start engine and select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 2nd position
   [Vehicle speed and accelerator angle: 2nd gear position retainable condition. (Refer to AT-603, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
   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-497, "Diagnostic Procedure" .



WITH GST

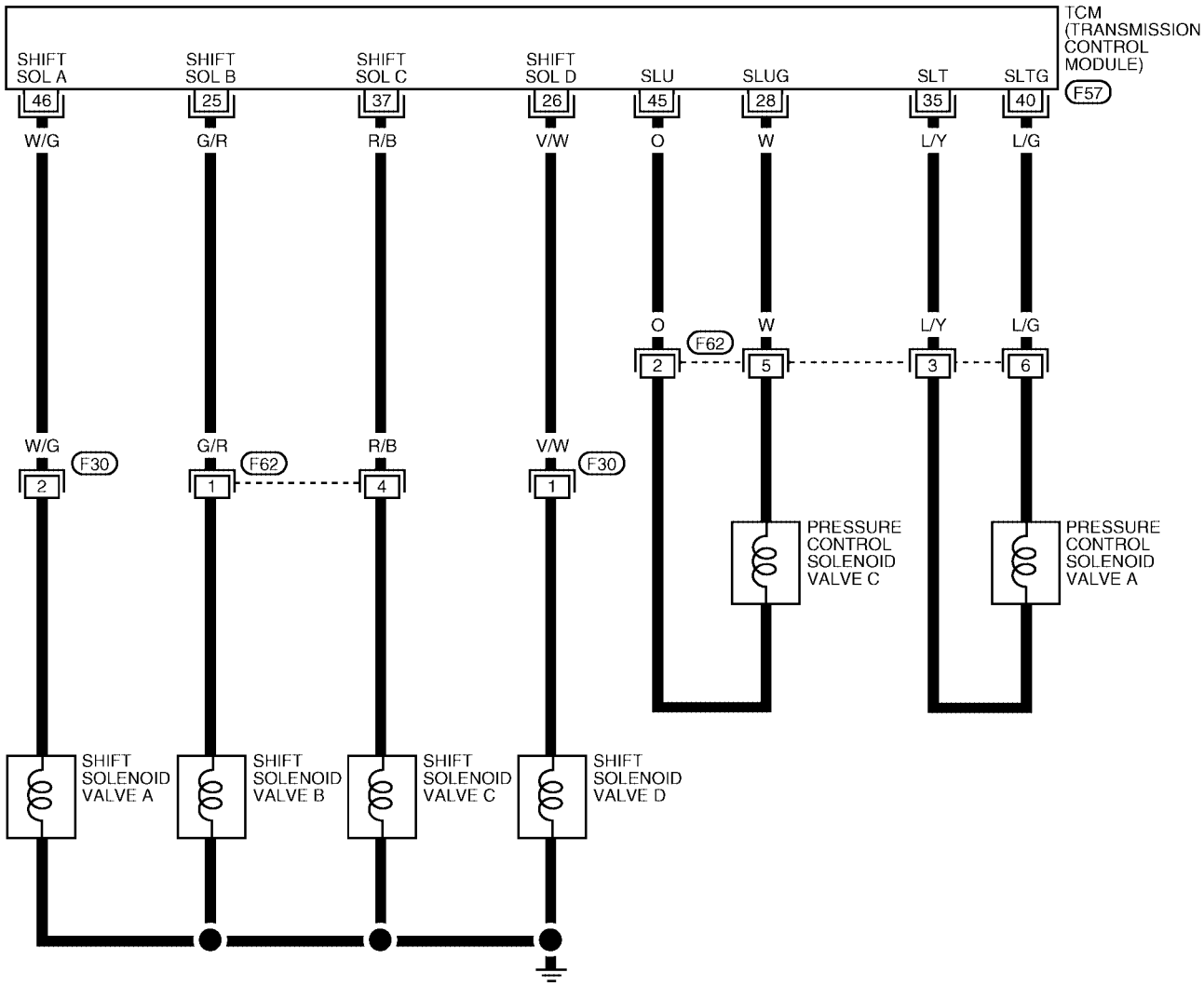
Follow the procedure “With CONSULT-II”.

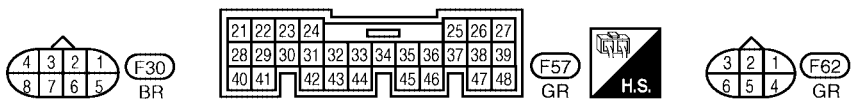
Wiring Diagram — AT — 2NDSIG

UCS0012B

AT-2NDSIG-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0599E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

UCS0012C

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0750 SHIFT SOLENOID VALVE A” (Refer to AT-520, "Diagnostic Procedure" .)
- “DTC P0755 SHIFT SOLENOID VALVE B” (Refer to AT-524, "Diagnostic Procedure" .)
- “DTC P0760 SHIFT SOLENOID VALVE C” (Refer to AT-528, "Diagnostic Procedure" .)
- “DTC P0765 SHIFT SOLENOID VALVE D” (Refer to AT-538, "Diagnostic Procedure" .)

OK or NG

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

2. CHECK EACH PRESSURE CONTROL SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0745 PRESSURE CONTROL SOLENOID VALVE A” (Refer to AT-516, "Diagnostic Procedure" .)
- “DTC P0795 PRESSURE CONTROL SOLENOID VALVE C” (Refer to AT-554, "Diagnostic Procedure" .)

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-494, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0733 A/T 3RD GEAR FUNCTION

PFP:31940

Description

UCS0012D

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into third gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position		Shift solenoid valve				
		A	B	C	D	E
3rd	D	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	OFF (Closed)
	M3	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	OFF (Closed)

On Board Diagnosis Logic

UCS0012E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 3RD GR FNCTN” with CONSULT-II or P0733 without CONSULT-II is detected when A/T cannot be shifted to the 3rd gear position even if electrical circuit is good.

Possible Cause

UCS0012F

- Shift solenoid valve A
  (On stick.)
- Shift solenoid valve B
  (On stick.)
- Shift solenoid valve C
  (Off stick.)
- Shift solenoid valve D
  (Off stick.)
- Pressure control solenoid valve A
  (On stick.)
- Forward clutch
- 2nd coast brake
- 2nd brake
- U/D brake
- Hydraulic control circuit

DTC Confirmation Procedure

UCS0014O

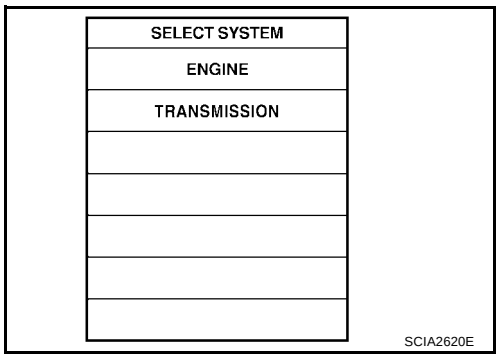
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 3rd position
   [Vehicle speed and accelerator angle: 3rd gear position retainable condition. (Refer to AT-603, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
   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-502, "Diagnostic Procedure" .



WITH GST

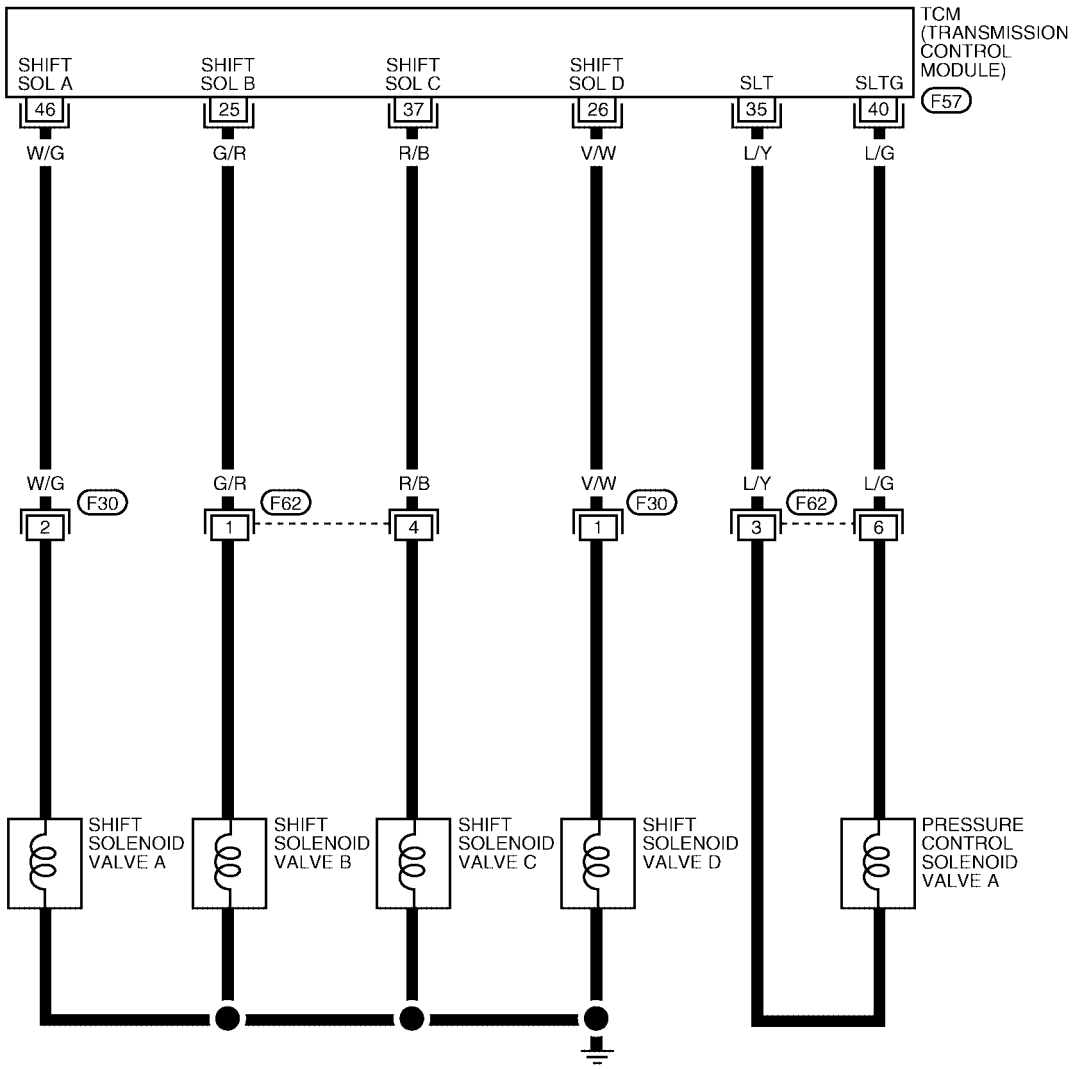
Follow the procedure “With CONSULT-II”.

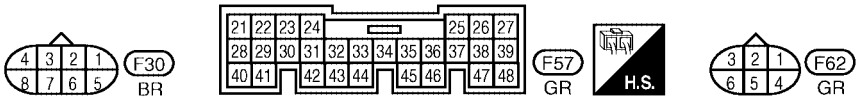
Wiring Diagram — AT — 3RDSIG

UCS0012H

AT-3RDSIG-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0600E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

UCS0012I

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0750 SHIFT SOLENOID VALVE A” (Refer to AT-520, "Diagnostic Procedure" .)
- “DTC P0755 SHIFT SOLENOID VALVE B” (Refer to AT-524, "Diagnostic Procedure" .)
- “DTC P0760 SHIFT SOLENOID VALVE C” (Refer to AT-528, "Diagnostic Procedure" .)
- “DTC P0765 SHIFT SOLENOID VALVE D” (Refer to AT-538, "Diagnostic Procedure" .)

OK or NG

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

2. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

Perform “Diagnostic Procedure” for DTC P0745. Refer to AT-516, "Diagnostic Procedure" .

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-499, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0734 A/T 4TH GEAR FUNCTION

PFP:31940

Description

UCS0012J

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into fourth gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position		Shift solenoid valve				
		A	B	C	D	E
4th	D	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	OFF (Closed)
	M4	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	OFF (Closed)

On Board Diagnosis Logic

UCS0012K

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 4TH GR FNCTN” with CONSULT-II or P0734 without CONSULT-II is detected when A/T cannot be shifted to the 4th gear position even if electrical circuit is good.

Possible Cause

UCS0012L

- Shift solenoid valve A
  (On stick.)
- Shift solenoid valve B
  (On stick.)
- Shift solenoid valve C
  (On stick.)
- Pressure control solenoid valve A
  (On stick.)
- Forward clutch
- U/D clutch
- 2nd coast brake
- 2nd brake
- Hydraulic control circuit

DTC Confirmation Procedure

UCS0014P

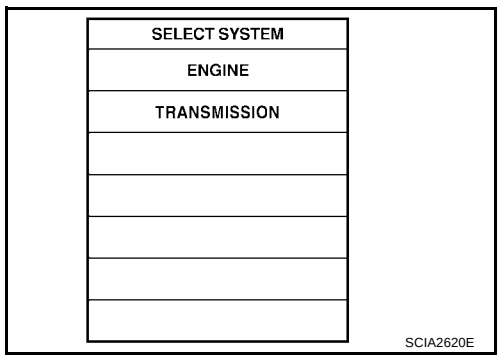
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 4th position
   [Vehicle speed and accelerator angle: 4th gear position retainable condition. (Refer to AT-603, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]



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-506, "Diagnostic Procedure" .

WITH GST

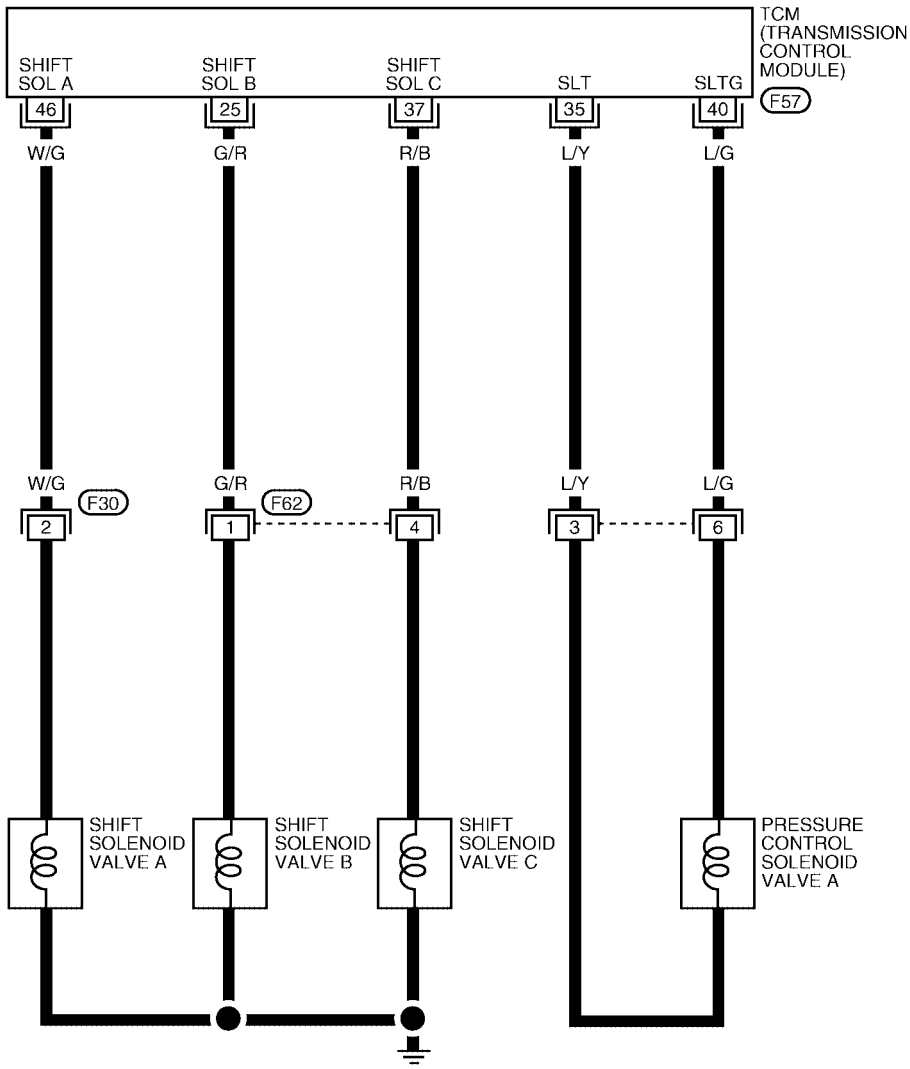
Follow the procedure “With CONSULT-II”.

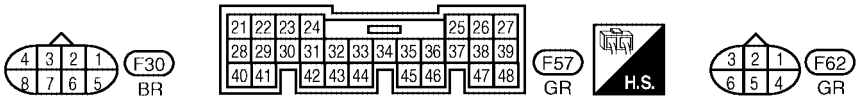
Wiring Diagram — AT — 4THSIG

UCS0012N

AT-4THSIG-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0601E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

UCS0012O

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0750 SHIFT SOLENOID VALVE A” (Refer to AT-520, "Diagnostic Procedure" .)
- “DTC P0755 SHIFT SOLENOID VALVE B” (Refer to AT-524, "Diagnostic Procedure" .)
- “DTC P0760 SHIFT SOLENOID VALVE C” (Refer to AT-528, "Diagnostic Procedure" .)

OK or NG

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

2. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

Perform “Diagnostic Procedure” for DTC P0745. Refer to AT-516, "Diagnostic Procedure" .

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-503, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0735 A/T 5TH GEAR FUNCTION

PFP:31940

Description

UCS0012P

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift into fifth gear position as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

Gear position		Shift solenoid valve				
		A	B	C	D	E
5th	D	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)
	M5	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)

On Board Diagnosis Logic

UCS0012Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “A/T 5TH GR FNCTN” with CONSULT-II or P0735 without CONSULT-II is detected when A/T cannot be shifted to the 5th gear position even if electrical circuit is good.

Possible Cause

UCS0012R

- Shift solenoid valve B
  (Off stick.)
- Shift solenoid valve C
  (On stick.)
- Shift solenoid valve E
  (On stick.)
- Pressure control solenoid valve A
  (On stick.)
- Pressure control solenoid valve B
  (On stick.)
- Forward clutch
- Direct clutch
- U/D clutch
- Hydraulic control circuit

DTC Confirmation Procedure

UCS0014Q

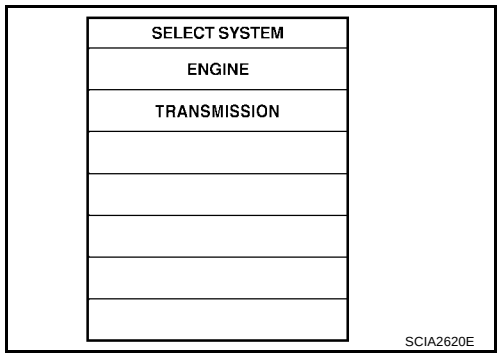
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing 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 “TRANSMISSION” with CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 5th position



[Vehicle speed and accelerator angle: 5th gear position retainable condition. (Refer to AT-603, "VEHICLE SPEED WHEN SHIFTING GEARS" .)]
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-510, "Diagnostic Procedure" .

WITH GST

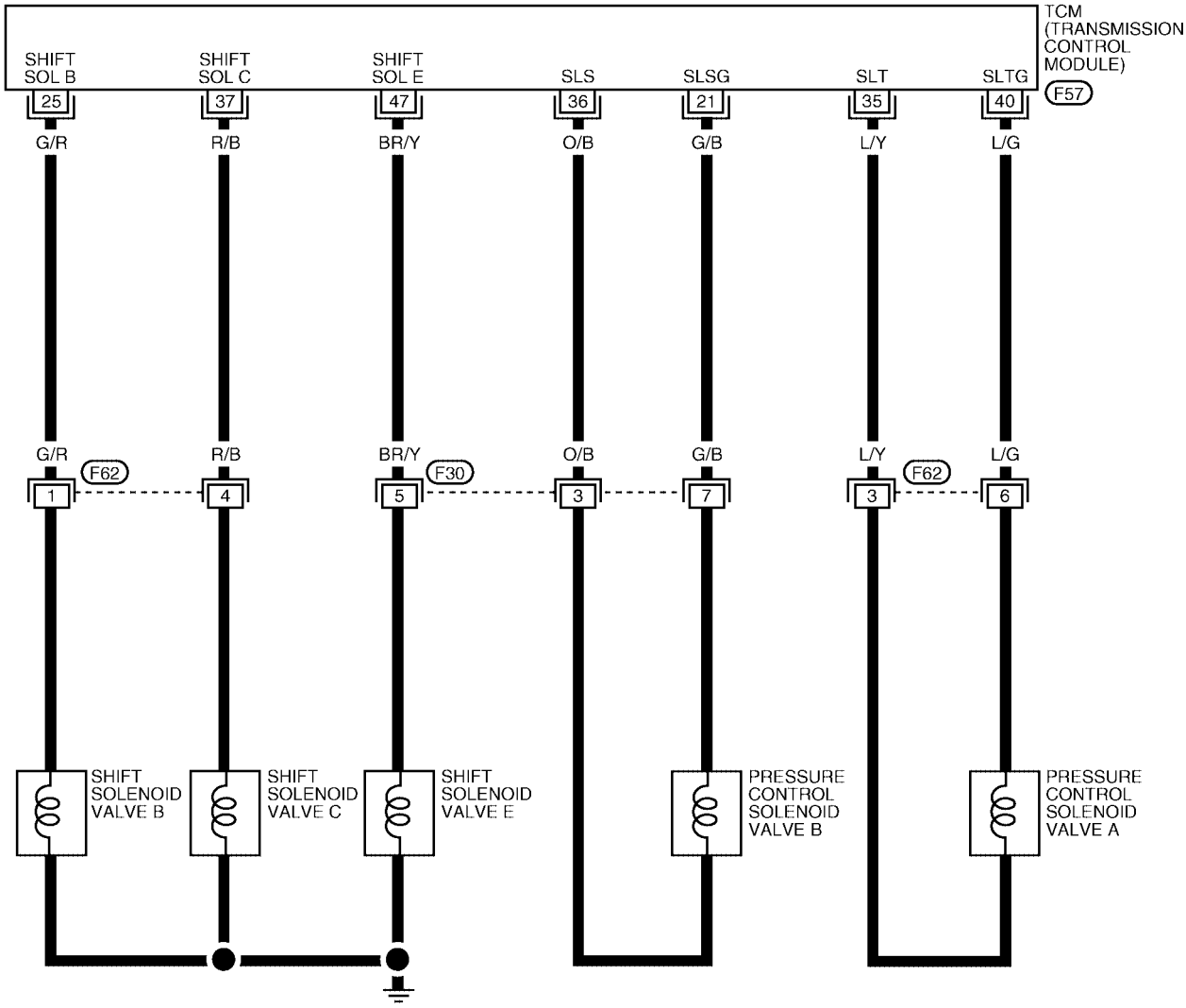
Follow the procedure “With CONSULT-II”.

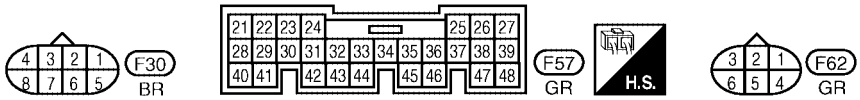
Wiring Diagram — AT — 5THSIG

UCS0012T

AT-5THSIG-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0602E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
21	G/B	Pressure control solenoid valve B ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
36	O/B	Pressure control solenoid valve B		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
47	BR/Y	Shift solenoid valve E		When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
				When shift solenoid valve E does not operate.	0V

Diagnostic Procedure

UCS0012U

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0755 SHIFT SOLENOID VALVE B” (Refer to AT-524, "Diagnostic Procedure" .)
- “DTC P0760 SHIFT SOLENOID VALVE C” (Refer to AT-528, "Diagnostic Procedure" .)
- “DTC P0770 SHIFT SOLENOID VALVE E” (Refer to AT-543, "Diagnostic Procedure" .)

OK or NG

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

2. CHECK EACH PRESSURE CONTROL SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0745 PRESSURE CONTROL SOLENOID VALVE A” (Refer to AT-516, "Diagnostic Procedure" .)
- “DTC P0775 PRESSURE CONTROL SOLENOID VALVE B” (Refer to AT-547, "Diagnostic Procedure" .)

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-507, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

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

PFP:31940

Description

UCS000V1

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the torque converter clutch does not lock up as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, malfunctioning oil pump or torque converter clutch, etc.

On Board Diagnosis Logic

UCS000V2

- This is an OBD-II self-diagnostic item.
- 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.

Possible Cause

UCS000V3

- Pressure control solenoid valve C
  (Off stick.)
- Torque converter clutch
- Hydraulic control circuit

DTC Confirmation Procedure

UCS000V4

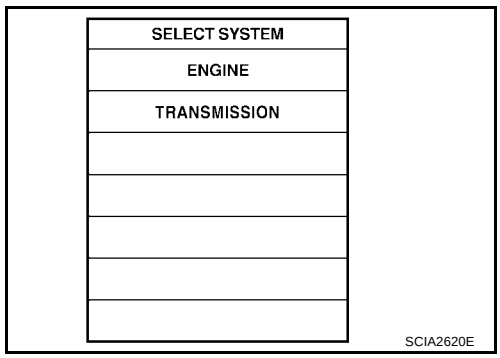
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing 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 “TRANSMISSION” with CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 20°C (68°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Accelerate vehicle to more than 100 km/h (62 MPH) and maintain the following conditions for at least 12 consecutive seconds.
   SLCT LVR POSI: “D” position
   GEAR: 5th position
   SLIP REV: Less than 100 rpm
   ACCELE ANGLE: More than 5 %
   LOCK-UP: ON (Refer to AT-604, "VEHICLE SPEED WHEN PERFORMING AND RELEASING COMPLETE LOCK-UP" .)
   [Vehicle speed: Constant speed of more than 100 km/h (62 MPH).]
   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-513, "Diagnostic Procedure" .

