<SUPPLEMENT-III>

AUTOMATIC TRANSMISSION

SECTION AT

MODIFICATION NOTICE:

- The RE5R05A model has been added.

CONTENTS

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

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER” used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to NISSAN MODEL Y61 is as follows (The composition varies according to the destination and optional equipment.):

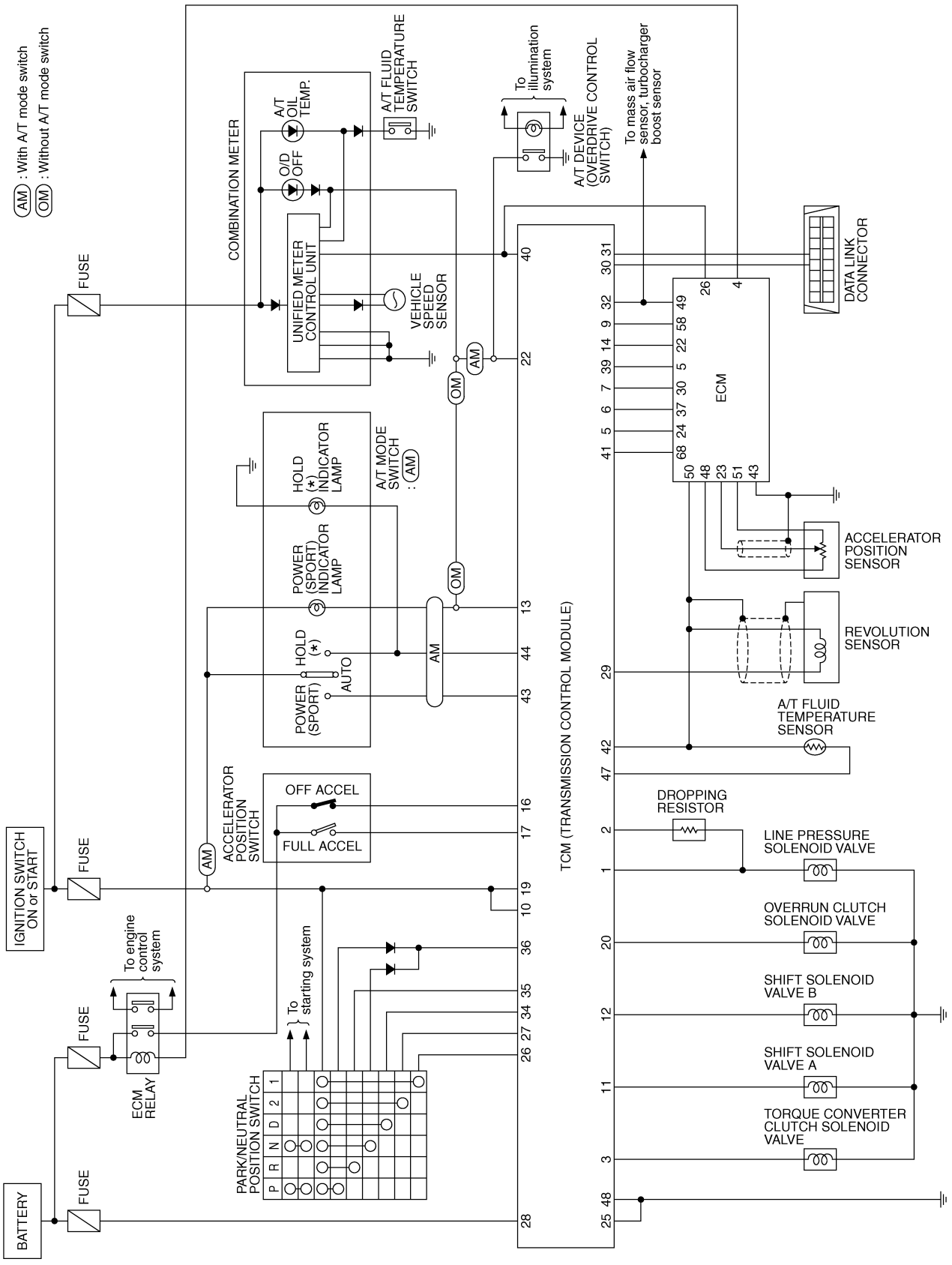
- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of front side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS 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 should be performed by an authorized NISSAN 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 RS 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 harness connector.**

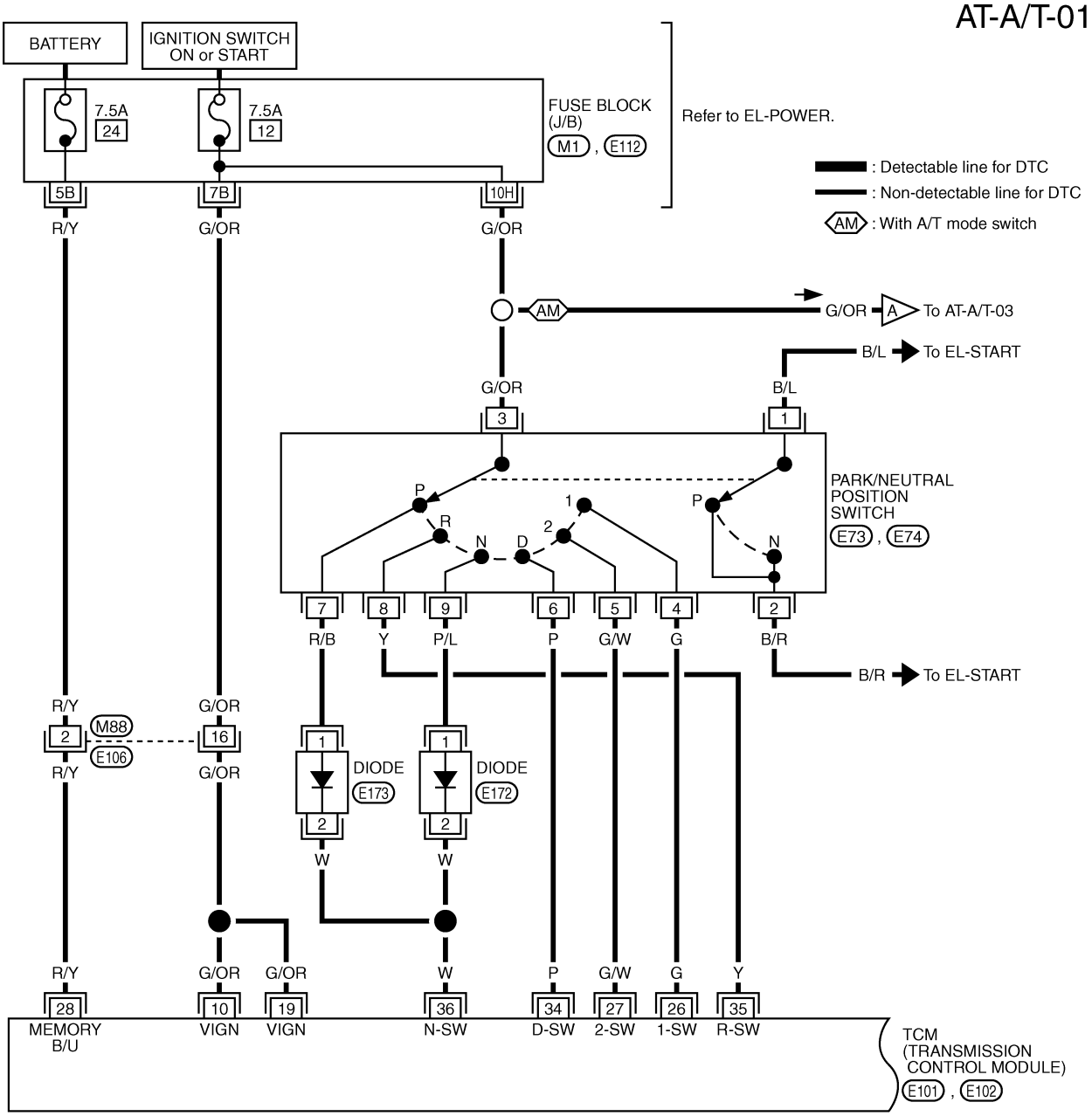
Circuit Diagram

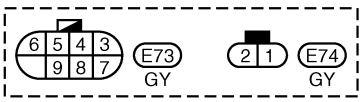


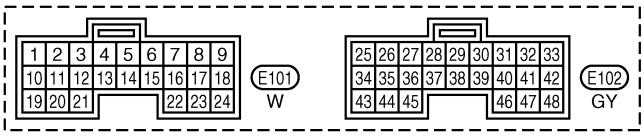
TAT059M

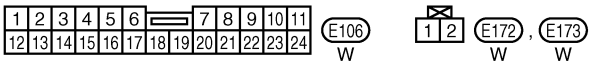
Wiring Diagram — A/T —

AT-A/T-01









Refer to last page (Foldout page).

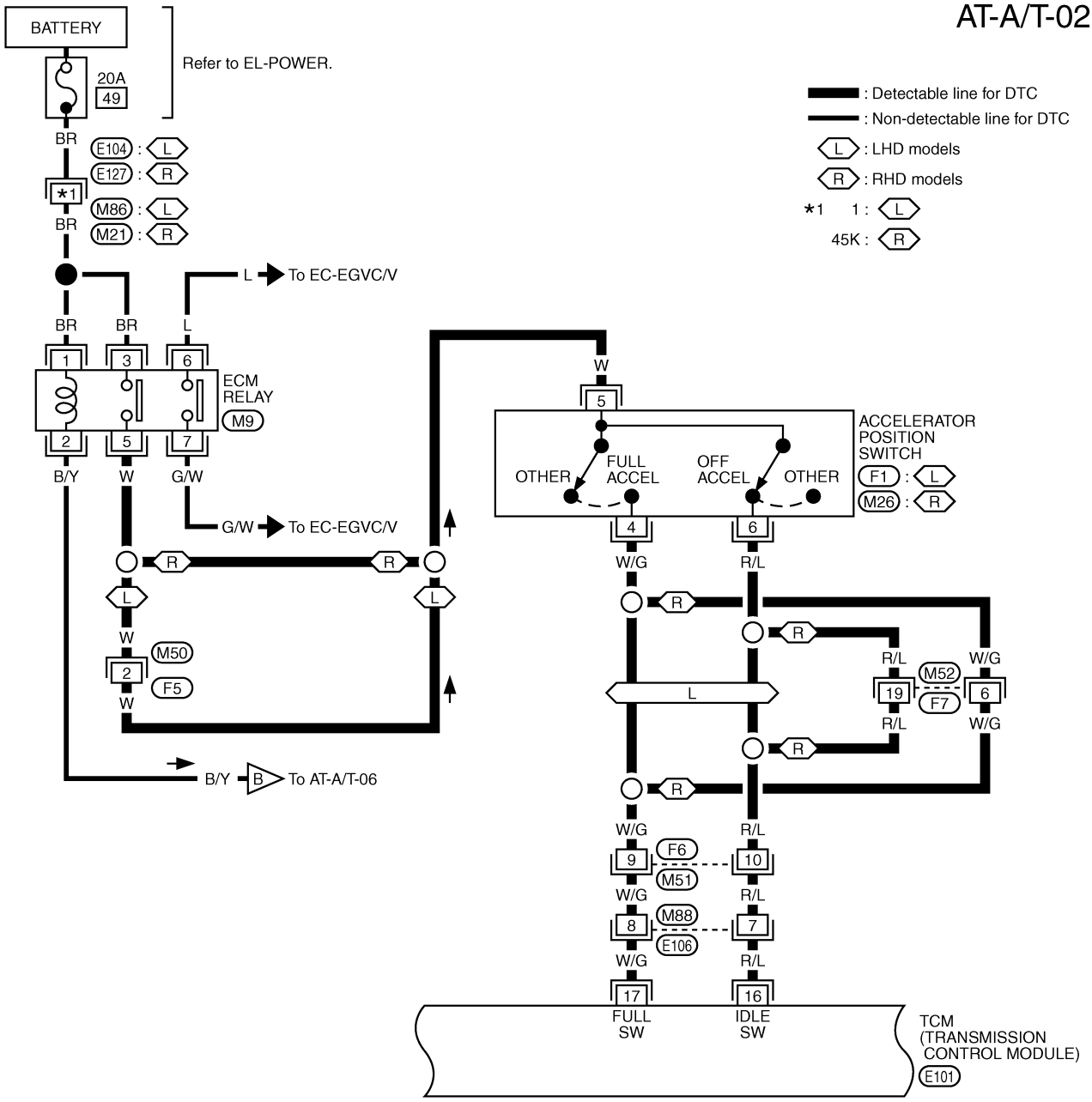
M1

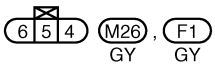
E112

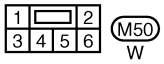
TAT061M

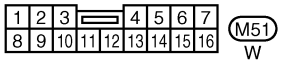
Wiring Diagram — A/T — (Cont'd)

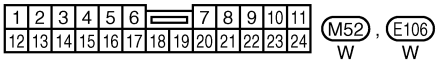
AT-A/T-02

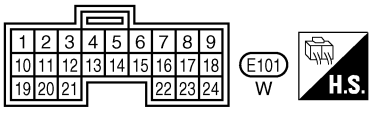


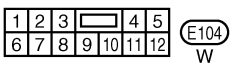










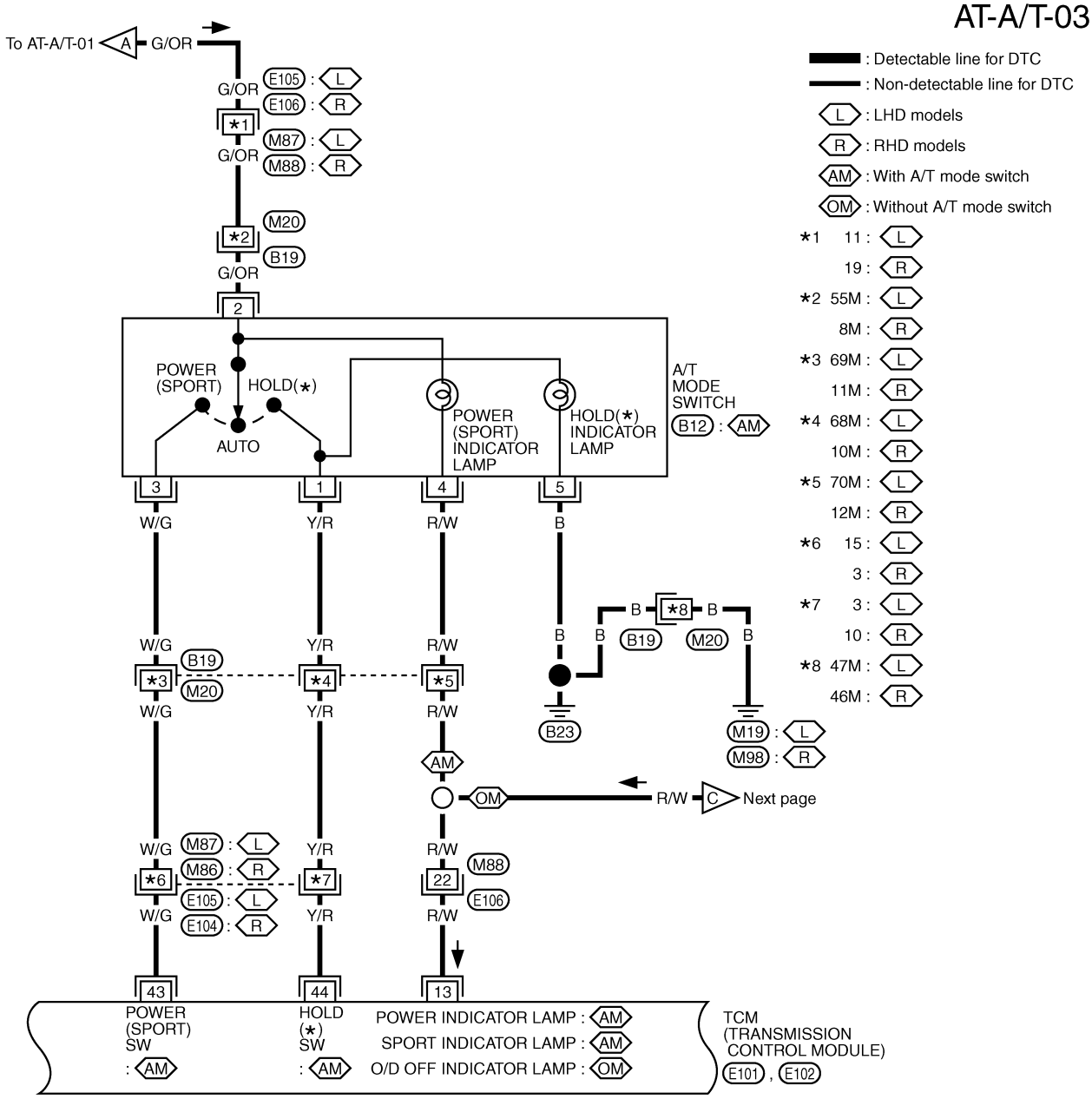


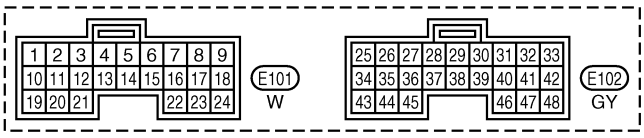
Refer to last page (Foldout page).
M21 , E127

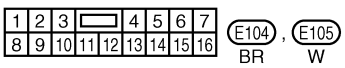
TAT108M

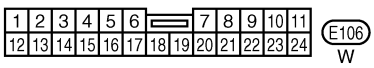
Wiring Diagram — A/T — (Cont'd)

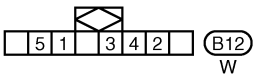
AT-A/T-03









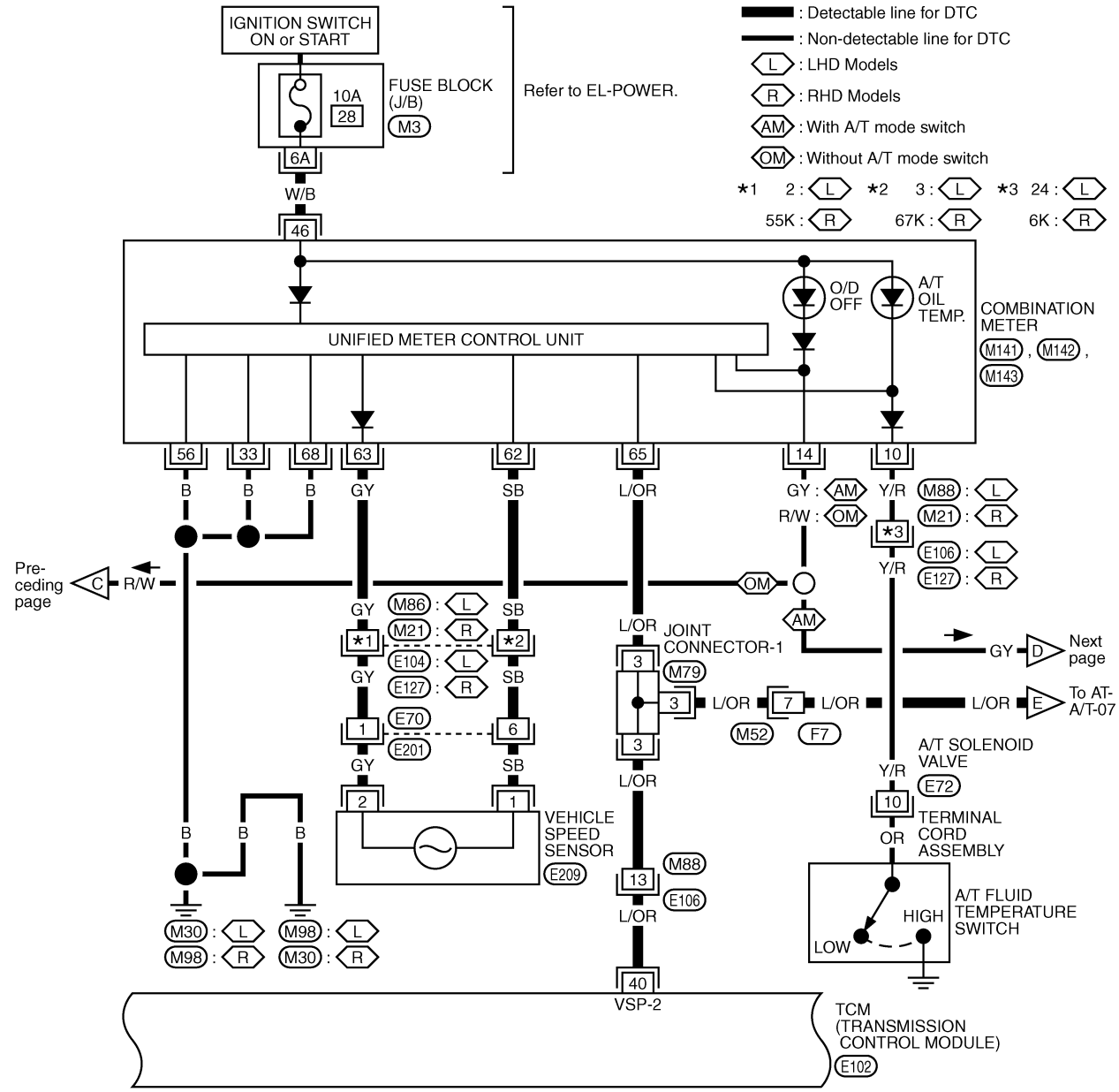


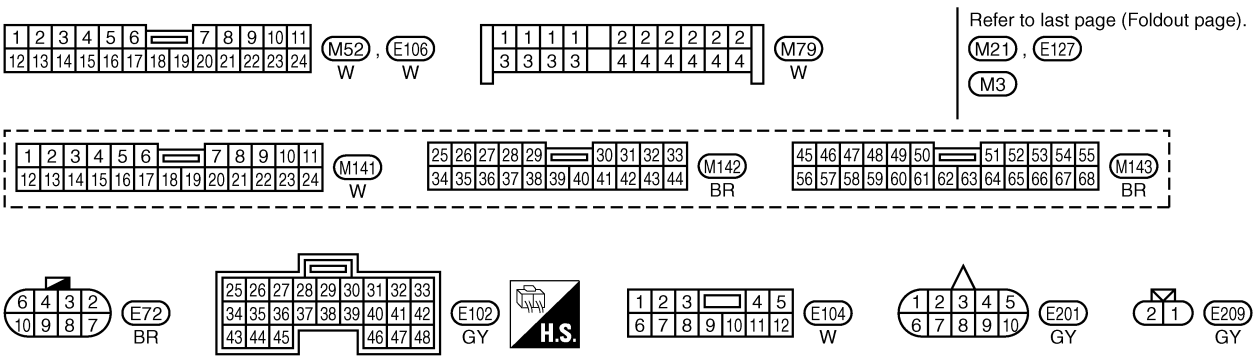
Refer to last page (Foldout page).
M20 , B19

TAT109M

Wiring Diagram — A/T — (Cont'd)

AT-A/T-04

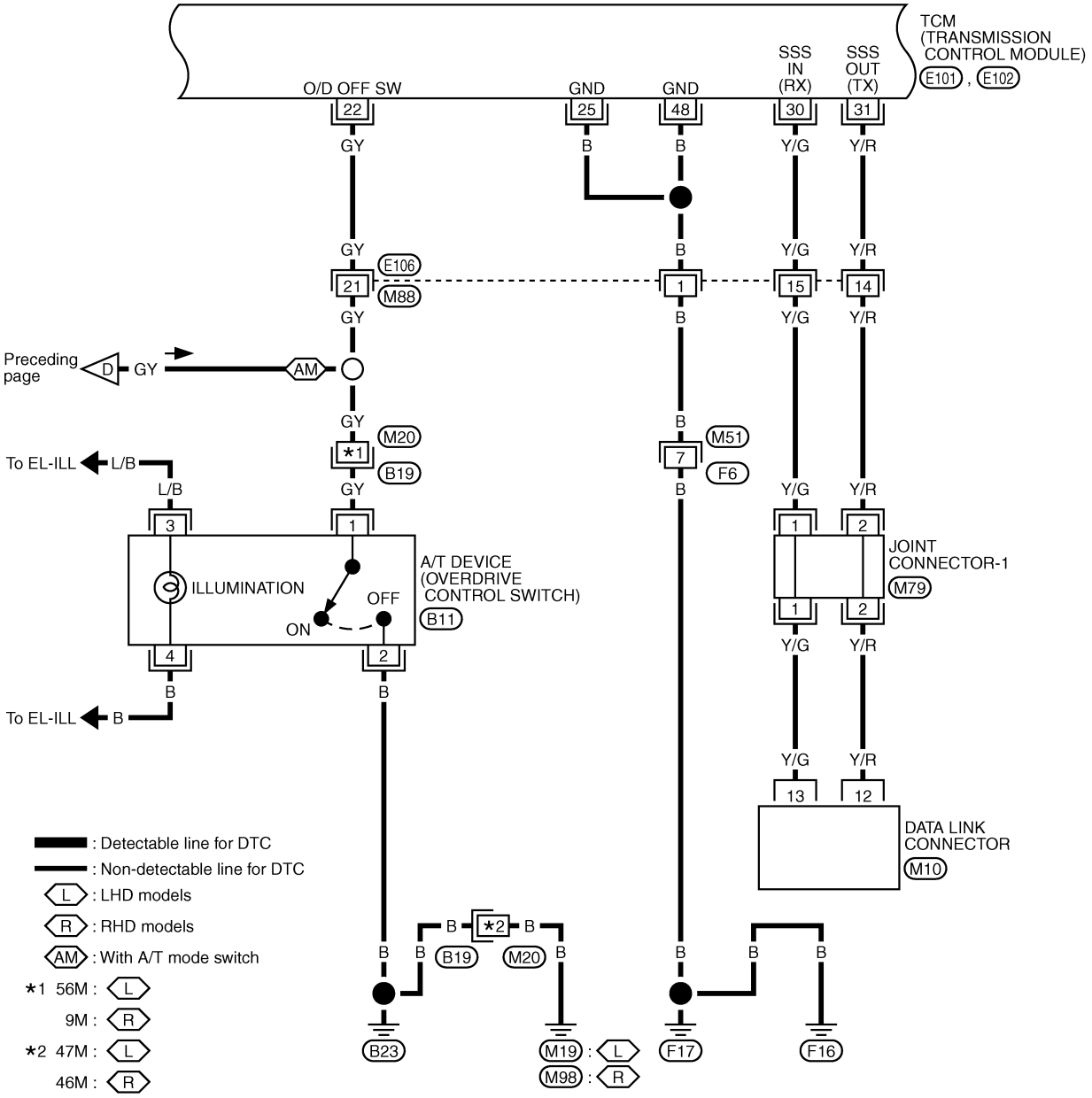


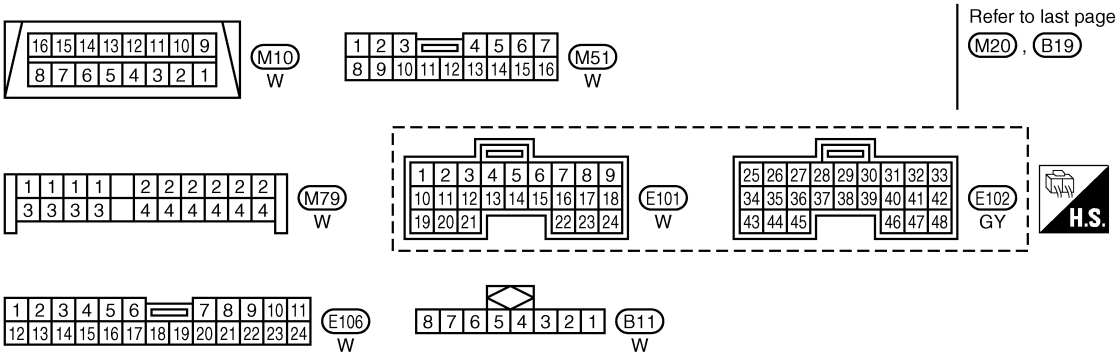


TAT122M

Wiring Diagram — A/T — (Cont'd)

AT-A/T-05



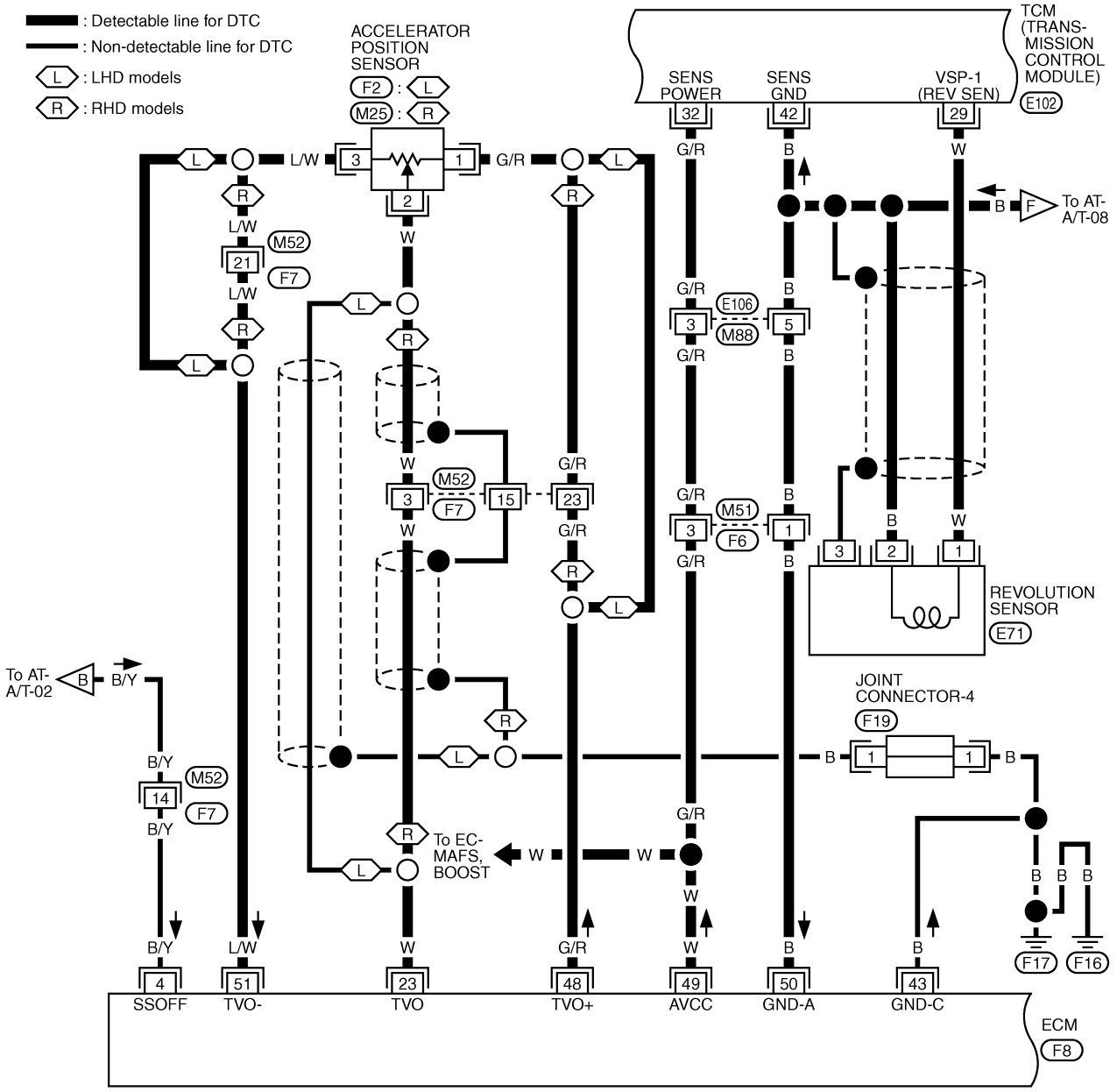


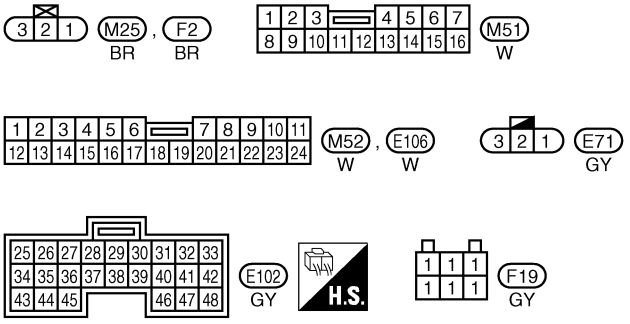
Refer to last page (Foldout page).
M20, B19

TAT111M

Wiring Diagram — A/T — (Cont'd)

AT-A/T-06



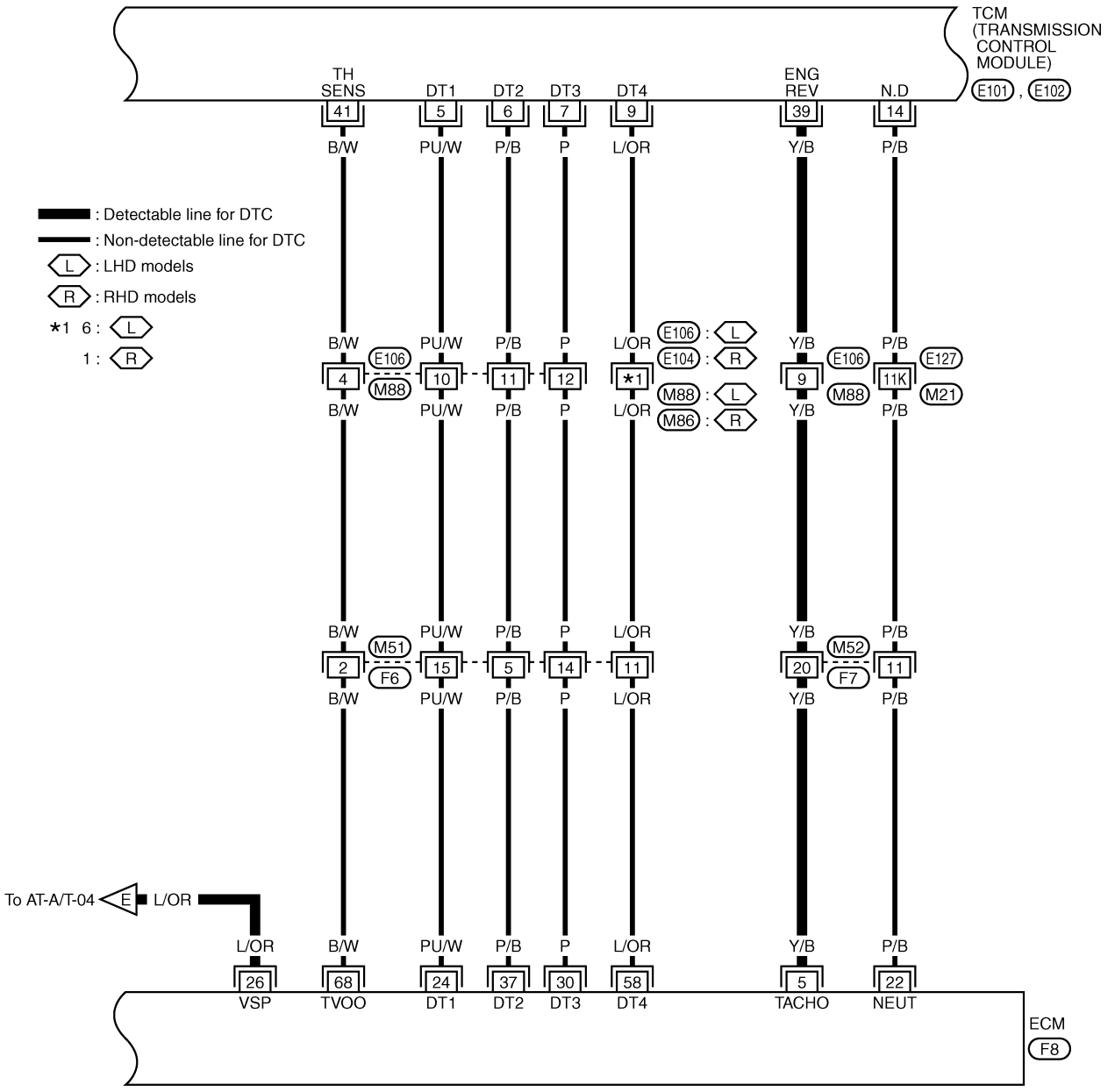


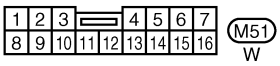
Refer to last page (Foldout page).
F8

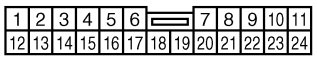
TAT112M

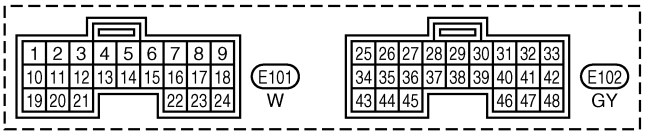
Wiring Diagram — A/T — (Cont'd)

AT-A/T-07

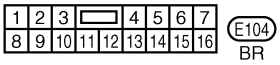



M51 W


M52, E106 W



E101 W, E102 GY

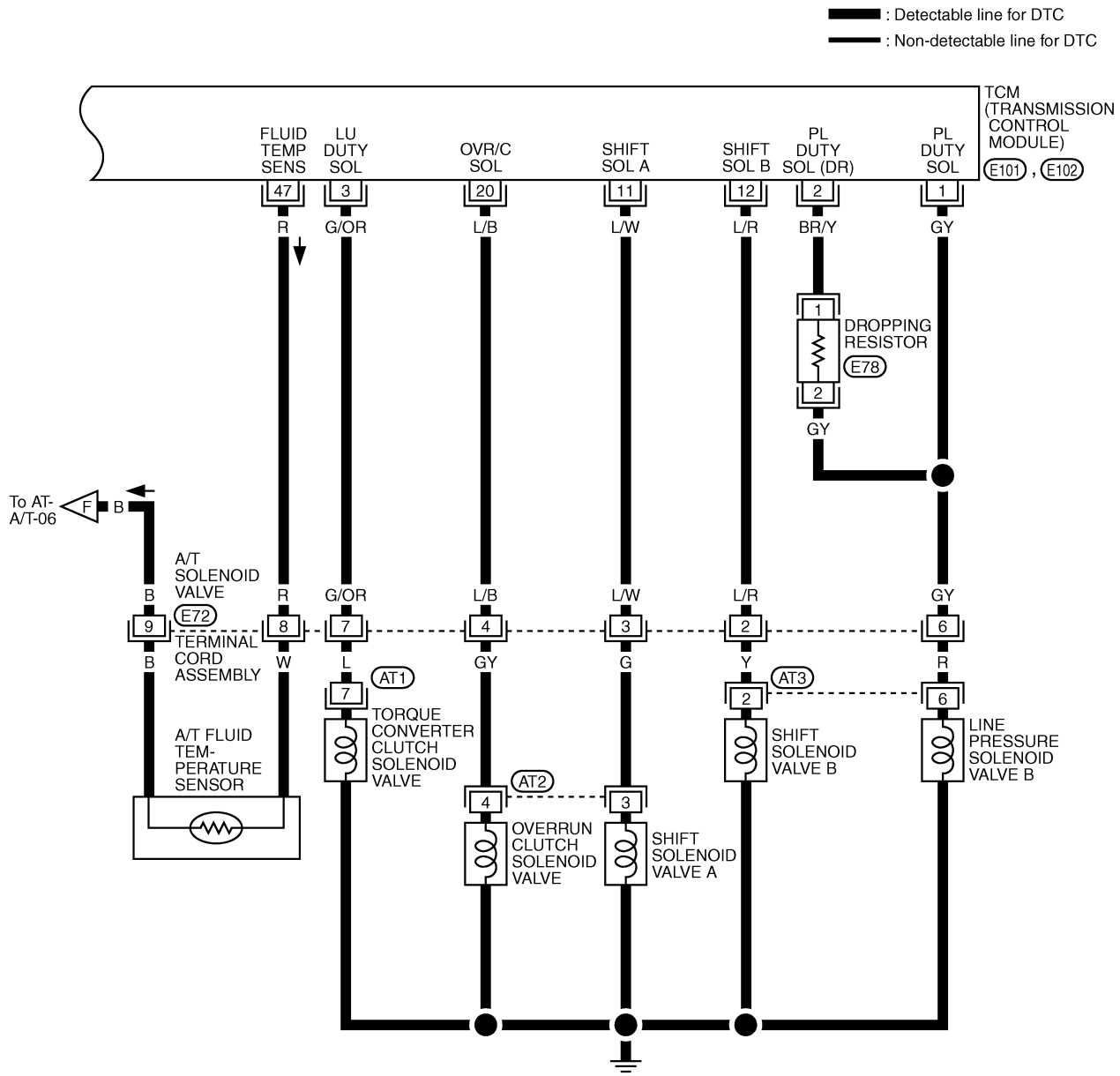

E104 BR

Refer to last page (Foldout page).
M21, E127
F8

TAT128M

Wiring Diagram — A/T — (Cont'd)

AT-A/T-08



*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT114M

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

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER” used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to NISSAN MODEL Y61 is as follows (The composition varies according to the destination and optional equipment.):

- For a frontal collision
  The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
  The Supplemental Restraint System consists of front side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS 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 should be performed by an authorized NISSAN 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 RS 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 harness connector.**

Precautions for A/T Assembly Replacement

REPLACEMENT

CAUTION:

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

EEPROM erasing patterns

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

Method for erasing the EEPROM in the TCM

1. Move selector lever in “R” position.
2. Set the closed throttle position switch to “OFF”. (Depressed accelerator pedal at half throttle)
3. Ignition switch to “ON” position.
4. Select “SELF-DIAG RESULTS” mode for A/T with CONSULT-II.
5. Touch “ERASE” the EEPROM memory.

Precautions for A/T Assembly Replacement (Cont'd)

Method for writing data from the ROM assembly in the transmission

With the EEPROM in the TCM erased, the selector lever in "P" position, and the ignition switch "ON" position.

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

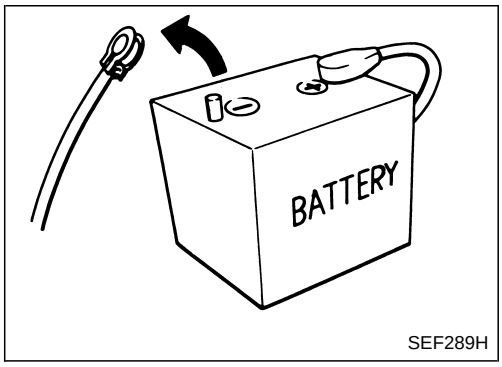
Check method

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

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

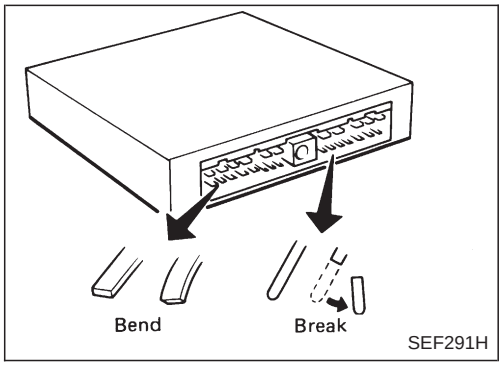
Precautions

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



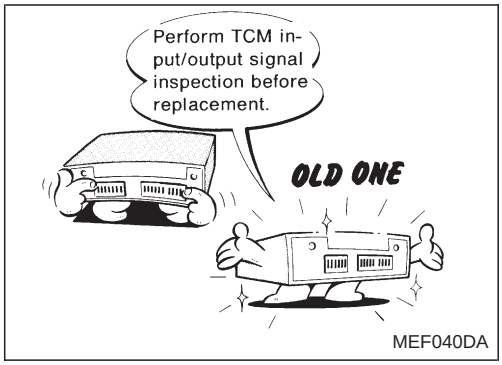
SEF289H

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



SEF291H

- **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.



MEF040DA

- **Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not. Refer to AT-64, "TCM INSPECTION TABLE".**
- Always use the specified brand of A/T fluid. Refer to MA section, "Changing A/T Fluid".
- 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.

Wiring Diagrams and Trouble Diagnosis

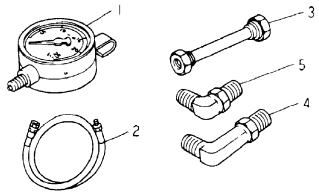
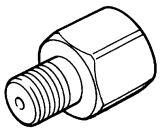
When you read wiring diagrams, refer to the following:

- Read GI section, “HOW TO READ WIRING DIAGRAMS”.
- See EL section, “POWER SUPPLY ROUTING” for power distribution circuit.

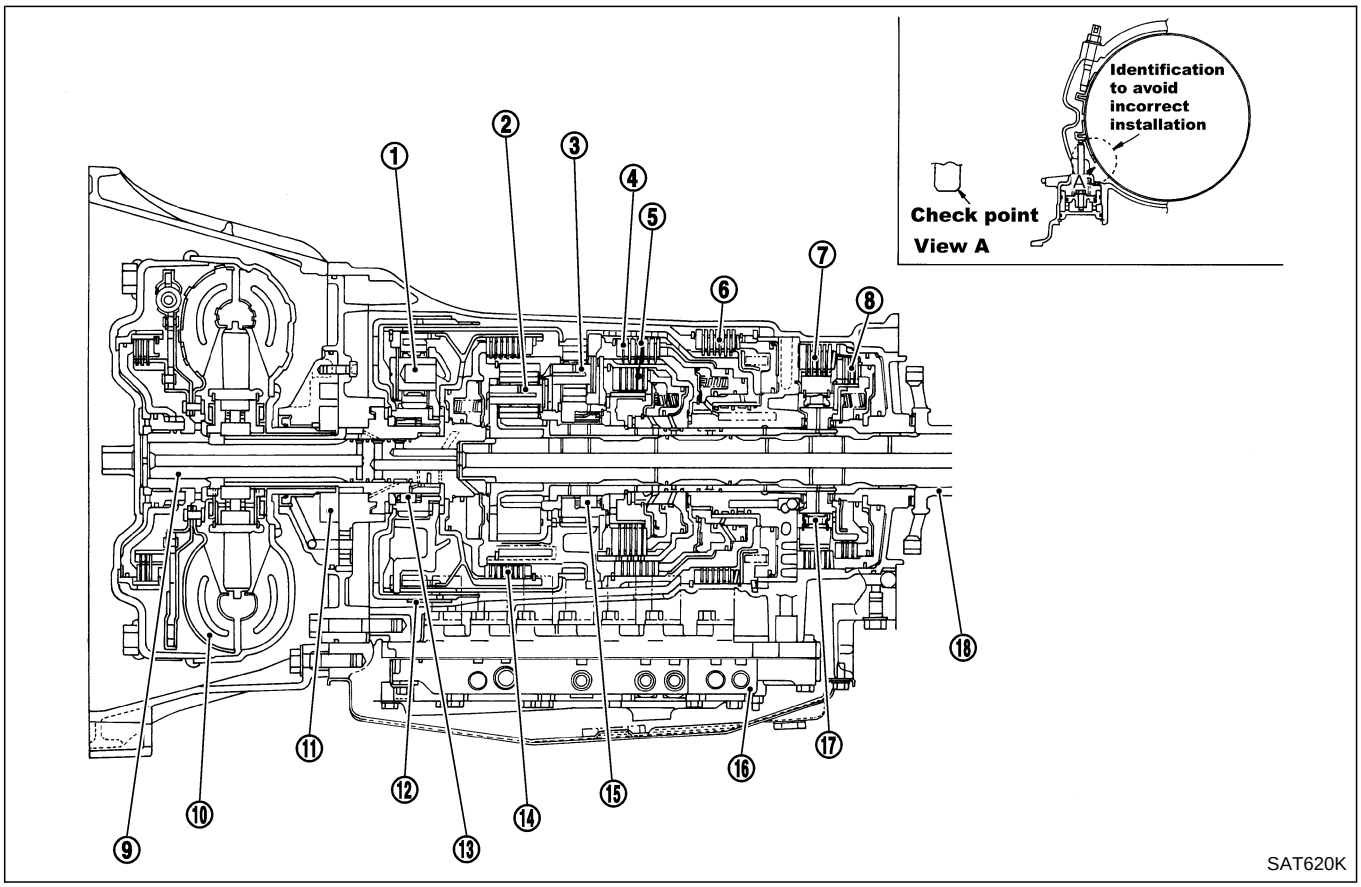
When you perform trouble diagnosis, refer to the following:

- Read GI section, “HOW TO FOLLOW FLOW CHART IN TROUBLE DIAGNOSES”.