WITH GST

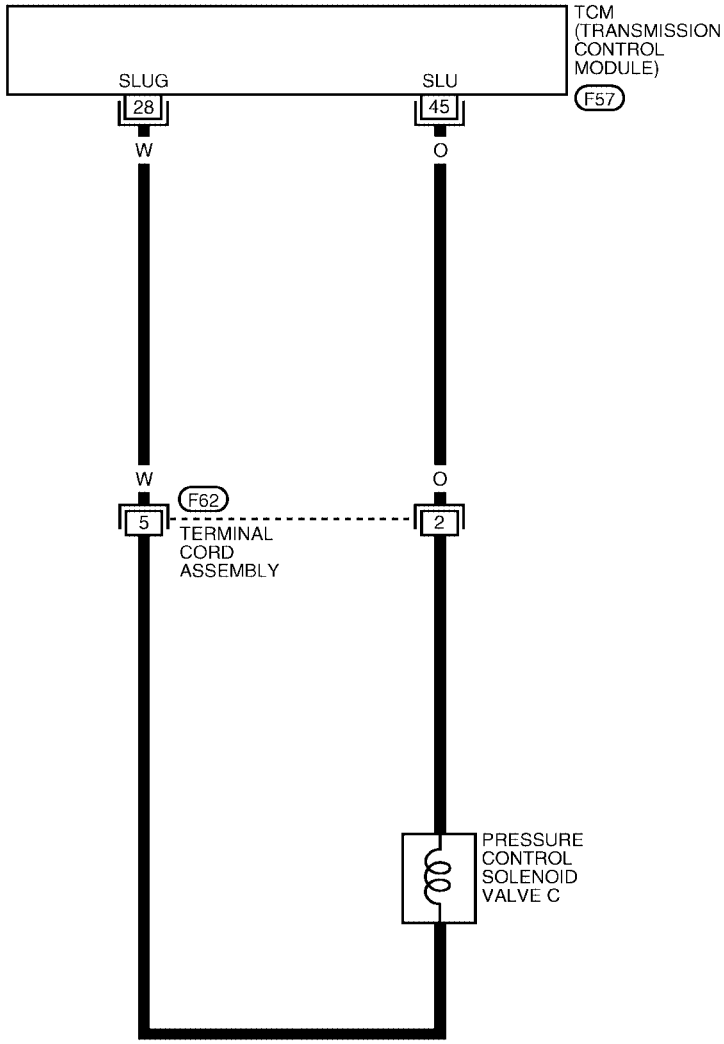
Follow the procedure “With CONSULT-II”.

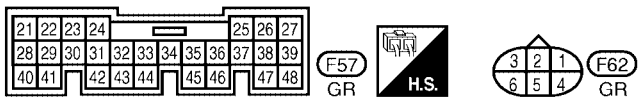
Wiring Diagram — AT — TCCSIG

UCS000V5

AT-TCCSIG-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0597E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz

Diagnostic Procedure

UCS000V6

1. CHECK PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

Perform “Diagnostic Procedure” for DTC P0795. Refer to AT-554, "Diagnostic Procedure" .

OK or NG

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

2. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-511, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

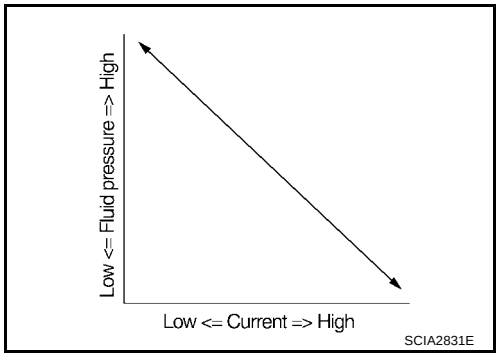
DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE)

PFP:31940

Description

UCS000V7

- The pressure control solenoid valve A is normally high, 3-port linear pressure control solenoid.
- The pressure control solenoid valve A regulates the oil pump discharge pressure to suit the driving condition in response to a signal sent from the TCM.



On Board Diagnosis Logic

UCS000V8

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PC SOL A(L/PRESS)” with CONSULT-II or P0745 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS000V9

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Pressure control solenoid valve A

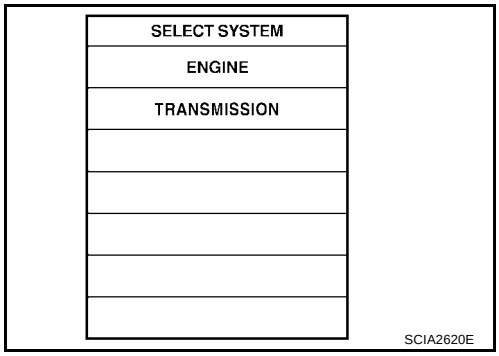
DTC Confirmation Procedure

UCS000VA

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 13 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-516, "Diagnostic Procedure" .



WITH GST

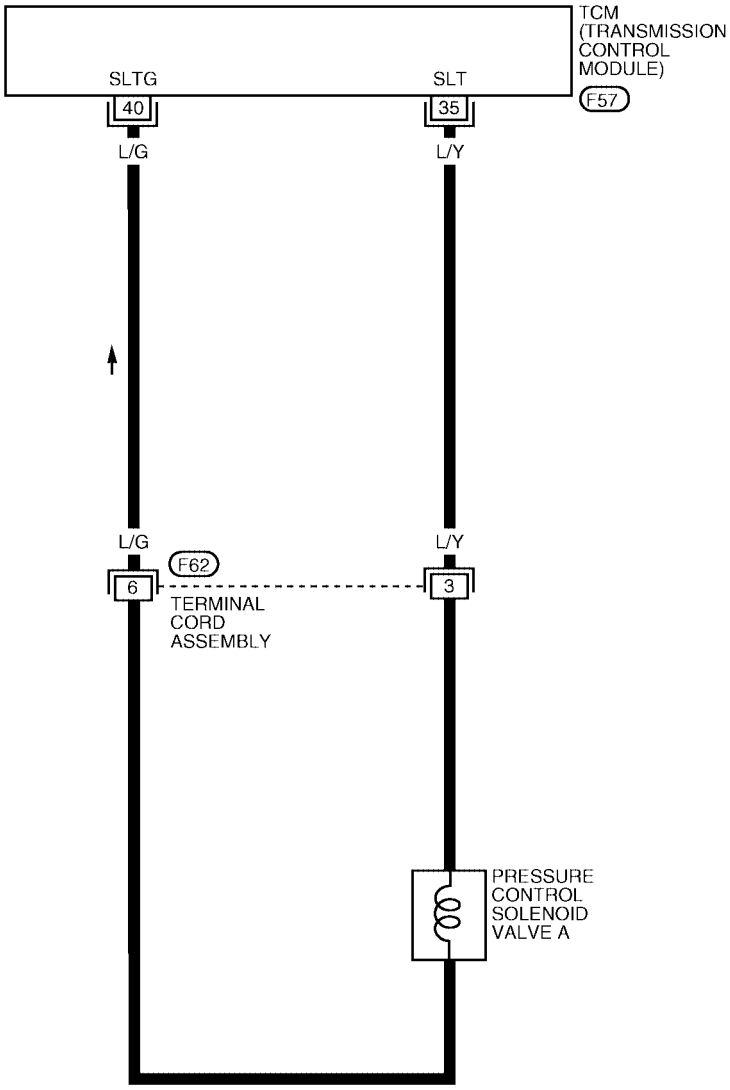
Follow the procedure “With CONSULT-II”.

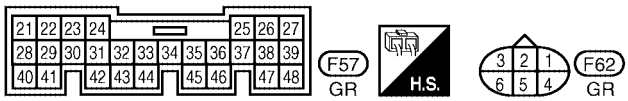
Wiring Diagram — AT — PC/A

UCS000VB

AT-PC/A-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0588E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V

Diagnostic Procedure

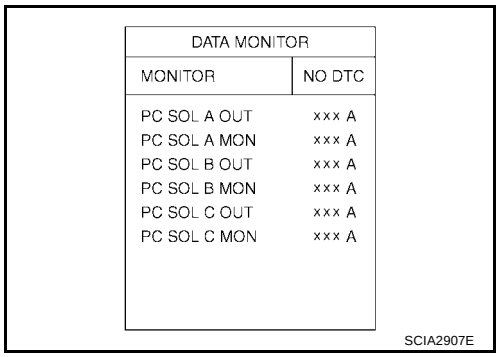
UCS000VC

1. CHECK PRESSURE CONTROL SOLENOID VALVE A SIGNAL

With CONSULT-II

1. After warming up the engine and transaxle, turn ignition switch “OFF”.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-II.
4. Read out the value of “PC SOL A OUT” and “PC SOL A MON”.

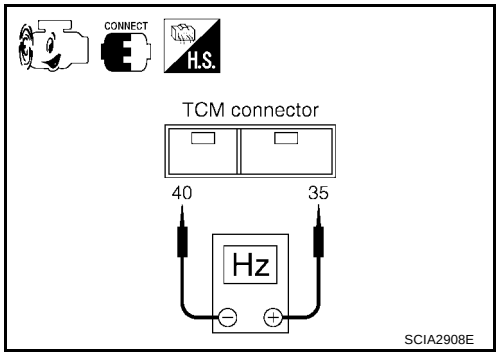
Monitor item	Condition	Display value (Approx.)
● PC SOL A OUT ● PC SOL A MON	When releasing accelerator pedal with setting selector lever to “P” position.	1.00 A
	When depressing accelerator pedal fully setting selector lever to “P” position.	0.32 A



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 35 and 40.

Connector	Terminal (Wire color)	Condition	Data (Approx.)
F57	35 (L/Y) - 40 (L/G) (Ground)	When engine is running with idle speed and setting selector lever to “P” position.	300 Hz



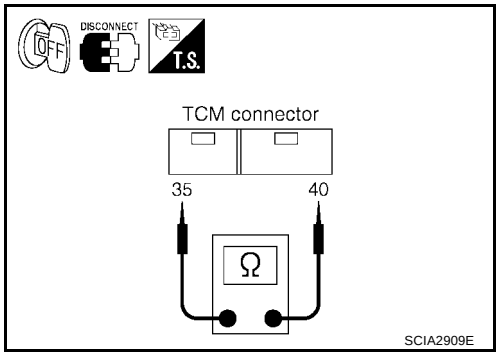
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminals 35 and 40.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	35 (L/Y) - 40 (L/G) (Ground)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



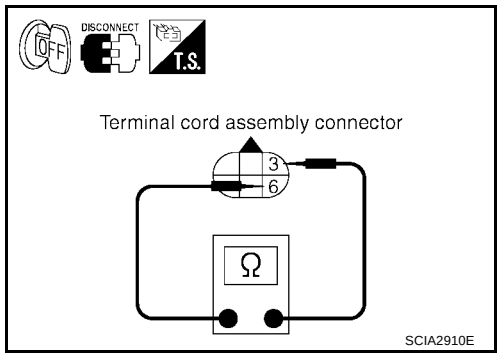
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK PRESSURE CONTROL SOLENOID VALVE A

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 3 and 6.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	3 (L/Y) - 6 (L/G)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND PRESSURE CONTROL SOLENOID VALVE A

Check the following.

- Open or short-circuit in the harness between TCM and pressure control solenoid valve A.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-514, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

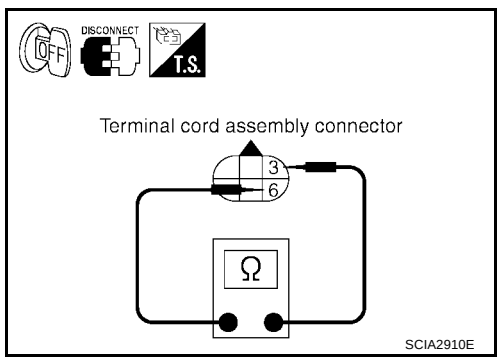
Component Inspection

UCS00157

PRESSURE CONTROL SOLENOID VALVE A

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 3 and 6.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	3 (L/Y) - 6 (L/G)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0750 SHIFT SOLENOID VALVE A

PFP:31940

Description

UCS00131

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve A is a normally open, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve A	ON (Closed)	OFF (Open)	OFF (Open)	OFF (Open)	OFF (Open)	OFF (Open)

On Board Diagnosis Logic

UCS00132

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL A” with CONSULT-II or P0750 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS00133

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve A

DTC Confirmation Procedure

UCS00134

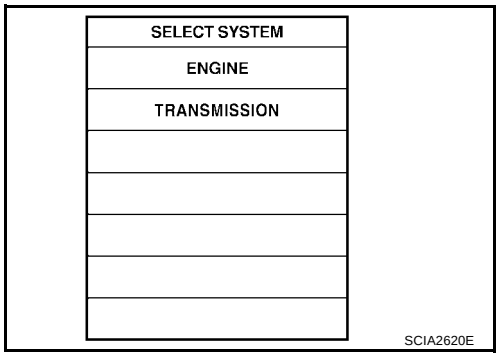
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 1st ⇒ 2nd position
5. If DTC is detected, go to AT-520, "Diagnostic Procedure" .



WITH GST

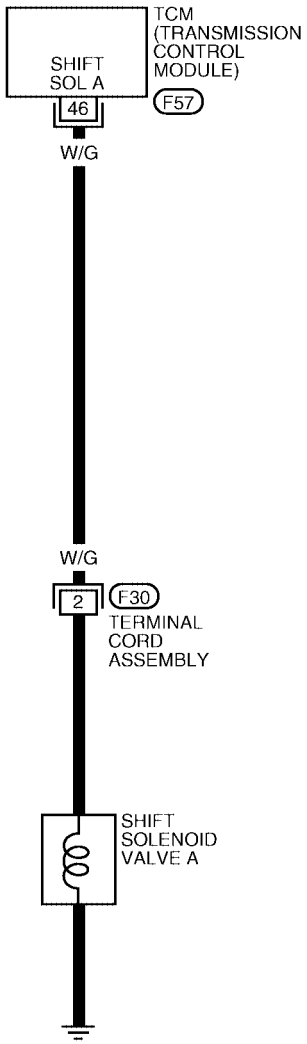
Follow the procedure “With CONSULT-II”.

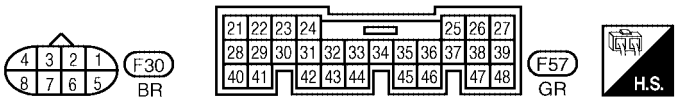
Wiring Diagram — AT — SSV/A

UCS00135

AT-SSV/A-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0582E

TCM terminal and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
46	W/G	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
				When shift solenoid valve A does not operate.	0V

Diagnostic Procedure

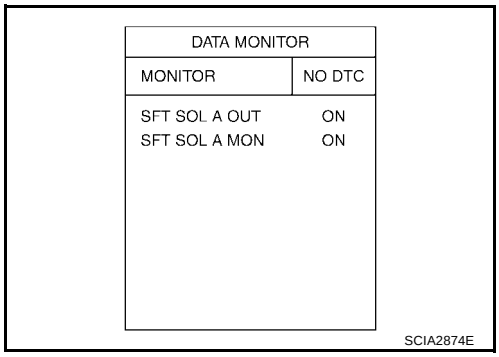
UCS00136

1. CHECK SHIFT SOLENOID VALVE A SIGNAL

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL A OUT” and “SFT SOL A MON”.

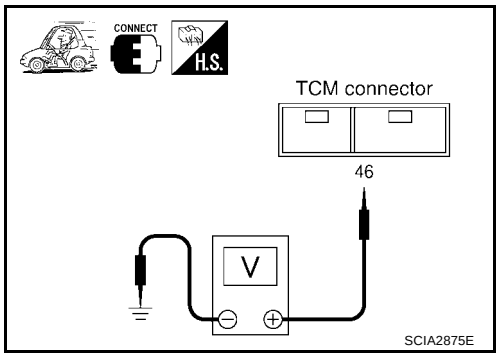
Monitor item	Condition	Indication
● SFT SOL A OUT ● SFT SOL A MON	When shift solenoid valve A operates. (When driving in 1st gear.)	ON
	When shift solenoid valve A does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
F57	46 (W/G) - Ground	When shift solenoid valve A operates. (When driving in 1st gear.)	Battery voltage
		When shift solenoid valve A does not operate.	0V



OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

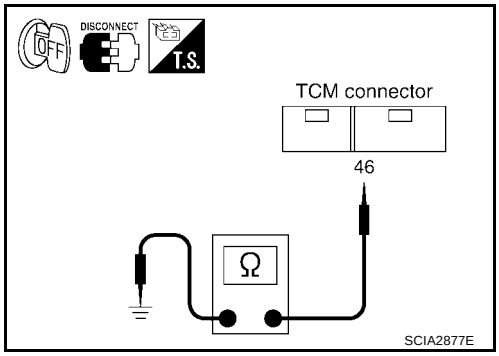
2. CHECK SHIFT SOLENOID VALVE A CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 46 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	46 (W/G) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

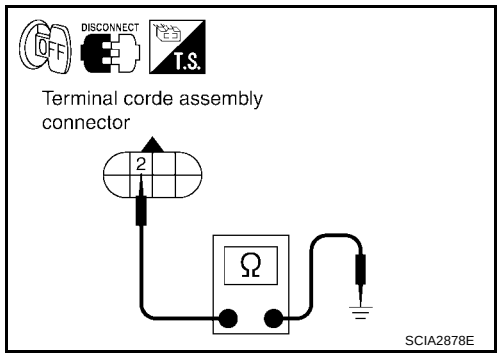
OK >> GO TO 5.
NG >> GO TO 3.



3. CHECK SHIFT SOLENOID VALVE A

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 2 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F30	2 (W/G) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND SHIFT SOLENOID VALVE A

Check the following.

- Open or short-circuit in the harness between TCM and shift solenoid valve A.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-518, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

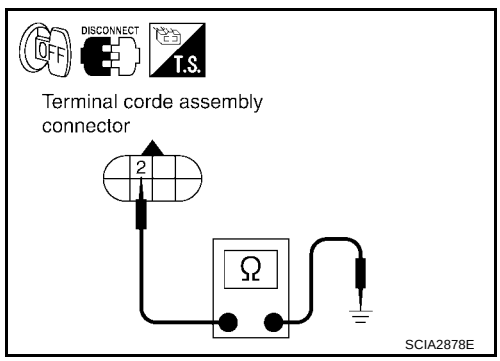
Component Inspection

UCS00150

SHIFT SOLENOID VALVE A

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 2 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F30	2 (W/G) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0755 SHIFT SOLENOID VALVE B

PFP:31940

Description

UCS0013D

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve B is a normally closed, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve B	ON (Open)	OFF (Closed)	OFF (Closed)	OFF (Closed)	ON (Open)	OFF (Closed)

On Board Diagnosis Logic

UCS0013E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL B” with CONSULT-II or P0755 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS0013F

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve B

DTC Confirmation Procedure

UCS0014R

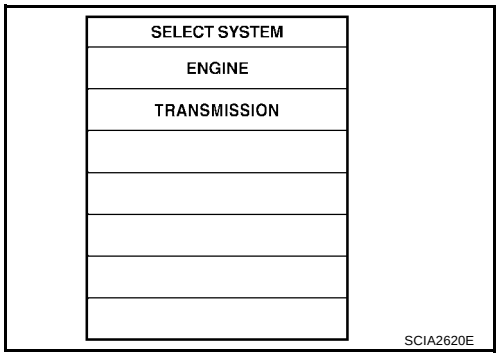
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 1st ⇒ 2nd and 4th ⇒ 5th position
5. If DTC is detected, go to AT-524, "Diagnostic Procedure" .



WITH GST

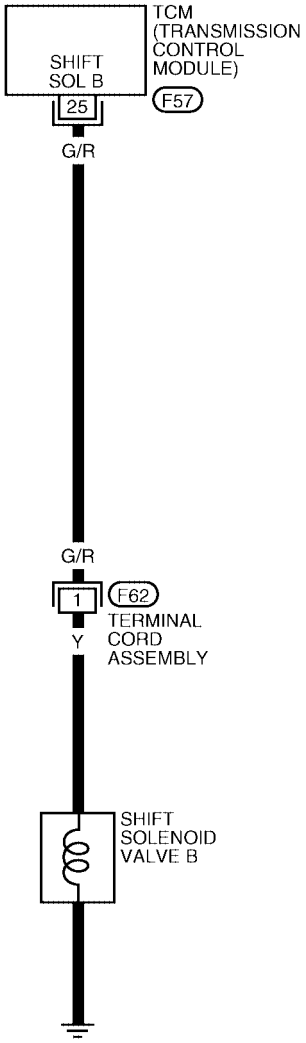
Follow the procedure “With CONSULT-II”.

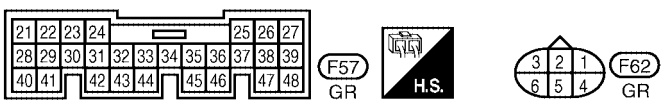
Wiring Diagram — AT — SSV/B

UCS0013H

AT-SSV/B-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0583E

TCM terminal and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
25	G/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
				When shift solenoid valve B does not operate.	0V

Diagnostic Procedure

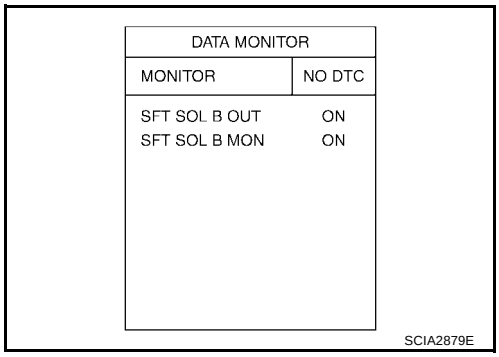
UCS0013I

1. CHECK SHIFT SOLENOID VALVE B SIGNAL

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL B OUT” and “SFT SOL B MON”.

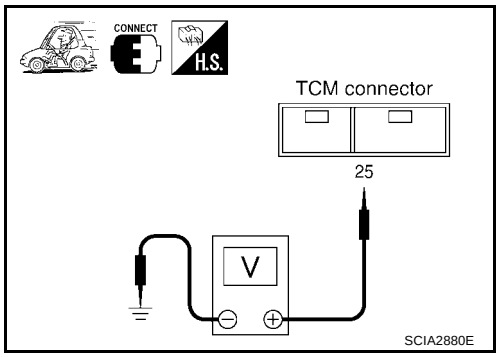
Monitor item	Condition	Indication
● SFT SOL B OUT ● SFT SOL B MON	When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	ON
	When shift solenoid valve B does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
F57	25 (G/R) - Ground	When shift solenoid valve B operates. (When driving in 1st or 5th gear.)	Battery voltage
		When shift solenoid valve B does not operate.	0V



OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

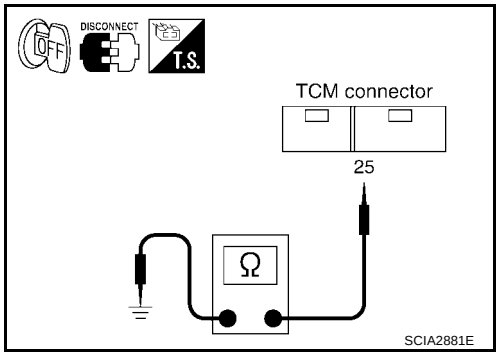
2. CHECK SHIFT SOLENOID VALVE B CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 25 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	25 (G/R) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

OK or NG

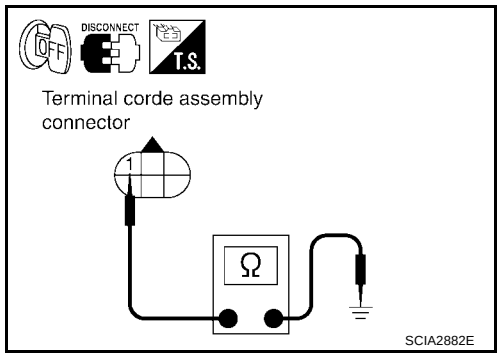
OK >> GO TO 5.
NG >> GO TO 3.



3. CHECK SHIFT SOLENOID VALVE B

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	1 (G/R) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND SHIFT SOLENOID VALVE B

Check the following.

- Open or short-circuit in the harness between TCM and shift solenoid valve B.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-522, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

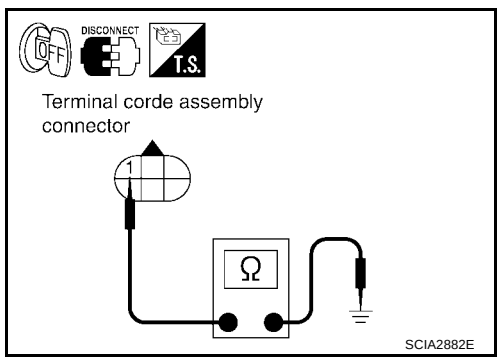
Component Inspection

UCS00151

SHIFT SOLENOID VALVE B

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	1 (G/R) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0760 SHIFT SOLENOID VALVE C

PFP:31940

Description

UCS0013J

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve C is a normally closed, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve C	ON (Open)	ON (Open)	ON (Open)	OFF (Closed)	OFF (Closed)	ON (Open)

On Board Diagnosis Logic

UCS0013K

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL C” with CONSULT-II or P0760 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS0013L

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve C

DTC Confirmation Procedure

UCS0014S

CAUTION:

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

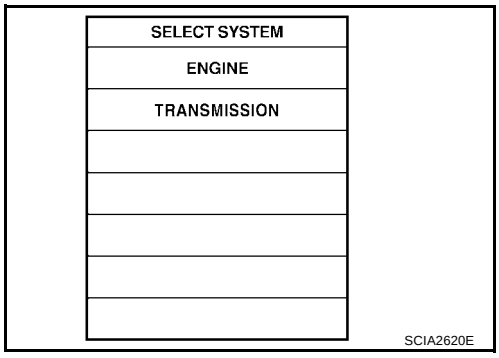
NOTE:

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

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 3rd ⇒ 4th position
5. If DTC is detected, go to AT-528, "Diagnostic Procedure" .



WITH GST

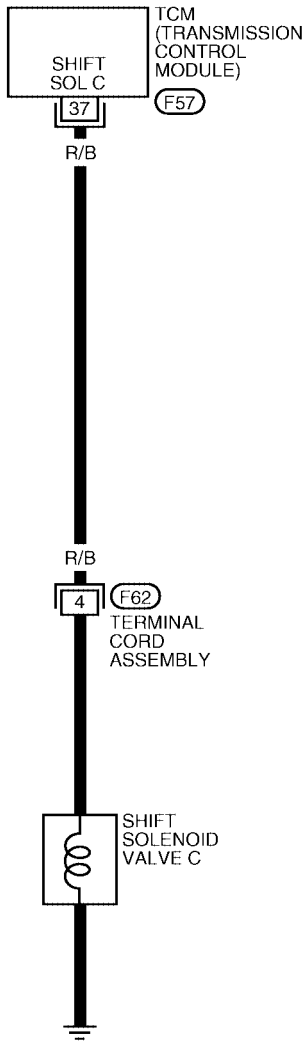
Follow the procedure “With CONSULT-II”.

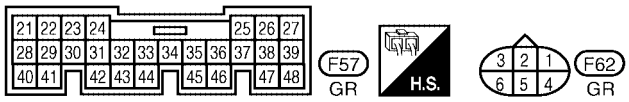
Wiring Diagram — AT — SSV/C

UCS0013N

AT-SSV/C-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0584E

TCM terminal and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V

Diagnostic Procedure

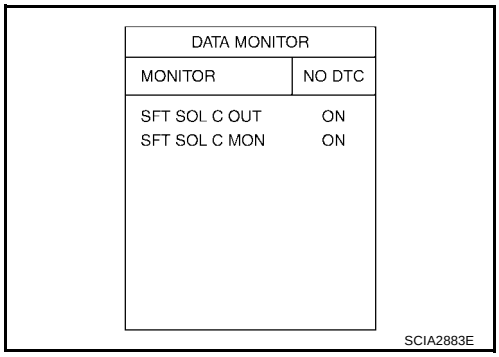
UCS0013O

1. CHECK SHIFT SOLENOID VALVE C SIGNAL

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL C OUT” and “SFT SOL C MON”.

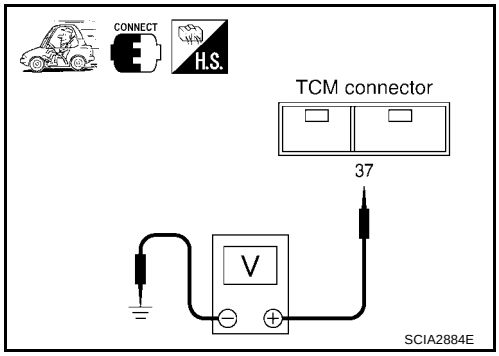
Monitor item	Condition	Indication
● SFT SOL C OUT ● SFT SOL C MON	When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	ON
	When shift solenoid valve C does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
F57	37 (R/B) - Ground	When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
		When shift solenoid valve C does not operate.	0V



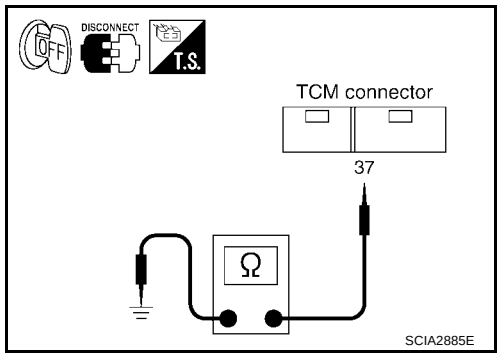
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK SHIFT SOLENOID VALVE C CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 37 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	37 (R/B) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



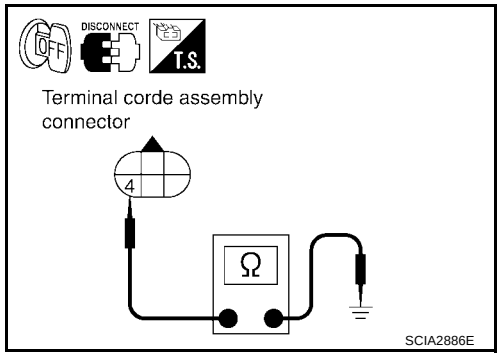
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK SHIFT SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 4 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	4 (R/B) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND SHIFT SOLENOID VALVE C

Check the following.

- Open or short-circuit in the harness between TCM and shift solenoid valve C.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-526, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

Component Inspection

UCS00152

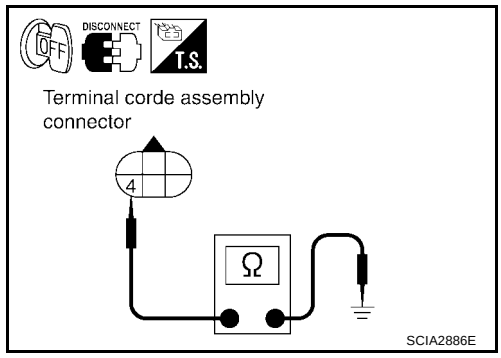
SHIFT SOLENOID VALVE C

1. Turn ignition switch “OFF”.

2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 4 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	4 (R/B) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .



DTC P0762 SHIFT SOLENOID VALVE C STUCK ON

PFP:31940

Description

UCS00141

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.
- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve C is a normally closed, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve C	ON (Open)	ON (Open)	ON (Open)	OFF (Closed)	OFF (Closed)	ON (Open)

On Board Diagnosis Logic

UCS00142

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SFT SOL C STUCK ON” with CONSULT-II or P0762 without CONSULT-II is detected when condition of shift solenoid valve C is different from monitor value, and relation between gear position and actual gear ratio is irregular.

Possible Cause

UCS00143

- Shift solenoid valve C
  (On stick.)
- Hydraulic control circuit

DTC Confirmation Procedure

UCS0014V

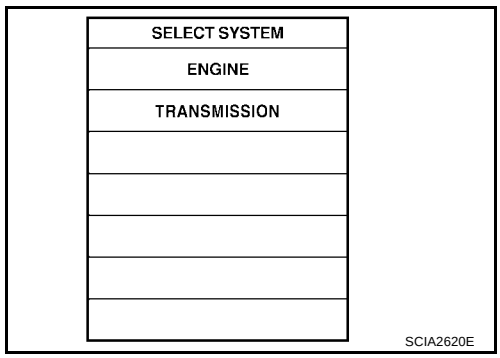
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 3rd ⇒ 4th position
   ACCELE ANGLE: More than 10 %
5. If DTC is detected, go to AT-533, "Diagnostic Procedure" .



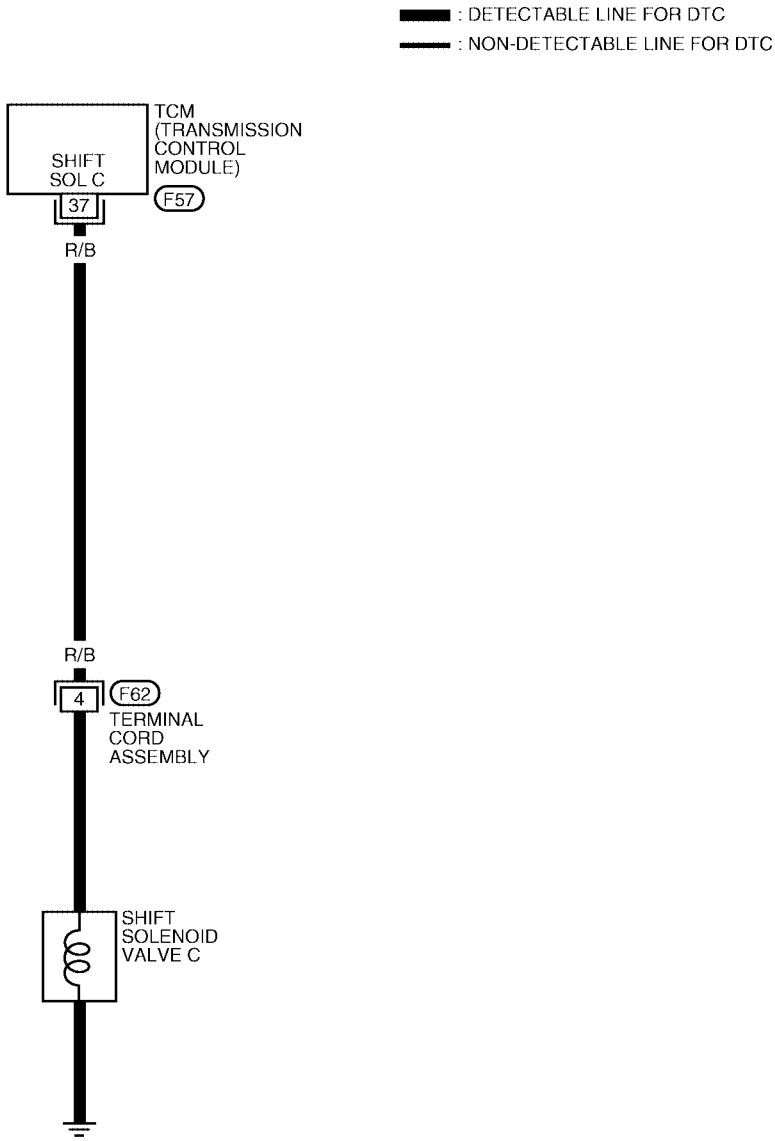
WITH GST

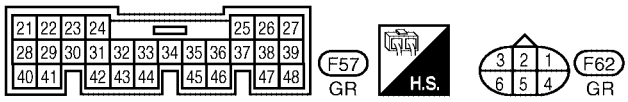
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SSV/CS

UCS00145

AT-SSV/CS-01





BBWA0585E

TCM terminal and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
37	R/B	Shift solenoid valve C		When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
				When shift solenoid valve C does not operate.	0V

Diagnostic Procedure

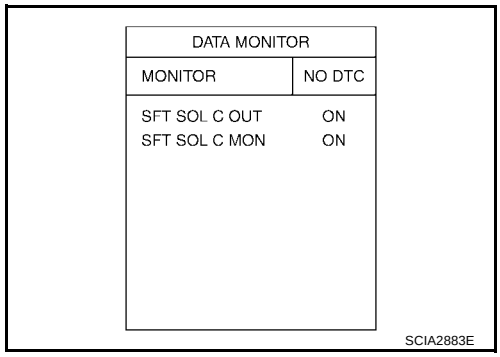
UCS00155

1. CHECK SHIFT SOLENOID VALVE C SIGNAL

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL C OUT” and “SFT SOL C MON”.

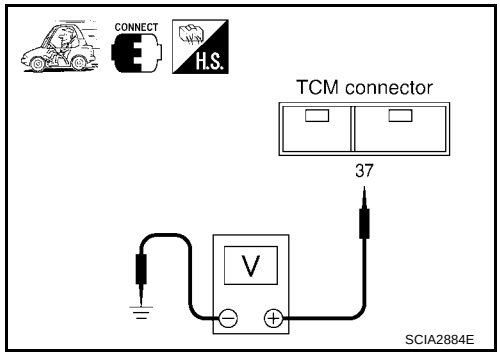
Monitor item	Condition	Indication
● SFT SOL C OUT ● SFT SOL C MON	When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	ON
	When shift solenoid valve C does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
F57	37 (R/B) - Ground	When shift solenoid valve C operates. (When driving in 1st, 2nd, 3rd or reverse gear.)	Battery voltage
		When shift solenoid valve C does not operate.	0V



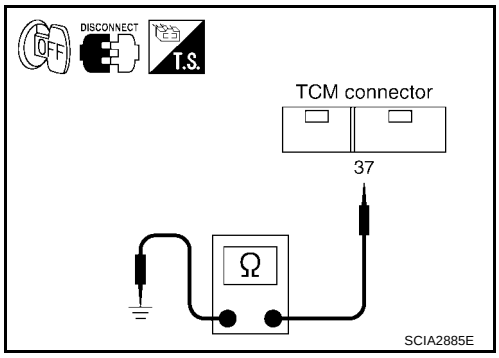
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK SHIFT SOLENOID VALVE C CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 37 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	37 (R/B) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



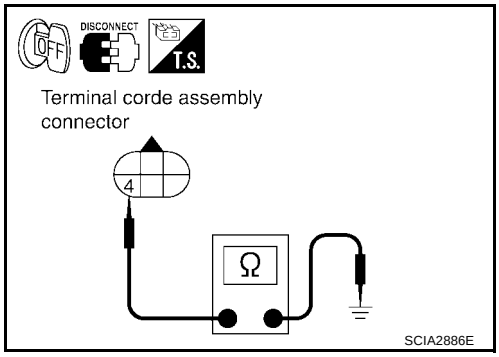
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK SHIFT SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 4 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	4 (R/B) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND SHIFT SOLENOID VALVE C

Check the following.

- Open or short-circuit in the harness between TCM and shift solenoid valve C.

OK or NG

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

5. CHECK TCM

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

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-531, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

Component Inspection

UCS0015H

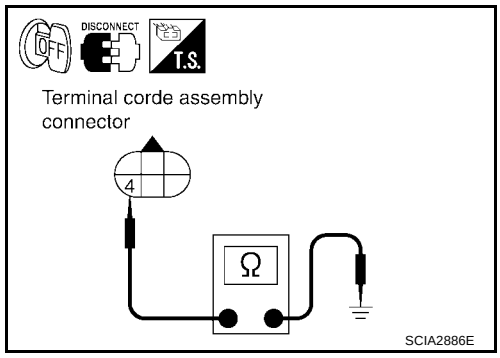
SHIFT SOLENOID VALVE C

1. Turn ignition switch “OFF”.

2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 4 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	4 (R/B) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .



DTC P0765 SHIFT SOLENOID VALVE D

PFP:31940

Description

UCS0013P

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve D is a normally open, ON-OFF type solenoid.

Gear position	D_1 , M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve D	OFF (Open)	OFF (Open)	ON (Closed)	ON (Closed)	ON (Closed)	OFF (Open)

On Board Diagnosis Logic

UCS0013Q

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL D” with CONSULT-II or P0765 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS0013R

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve D

DTC Confirmation Procedure

UCS0014T

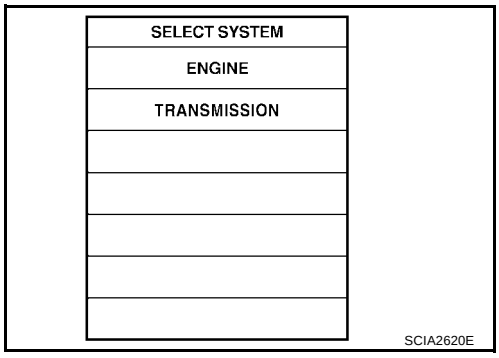
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 2nd ⇒ 3rd position
5. If DTC is detected, go to AT-538, "Diagnostic Procedure" .



WITH GST

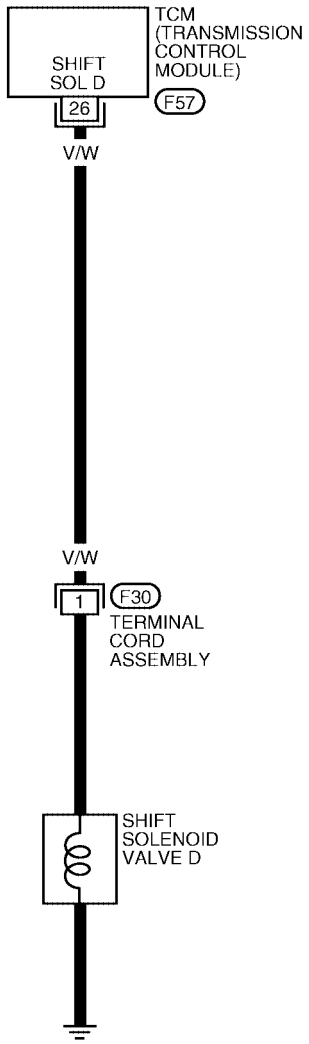
Follow the procedure “With CONSULT-II”.

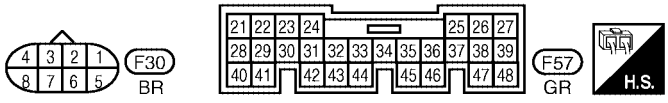
Wiring Diagram — AT — SSV/D

UCS0013T

AT-SSV/D-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0586E

TCM terminal and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V

Diagnostic Procedure

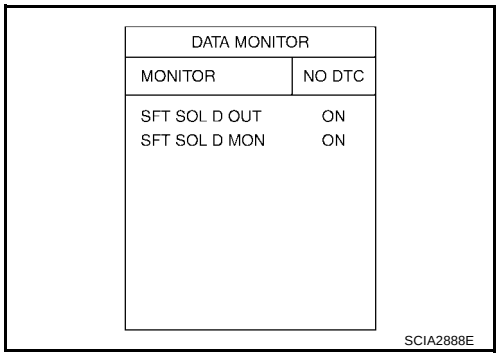
UCS0013U

1. CHECK SHIFT SOLENOID VALVE D SIGNAL

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL D OUT” and “SFT SOL D MON”.

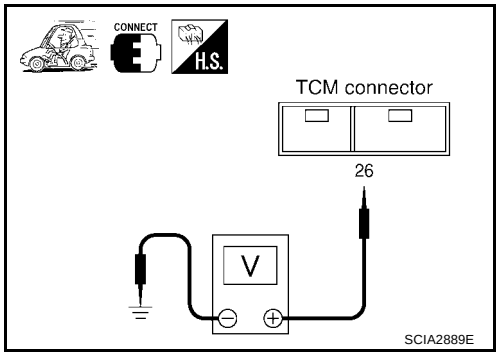
Monitor item	Condition	Indication
● SFT SOL D OUT ● SFT SOL D MON	When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	ON
	When shift solenoid valve D does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
F57	26 (V/W) - Ground	When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
		When shift solenoid valve D does not operate.	0V



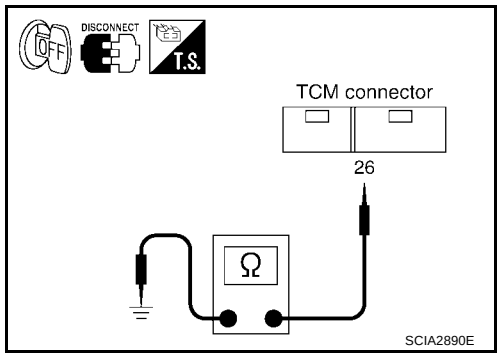
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK SHIFT SOLENOID VALVE D CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 26 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	26 (V/W) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



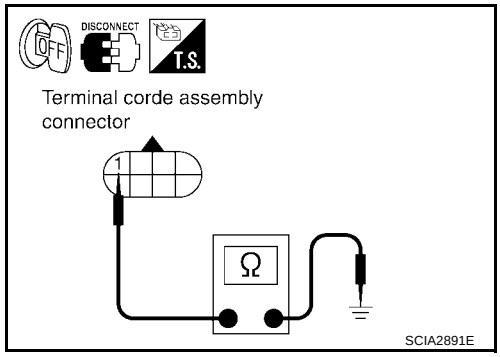
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK SHIFT SOLENOID VALVE D

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F30	1 (V/W) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND SHIFT SOLENOID VALVE D

Check the following.

- Open or short-circuit in the harness between TCM and shift solenoid valve D.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-536, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

Component Inspection

UCS00153

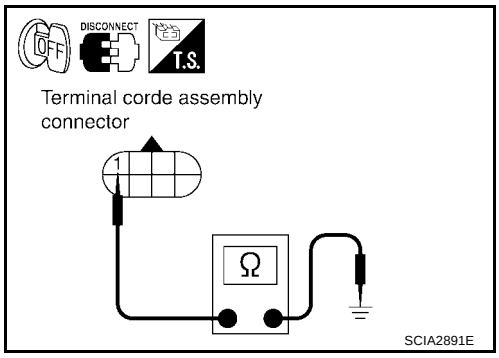
SHIFT SOLENOID VALVE D

1. Turn ignition switch “OFF”.

2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 1 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F30	1 (V/W) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω

4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .



DTC P0770 SHIFT SOLENOID VALVE E

PFP:31940

Description

UCS00137

- Shift solenoid valves are installed directly in control valve body. The shift solenoid valves operates of ON and OFF by the control signal from TCM. Combinations of 5 shift solenoid valves, A, B, C, D and E, shifts gear positions.
- The shift solenoid valve E is a normally closed, ON-OFF type solenoid.

Gear position	D_1	M_1	D_2 , M_2	D_3 , M_3	D_4 , M_4	D_5 , M_5	Reverse
Shift solenoid valve E	OFF (Closed)	ON (Open)	OFF (Closed)	OFF (Closed)	OFF (Closed)	OFF (Closed)	ON (Open)

NOTE:
The condition of shift solenoid valve E is ON (Open) with shifting $D_2 \Leftrightarrow D_3$ and $D_3 \Leftrightarrow D_4$.

On Board Diagnosis Logic

UCS00138

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT SOL E” with CONSULT-II or P0770 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS00139

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Shift solenoid valve E

DTC Confirmation Procedure

UCS0014U

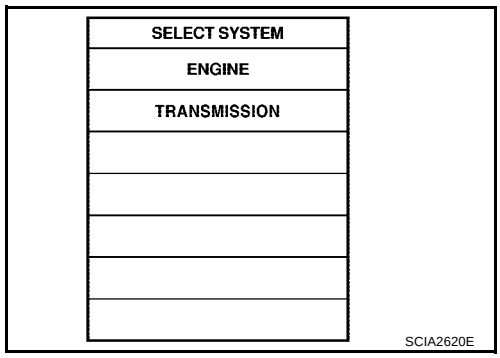
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Move selector lever between “N” and “R”.
   SLCT LVR POSI: “N” ⇔ “R” position
5. If DTC is detected, go to AT-543, "Diagnostic Procedure" .



WITH GST

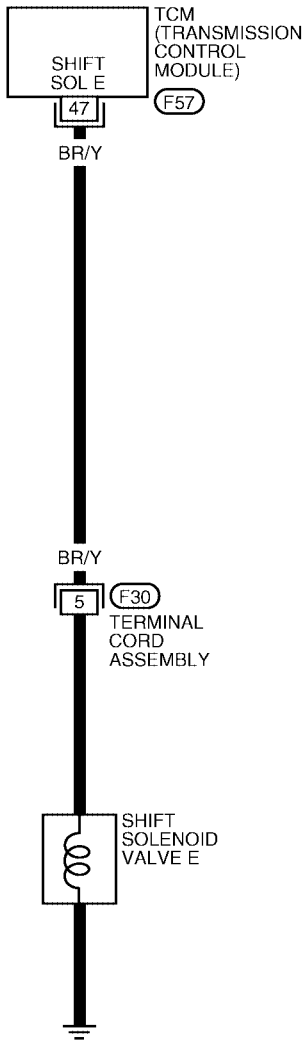
Follow the procedure “With CONSULT-II”.

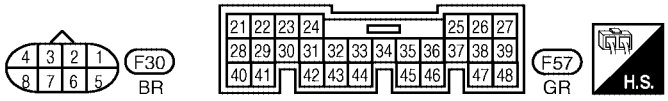
Wiring Diagram — AT — SSV/E

UCS0013B

AT-SSV/E-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0587E

TCM terminal and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
47	BR/Y	Shift solenoid valve E		When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
				When shift solenoid valve E does not operate.	0V

Diagnostic Procedure

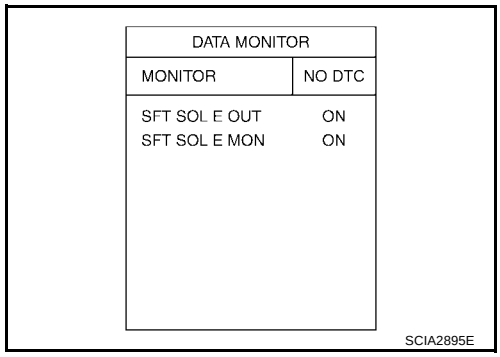
UCS0013C

1. CHECK SHIFT SOLENOID VALVE E SIGNAL

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Drive vehicle and read out the value of “SFT SOL E OUT” and “SFT SOL E MON”.

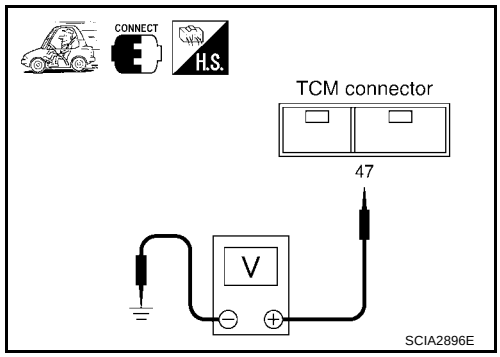
Monitor item	Condition	Indication
● SFT SOL E OUT ● SFT SOL E MON	When shift solenoid valve E operates. (When driving in reverse gear.)	ON
	When shift solenoid valve E does not operate.	OFF



Without CONSULT-II

1. Drive vehicle.
2. Check voltage between TCM connector terminal and ground.

Connector	Terminal (Wire color)	Condition	Voltage (Approx.)
F57	47 (BR/Y) - Ground	When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
		When shift solenoid valve E does not operate.	0V



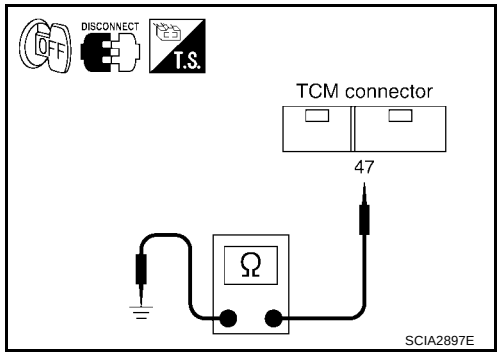
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK SHIFT SOLENOID VALVE E CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminal 47 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	47 (BR/Y) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



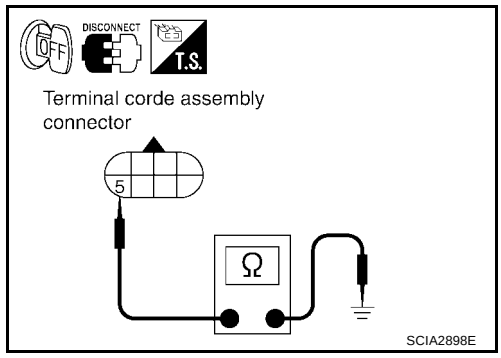
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK SHIFT SOLENOID VALVE E

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 5 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F30	5 (BR/Y) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND SHIFT SOLENOID VALVE E

Check the following.