Special Service Tools

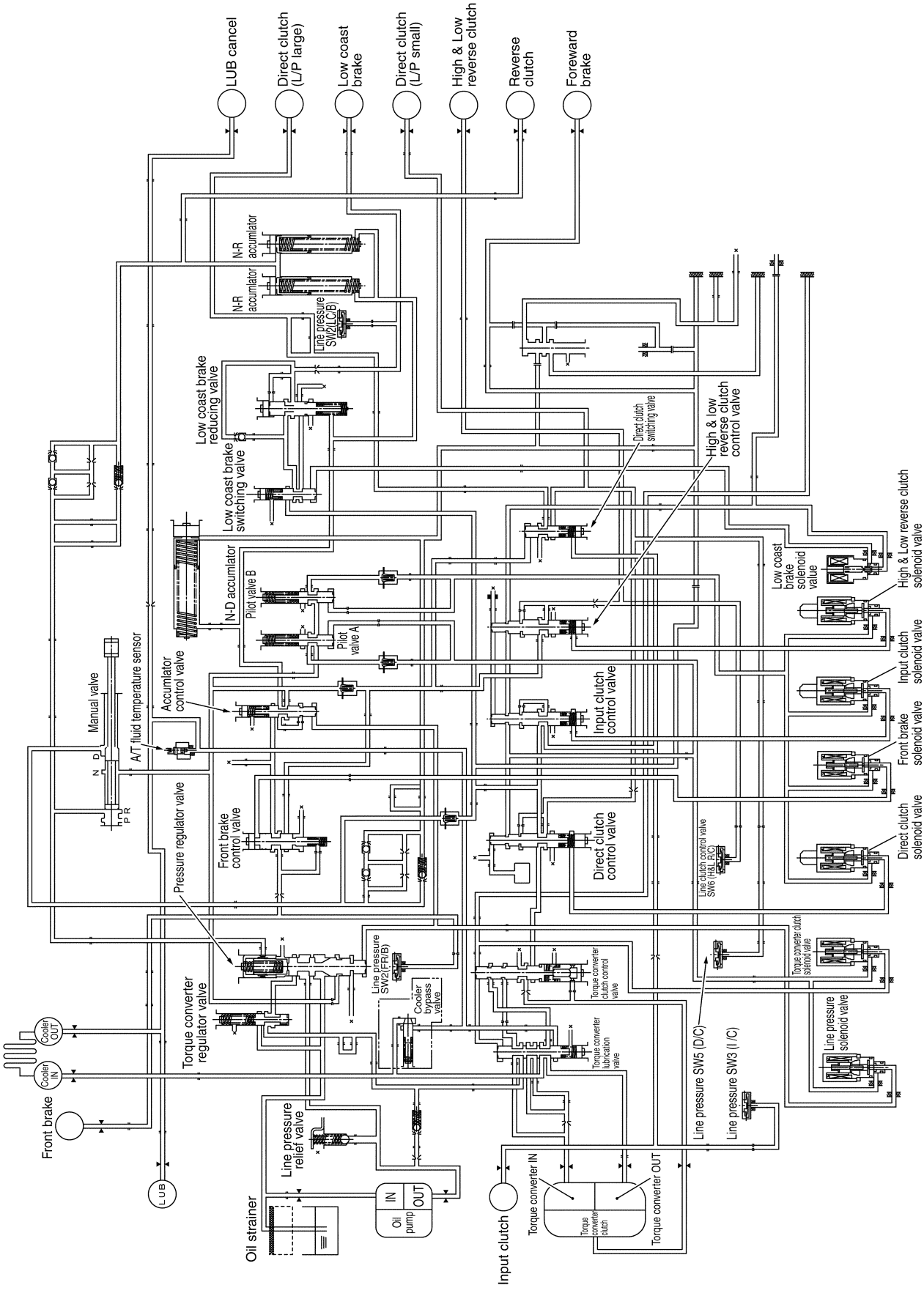
Tool number Tool name	Description
ST2505S001 Oil pressure gauge set 1 ST25051001 Oil pressure gauge 2 ST25052000 Hose 3 ST25053000 Joint pipe 4 ST25054000 Adapter 5 ST25055000 Adapter	 ZZA0600D Measuring line pressure
KV31103600 Joint pipe adapter (With ST25054000)	 ZZA1227D Measuring line pressure

Cross-Sectional View



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

Hydraulic Control Circuit

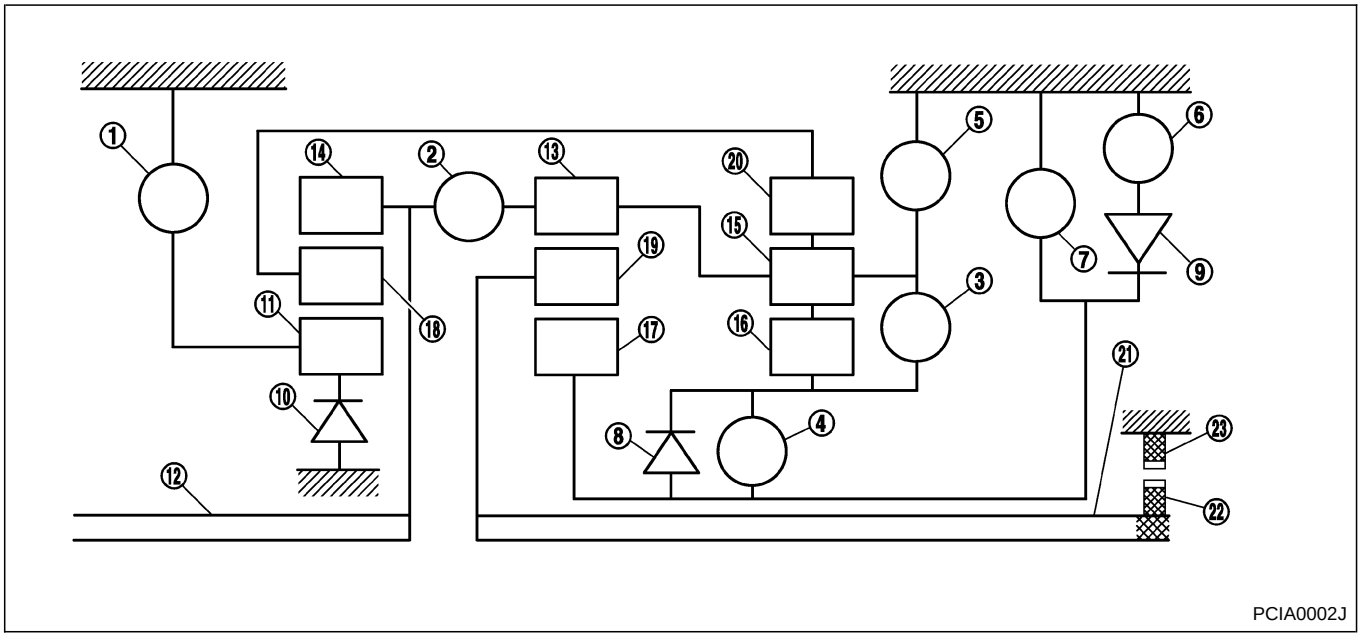


PCIA0001E

Shift Mechanism

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

CONSTRUCTION



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

FUNCTION OF CLUTCH AND BRAKE

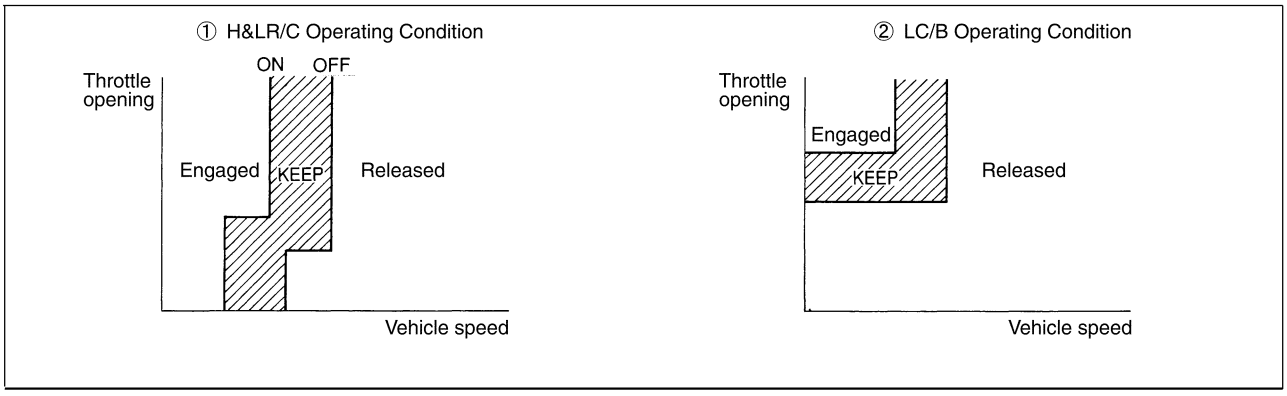
Name of the Part	Abbreviation	Function
Front brake (1)	Fr/B	Fastens the front sun gear (11)
Input clutch (2)	I/C	Connects the input shaft (12), the mid internal gear (13), and the front internal gear (14).
Direct clutch (3)	D/C	Connects the rear carrier (15) and the rear sun gear (16).
High and low reverse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

Shift Mechanism (Cont'd)

CLUTCH AND BAND CHART

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

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



SCIA0492E

Shift Mechanism (Cont'd)

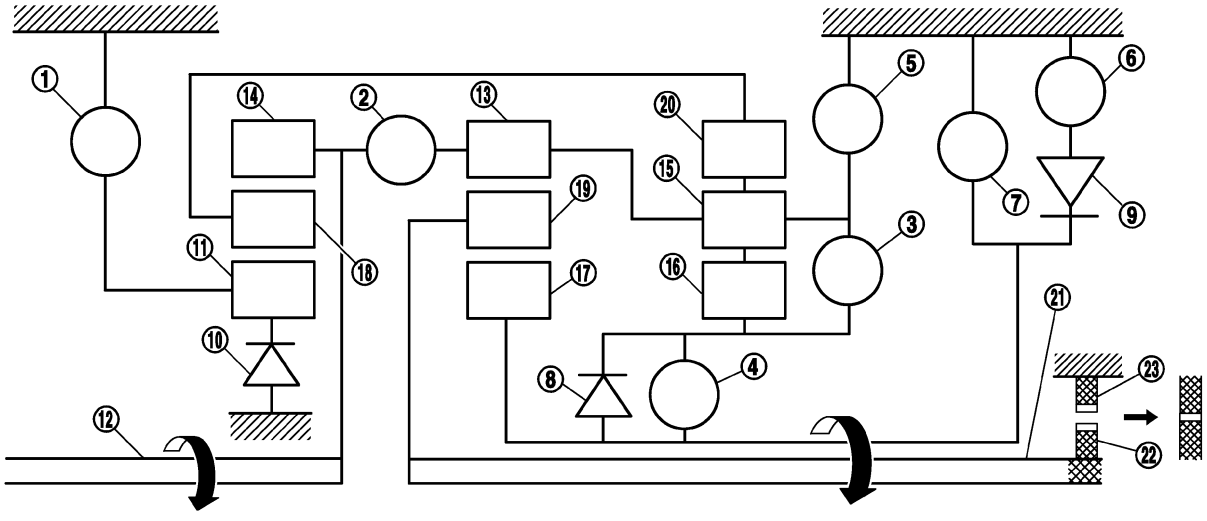
POWER TRANSMISSION

"N" position

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

"P" position

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

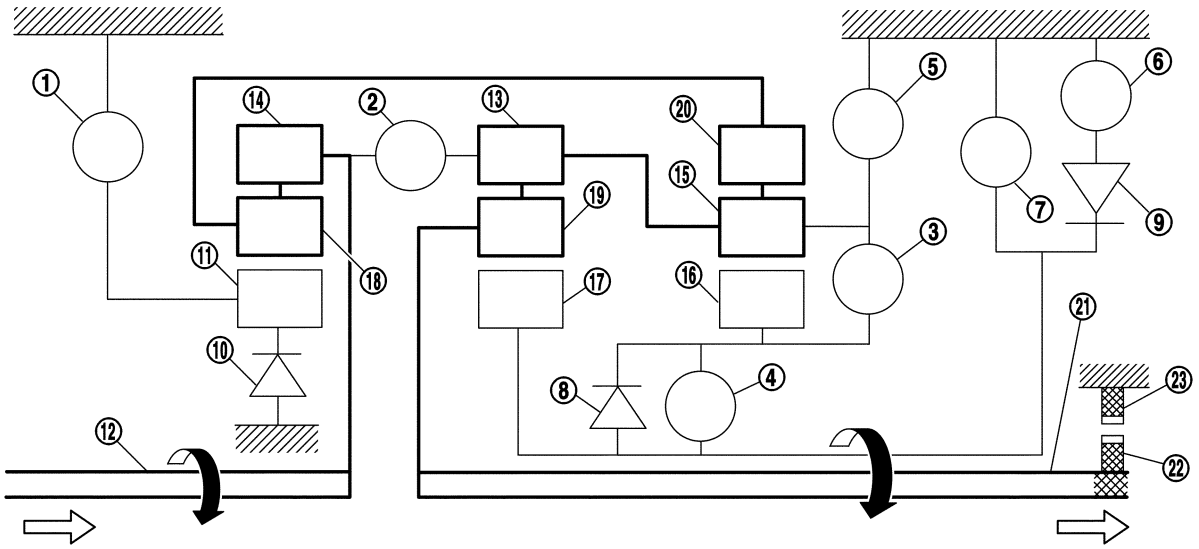


PCIA0003J

Shift Mechanism (Cont'd)

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

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



Power transmission

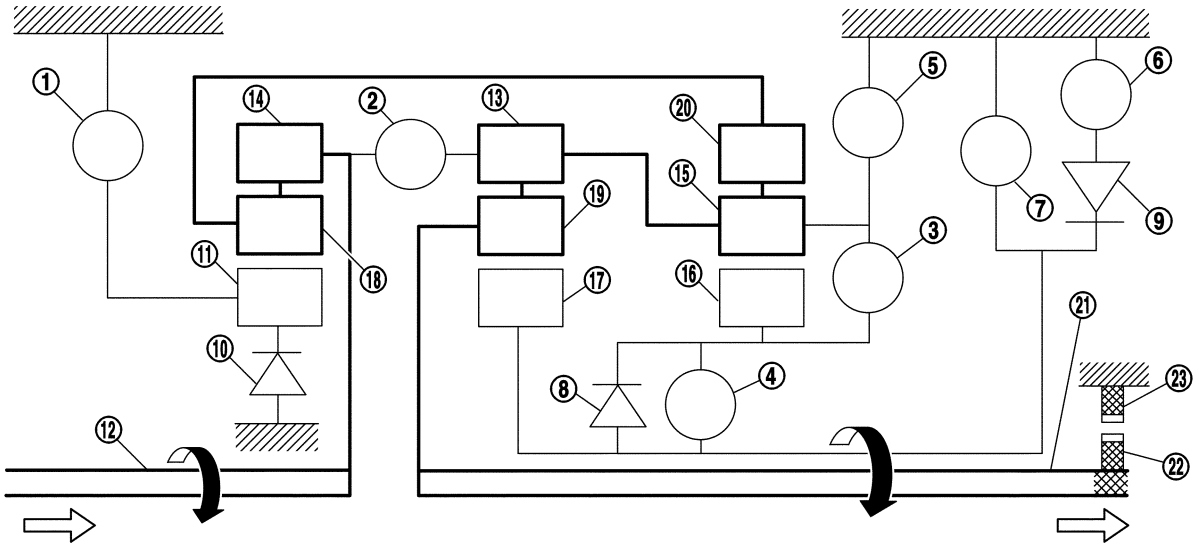
Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Middle internal gear ⇨ Middle carrier ⇨ Output shaft

PCIA0004E

Shift Mechanism (Cont'd)

"M1" POSITION 1ST SPEED

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



Power transmission

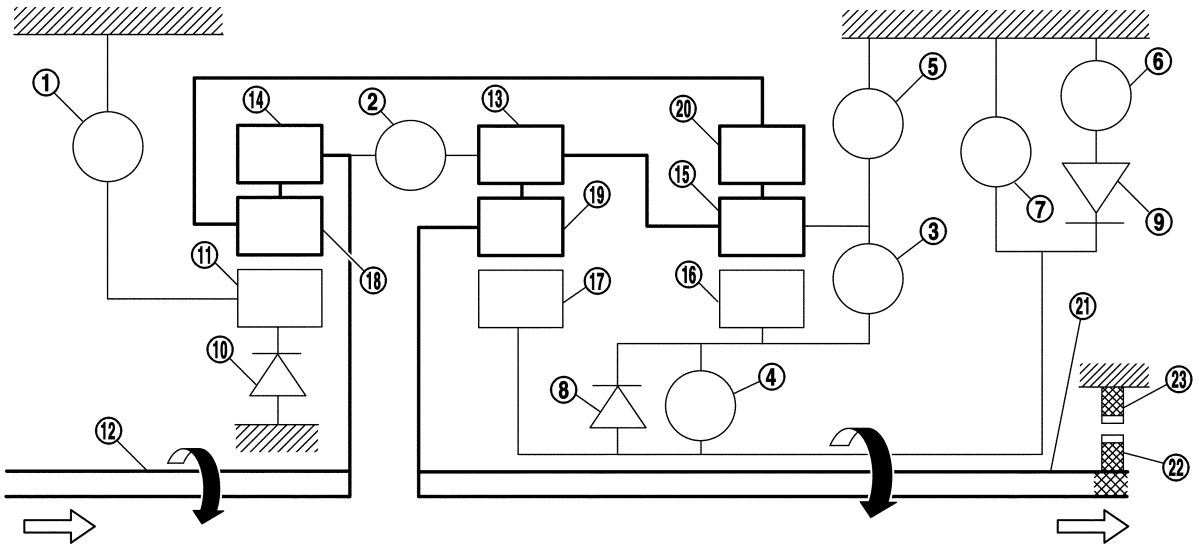
Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Middle internal gear ⇨ Middle carrier ⇨ Output shaft

PCIA0004E

Shift Mechanism (Cont'd)

"D", "M3", "M4", "M5" POSITIONS 2ND SPEED

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



Power transmission

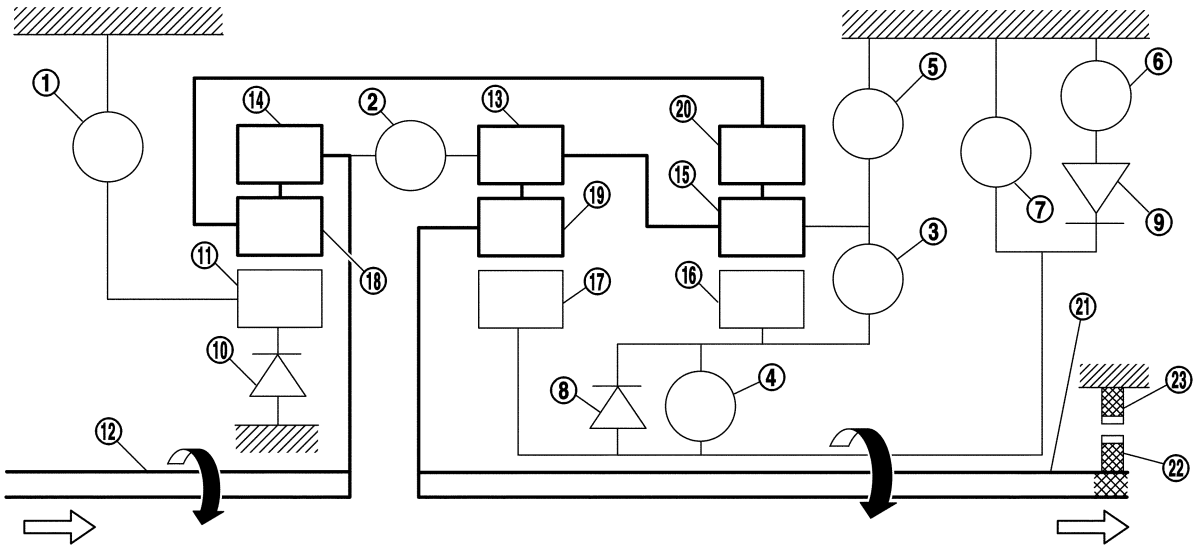
Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Middle internal gear ⇨ Middle carrier ⇨ Output shaft

PCIA0004E

Shift Mechanism (Cont'd)

"M2" POSITION 2ND SPEED

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



Power transmission

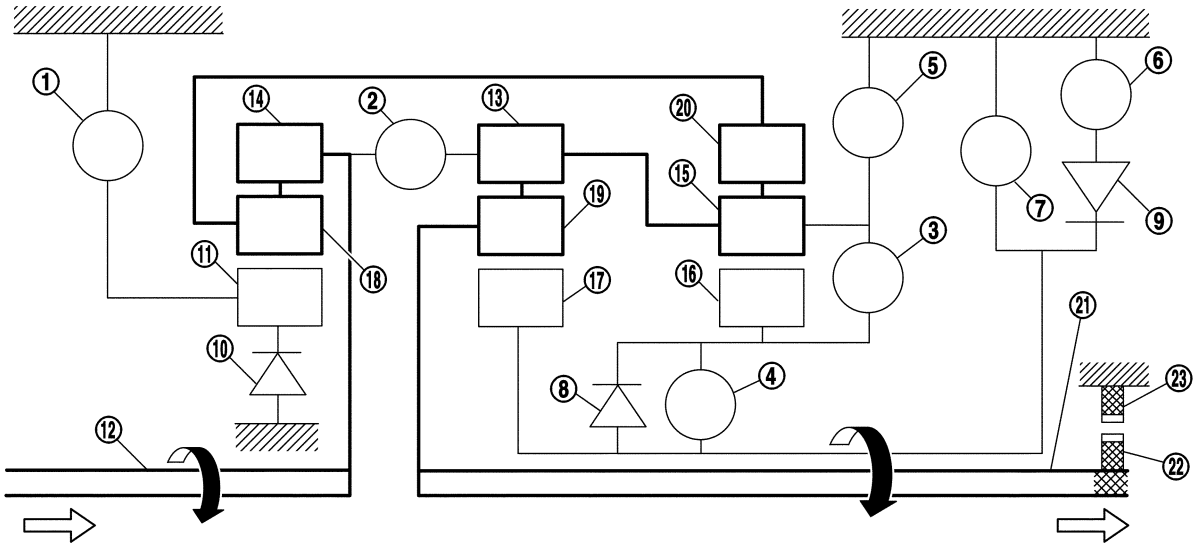
Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Middle internal gear ⇨ Middle carrier ⇨ Output shaft

PCIA0004E

Shift Mechanism (Cont'd)

"D", "M3", "M4", "M5" POSITIONS 3RD SPEED

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



Power transmission

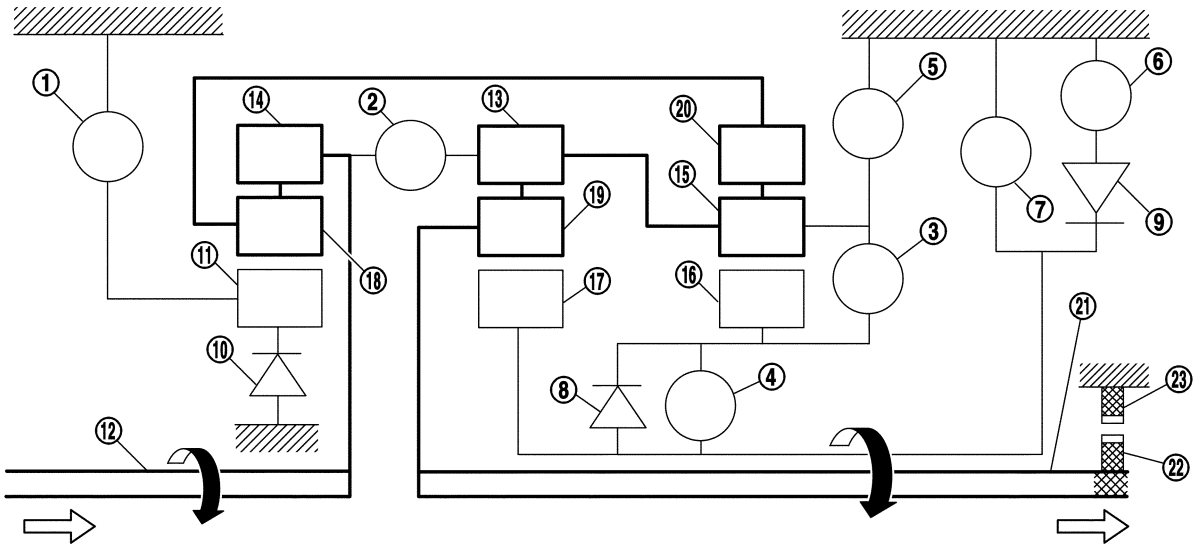
Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Middle internal gear ⇨ Middle carrier ⇨ Output shaft

PCIA0004E

Shift Mechanism (Cont'd)

"D", "M4", "M5" POSITIONS 4TH SPEED

- The front brake is released and the sun gears rotate forward.
- The input clutch is coupled and the front internal gear and mid internal gear are connected.
- The drive power is conveyed to the front internal gear, mid internal gear, and rear carrier and the three planetary gears rotate as one unit.



Power transmission

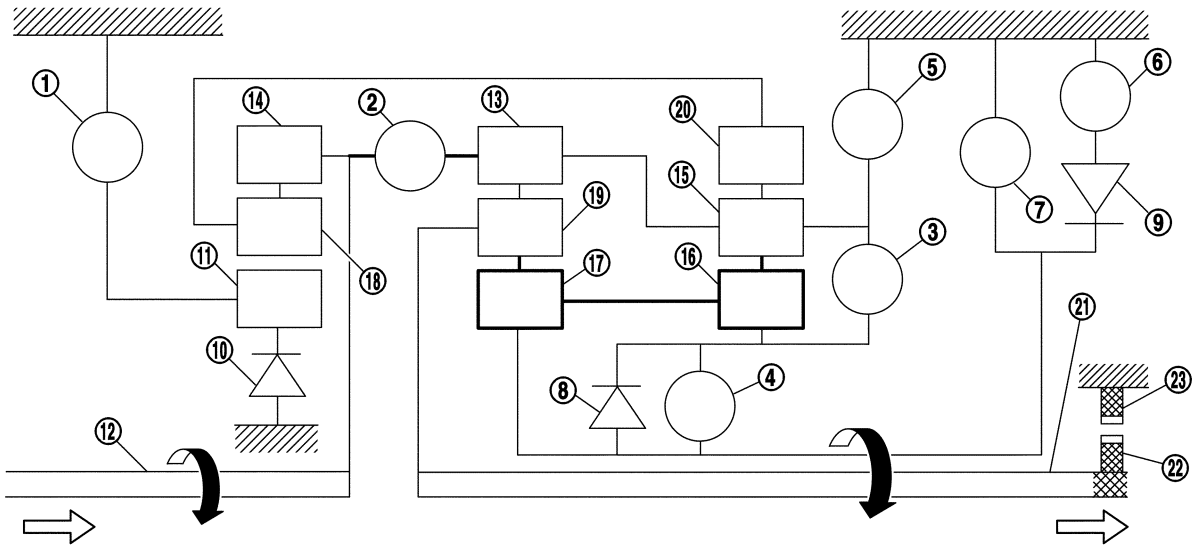
Input shaft ⇨ Front internal gear ⇨ Front carrier ⇨ Rear internal gear ⇨
Rear carrier ⇨ Middle internal gear ⇨ Middle carrier ⇨ Output shaft

PCIA0004E

Shift Mechanism (Cont'd)

"D", "M5" POSITIONS 5TH SPEED

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



Power transmission

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

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

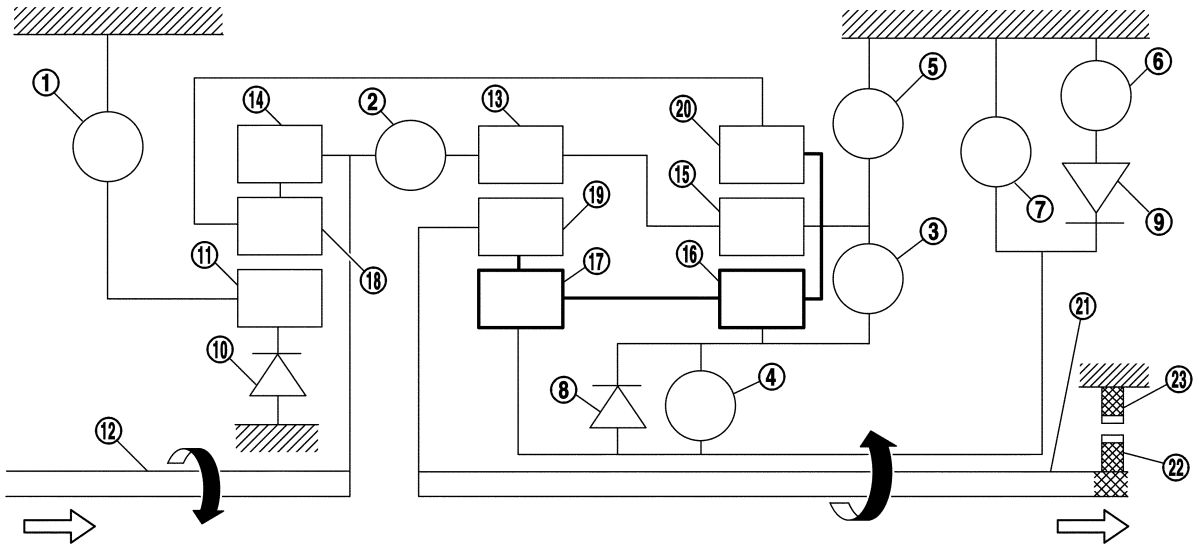
Middle sun gear ⇨ Middle carrier ⇨ Output shaft

PCIA0005E

Shift Mechanism (Cont'd)

"R" POSITION

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



Power transmission

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

PCIA0006E

TCM Function

The function of the TCM is to:

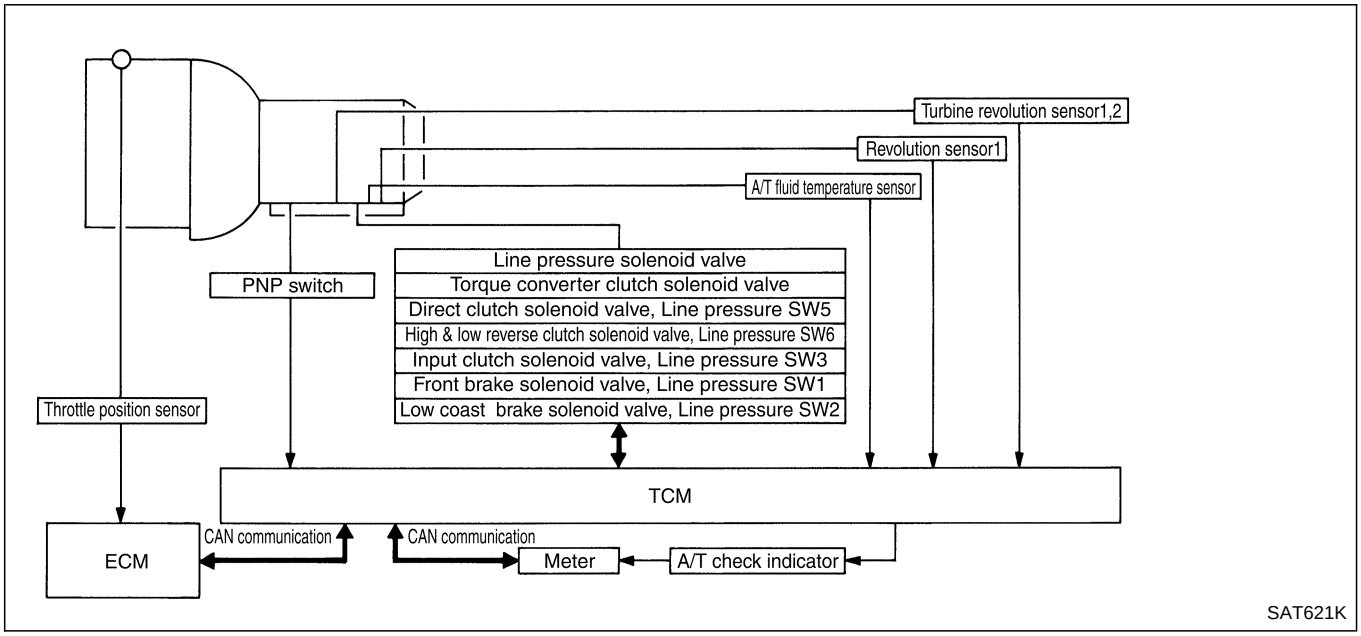
- Receive input signals sent from various switches and sensors.
- Determine required line pressure, shifting point, lock-up operation, and engine brake operation.
- Send required output signals to the respective solenoids and sensors.

CONTROL SYSTEM OUTLINE

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

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

CONTROL SYSTEM DIAGRAM

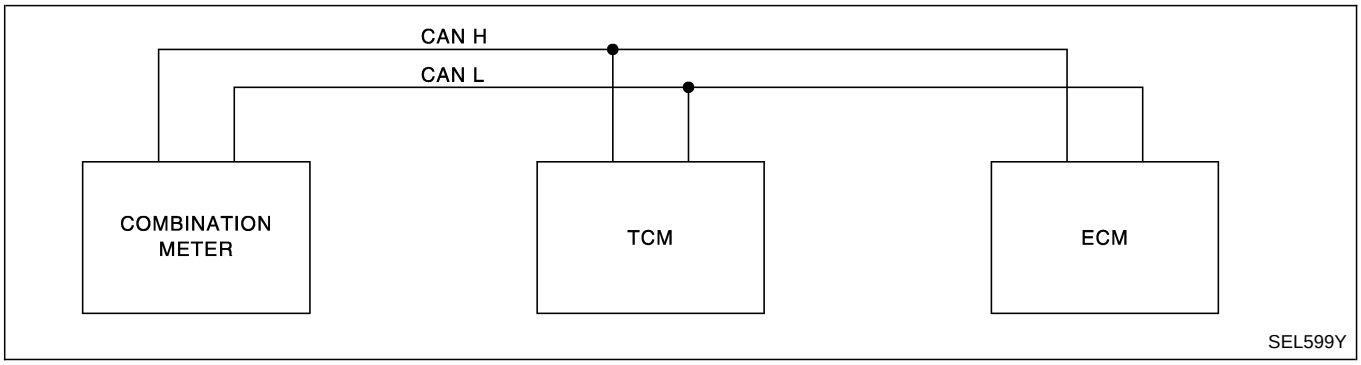


CAN Communication

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.

System diagramË



INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

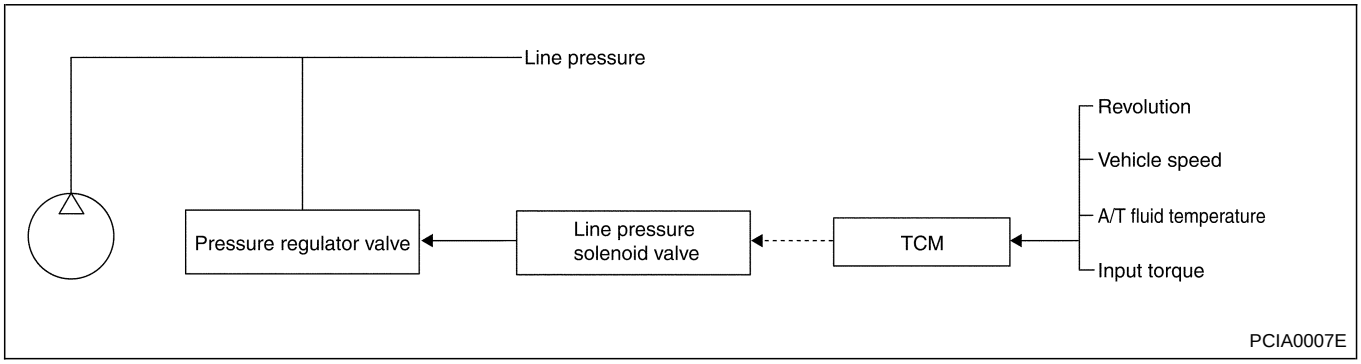
Signals	Combination meter	TCM	ECM
Engine speed signal	R	R	T
Engine coolant temperature signal	R	R	T
Accelerator pedal position signal		R	T
Closed throttle position signal		R	T
Wide open throttle position signal		R	T
A/T fluid temperature warning lamp signal	R	T	R

CAN Communication (Cont'd)

Signals	Combination meter	TCM	ECM
Current gear position signal	R	T	R
Shift change signal		T	R
Air conditioner switch signal	T		R
Headlamp switch signal	T		R
Rear window defogger switch signal	T		R
Brake switch signal	T	R	
Vehicle speed signal	T	R	R
A/T self diagnosis signal		T	R
Manual mode signal	T	R	

Line Pressure Control

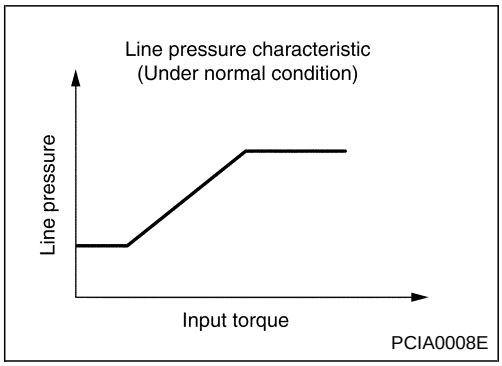
- When an input torque signal equivalent to the engine drive force is sent from the ECM to the TCM, the TCM controls the line pressure solenoid.
- This line pressure solenoid controls the pressure regulator valve as the signal pressure and adjusts the pressure of the operating oil discharged from the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



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

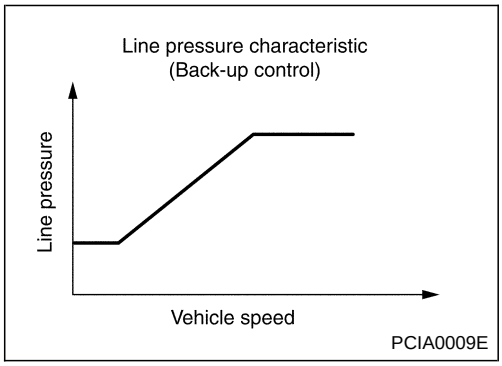
- The TCM has stored in memory a number of patterns for the optimum line pressure characteristic for the driving state.
- In order to obtain the line pressure characteristic that the TCM has selected as being the most appropriate characteristic in the current driving state, the TCM controls the line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

Line Pressure Control (Cont'd)



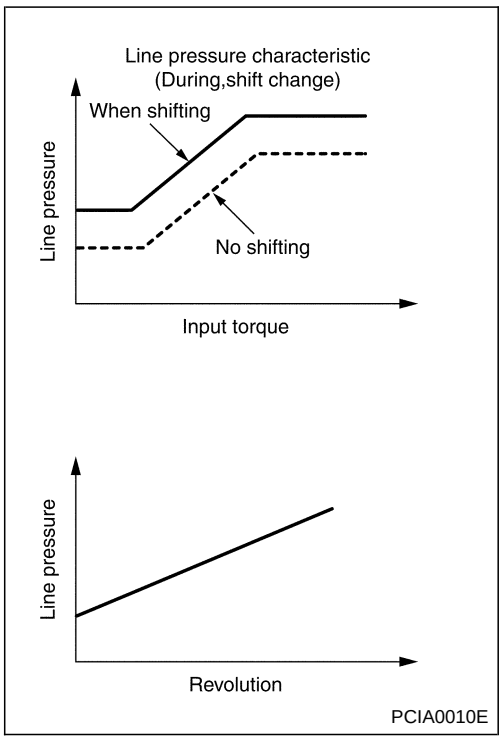
Normal Control

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



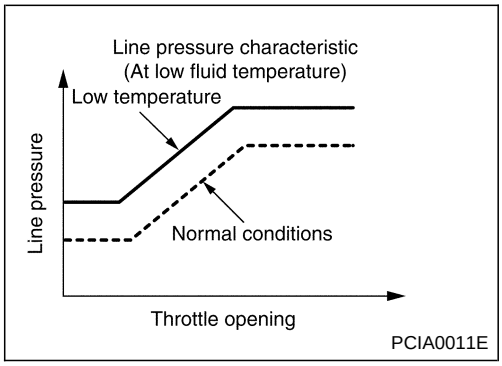
Back-up Control (Engine Brake)

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



During Shift Change

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

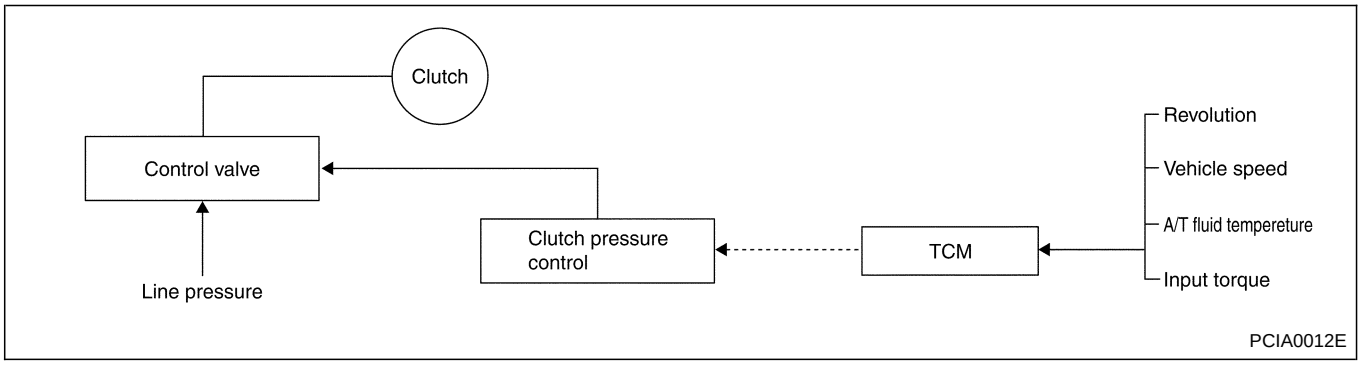


At Low Fluid Temperature

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

Shift Control

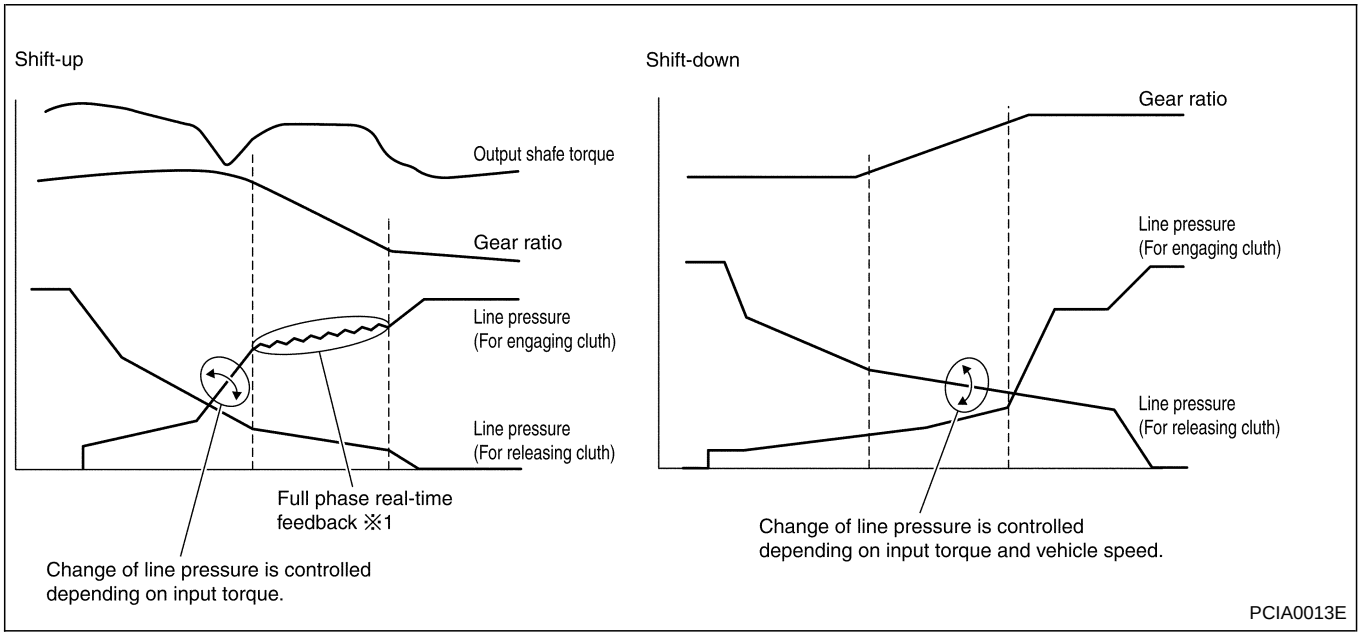
The clutch pressure control solenoid is driven by the signals from the switches and sensors. Thus, as the clutch pressure is adjusted to be appropriate to the engine load state and vehicle driving state. It becomes possible to finely control the clutch hydraulic pressure with high precision and a smoother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



SHIFT CHANGE

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

Shift Change System Diagram



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

Lock-Up Control

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

Lock-Up Operation Condition Table

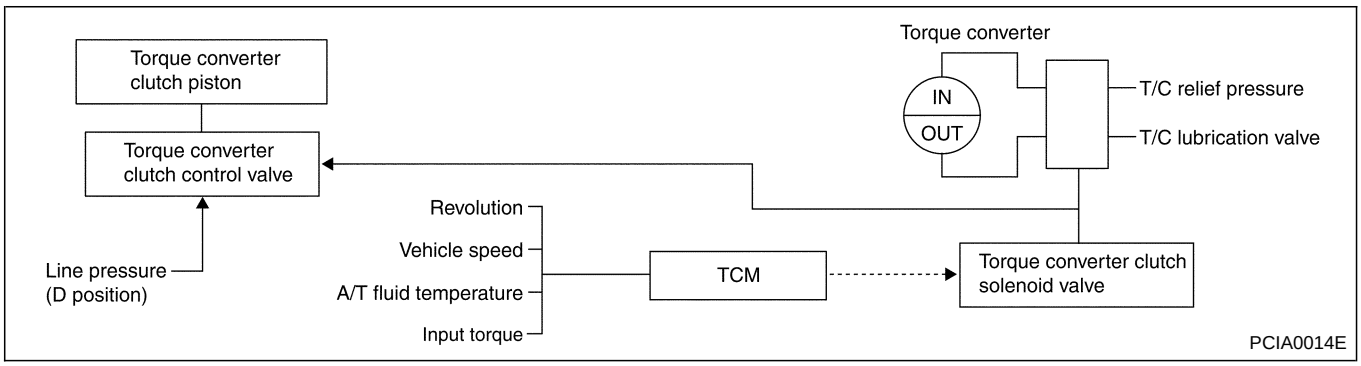
Select lever	D position		M position
Gear position	5	4	4
Lock-up	X	—	X

Lock-Up Control (Cont'd)

TORQUE CONVERTER CLUTCH CONTROL VALVE CONTROL

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

Lock-Up Control System Diagram



Lock-Up Released

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

Lock-Up Applied

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

SMOOTH LOCK-UP CONTROL

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

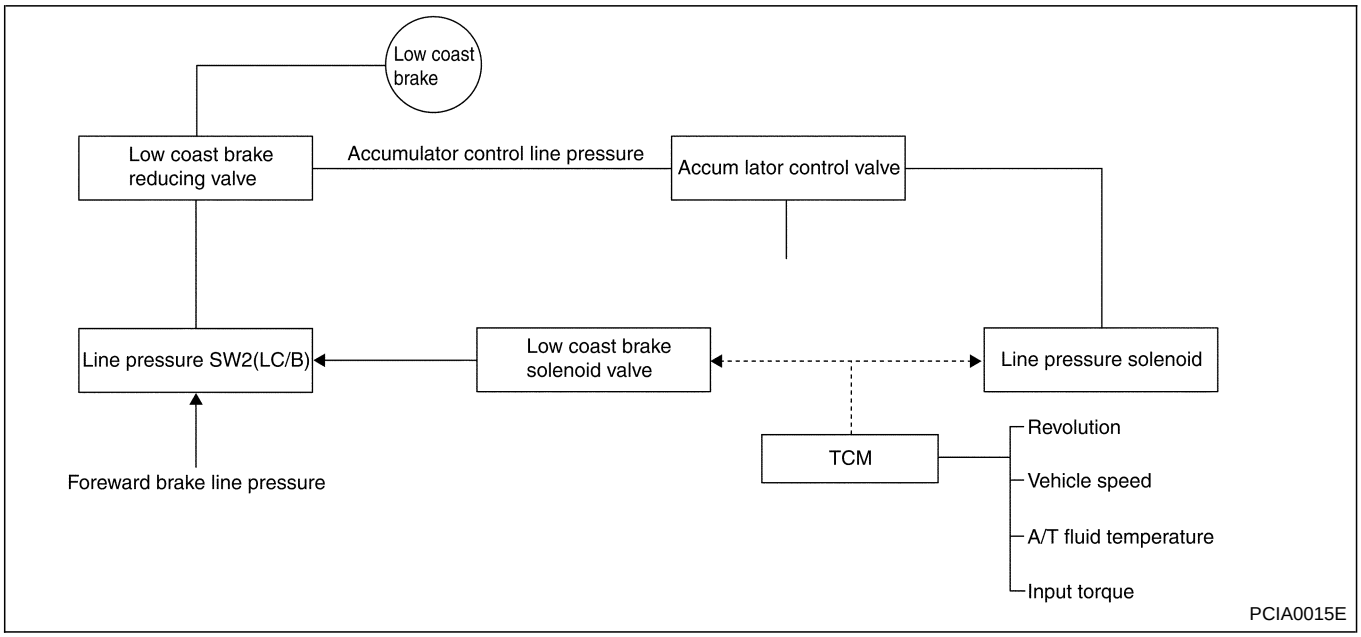
Half Clutched State

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

Engine Brake Control

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

Engine Brake Control (Cont'd)



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

Control Valve

FUNCTION OF CONTROL VALVE

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

Control Valve (Cont'd)

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

FUNCTION OF PRESSURE SWITCH

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

DTC Inspection Priority Chart

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-75, "DTC U1000 CAN COMMUNICATION LINE".