- Open or short-circuit in the harness between TCM and shift solenoid valve E.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-541, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

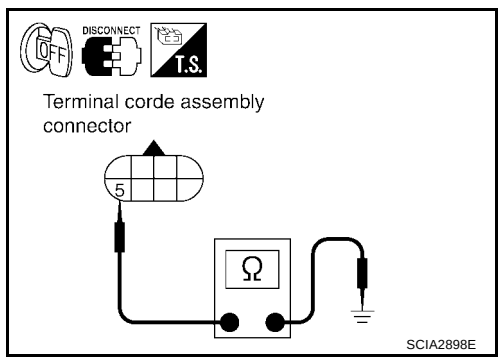
Component Inspection

UCS00154

SHIFT SOLENOID VALVE E

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminal 5 and ground.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F30	5 (BR/Y) - Ground	Temperature: 20°C (68°F)	11 - 16 Ω



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

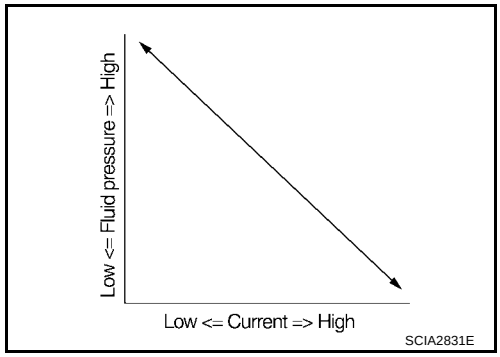
DTC P0775 PRESSURE CONTROL SOLENOID VALVE B (SHIFT PRESSURE)

PFP:31940

Description

UCS0012V

- The pressure control solenoid valve B is normally high, 3-port linear pressure control solenoid.
- The pressure control solenoid valve B controls linear shift pressure by control signal from TCM and controls 2nd coast brake directly under 2nd, 3rd, 4th and direct clutch directly under 5th and reverse.



On Board Diagnosis Logic

UCS0012W

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PC SOL B(SFT/PRS)” with CONSULT-II or P0775 without CONSULT-II is detected under the following conditions.
  - When normal voltage is not applied to solenoid due to open, short, and so on.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS0012X

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Pressure control solenoid valve B

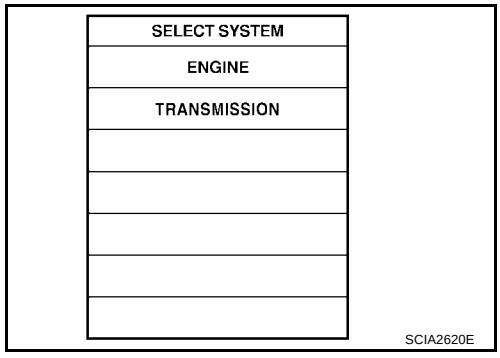
DTC Confirmation Procedure

UCS0012Y

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 13 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-547, "Diagnostic Procedure" .



WITH GST

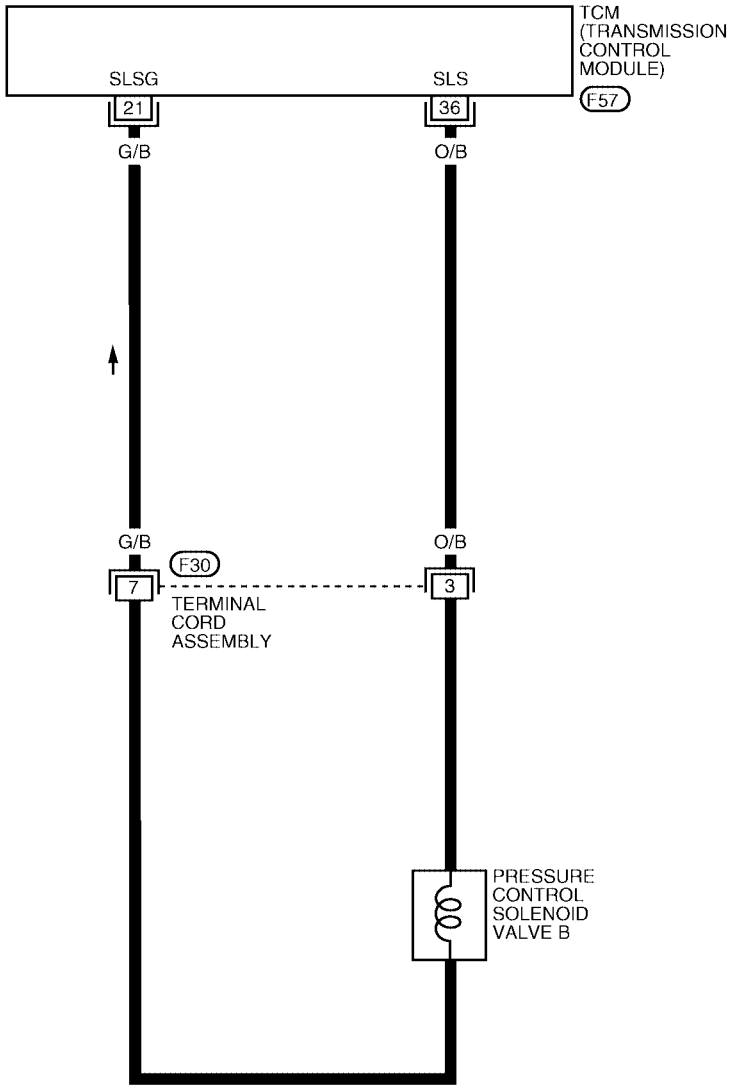
Follow the procedure “With CONSULT-II”.

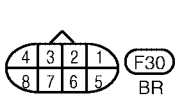
Wiring Diagram — AT — PC/B

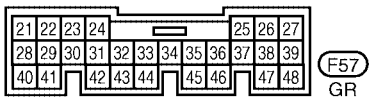
UCS0012Z

AT-PC/B-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC







BBWA0589E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
21	G/B	Pressure control solenoid valve B ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
36	O/B	Pressure control solenoid valve B		When engine is running with idle speed and setting selector lever to “P” position.	300Hz

Diagnostic Procedure

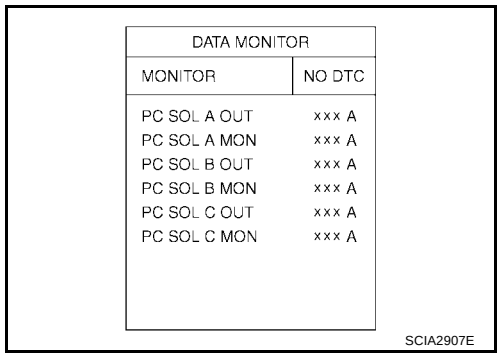
UCS00130

1. CHECK PRESSURE CONTROL SOLENOID VALVE B SIGNAL

With CONSULT-II

1. After warming up the engine and transaxle, turn ignition switch “OFF”.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Select “DATA MONITOR” mode for “TRANSMISSION” with CONSULT-II.
4. Read out the value of “PC SOL B OUT” and “PC SOL B MON”.

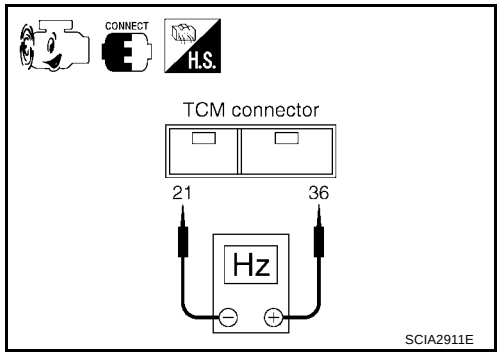
Monitor item	Condition	Display value (Approx.)
● PC SOL B OUT	Selector lever: Manual shift gate position	1.00 A
● PC SOL B MON	Other than the above.	0.30 A



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 21 and 36.

Connector	Terminal (Wire color)	Condition	Data (Approx.)
F57	36 (O/B) - 21 (G/B) (Ground)	When engine is running with idle speed and setting selector lever to “P” position.	300 Hz



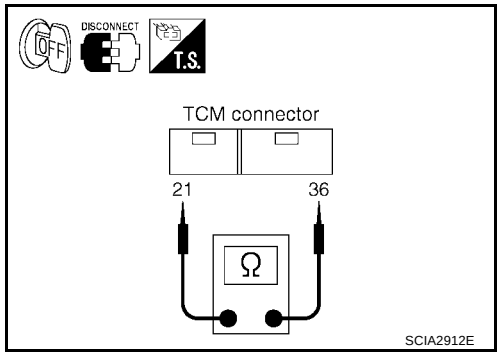
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK PRESSURE CONTROL SOLENOID VALVE B CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminals 21 and 36.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	36 (O/B) - 21 (G/B) (Ground)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



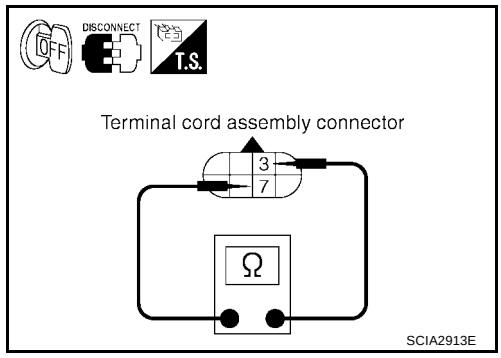
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK PRESSURE CONTROL SOLENOID VALVE B

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 3 and 7.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	3 (O/B) - 7 (G/B)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND PRESSURE CONTROL SOLENOID VALVE B

Check the following.

- Open or short-circuit in the harness between TCM and pressure control solenoid valve B.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-545, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

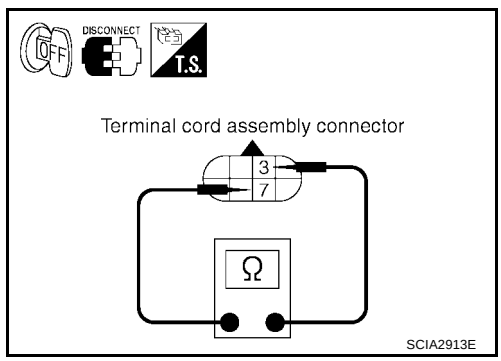
Component Inspection

UCS00158

PRESSURE CONTROL SOLENOID VALVE B

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 3 and 7.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	3 (O/B) - 7 (G/B)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0780 SHIFT

PFP:31940

Description

UCS0014D

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This malfunction is detected when the A/T does not shift as instructed by the TCM. This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.

On Board Diagnosis Logic

UCS0014E

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “SHIFT” with CONSULT-II or P0780 without CONSULT-II is detected under the following conditions.
  - When no rotation change occurs between input (turbine revolution sensor) and output (revolution sensor) and shifting time is long.
  - When shifting ends immediately.
  - When engine revs up unusually during shifting.

Possible Cause

UCS0014F

- Shift solenoid valve D
  (Off error.)
- Shift solenoid valve E
  (Off error.)
- Pressure control solenoid valve A
  (On/Off error.)
- Pressure control solenoid valve B
  (On/Off error.)
- Pressure control solenoid valve C
  (On/Off error.)
- Hydraulic control circuit

DTC Confirmation Procedure

UCS0014W

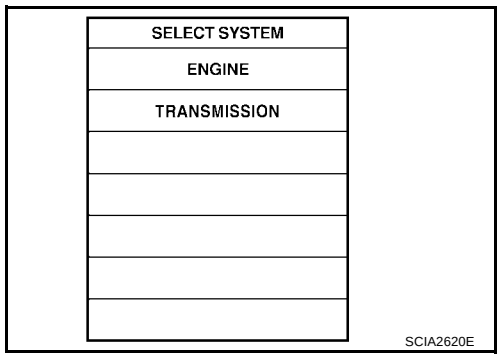
CAUTION:

- **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 performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Start engine and select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
2. Make sure that ATF temperature is within the range below.
   FLUID TEMP: More than 60°C (140°F)
   If out of range, drive the vehicle to warm up the fluid.
3. Drive vehicle and allow the following conditions.
   SLCT LVR POSI: “D” position
   GEAR: 1st ⇒ 2nd ⇒ 3rd ⇒ 4th ⇒ 5th position
   (Vehicle speed: Refer to AT-603, "VEHICLE SPEED WHEN SHIFTING GEARS" .)
4. If DTC is detected, go to AT-551, "Diagnostic Procedure" .



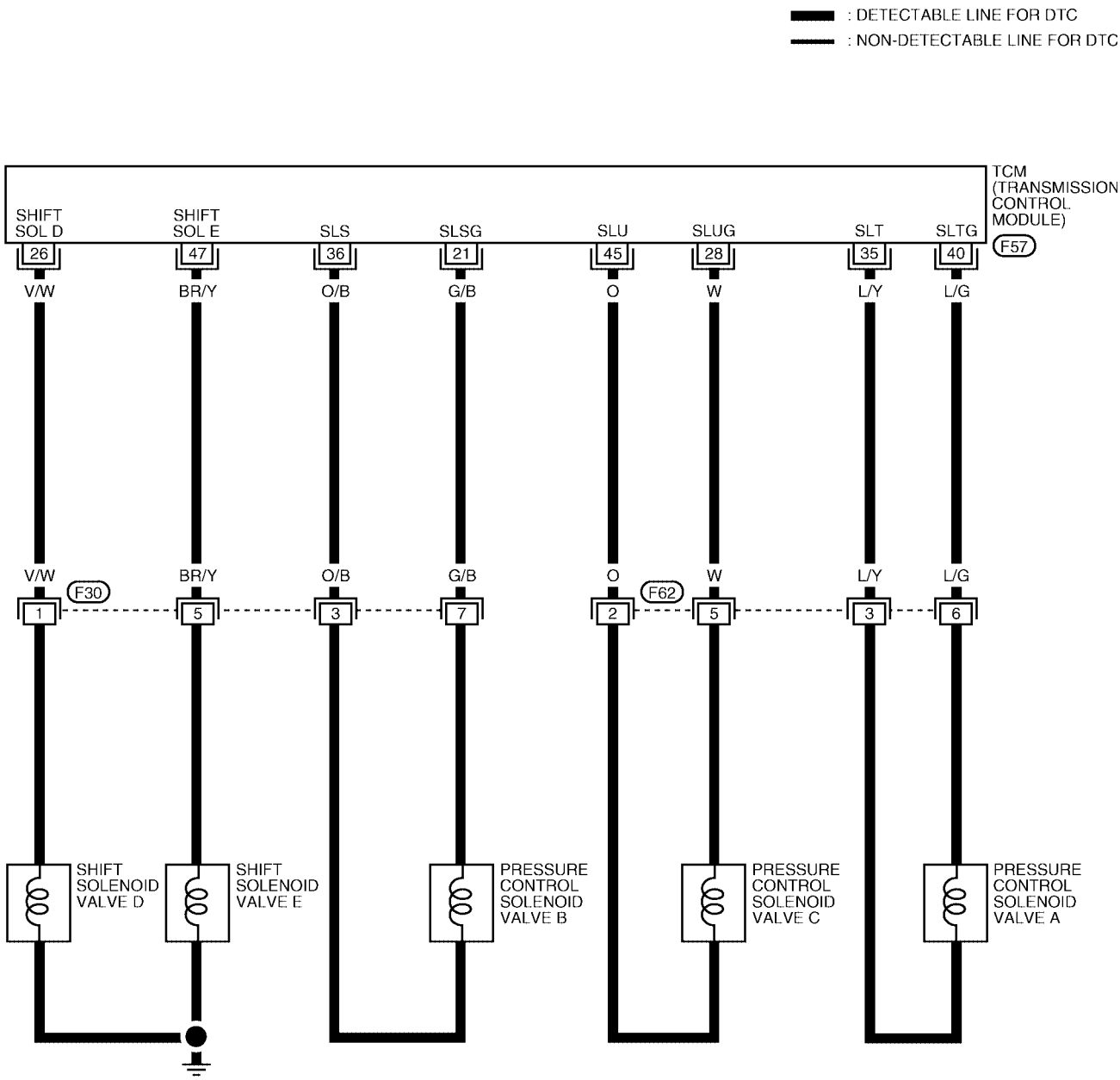
WITH GST

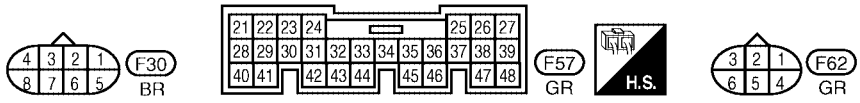
Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — SFTFNC

UCS0014H

AT-SFTFNC-01





BBWA0603E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
21	G/B	Pressure control solenoid valve B ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
26	V/W	Shift solenoid valve D		When shift solenoid valve D operates. (When driving in 3rd, 4th or 5th gear.)	Battery voltage
				When shift solenoid valve D does not operate.	0V
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
35	L/Y	Pressure control solenoid valve A		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
36	O/B	Pressure control solenoid valve B		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
40	L/G	Pressure control solenoid valve A ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz
47	BR/Y	Shift solenoid valve E		When shift solenoid valve E operates. (When driving in reverse gear.)	Battery voltage
				When shift solenoid valve E does not operate.	0V

Diagnostic Procedure

UCS0014I

1. CHECK EACH SHIFT SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0765 SHIFT SOLENOID VALVE D” (Refer to AT-538, "Diagnostic Procedure" .)
- “DTC P0770 SHIFT SOLENOID VALVE E” (Refer to AT-543, "Diagnostic Procedure" .)

OK or NG

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

2. CHECK EACH PRESSURE CONTROL SOLENOID VALVE CIRCUIT

Perform “Diagnostic Procedure” for the following DTCs.

- “DTC P0745 PRESSURE CONTROL SOLENOID VALVE A” (Refer to AT-516, "Diagnostic Procedure" .)
- “DTC P0775 PRESSURE CONTROL SOLENOID VALVE B” (Refer to AT-547, "Diagnostic Procedure" .)
- “DTC P0795 PRESSURE CONTROL SOLENOID VALVE C” (Refer to AT-554, "Diagnostic Procedure" .)

OK or NG

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

3. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-549, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

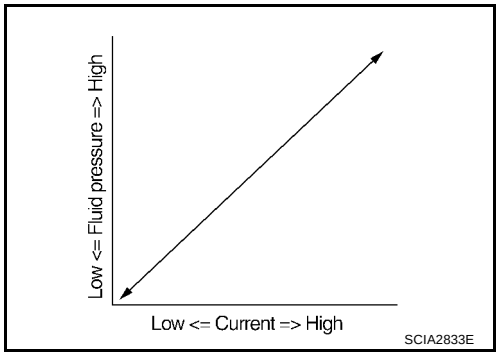
DTC P0795 PRESSURE CONTROL SOLENOID VALVE C (TCC AND SHIFT PRESSURE)

PFP:31940

Description

UCS000UU

- The pressure control solenoid valve C is normally low, 3-port linear pressure control solenoid.
- The pressure control solenoid valve C is activated to control the apply and release of the 2nd brake and 1st and reverse brake, and torque converter clutch.
- 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

UCS000UW

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PC SOL C(TCC&SFT)” with CONSULT-II or P0795 without CONSULT-II is detected under the following conditions.

– When normal voltage is not applied to solenoid due to open, short, and so on.
– When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS000UX

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Pressure control solenoid valve C

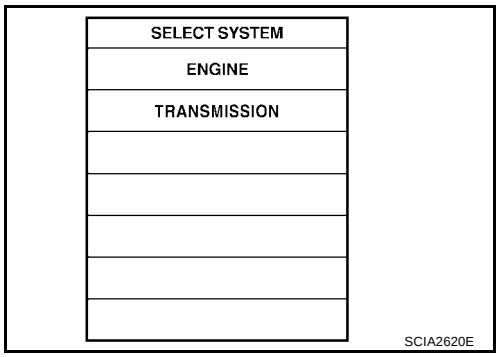
DTC Confirmation Procedure

UCS000UY

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 13 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-554, "Diagnostic Procedure" .



WITH GST

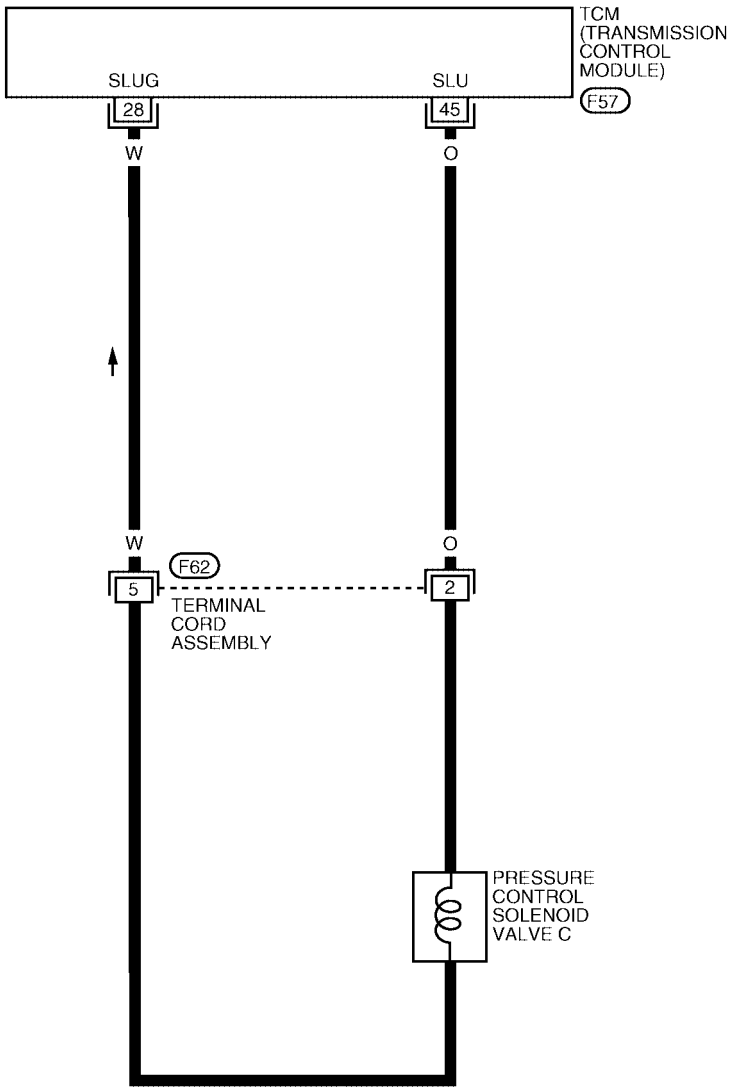
Follow the procedure “With CONSULT-II”.

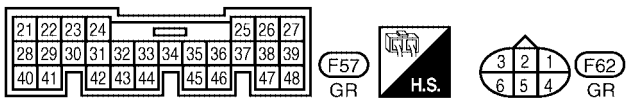
Wiring Diagram — AT — PC/C

UCS000UZ

AT-PC/C-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC





BBWA0590E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz

Diagnostic Procedure

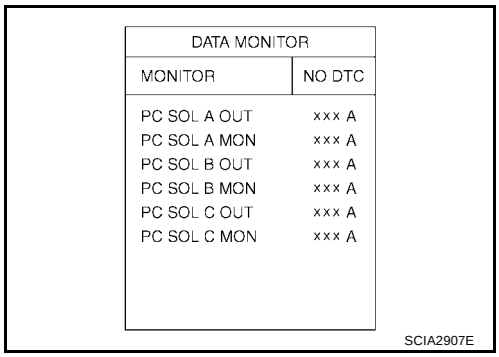
UCS000V0

1. CHECK PRESSURE CONTROL SOLENOID VALVE C SIGNAL

With CONSULT-II

1. After warming up the engine and transaxle, turn ignition switch “OFF”.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
4. Read out the value of “PC SOL C OUT” and “PC SOL C MON”.

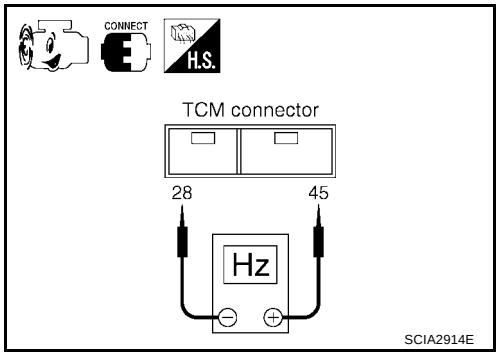
Monitor item	Condition	Display value (Approx.)
● PC SOL C OUT	Selector lever: Manual shift gate position	1.00 A
● PC SOL C MON	Other than the above.	0.20 A



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 28 and 45.

Connector	Terminal (Wire color)	Condition	Data (Approx.)
F57	45 (O) - 28 (W) (Ground)	When engine is running with idle speed and setting selector lever to “P” position.	300 Hz



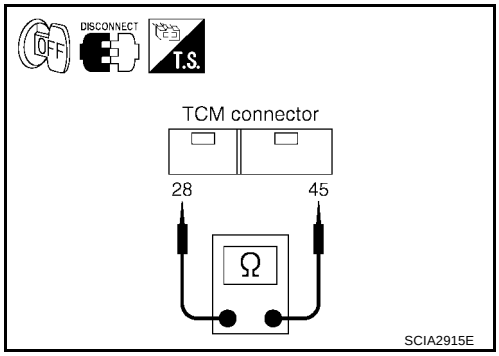
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminals 28 and 45.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	45 (O) - 28 (W) (Ground)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



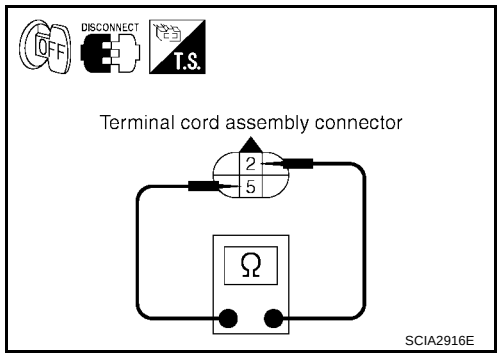
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK PRESSURE CONTROL SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 2 and 5.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	2 (O) - 5 (W)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND PRESSURE CONTROL SOLENOID VALVE C

Check the following.

- Open or short-circuit in the harness between TCM and pressure control solenoid valve C.

OK or NG

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

5. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-552, "DTC Confirmation Procedure" .

OK or NG

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

6. CHECK TCM

1. Check TCM input/output signal.
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.

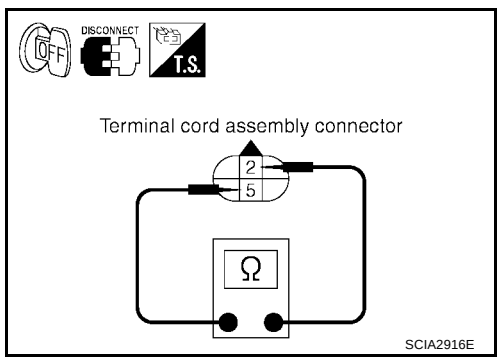
Component Inspection

UCS00159

PRESSURE CONTROL SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 2 and 5.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	2 (O) - 5 (W)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

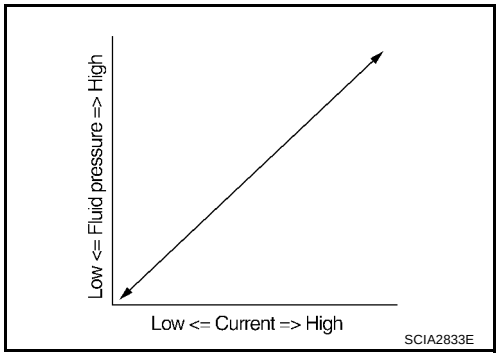
DTC P0797 PRESSURE CONTROL SOLENOID VALVE C STUCK ON

PFP:31940

Description

UCS00147

- This malfunction will not be detected while the A/T CHECK indicator lamp is indicating another self-diagnosis malfunction.
- This is not caused by electrical malfunction (circuits open or shorted) but by mechanical malfunction such as control valve sticking, improper solenoid valve operation, etc.
- The pressure control solenoid valve C is normally low, 3-port linear pressure control solenoid.
- The pressure control solenoid valve C is activated to control the apply and release of the 2nd brake and 1st and reverse brake, and torque converter clutch.
- 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

UCS00148

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “PC SOL C STC ON” with CONSULT-II or P0797 without CONSULT-II is detected when condition of pressure control solenoid valve C is different from monitor value, and relation between gear position and actual gear ratio or lock-up status is irregular.

Possible Cause

UCS00149

- Pressure control solenoid valve C
  (On stick.)
- Hydraulic control circuit

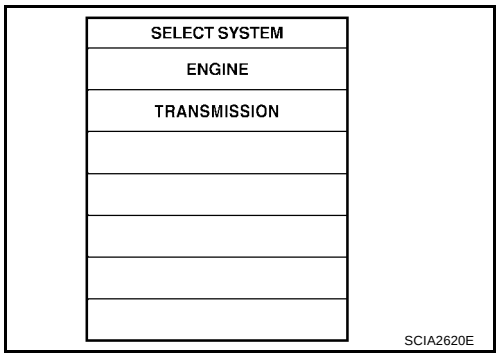
DTC Confirmation Procedure

UCS0014A

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Run engine for at least 4 consecutive minutes at idle speed.
5. If DTC is detected, go to AT-558, "Diagnostic Procedure" .

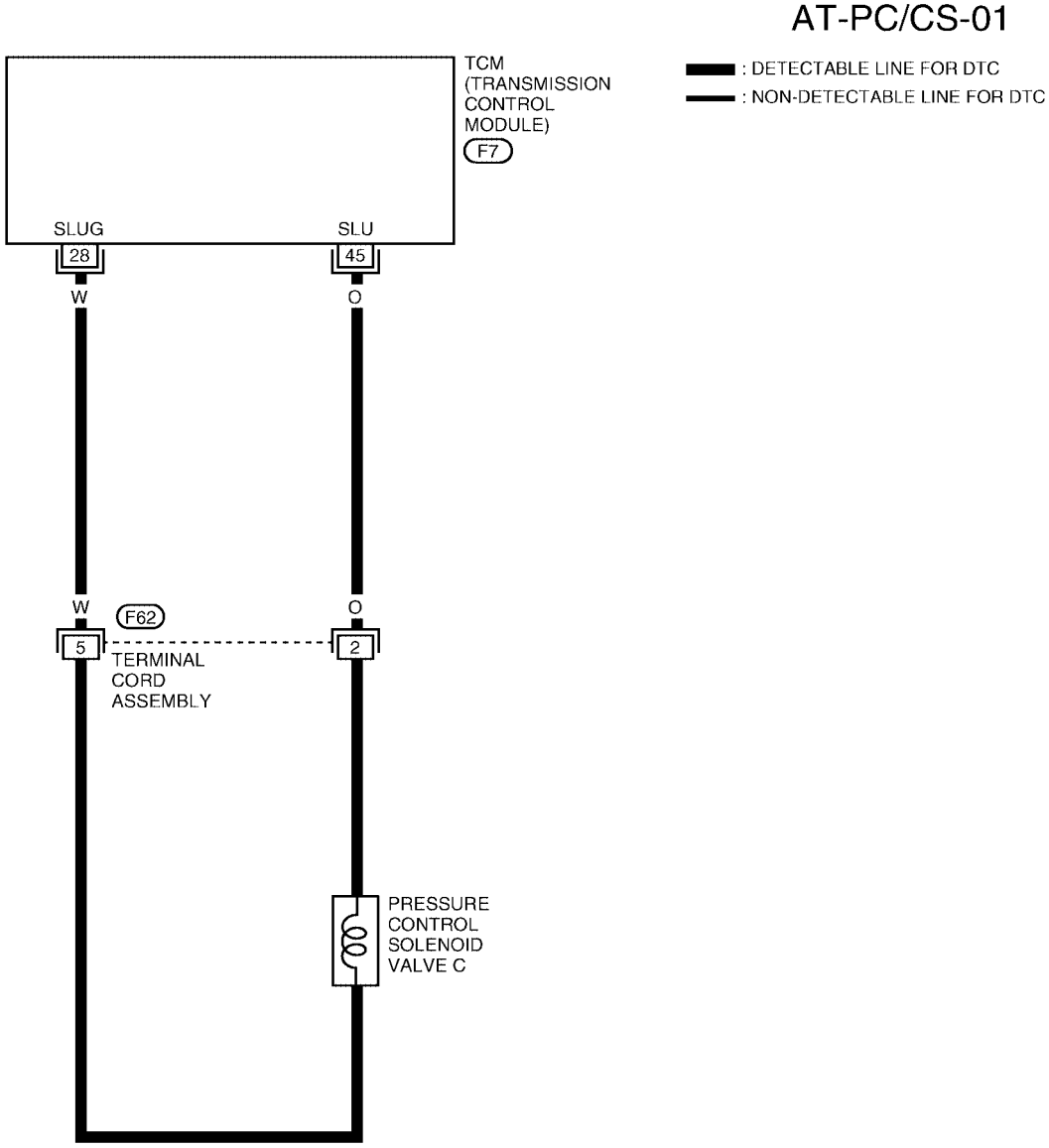


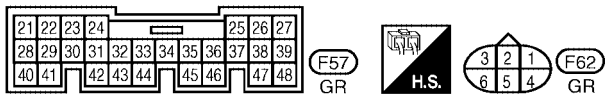
WITH GST

Follow the procedure “With CONSULT-II”.

Wiring Diagram — AT — PC/CS

UCS0014B





BBWA0672E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
28	W	Pressure control solenoid valve C ground		When engine is running with idle speed and setting selector lever to “P” position.	0V
45	O	Pressure control solenoid valve C		When engine is running with idle speed and setting selector lever to “P” position.	300Hz

Diagnostic Procedure

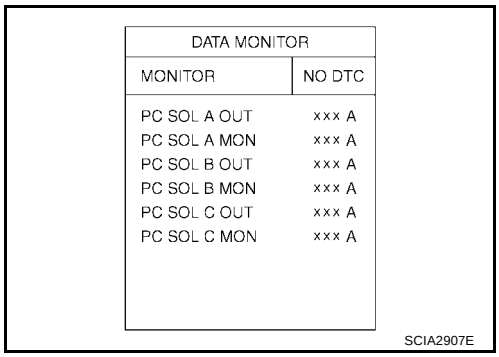
UCS0014C

1. CHECK PRESSURE CONTROL SOLENOID VALVE C SIGNAL

With CONSULT-II

1. After warming up the engine and transaxle, turn ignition switch “OFF”.
2. Turn ignition switch “ON”. (Do not start engine.)
3. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
4. Read out the value of “PC SOL C OUT” and “PC SOL C MON”.

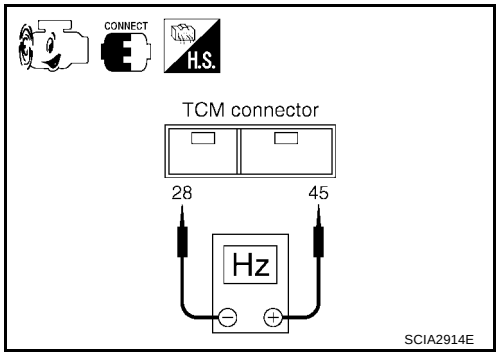
Monitor item	Condition	Display value (Approx.)
● PC SOL C OUT	Selector lever: Manual shift gate position	1.00 A
● PC SOL C MON	Other than the above.	0.20 A



Without CONSULT-II

1. Start the engine.
2. Check pulse between TCM connector terminals 28 and 45.

Connector	Terminal (Wire color)	Condition	Data (Approx.)
F57	45 (O) - 28 (W) (Ground)	When engine is running with idle speed and setting selector lever to “P” position.	300 Hz



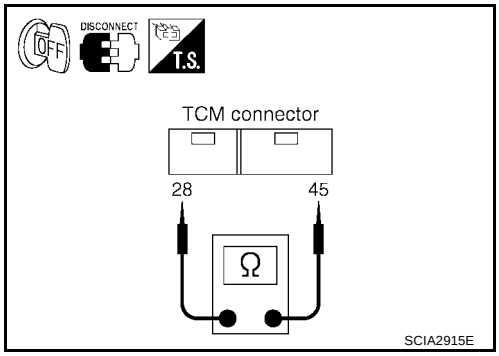
OK or NG

OK >> GO TO 5.
NG >> GO TO 2.

2. CHECK PRESSURE CONTROL SOLENOID VALVE C CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check resistance between TCM connector terminals 28 and 45.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F57	45 (O) - 28 (W) (Ground)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



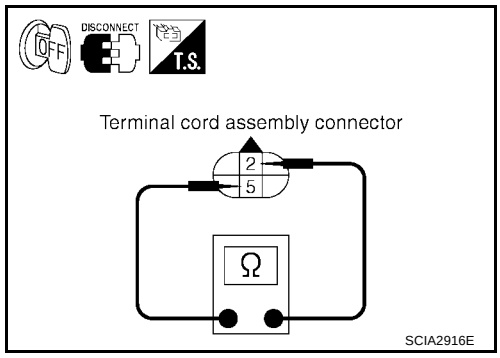
OK or NG

OK >> GO TO 5.
NG >> GO TO 3.

3. CHECK PRESSURE CONTROL SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 2 and 5.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	2 (O) - 5 (W)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. Reinstall any part removed.

OK or NG

OK >> GO TO 4.
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

4. CHECK HARNESS BETWEEN TCM AND PRESSURE CONTROL SOLENOID VALVE C

Check the following.

- Open or short-circuit in the harness between TCM and pressure control solenoid valve C.

OK or NG

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

5. CHECK TCM

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

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-556, "DTC Confirmation Procedure" .

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

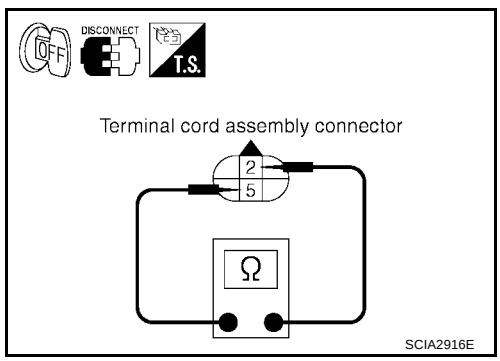
Component Inspection

UCS0015I

PRESSURE CONTROL SOLENOID VALVE C

1. Turn ignition switch “OFF”.
2. Disconnect terminal cord assembly harness connector.
3. Check resistance between terminals 2 and 5.

Connector	Terminal (Wire color)	Condition	Resistance (Approx.)
F62	2 (O) - 5 (W)	Temperature: 20°C (68°F)	5.0 - 5.6 Ω



4. If NG, replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

DTC P0826 MANUAL MODE SWITCH CIRCUIT

PFP:34901

Description

UCS0010X

Manual mode switch is installed in A/T device. It sends manual mode switch, shift up and shift down switch signals to TCM.
TCM sends the switch signals to unified meter and A/C amp. by CAN communication line. Then manual mode switch position is indicated on the A/T indicator. For inspection, refer to AT-565, "Position Indicator" .

CONSULT-II Reference Value in Data Monitor Mode

UCS0010Y

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	(ON/OFF)	Selector lever: + side	ON
		Other than the above	OFF
DOWN SW	(ON/OFF)	Selector lever: - side	ON
		Other than the above	OFF

On Board Diagnosis Logic

UCS0010Z

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “MANUAL MODE SWITCH” with CONSULT-II is detected when TCM monitors manual mode, non manual mode, up or down switch signals, and judges as irregular when impossible input pattern occurs.

Possible Cause

UCS00110

- Harness or connectors
  (These switches circuit is open or shorted.)
- Manual mode switch (built into A/T device)

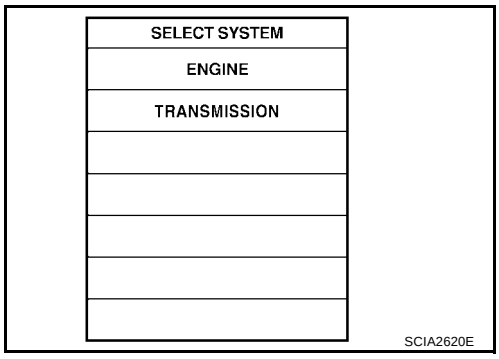
DTC Confirmation Procedure

UCS00111

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

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Move selector lever to “M” position (manual shift gate position).
4. Shift selector lever into “+ side” and “- side”.
5. Wait for at least 30 consecutive seconds.
6. If DTC is detected, go to AT-563, "Diagnostic Procedure" .

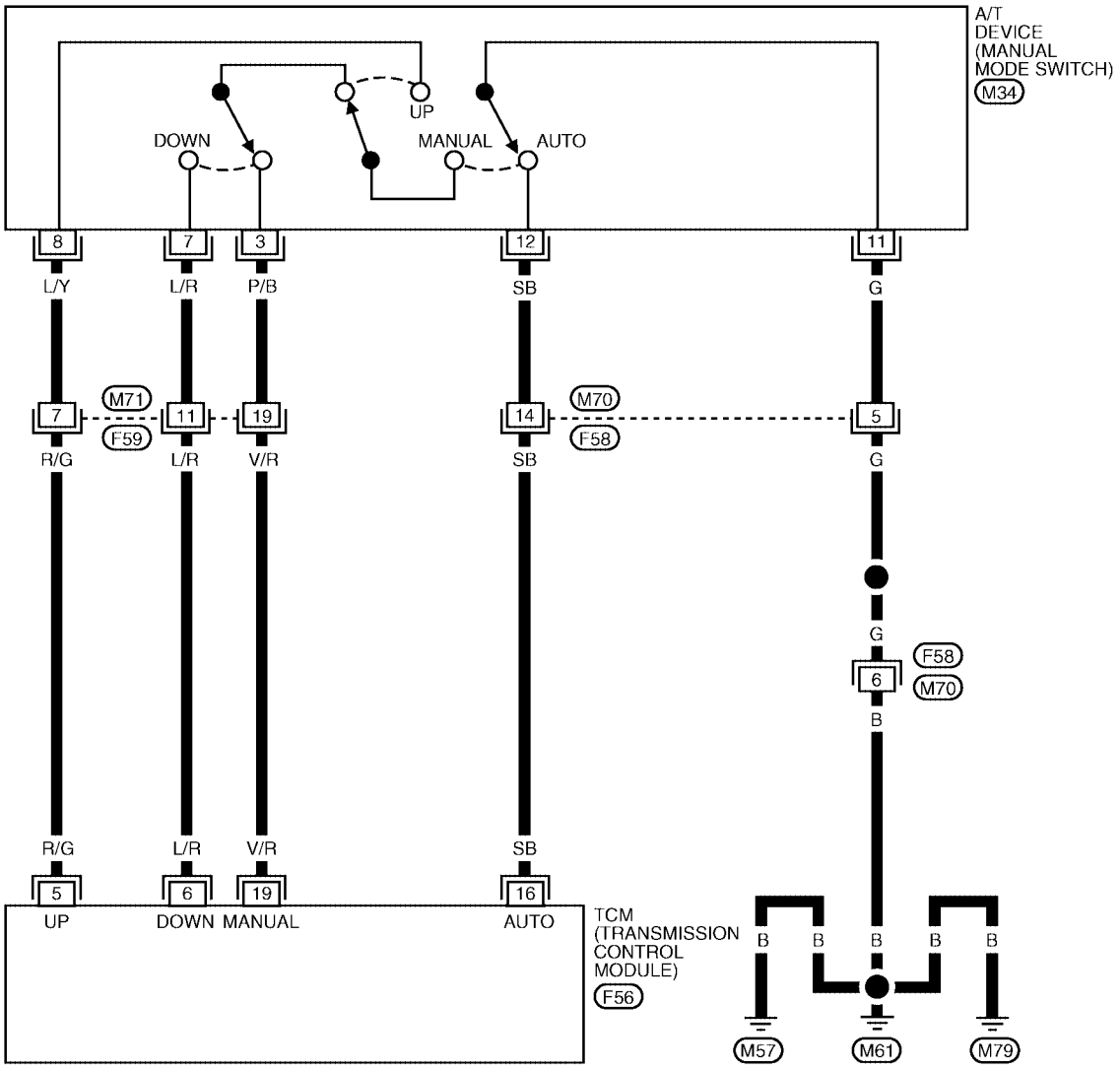


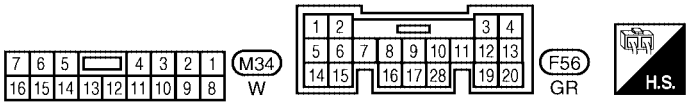
Wiring Diagram — AT — MMSW

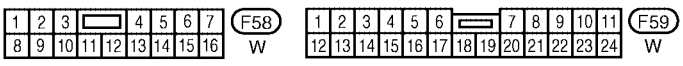
UCS00112

AT-MMSW-01

: DETECTABLE LINE FOR DTC
: NON-DETECTABLE LINE FOR DTC







BBWA0604E

TCM terminals and data are reference value. Measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
5	R/G	Manual mode switch UP (+)		Selector lever: + side	0V
				Other than the above	Battery voltage
6	L/R	Manual mode switch DOWN (-)		Selector lever: - side	0V
				Other than the above	Battery voltage
16	SB	Manual mode switch AUTO		Selector lever: “P”, “R”, “N” or “D” position	0V
				Selector lever: Manual shift gate position	Battery voltage
19	V/R	Manual mode switch MANUAL		Selector lever: Manual shift gate position (neutral)	0V
				Other than the above	Battery voltage

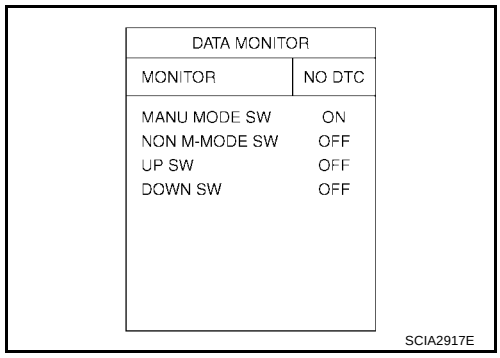
Diagnostic Procedure

UCS00113

1. CHECK MANUAL MODE SWITCH CIRCUIT

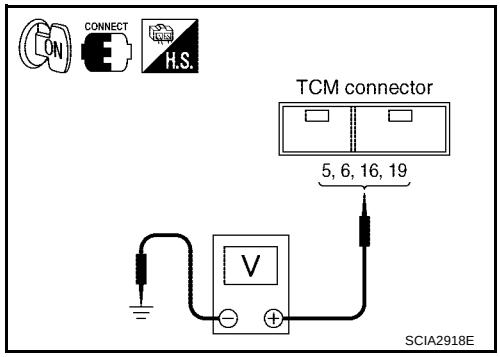
With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Read out ON/OFF switching action of the “MANU MODE SW”, “NON M-MODE SW”, “UP SW”, “DOWN SW”.



Without CONSULT-II

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



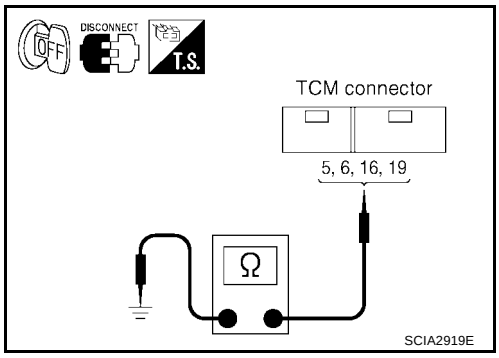
Connector No.	Terminal (Wire color)	Condition	Voltage (Approx.)
F57	5 (R/G) - Ground	Selector lever: + side	0V
		Other than the above	Battery voltage
	6 (L/R) - Ground	Selector lever: - side	0V
		Other than the above	Battery voltage
	16 (SB) - Ground	Selector lever: “P”, “R”, “N” or “D” position	0V
		Selector lever: Manual shift gate position	Battery voltage
	19 (V/R) - Ground	Selector lever: Manual shift gate position (neutral)	0V
		Other than the above	Battery voltage

OK or NG

OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK HARNESS BETWEEN TCM AND A/T DEVICE (MANUAL MODE SWITCH)

1. Turn ignition switch “OFF”.
2. Disconnect the TCM connector.
3. Check the continuity between TCM connector terminals 5, 6, 16, 19 and ground.



Connector No.	Terminal (Wire color)	Condition	Continuity
F57	5 (R/G) - Ground	Selector lever: + side	Yes
		Other than the above	No
	6 (L/R) - Ground	Selector lever: - side	Yes
		Other than the above	No
	16 (SB) - Ground	Selector lever: “P”, “R”, “N” or “D” position	Yes
		Selector lever: Manual shift gate position	No
	19 (V/R) - Ground	Selector lever: Manual shift gate position (neutral)	Yes
		Other than the above	No

4. If OK, check harness for short-circuit to ground or power source.

OK or NG

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

3. DETECT MALFUNCTIONING ITEM

Check the following.

- Open or short-circuit in the harness between TCM and A/T device (manual mode switch).
- Open or short-circuit in the harness for ground of manual mode switch.
- Manual mode switch. Refer to AT-565, "Component Inspection" .

OK or NG

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

4. CHECK DTC

Perform “DTC Confirmation Procedure”. Refer to AT-560, "DTC Confirmation Procedure" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal.
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.

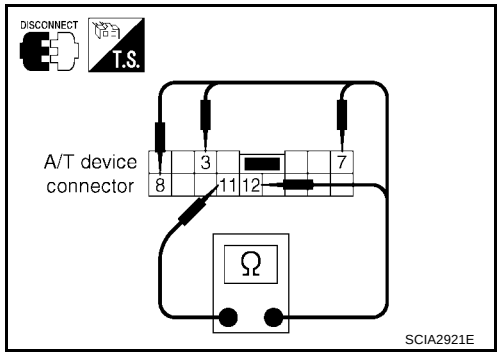
Component Inspection

UCS00114

MANUAL MODE SWITCH

Check continuity between terminals.

Item	Position	Connector	Terminal (Unit side)	Continuity
Manual mode (select) switch	Auto	M34	11 - 12	Yes
	Manual		3 - 11	
UP switch	UP		8 - 11	
DOWN switch	DOWN		7 - 11	



Position Indicator

UCS00115

DIAGNOSTIC PROCEDURE

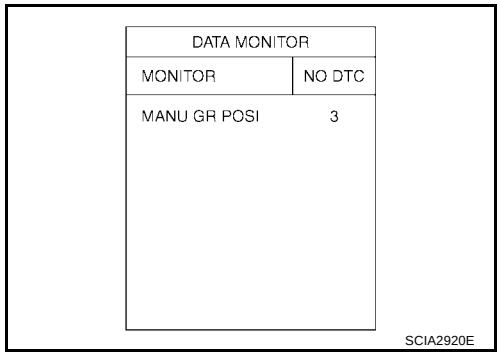
1. CHECK INPUT SIGNALS (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II and read out the value of “MANU GR POSI”.
3. Drive vehicle in the manual mode, and make sure 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 >> **INSPECTION END**
NG >> GO TO 2.



2. CHECK DTC WITH TCM

Perform self-diagnosis of TCM. Refer to AT-452, "SELF-DIAG RESULT MODE" .

OK or NG

OK >> Check combination meter. Refer to DI-54, "A/T INDICATOR" .
NG >> Check the malfunctioning system.

DTC P0882 TCM POWER INPUT SIGNAL

PFP:31036

Description

UCS000VD

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

On Board Diagnosis Logic

UCS000VE

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “TCM POWER INPT SIG” with CONSULT-II or P0882 without CONSULT-II is detected when voltage supplied to TCM is too low.