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

Fail-Safe

The TCM has an electrical fail safe mode. This mode makes it possible to operate even if there is a breakdown in a main electronic control input/output signal path.
In fail-safe mode, even if the select lever is "D" or "M" mode, the transmission is fixed in 2nd, 4th, or 5th (depending on the breakdown position), so the customer should feel "slipping" or "detective acceleration". When fail-safe mode is triggered, when the ignition switch is switched "ON", the A/T malfunction CHECK indicator lamp flashes for about 8 seconds. (Refer to AT-73, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)"). Even when the electronic circuits are normal, under special conditions (for example, when slamming on the brake with the wheels spinning drastically and stopping the tire rotation), the transmission can go into fail-safe mode. If this happens, switch "OFF" the ignition switch for 10 seconds, then switch it "ON" again to return to the normal shift pattern. Also, the A/T CHECK indicator lamp flashes for about 8 seconds once, then is cleared. Therefore, the customer's vehicle has returned to normal, so handle according to the "diagnostics flow" (Refer to AT-43, "WORK FLOW").

FAIL-SAFE FUNCTION

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

Fail-Safe Chart

Control item		Line pressure control	Vehicle speed control	Shift control	Lock-up control	Engine brake control	Fail-safe function (*3)	Self-diagnostics function
Input	Throttle position sensor	X	X	X	X	X	X	X
	Vehicle speed sensor A/T (revolution sensor)	X	X	X	X		X	X
	Vehicle speed sensor MTR (*1)	X	X	X	X			X
	Closed throttle position switch	(*2) X	(*2) X					(*4) X
	Wide open throttle position switch	(*2) X	(*2) X					(*4) X
	Turbine revolution sensor 1	X	X				X	X
	Turbine revolution sensor 2 (for 4th or 5th speed only)	X	X				X	X
	Engine speed signals				X			X
	PNP switch	X	X	X	X	X	X	(*4) X
	Brake switch		X			X		(*4) X
	Fluid temperature sensors 1 or 2	X	X		X	X	X	X
	TCM power supply voltage signal	X	X	X	X	X	X	X

Fail-Safe (Cont'd)

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

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

VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)

Signals are input from two systems — from vehicle speed sensor A/T (revolution sensor) installed on the transmission and from COMBINATION METER so normal driving is possible even if there is an error in one of the systems.

ACCELERATOR PEDAL POSITION SENSOR

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

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

PNP SWITCH

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

PNP RELAY

The PNP relay is switched "OFF". (Starter starting is disabled.)

A/T INTERLOCK

If there is an A/T interlock judgment error, the transmission is fixed in 2nd speed, 4th speed, or 5th speed to make driving possible.

NOTE:
When the vehicle is driven fixed in 2nd speed or 5th speed, a turbine revolution sensor error is displayed but this is not a turbine revolution sensor error.

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

Fail-Safe (Cont'd)

A/T interlock coupling pattern table

●: NG, X: OK

Gear position		Hydraulic pressure switch output					Fail-safe function	Clutch pressure output pattern after fail-safe function					
		SW3 (I/C)	SW6 (H & LR /C)	SW5 (D/C)	SW1 (Fr/B)	SW2 (LC/B)		I/C	H & LR/C	D/C	Fr/B	LC/B	L/U
A/T interlock coupling pattern	1st	●	X		X	X	Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
			X	●		X	Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
	2nd		●	X		X	Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
		●		X	X		Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
	3rd		X	X		●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
		●		X	X		Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
	4th		X	X		●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
		X		X	●		Held in 5th speed	ON	ON	OFF	ON	OFF	OFF
	5th	X	X		X	●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
		X		●	X		Held in 4th speed	ON	ON	ON	OFF	OFF	OFF

A/T 1ST ENGINE BRAKING

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

LINE PRESSURE SOLENOID

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

TORQUE CONVERTER CLUTCH SOLENOID

The solenoid is switched "OFF" to release the lock-up.

LOW COAST BRAKE SOLENOID

When an electrical error occurs, in order to make driving possible, if the solenoid is "ON", the transmission is held in 2nd speed; if the solenoid is "OFF", the transmission is held in 4th speed.

INPUT CLUTCH SOLENOID

If an electrical error occurs with the solenoid either "ON" or "OFF", the transmission is held in 4th speed to make driving possible.

DIRECT CLUTCH SOLENOID

If an electrical error occurs with the solenoid either "ON" or "OFF", the transmission is held in 4th speed to make driving possible.

Fail-Safe (Cont'd)

FRONT BRAKE SOLENOID

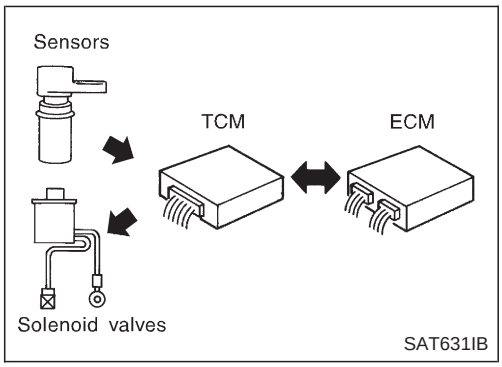
If an electrical error occurs with the solenoid "ON", in order to make driving possible, the A/T is held in 5th speed; if the solenoid is "OFF", 4th speed.

HIGH & LOW REVERSE CLUTCH SOLENOID

If an electrical error occurs with the solenoid either "ON" or "OFF", the transmission is held in 4th speed to make driving possible.

TURBINE REVOLUTION SENSOR 1 OR 2

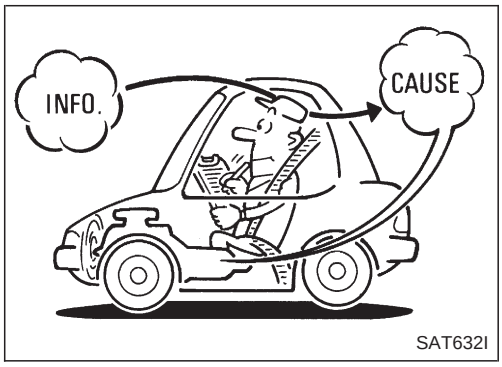
The control is the same as if there were no turbine revolution sensors and control is from vehicle speed sensor·A/T.



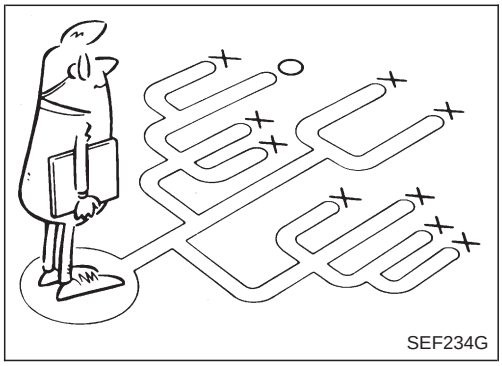
How To Perform Trouble Diagnosis For Quick and Accurate Repair

INTRODUCTION

The TCM receives a signal from the vehicle speed sensor, throttle position sensor or PNP switch and provides shift control or lock-up control via A/T solenoid valves.
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.
Input and output signals must always be correct and stable in the operation of the A/T system. The A/T system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.



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



Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such problems, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A "Diagnostic Worksheet" as shown on the example (Refer to AT-45, "DIAGNOSTIC WORKSHEET") 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.

How To Perform Trouble Diagnosis For Quick and Accurate Repair (Cont'd)

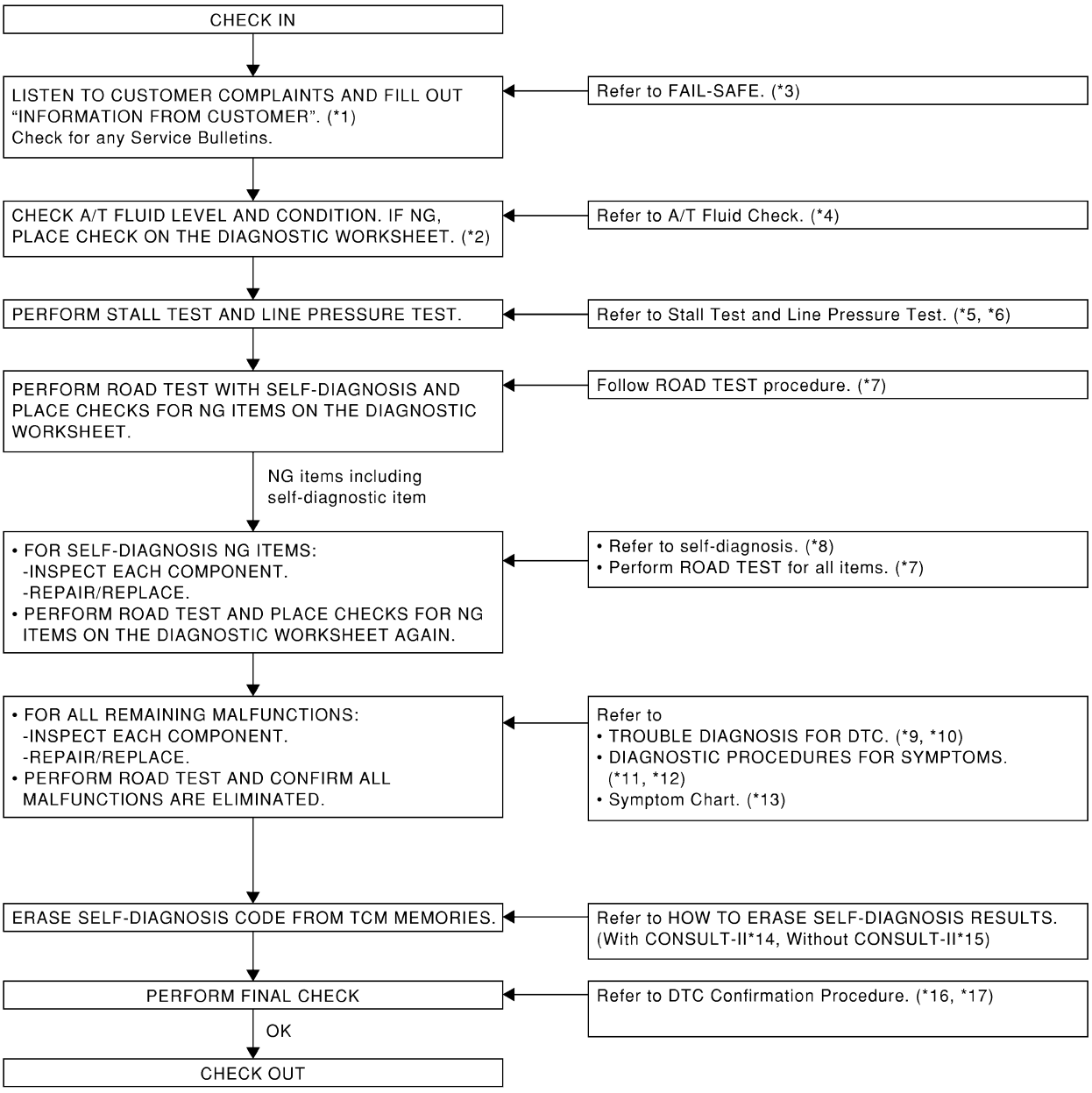
WORK FLOW

A good understanding of the malfunction conditions can make troubleshooting faster and more accurate. In general, each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.

Make good use of the two sheets provided, "Information From Customer" (Refer to AT-45, "Information From Customer") and "Diagnostic Worksheet" (Refer to AT-45, "Diagnostic Worksheet Chart"), to perform the best troubleshooting possible.

How To Perform Trouble Diagnosis For Quick and Accurate Repair (Cont'd)

Work Flow Chart



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*1 AT-45
*2 AT-45
*3 AT-39
*4 MA section
*5 AT-50
*6 AT-52
*7 AT-53
*8 AT-68
*9 AT-75
*10 AT-164
*11 AT-166
*12 AT-187
*13 AT-59
*14 AT-73
*15 AT-73
*16 AT-75
*17 AT-160

How To Perform Trouble Diagnosis For Quick and Accurate Repair (Cont'd)

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 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 Chart

1	□ Read the item on "cautions concerning fail-safe" and understand the customer's complaint.			AT-39
2	□ A/T FLUID CHECK			MA section, "Checking A/T Fluid".
		□ Leak (Repair leak location.) □ State □ Amount		
3	□ Stall test and line pressure test			AT-50, 52
		□ Stall test		
			□ Torque converter one-way clutch □ Input clutch □ Front brake □ Direct clutch □ High & low reverse clutch □ Low coast brake □ Forward brake □ Forward one-way clutch	□ 1st one-way clutch □ 3rd one-way clutch □ Engine □ Line pressure low □ Except for input clutch and front brake, clutches and brakes OK
		□ Line pressure inspection — Suspected part:		

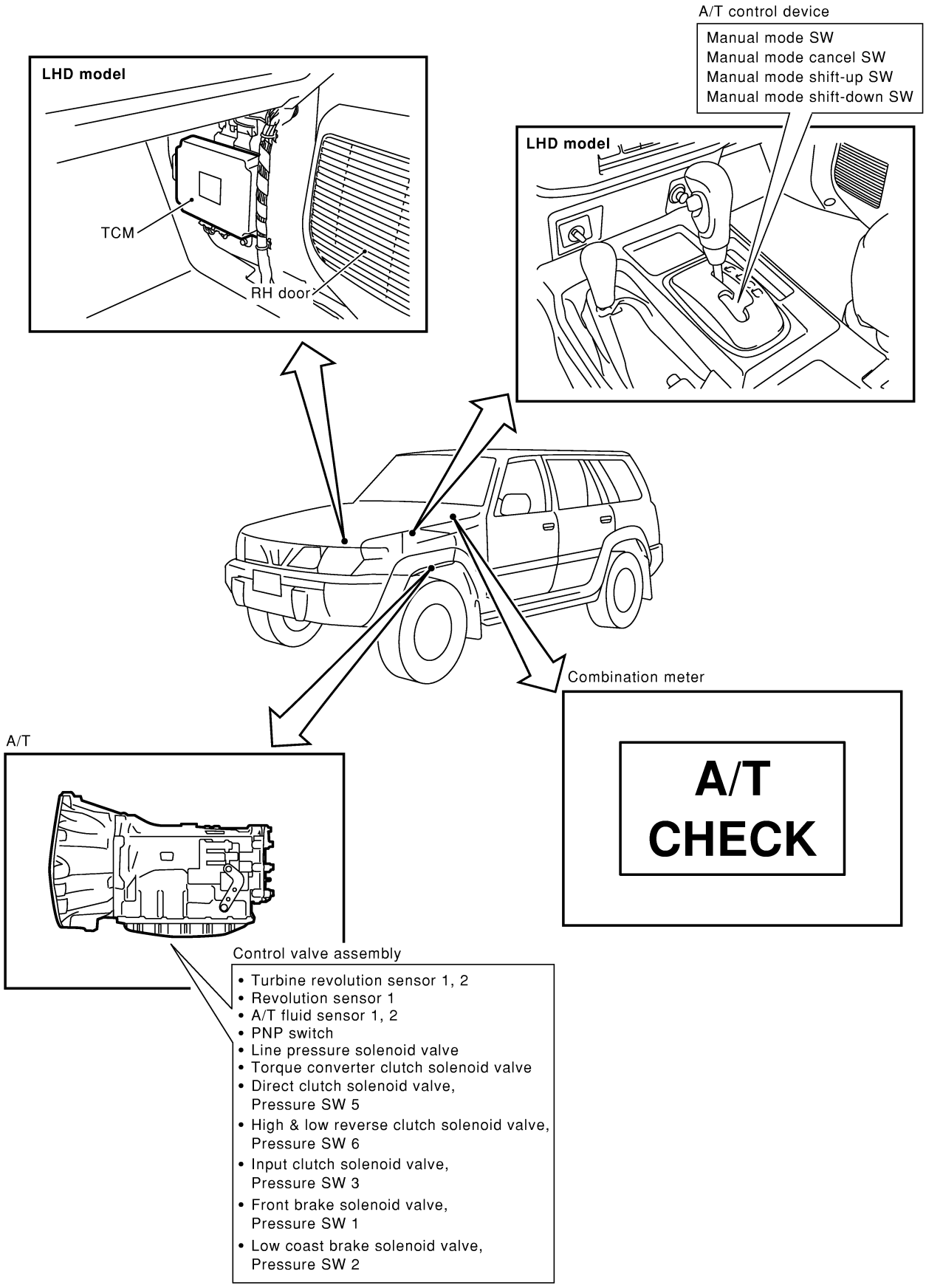
How To Perform Trouble Diagnosis For Quick and Accurate Repair (Cont'd)

4	□ Execute all road tests and enter checks in required inspection items.			AT-53
	4-1.	Check before engine is started		AT-54
		□ Execute self-diagnostics Enter checks for detected items.		
			□ Vehicle speed sensor·A/T, AT-86. □ Vehicle speed sensor·MTR, AT-120. □ Direct clutch solenoid valve, AT-137. □ TCC solenoid valve, AT-94. □ Line pressure solenoid valve, AT-97. □ Input clutch solenoid valve, AT-131. □ Front brake solenoid valve, AT-134. □ Low coast brake solenoid valve, AT-143. □ High & low reverse clutch solenoid valve, AT-140. □ PNP switch, AT-82. □ A/T Fluid temperature sensors 1, 2, AT-110. □ Turbine revolution sensors 1, 2, AT-115. □ A/T interlock, AT-122. □ A/T 1st engine braking, AT-128. □ Start signal, AT-78. □ Throttle position sensor, AT-108. □ Engine speed signal, AT-91. □ CAN communication, AT-75. □ TCM power supply, AT-100. □ Battery □ Other	
	4-2.	Check at idle		AT-54
		□ The A/T CHECK Indicator Lamp does come on, AT-168. □ Engine Cannot Be Started in "P" and "N" Position, AT-169. □ In "P" Position, Vehicle Moves When Pushed, AT-170. □ In "N" Position Vehicle Moves, AT-171. □ Large Shock "N" to "D" Position, AT-172. □ Vehicle Does Not Creep Backward In "R" Position, AT-173. □ Vehicle Does Not Creep Forward In "D" Position, AT-174.		
	4-3.	Cruise test		AT-55
		Part 1		
		□ Vehicle Cannot Be Started From D1, AT-175. □ A/T Does Not Shift: D1 → D2 Or Does Not Kick Down D4 → D2, AT-176. □ A/T Does Not Shift: D2 → D3, AT-177. □ A/T Does Not Shift: D3 → D4, AT-178. □ A/T Does Not Shift: D4 → D5, AT-179. □ A/T Does Not Perform Lock-up, AT-180. □ A/T Does Not Hold Lock-up Condition, AT-181. □ Lock-up Is Not Released, AT-181. □ Engine Speed Does Not Return To Idle, AT-182.		

How To Perform Trouble Diagnosis For Quick and Accurate Repair (Cont'd)

4	4-3	Part 2		AT-57
		□ Vehicle Cannot Be Started From D1, AT-175. □ A/T Does Not Shift: D1 → D2 Or Does Not Kick Down D4 → D2, AT-176. □ A/T Does Not Shift: D2 → D3, AT-177. □ A/T Does Not Shift: D3 → D4, AT-178. □ A/T Does Not Shift: D4 → D5, AT-179.		
		Part 3		AT-58
		□ Engine rotation does not drop to idle rotation, AT-182. □ A/T Does Not Shift: D5 → D4, AT-183. □ A/T Does Not Shift: D4 → D3, AT-184. □ A/T Does Not Shift: D3 → D2, AT-185. □ A/T Does Not Shift: D2 → D1, AT-186. □ Vehicle Does Not Decelerate By Engine Brake, AT-187. □ Execute self-diagnostics Enter checks for detected items.		
			□ Vehicle speed sensor·A/T, AT-86. □ Vehicle speed sensor·MTR, AT-120. □ Direct clutch solenoid valve, AT-137. □ TCC solenoid valve, AT-94. □ Line pressure solenoid valve, AT-97. □ Input clutch solenoid valve, AT-131. □ Front brake solenoid valve, AT-134. □ Low coast brake solenoid valve, AT-143. □ High & low reverse clutch solenoid valve, AT-140. □ PNP switch, AT-82. □ A/T fluid temperature sensors 1, 2, AT-110. □ Turbine revolution sensors 1, 2, AT-115. □ A/T interlock, AT-122. □ A/T 1st engine braking, AT-128. □ Start signal, AT-78. □ Throttle position sensor, AT-108. □ Engine speed signal, AT-91. □ CAN communication, AT-75. □ TCM power supply, AT-100. □ Battery □ Other	
5	□ Inspect each system for items found to be NG in the self-diagnostics and repair or replace the malfunction parts.			
6	□ Execute all road tests and enter the checks again for the required items.			AT-53
7	□ For any remaining NG items, execute the "diagnostics procedure" and repair or replace the malfunction parts. See the chart for breakdown diagnostics by symptoms. (This chart also contains other symptoms and inspection procedures.)			AT-59
8	□ Erase the results of the self-diagnostics from the TCM.			AT-73, AT-74

A/T Electrical Parts Location



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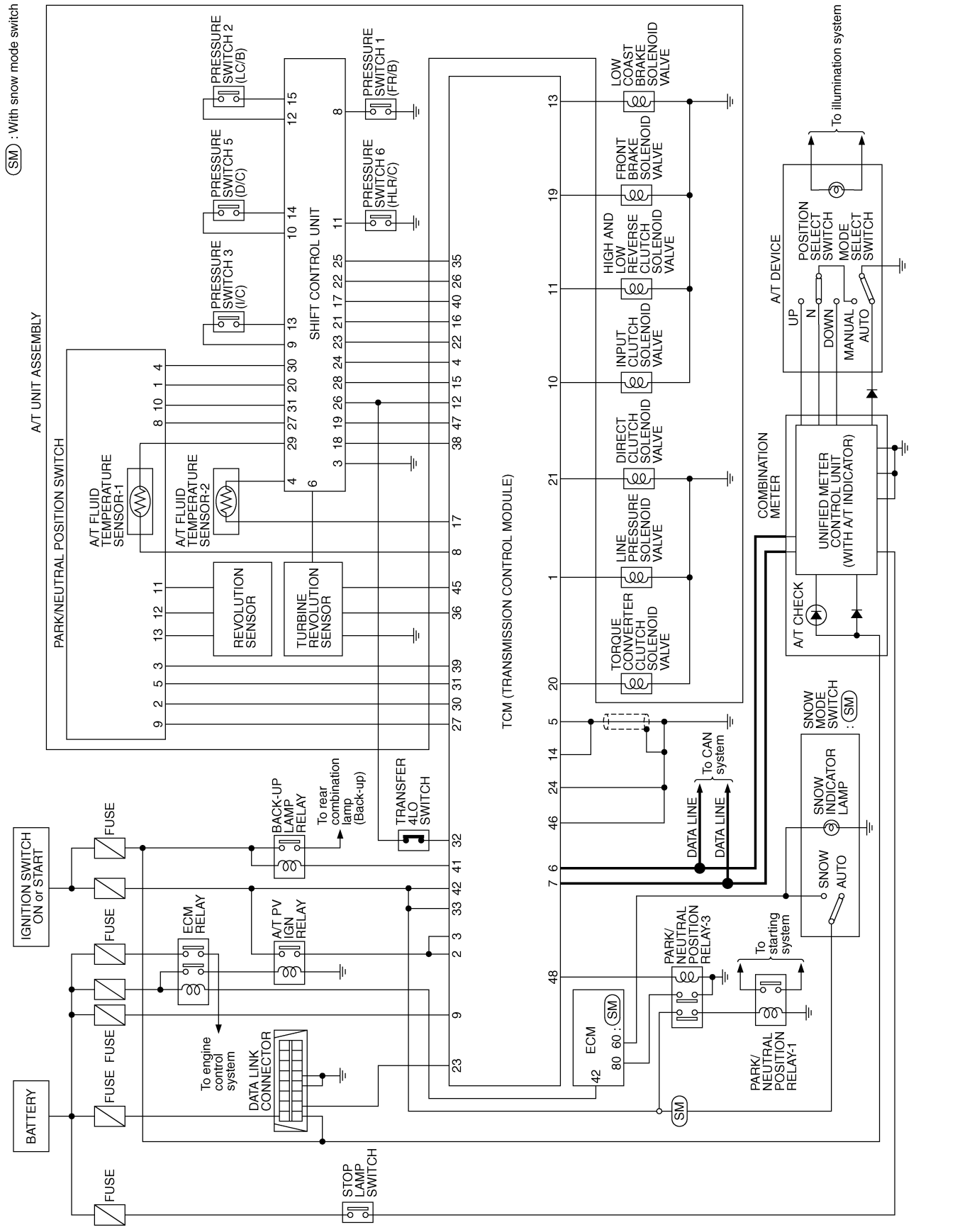
Circuit Diagram



TAT060M

Inspections Before Trouble Diagnosis

A/T FLUID CHECK

Fluid Leakage and Fluid Level Check

- Inspect for fluid leakage and check the fluid level. Refer to MA section, “Checking A/T Fluid”.
  Inspect the amount of A/T fluid under the hot conditions 50 to 80°C (122 to 176°F) according to the instructions below.

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

CAUTION:

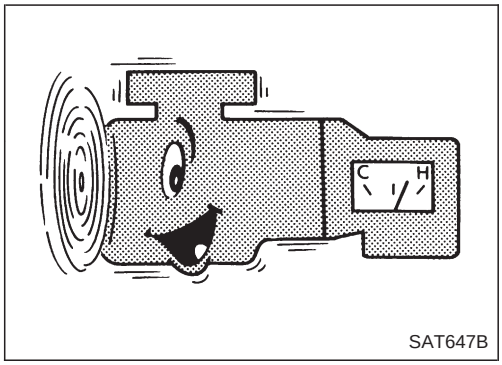
- **If it is necessary to check the amount of A/T fluid with the A/T fluid at low temperature 30 to 50°C (86 to 122°F), after adjusting within the cold level of the level gauge, then always check the amount of A/T fluid under the above hot condition.**
- **When wiping away the oil level gauge, always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


SAT638A

Fluid Condition Check

Inspect the fluid status.

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



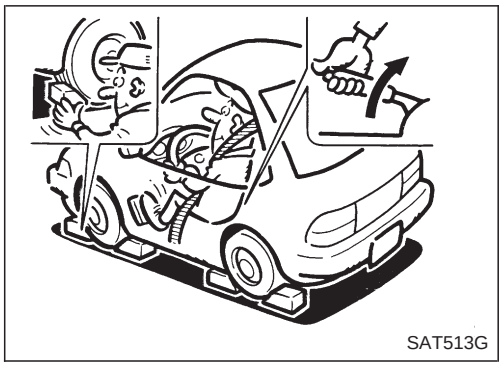
SAT647B

STALL TEST

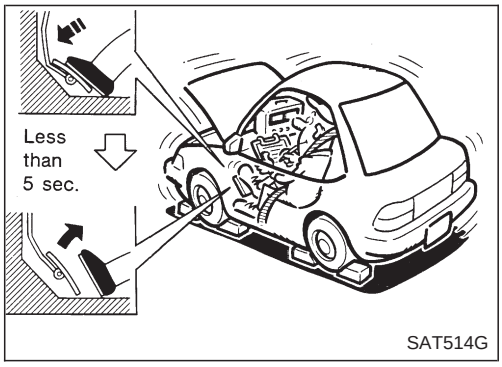
Stall Test Procedure

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.

Inspections Before Trouble Diagnosis (Cont'd)


SAT513G

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



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

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

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

CAUTION:
Run the engine at idle for at least one minute.
Stall revolution: 1,900 - 2,200 rpm

Judgement Stall Test

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

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

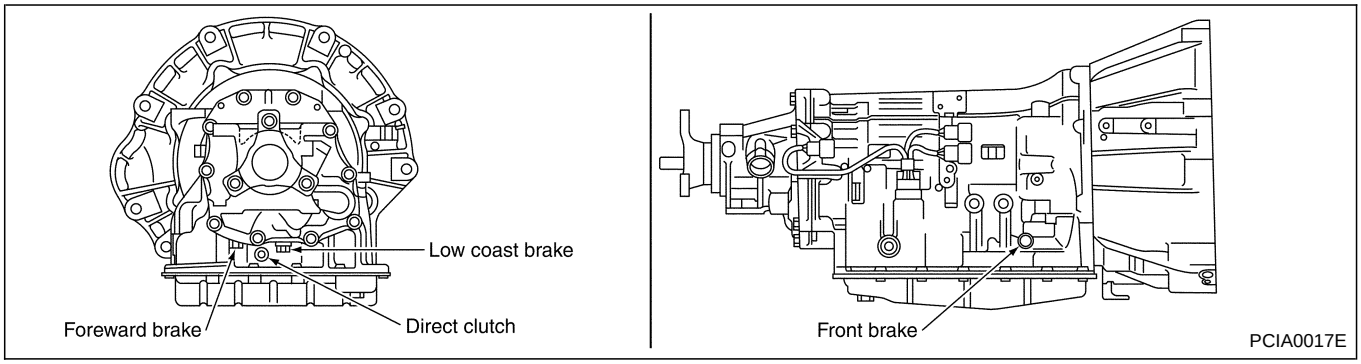
Stall test standard value position

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

Inspections Before Trouble Diagnosis (Cont'd)

LINE PRESSURE TEST

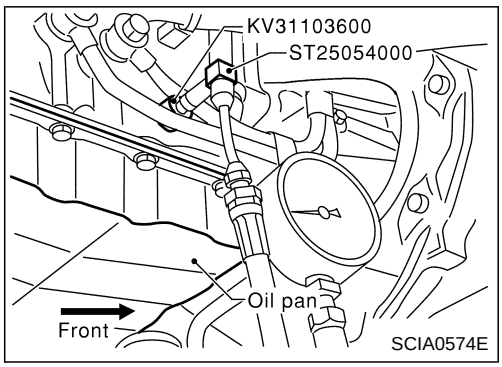
Line Pressure Test Port



Line Pressure Test Procedure

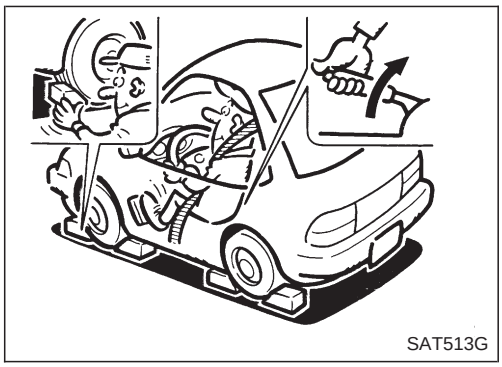
1. Inspect the amount of engine oil and replenish if necessary.
2. Drive the car for about 10 minutes to warm it up so that the A/T fluid reaches in range of 50 to 80°C (122 to 176°F), then inspect the amount of A/T fluid and replenish if necessary.

NOTE:
The automatic fluid temperature rises in range of 50 to 80°C (122 to 176°F) during 10 minutes of driving.

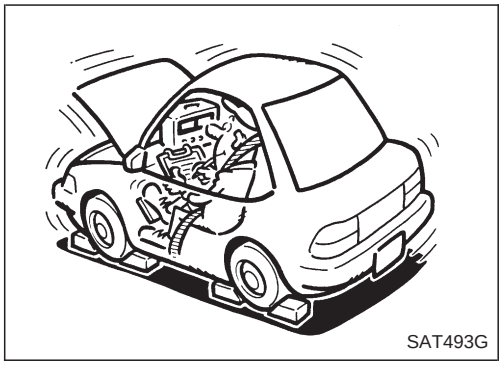


3. After warming up your A/T, remove the oil pressure detection plug and install the oil pressure gauge.

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



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



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

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

6. After the measurements are complete, install the oil pressure detection plug and tighten to the regulation torque below.
   Plug: 4.8 - 9.8 N·m (0.45 - 0.99 kg-m, 39 - 86 in-lb)

CAUTION:
Do not reuse the O-ring.

Inspections Before Trouble Diagnosis (Cont'd)

Line Pressure

Engine speed rpm	Line Pressure kPa (bar, kg/cm^2, psi)	
	"R" position	"D", "M" positions
Idling Revolution	392 - 441 (3.9 - 4.4, 4.0 - 4.5, 57 - 64)	373 - 422 (3.7 - 4.2, 3.8 - 4.3, 54 - 61)
Stall Revolution	1,310 - 1,500 (13.1 - 15.0, 13.4 - 15.3, 191 - 218)	

Judgement of Line Pressure Test

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

ROAD TEST

Description

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

1. Check before engine is started. Refer to AT-54, "Check Before Engine is Started".
2. Check at idle. Refer to AT-54, "Check at Idle".
3. Cruise test.
   - Inspect all the items from Part 1 to Part 3. Refer to AT-55, "Cruise Test — Part 1", AT-57, "Cruise Test — Part 2", AT-58, "Cruise Test — Part 3".

- 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

1. CHECK A/T CHECK INDICATOR LAMP STEP 1

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

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

YES >> GO TO 2.
NO >> Stop the road test and go to AT-168, “A/T CHECK Indicator Lamp does not come on”.

2. CHECK A/T CHECK INDICATOR LAMP STEP 2

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

YES >> Carry out the self-diagnostics and record all NG items on the diagnostics sheet. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
NO >> 1. Turn ignition switch to “OFF” position.
2. Carry out the self-diagnostics and record all NG items on the diagnostics sheet. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
3. GO TO “Check at Idle”. Refer to AT-54.

Check at Idle

1. CHECK STARTING THE ENGINE

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

Does the engine start?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-169, “Engine Cannot Be Started In “P” and “N” Position”.

2. CHECK STARTING THE ENGINE

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

Does the engine start in either position?

YES >> Stop the road test and go to AT-169, “Engine Cannot Be Started In “P” and “N” Position”.
NO >> GO TO 3.

3. CHECK “P” POSITION FUNCTIONS

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

When you push the vehicle, does it move?

YES >> Stop the road test and go to AT-170, “In “P” Position, Vehicle Moves When Pushed”.
NO >> GO TO 4.

Check at Idle (Cont'd)

4. CHECK "N" POSITION FUNCTIONS

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

Does the vehicle move?

YES >> Stop the road test and go to AT-171, "In "N" Position, Vehicle Moves".
NO >> GO TO 5.

5. CHECK SHIFT SHOCK

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

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

YES >> Stop the road test and go to AT-172, "Large Shock "N" to "D" Position".
NO >> GO TO 6.

6. CHECK "R" POSITION FUNCTIONS

Disengage the brake for 4 to 5 seconds.
Does the vehicle creep backward?

YES >> GO TO 7.
NO >> Stop the road test and go to AT-173, "Vehicle Does Not Creep Backward In "R" Position".

7. CHECK "D", "M" POSITION FUNCTIONS

Inspect whether the vehicle moves forward when the transmission is put into the "D" or "M" position.
Does the vehicle move forward in the "D" and "M" positions?

YES >> GO TO "Cruise test - Part 1" (Refer to AT-55), "Cruise Test - Part 2" (Refer to AT-57), and Cruise test - Part 3 (Refer to AT-58).
NO >> Stop the road test and go to AT-174, "Vehicle Does Not Creep Forward In "D" Position".

Cruise Test — Part 1

Cruise test Part 1

1. CHECK STARTING OUT FROM D1

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

With CONSULT-II

Read off the gear positions.
Starts from D1?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-175, "Vehicle Cannot Be Started From D1".

Cruise Test — Part 1 (Cont'd)

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.

- See AT-58, "Vehicle Speed When Shifting Gears Throttle Position".

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 >> Stop the road test and go to AT-176, "A/T Does Not Shift: D1 → D2 Or Does Not Kick down: D4 → D2".

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.

- See AT-58, "Vehicle Speed When Shifting Gears Throttle Position".

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 >> Stop the road test and go to AT-177, "A/T Does Not Shift: D2 → D3".

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.

- See AT-58, "Vehicle Speed When Shifting Gears Throttle Position".

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 >> Stop the road test and go to AT-178, "A/T Does Not Shift: D3 → D4".

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.

- See AT-58, "Vehicle Speed When Shifting Gears Throttle Position".

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 >> Stop the road test and go to AT-179, "A/T Does Not Shift: D4 → D5".

6. CHECK LOCK-UP

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

- See AT-58, "Vehicle Speed When Shifting Gears Throttle Position".

With CONSULT-II

Select "TCC SOL 0.00A" with the "MAIN SIGNAL" mode for A/T.
Does the A/T lock-up at the correct speed?

YES >> GO TO 7.
NO >> Stop the road test and go to AT-180, "A/T Does Not Perform Lock-up".

Cruise Test — Part 1 (Cont'd)

7. CHECK LOCK-UP HOLD

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

YES >> GO TO 8.
NO >> Stop the road test and go to AT-181, "A/T Does Not Hold Lock-up Condition".

8. CHECK LOCK-UP RELEASE

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

YES >> GO TO 9.
NO >> Stop the road test and go to AT-181, Lock-up Is Not Released.

9. CHECK SHIFT DOWN D5 → D4

Decelerate by pressing lightly on the brake pedal.

With CONSULT-II

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

YES >> 1. Stop the car.
2. GO TO "Cruise test — Part 2" (Refer to AT-57).
NO >> Stop the road test and go to AT-183, "A/T Does Not Shift: D5 → D4".

Cruise Test — Part 2

Cruise Test Part 2

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 >> Stop the road test and go to AT-175, "Vehicle Cannot Be Started From D1".

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

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

With CONSULT-II

Read the gear position and throttle position.
When you press the accelerator pedal, does the transmission immediately shift down D4 → D2?

YES >> GO TO 3.
NO >> Stop the road test and go to AT-176, "A/T Does Not Shift: D1 → D2 Or Does Not Kick Down D4 → D2".

Cruise Test — Part 2 (Cont'd)

3. CHECK SHIFT UP D2 → D3

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

- See AT-177, "Vehicle Speed When Shifting Gears Throttle Position".

With CONSULT-II

Read the gear position, throttle position and vehicle speed.
Does the A/T shift up D2 → D3 at the correct speed?

YES >> GO TO 4.
NO >> Stop the road test and go to AT-177, "A/T Does Not Shift: D2 → D3".

4. CHECK SHIFT UP D3 → D4 AND ENGINE BRAKE

When the transmission changes speed D3 → D4, 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-58).
NO >> Stop the road test and go to AT-178, "A/T Does Not Shift: D3 → D4".

Cruise Test — part 3

Driving test part 3

1. CHECK SHIFT DOWN

Shift down one while driving in each position.

With CONSULT-II

Read the gear position.
Shift down?

YES >> GO TO 2.
NO >> Stop the road test and go to AT-183, "A/T Does Not Shift: D5 → D4", AT-184, "A/T Does Not Shift: D4 → D3", AT-185, "A/T Does Not Shift: D3 → D2", AT-186, "A/T Does Not Shift: D2 → D1".

2. CHECK ENGINE BRAKE

Does the engine brake work to decelerate the vehicle?

YES >> 1. Stop the vehicle.
2. Perform self-diagnostics. Refer to AT-73, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)".
NO >> Stop the road test and go to AT-187, "Vehicle Does Not Decelerate By Engine Brake".

Vehicle Speed When Shifting Gears Throttle Position

Throttle position	Vehicle Speed km/h (MPH)							
	$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_5 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	52 - 56 (32 - 35)	81 - 89 (50 - 55)	126 - 136 (78 - 85)	188 - 198 (117 - 123)	184 - 194 (114 - 121)	116 - 126 (72 - 78)	70 - 78 (43 - 48)	36 - 40 (22 - 25)
Half throttle	32 - 36 (20 - 22)	62 - 68 (39 - 42)	104 - 112 (65 - 70)	126 - 134 (78 - 83)	100 - 108 (62 - 67)	61 - 69 (38 - 43)	37 - 43 (23 - 27)	10 - 14 (6 - 9)

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

Vehicle Speed When Performing and Releasing Lock-up

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up “ON”	Lock-up “OFF”
Closed throttle	64 - 72 (39 - 45)	61 - 69 (38 - 43)
Half throttle	164 - 172 (102 - 107)	130 - 138 (81 - 86)

●When throttle is closed, the accelerator opening is 1/8 or lower of the full opening, and the closed throttle position switch is turned “OFF”.
- At half throttle, the accelerator opening is 4/8 of the full opening.