Possible Cause

UCS000VF

- Harness or connectors
  (Battery or ignition switch and TCM circuit is open or shorted.)
- A/T PV IGN relay

DTC Confirmation Procedure

UCS0014X

CAUTION:

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

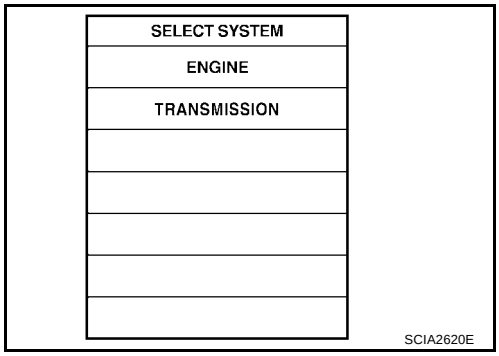
NOTE:

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

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

WITH CONSULT-II

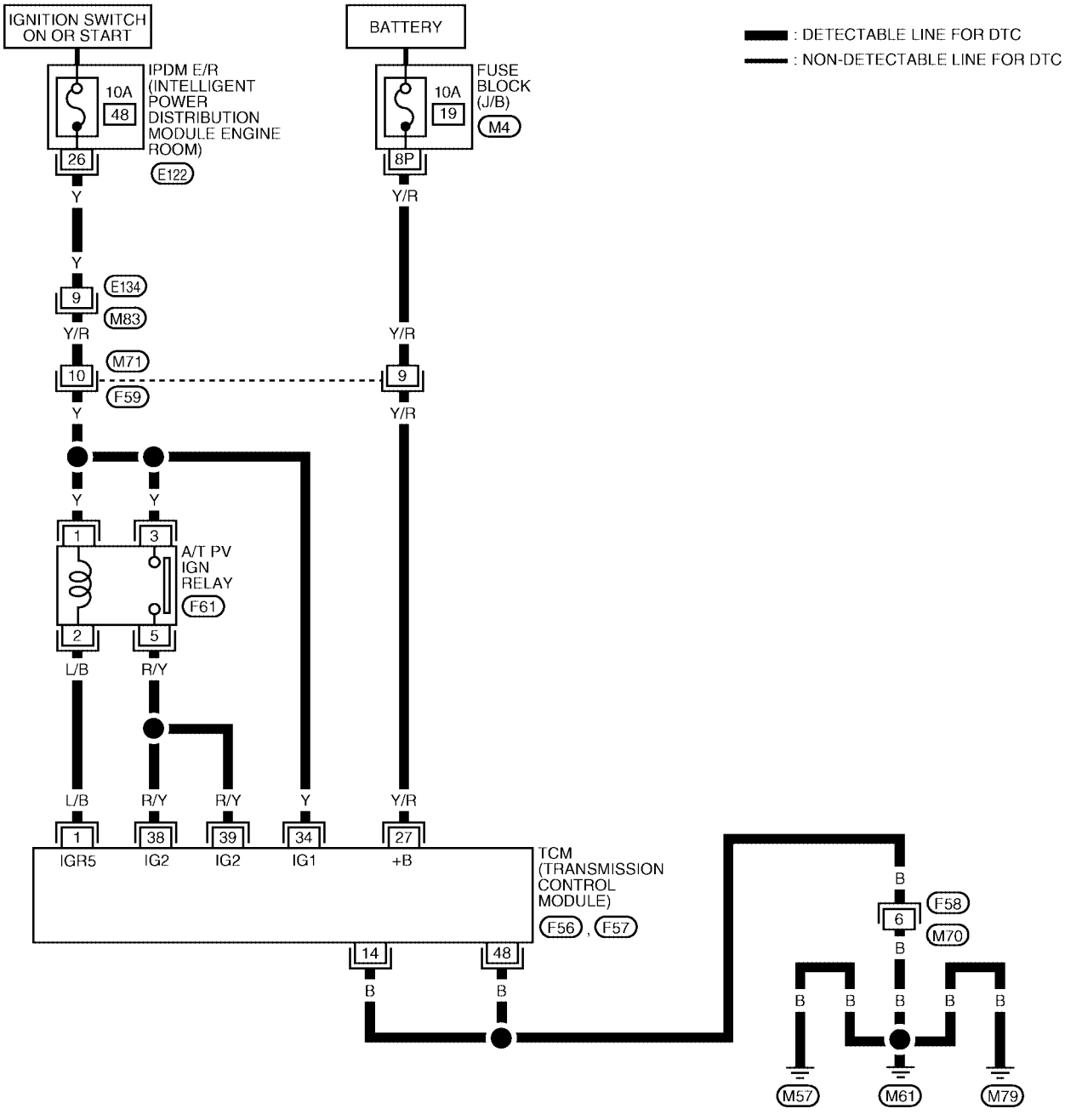
1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Start engine.
4. Depress accelerator pedal or drive vehicle and maintain the following condition for at least 20 consecutive seconds.
   TURBINE REV: More than 800 rpm
5. If DTC is detected, go to AT-569, "Diagnostic Procedure" .

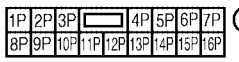


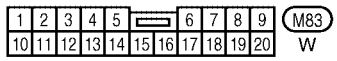
Wiring Diagram — AT — PWR/IN

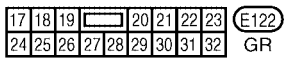
UCS000VH

AT-PWR/IN-01

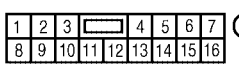


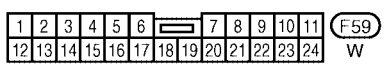


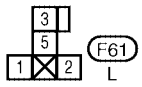




REFER TO THE FOLLOWING.
F56 , F57 - ELECTRICAL UNITS







BBWA0596E

TCM terminals and data are reference value. Measured between each terminal and ground.

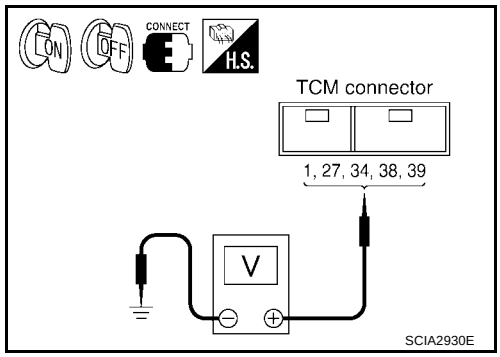
Terminal	Wire color	Item	Condition		Data (Approx.)
1	L/B	A/T PV IGN relay		When turning ignition switch ON.	0 - 1.5V
				When turning ignition switch OFF.	0V
14	B	Ground	–		0V
27	Y/R	Power supply (Memory back-up)		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	Battery voltage
34	Y	Power supply		When turning ignition switch ON.	Battery voltage
				When turning ignition switch OFF.	0V
38	R/Y	Power supply (A/T PV IGN relay)		When turning ignition switch ON.	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
39	R/Y	Power supply (A/T PV IGN relay)		When turning ignition switch ON.	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
48	B	Ground	–		0V

Diagnostic Procedure

UCS000VI

1. CHECK TCM POWER SOURCE CIRCUIT

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



Connector	Terminal (Wire color)	Voltage (Approx.)
F56	1 (L/B) - Ground	0 - 1.5V
F57	27 (Y/R) - Ground	Battery voltage
	34 (Y) - Ground	
	38 (R/Y) - Ground	
	39 (R/Y) - Ground	

3. Turn ignition switch “OFF”.
4. Check voltage between TCM terminals and ground.

Connector	Terminal (Wire color)	Voltage (Approx.)
F56	1 (L/B) - Ground	0V
F57	27 (Y/R) - Ground	Battery voltage
	34 (Y) - Ground	0V
	38 (R/Y) - Ground	0V
	39 (R/Y) - Ground	0V

OK or NG

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

2. DETECT MALFUNCTIONING ITEM

Check the following:

- Harness for short or open between battery and TCM terminal 27
- Harness for short or open between ignition switch and TCM terminals 1, 34, 38 and 39
- 10A fuse [No. 19, located in the fuse block (J/B) or No. 48, located in the IPDM E/R]
- Ignition switch. Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT"
- A/T PV IGN relay. Refer to AT-570, "Component Inspection"

OK or NG

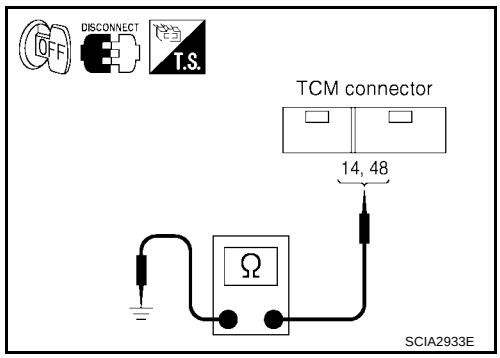
OK >> GO TO 3.
NG >> Repair or replace damaged parts.

3. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect TCM harness connector.
3. Check continuity between TCM terminals 14 (B), 48 (B) and ground.

Continuity should exist.

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



OK or NG

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

4. CHECK DTC

Check again. Refer to AT-566, "DTC Confirmation Procedure" .

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal.
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.

Component Inspection

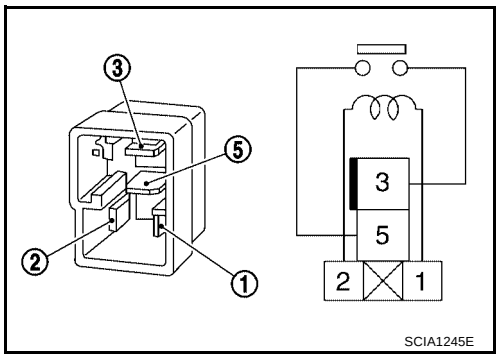
UCS000VJ

A/T PV IGN RELAY

1. Apply 12V direct current between A/T PV IGN relay terminals 1 and 2.
2. Check continuity between relay terminals 3 and 5.

Condition	Continuity
12V direct current supply between terminals 1 and 2	Yes
OFF	No

3. If NG, replace A/T PV IGN relay.



DTC P1726 ELECTRIC THROTTLE CONTROL SYSTEM

PFP:23710

Description

UCS000VZ

This DTC is displayed with other DTCs regarding ECM. Perform the trouble diagnosis for other DTCs displayed. Refer to EC-75, "TROUBLE DIAGNOSIS" .
When this DTC is detected, lock-up operation and learning control are canceled.

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

A/T CHECK Indicator Lamp does not come on

UCS000ZM

SYMPTOM:

A/T CHECK indicator lamp does not come on for about 2 seconds when turning ignition switch to “ON”.

DIAGNOSTIC PROCEDURE

1. CHECK CAN COMMUNICATION LINE

Perform the self-diagnosis. Is a malfunction in the CAN communication indicated in the results?

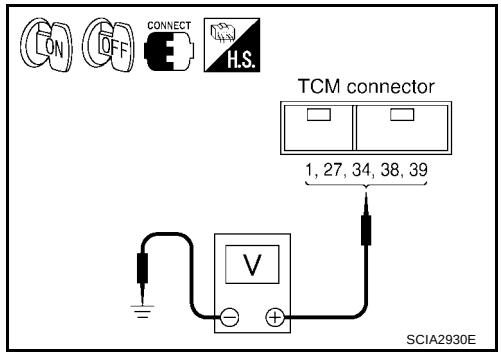
YES or NO

YES >> Check the CAN communication line. Refer to AT-459, "DTC U1000 CAN COMMUNICATION LINE" .

NO >> GO TO 2.

2. CHECK TCM POWER SOURCE CIRCUIT

1. Turn ignition switch “ON”. (Do not start engine.)
2. Check voltage between TCM connector terminals and ground. Refer to AT-567, "Wiring Diagram — AT — PWR/IN" .



Connector	Terminal (Wire color)	Voltage (Approx.)
F56	1 (L/B) - Ground	0 - 1.5V
F57	27 (Y/R) - Ground	Battery voltage
	34 (Y) - Ground	
	38 (R/Y) - Ground	
	39 (R/Y) - Ground	

3. Turn ignition switch “OFF”.
4. Check voltage between TCM connector terminals and ground. Refer to AT-567, "Wiring Diagram — AT — PWR/IN" .

Connector	Terminal (Wire color)	Voltage (Approx.)
F56	1 (L/B) - Ground	0V
F57	27 (Y/R) - Ground	Battery voltage
	34 (Y) - Ground	0V
	38 (R/Y) - Ground	0V
	39 (R/Y) - Ground	0V

OK or NG

OK >> GO TO 4.

NG >> GO TO 3.

3. DETECT MALFUNCTIONING ITEM

Check the following:

- Harness for short or open between battery and TCM terminal 27
- Harness for short or open between ignition switch and TCM terminals 1, 34, 38 and 39
- 10A fuse [No. 19, located in the fuse block (J/B) or No. 48, located in the IPDM E/R]
- Ignition switch. Refer to PG-3, "POWER SUPPLY ROUTING CIRCUIT" .
- A/T PV IGN relay. Refer to AT-570, "Component Inspection" .

OK or NG

OK >> GO TO 4.

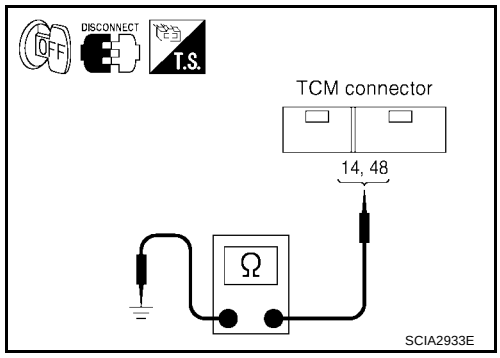
NG >> Repair or replace damaged parts.

4. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch “OFF”.
2. Disconnect the TCM harness connector.
3. Check continuity between TCM terminals 14 (B), 48 (B) and ground. Refer to AT-567, "Wiring Diagram — AT — PWR/IN" .
4. If OK, check harness for short-circuit to ground or the power source.

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 A/T CHECK INDICATOR LAMP CIRCUIT

1. Turn ignition switch “OFF”.
2. Check the combination meter.
   Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 6.
NG >> Replace the combination meter. Refer to DI-31, "Removal and Installation of Combination Meter" .

6. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> GO TO 7.

7. CHECK TCM

1. Check TCM input/output signal.
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.

Engine Cannot Be Started In “P” or “N” Position

UCS000ZN

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 STARTING SYSTEM

Check starting system. Refer to SC-10, "STARTING SYSTEM" .

OK or NG

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

2. CHECK CONTROL LINKAGE

Check the control linkage.

- Refer to AT-599, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control linkage. Refer to AT-599, "Control Cable Adjustment" .

3. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis.

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-466, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> **INSPECTION END**

In “P” Position, Vehicle Moves When Pushed

UCS000ZO

SYMPTOM:

Even though the selector 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 SWITCH CIRCUIT

Perform self-diagnosis.

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-466, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> GO TO 2.

2. CHECK CONTROL LINKAGE

Check the control linkage.

- Refer to AT-599, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control linkage. Refer to AT-599, "Control Cable Adjustment" .

3. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

In “N” Position, Vehicle Moves

UCS000ZP

SYMPTOM:

Vehicle moves forward or backward when selecting “N” position.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK PNP SWITCH CIRCUIT

Perform self-diagnosis.

Do the self-diagnostic results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-466, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .
NO >> GO TO 3.

3. CHECK CONTROL LINKAGE

Check the control linkage.

- Refer to AT-599, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control linkage. Refer to AT-599, "Control Cable Adjustment" .

4. SYMPTOM CHECK

Check again.

OK or NG

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

5. CHECK TCM

1. Check TCM input/output signal.
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.

Large Shock (“N” to “D” Position)

UCS000ZQ

SYMPTOM:

A noticeable shock occurs when the selector lever is shifted from the “N” to “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. CHECK TCM

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

OK or NG

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

4. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

Vehicle Does Not Creep Backward In “R” Position

UCS000ZR

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 LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK CONTROL LINKAGE AND PNP SWITCH POSITION

Check the control linkage and PNP switch position.

- Refer to AT-599, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control linkage and PNP switch position. Refer to AT-599, "Control Cable Adjustment" or AT-597, "Park/Neutral Position (PNP) Switch Adjustment" .

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

Vehicle Does Not Creep Forward In “D” Position

UCS000ZS

SYMPTOM:

Vehicle does not creep forward when selecting “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK CONTROL LINKAGE AND PNP SWITCH POSITION

Check the control linkage and PNP switch position.

- Refer to AT-599, "Control Cable Adjustment" .

OK or NG

OK >> GO TO 3.
NG >> Adjust control linkage and PNP switch position. Refer to AT-599, "Control Cable Adjustment" or AT-597, "Park/Neutral Position (PNP) Switch Adjustment" .

3. CHECK PRESSURE CONTROL SOLENOID VALVE A CIRCUIT

Perform self-diagnosis.

Do the self-diagnostic results indicate pressure control solenoid valve A?

YES >> Check the malfunctioning system. Refer to AT-514, "DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE)" .
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

Vehicle Cannot Be Started From D1

UCS000ZT

SYMPTOM:

Vehicle cannot be started from D1 on cruise test - Part 1.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps in “R” position.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-576, "Vehicle Does Not Creep Backward In “R” Position" .

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. CHECK LINE PRESSURE

Check the line pressure at the engine stall point. Refer to AT-434, "LINE PRESSURE TEST" .

OK or NG

OK >> GO TO 4.
NG >> Check pressure control solenoid valve A. Refer to AT-514, "DTC P0745 PRESSURE CONTROL SOLENOID VALVE A (LINE PRESSURE)" .

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Shift: D1 → D2

UCS000ZU

SYMPTOM:

The vehicle does not shift-up from the D1 to D2 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-576, "Vehicle Does Not Creep Forward In “D” Position" , AT-578, "Vehicle Cannot Be Started From D1" .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Shift: $D_2 \rightarrow D_3$

UCS000ZV

SYMPTOM:

The vehicle does not shift-up from D_2 to D_3 gear at the specified speed.

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-576, "Vehicle Does Not Creep Forward In “D” Position" ,AT-578, "Vehicle Cannot Be Started From D_1" .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Shift: $D_3 \rightarrow D_4$

UCS000ZW

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. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-576, "Vehicle Does Not Creep Forward In “D” Position" , AT-578, "Vehicle Cannot Be Started From D_1" .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Shift: $D_4 \rightarrow D_5$

UCS000ZX

SYMPTOM:

- **The vehicle does not shift-up from the D_4 to D_5 gear at the specified speed.**
- **The vehicle does not shift-up from the D_4 to D_5 gear unless A/T is warmed up.**

DIAGNOSTIC PROCEDURE

1. CONFIRM THE SYMPTOM

Check if vehicle creeps forward in “D” position and vehicle can be started from D_1.

OK or NG

OK >> GO TO 2.
NG >> Refer to AT-576, "Vehicle Does Not Creep Forward In “D” Position" ,AT-578, "Vehicle Cannot Be Started From D_1" .

2. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 3.
NG >> Refill ATF.

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Perform Lock-up

UCS000ZY

SYMPTOM:

A/T does not perform lock-up at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK STOP LAMP SWITCH CIRCUIT

Check the stop lamp switch circuit. Refer to BRC-12, "TROUBLE DIAGNOSIS" (with ABS), BRC-53, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-97, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

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

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Hold Lock-up Condition

UCS000ZZ

SYMPTOM:

The lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK STOP LAMP SWITCH CIRCUIT

Check the stop lamp switch circuit. Refer to BRC-12, "TROUBLE DIAGNOSIS" (with ABS), BRC-53, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-97, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

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

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

Lock-up Is Not Released

UCS00100

SYMPTOM:

The lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK STOP LAMP SWITCH CIRCUIT

Check the stop lamp switch circuit. Refer to BRC-12, "TROUBLE DIAGNOSIS" (with ABS), BRC-53, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-97, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

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

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

Cannot Be Changed to Manual Mode

UCS00102

SYMPTOM:

Does not change to manual mode when manual shift gate is used.

DIAGNOSTIC PROCEDURE

1. CHECK MANUAL MODE SWITCH CIRCUIT

Check the manual mode switch circuit. Refer to AT-560, "DTC P0826 MANUAL MODE SWITCH CIRCUIT" .

OK or NG

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

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> **INSPECTION END**

A/T Does Not Shift: 5th gear → 4th gear

UCS00103

SYMPTOM:

When shifted from 5M to 4M position in manual mode, does not downshift from 5th to 4th gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. CHECK TCM

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

OK or NG

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

4. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Shift: 4th gear → 3rd gear

UCS00104

SYMPTOM:

When shifted from 4M to 3M position in manual mode, does not downshift from 4th to 3rd gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. CHECK TCM

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

OK or NG

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

4. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Shift: 3rd gear → 2nd gear

UCS00105

SYMPTOM:

When shifted from 3M to 2M position in manual mode, does not downshift from 3rd to 2nd gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. CHECK TCM

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

OK or NG

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

4. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

A/T Does Not Shift: 2nd gear → 1st gear

UCS00106

SYMPTOM:

When shifted from 2M to 1M position in manual mode, does not downshift from 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Is any malfunction detected by self-diagnostic?

YES >> Check the malfunctioning system.
NO >> GO TO 3.

3. CHECK TCM

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

OK or NG

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

4. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

Vehicle Does Not Decelerate By Engine Brake

UCS00107

SYMPTOM:

No engine brake is applied when the gear is shifted from the 2nd to 1st gear.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check the A/T fluid level again. Refer to AT-432, "A/T FLUID CHECK" .

OK or NG

OK >> GO TO 2.
NG >> Refill ATF.

2. CHECK MANUAL MODE SWITCH CIRCUIT

Check the manual mode switch circuit. Refer to AT-560, "DTC P0826 MANUAL MODE SWITCH CIRCUIT" .

OK or NG

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

3. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis.

Do the self-diagnostic results indicate shift solenoid valve E, electric throttle control system?

YES >> Check the malfunctioning system. Refer to AT-541, "DTC P0770 SHIFT SOLENOID VALVE E" , AT-571, "DTC P1726 ELECTRIC THROTTLE CONTROL SYSTEM" .
NO >> GO TO 4.

4. CHECK TCM

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

OK or NG

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

5. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the transaxle assembly. Refer to AT-600, "REMOVAL AND INSTALLATION" .

TCM Self-diagnosis Does Not Activate

UCS0011O

SYMPTOM:
A/T CHECK indicator lamp does not come on in TCM self-diagnostic procedure even if the lamp circuit is good.

DESCRIPTION

- **Park/neutral position (PNP) switch**
  The park/neutral (PNP) switch assembly includes a transmission range switch. The transmission range switch detects the selector lever position and sends a signal to the TCM.
- **Stop lamp switch signal**
  Detects the brake pedal state (stop lamp switch is ON or OFF) and sends a signal via CAN communication line to the TCM.
- **Closed throttle position signal**
  ECM judges throttle opening based on a signal from accelerator pedal position sensor, and sends the signal via CAN communication line to TCM.

DIAGNOSTIC PROCEDURE

1. CHECK PARK/ NEUTRAL POSITION (PNP) SWITCH CIRCUIT

Check the park/neutral position (PNP) switch circuit. Refer to AT-466, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

OK or NG

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

2. CHECK STOP LAMP SWITCH CIRCUIT

Perform self-diagnosis for ABS actuator and electric unit (control unit). Refer to BRC-12, "TROUBLE DIAGNOSIS" (with ABS), BRC-53, "TROUBLE DIAGNOSIS" (with TCS/ABS) or BRC-97, "TROUBLE DIAGNOSIS" (with VDC/TCS/ABS).

OK or NG

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

3. CHECK CLOSED THROTTLE POSITION SIGNAL CIRCUIT

Perform self-diagnosis for ECM. Refer to EC-51, "Emission-related Diagnostic Information" .

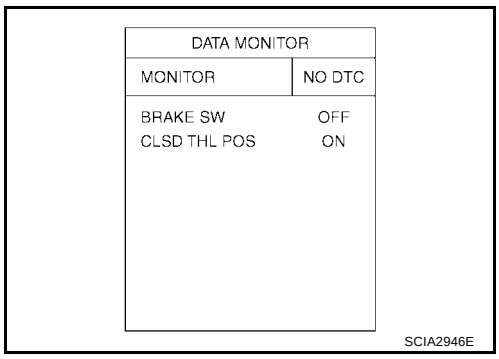
OK or NG

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

4. CHECK DATA MONITOR (WITH CONSULT-II)

With CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “TRANSMISSION” with “DATA MONITOR” mode in CONSULT-II.
3. Depress or release accelerator pedal and read out ON/OFF signaling action of the “CLSD THL POS”.
4. Depress or release brake pedal and read out ON/OFF signaling action of the “BRAKE SW”.



OK or NG

OK >> GO TO 7.
NG >> GO TO 5.

5. CHECK TCM

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

OK or NG

OK >> GO TO 6.
NG >> Repair or replace damaged parts.

6. CHECK CAN COMMUNICATION LINE

Check the CAN communication line. Refer to AT-459, "DTC U1000 CAN COMMUNICATION LINE" .

OK or NG

OK >> GO TO 7.
NG >> Repair or replace damaged parts.

7. SYMPTOM CHECK

Check again.

OK or NG

OK >> **INSPECTION END**
NG >> Replace the TCM.