Symptom Chart

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

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

Symptom	Diagnostic Item	Reference page
Engine does not start in “N”, “P” position.	1. Ignition switch and starter	—
	2. Control linkage adjustment	AT-196
	3. PNP switch	AT-82
Engine starts in positions other than “N” or “P”.	1. Control linkage adjustment	AT-196
	2. PNP switch	AT-82
Strange noise in “P” or “N” position	1. Fluid level	MA section
	2. Line pressure inspection	AT-52
	3. Accelerator pedal position sensor	AT-108
	4. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-120
	5. Engine speed signal	AT-91
Vehicle not parked when transmission in “P” position or vehicle is parked even when transmission put into position other than P	1. Control linkage adjustment	AT-196
	2. PNP switch	AT-82
Vehicle runs with transmission in “P” position	1. Control linkage adjustment	AT-196
	2. PNP switch	AT-82
Vehicle runs with transmission in “N” position	1. Control linkage adjustment	AT-196
	2. PNP switch	AT-82
Vehicle cannot run in “R” position	1. Control linkage adjustment	AT-196
	2. Line pressure inspection	AT-52
	3. Line pressure solenoid valve	AT-97
	4. PNP switch	AT-82

Symptom Chart (Cont'd)

Symptom	Diagnostic Item	Reference page
Large shock ("N" → "D" position)	1. Engine idle speed	EC section
	2. Accelerator pedal position sensor	AT-108
	3. Throttle position sensor adjustment	EC section
	4. Line pressure test	AT-52
	5. ATF temperature sensor	AT-110
	6. ATF pressure switch 1 and front brake solenoid	AT-150, AT-134
	7. Engine speed signal	AT-91
	8. Line pressure solenoid valve	AT-97
Vehicle cannot run in "D" position. Clutch slips Extreme acceleration malfunction	1. Fluid level and state	MA section
	2. Line pressure test	AT-52
	3. Line pressure solenoid valve	AT-97
	4. PNP switch	AT-82
When vehicle starts out, clutch and brake slip	1. Fluid level and state	MA section
	2. Control linkage adjustment	AT-196
	3. Accelerator pedal position sensor	AT-108
	4. Line pressure test	AT-52
	5. Line pressure solenoid valve	AT-97
Extremely large creep	Engine idle speed	EC section
No creep at all	1. Fluid level and state	MA section
	2. Line pressure test	AT-52
	3. Engine speed signal	AT-91
	4. ATF pressure switch 5 and direct clutch solenoid	AT-157, AT-137
1 → 2 vehicle speed change malfunction	1. PNP switch	AT-82
	2. Control linkage adjustment	AT-196
	3. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	4. ATF pressure switch 5 and direct clutch solenoid	AT-157, AT-137
2 → 3 vehicle speed change malfunction	1. Control linkage adjustment	AT-196
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-160, AT-140
3 → 4 vehicle speed change malfunction	1. Control linkage adjustment	AT-196
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-131
4 → 5 vehicle speed change malfunction	1. Control linkage adjustment	AT-196
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 1 and front brake solenoid	AT-150, AT-134
"D" position vehicle speed change point is too high	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	2. Accelerator pedal position sensor	AT-108
	3. ATF temperature sensor	AT-110
"D" position vehicle speed change point is too low	1. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	2. Accelerator sensor adjustment	EC section

Symptom Chart (Cont'd)

Symptom	Diagnostic Item	Reference page
Shock is too large when changing 1 → 2.	1. Accelerator pedal position sensor	AT-108
	2. Line pressure test	AT-52
	3. ATF pressure switch 5 and direct clutch solenoid	AT-157, AT-137
Shock is too large when changing 2 → 3.	1. Accelerator pedal position sensor	AT-108
	2. Line pressure test	AT-52
	3. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-160, AT-140
Shock is too large when changing 3 → 4.	1. Accelerator pedal position sensor	AT-108
	2. Line pressure test	AT-52
	3. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-131
Shock is too large when changing 4 → 5.	1. Accelerator pedal position sensor	AT-108
	2. Line pressure test	AT-52
	3. ATF pressure switch 1 and front brake solenoid	AT-150, AT-134
Shock is too large for downshift when brake pedal is pressed.	1. Fluid level and state	MA section
	2. Accelerator pedal position sensor	AT-108
	3. Line pressure test	AT-52
	4. Engine speed	AT-91
	5. Turbine revolution sensor	AT-115
Shock is too large for upshift when brake pedal is released.	1. Fluid level and state	MA section
	2. Accelerator pedal position sensor	AT-108
	3. Line pressure test	AT-52
	4. Engine speed	AT-91
	5. Turbine revolution sensor	AT-115
Shock is too large for lock-up.	1. Fluid level and state	MA section
	2. Accelerator sensor adjustment	AT-108
	3. Line pressure test	AT-52
	4. Engine speed	AT-91
	5. Turbine revolution sensor	AT-115
	6. TCC solenoid valve	AT-94
Shock is too large when engine brake is selected.	1. Fluid level and state	MA section
	2. Accelerator pedal position sensor	AT-108
	3. Line pressure inspection	AT-52
No shock at all or the clutch slips when vehicle changes speed 1 → 2.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 5 and direct clutch solenoid	AT-157, AT-137
No shock at all or the clutch slips when vehicle changes speed 2 → 3.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-160, AT-140
No shock at all or the clutch slips when vehicle changes speed 3 → 4.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-131

Symptom Chart (Cont'd)

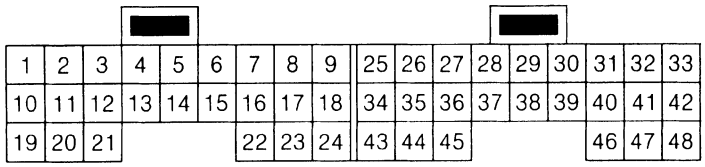
Symptom	Diagnostic Item	Reference page
No shock at all or the clutch slips when vehicle changes speed 4 → 5.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 1 and front brake solenoid	AT-150, AT-134
Maximum speed low	1. Fluid level and state	MA section
	2. Line pressure test	AT-52
	3. Accelerator pedal position sensor	AT-108
	4. ATF pressure switch 5 and direct clutch solenoid	AT-157, AT-137
Does not change 5 → 4.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-131
Does not change 5, 4 → 3.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-160, AT-140
Does not change 5, 4, 3 → 2.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 5 and direct clutch solenoid	AT-157, AT-137
Does not change 4, 3, 2 → 1.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
When you press the accelerator pedal and shift speed 5 → 4, the engine idles or the transmission slips.	1. Fluid level and state	MA section
	2. Vehicle speed sensor A/T and vehicle speed sensor MTR	AT-86, AT-120
	3. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-131
When you press the accelerator pedal and shift speed 5, 4 → 3, the engine idles or the transmission slips.	1. Fluid level and state	MA section
	2. PNP switch	AT-82
	3. Control linkage adjustment	AT-196
	4. Manual mode switch	AT-146
	5. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-131
	6. ATF pressure switch 1 and front brake solenoid	AT-150, AT-134
When you press the accelerator pedal and shift speed 5, 4, 3 → 2, the engine idles or the transmission slips.	1. Fluid level and state	MA section
	2. Control linkage adjustment	AT-196
	3. PNP switch	AT-82
	4. Manual mode switch	AT-146
	5. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-134
	6. ATF pressure switch 1 and front brake solenoid	AT-150, AT-134
When you press the accelerator pedal and shift speed 4, 3, 2 → 1, the engine idles or the transmission slips.	1. Fluid level and state	MA section
	2. Control linkage adjustment	AT-196
	3. PNP switch	AT-82
	4. Manual mode switch	AT-146
	5. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-131
	6. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-134, AT-140

Symptom Chart (Cont'd)

Symptom	Diagnostic Item	Reference page
Vehicle runs in all positions.	1. Fluid level and state	MA section
	2. Control linkage adjustment	AT-196
	3. Line pressure test	AT-52
	4. PNP switch	AT-82
Loud, strange noise in "D", "R" position	1. Fluid level and state	MA section
Engine brake does not work 5 → 4.	1. PNP switch	AT-82
	2. Fluid level and state	MA section
	3. Control linkage adjustment	AT-196
	4. Manual mode switch	AT-146
Engine brake does not work 5, 4 → 3.	1. PNP switch	AT-82
	2. Fluid level and state	MA section
	3. Control linkage adjustment	AT-196
	4. Manual mode switch	AT-146
	5. ATF pressure switch 3 and input clutch solenoid	AT-160, AT-131
	6. ATF pressure switch 1 and front brake solenoid	AT-150, AT-134
Engine brake does not work 5, 4, 3 → 2.	1. PNP switch	AT-82
	2. Fluid level and state	MA section
	3. Control linkage adjustment	AT-196
	4. Manual mode switch	AT-146
	5. ATF pressure switch 3 and input clutch solenoid	AT-154, AT-131
	6. ATF pressure switch 1 and front brake solenoid	AT-150, AT-134
Engine brake does not work 4, 3, 2 → 1.	1. PNP switch	AT-82
	2. Fluid level and state	MA section
	3. Control linkage adjustment	AT-196
	4. Manual mode switch	AT-146
	5. ATF pressure switch 3 and input clutch solenoid	AT-160, AT-131
	6. ATF pressure switch 6 and high & low reverse clutch solenoid	AT-160, AT-140
Engine stalls when select lever shifted "N" → "D", "R"	1. Fluid level and state	MA section
	2. Engine speed signal	AT-91
	3. TCC solenoid valve	AT-94
	4. Turbine revolution sensor	AT-115

TCM Input/Output Signal Reference Values

TCM TERMINAL CONNECTOR LAYOUT



SCIA0495E

TCM INSPECTION TABLE

Data are reference value.

Terminal No.	Wire color	Item	Condition		Data (Approx.)
1	L/B	Line pressure solenoid valve		After warming up the engine, release your foot from the accelerator pedal.	2V
				After warming up the engine, press the accelerator pedal all the way down.	0.7V
2	LG/R	Power supply		—	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
3	LG/R	Power supply		—	Battery voltage
				Measure 3 seconds after switching “OFF” the ignition switch.	0V
4	G/R	SEL3 (pressure switches 2, 3, 5)	—	—	—
5	B	Ground	—	—	—
6	G/B	CAN-H	—	—	—
7	W/R	CAN-L	—	—	—
8	SB	Fluid temperature sensor 1		When ATF temperature 0°C (32°F)	3.3V
				When ATF temperature 20°C (68°F)	2.7V
				When ATF temperature 80°C (176°F)	0.9V
9	R/Y	Power supply (Memory back-up)		—	Battery voltage

TCM Input/Output Signal Reference Values (Cont'd)

Terminal No.	Wire color	Item	Condition		Data (Approx.)
10	W/B	Input clutch solenoid valve	When vehicle starts	When the solenoid valve operating (in 1st speed, 2nd speed, or 3rd speed)	More than 2V
				When the solenoid valve is not operating (4th speed or 5th speed)	0V
11	P/B	High & low reverse clutch solenoid valve		When the solenoid valve operating [6 km/h (4 MPH) or faster in 1st speed or 2nd speed]	More than 2V
				When the solenoid valve is not operating [6 km/h (4 MPH) or slower in 1st speed or 3rd, 4th, or 5th speed]	0V
12	Y	Power supply (out)		—	Battery voltage
				—	0V
13	W/L	Low coast brake solenoid valve	When vehicle starts	When the solenoid valve is operating (when running in M1-1st speed or M2-2nd speed)	Battery voltage
				When the solenoid valve is not operating (when running in "D")	0V
14	B	Ground	—	—	—
15	B/W	SEL4	—	—	—
16	W	SEL1 (pressure switches 2, 3, 5)	—	—	—
17	LG	Fluid temperature sensor 2		When ATF temperature about 0°C (32°F)	3.3V
				When ATF temperature about 20°C (68°F)	2.5V
				When ATF temperature about 80°C (176°F)	0.7V
19	R	Front brake solenoid valve	When vehicle starts	When the solenoid valve is operating (other than 4th speed)	More than 2V
				When the solenoid valve is not operating (4th speed)	0V
20	BR	TCC solenoid valve		When lock-up	More than 2V
				When not lock-up	0V
21	G	Direct clutch solenoid valve		When the solenoid valve is operating (1st speed or 5th speed)	More than 2V
				When the solenoid valve is not operating (2nd speed, 3rd speed, or 4th speed)	0V

TCM Input/Output Signal Reference Values (Cont'd)

Terminal No.	Wire color	Item	Condition		Data (Approx.)
22	P	SEL2	—	—	—
23	PU	K-line (CONSULT-II signal)	The terminal is connected to the data link connector for CONSULT-II		
24	B	Ground	—	—	—
26	G/Y	PSC2 (pressure switch 6)	When vehicle starts	When high & low reverse clutch solenoid valve "ON".	0V
				When high & low reverse clutch solenoid valve "OFF".	Battery voltage
27	R/L	Vehicle speed sensor A/T (revolution sensor)		When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	149 (Hz)
30	R/W	PNP switch 1		Selector lever in "P" position.	Battery voltage
				Selector lever in "N" position.	Less than 2.5V
31	OR	PNP switch 2		Selector lever in "P" position.	Battery voltage
				Selector lever in "D" position.	Less than 2.5V
32	R/G	Transfer 4LO switch	When vehicle starts	When shifting transfer lever to the "4LO" position.	0V
				When shifting transfer lever to other positions.	Battery voltage
33	G/OR	Power supply		—	Battery voltage
				—	0V
35	B/Y	PSB2 (pressure switch 1)	When vehicle starts	When front brake solenoid valve "OFF".	Battery voltage
				When front brake solenoid valve "ON".	0V
36	L/Y	Turbine revolution sensor 1		When moving at 20 km/h (12 MPH) in 1st speed with the closed throttle position switch "OFF", use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	1.1 (kHz)
38	LG	PNP switch 3		Selector lever in "D" position.	Battery voltage
				Selector lever in "R" position.	Less than 2.5V
39	BR/W	PNP switch 4		Selector lever in "D" position.	More than 2.5V
				Selector lever in "R" position.	Less than 2.5V
40	L	DATA BIT1	—	—	—

TCM Input/Output Signal Reference Values (Cont'd)

Terminal No.	Wire color	Item	Condition		Data (Approx.)
41	LG/R	Back-up lamp relay		Selector lever in "R" position.	Battery voltage
				Selector lever in other position.	Less than 2V
42	G/OR	Power supply		—	Battery voltage
				—	0V
45	PU	Turbine revolution sensor 2	When vehicle starts	When running at 50 km/h (31 MPH) in 4th speed with the closed throttle position switch "OFF", use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	1.1 (kHz)
46	B	Ground	—	—	—
47	G/W	PNP switch 3 (monitor)		Selector lever in "D" position.	Battery voltage
				Selector lever in "R" position.	Less than 2.5V
48	GY/L	PNP relay (Starter relay)		Selector lever in "N", "P" position.	Battery voltage
				Selector lever in other position.	0V

CONSULT-II

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

NOTICE:

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

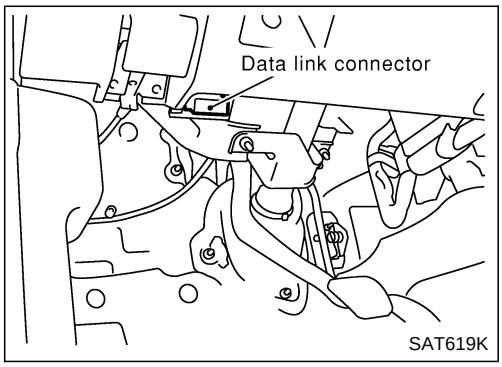
— Actual shift schedule has more or less tolerance or allowance,
— Shift schedule indicated in Service Manual refers to the point where shifts start, and
— Gear position displayed on CONSULT-II indicates the point where shifts are completed.

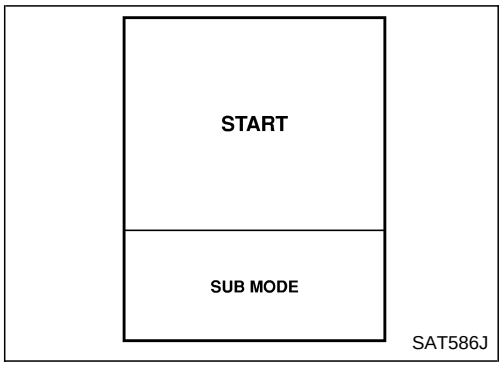
3. Display of solenoid valves on CONSULT-II changes at the start of shifting, while gear position is displayed upon completion of shifting (which is computed by TCM).
4. Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II unit.

CAUTION:
In CONSULT-II diagnostic mode “WORK SUPPORT” and “DTC WORK SUPPORT” can be selected, but they are not used.

CONSULT-II REFERENCE VALUE

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





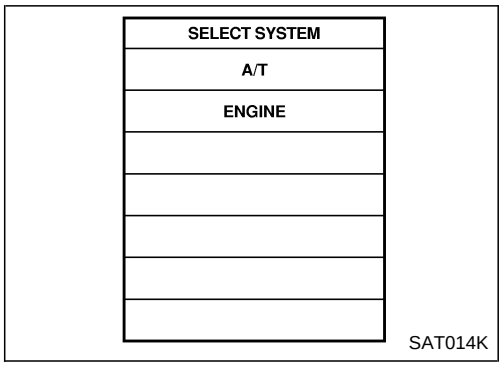
SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

CONSULT-II Setting Procedure

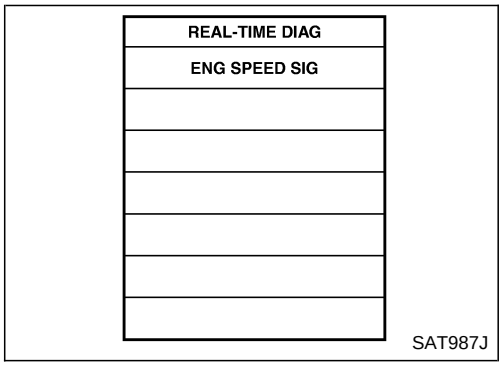
- For details, refer to the separate “CONSULT-II Operations Manual”.

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

CONSULT-II (Cont'd)



5. Touch "A/T" and on the CONSULT-II screen in that order.
6. Turn on CONSULT-II and touch "A/T" for TCM self-diagnosis.
   If A/T is not displayed, check TCM power supply and ground circuit. Refer to AT-64. If result is NG, refer to EL section "POWER SUPPLY ROUTING".



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

Self-Diagnostic Result Test Mode

X: Applicable, —: Not applicable

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis	
		A/T CHECK indicator lamp	"A/T" with CONSULT-II
CAN COMM CIRCUIT	● When an abnormality is detected in CAN communications	X	U1000
STARTER RELAY/CIRC (PNP relay)	● If this signal is "ON" other than in "P" or "N" position, this is judged to be an abnormality. (And if it is "OFF" in "P" or "N" position, this too is judged to be an abnormality.)	X	P0615
PNP SW/CIRC	● PNP switch 1-4 signals input with impossible pattern ● PNP switch 3 monitor terminal cut line ● "P" position is detected from "3" position or "N" position without any other position being detected in between	X	P0705
VEH SPD SEN/CIR AT (Revolution sensor)	● Signal from vehicle sensor 1 not input due to cut line or the like ● Abnormal signal input during running ● After ignition switch is turned "ON", abnormal signal input from vehicle sensor MTR before the vehicle starts moving	X	P0720
ENGINE SPEED SIG	● TCM does not receive the proper voltage signal from the ECM.	X	P0725
TCC SOLENOID/CIRC	● Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P0740
L/PRESS SOL/CIRC	● Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P0745
TCM-POWER SUPPLY	● When the power supply to the TCM is cut "OFF", for example because the battery is removed, and the self-diagnostics memory function stops ● This is not a malfunction message (Whenever shutting "OFF" a power supply to the TCM, this message appears on the screen.)	—	P1701
TCM·RAM	● TCM memory (RAM) is malfunctioning.	—	P1702

CONSULT-II (Cont'd)

Items (CONSULT-II screen terms)	Malfunction is detected when...	TCM self-diagnosis	
		A/T CHECK indicator lamp	"A/T" with CONSULT-II
TCM·ROM	● TCM memory (ROM) is malfunctioning.	—	P1703
TCM·EEPROM	● TCM memory (EEPROM) is malfunctioning.	—	P1704
TP SEN/CIRC A/T	● Voltage for accelerator sensor signal abnormally high ● Voltage for accelerator sensor signal abnormally low when idle signal OFF or full switch signal ON	X	P1705
ATF TEMP SEN/CIRC	● During running, the ATF temperature sensor signal voltage is abnormally high or low	X	P1710
TURBINE REV S/CIRC	● TCM does not receive the proper voltage signal from the sensor.	X	P1716
VEH SPD SE/CIR·MTR	● Signal from vehicle sensor MTR not input due to cut line or the like ● Abnormal signal input during running	—	P1721
A/T INTERLOCK	● Except during speed change, the gear position and hydraulic switch states are monitored and comparative judgement made.	X	P1730
A/T 1ST E/BRAKING	Each hydraulic switch and solenoid current is monitored and if a pattern is detected having engine braking other than in the 1 position, this is judged to be an abnormality.	X	P1731
I/C SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1752
FR/B SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1757
D/C SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1762
HLR/C SOL/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1767
LC/B SOLENOID/CIRC	Normal voltage not applied to solenoid due to functional problem, cut line, short, or the like	X	P1772
MANU MODE SW/CIRC	When an impossible pattern of switch signals is detected, this is judged to be an abnormality.	—	P1815
ATF PRES SW 1/CIRC	When there is a difference found in the comparison between a pressure switch state and the electrical current monitor value, (Other than during speed change)	—	P1841
ATF PRES SW 3/CIRC		—	P1843
ATF PRES SW 5/CIRC		—	P1845
ATF PRES SW 6/CIRC		—	P1846
NO DTC IS DETECTED FURTHER TESTING MAY BE REQUIRED	No NG item has been detected.	—	X

Data Monitor Mode (A/T)

X: Standard, —: Not applicable

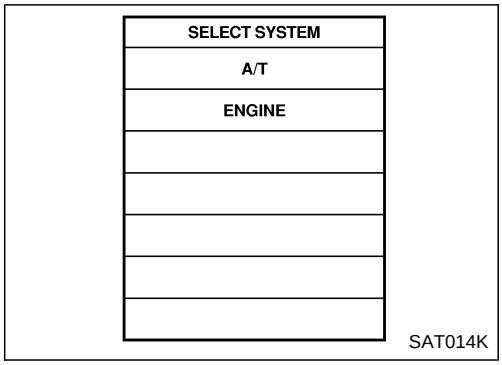
Monitored item (Unit)	Monitor Item Selection				Remarks
	TCM INPUT SIGNALS	MAIN SIGNALS	CAN COMM SIGNALS	SELECTION FROM MENU	
VHCL/S SE·A/T (km/h)	X	X	—	X	Revolution sensor
VHCL/S SE·MTR (km/h)	X	—	—	X	
ACCELE POSI (0.0/8)	X	—	—	X	Accelerator pedal position sensor signal
THROTTLE POS (0.0/8)	X	X	—	X	Throttle position is recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
BATTERY BOLT (V)	X	—	—	X	
ENGINE SPEED (rpm)	X	X	—	X	
TURBINE REV (rpm)	X	—	—	X	
ATF TEMP 1 (V)	—	X	—	X	
ATF TEMP 2 (V)	—	X	—	X	
OUTPUT REV (rpm)	X	X	—	X	
ATF TEMP SE 1 (V)	X	—	—	X	
ATF TEMP SE 2 (V)	X	—	—	X	
ATF PRES SW 1 (ON-OFF display)	X	X	—	X	(for FR/B solenoid)
ATF PRES SW 2 (ON-OFF display)	X	X	—	X	(for LC/B solenoid)
ATF PRES SW 3 (ON-OFF display)	X	X	—	X	(for I/C solenoid)
ATF PRES SW 5 (ON-OFF display)	X	X	—	X	(for D/C solenoid)
ATF PRES SW 6 (ON-OFF display)	X	X	—	X	(for HLR/C solenoid)
PNP SW 1 (ON-OFF display)	X	—	—	X	
PNP SW 2 (ON-OFF display)	X	—	—	X	
PNP SW 3 (ON-OFF display)	X	—	—	X	
PNP SW 4 (ON-OFF display)	X	—	—	X	
1 POSITION SW (ON-OFF display)	X	—	—	X	
ASCD·CRUISE (ON-OFF display)	X	—	—	X	
ASCD·OD CUT (ON-OFF display)	X	—	—	X	
OD CONT SW (ON-OFF display)	X	—	—	X	Not mounted but displayed.
MANU MODE SW (ON-OFF display)	X	—	—	X	
NON M-MODE SW (ON-OFF display)	X	—	—	X	
UP SW LEVER (ON-OFF display)	X	—	—	X	
DOWN SE LEVER (ON-OFF display)	X	—	—	X	
POWER SHIFT SW (ON-OFF display)	X	—	—	X	Not mounted but displayed
CLSO THL POS (ON-OFF display)	X	—	—	X	Signal input with CAN communications
W/O THL POS (ON-OFF display)	X	—	—	X	Signal input with CAN communications
TCC SOLENOID (A)	—	X	—	X	
LINE PRES SOL (A)	—	X	—	X	
I/C SOLENOID (A)	—	X	—	X	
FR/B SOLENOID (A)	—	X	—	X	

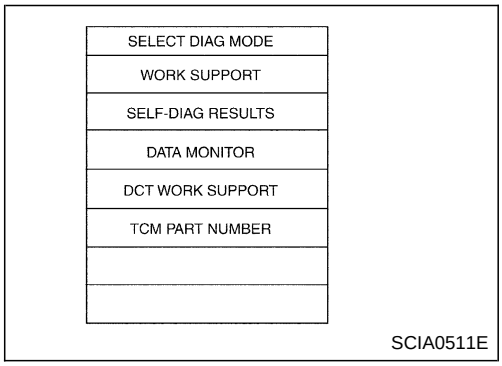
CONSULT-II (Cont'd)

Monitored item (Unit)	Monitor Item Selection				Remarks
	TCM INPUT SIGNALS	MAIN SIGNALS	CAN COMM SIGNALS	SELECTION FROM MENU	
D/C SOLENOID (A)	—	X	—	X	
HLR/C SOL (A)		X	—	X	
HOLD SW (ON-OFF display)	X	—	—	X	Not mounted but displayed
BRAKE SW (ON-OFF display)	X	—	—	X	Stop lamp switch
GEAR	—	X	—	X	Gear position recognized by the TCM updated after gear-shifting
GEAR RATIO	—	X	—	X	
SLCTLVR POSI	—	X	—	X	Selector lever position is recognized by the TCM. For fail-safe operation, the specific value used for control is displayed.
VEHICLE SPEED (km/h)	—	X	—	X	Vehicle speed recognized by the TCM.
TC SLIP SPEED (rpm)	—	X	—	X	Difference between engine speed and torque converter input shaft speed
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 CIRC 5 (OK-UNKWN)	—	—	X	—	
CAN CIRC 6 (OK-UNKWN)			X	—	
Voltage (V)	—	—	—	X	Displays the value measured by the voltage probe.
F SUN GW REV (rpm)	—	—	—	X	
F CARR GR REV (rpm)	—	—	—	X	
SFT UP ST SW	—	—	—	X	Not mounted but displayed
SFT DWN ST SW	—	—	—	X	
ABS SIGNAL	—	—	—	X	
ACC OD CUT	—	—	—	X	
ACC SIGNAL	—	—	—	X	
TCS GR/P KEEP	—	—	—	X	
TCS SIGNAL 2	—	—	—	X	
TCS SIGNAL 1	—	—	—	X	
ON OFF SOL (ON-OFF display)	—	—	—	X	LC/B solenoid
TCC SOL MON	—	—	—	X	
L/P SOL MON	—	—	—	X	
I/C SL MON	—	—	—	X	
FR/B SOL MON	—	—	—	X	
D/C SOL MON	—	—	—	X	
HLR/C SOL MON	—	—	—	X	
ONOFF SOL MON	—	—	—	X	LC/B solenoid

CONSULT-II (Cont'd)

Monitored item (Unit)	Monitor Item Selection				Remarks
	TCM INPUT SIGNALS	MAIN SIGNALS	CAN COMM SIGNALS	SELECTION FROM MENU	
P POSI IND	—	—	—	X	
R POSI IND	—	—	—	X	





HOW TO ERASE SELF-DIAGNOSTIC RESULTS (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.
2. Turn CONSULT-II "ON" and touch "A/T".
3. Touch "SELF-DIAG RESULTS".
4. Touch "ERASE". (The self-diagnostic results will be erased.)

Diagnostic Procedure Without CONSULT-II

SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)

Description

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

Diagnostic Procedure

1. CHECK A/T CHECK INDICATOR LAMP

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

Yes or No?

Yes >> GO TO 2.
No >> GO TO AT-168, "A/T CHECK Indicator Lamp does not come on".

Diagnostic Procedure Without CONSULT-II (Cont'd)

2. JUDGEMENT PROCEDURE STEP 1

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

>> GO TO 3.

3. CHECK SELF-DIAGNOSIS CODE

Check A/T CHECK indicator lamp.

Refer to AT-74, "Judgement Self-Diagnosis Code".

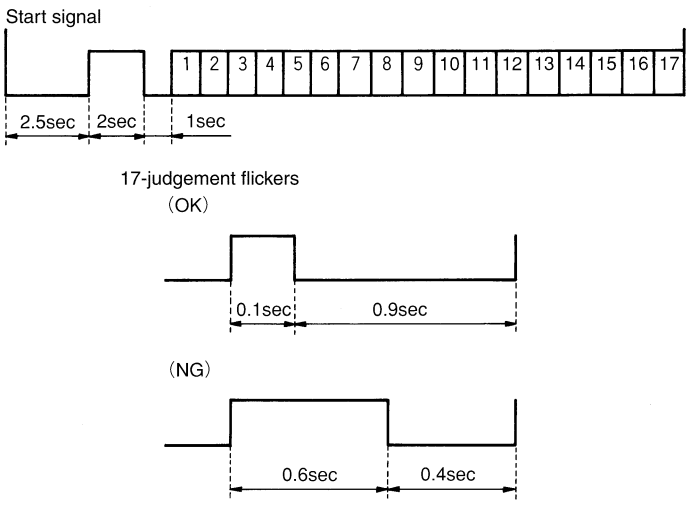
If the system does not go into self-diagnostics. Refer to AT-164, "PARK/NEUTRAL POSITION, MANUAL MODE, BRAKE AND THROTTLE POSITION SWITCH CIRCUIT".

>> **DIAGNOSIS END**

Judgement Self-Diagnosis Code

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

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



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

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⊗ HOW TO ERASE SELF-DIAGNOSTIC RESULTS (WITHOUT CONSULT-II)

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

1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 10 seconds and then turn it "ON" (engine stopped) again.
2. Perform self-diagnostic procedure. Refer to AT-73, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)". (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Turn ignition switch to "OFF" position. (The self-diagnostic results will be erased.)

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.

On Board Diagnosis Logic

- This is a self-diagnostic item.
- Diagnostic trouble code “CAN COMM CIRCUIT” with CONSULT-II or “17th judgment flicker” without CONSULT-II is detected when TCM cannot communicate to other control unit.

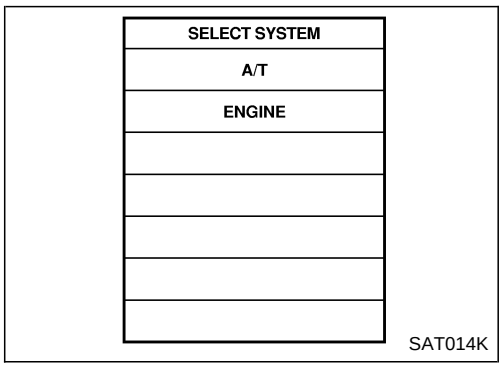
Possible Cause

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

DTC Confirmation Procedure

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

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



WITH CONSULT-II

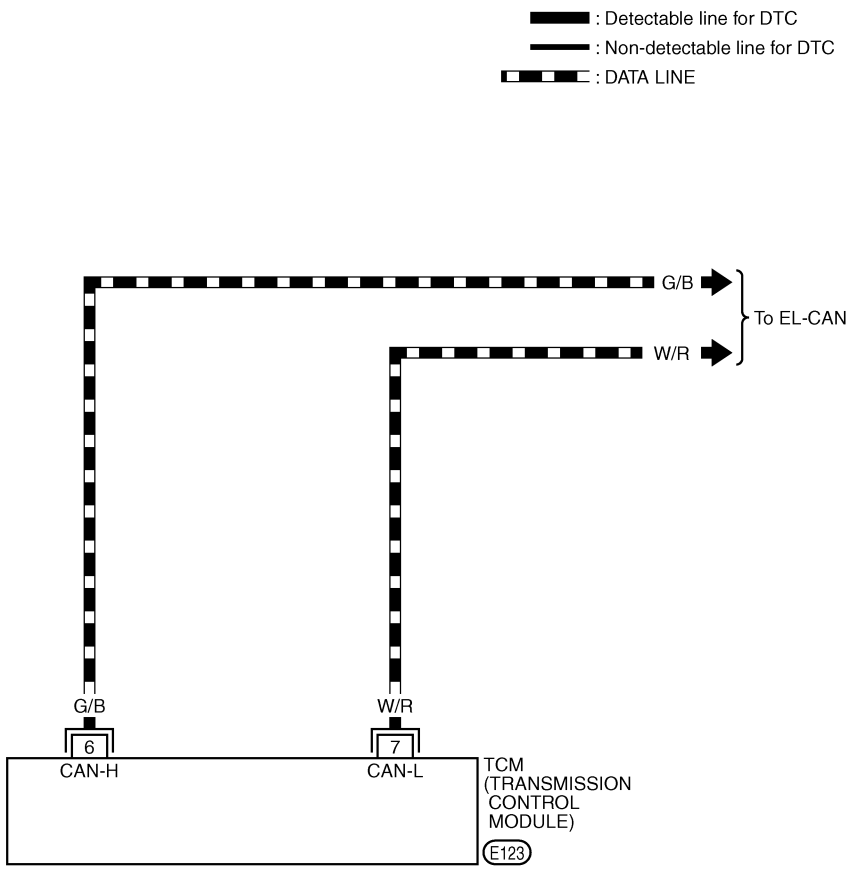
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and wait for at least 6 seconds.
4. If DTC is detected, go to AT-77, “Diagnostic Procedure”.

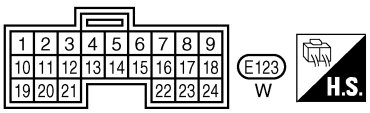
WITHOUT CONSULT-II

1. Start engine and wait for at least 6 seconds.
2. Perform self-diagnosis.
   Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
3. If DTC is detected, go to AT-77, “Diagnostic Procedure”.

Wiring Diagram — AT — CAN

AT-CAN-01





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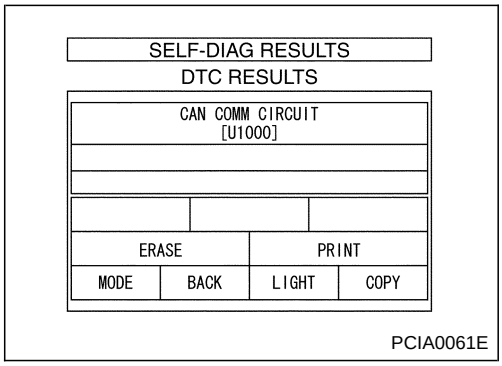
Diagnostic Procedure

1. CHECK CAN COMMUNICATION CIRCUIT (WITH CONSULT-II)



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 3.
No >> INSPECTION END

2. CHECK CAN COMMUNICATION CIRCUIT (WITHOUT CONSULT-II)

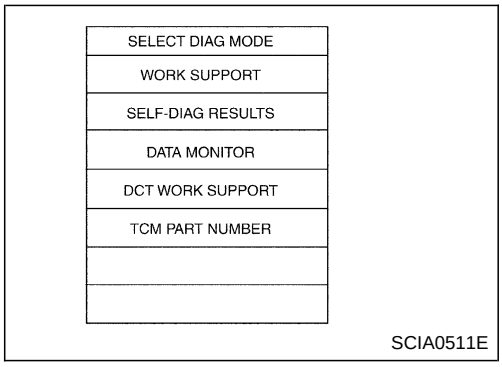
Without CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Perform self-diagnosis.
   Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
3. The DTC is detected.

Yes or No?

Yes >> GO TO “CAN SYSTEM”.
No >> INSPECTION END

3. CHECK CAN COMMUNICATION SIGNALS (WITH CONSULT-II)



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 “CAN SYSTEM”.

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
CAN CIRC 6: UNKWN	CAN CIRC 6: UNKWN

Description

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “STARTER RELAY/CIRC” with CONSULT-II or “14th judgement flicker” without CONSULT-II is detected when detects as abnormal when switched “ON” other than at “P” or “N” position. (Or when switched “OFF” at “P” or “N” position).

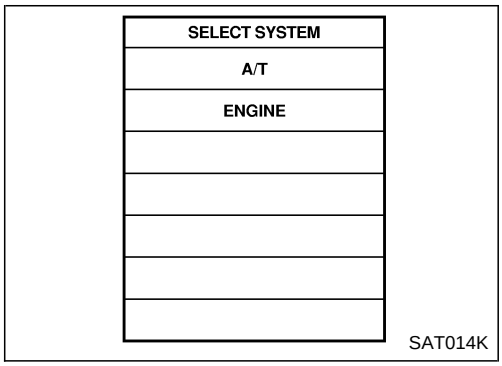
Possible Cause

Check the following items.
- Harness or connectors
  (PNP relay and TCM circuit is open or shorted.)
- PNP relay

DTC Confirmation Procedure

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

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



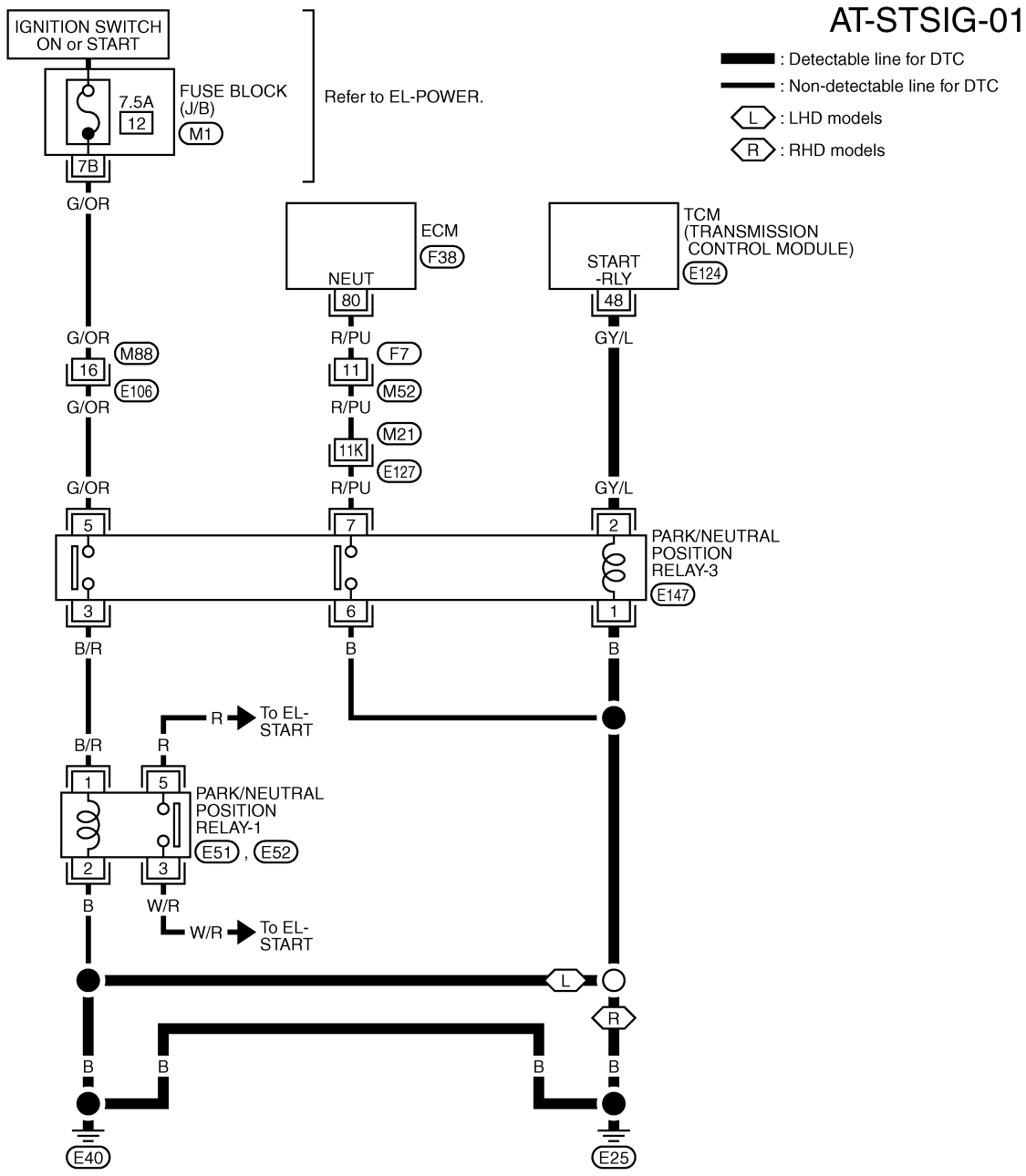
WITH CONSULT-II

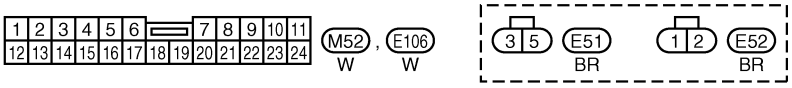
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle for at least 2 consecutive seconds.
5. If DTC is detected, go to AT-80, “Diagnostic Procedure”.

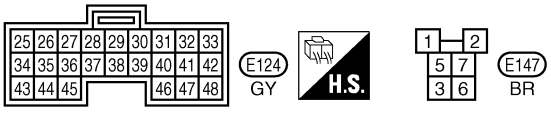
WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle for at least 2 consecutive seconds.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-80, “Diagnostic Procedure”.

Wiring Diagram — AT — STSIG





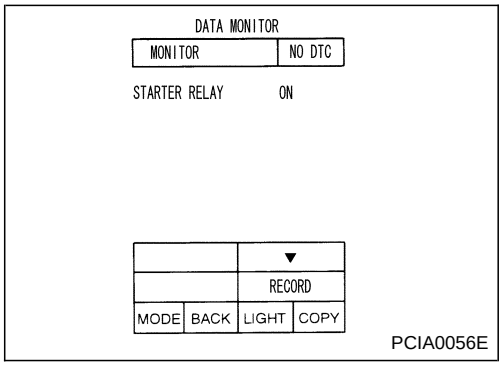


Refer to last page (Foldout page).
M21, E127
M1
F38

TAT083M

Diagnostic Procedure

1. CHECK PNP RELAY (WITH CONSULT-II)



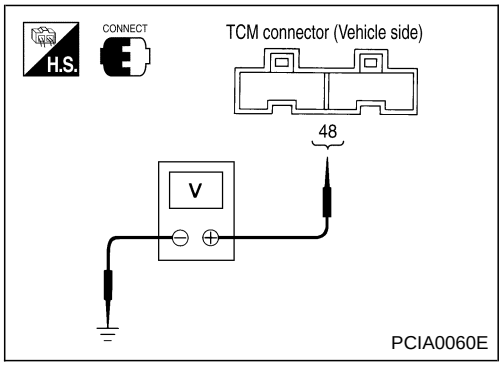
With CONSULT-II

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

OK or NG?

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

2. CHECK PNP RELAY (WITHOUT CONSULT-II)



Without CONSULT-II

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

Item	Connector No.	Terminal No.		Shift position	Voltage (Approx.)
PNP relay (Starter relay)	E124	48	Ground	N and P	Battery voltage
				R and D	0V

OK or NG?

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

3. DETECT MALFUNCTIONING ITEM

Check the following items.

1. PNP relay.
2. Disconnections or short-circuits in the main harness between TCM and the PNP relay.
3. Ground circuit for the PNP relay.

OK or NG?

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

4. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

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

5. CHECK TCM INSPECTION

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

OK or NG?

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

Component Inspection

PNP RELAY

Check continuity between PNP relay harness connector terminals. Refer to AT-79, “Wiring Diagram — AT — STSIG”.

Item	Shift position	Ignition switch	Connector No.	Terminal No.	Continuity
PNP relay	P and N	OFF	E52	1-2	Yes
			E51	3-5	No
		ON		3-5	No
					Yes

Description

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

On Board Diagnosis Logic

- This is a self-diagnostic item.
- Diagnostic trouble code “PNP SW/CIRC” with CONSULT-II or “9th judgment flicker” without CONSULT-II is detected when TCM does not receive the correct voltage signal from the PNP switch 1, 2, 3, 4 based on the gear position.
- When monitor terminal of PNP switch 3 is disconnected.
- When no other position but “P” position is detected from “3” or “N” positions.

Possible Cause

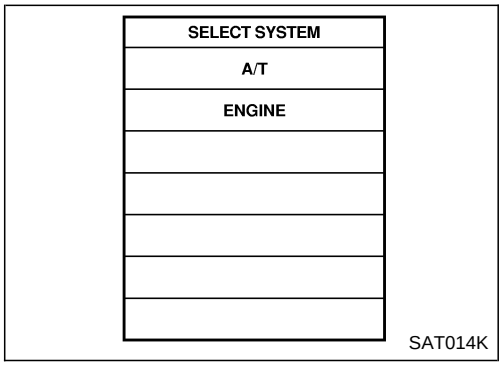
Check the following items.
- Harness or connectors
  (PNP switch 1, 2, 3, 4 and TCM circuit is open or shorted.)
- PNP switch 1, 2, 3, 4
- PNP switch 3 monitor terminal disconnected

DTC Confirmation Procedure

CAUTION:
Always drive vehicle at a safe speed.

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

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



WITH CONSULT-II

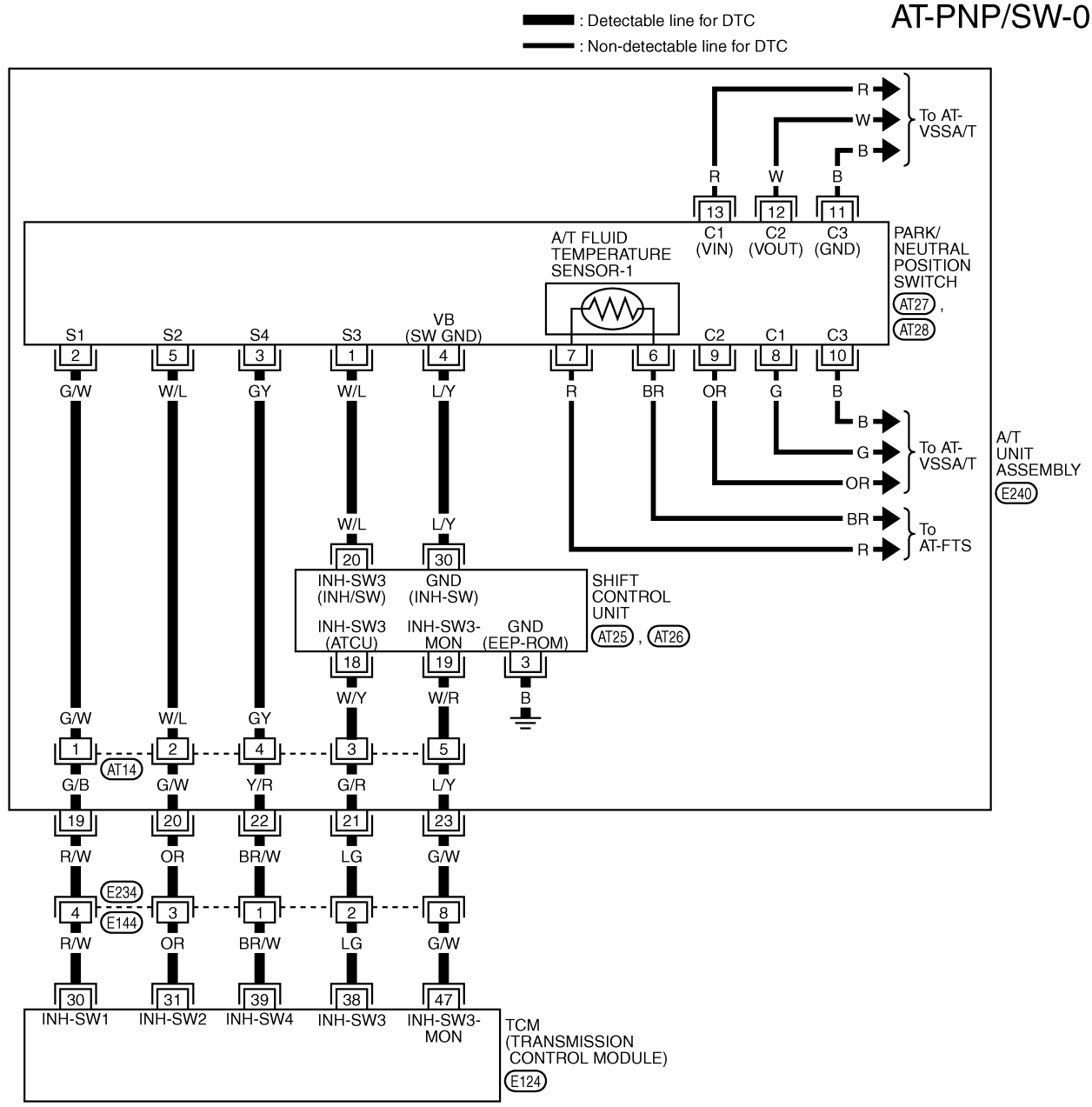
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
3. Start engine.
4. Vehicle start and maintain the following conditions for at least 2 consecutive seconds.
   THRTL POS SEN: More than 1.2V
5. If DTC is detected, go to AT-84, “Diagnostic Procedure”.

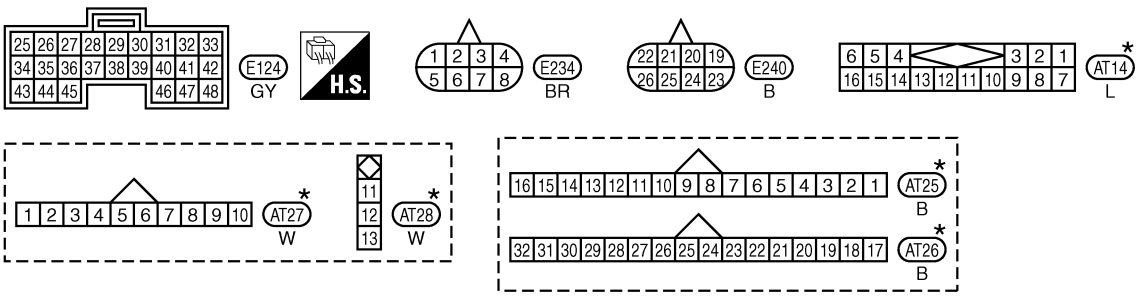
WITHOUT CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
3. If DTC is detected, go to AT-84, “Diagnostic Procedure”.

Wiring Diagram — AT — PNP/SW

AT-PNP/SW-01



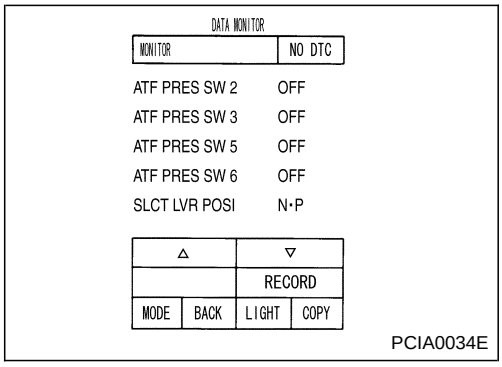


∗: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT084M

Diagnostic Procedure

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



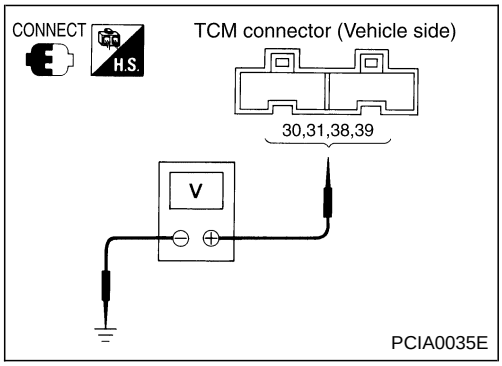
With CONSULT-II

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

OK or NG?

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

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



Without CONSULT-II

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

Shift position	Connector No.	E124		
	Terminal No.			
	30 - Ground	31 - Ground	38 - Ground	39 - Ground
P	Battery voltage	Battery voltage	—	—
R	—	—	Less than 2.5V	Less than 2.5V
N	Less than 2.5V	—	—	—
D	—	Less than 2.5V	Battery voltage	More than 2.5V

OK or NG?

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

3. DETECT MALFUNCTIONING ITEM

Check the following items.

- Disconnection or short-circuit in the main harness between TCM and PNP switch 1, 2, 3, 4.
- Disconnection or short-circuit in the main harness between the PNP switch 3 monitor and TCM.
- PNP switch.

OK or NG?

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

4. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

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

Diagnostic Procedure (Cont'd)

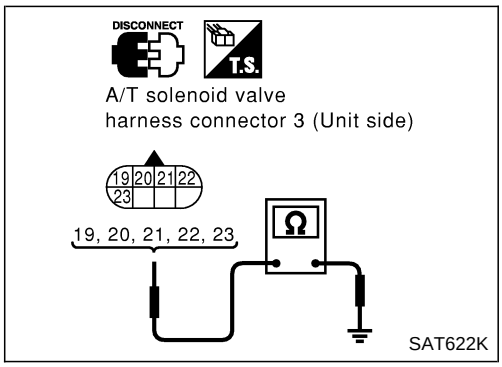
5. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".



Component Inspection

PNP SWITCH

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

PNP SW	Shift position	Connector No.	Terminal No.	Continuity
SW 1	P	E240	19 - Ground	No
SW 2			20 - Ground	
SW 3	D		21 - Ground	
SW 4			22 - Ground	Yes
SW 3 Monitor	P, R, N, D		21 - 23	

2. If NG, check the continuity with the control cable disconnected. (Refer to Step 1 above.)
3. If OK with the control cable disconnected, adjust the control cable.
4. If NG even when the control cable is disconnected, replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Description

The revolution sensor detects the revolution of the out put shaft 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

- This is a self-diagnostic item.
- Diagnostic trouble code “VEH SPD SEN/CIR AT” with CONSULT-II or “1st judgement flicker” without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.
- After ignition switch is turned “ON”, abnormal signal input from vehicle sensor MTR before the vehicle starts moving.

Possible Cause

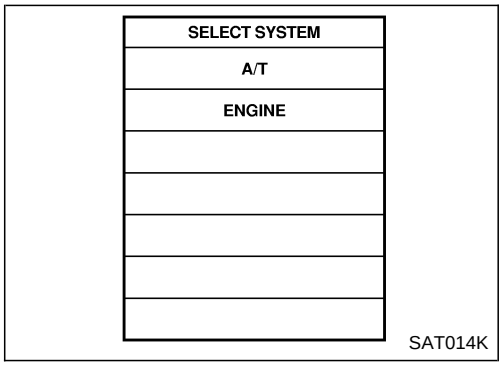
Check the following items.
- Harness or connectors
  (The sensor circuit is open or shorted.)
- Revolution sensor

DTC Confirmation Procedure

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

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

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



WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and check for an increase of “VHCL/S SE·MTR” value.
   If the check result is NG, go to AT-120, “DTC P1721 VEHICLE SPEED SENSOR MTR”.
   If the check result is OK, go to following step.
5. Turn ignition switch to “OFF” position and wait at least 10 seconds.
6. Turn ignition switch to “ON” position. (Do not start engine.)
7. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
8. Start engine.
9. Drive vehicle 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 1.0/8
   Selector lever: “D” position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
   If the check result is NG, go to AT-89, “Diagnostic Procedure”.
   If the check result is OK, go to following step.
10. Turn ignition switch to “OFF” position and wait at least 10 seconds.
11. Turn ignition switch to “ON” position. (Do not start engine.)
12. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.

DTC Confirmation Procedure (Cont'd)

13. Start engine.
14. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
    ENGINE SPEED: 3,500 rpm or more
    THRTL POS SEN: More than 1.0/8
    Selector lever: "D" position
    Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

    If the check result is NG, go to AT-89, "Diagnostic Procedure".

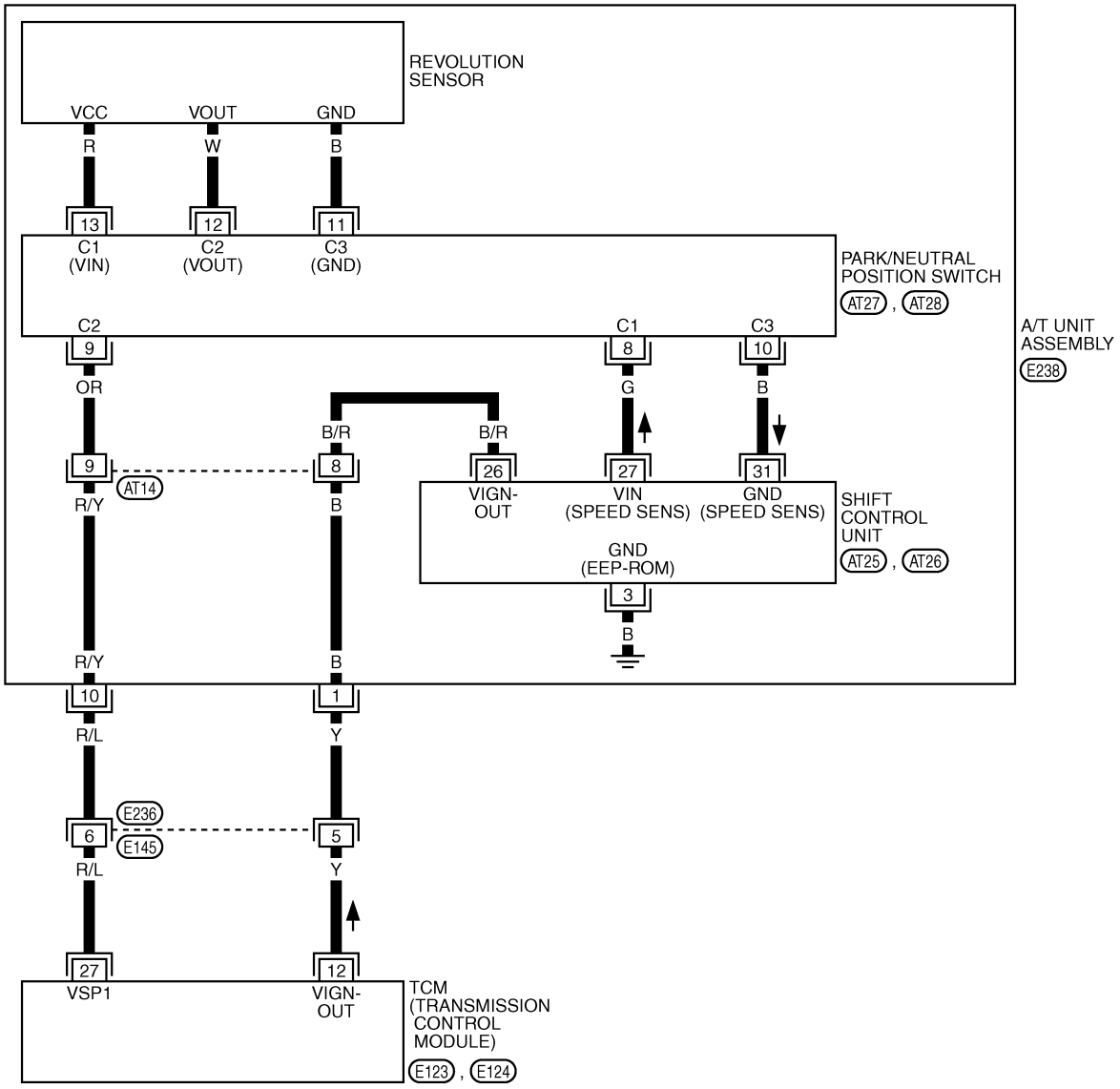
WITHOUT CONSULT-II

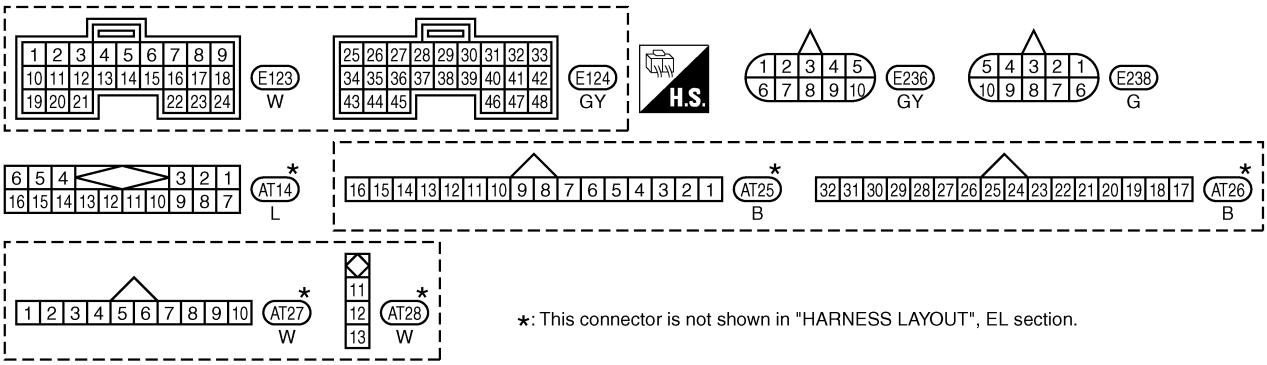
1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever "D" position, vehicle speed higher than 30 km/h (19 MPH), throttle opening greater than 1/8 of the full throttle position and driving for at least 5 consecutive seconds.
3. Perform self-diagnosis. Refer to AT-73, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)".
4. If DTC is detected, go to AT-89, "Diagnostic Procedure".

Wiring Diagram — AT — VSSA/T

AT-VSSA/T-01

: Detectable line for DTC
: Non-detectable line for DTC

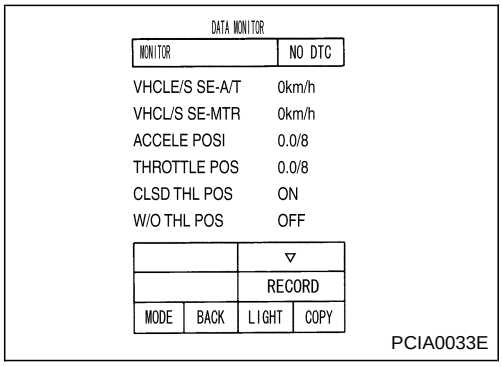




TAT085M

Diagnostic Procedure

1. CHECK INPUT SIGNALS (WITH CONSULT-II)



With CONSULT-II

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

OK or NG?

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

2. CHECK INPUT SIGNALS (WITHOUT CONSULT-II)

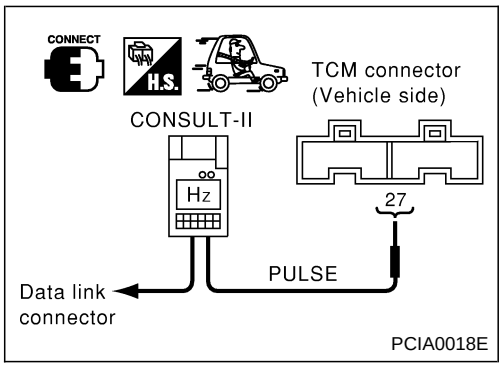
Without CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Perform self-diagnosis. Refer to AT-73, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)".

OK or NG?

OK >> GO TO 4.
NG >> ● Harness for short or open between TCM and revolution sensor (Main harness)
● Repair or replace damaged parts.

3. CHECK REVOLUTION SENSOR (WITH CONSULT-II)



With CONSULT-II

1. Start the engine.

Condition	Connector No.	Terminal No.	Data (Approx.)
When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the data link connector to the vehicle-side diagnosis connector.**	E124	27	149 (Hz)

OK or NG?

OK >> GO TO 4.
NG >> ● Harness for short or open between TCM and revolution sensor (Main harness)
● Repair or replace damaged parts.

4. CHECK DTC

Perform DTC confirmation procedure. Refer to AT-89, "DTC Confirmation Procedure".

OK or NG?

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

Diagnostic Procedure (Cont'd)

5. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >>
- Repair or replace damaged parts.
- Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Description

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

On Board Diagnosis Logic

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

Possible Cause

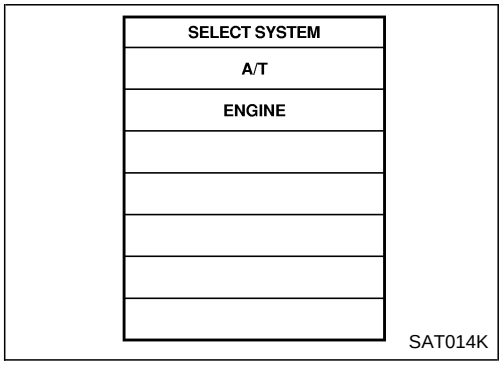
Check harness or connectors. (The ECM to the TCM circuit is open or shorted.)

DTC Confirmation Procedure

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

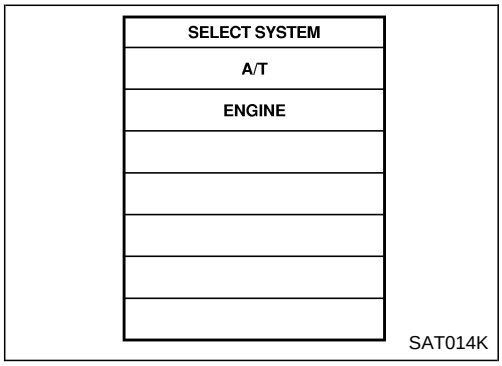
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 10 consecutive seconds.
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   ACCELE POSI: More than 1.0/8
   Selector lever: “D” position
4. If DTC is detected, go to AT-92, “Diagnostic Procedure”.

WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following condition:
   Selector lever “D” position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/8 of the full throttle position and driving for at least 10 consecutive seconds.
3. Perform self-diagnosis.
   Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-92, “Diagnostic Procedure”.

Diagnostic Procedure

1. CHECK DTC WITH ECM (WITH CONSULT-II)



With CONSULT-II

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

OK or NG?

OK >> GO TO 3.

NG >> Check the DTC detected item, go to CONSULT-II Function.

- If CAN communication line is detected, go to AT-75, “DTC U1000 CAN COMMUNICATION LINE”.

2. CHECK DTC WITH ECM (WITHOUT CONSULT-II)

Without CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Perform self-diagnosis.

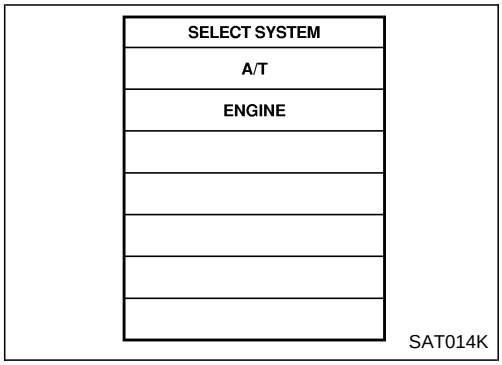
OK or NG?

OK >> GO TO 4.

NG >> Check the DTC detected item, go to CONSULT-II Function.

- If CAN communication line is detected, go to AT-75, “DTC U1000 CAN COMMUNICATION LINE”.

3. CHECK DTC WITH TCM (WITH CONSULT-II)



With CONSULT-II

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

OK or NG?

OK >> GO TO 5.

NG >> Check the ignition signal circuit.

- Refer to DTC P1320 IGNITION SIGNAL.

4. CHECK DTC WITH TCM (WITHOUT CONSULT-II)

Without CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.

OK or NG?

OK >> GO TO 5.

NG >> Check the ignition signal circuit.

- Refer to DTC P1320 IGNITION SIGNAL.

Diagnostic Procedure (Cont'd)

5. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END

NG >> Repair or replace damaged parts.

Description

- The torque converter clutch solenoid valve is activated, with the gear in D_4, D_5, by the TCM in response to signals sent from the vehicle speed and throttle position sensors. Lock-up piston operation will then be controlled.
- Lock-up operation, however, is prohibited when A/T fluid temperature is too low.
- When the accelerator pedal is depressed (less than 1/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “TCC SOLENOID/CIRC” with CONSULT-II or “3rd judgement flicker” without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

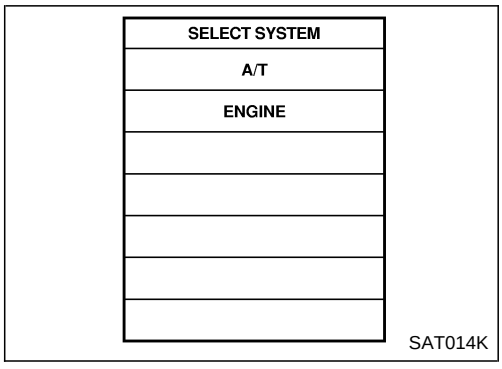
Check the following items.
- Torque converter clutch solenoid valve
- Harness or connectors
  (The solenoid circuit is open or shorted.)

DTC Confirmation Procedure

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

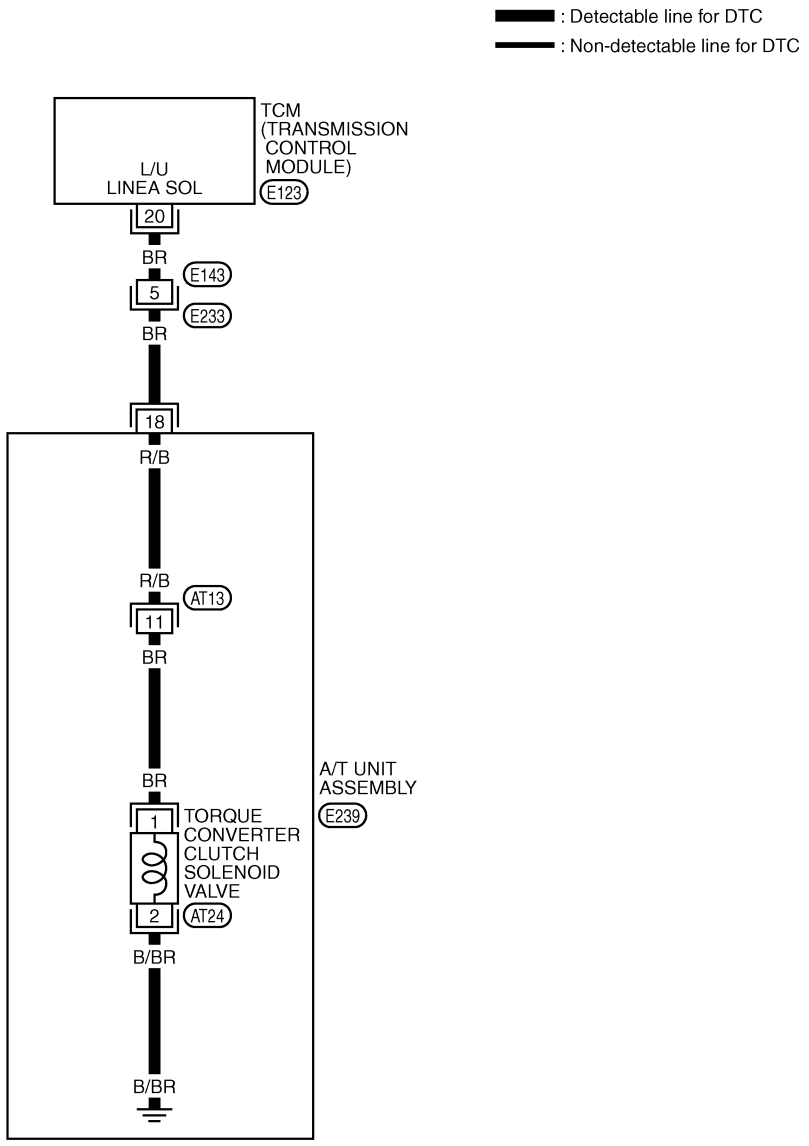
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 80 km/h (50 MPH) or more
   ACCELE POS: 0.5/8 - 1.0/8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

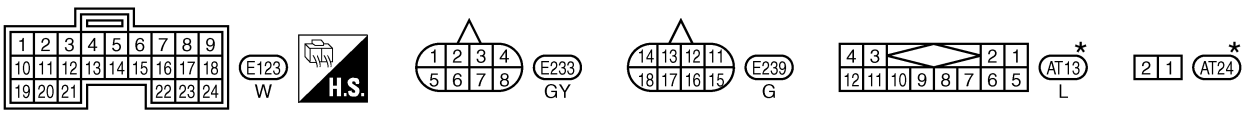
WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever “D” position, vehicle speed higher than 80 km/h (50 MPH) (Lock-up position), throttle opening greater than 1/8 of the full throttle position and driving for at least 5 consecutive seconds.
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-96, “Diagnostic Procedure”.

Wiring Diagram — AT — TCV

AT-TCV-01



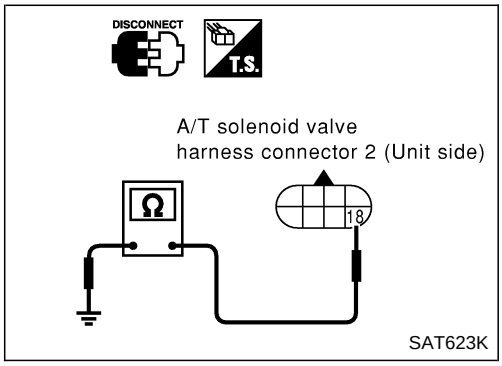


*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT086M

Diagnostic Procedure

1. CHECK VALVE RESISTANCE

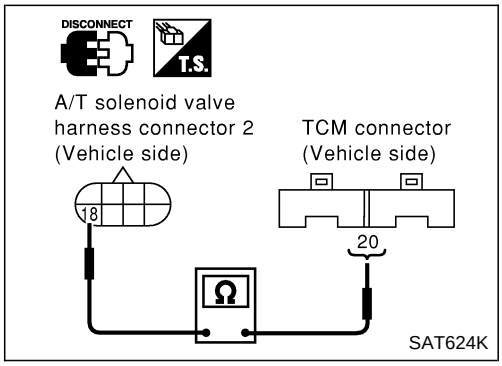


1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.

Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Torque converter clutch solenoid valve	E239	18 - Ground	3 - 9Ω

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

2. CHECK POWER SOURCE CIRCUIT



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

Item	Connector No.	Terminal No.	Continuity
TCM	E123	20	Yes
A/T solenoid valve harness connector 2	E239	18	

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

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

3. CHECK DTC

Perform DTC confirmation procedure.
OK or NG?
OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Description

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

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code "L/PRESS SOL/CIRC" with CONSULT-II or "4th judgement flicker" without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

Check the following items.

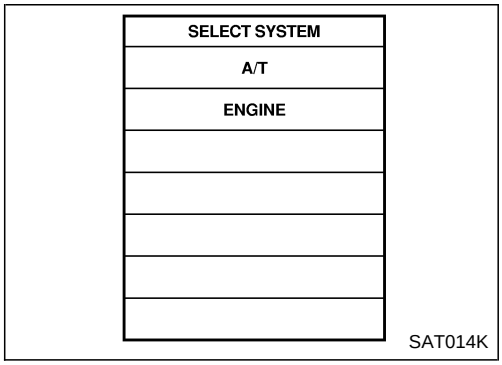
- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Line pressure solenoid valve

DTC Confirmation Procedure

NOTE:

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

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



WITH CONSULT-II

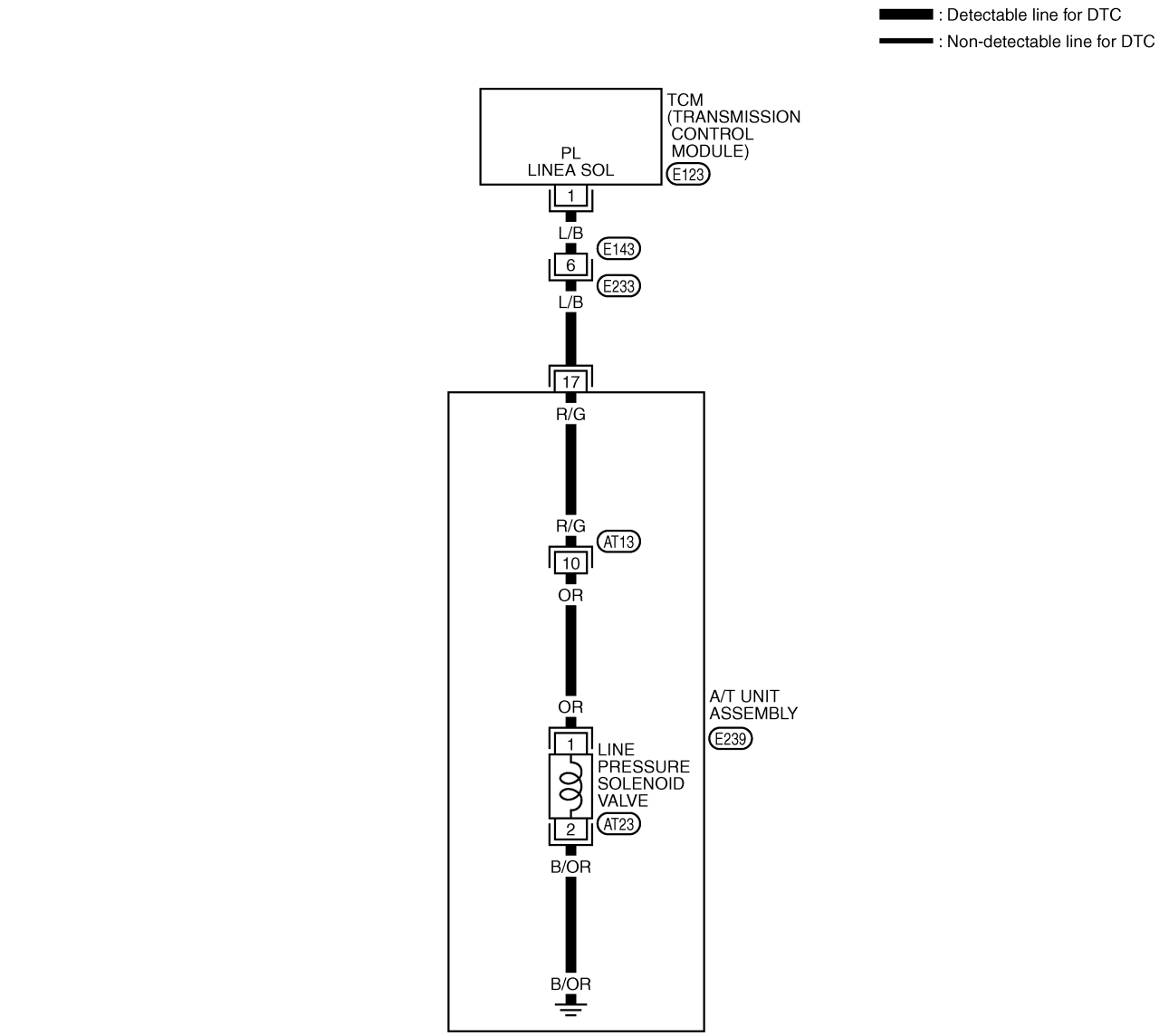
1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Start engine and wait at least 5 consecutive seconds.
4. If DTC is detected, go to AT-99, "Diagnostic Procedure".

WITHOUT CONSULT-II

1. Start engine and wait at least 5 consecutive seconds.
2. Perform self-diagnosis. Refer to AT-73, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)".
3. If DTC is detected, go to AT-99, "Diagnostic Procedure".

Wiring Diagram — AT — LPSV

AT-LPSV-01

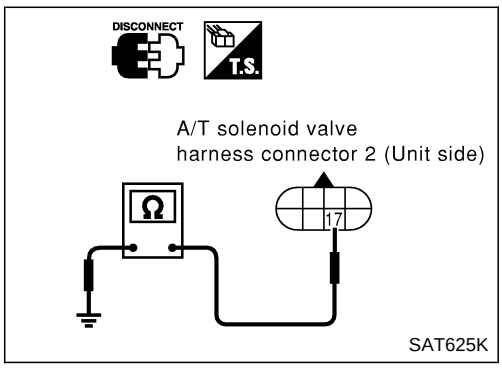


*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT087M

Diagnostic Procedure

1. CHECK VALVE RESISTANCE



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

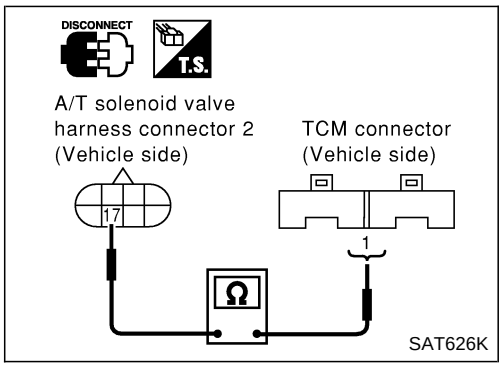
Solenoid Valve	Connector No.	Terminal No	Resistance (Approx.)
Line pressure solenoid valve	E239	17 - Ground	3 - 9Ω

OK or NG?

OK >> GO TO 2.

NG >> Repair or replace damaged parts.

2. CHECK POWER SOURCE CIRCUIT



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

Item	Connector No.	Terminal No.	Continuity
TCM	E123	1	Yes
A/T solenoid valve harness connector 2	E239	17	

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

OK or NG?

OK >> GO TO 3.

NG >> Repair open circuit or short to ground or short to power in harness or connectors.

3. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Description

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

On Board Diagnosis Logic

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

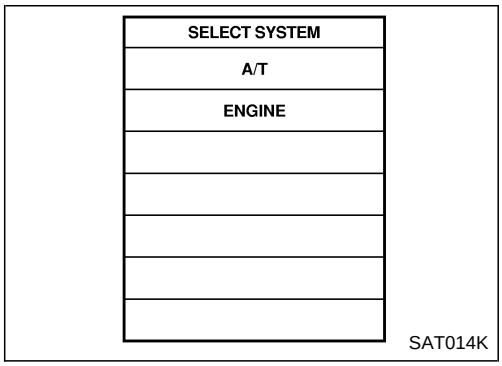
Possible Cause

Check harness or connectors.
(Battery or ignition switch and TCM circuit is open or shorted.)

DTC Confirmation Procedure

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

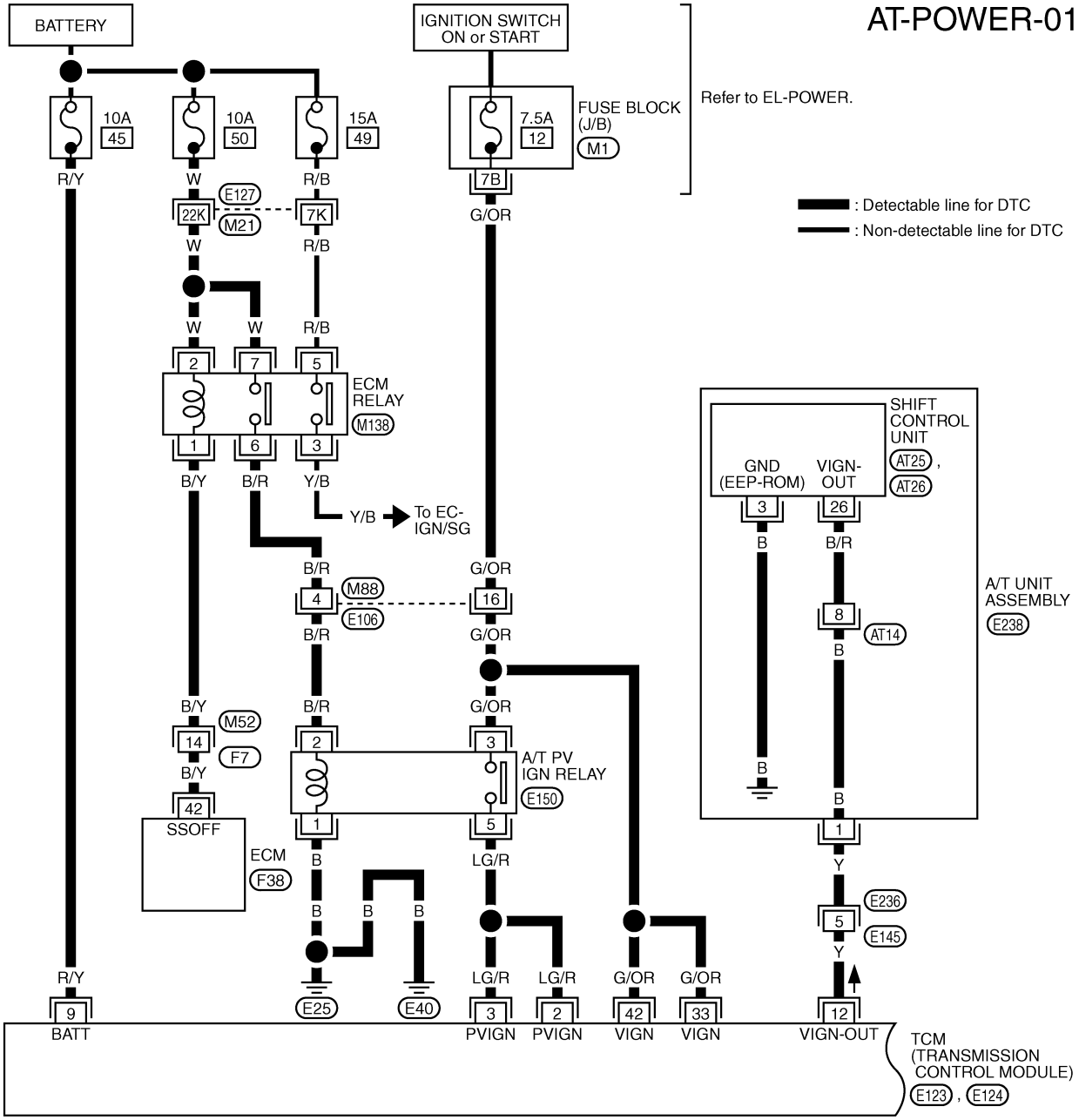
After the repair, perform the following procedure to confirm the malfunction is eliminated.

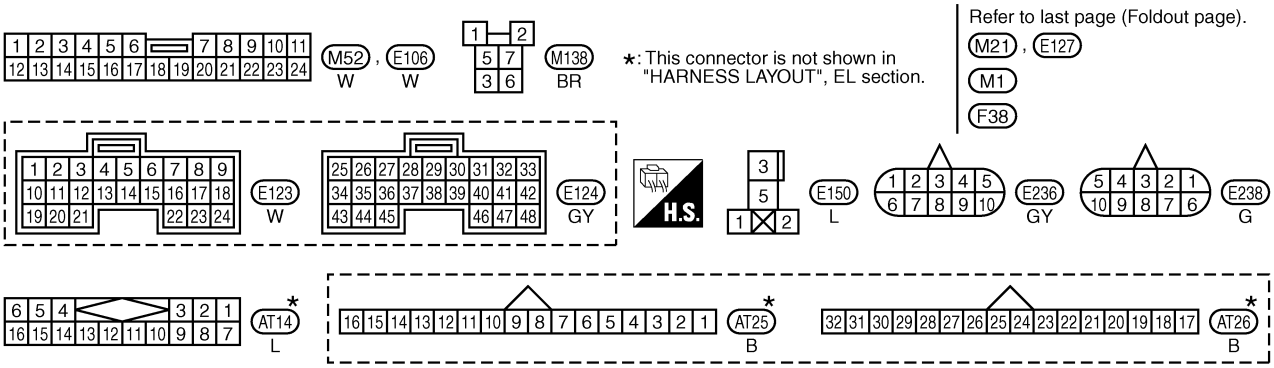


WITH CONSULT-II

1. Turn ignition switch “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Wait for at least 2 consecutive seconds.
4. If DTC is detected, go to AT-103, “Diagnostic Procedure”.

Wiring Diagram — AT — POWER

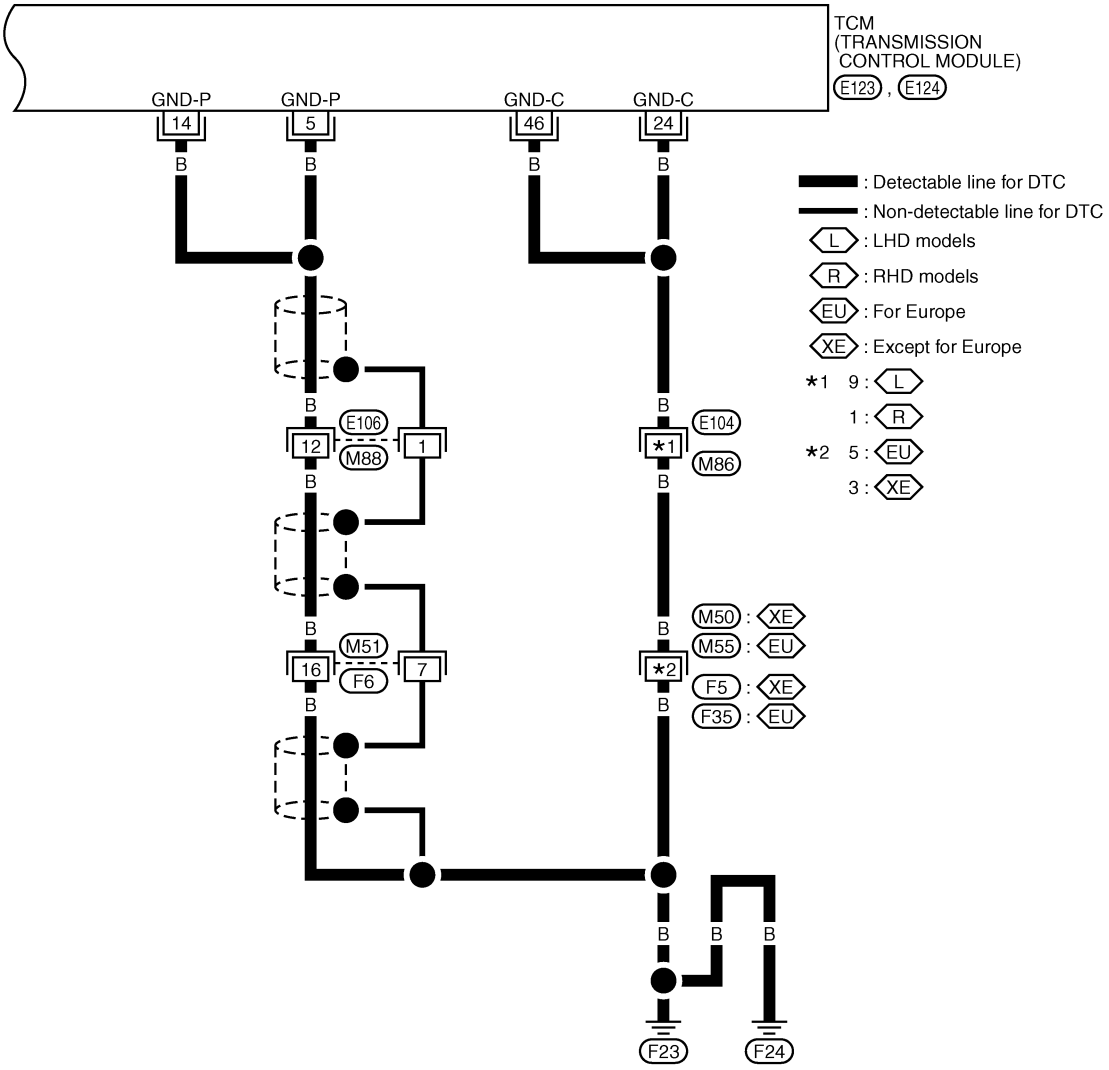


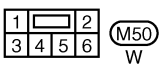


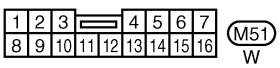
TAT088M

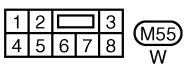
Wiring Diagram — AT — POWER (Cont'd)

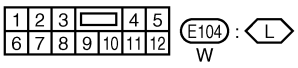
AT-POWER-02

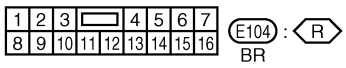


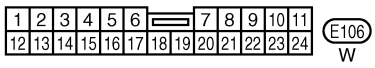


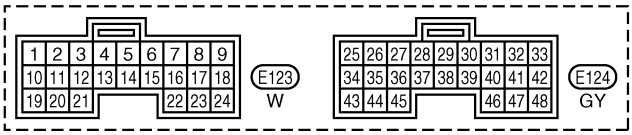








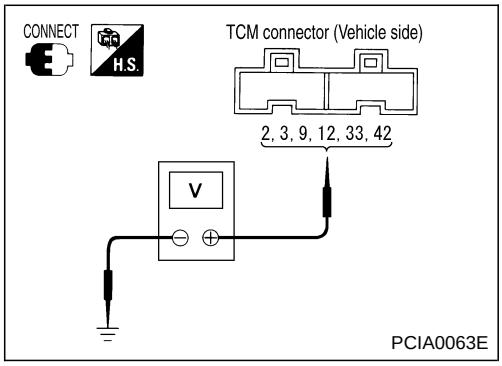




TAT115M

Diagnostic Procedure

1. CHECK TCM POWER SOURCE STEP 1

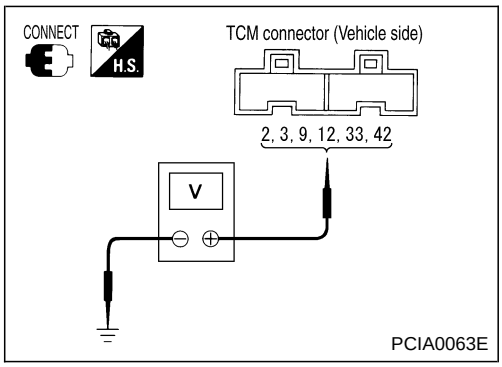


1. Turn ignition switch to “OFF” position. (Do not start engine.)
2. Check voltage between TCM terminal and ground.

Item	Connector No.	Terminal No.	Voltage
TCM	E123	9 - Ground	Battery voltage

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

2. CHECK TCM POWER SOURCE STEP 2



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

Item	Connector No.	Terminal No.	Voltage
TCM	E123	2 - Ground	Battery voltage
		3 - Ground	
		9 - Ground	
		12 - Ground	
	E124	33 - Ground	
		42 - Ground	

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

3. DETECT MALFUNCTIONING ITEM

Check the following items:
- Harness for short or open between battery and TCM terminal 9 (Main harness)
- Harness for short or open between ignition switch and TCM terminals 2, 3, 12, 33 and 42 (Main harness)
- 7.5A fuse [No. 12 located in the fuse block (J/B)], 10A fuse (No. 45 fuse and fusible link box), 10A fuse (No. 50 fuse and fusible link box) and 15A fuse (No. 49 fuse and fusible link box).
- Ignition switch
- A/T PV IGN relay.
- ECM relay, Refer to EC section.

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

4. CHECK TCM GROUND CIRCUIT

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

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

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

Diagnostic Procedure (Cont'd)

5. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 6.

6. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

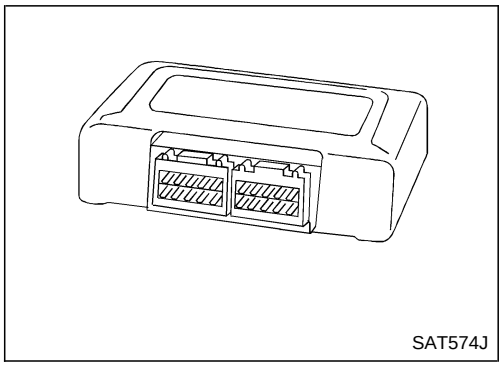
NG >> Repair or replace damaged parts.

Component Inspection

A/T PV IGN RELAY

Check continuity between A/T PV IGN relay harness connector terminals. Refer to AT-101, "Wiring Diagram — AT — POWER".

Item	Ignition switch	Connector No.	Terminal No.	Continuity
A/T PV IGN relay	OFF	E150	1 - 2	Yes
			3 - 5	No
	ON		3 - 5	Yes


SAT574J

Description

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

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

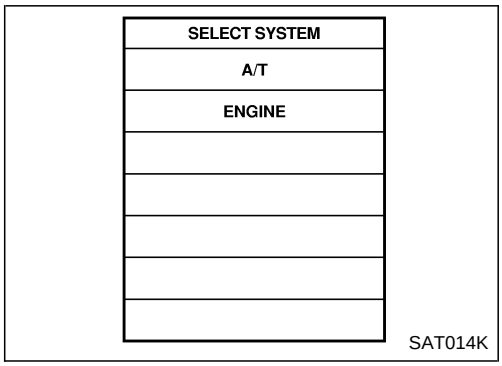
Possible Cause

Check TCM.

DTC Confirmation Procedure

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.



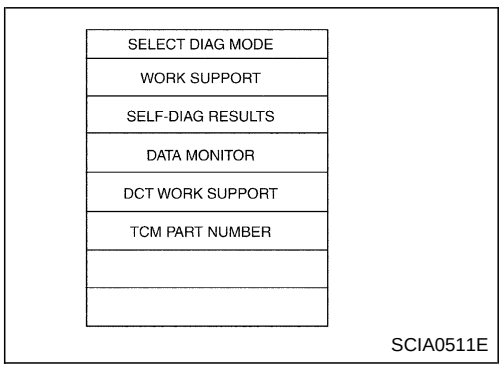
SAT014K

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for A/T with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-105, “Diagnostic Procedure”.