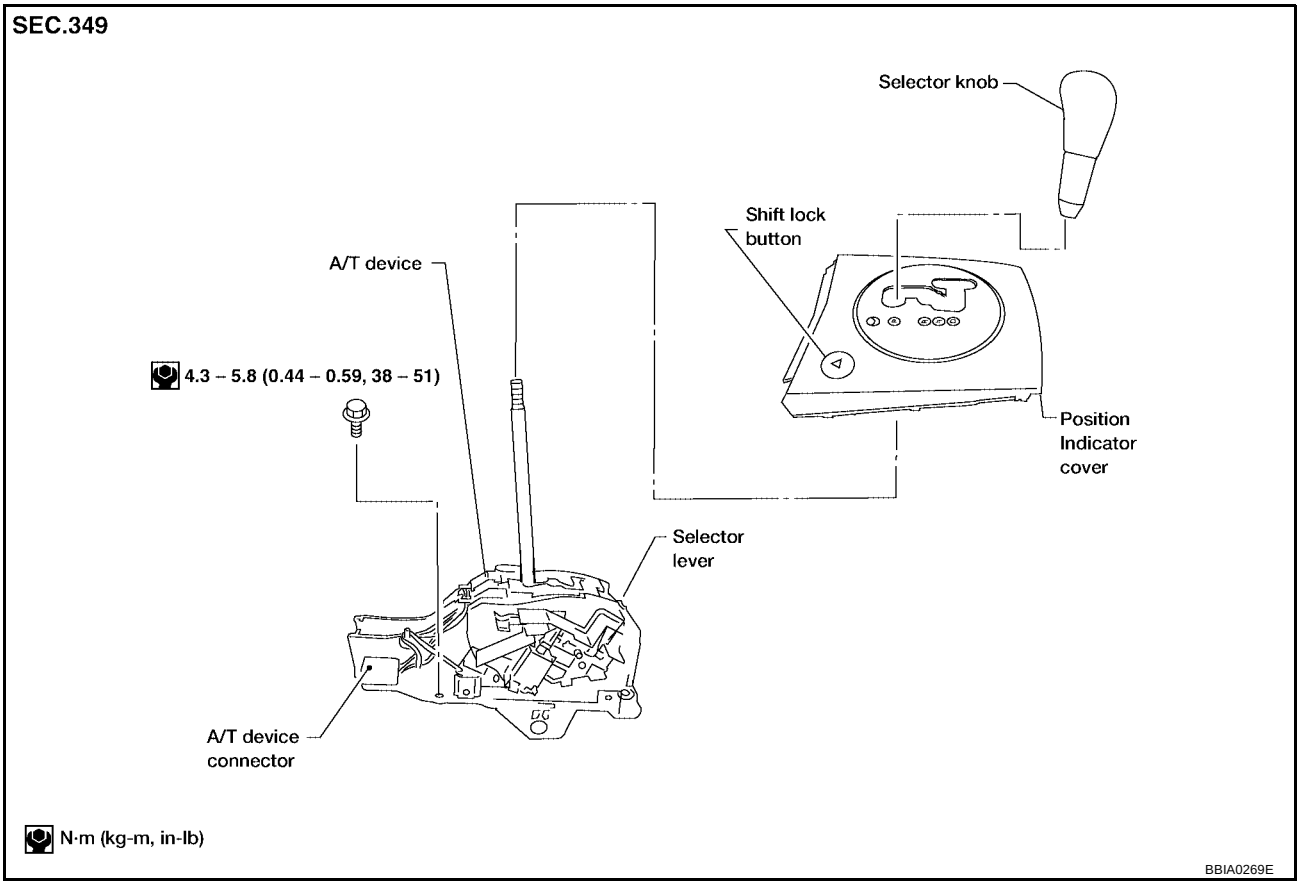
SHIFT CONTROL SYSTEM

PFP:34901

Control Device

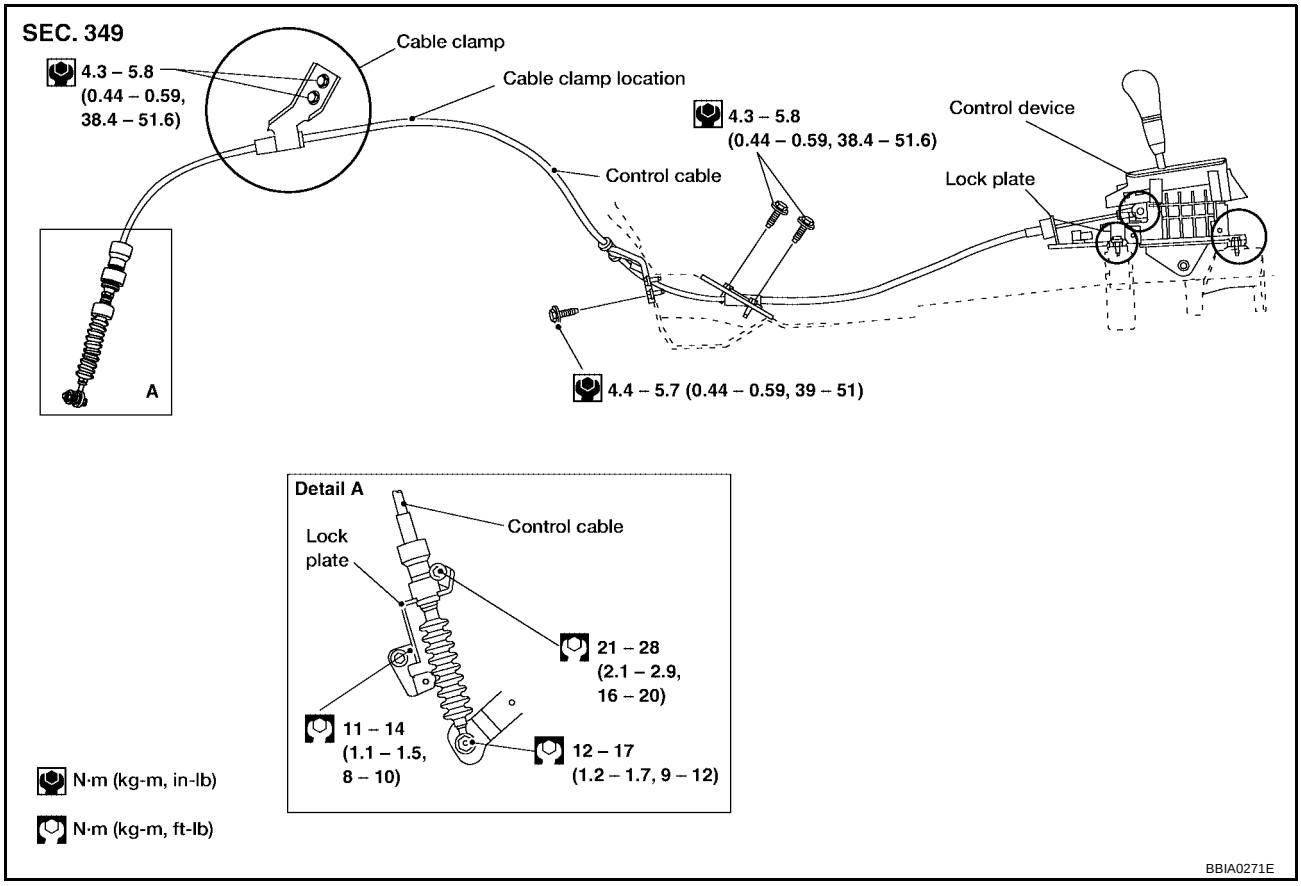
UCS00116

SEC.349



Control Cable

UCS00117



A/T SHIFT LOCK SYSTEM

PFP:34950

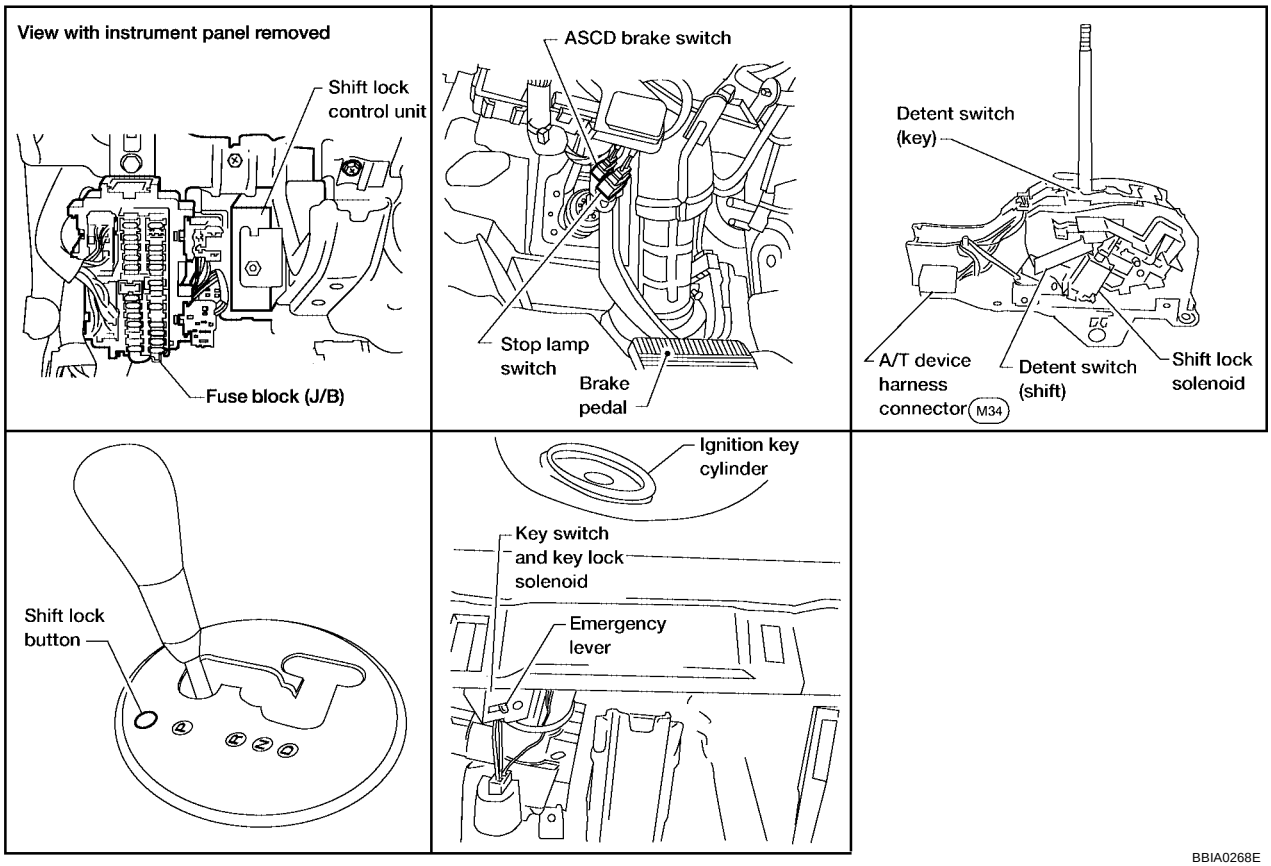
Description

UCS00118

- The electrical key interlock mechanism also operates as a shift lock:
  With the key switch turned to ON, the selector lever cannot be shifted from “P” (parking) 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.

Shift Lock System Electrical Parts Location

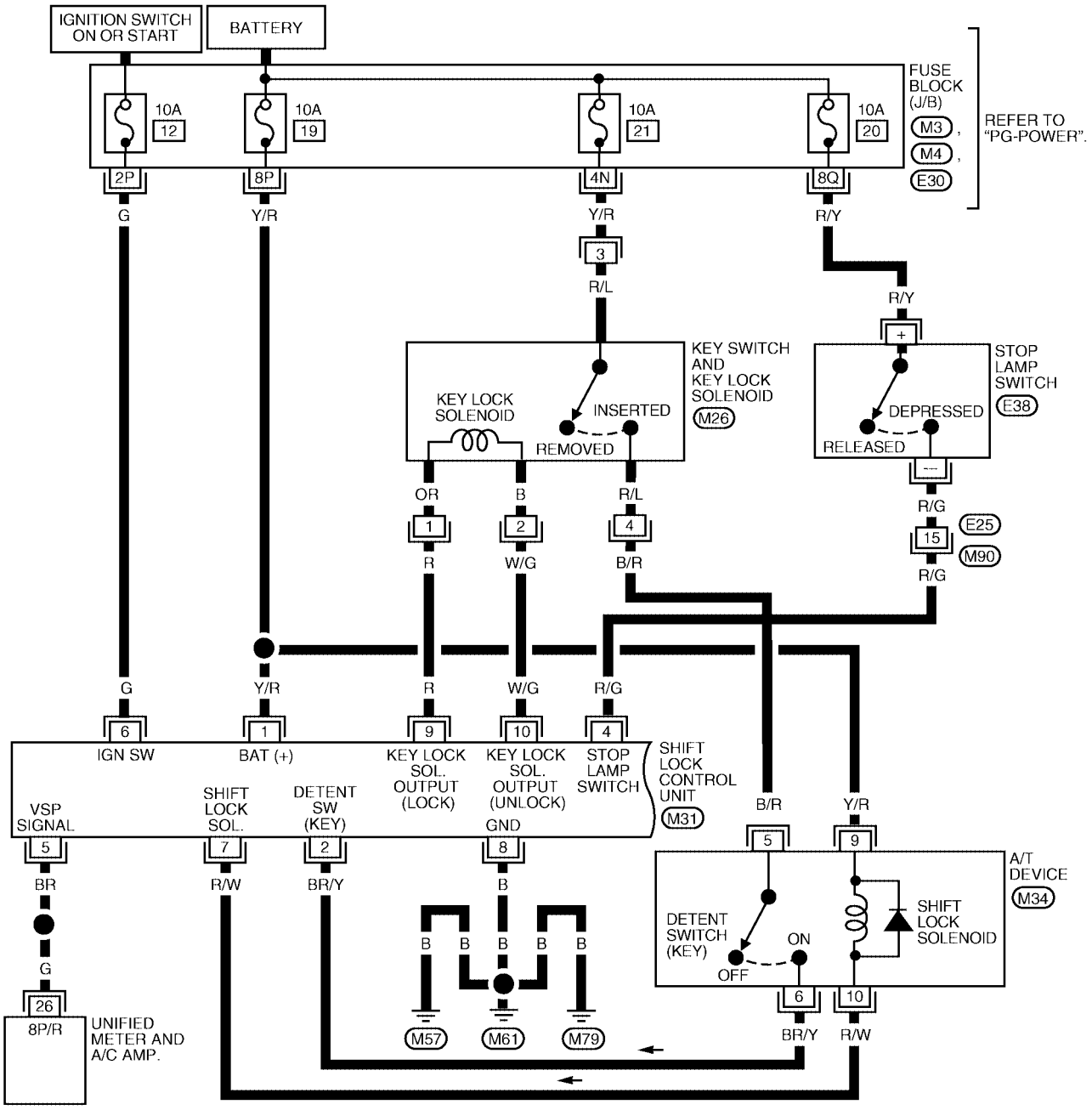
UCS00119

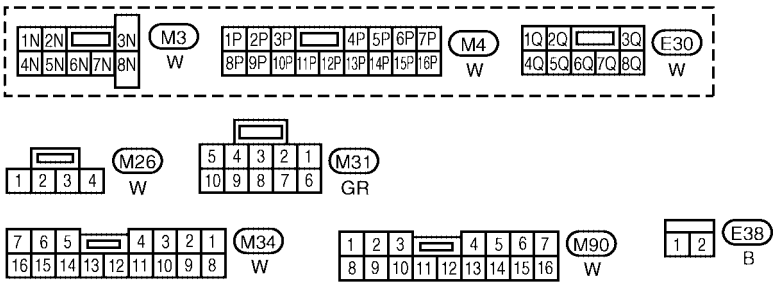


Wiring Diagram — SHIFT —

UCS0011A

AT-SHIFT-01



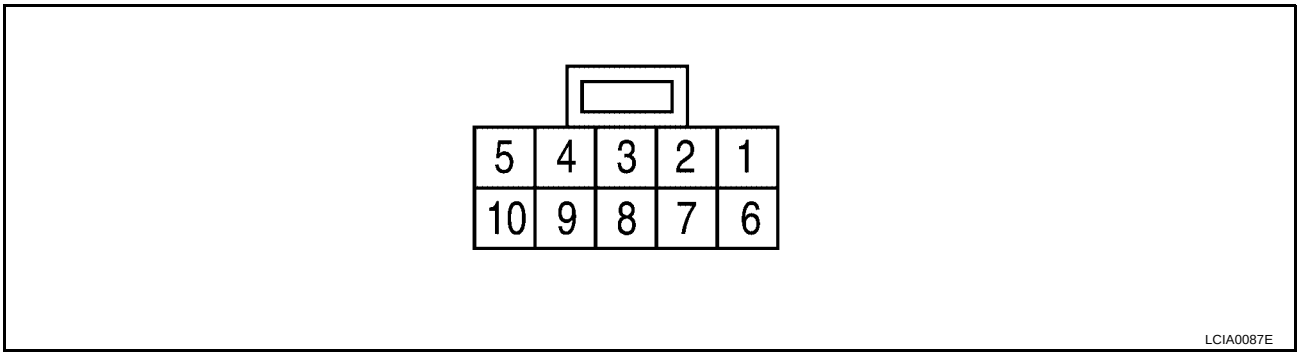


BBWA0579E

Shift Lock Control Unit Reference Values

UCS0015N

SHIFT LOCK HARNESS CONNECTOR TERMINAL LAYOUT



SHIFT LOCK CONTROL UNIT INSPECTION TABLE

Data are reference values.

Terminal No. (Wire color)		Item	Condition	Judgement standard
(+)	(-)			
1 (Y/R)	8 (B)	Power source	Always	Battery voltage
2 (BR/Y)	8 (B)	Detent switch (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
4 (R/G)	8 (B)	Stop lamp switch	When brake pedal is depressed	Battery voltage
			When brake pedal is released	Approx. 0V
5 (BR)	8 (B)	Vehicle speed signal	—	—
6 (G)	8 (B)	Ignition signal	Ignition switch: “ON”	Battery voltage
			Ignition switch: “OFF”	Approx. 0V
7 (R/W)	8 (B)	Shift lock solenoid	When the brake pedal is depressed	Battery voltage
			Ignition switch: "ON" and vehicle speed is less than 8 km/h (5 MPH)	Approx. 0V
8 (B)	–	Ground	Always	Approx. 0V
9 (R)	8 (B)	Key lock signal	When the selector lever is set to a position other than the “P” position	Battery voltage for approx. 0.1 sec. (Note)
			Except the above	Approx. 0V
10 (W/G)	8 (B)	Key unlock signal	When the selector lever is set to the“ P” position	Battery voltage for approx. 0.1 sec. (Note)
			Except the above	Approx. 0V

NOTE:

Make sure 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

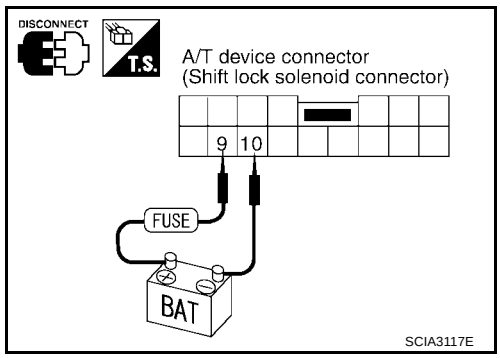
UCS0015O

SHIFT LOCK SOLENOID

- Check operation by applying battery voltage to A/T device connector.

CAUTION:
Be sure to apply the voltage of the correct polarity to the respective terminals. Otherwise, the part may be damaged.

Connector	Terminal
M34	9 (Battery voltage) - 10 (Ground)

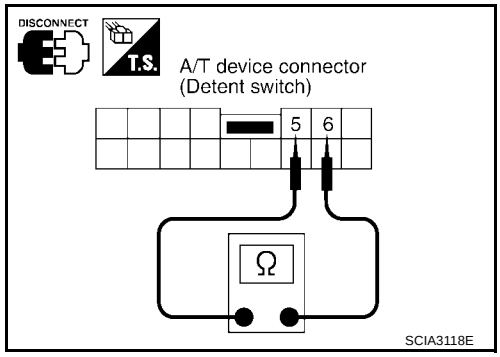


DETENT SWITCH

For Key:

- Check continuity between terminals of the A/T device connector.

Condition	Connector	Terminal	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	M34	5 - 6	Yes
Except the above			No



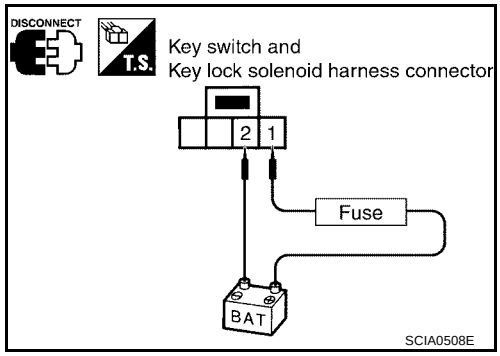
KEY LOCK SOLENOID

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	Terminal
M26	1 (Battery voltage) - 2 (Ground)

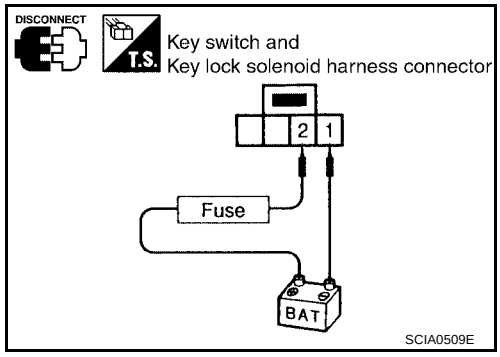


Key Unlock

- Check operation by applying battery voltage to key switch and key lock solenoid connector.

CAUTION:
Be careful not to cause burnout of the harness.

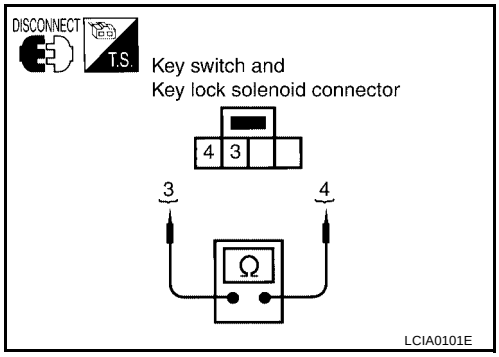
Connector	Terminal
M26	2 (Battery voltage) - 1 (Ground)



KEY SWITCH

- Check continuity between terminals of the key switch and key lock solenoid connector.

Condition	Connector	Terminal	Continuity
Key inserted	M26	3 - 4	Yes
Key removed			No

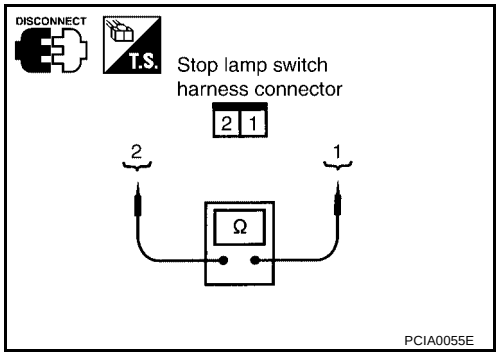


STOP LAMP SWITCH

- Check continuity between terminals of the stop lamp switch connector.

Condition	Connector	Terminal	Continuity
When brake pedal is depressed	E38	1 - 2	Yes
When brake pedal is released			No

Check stop lamp switch after adjusting brake pedal. Refer to BR-6, "Inspection and Adjustment" .



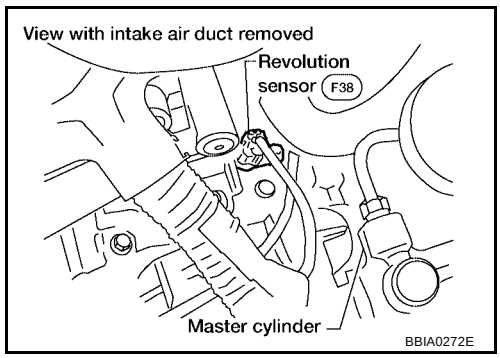
ON-VEHICLE SERVICE

PFP:00000

Revolution Sensor Replacement

UCS0011E

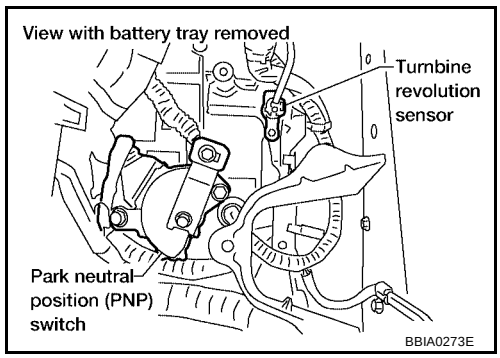
1. Remove intake air duct.
2. Disconnect electrical connector.
3. Remove revolution sensor from A/T.
4. Reinstall any part removed.
   - **Always use new seal bolt.**



Turbine Revolution Sensor Replacement

UCS0011F

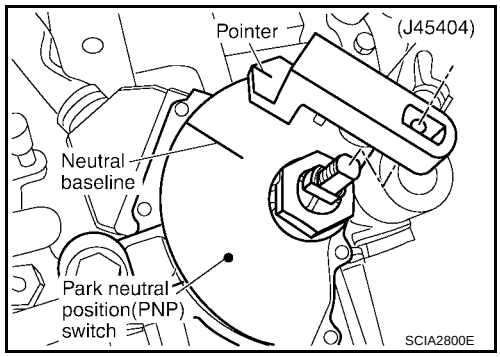
1. Remove battery and bracket.
2. Disconnect electrical connector.
3. Remove bolt, and turbine revolution sensor from A/T.
4. Reinstall any part removed.
   - **Always use new seal bolt.**



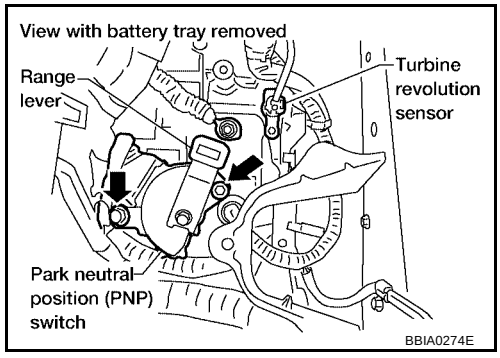
Park/Neutral Position (PNP) Switch Adjustment

UCS0011G

1. Remove battery and bracket.
2. Remove cable from range lever.
3. Set range lever in neutral position.
4. Remove range lever and install alignment tool (J45404).
5. Loosen park/neutral position (PNP) switch fixing bolts.
6. Adjust park/neutral position (PNP) switch so that alignment tool (J45404) pointer aligns with neutral base line on park/neutral position (PNP) switch body.



7. Tighten park/neutral position (PNP) switch fixing bolts.
8. Reinstall range lever and cable.
9. Adjust control cable. Refer to AT-599, "Control Cable Adjustment" .
10. Reinstall battery and bracket.
11. Check continuity of park/neutral position (PNP) switch. Refer to AT-470, "Component Inspection" .



ATF Cooler

UCS0011P

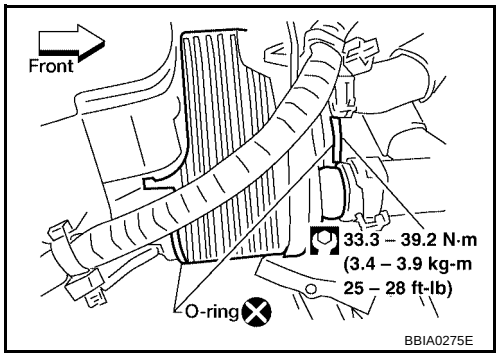
REMOVAL

1. Drain ATF.
2. Drain engine coolant, refer to MA-14, "Changing Engine Coolant" .
3. Remove hose clamps and hoses from ATF cooler.
4. Remove bolt from ATF cooler and remove ATF cooler.

INSTALLATION

Installation is the reverse order of removal.