Diagnostic Procedure

1. CHECK DTC



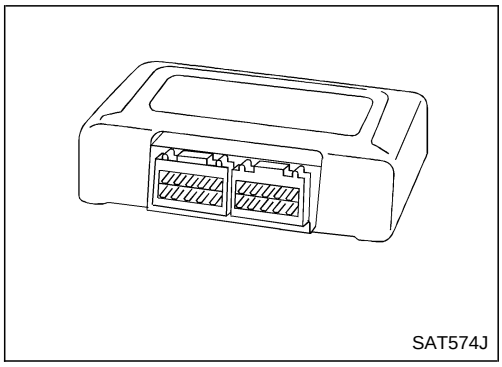
SCIA0511E

With CONSULT-II

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

Is the “TCM·RAM” displayed again?

Yes >> Replace TCM.
No >> INSPECTION END


SAT574J

Description

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

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

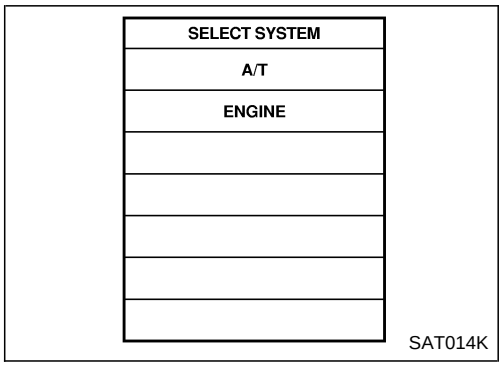
Possible Cause

Check TCM.

DTC Confirmation Procedure

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.



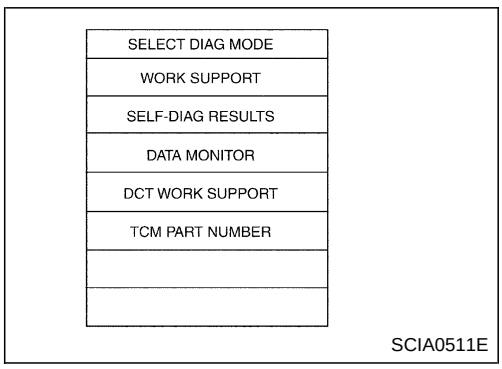
SAT014K

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for A/T with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-106, “Diagnostic Procedure”.

Diagnostic Procedure

1. CHECK DTC



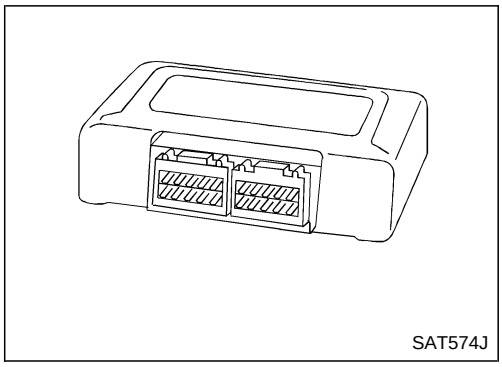
SCIA0511E

With CONSULT-II

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

Is the “TCM·ROM” displayed again?

Yes >> Replace TCM.
No >> INSPECTION END


SAT574J

Description

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

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

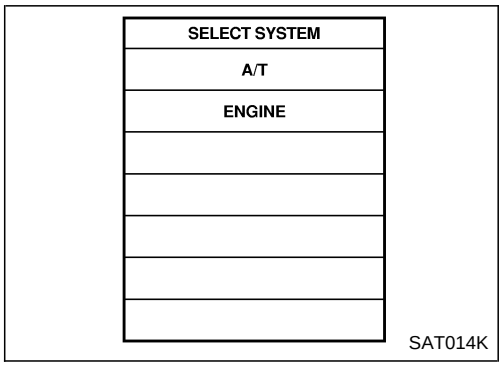
Possible Cause

Check TCM.

DTC Confirmation Procedure

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.



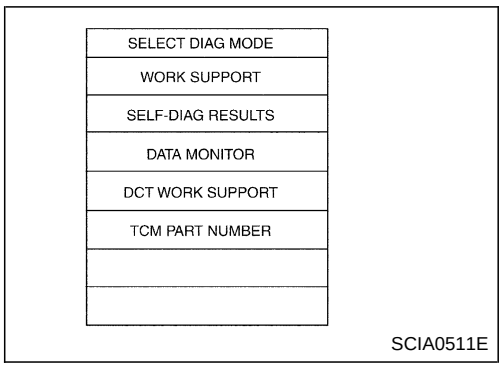
SAT014K

WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for A/T with CONSULT-II.
3. Start engine.
4. Run engine for at least 2 consecutive seconds at idle speed.
5. If DTC is detected, go to AT-107, “Diagnostic Procedure”.

Diagnostic Procedure

1. CHECK DTC



SCIA0511E

With CONSULT-II

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

Is the “TCM·EEPROM” displayed again?

Yes >> Replace TCM.
No >> INSPECTION END

Description

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

On Board Diagnosis Logic

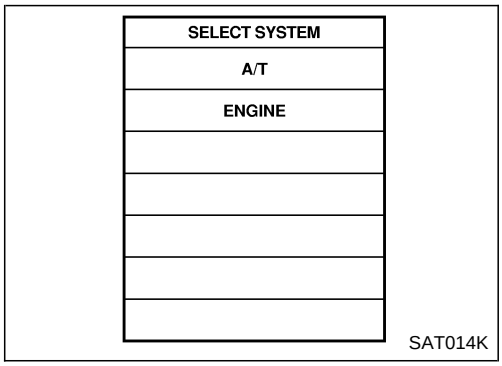
- This is not a self-diagnosis item.
- Diagnostic trouble code “TP SEN/CIRC A/T” with CONSULT-II or “15th judgement flicker” without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

Possible Cause

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

DTC Confirmation Procedure

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



WITH CONSULT-II

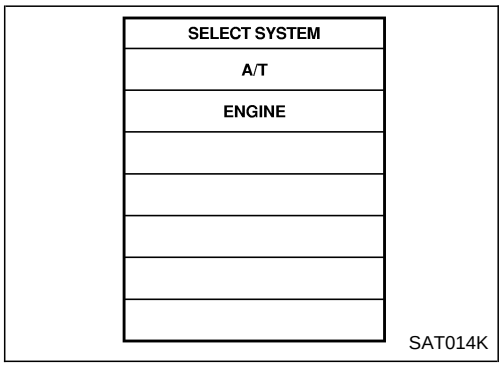
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and let it idle for 1 second.
4. If DTC is detected go to AT-108, “Diagnostic Procedure”.

WITHOUT CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Start engine and let it idle for 1 second.
3. Perform self-diagnosis.
   Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-108, “Diagnostic Procedure”.

Diagnostic Procedure

1. CHECK DTC WITH ECM (WITH CONSULT-II)



With CONSULT-II

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

OK or NG?

OK >> GO TO 3.
NG >> Check the DTC detected item.
- If CAN communication line is detected, go to AT-75, “DTC U1000 CAN COMMUNICATION LINE”.

2. CHECK DTC WITH ECM (WITHOUT CONSULT-II)

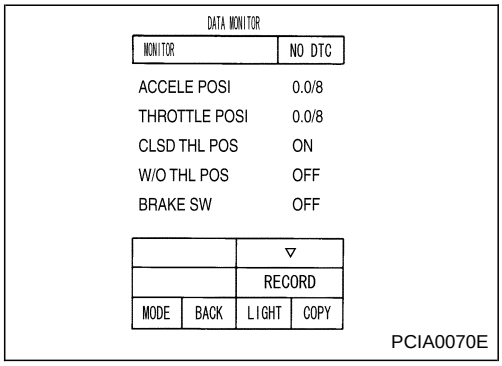
Without CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Perform self-diagnosis.
   Refer to AT-73, SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II).

OK or NG?

OK >> GO TO 4.
NG >> Check the DTC detected item.
- If CAN communication line is detected, go to AT-75, "DTC U1000 CAN COMMUNICATION LINE".

3. CHECK DTC WITH TCM (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. Depressed accelerator pedal and read out the value of "ACCLE POS SEN" and "THROTTLE POSI".
   Check engine speed changes according to throttle position.
4. Select "SELF-DIAG RESULTS" mode for "ENGINE" with CONSULT-II.

OK or NG?

OK >> GO TO 5.
NG >> Check the accelerator pedal position sensor circuit.

4. CHECK DTC WITH TCM (WITHOUT CONSULT-II)

Without CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Perform self-diagnosis.
   Refer to AT-73, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)".

OK or NG?

OK >> GO TO 5.
NG >> Check the accelerator pedal position sensor circuit.

5. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

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

Description

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

CONSULT-II Reference Value

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “ATF TEMP SEN/CIRC” with CONSULT-II or “10th judgement flicker” without CONSULT-II is detected when TCM receives an excessively low or high voltage from the sensor.

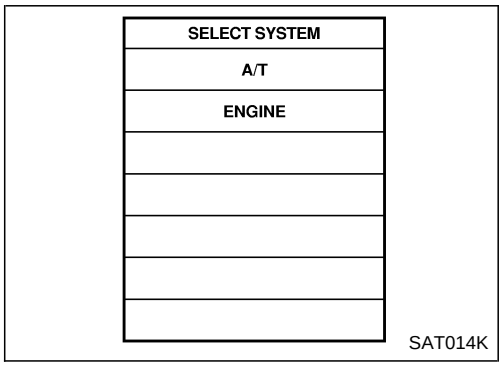
Possible Cause

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

DTC Confirmation Procedure

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

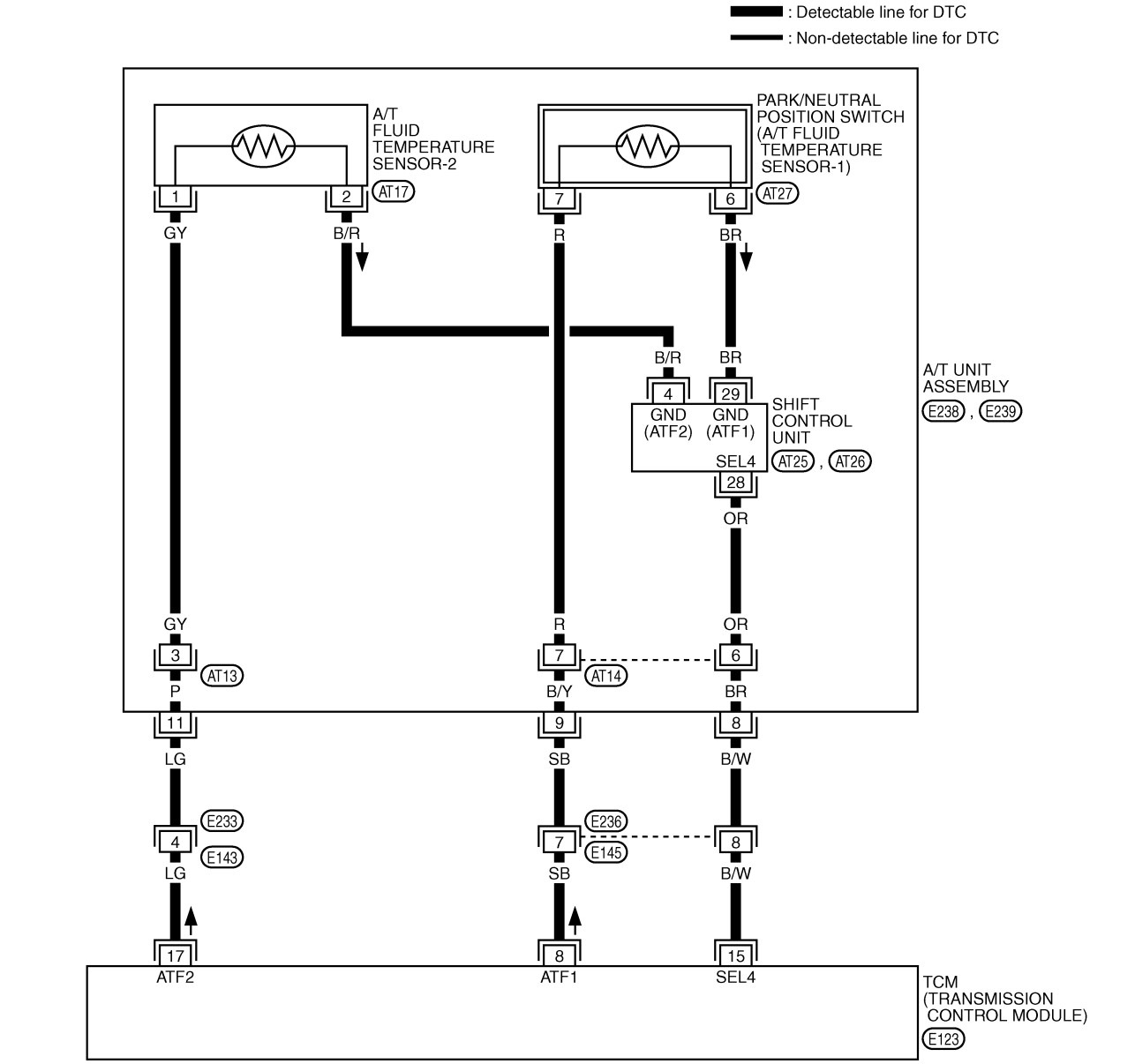
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   THRTL POS SEN: More than 1.0/8
   Selector lever: “D” position
4. If DTC is detected, go to AT-112, “Diagnostic Procedure”.

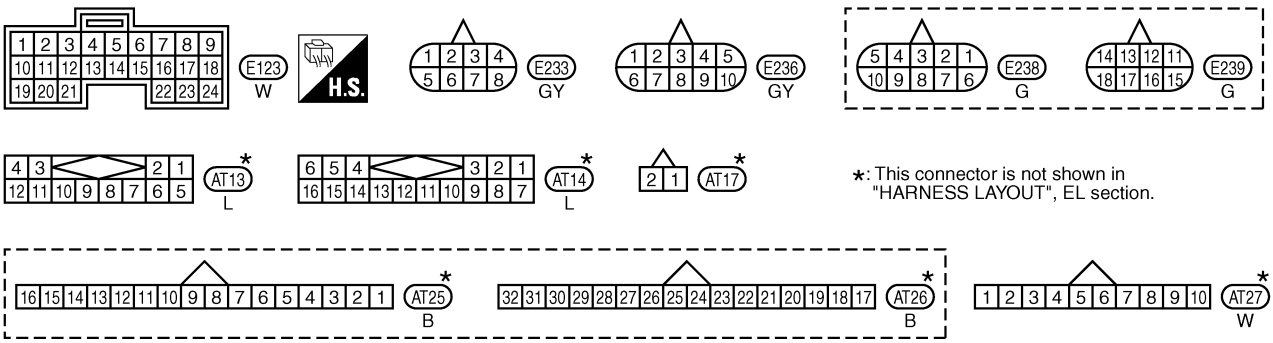
WITHOUT CONSULT-II

1. Start engine.
2. Selector lever “D” position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/8 of the full throttle position and driving for at least 10 minutes (Total).
3. Perform self-diagnosis.
   Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-112, “Diagnostic Procedure”.

Wiring Diagram — AT — FTS

AT-FTS-01

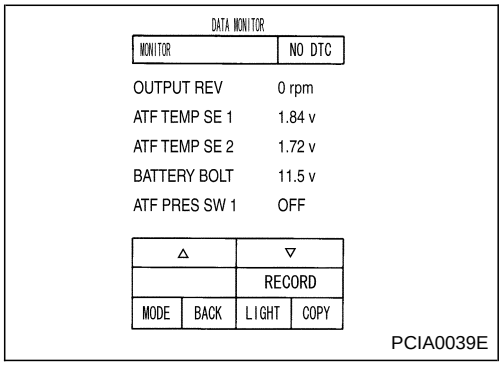




TAT090M

Diagnostic Procedure

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



With CONSULT-II

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

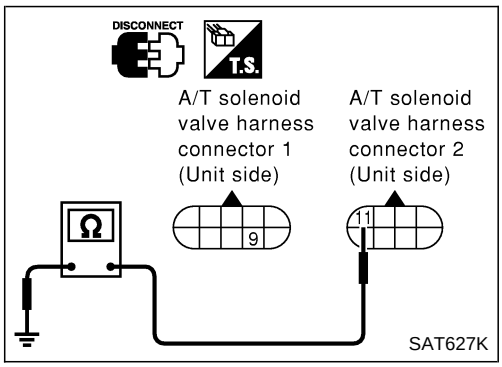
Item name	Condition °C (°F)	Display value (Approx.) V
Fluid temperature sensor 1	0 (32) - 20 (68) - 80 (176)	3.3 - 2.7 - 0.9
Fluid temperature sensor 2		3.3 - 2.5 - 0.7

OK or NG?

OK >> GO TO 4.

NG >> Check the fluid temperature sensor.

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



Without CONSULT-II

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

Name	Connector No.	Terminal No.	Temperature °C (°F)	Resistance (kΩ) (Approx.)
Fluid temperature sensor 1	E238 A/T solenoid valve harness connector 1	9 - Ground	0 (32)	15
			20 (68)	6.5
			80 (176)	0.9
Fluid temperature sensor 2	E239 A/T solenoid valve harness connector 2	11 - Ground	0 (32)	10.5
			20 (68)	4.3
			80 (176)	0.5

4. Reinstall any part removed.

OK or NG?

OK >> GO TO 3.

NG >> Repair or replace damaged parts.

Diagnostic Procedure (Cont'd)

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

Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector and ground while warming up A/T.

Name	Connector No.	Terminal No.	Temperature °C (°F)	Voltage (V) (Approx.)
Fluid temperature sensor 1	E123	8 - 24 or 46 (ground)	0 (32)	3.3V
			20 (68)	2.7V
			80 (176)	0.9V
Fluid temperature sensor 2		17 - 24 or 46 (ground)	0 (32)	3.3V
			20 (68)	2.5V
			80 (176)	0.7V

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

OK or NG?

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

4. DETECT MALFUNCTIONING ITEM

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

OK or NG?

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

5. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

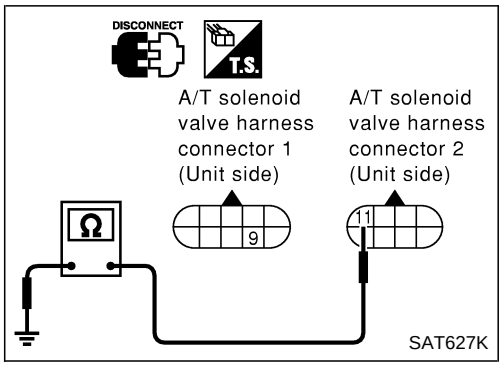
OK >> INSPECTION END
NG >> GO TO 6.

6. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".



Component Inspection

FLUID TEMPERATURE SENSOR

Check the resistance between terminals and ground.

Name	Connector No.	Terminal No.	Temperature °C (°F)	Resistance (kΩ) (Approx.)
Fluid temperature sensor 1	E238 A/T solenoid valve harness connector 1	9 - Ground	0 (32)	15
			20 (68)	6.5
			80 (176)	0.9
Fluid temperature sensor 2	E239 A/T solenoid valve harness connector 2	11 - Ground	0 (32)	10.5
			20 (68)	4.3
			80 (176)	0.5

Description

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “TURBINE REV S/CIRC” with CONSULT-II or “11th judgement flicker” without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor.
- Detects abnormality only at position of 4th gear for turbine revolution sensor 2.

Possible Cause

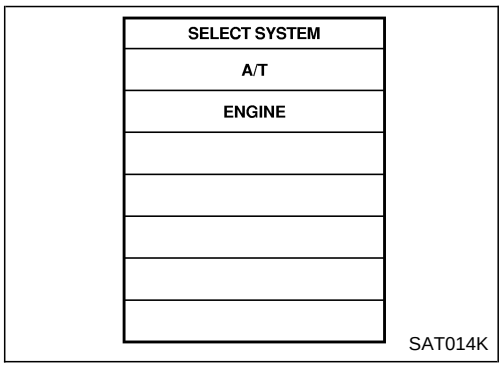
Check the following items.
- Harness or connectors
  (The sensor circuit is open or shorted.)
- Turbine revolution sensor 1, 2

DTC Confirmation Procedure

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 “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 40 km/h (25 MPH) or more
   ENGINE SPEED: 1,500 rpm or more
   Selector lever: “D” position
   Gear position (Turbine revolution sensor 1):
   All position
   Gear position (Turbine revolution sensor 2):
   4th or 5th position
   Driving location:
   Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If DTC is detected, go to AT-118, “Diagnostic Procedure”.

WITHOUT CONSULT-II

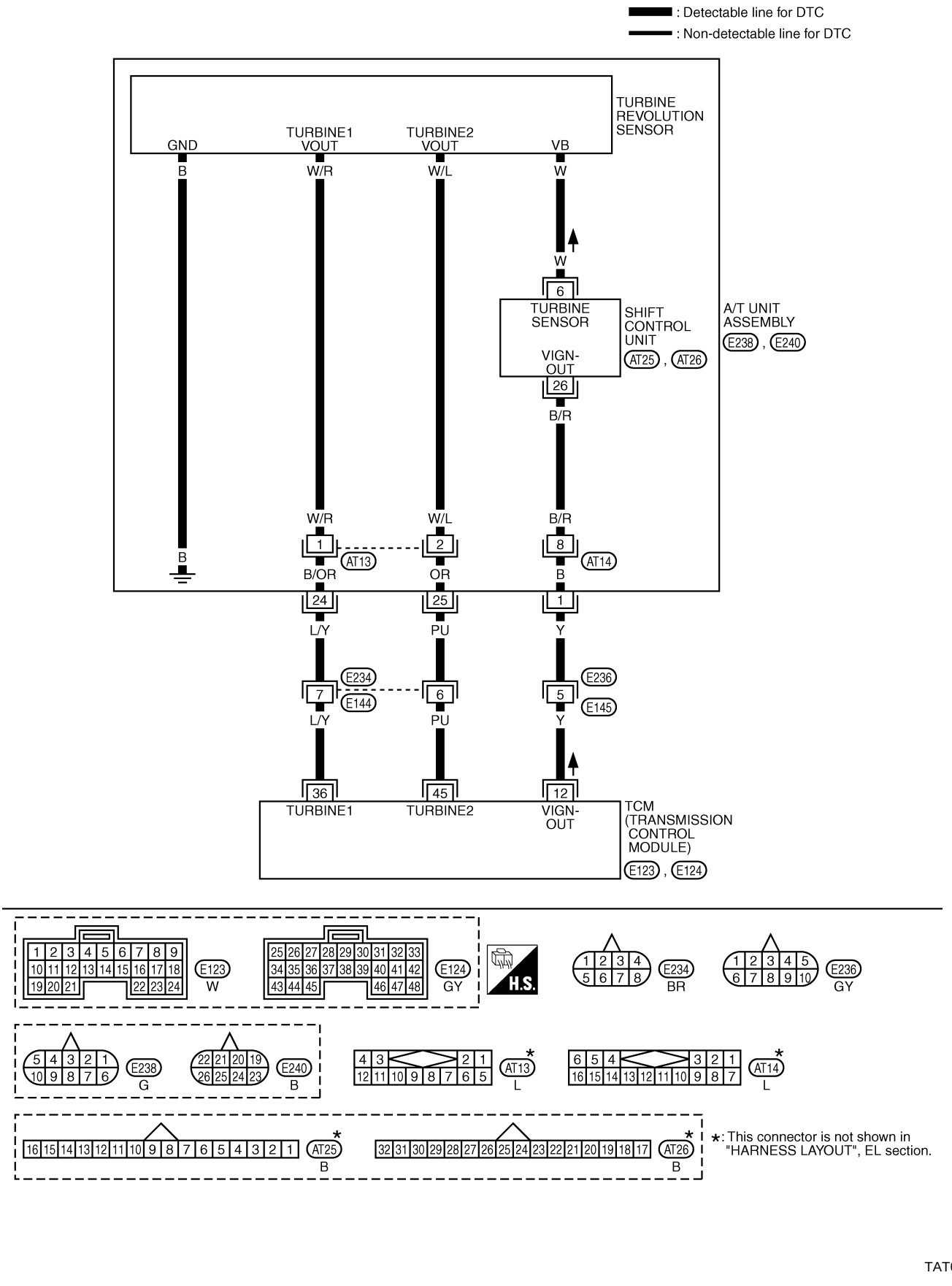
1. Start engine.
2. Drive vehicle under the following condition:
   Selector lever “D” position, vehicle speed higher than 40 km/h (25 MPH), engine speed more than 1,500 rpm and driving for at least 5 consecutive seconds.
   Gear position (Turbine revolution sensor 1):
   All position
   Gear position (Turbine revolution sensor 2):
   4th or 5th position
   Driving location:
   Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.

DTC Confirmation Procedure (Cont'd)

3. Perform self-diagnosis.
   Refer to AT-73, "SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)".
4. If DTC is detected, go to AT-118, "Diagnostic Procedure".

Wiring Diagram — AT — TRSA/T

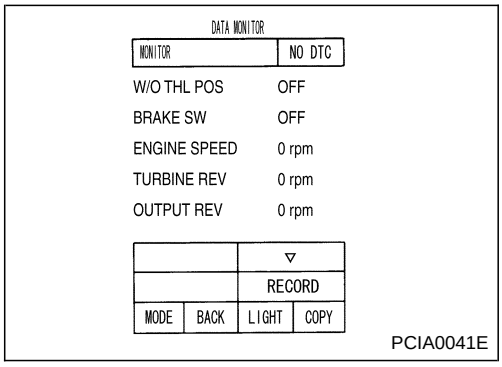
AT-TRSA/T-01



TAT091M

Diagnostic Procedure

1. CHECK INPUT SIGNALS (WITH CONSULT-II)



With CONSULT-II

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

OK or NG?

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

2. CHECK INPUT SIGNALS (WITHOUT CONSULT-II)

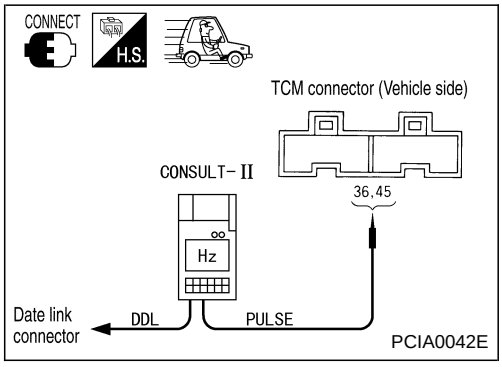
Without CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Perform self-diagnosis.
   Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.

OK or NG?

OK >> GO TO 4.
NG >> ● Harness for short or open between TCM and turbine revolution sensor (Main harness).
● Repair or replace damaged parts.

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



With CONSULT-II

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

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

Item	Connector No.	Terminal No.	Name	Data (Approx.)
TCM	E124	36	Turbine revolution sensor 1	1.1 (kHz)
		45	Turbine revolution sensor 2	

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 DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Description

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

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

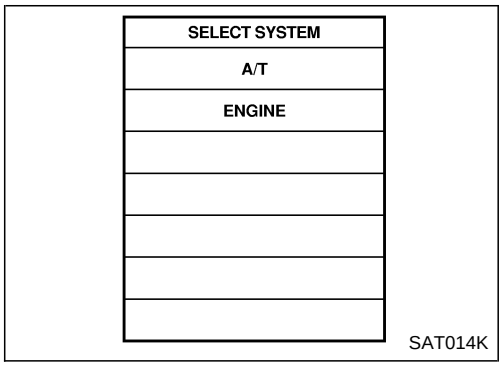
Possible Cause

Check the following items.
- Harness or connectors
  (The sensor circuit is open or shorted.)

DTC Confirmation Procedure

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

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

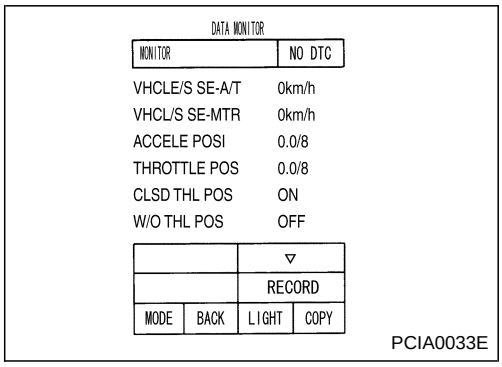


WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1/8 or less
   VHCL SPEED SE: 30 km/h (17 MPH) or more
4. If DTC is detected, go to AT-120, “Diagnostic Procedure”.

Diagnostic Procedure

1. CHECK INPUT SIGNALS (WITH CONSULT-II)



With CONSULT-II

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

OK or NG?

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

2. CHECK DTC STEP 1

Check following items.

1. Refer to AT-75, "DTC U1000 CAN COMMUNICATION LINE".
2. Wheel sensors.
3. Combination meter.

OK or NG?

OK >> INSPECTION END

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

3. CHECK DTC STEP 2

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END

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

Description

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “A/T INTERLOCK” with CONSULT-II or “12th judgement flicker” without CONSULT-II is detected when TCM does not receive the proper voltage signal from the sensor and switch.
- Monitors and compares gear position and conditions of each pressure switch when gear is steady.

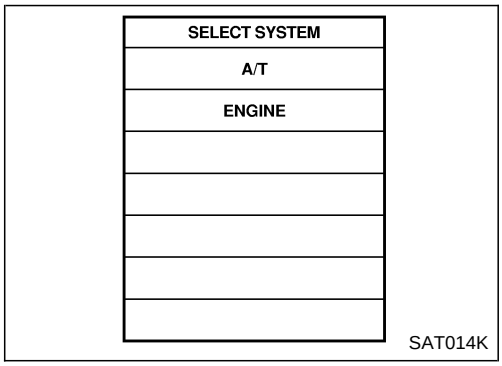
Possible Cause

Check the following items.
- Harness or connectors
  (The solenoid and switch circuit is open or shorted.)
- Input clutch, direct clutch, high & low reverse clutch, front brake, low coast brake solenoid valves
- Pressure switch 1, 3, 5 and 6

DTC Confirmation Procedure

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

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



WITH CONSULT-II

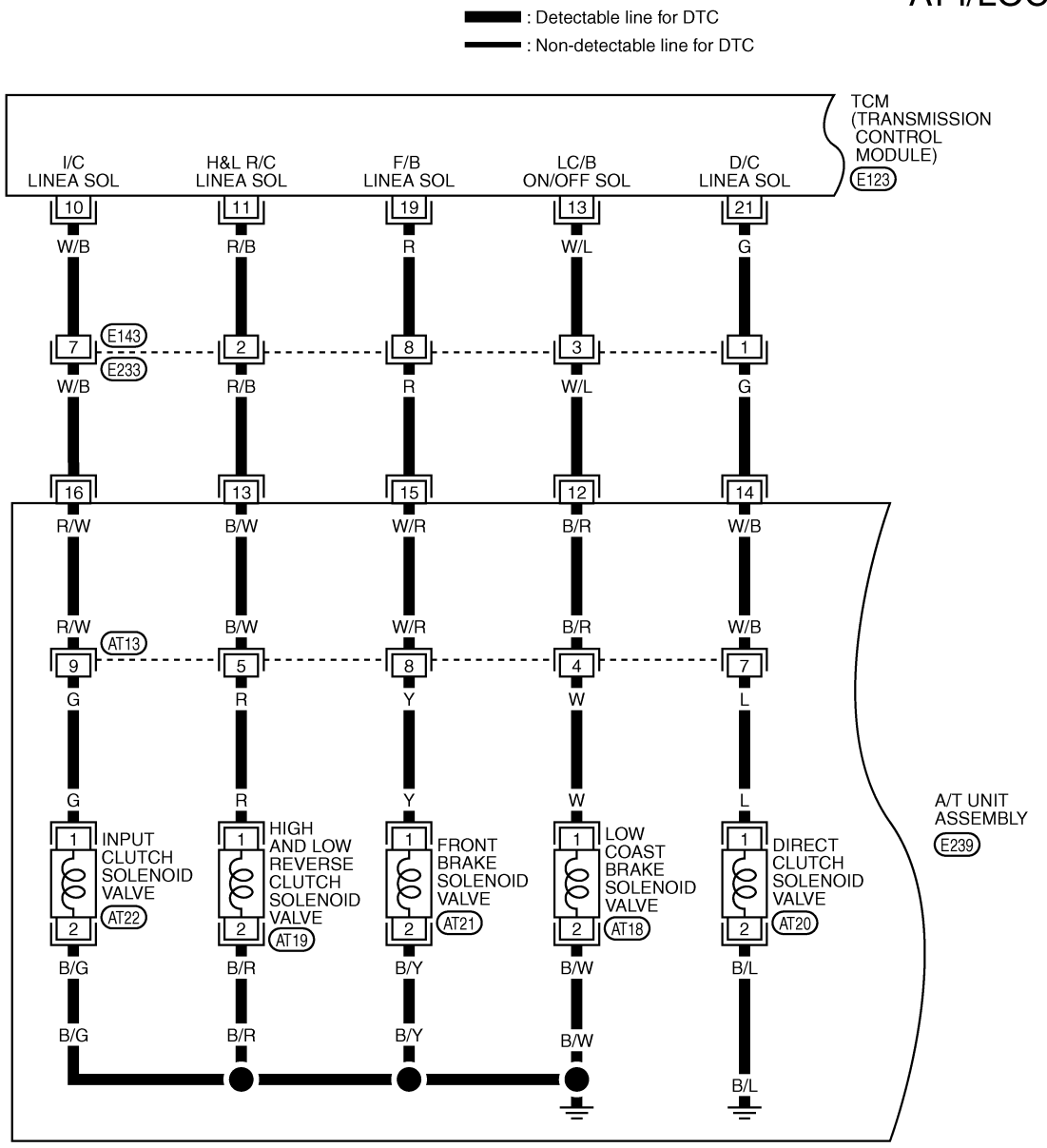
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   Selector lever: “D” position
5. If DTC is detected, go to AT-126, “Diagnostic Procedure”.

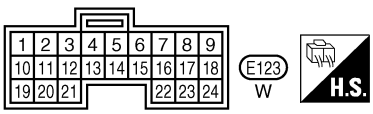
WITHOUT CONSULT-II

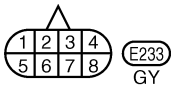
1. Start engine.
2. Drive vehicle for at least 2 consecutive seconds.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-126, “Diagnostic Procedure”.

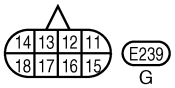
Wiring Diagram — AT — I/LOCK

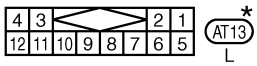
AT-I/LOCK-01




E123 W


E233 GY


E239 G


AT13 L

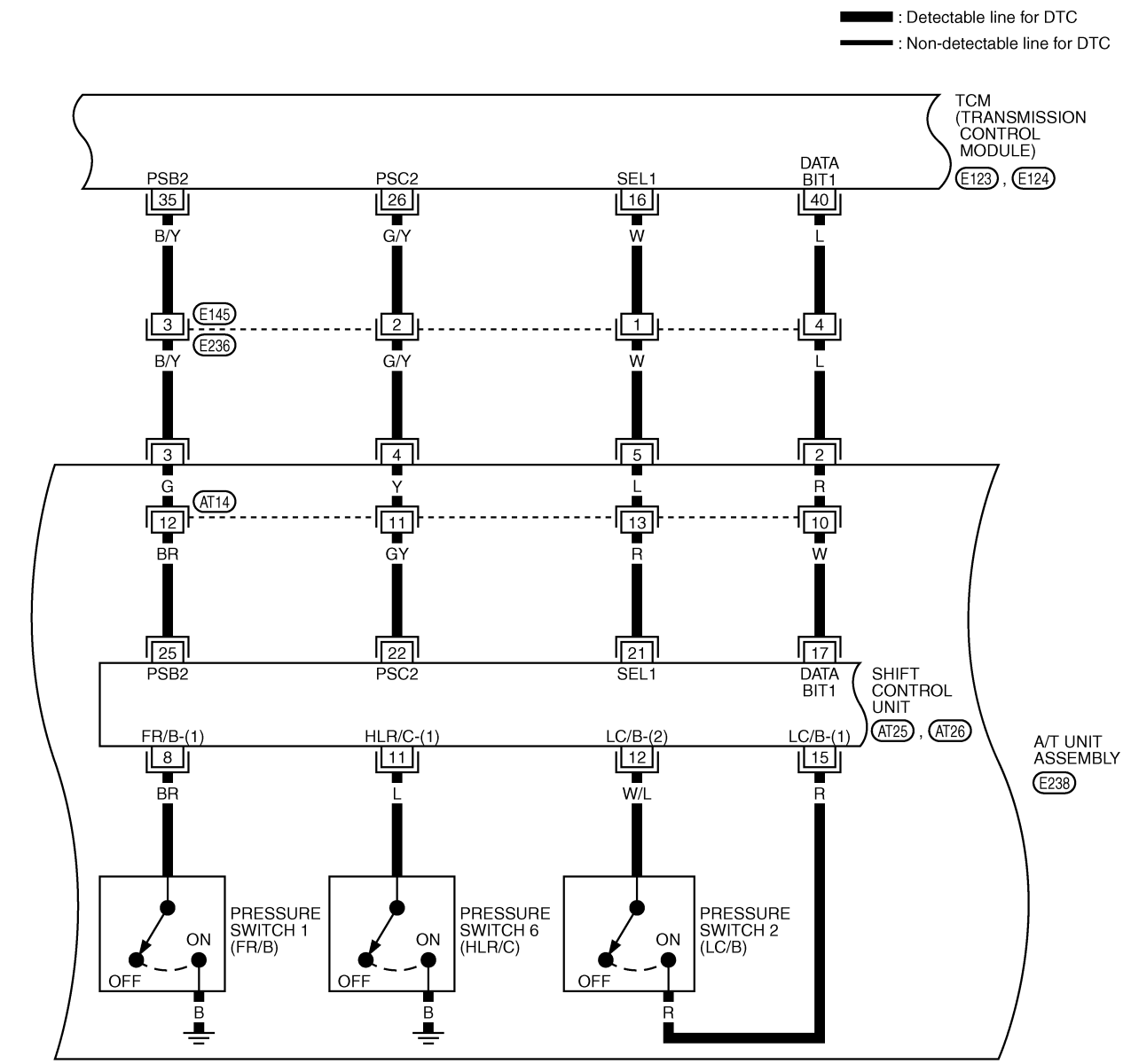
2 1 AT18*, AT19*, AT20*, AT21*, AT22*

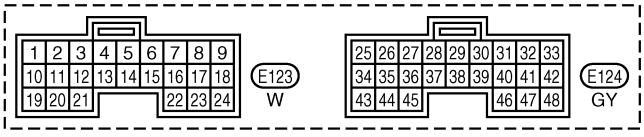
*: This connector is not shown in "HARNESS LAYOUT", EL section.

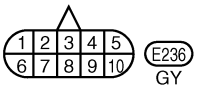
TAT092M

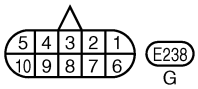
Wiring Diagram — AT — I/LOCK (Cont'd)

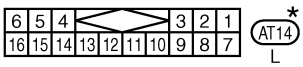
AT-I/LOCK-02



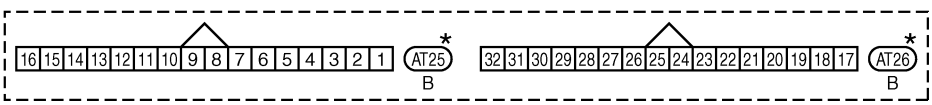








*: This connector is not shown in "HARNESS LAYOUT", EL section.

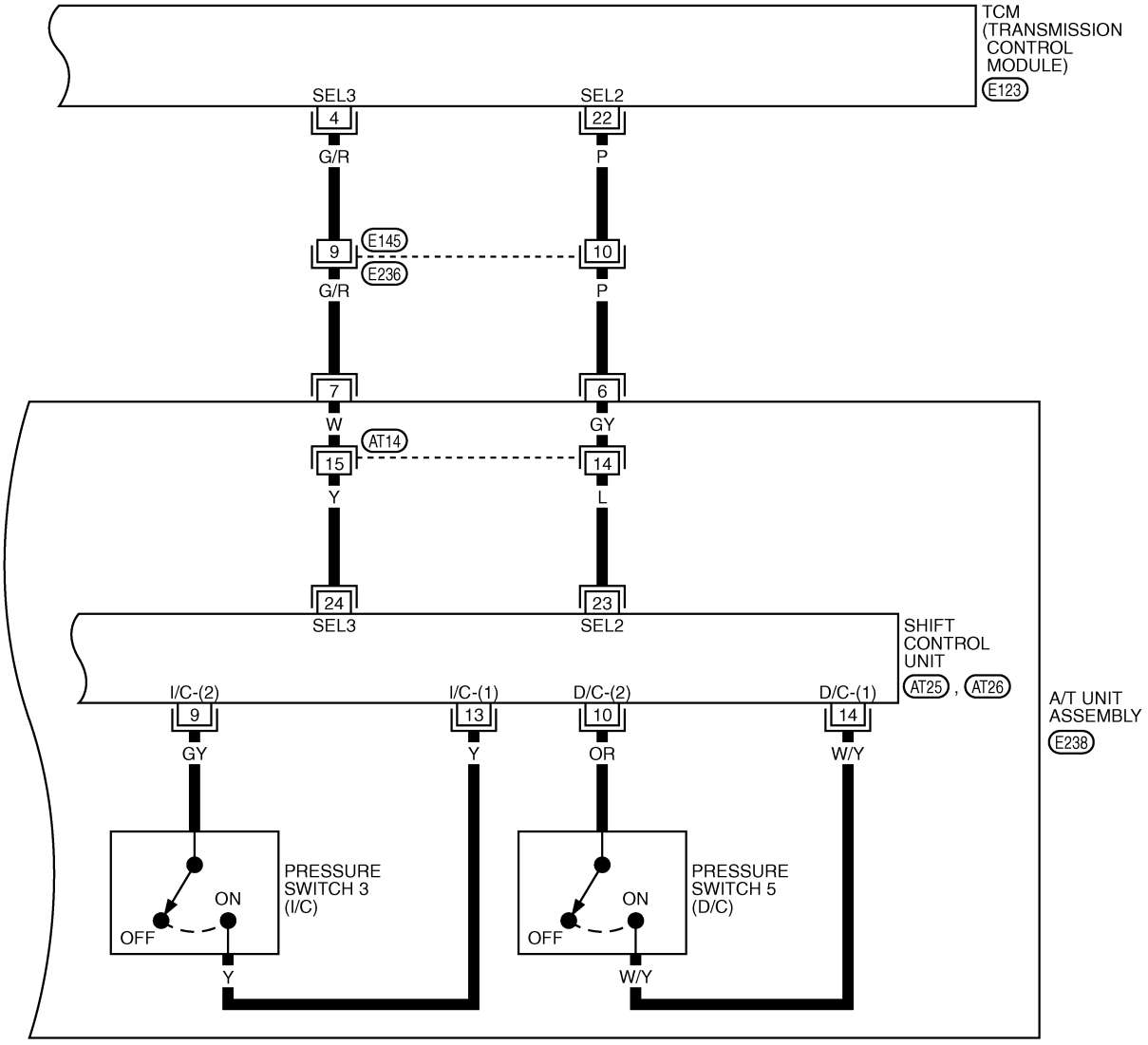


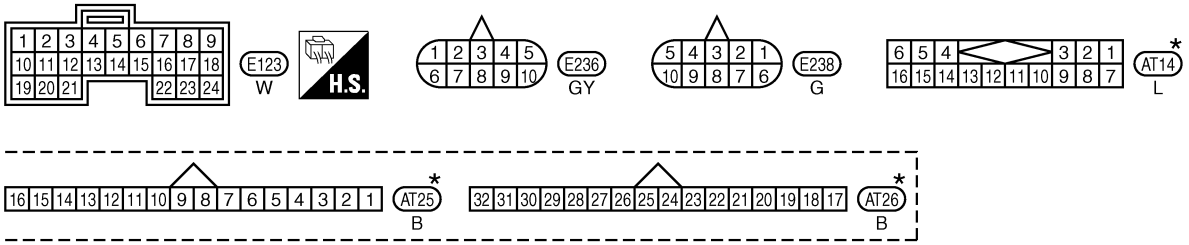
TAT093M

Wiring Diagram — AT — I/LOCK (Cont'd)

AT-I/LOCK-03

: Detectable line for DTC
: Non-detectable line for DTC





*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT094M

Judgement of A/T Interlock

When A/T Interlock is judged to be abnormal, the vehicle should be fixed in 2nd, 4th, or 5th gear, and should be set in a condition in which it can travel.
When one of the following fastening patterns is detected, the fail-safe function in correspondence with the individual pattern should be executed.

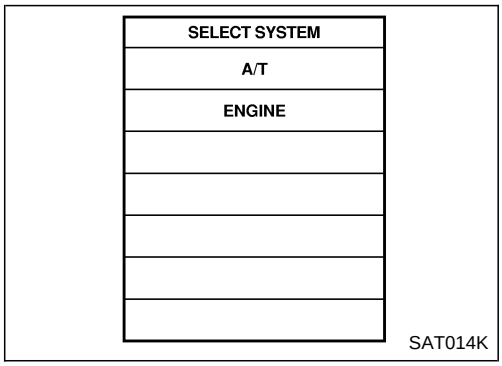
A/T interlock coupling pattern table

●: NG, X: OK

Gear position		Hydraulic pressure switch output					Fail-safe function	Clutch pressure output pattern after fail-safe function					
		SW3 (I/C)	SW6 (H & LR/C)	SW5 (D/C)	SW1 (Fr/B)	SW2 (LC/B)		I/C	H & LR/C	D/C	Fr/B	LC/B	L/U
A/T interlock coupling patterns	1st	●	X		X	X	Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
			X	●		X	Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
	2nd		●	X		X	Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
		●		X	X		Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
	3rd		X	X		●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
		●		X	X		Held in 4th speed	ON	ON	ON	OFF	OFF	OFF
	4th		X	X		●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
		X		X	●		Held in 5th speed	ON	ON	OFF	ON	OFF	OFF
	5th	X	X		X	●	Held in 2nd speed	OFF	OFF	ON	OFF	OFF	OFF
		X		●	X		Held in 4th speed	ON	ON	ON	OFF	OFF	OFF

Diagnostic Procedure

1. SELF-DIAGNOSIS (WITH CONSULT-II)



With CONSULT-II

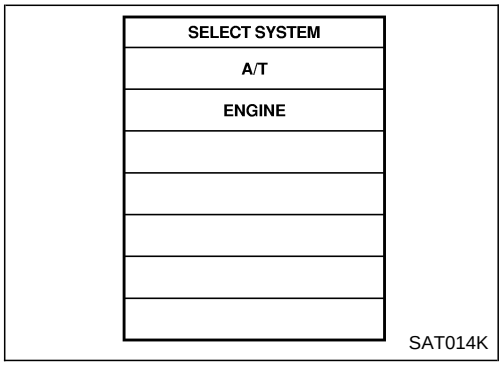
1. Start engine.
2. Select “SELF-DIAG RESULTS” mode for “A/T” with CONSULT-II.
3. Drive vehicle.

OK or NG?

OK >> GO TO 3.

NG >>
- Check pressure switch, Refer to AT-150, “DTC P1841 ATF PRESSURE SWITCH 1”, AT-154, “DTC P1843 ATF PRESSURE SWITCH 3”, AT-157, “DTC P1845 ATF PRESSURE SWITCH 5”, AT-160, “DTC P1846 ATF PRESSURE SWITCH 6”.
- Check each solenoid valves, Refer to AT-131, “DTC P1752 INPUT CLUTCH SOLENOID VALVE”, AT-134, “DTC P1757 FRONT BRAKE SOLENOID VALVE”, AT-137, “DTC P1762 DIRECT CLUTCH SOLENOID VALVE”, AT-140, “DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE”, AT-143, “DTC P1772 LOW COAST BRAKE SOLENOID VALVE”.

2. SELF-DIAGNOSIS (WITHOUT CONSULT-II)



Without CONSULT-II

1. Start engine.
2. Perform self-diagnosis.
3. Drive vehicle.

OK or NG?

OK >> GO TO 3.

NG >>
- Check pressure switch, Refer to AT-150, "DTC P1841 ATF PRESSURE SWITCH 1", AT-154, "DTC P1843 ATF PRESSURE SWITCH 3", AT-157, "DTC P1845 ATF PRESSURE SWITCH 5", AT-160, "DTC P1846 ATF PRESSURE SWITCH 6".
- Check each solenoid valves, Refer to AT-131, "DTC P1752 INPUT CLUTCH SOLENOID VALVE", AT-134, "DTC P1757 FRONT BRAKE SOLENOID VALVE", AT-137, "DTC P1762 DIRECT CLUTCH SOLENOID VALVE", AT-143, "DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE", AT-143, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE".

3. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Description

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

On Board Diagnosis Logic

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

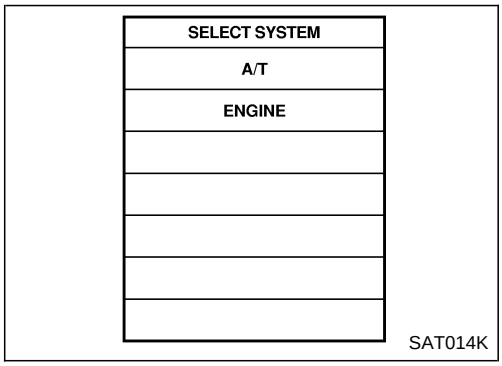
Possible Cause

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

DTC Confirmation Procedure

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

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



WITH CONSULT-II

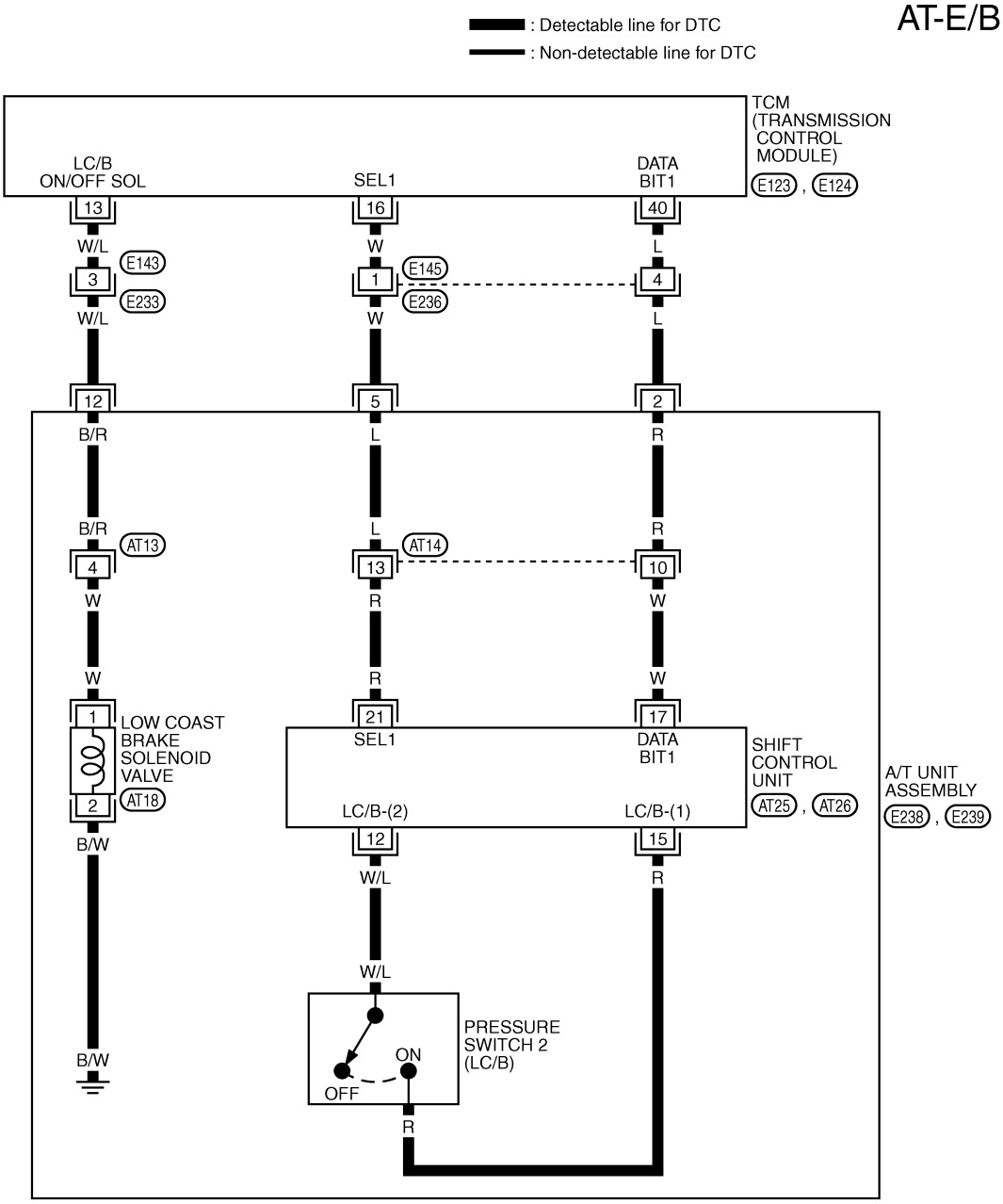
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 2 consecutive seconds.
   ENGINE SPEED: 1,200 rpm
   Selector lever: “M” position
   Gear position: “M1-1st” or “M2-2nd” gear position
5. If DTC is detected, go to AT-130, “Diagnostic Procedure”.

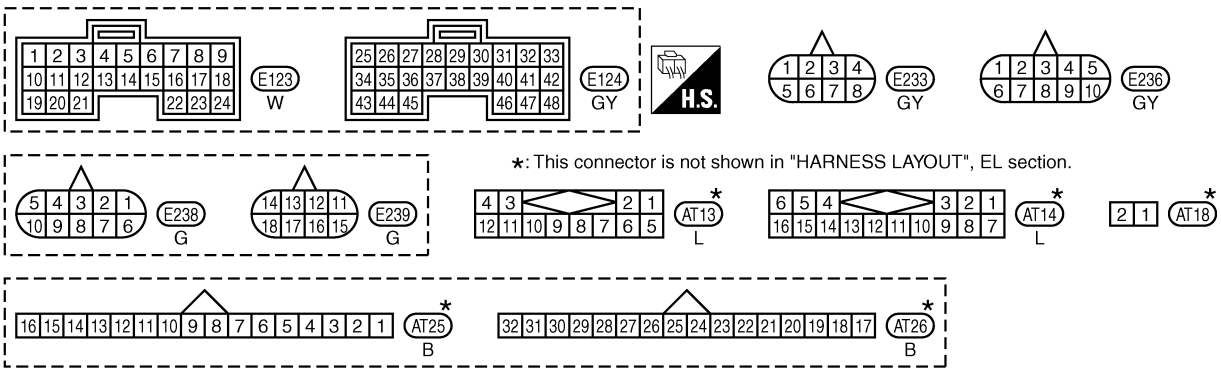
WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever “M” position, gear position “M1-1st” or “M2-2nd”, engine speed more than 1,200 rpm and driving for at least 2 consecutive seconds.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-130, “Diagnostic Procedure”.

Wiring Diagram — AT — E/BRE

AT-E/BRE-01



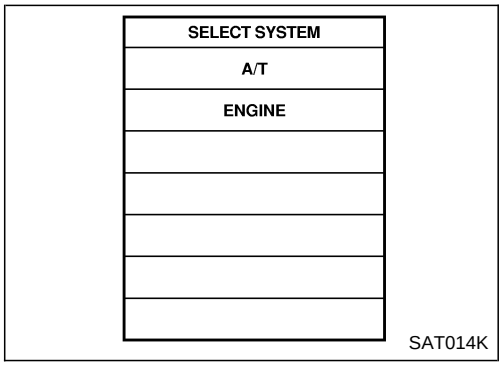


★: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT095M

Diagnostic Procedure

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



With CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "SELF-DIAG RESULTS" mode for "A/T" with CONSULT-II.
3. Start engine and drive vehicle.

OK or NG?

OK >> GO TO 3.

NG >> ● Check the pressure switch. Refer to AT-150, "DTC P1841 ATF PRESSURE SWITCH 1", AT-154, "DTC P1843 ATF PRESSURE SWITCH 3", AT-157, "DTC P1845 ATF PRESSURE SWITCH 5", AT-160, "DTC P1846 ATF PRESSURE SWITCH 6".
● Check the low coast brake solenoid. Refer to AT-143, "DTC P1772 LOW COAST BRAKE SOLENOID VALVE".

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

WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle.
3. Perform self-diagnosis.

OK or NG?

OK >> GO TO 3.

NG >> ● Check the pressure switch. Refer to AT-150, "DTC P1841 ATF PRESSURE SWITCH 1", AT-154, "DTC P1843 ATF PRESSURE SWITCH 3", AT-157, "DTC P1845 ATF PRESSURE SWITCH 5", AT-160, "DTC P1846 ATF PRESSURE SWITCH 6".
● Check the low coast brake solenoid. Refer to AT-143, DTC P1772 LOW COAST BRAKE SOLENOID VALVE.

3. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Description

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “I/C SOLENOID/CIRC” with CONSULT-II or “5th judgement flicker” without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

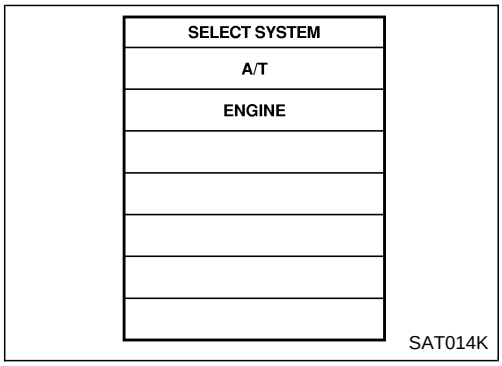
Check the following items.
- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Input clutch solenoid valve

DTC Confirmation Procedure

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 “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd → 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected go to AT-133, “Diagnostic Procedure”.

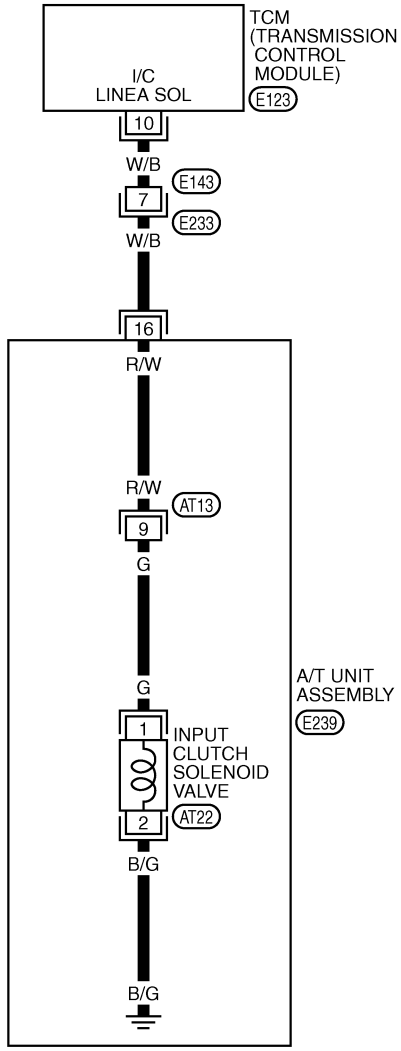
WITHOUT CONSULT-II

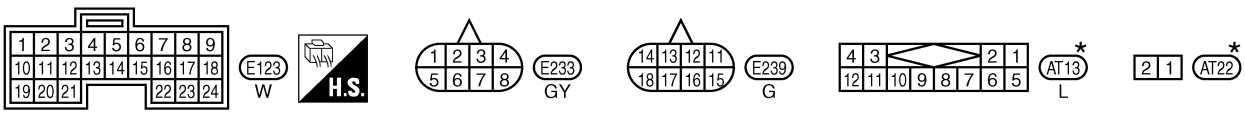
1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever “D” position, gear position 3rd → 4th, throttle opening greater than 1.5/8 - 2/8 of the full throttle position and driving for at least 5 consecutive seconds.
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-133, “Diagnostic Procedure”.

Wiring Diagram — AT — I/C

AT-I/C-01

: Detectable line for DTC
: Non-detectable line for DTC



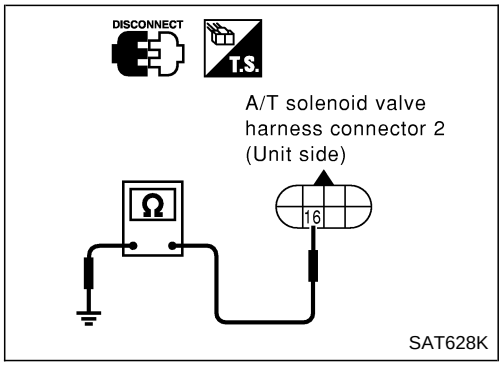


*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT096M

Diagnostic Procedure

1.CHECK VALVE RESISTANCE

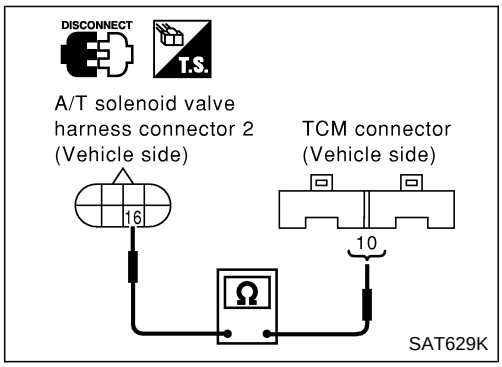


1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.

Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Input clutch solenoid valve	E239	16 - Ground	3 - 9Ω

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

2.CHECK POWER SOURCE CIRCUIT



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

Item	Connector No.	Terminal No.	Continuity
TCM	E123	10	Yes
A/T solenoid valve harness connector 2	E239	16	

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

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

3.CHECK DTC

Perform DTC confirmation procedure.
OK or NG?
OK >> INSPECTION END
NG >> GO TO 4.

4.CHECK TCM INSPECTION

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

OK or NG?
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Description

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “FR/B SOLENOID/CIRC” with CONSULT-II or “6th judgement flicker” without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

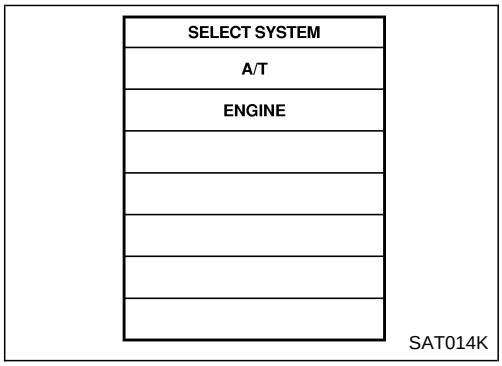
Check the following items.
- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Front brake solenoid valve

DTC Confirmation Procedure

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 “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st → 3rd Gear (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected go to AT-136, “Diagnostic Procedure”.

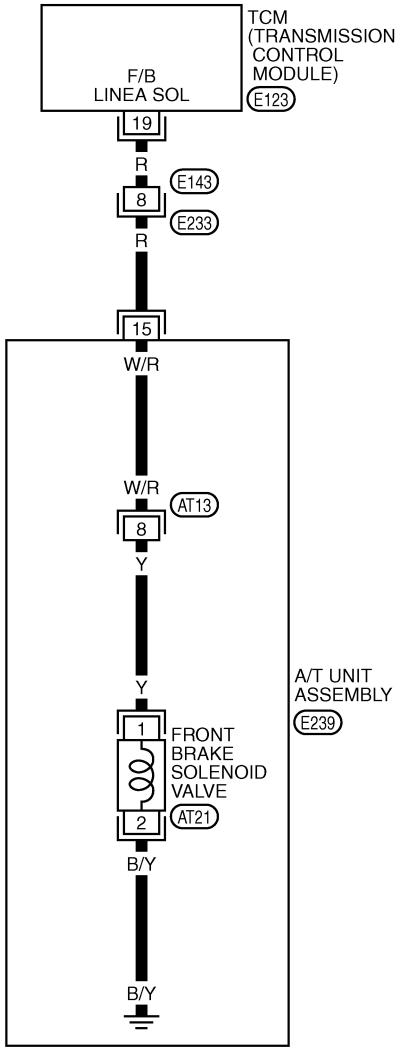
WITHOUT CONSULT-II

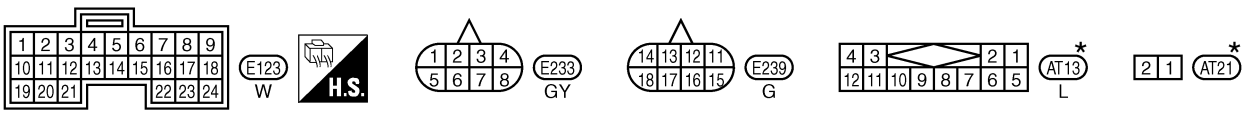
1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever “D” position, gear position 1st → 3rd, throttle opening greater than 1.5/8 - 2/8 of the full throttle position and driving for at least 5 consecutive seconds.
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-136, “Diagnostic Procedure”.

Wiring Diagram — AT — FR/B

AT-FR/B-01

: Detectable line for DTC
: Non-detectable line for DTC



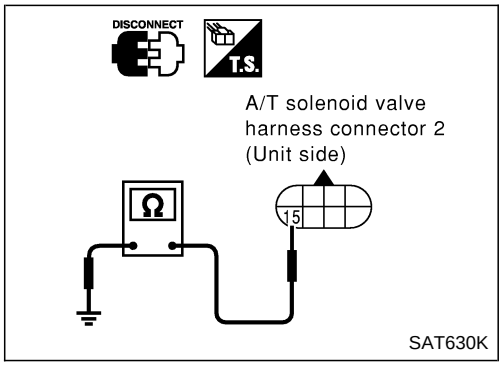


*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT097M

Diagnostic Procedure

1. CHECK VALVE RESISTANCE

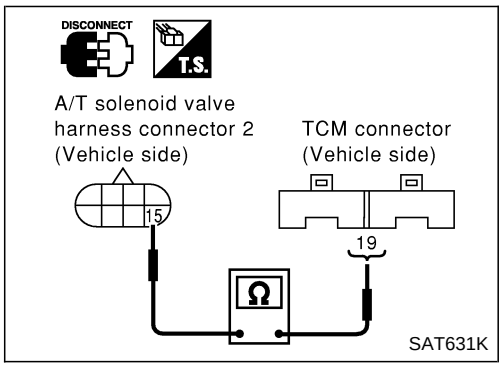


1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.

Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Front brake solenoid valve	E239	15 - Ground	3 - 9Ω

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

2. CHECK POWER SOURCE CIRCUIT



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

Item	Connector No.	Terminal No.	Continuity
TCM	E123	19	Yes
A/T solenoid valve harness connector 2	E239	15	

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

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

3. CHECK DTC

Perform DTC confirmation procedure.
OK or NG?
OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Description

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “D/C SOLENOID/CIRC” with CONSULT-II or “2nd judgement flicker” without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

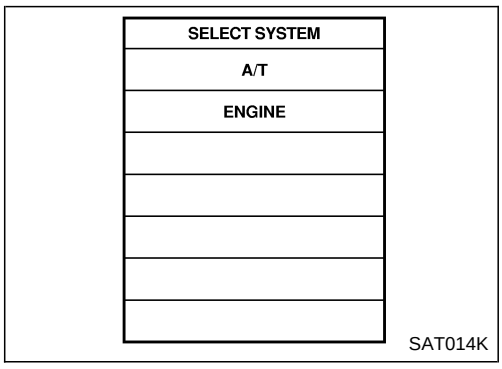
Possible Cause

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

DTC Confirmation Procedure

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

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



WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st → 2nd Gear (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected, go to AT-139, “Diagnostic Procedure”.

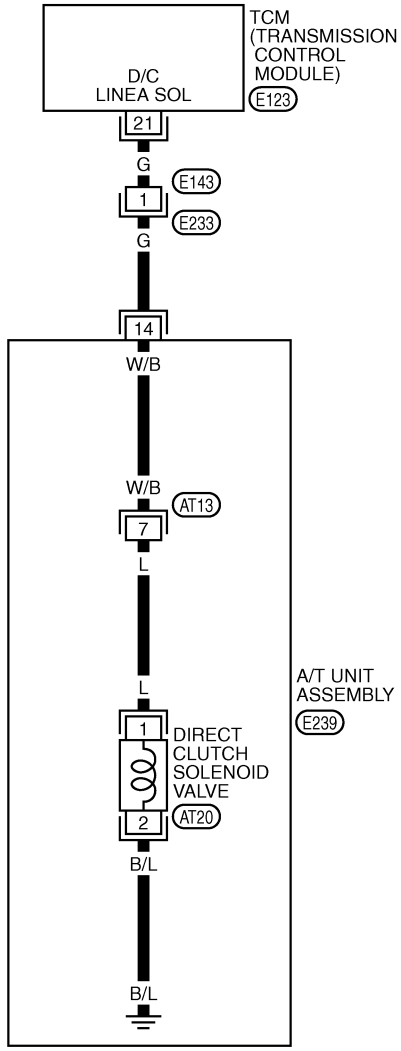
WITHOUT CONSULT-II

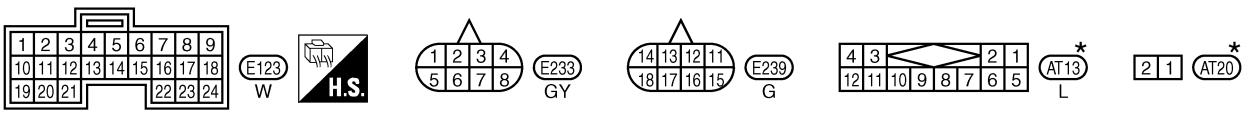
1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever “D” position, gear position 1st → 2nd, throttle opening greater than 1.5/8 - 2/8 of the full throttle position and driving for at least 5 consecutive seconds.
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-139, “Diagnostic Procedure”.

Wiring Diagram — AT — D/C

AT-D/C-01

: Detectable line for DTC
: Non-detectable line for DTC



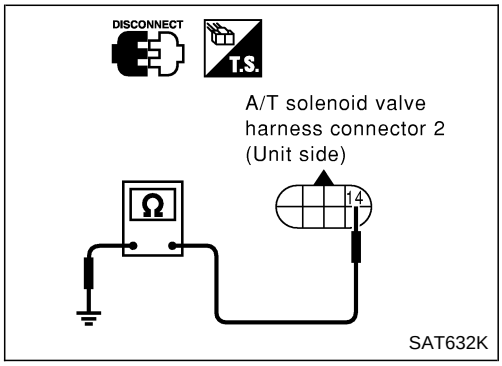


*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT098M

Diagnostic Procedure

1. CHECK VALVE RESISTANCE

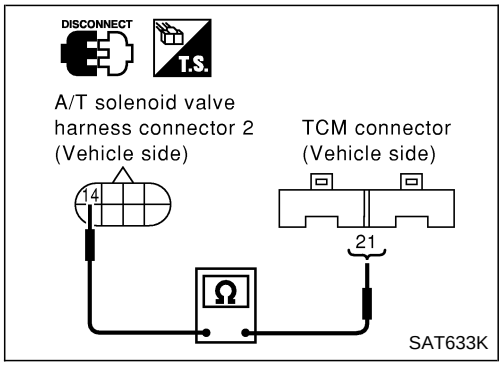


1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.

Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Direct clutch solenoid valve	E239	14 - Ground	3 - 9Ω

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

2. CHECK POWER SOURCE CIRCUIT



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

Item	Connector No.	Terminal No.	Continuity
TCM	E123	21	Yes
A/T solenoid valve harness connector 2	E239	14	

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

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

3. CHECK DTC

Perform DTC confirmation procedure.
OK or NG?
OK >> INSPECTION END
NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Description

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “HLR/C SOL/CIRC” with CONSULT-II or “8th judgement flicker” without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.
- Detects as abnormal by comparing target value with monitor value.

Possible Cause

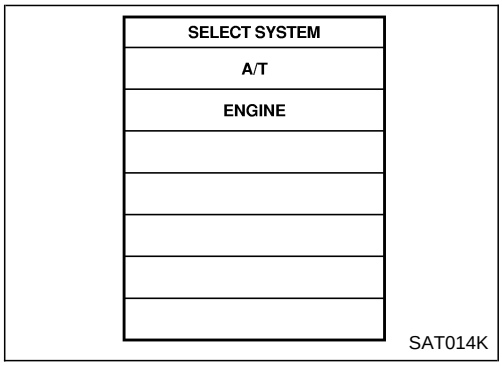
Check the following items.
- Harness or connectors
  (The solenoid circuit is open or shorted.)
- High & low reverse clutch solenoid valve

DTC Confirmation Procedure

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 “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st → 3rd Gear (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected, go to AT-142, “Diagnostic Procedure”.

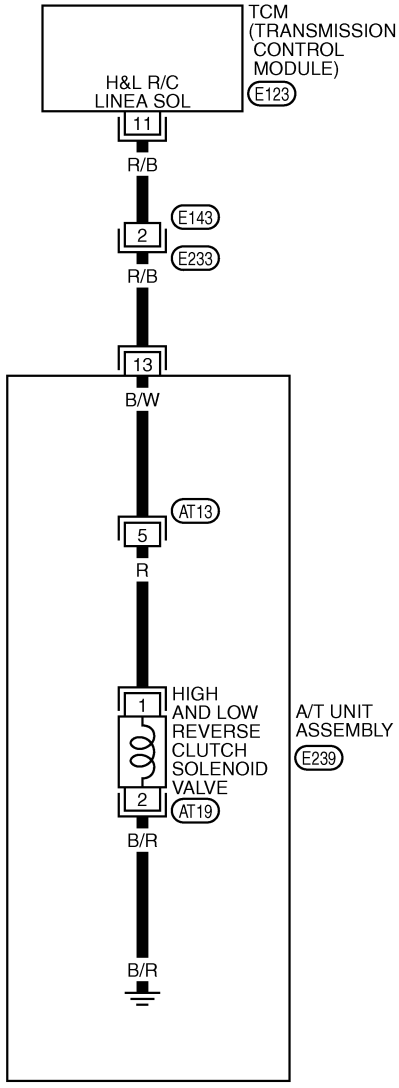
WITHOUT CONSULT-II

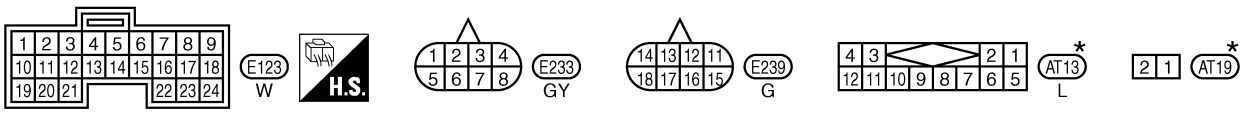
1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever “D” position, gear position 1st → 3rd, throttle opening greater than 1.5/8 - 2/8 of the full throttle position and driving for at least 5 consecutive seconds.
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-142, “Diagnostic Procedure”.

Wiring Diagram — AT — HLR/C

AT-HLR/C-01

: Detectable line for DTC
: Non-detectable line for DTC



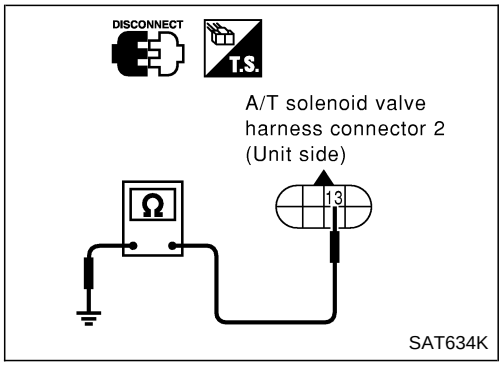


∗: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT099M

Diagnostic Procedure

1.CHECK VALVE RESISTANCE

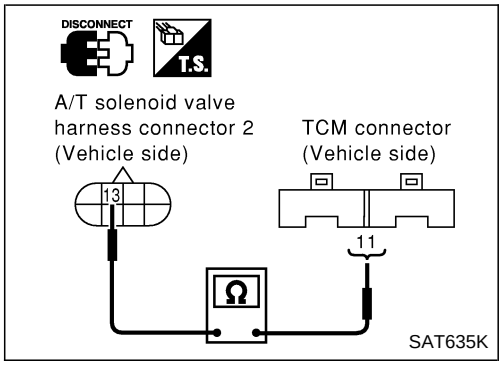


1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.

Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
High & low reverse clutch solenoid valve	E239	13 - Ground	13 - 9Ω

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

2.CHECK POWER SOURCE CIRCUIT



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

Item	Connector No.	Terminal No.	Continuity
TCM	E123	11	Yes
A/T solenoid valve harness connector 2	E239	13	

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

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

3.CHECK DTC

Perform DTC confirmation procedure.
OK or NG?
OK >> INSPECTION END
NG >> GO TO 4.

4.CHECK TCM INSPECTION

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

OK or NG?
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement.”

Description

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

On Board Diagnosis Logic

- This is a self-diagnosis item.
- Diagnostic trouble code “LC/B SOLENOID/CIRC” with CONSULT-II or “7th judgement flicker” without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate the solenoid valve.

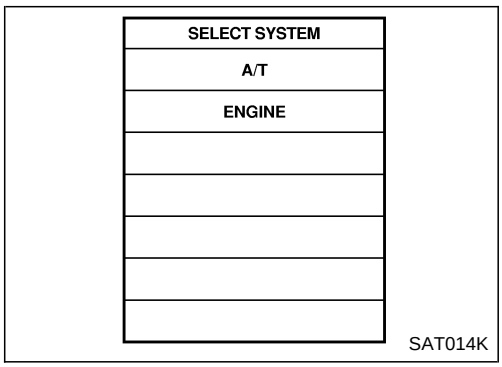
Possible Cause

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

DTC Confirmation Procedure

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

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



WITH CONSULT-II

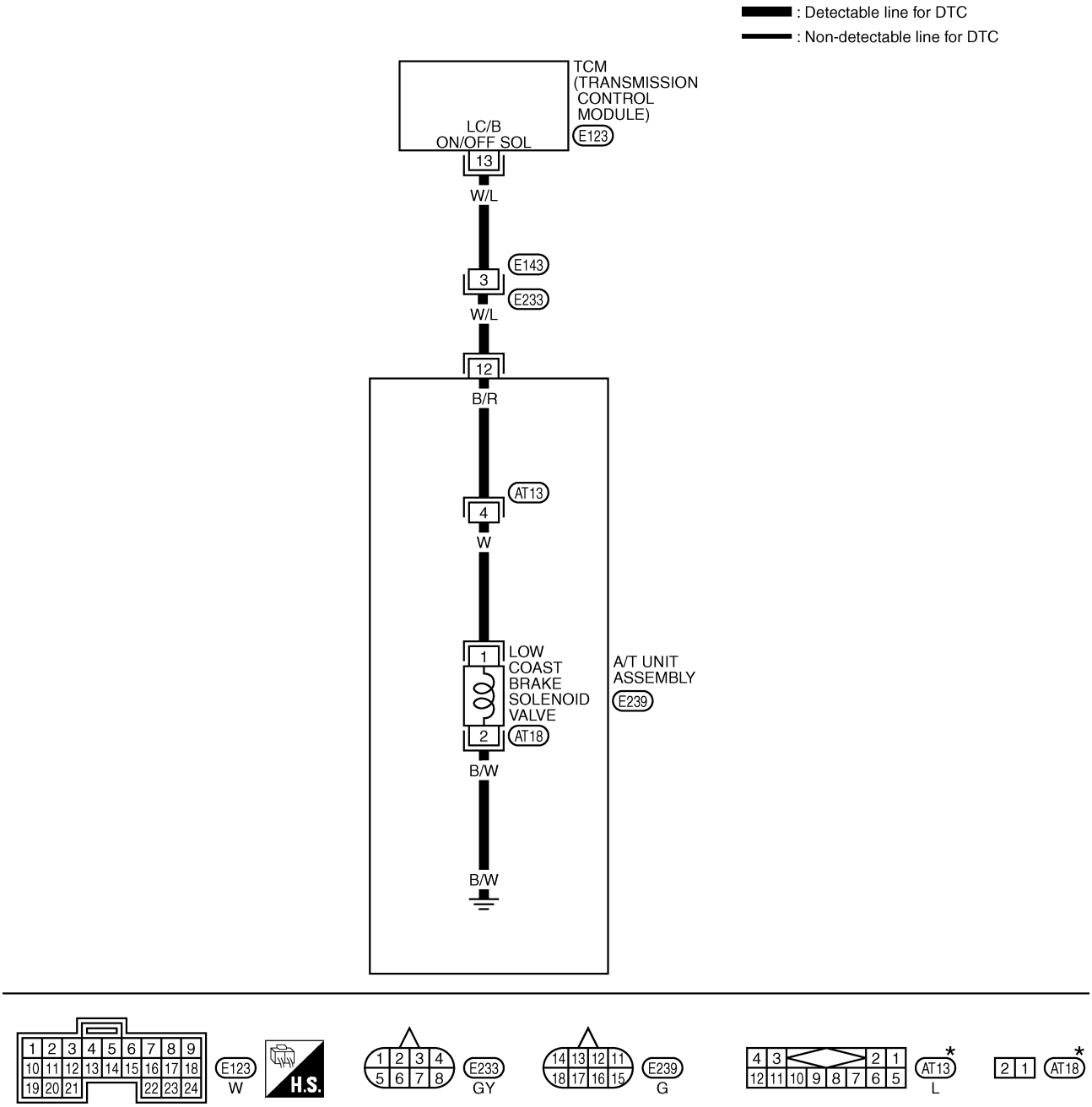
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T ” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   Selector lever: “M” position
   Gear position: “M1-1st” or “M2-2nd” gear (LC/B ON/OFF)
5. If DTC is detected, go to AT-145, “Diagnostic Procedure”.

WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever “M” position, gear position “M1-1st” or “M2-2nd”, throttle opening greater than 1.5/8 - 2/8 of the full throttle position and driving for at least 5 consecutive seconds.
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
3. Perform self-diagnosis. Refer to AT-73, “SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)”.
4. If DTC is detected, go to AT-145, “Diagnostic Procedure”.

Wiring Diagram — AT — LC/B

AT-LC/B-01

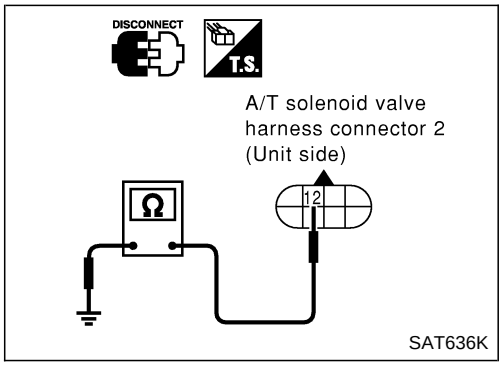


*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT100M

Diagnostic Procedure

1. CHECK VALVE RESISTANCE

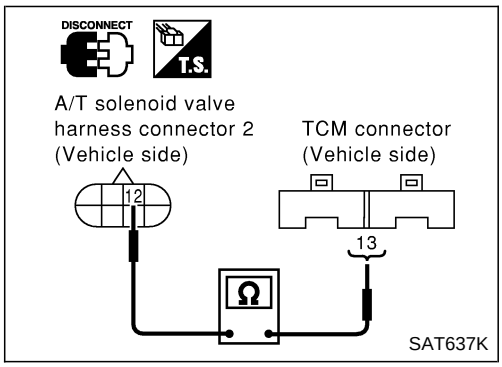


1. Turn ignition switch to “OFF” position.
2. Disconnect A/T solenoid valve harness connector 2 at the transmission right side.
3. Check the resistance between terminal and ground.

Solenoid Valve	Connector No.	Terminal No.	Resistance (Approx.)
Low coast brake solenoid valve	E239	12 - Ground	20 - 40Ω

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

2. CHECK POWER SOURCE CIRCUIT



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

Item	Connector No.	Terminal No.	Continuity
TCM	E123	13	Yes
A/T solenoid valve harness connector 2	E239	12	

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

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

3. CHECK DTC

Perform DTC confirmation procedure.

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

4. CHECK TCM INSPECTION

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

OK or NG?
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Description

When an impossible pattern of switch signals is detected, this is judged to be an abnormality.

CONSULT-II Reference Value in Data Monitor Mode

Monitor Item		Condition	Reference Value
MANU MODE SW	[ON - OFF]	Manual shift gate position (neutral)	ON
		Other than the above	OFF
NON M-MODE SW	[ON - OFF]	Manual shift gate position	OFF
		Other than the above	ON
UP SW LEVER	[ON - OFF]	Select lever: + side	ON
		Other than the above	OFF
DOWN SW LEVER	[ON - OFF]	Select lever: − side	ON
		Other than the above	OFF

On Board Diagnosis Logic

- This is not a self-diagnosis item.
- Diagnostic trouble code “MANU MODE SW/CIR” with CONSULT-II is detected when monitors Manual mode, Non manual mode, Up or Down switch signal and detects as abnormal when impossible input pattern occurs 1 second or more.

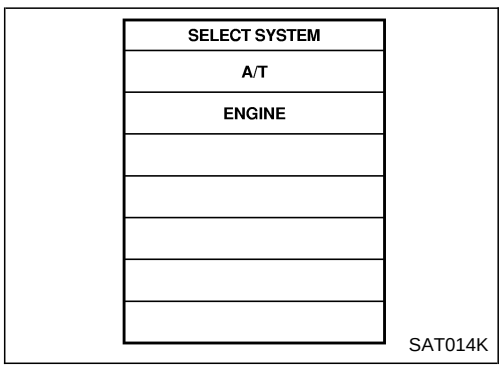
Possible Cause

Check the following items.
- Harness or connectors
  (These switches circuit is open or shorted.)
- Manual mode switch
- Non manual mode switch
- Up switch
- Down switch

DTC Confirmation Procedure

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

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

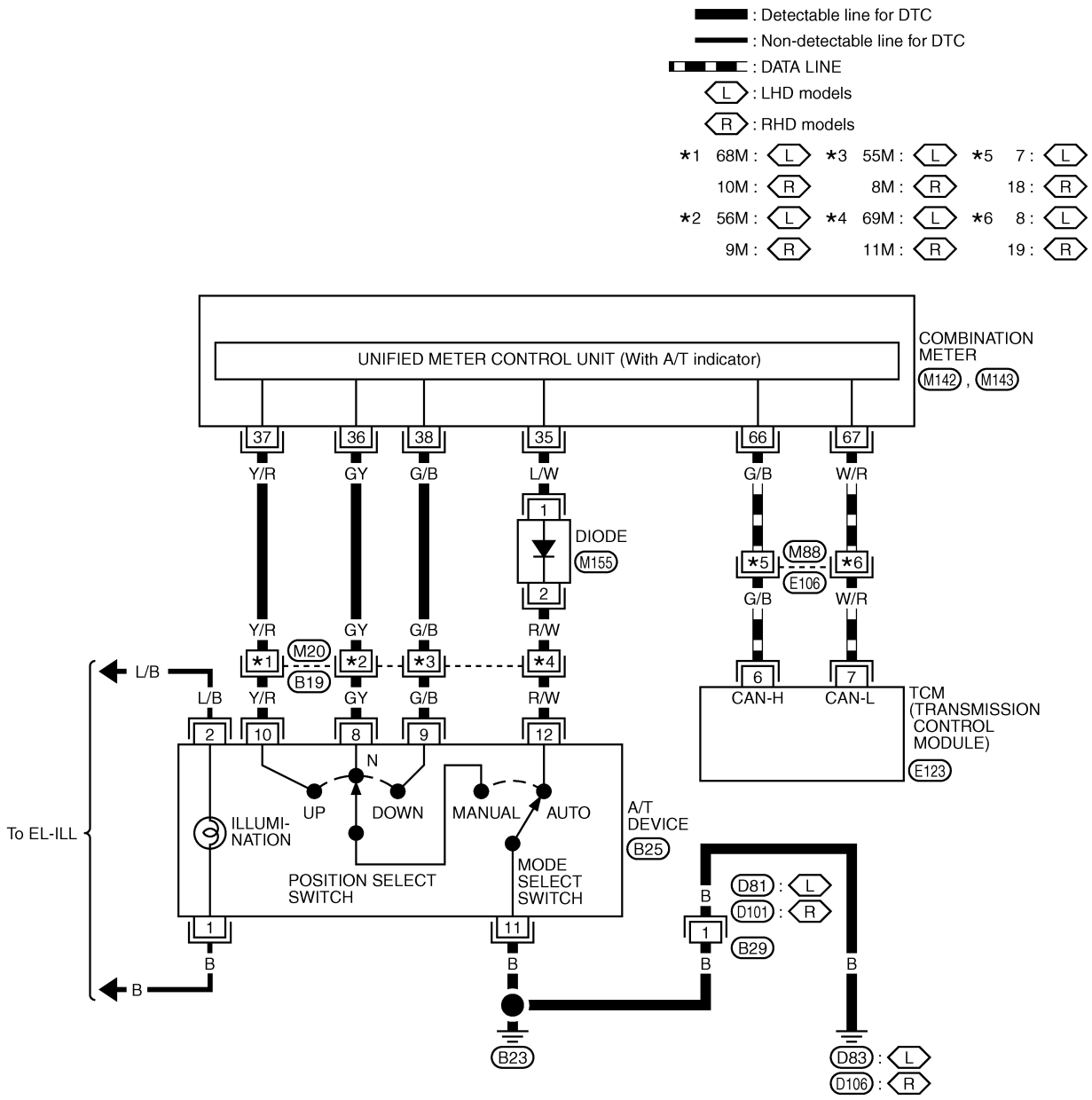


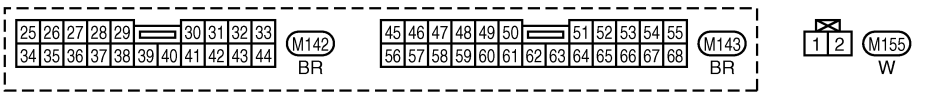
WITH CONSULT-II

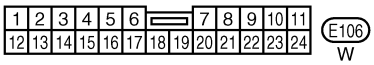
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Move selector lever to “M” position.
4. Start engine and vehicle start for at least 2 consecutive seconds.
5. If DTC is detected, go to AT-148, “Diagnostic Procedure”.

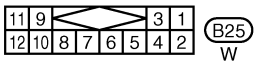
Wiring Diagram — AT — MMSW

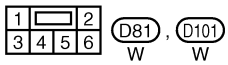
AT-MMSW-01











Refer to last page (Foldout page).

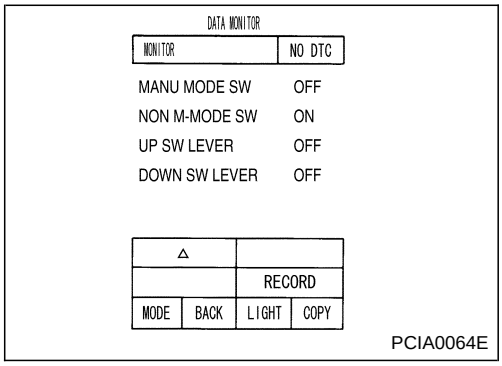
M20 , B19

E123

TAT118M

Diagnostic Procedure

1. CHECK MANUAL MODE SWITCH CIRCUIT (WITH CONSULT-II)



With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out ON/OFF switching action of the “MANU MODE SW”, “NON M-MODE SW”, “UP SW LEVER”, “DOWN SW LEVER”.

OK or NG?

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

2. CHECK MANUAL MODE SWITCH CIRCUIT (WITHOUT CONSULT-II)

Without CONSULT-II

Drive the vehicle in the manual mode, and confirm that the actual gear position and the meter’s indication of the position mutually coincide when the selector lever is shifted to the “+ (up)” or “− (down)” side (1st ↔ 5th gear).

OK or NG?

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

3. DETECT MALFUNCTIONING ITEM

Check the following items.

- Combination meter.
- Manual mode switch.
- Check pin terminals for damage or loose connection with harness connector.

OK or NG?

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

4. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END
NG >> Replace the control device assembly.

Component Inspection

MANUAL MODE SWITCH

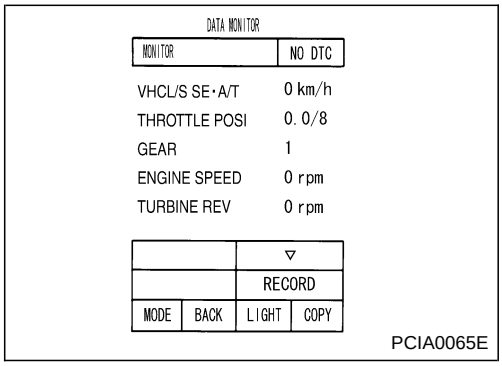
Check continuity between terminals. Refer to AT-147, “Wiring Diagram — AT — MMSW”.

Item	Position	Connector No.	Terminal No. (Unit side)	Continuity
Manual mode (select) SW	Auto	B25	11 - 12	Yes
	Manual		8 - 11	
UP SW	Neutral		8 - 11	
	Up		10 - 11	
DOWN SW	Neutral		8 - 11	
	Down		9 - 11	

Position Indicator Lamp

DIAGNOSTIC PROCEDURE

1. CHECK INPUT SIGNALS (WITH CONSULT-II)



With CONSULT-II

1. Start the engine.
2. Select “MAIN SIGNALS” in “DATA MONITOR” mode for A/T with CONSULT-II and read out the value of “GEAR”.
3. Drive the vehicle in the manual mode, and confirm that the actual gear position and the meter’s indication of the position mutually coincide when the select lever is shifted to the “+ (up)” or “− (down)” side (1st ↔ 5th gear).

OK or NG?

OK >> INSPECTION END

NG >> Check the following items.

Position Indicator Lamp Symptom Chart

Items	Presumed Location of Trouble
The actual gear position does not change, or shifting into the manual mode is not possible (no gear shifting in the manual mode possible). The position indicator lamp is not indicated.	Manual mode SW Refer to AT-146, “DTC P1815 MANUAL MODE SWITCH”. A/T main system (Fail-safe function actuated) ● Refer to AT-68, “SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)”.
The actual gear position changes, but the position indicator lamp is not indicated.	Execute the self-diagnosis function. ● Refer to AT-68, “SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)”.
The actual gear position and the indication on the position indicator lamp do not coincide.	Execute the self-diagnosis function. ● Refer to AT-68, “SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)”.
Only a specific position or positions is/are not indicated on the position indicator lamp.	Check the meter Control unit.

Description

Fail-safe function to detect front brake clutch solenoid valve condition.