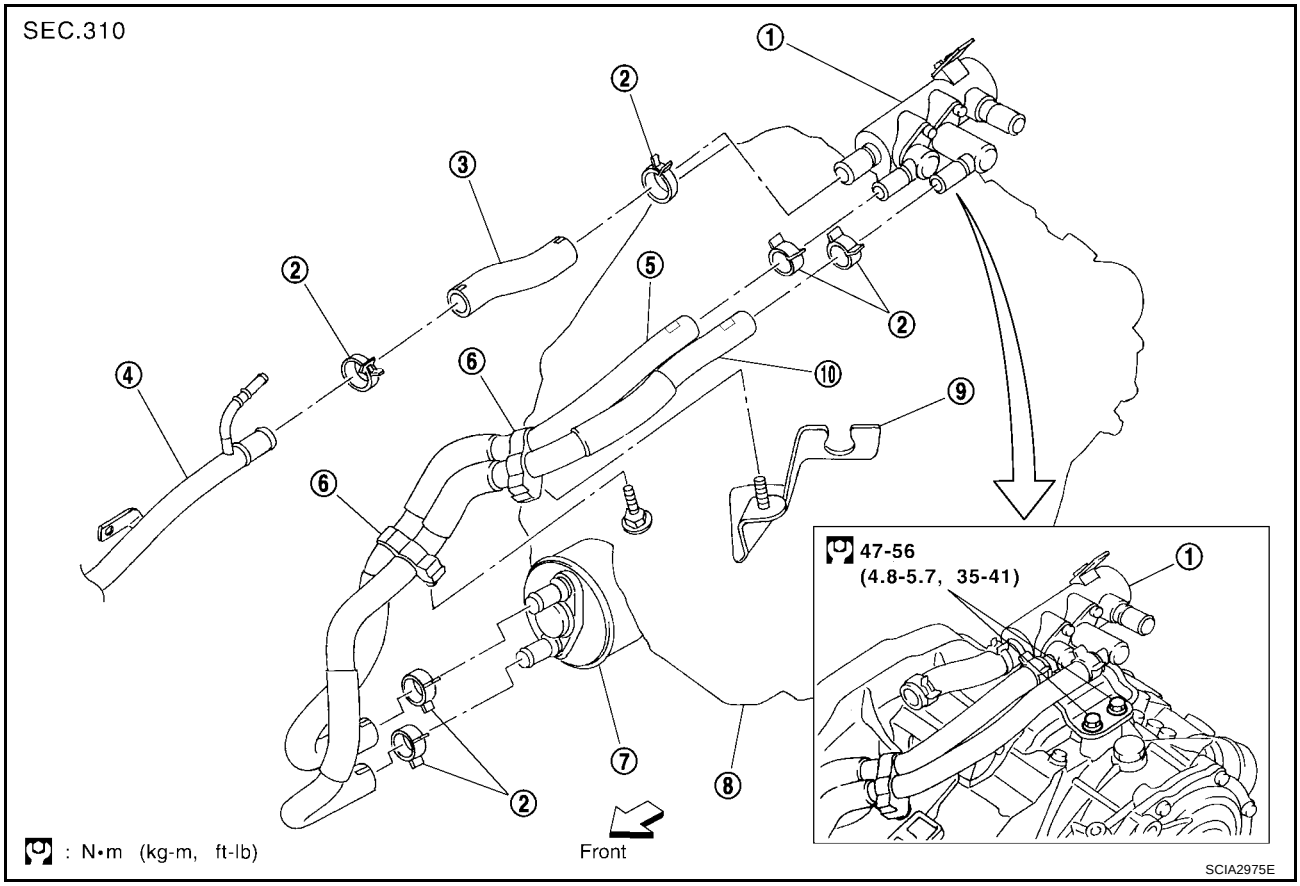
- **Always use new sealing parts.**



ATF Cooler Valve

UCS0015K

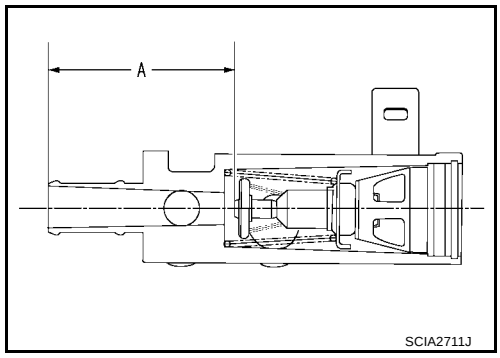
Refer to the figure for ATF cooler valve and hoses removal and installation information.



1. ATF cooler valve assembly
2. Hose clamp
3. Heater hose
4. Heater pipe
5. Outlet water hose
6. Hose clip
7. ATF cooler
8. Transaxle assembly
9. Control cable bracket
10. Inlet water hose

COMPONENT INSPECTION

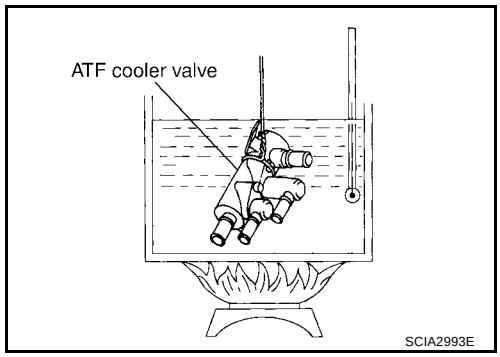
1. Make sure that ATF cooler valve is fully opened at room temperature.



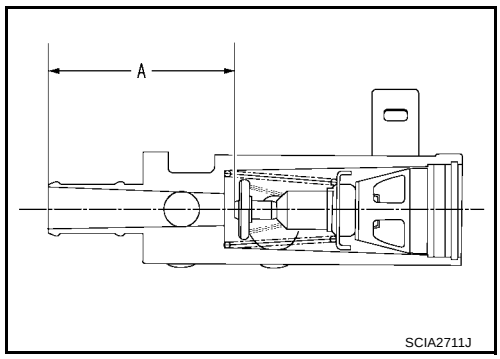
Dimension "A": More than 72.0 mm (2.835 in)

A: Distance between ATF cooler valve port end face and valve shaft end face.

2. Submerge ATF cooler valve in a water-filled container, and then heat it up with temperature of over 82°C (180°F) for 10 minutes more.



3. Make sure that ATF cooler valve is fully closed.



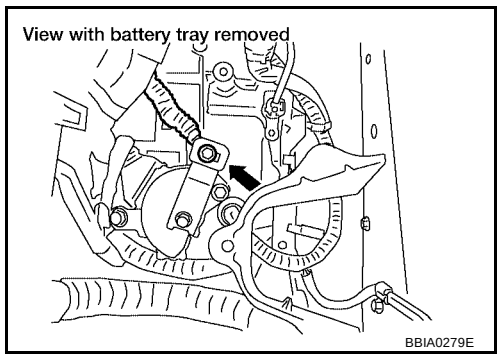
Dimension "A": Less than 66.5 mm (2.618 in)

A: Distance between ATF cooler valve port end face and valve shaft end face.

Control Cable Adjustment

UCS0011H

Move selector lever from the P position to the D position. You should be able to feel the detent in each position. If the detent cannot be felt or the pointer indicating the position is improperly aligned, the control cable needs adjustment.



1. Place selector lever in the P position.

CAUTION:
Turn wheels more than 1/4 turn and apply the parking brake.

2. Loosen control cable lock nut.
3. Using the specified force, push control cable in the direction of the arrow shown in the illustration.

Specified force : 9.8 N (1.0 kg, 2.2 lb)

4. Tighten control cable lock nut.
5. Move selector lever from P to D position. Make sure that selector lever moves smoothly.
   - **Make sure that the starter operates when the selector lever is placed in the N or P position.**
   - **Make sure that the transmission is locked properly when the selector lever is placed in the P position.**

REMOVAL AND INSTALLATION

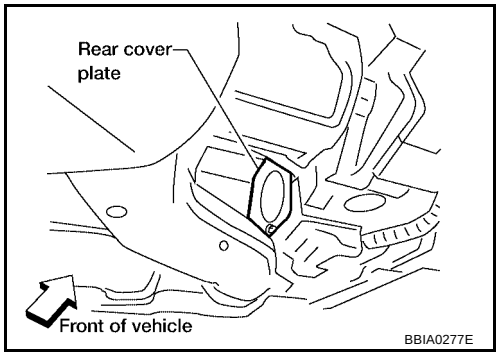
PFP:00000

Removal

UCS0015P

CAUTION:
When removing the transaxle assembly from engine, first remove the crankshaft position sensor from the assembly.
Be careful not to damage sensor edge.

1. Drain engine coolant. Refer to MA-14, "Changing Engine Coolant" .
2. Remove battery and bracket.
3. Remove air cleaner assembly. Refer to EM-15, "Removal and Installation" .
4. Disconnect terminal cord assembly harness connector and park/neutral position (PNP) switch harness connectors.
5. Disconnect harness connectors of revolution sensor, ground, mass air flow sensor, and turbine revolution sensor.
6. Remove ATF cooler valve assembly bracket bolts.
7. Disconnect ATF cooler line retainers.
8. Disconnect ATF cooler lines from ATF cooler valve assembly.
9. Disconnect control cable at transaxle side.
10. Drain ATF.
11. Remove push clips and engine undercover.
12. Remove upper transaxle to engine bolts.
13. Support engine.
14. Remove drive shafts. Refer to FAX-11, "Removal and Installation" .
15. Remove crankshaft position sensor from transaxle.
16. Support transaxle with a jack.
17. Remove starter motor from transaxle. Refer to SC-18, "Removal and Installation" .
18. Remove front suspension member. Refer to FSU-15, "Removal and Installation" .
19. Remove rear cover plate and bolts securing torque converter to drive plate.
    - **Rotate crankshaft for access to securing bolts.**
20. Remove lower transaxle to engine bolts.
21. Lower transaxle while supporting it with a jack.
22. If replacing the transaxle as a unit, remove the LH transaxle mount from the transaxle case.



Installation

UCS0015Q

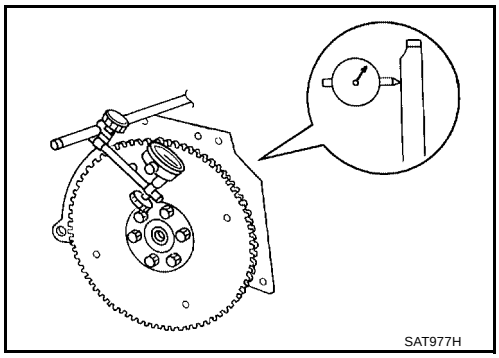
- Drive plate runout

  CAUTION:
  Do not allow any magnetic materials to contact the ring gear teeth.

  Maximum allowable runout:

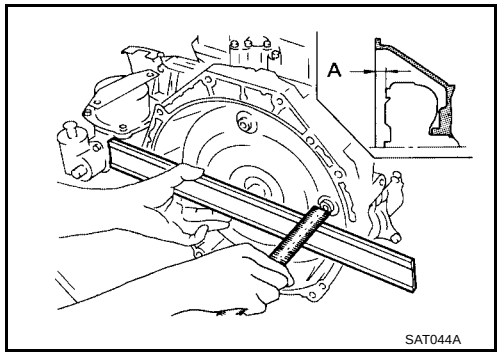
  Refer to EM-144, "DRIVE PLATE RUNOUT (A/T)" .

- If this runout is out of allowance, replace drive plate and ring gear.



- When connecting torque converter to transaxle, measure distance “A” to be certain that they are correctly assembled.

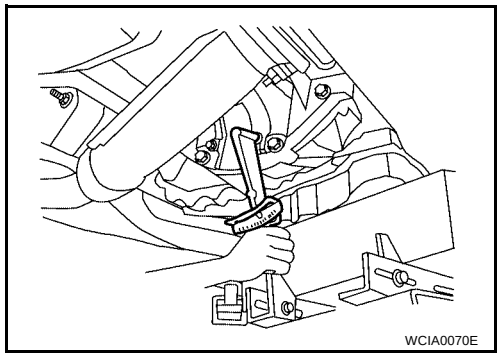
  Distance “A” : 14 mm (0.55 in) or more



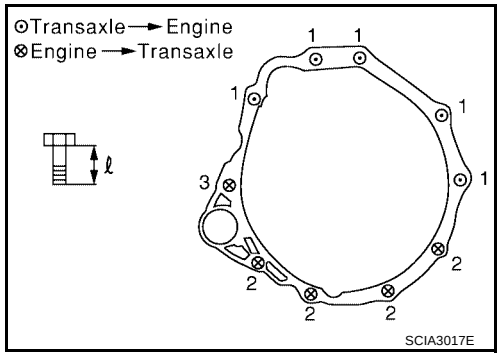
- Install bolts fixing converter to drive plate.

  : 49 - 58 N·m (5.0 - 5.9 kg-m, 37 - 42 ft-lb)

- **With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.**

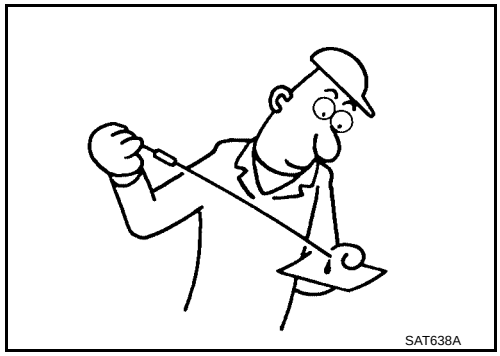


- Tighten bolts securing transaxle.
- Tighten LH mounting bracket bolts to the specified torque. Refer to EM-113, "Removal and Installation" .
- Tighten front suspension member bolts to the specified torque. Refer to FSU-15, "Removal and Installation" .
- Tighten rear plate cover bolts to the specified torque. Refer to EM-31, "Removal and Installation" .



Bolt No.	Tightening torque N·m (kg-m, ft-lb)	ℓ mm (in)
1	70 - 79 (7.2 - 8.0, 52 - 58)	55 (2.17)
2	41.2 - 52.0 (4.2 - 5.3, 31 - 38)	40 (1.57)
3	70 - 79 (7.2 - 8.0, 52 - 58)	55 (2.17)

- Reinstall any part removed.
- Reconnect electrical connectors.
- Check fluid level in transaxle.
- Move selector lever through all positions to be sure that transaxle operates correctly.
  With parking brake applied, rotate engine at idling. Move selector lever through N to D and to R position. A slight shock should be felt by hand gripping selector each time transaxle is shifted.
- When replacing the A/T assembly, initialize TCM. Refer to AT-389, "Precautions for A/T Assembly or TCM Replacement" .
- Perform road test. Refer to AT-435, "ROAD TEST" .

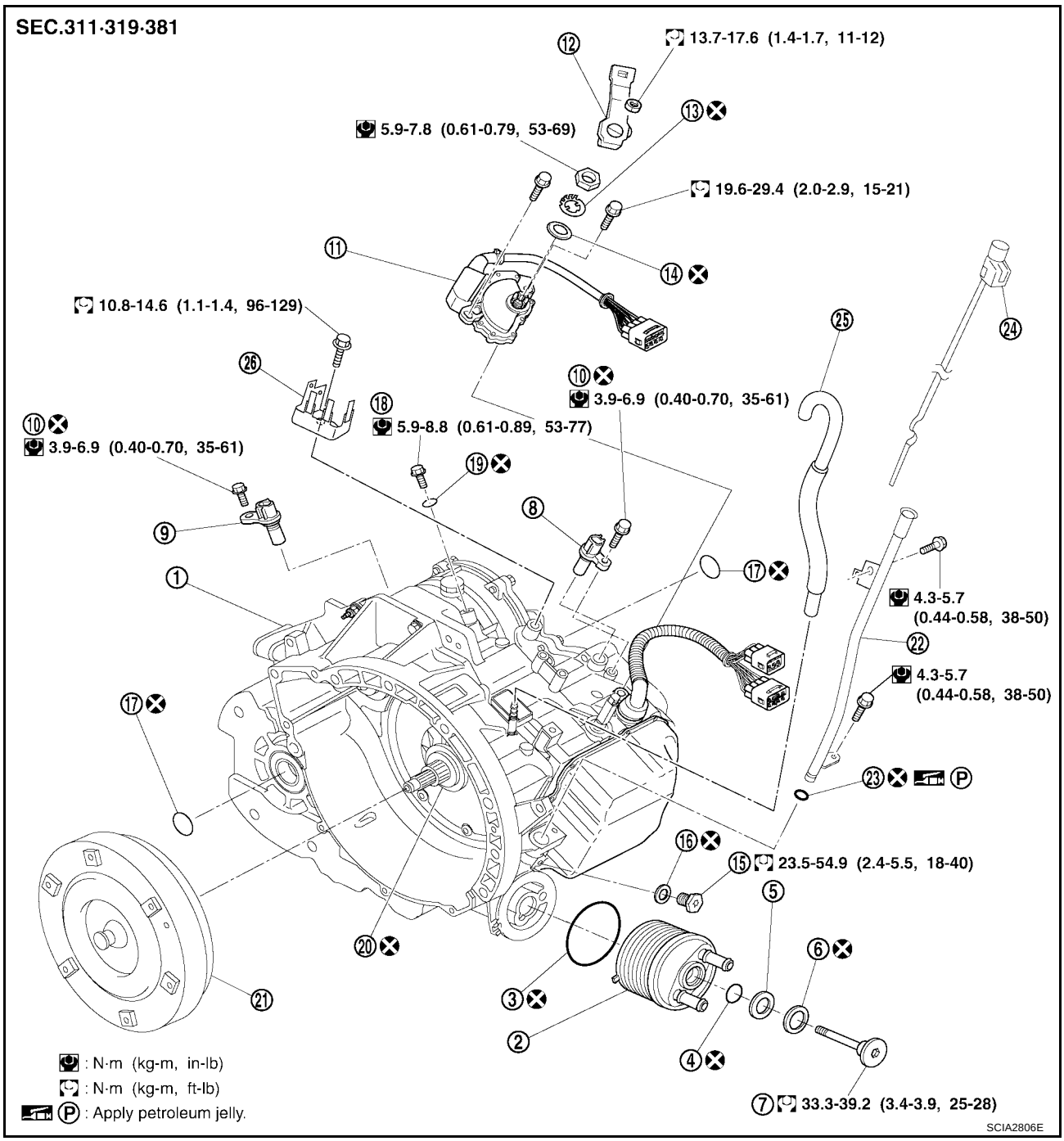


OVERHAUL

PFP:00000

Components

UCS0011L



1. Transaxle assembly
2. ATF cooler assembly
3. O-ring
4. O-ring
5. Washer
6. Spring washer
7. Hexagon bolt
8. Turbine revolution sensor
9. Revolution sensor
10. Seal bolt
11. PNP switch
12. Range lever
13. Lock washer
14. Washer plate
15. Drain plug
16. Gasket
17. Differential side oil seal
18. Test plug
19. O-ring
20. Oil seal
21. Torque converter
22. A/T fluid charging pipe
23. O-ring
24. A/T fluid level gauge
25. Air breather hose
26. Connector bracket

NOTE:
Replace 1 and 21 as a set.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

UCS0010I

Engine		VQ35DE
Automatic transaxle model		RE5F22A
Automatic transaxle model code number		8Y000
Stall torque ratio		1.8: 1
Transaxle gear ratio	1st	4.657
	2nd	3.032
	3rd	1.982
	4th	1.341
	5th	1.018
	Reverse	5.114
	Final drive	2.440
Recommended fluid		Genuine Nissan Matic Fluid K*
Fluid capacity ℓ (US qt, Imp qt)		7.3 (7-3/4, 6-3/8)

CAUTION:

- **Use only Genuine Nissan Matic Fluid K. Do not mix with other fluid.**
- **Using automatic transaxle fluid other than Genuine Nissan Matic Fluid K will deteriorate in driveability and automatic transaxle durability, and may damage the automatic transaxle, which is not covered by the warranty.**

*: Refer to MA-10, "RECOMMENDED FLUIDS AND LUBRICANTS" .

Shift Schedule

UCS0010T

VEHICLE SPEED WHEN SHIFTING GEARS

Accelerator angle	Vehicle speed km/h (MPH) (Approx.)							
	D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
100 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
90 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
80 %	59 (37)	95 (59)	147 (91)	217 (135)	207 (129)	142 (88)	83 (52)	41 (25)
70 %	59 (37)	95 (59)	147 (91)	217 (135)	197 (122)	141 (88)	81 (50)	41 (25)
60 %	59 (37)	95 (59)	147 (91)	217 (135)	190 (118)	135 (84)	76 (47)	41 (25)
50 %	59 (37)	90 (56)	137 (85)	202 (126)	176 (109)	123 (76)	69 (43)	41 (25)
40 %	50 (31)	82 (51)	117 (73)	172 (107)	148 (92)	92 (57)	54 (34)	32 (20)
30 %	37 (23)	62 (39)	87 (54)	127 (79)	105 (65)	59 (37)	35 (22)	19 (12)
20 %	27 (17)	44 (27)	59 (37)	87 (54)	60 (37)	40 (25)	22 (14)	8 (5)
10 %	19 (12)	27 (17)	35 (22)	55 (34)	44 (27)	32 (20)	22 (14)	8 (5)

VEHICLE SPEED WHEN PERFORMING AND RELEASING COMPLETE LOCK-UP

Accelerator angle	Vehicle speed km/h (MPH) (Approx.)	
	Lock-up “ON”	Lock-up “OFF”
50 %	217 (135)	195 (121)
15%	108 (67)	70 (43)
0 - 8 %	66 (41)	63 (39)

- Lock-up vehicle speed indicates the speed in D position.
- Perform lock-up inspection after warming up engine.
- Lock-up vehicle speed may vary depending on the driving conditions and circumstances.

VEHICLE SPEED WHEN PERFORMING AND RELEASING SLIP LOCK-UP

Accelerator angle	Gear position	Vehicle speed km/h (MPH) (Approx.)	
		Slip lock-up “ON”	Slip lock-up “OFF”
0 - 10 %	4th	41 (25)	38 (24)
	5th	53 (33)	50 (31)

- Slip lock-up vehicle speed indicates the speed in D position.
- Perform slip lock-up inspection after warming up engine.
- Slip lock-up vehicle speed may vary depending on the driving conditions and circumstances.

Stall Speed

UCS0010M

Stall speed	2,430 - 2,730 rpm

Line Pressure

UCS0010N

Engine speed	Line pressure kPa (kg/cm^2 , psi)	
	D, M positions	R position
At idle speed	333 - 392 (3.4 - 4.0, 48 - 57)	500 - 608 (5.1 - 6.2, 73 - 88)
At stall speed	1,285 - 1,393 (13.1 - 14.2, 186 - 202)	1,706 - 1,981 (17.4 - 20.2, 247 - 287)

Time Lag

UCS0010U

Selector lever	Time
N to D position	Less than 0.7 sec.
N to R position	Less than 1.2 sec.

Shift Solenoid Valves

UCS0010V

Shift position		Shift solenoid valve					Remarks
		A	B	C	D	E	
P		OFF (Open)	OFF (Closed)	OFF (Closed)	OFF (Open)	OFF (Closed)	PARK POSITION
R		OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	ON (Open)	REVERSE POSITION
N		OFF (Open)	OFF (Closed)	OFF (Closed)	OFF (Open)	OFF (Closed)	NEUTRAL POSITION
D	1st	ON (Closed)	ON (Open)	ON (Open)	OFF (Open)	OFF (Closed)	Automatic shift 1 ⇔ 2 ⇔ 3 ⇔ 4 ⇔ 5
	1 ⇔ 2	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)	
	2nd	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)	
	2 ⇔ 3	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	ON (Open)	
	3rd	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	OFF (Closed)	
	3 ⇔ 4	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	ON (Open)	
	4th	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	OFF (Closed)	
	4 ⇔ 5	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)	
	5th	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)	

Shift position		Shift solenoid valve					Remarks
		A	B	C	D	E	
M5	5th	OFF (Open)	ON (Open)	OFF (Closed)	ON (Closed)	OFF (Closed)	Locks in 5th gear*
M4	4th	OFF (Open)	OFF (Closed)	OFF (Closed)	ON (Closed)	OFF (Closed)	Locks in 4th gear*
M3	3rd	OFF (Open)	OFF (Closed)	ON (Open)	ON (Closed)	OFF (Closed)	Locks in 3rd gear*
M2	2nd	OFF (Open)	OFF (Closed)	ON (Open)	OFF (Open)	OFF (Closed)	Locks in 2nd gear*
M1	1st	ON (Closed)	ON (Open)	ON (Open)	OFF (Open)	ON (Open)	Locks in 1st gear*

*: Except when automated up/down shift control and up/down shift permission control are actuated. Refer to AT-415, "MANUAL MODE" .

Solenoid Valves

UCS0010O

Solenoid valves	Resistance (Approx.)	Connector (Color)	Terminal
Shift solenoid valve A	11 - 16 Ω	F30 (BR)	2
Shift solenoid valve B		F62(GR)	1
Shift solenoid valve C		F62(GR)	4
Shift solenoid valve D		F30 (BR)	1
Shift solenoid valve E		F30 (BR)	5
Pressure control solenoid valve A	5.0 - 5.6 Ω	F62(GR)	3 - 6
Pressure control solenoid valve B		F30 (BR)	3 - 7
Pressure control solenoid valve C		F62(GR)	2 - 5

Specified resistance at 20°C (68°F).

A/T Fluid Temperature Sensor

UCS0010P

Condition		Voltage (Approx.)	Resistance (Approx.)
ATF temperature	0°C (32°F)	4.0V	9.8 kΩ
	20°C (68°F)	3.0V	4.2 kΩ
	80°C (176°F)	0.8V	0.54 kΩ
	100°C (212°F)	0.5V	0.31 kΩ

Turbine Revolution Sensor

UCS0010Q

Condition	Signal	Voltage* (Approx.)
Connect 12V power supply and 100 Ω resistance, and then shake magnetic body.	HIGH	1.2 - 1.6V
	LOW	0.4 - 0.8V

*: Voltage with both end of 100 Ω resistance.

Revolution Sensor

UCS0010R

Condition	Signal	Voltage* (Approx.)
Connect 12V power supply and 100 Ω resistance, and then shake magnetic body.	HIGH	1.2 - 1.6V
	LOW	0.4 - 0.8V

*: Voltage with both end of 100 Ω resistance.