On Board Diagnosis Logic

- This is not a self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 1/CIRC” with CONSULT-II is detected.
- When condition of pressure switch 1 is different from monitor value, and relation between gear position and actual gear ratio is abnormal. (Other than during speed change)

Possible Cause

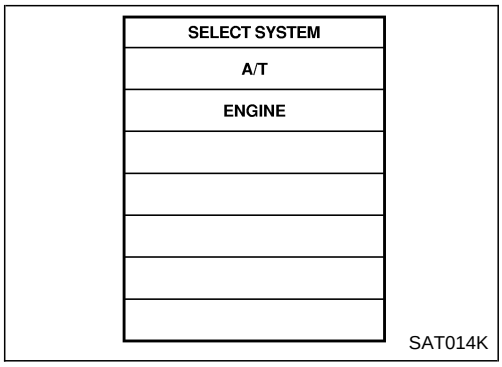
- Pressure switch 1
- Harness or connectors
  (The switch circuit is open or shorted.)

DTC Confirmation Procedure

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.

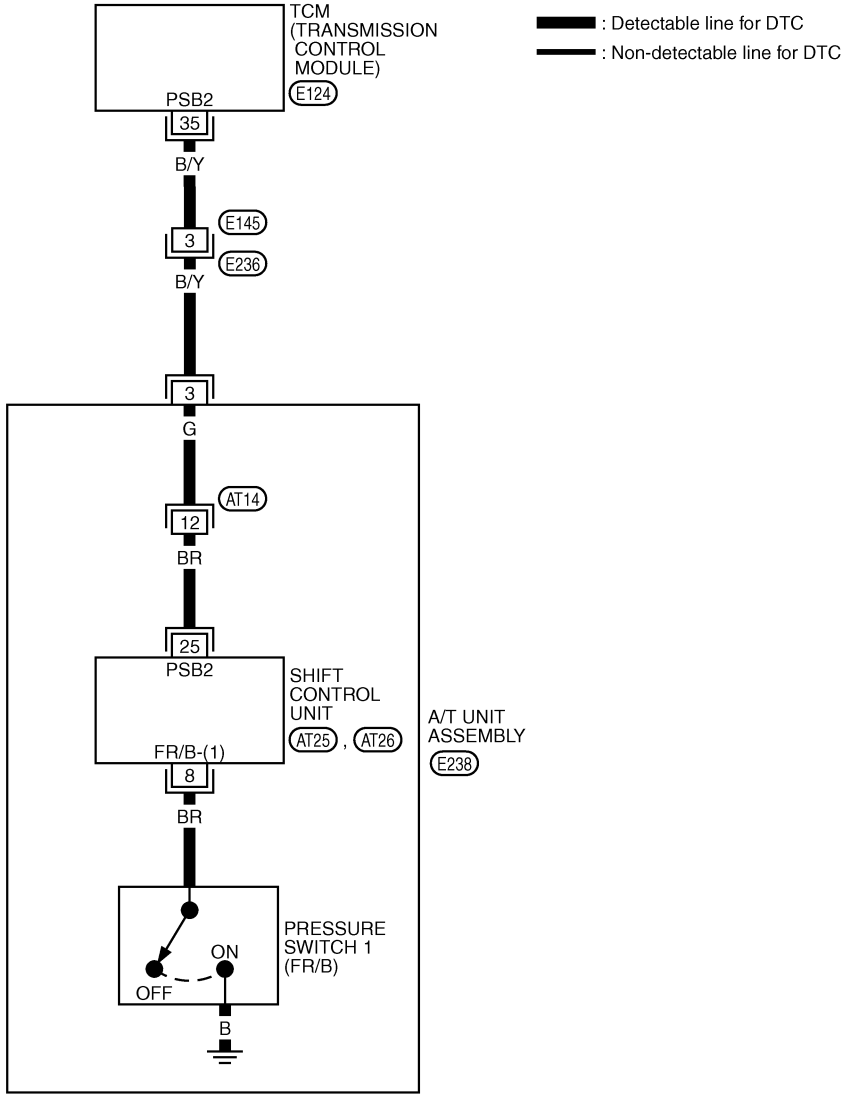


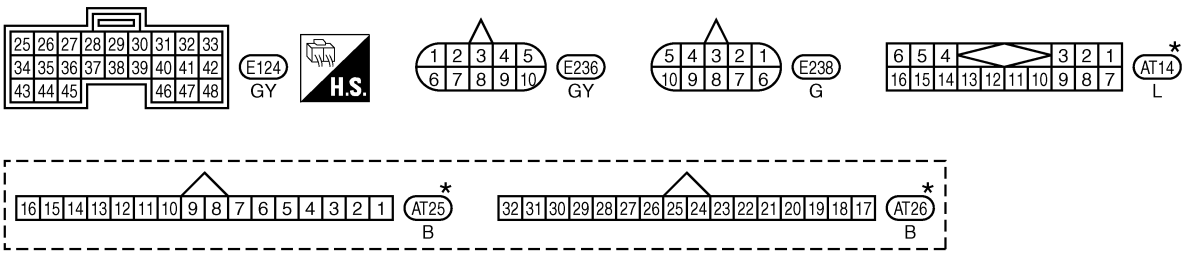
WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 4 consecutive seconds. (Other than during speed change).
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st → 3rd Gear (FR/B ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If P1841 is detected, go to AT-152, “Diagnostic Procedure”.
   If P1757 is detected, go to AT-136, “Diagnostic Procedure”.

Wiring Diagram — AT — FPSW1

AT-FPSW1-01



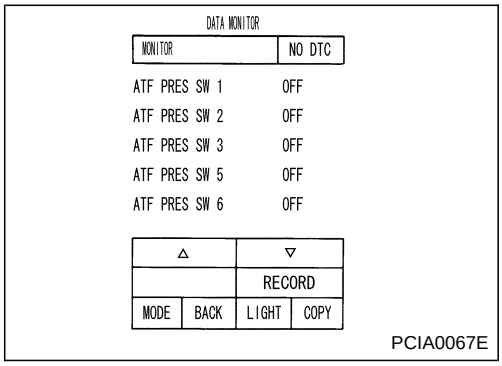


*: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT102M

Diagnostic Procedure

1. INPUT SIGNALS (WITH CONSULT-II)



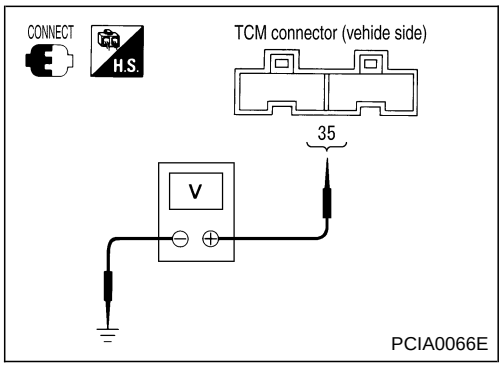
With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (1st → 3rd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 1”.

OK or NG?

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

2. INPUT SIGNALS (WITHOUT CONSULT-II)



Without CONSULT-II

1. Start engine.
2. Drive the vehicle in the “D” position (1st → 3rd gear).

Solenoid Valve		Connector No.	Terminal No.	Voltage
Front brake solenoid valve	OFF	E124	35 - Ground	Battery voltage
	ON			Approx. 0V

OK or NG?

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

3. DETECT MALFUNCTIONING ITEM

Check the following items.

1. Check disconnection or short-circuit in the main harness between pressure switch 1 (FR/B) (PSB2) and TCM.
2. Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

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

4. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

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

5. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.

Diagnostic Procedure (Cont'd)

2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Description

Fail-safe function to detect input clutch solenoid valve condition.

On Board Diagnosis Logic

- This is not a self-diagnostic item.
- Diagnostic trouble code “ATF PRES SW 3/CIRC” with CONSULT-II is detected.
- When condition of pressure switch 3 is different from monitor value, and relation between gear position and actual gear ratio is abnormal. (Other than during speed change)

Possible Cause

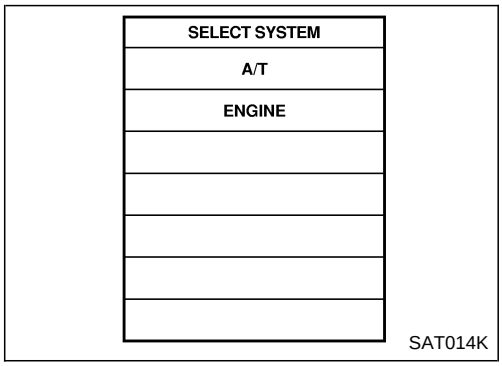
Check the following items.
- Pressure switch 3
- Harness or connectors
  (The switch circuit is open or shorted.)

DTC Confirmation Procedure

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.

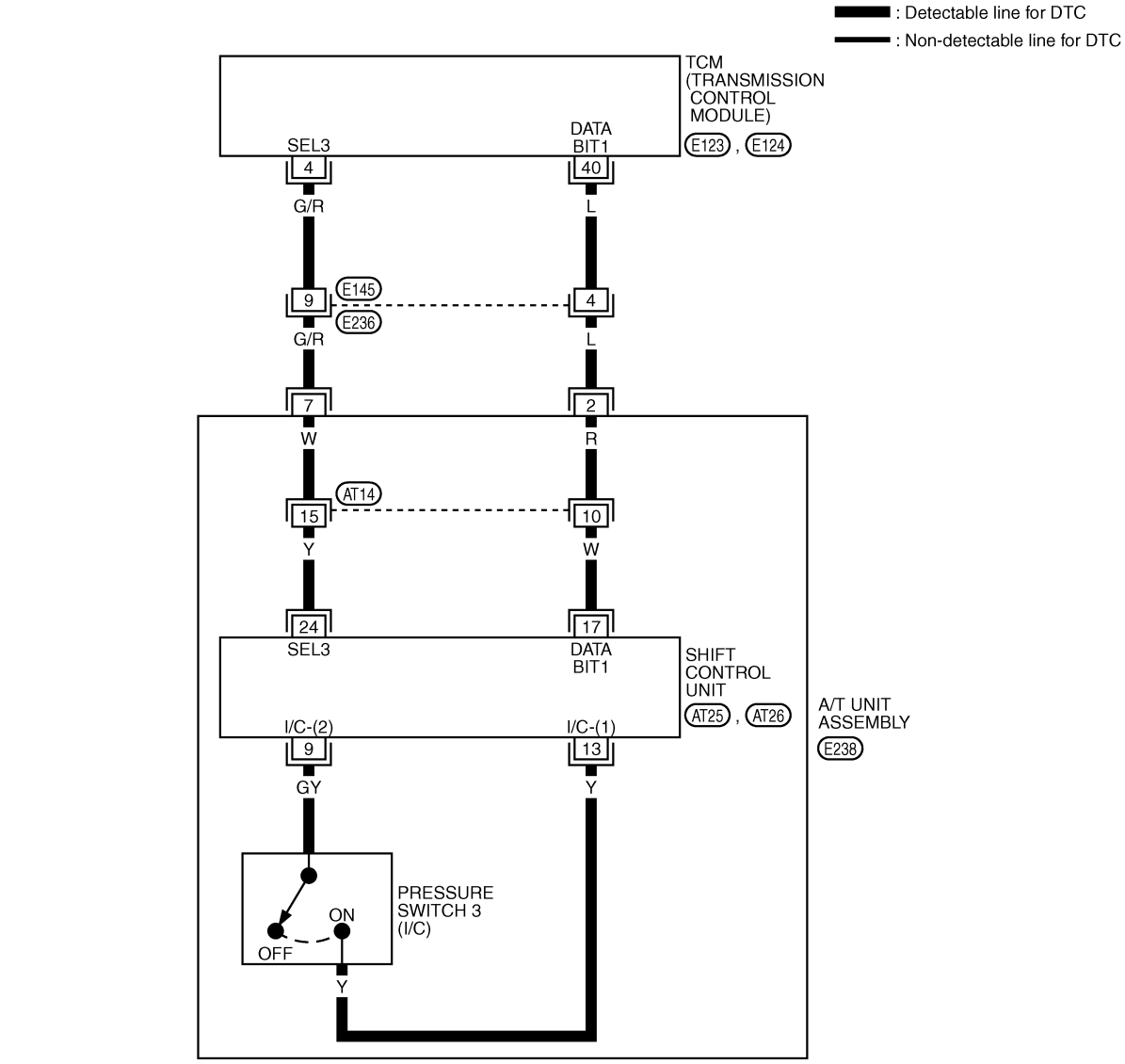


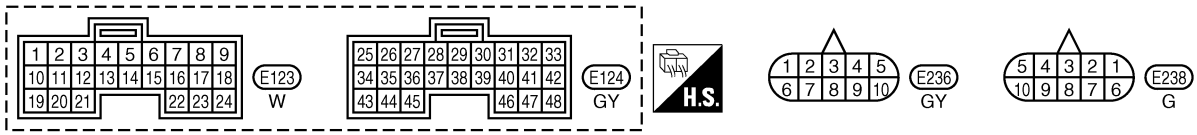
WITH CONSULT-II

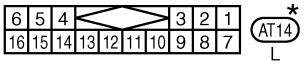
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 4 consecutive seconds. (Other than during speed change).
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd → 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If P1843 is detected, go to AT-156, “Diagnostic Procedure”.
   If P1752 is detected, go to AT-133, “Diagnostic Procedure”.

Wiring Diagram — AT — FPSW3

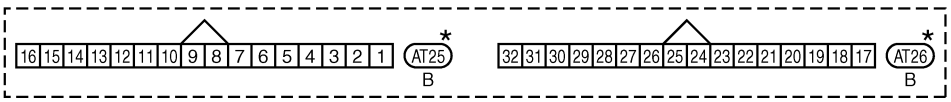
AT-FPSW3-01







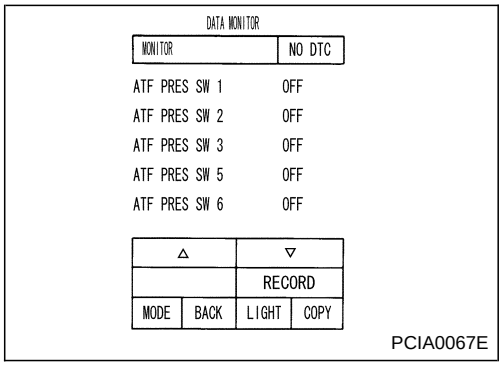
★: This connector is not shown in "HARNESS LAYOUT", EL section.



TAT103M

Diagnostic Procedure

1. INPUT SIGNALS (WITH CONSULT-II)



With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive the vehicle in the “D” position (3rd → 4th gear), and confirm the ON/OFF actuation of the “ATF PRES SW 3”.

OK or NG?

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

2. DETECT MALFUNCTIONING ITEM

Check the following items.

1. Check disconnection or short-circuit in the main harness between pressure switch 3 (I/C) (SEL 3 or DATA BIT 1) and TCM.
2. Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

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

3. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END
NG >> Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Description

Fail-safe function to detect direct clutch solenoid valve condition.

On Board Diagnosis Logic

- This is not a self-diagnosis item.
- Diagnostic trouble code “ATF PRES SW 5/CIRC” with CONSULT-II is detected.
- When condition of pressure switch 1 is different from monitor value, and relation between gear position and actual gear ratio is abnormal. (Other than during speed change)

Possible Cause

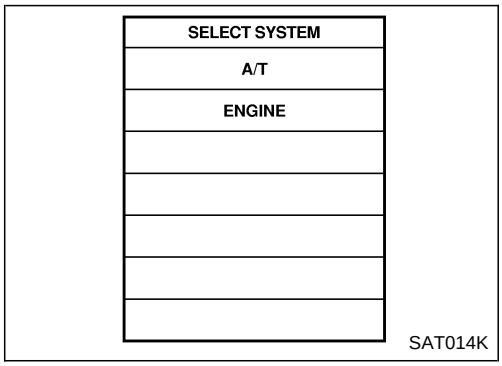
Check the following items.
- Pressure switch 5
- Harness or connectors
  (The switch circuit is open or shorted.)

DTC Confirmation Procedure

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.

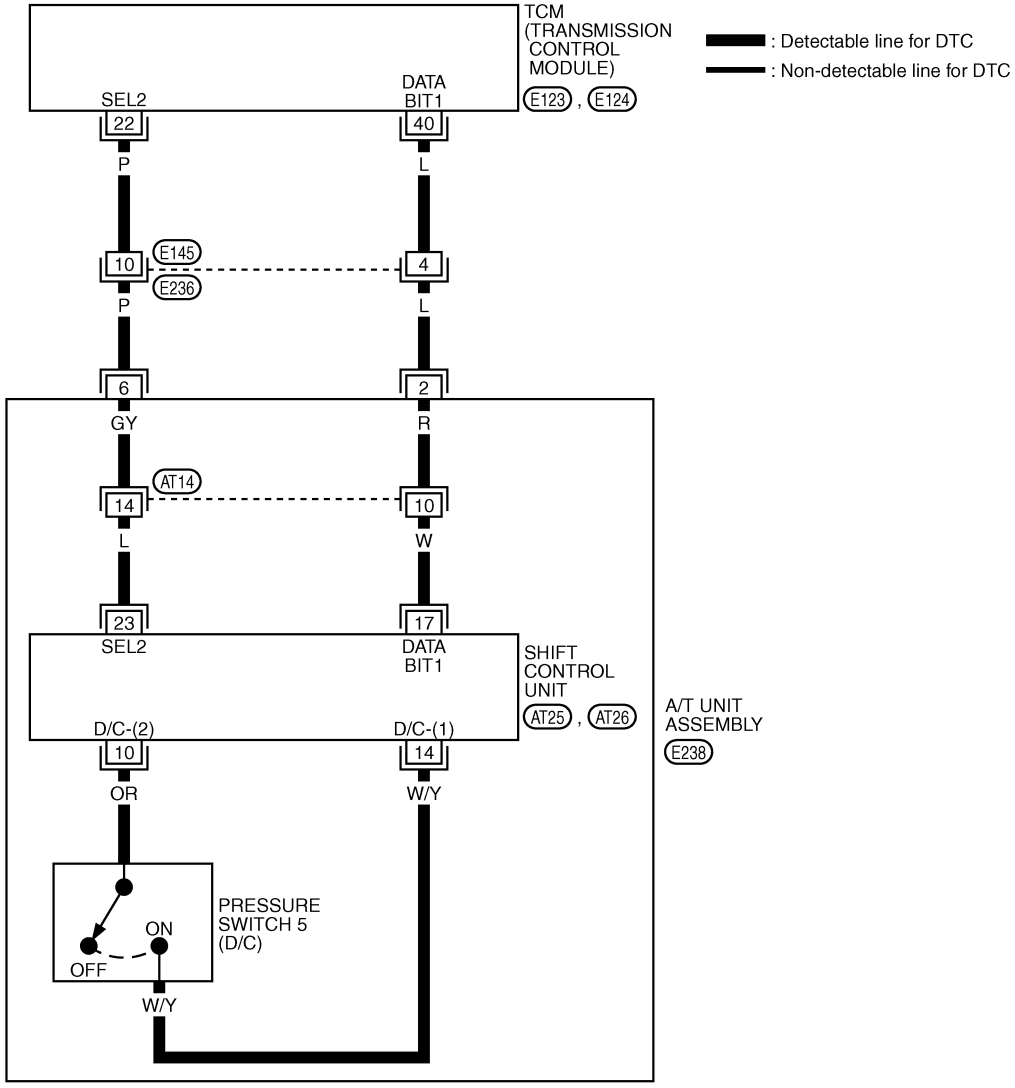


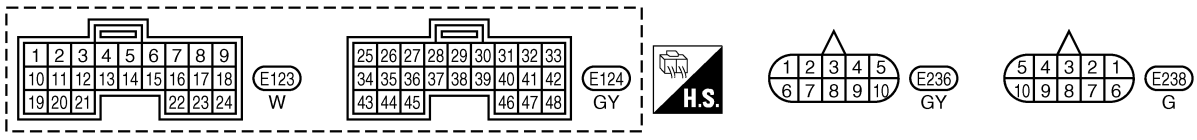
WITH CONSULT-II

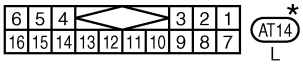
1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 4 consecutive seconds. (Other than during speed change).
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st → 2nd Gear (D/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If P1845 is detected, go to AT-159, “Diagnostic Procedure”.
   If P1762 is detected, go to AT-139, “Diagnostic Procedure”.

Wiring Diagram — AT — FPSW5

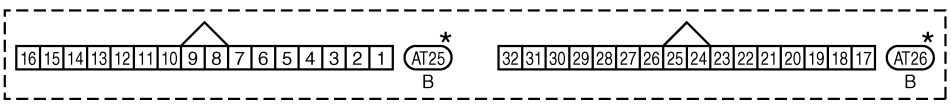
AT-FPSW5-01







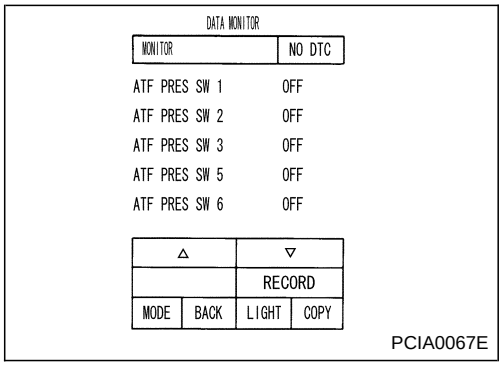
∗: This connector is not shown in "HARNESS LAYOUT", EL section.



TAT104M

Diagnostic Procedure

1. INPUT SIGNALS (WITH CONSULT-II)



With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (1st → 2nd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 5”.

OK or NG?

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

2. DETECT MALFUNCTIONING ITEM

Check the following items.

1. Check disconnection or short-circuit in the main harness between pressure switch 5 (D/C) (SEL 2 or DATA BIT 1) and TCM.
2. Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

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

3. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

OK >> INSPECTION END
NG >> Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Description

Fail-safe function to detect high & low reverse clutch solenoid valve condition.

On Board Diagnosis Logic

- This is not a self-diagnosis item.
- Diagnostic trouble code “ATF PRES SW 6/CIRC” with CONSULT-II is detected.
- When condition of pressure switch 6 is different from monitor value, and relation between gear position and actual gear ratio is abnormal. (Other than during speed change)

Possible Cause

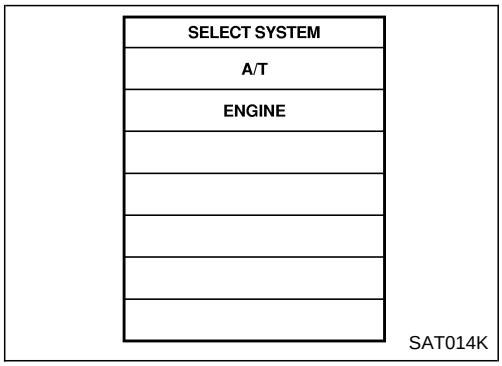
Check the following items.
- Pressure switch 6
- Harness or connectors
  (The switch circuit is open or shorted.)

DTC Confirmation Procedure

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.

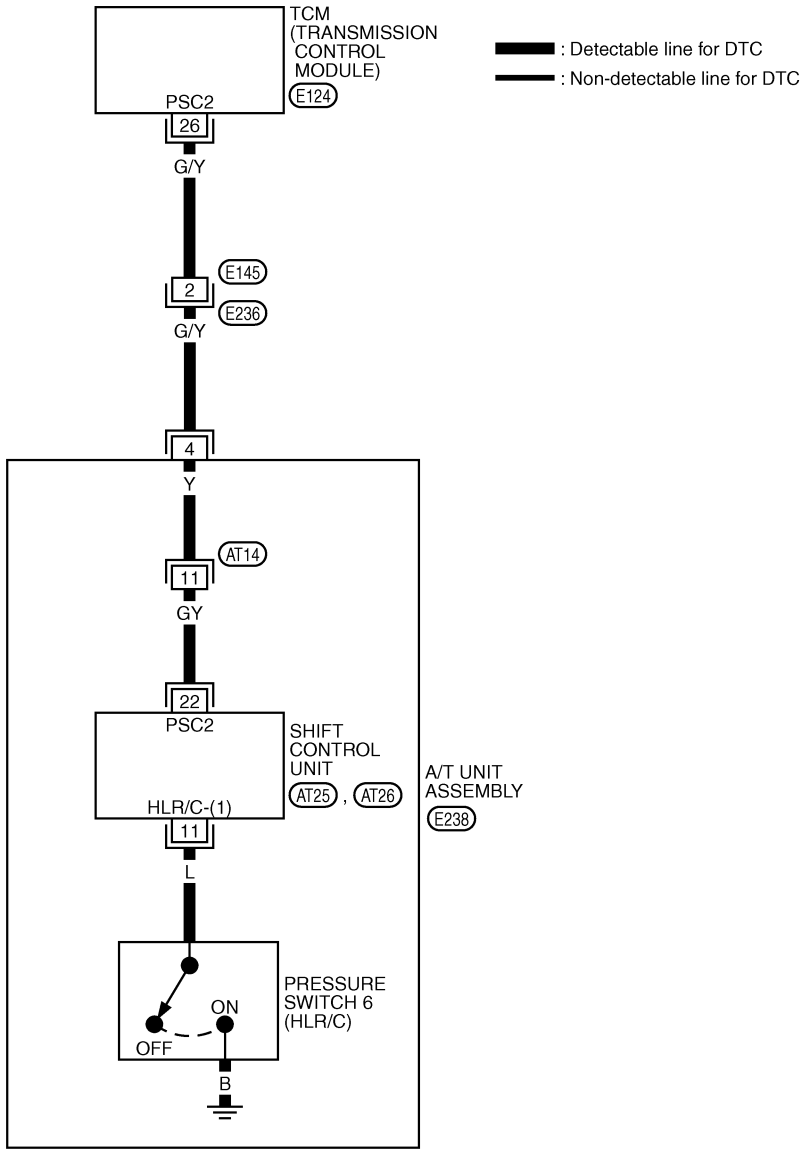


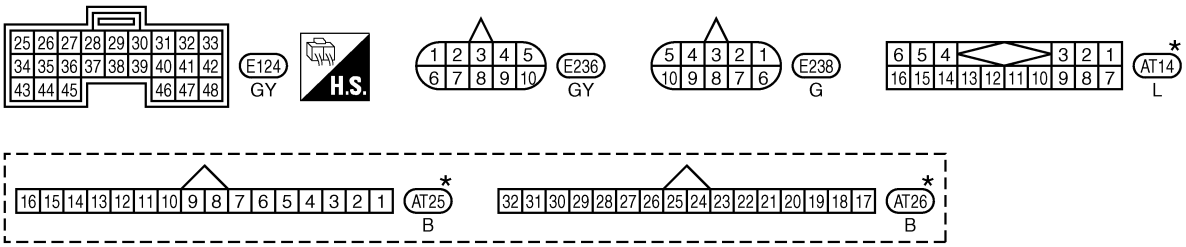
WITH CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine and maintain the following conditions for at least 4 consecutive seconds. (Other than during speed change).
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 1st → 3rd Gear (HLR/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
4. If P1846 is detected, go to AT-162, “Diagnostic Procedure”.
   If P1767 is detected, go to AT-142, “Diagnostic Procedure”.

Wiring Diagram — AT — FPSW6

AT-FPSW6-01



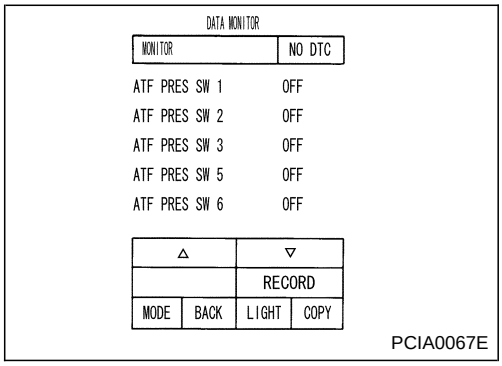


∗: This connector is not shown in "HARNESS LAYOUT", EL section.

TAT105M

Diagnostic Procedure

1. INPUT SIGNALS (WITH CONSULT-II)



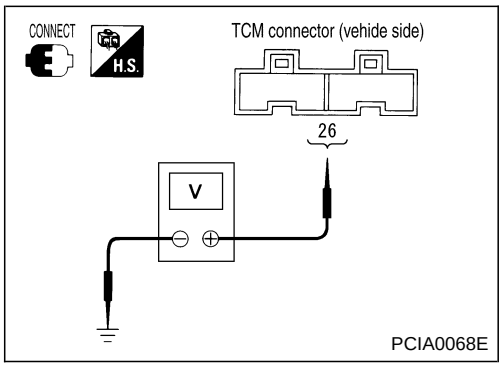
With CONSULT-II

1. Start engine.
2. Select “TCM INPUT SIGNALS” or “MAIN SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle in the “D” position (1st → 3rd gear), and confirm the ON/OFF actuation of the “ATF PRES SW 6”.

OK or NG?

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

2. INPUT SIGNALS (WITHOUT CONSULT-II)



Without CONSULT-II

1. Start engine.
2. Drive vehicle in the “D” position (1st → 3rd gear).

Solenoid Valve		Connector No.	Terminal No.	Voltage
High & low reverse clutch solenoid valve	OFF	E124	26 - Ground	Battery voltage
	ON			Approx. 0V

OK or NG?

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

3. DETECT MALFUNCTIONING ITEM

Check the following items.

1. Check disconnection or short-circuit in the main harness between pressure switch 6 (HLR/C) (PSC 2) and TCM.
2. Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

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

4. CHECK DTC

Perform DTC confirmation procedure.

OK or NG?

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

5. CHECK TCM INSPECTION

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

OK or NG?

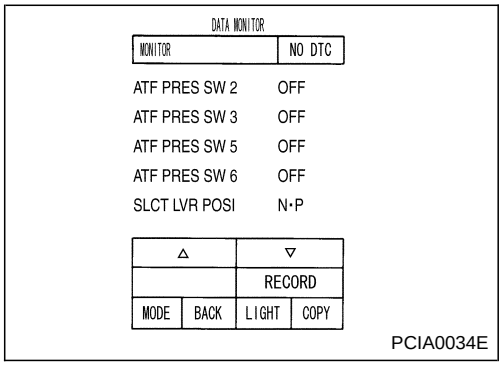
OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.

Diagnostic Procedure (Cont'd)

2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Diagnostic Procedure

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



With CONSULT-II

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

OK or NG?

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

2. DETECT MALFUNCTIONING ITEM

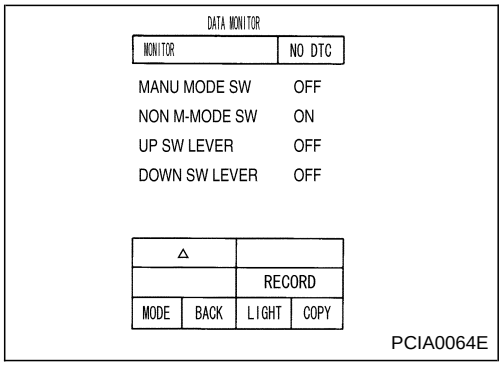
Check the following items.

- Disconnection or short-circuit in the main harness between TCM and PNP switch 1, 2, 3, 4.
- Disconnection or short-circuit in the main harness between PNP switch 3 monitor and TCM.
- PNP switch. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.

OK or NG?

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

3. CHECK MANUAL MODE SWITCH CIRCUIT (WITH CONSULT-II)



With CONSULT-II

1. Turn ignition switch to “ON” position. (Do not start engine.)
2. Select “TCM INPUT SIGNALS” in “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Read out ON/OFF switching action of the “MANU MODE SW”, “NON M-MODE SW”, “UP SW LEVER”, “DOWN SW LEVER”.

OK or NG?

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

4. DETECT MALFUNCTIONING ITEM

Check the following items.

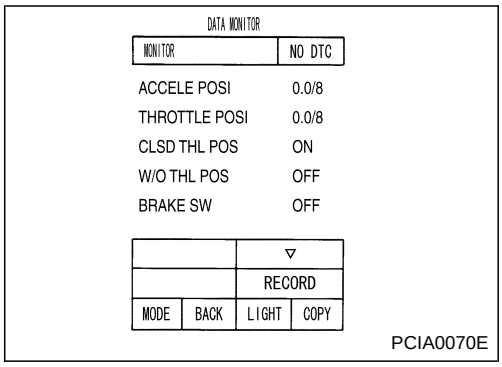
- Manual mode switch. Refer to AT-146, “DTC P1815 MANUAL MODE SWITCH”.
- Check the connector housing for missing, loosening, bending or falling down of any terminal.

OK or NG?

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

Diagnostic Procedure (Cont'd)

5. CHECK BRAKE SWITCH CIRCUIT (WITH CONSULT-II)



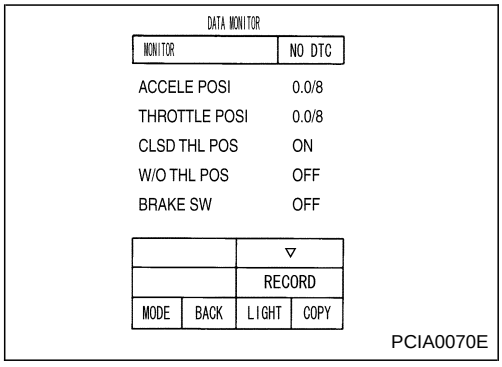
With CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Read out ON/OFF switching action of the "BRAKE SW".

OK or NG?

OK >> GO TO 6.
NG >> Refer to BR section.

6. CHECK CLOSED THROTTLE 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. Depressed accelerator pedal and read out the value of "CLSO THL POS" and "W/O THL POS".

Accelerator Pedal Operation	Monitor Item	
	CLSD THL POS	W/O THL POS
Released	ON	OFF
Fully depressed	OFF	ON

4. Select "SELF-DIAG RESULTS" mode for "ENGINE" with CONSULT-II.
5. If P0121 is detected, go to EC section, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR".

OK or NG?

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

7. CHECK DTC

Perform DTC confirmation procedure.

- Refer to AT-75, "CONSULT-II".
- CAN Communication Line. Refer to AT-75, "DTC U1000 CAN COMMUNICATION LINE".

OK or NG?

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

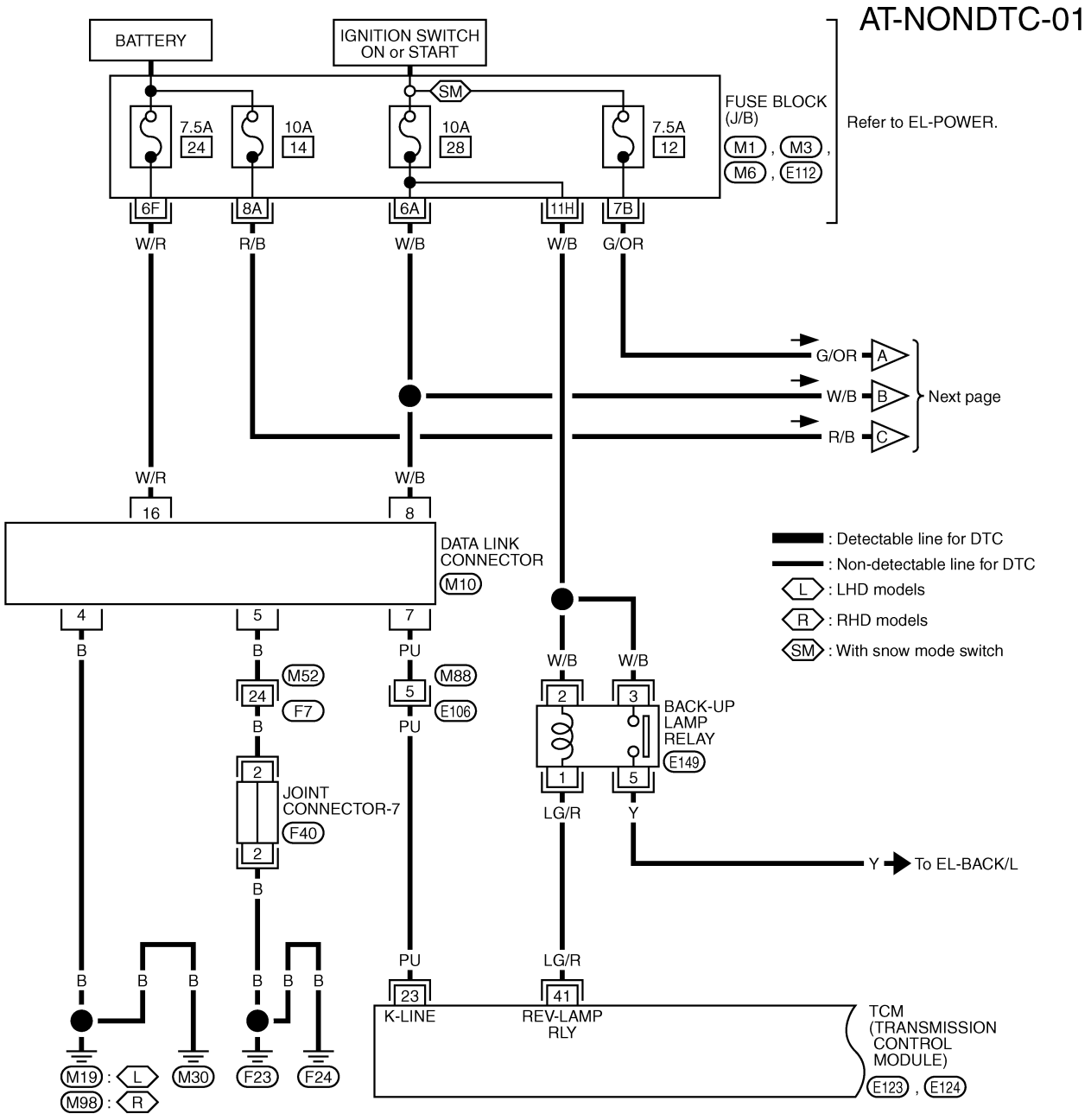
8. CHECK TCM INSPECTION

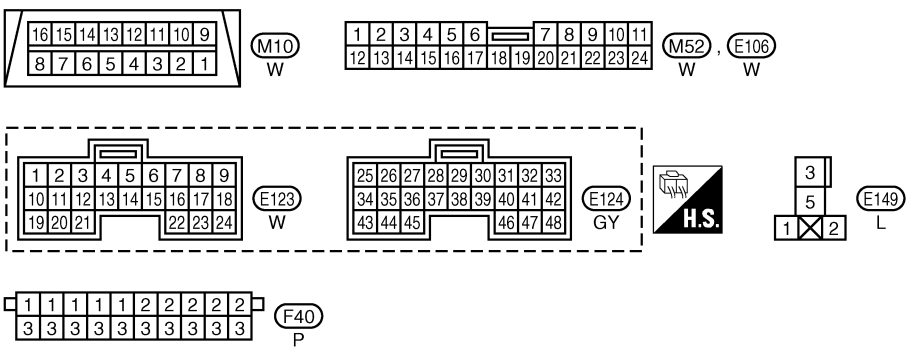
1. Perform TCM input/output signal inspection.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Wiring Diagram — AT — NONDTC





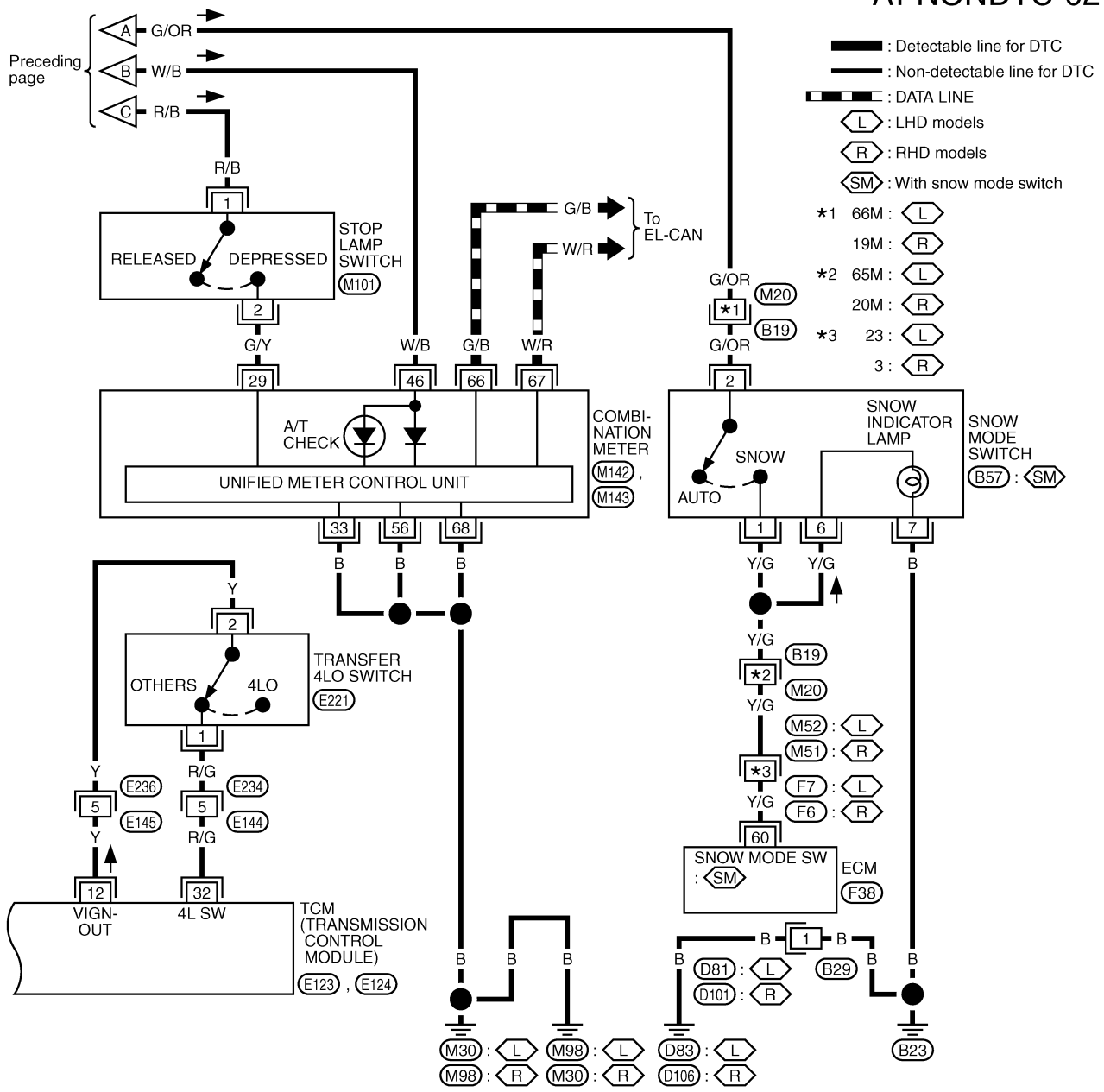
Refer to last page (Foldout page).

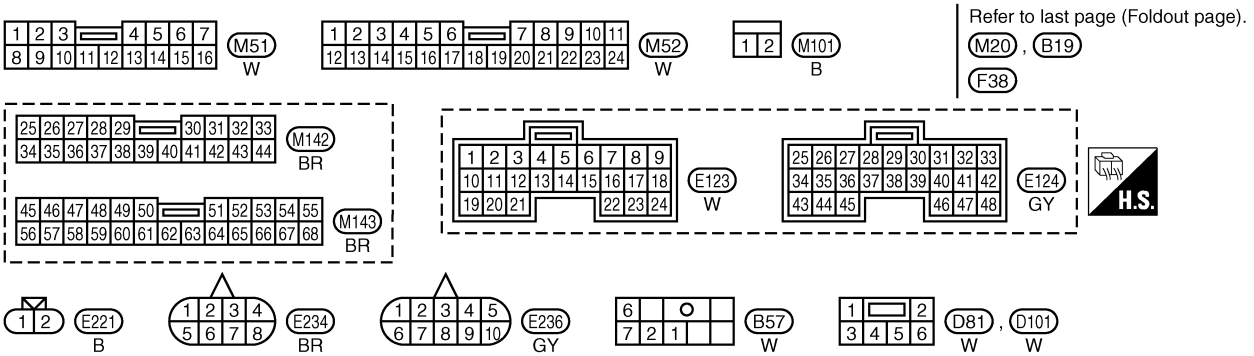
M1
M3
M6
E112

TAT106M

Wiring Diagram — AT — NONDTC (Cont'd)

AT-NONDTC-02





TAT116M

A/T CHECK Indicator Lamp Does not Come on

SYMPTOM

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

DIAGNOSTIC PROCEDURE

1. CHECK TCM POWER SOURCE STEP 1

1. Turn ignition switch to "OFF" position.
2. Check the voltage between TCM connector and ground. Refer to AT-101, "Wiring Diagram — AT — POWER".

Item	Connector No.	Terminal No.	Voltage
TCM	E123	9 - Ground	Battery voltage

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

2. CHECK TCM POWER SOURCE STEP 2

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Check the voltage between TCM connector terminals 33, 42 and ground. Refer to AT-101, "Wiring Diagram — AT — POWER".

Item	Connector No.	Terminal No.	Voltage
TCM	E124	33 - Ground	Battery voltage
		42 - Ground	

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

3. DETECT MALFUNCTIONING ITEM

Check the following items:
- Harness for short or open between battery and TCM terminal 9 (Main harness)
- Harness for short or open between ignition switch and TCM terminals 33 and 42 (Main harness)
- 10A fuse [No. 45] or 7.5A fuse [No. 12, located in the fuse block (J/B)]
- Ignition switch

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 the TCM connector.
3. Check continuity between terminals 5, 14, 24, 46 and ground. Refer to AT-101, "Wiring Diagram — AT — POWER".
4. If OK, check the harness for short-circuit to ground or the power source.

OK or NG?
OK >> GO TO 5.
NG >> Repair the short-circuit(s) in the harness or connector to ground or the power source.

A/T CHECK Indicator Lamp Does not Come on (Cont'd)

5. CHECK A/T CHECK INDICATOR LAMP CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Check the combination meter.

OK or NG?

OK >> GO TO 6.
NG >> Check the following item.
- Refer to AT-75, "DTC U1000 CAN COMMUNICATION LINE".

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-101.
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Engine Cannot Be Started In "P" and "N" Position

SYMPTOM

- **Engine cannot be started with selector lever in "P" or "N" position.**
- **Engine can be started with selector lever in "D" or "R" position.**

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, "DTC P0705 PARK/NEUTRAL POSITION SWITCH".
No >> GO TO 2.

2. CHECK STARTING SYSTEM

Check starting system.

OK or NG?

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

In “P” Position, Vehicle Moves When Pushed

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 SW CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.

No >> GO TO 2.

2. CHECK CONTROL CABLE

Check control linkage. Refer to AT-196, “Control Linkage Adjustment”.

OK or NG?

OK >> GO TO 3.

NG >> ● Adjust control linkage. Refer to AT-196, “Control Linkage Adjustment”.
● Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

3. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

In “N” Position, Vehicle Moves

SYMPTOM

Vehicle moves forward or backward when selecting “N” position.

DIAGNOSTIC PROCEDURE

1. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.

No >> GO TO 2.

2. CHECK CONTROL CABLE

Check control linkage. Refer to AT-196, “Control Linkage Adjustment”.

OK or NG?

OK >> GO TO 3.

NG >> ● Adjust control linkage. Refer to AT-196, “Control Linkage Adjustment”.
● Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

3. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Large Shock “N” to “D” Position

SYMPTOM

A noticeable shock occurs when the selector lever is shifted from the “N” to “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Execute self-diagnosis.

Do the self-diagnosis results indicate A/T fluid temperature sensor, line pressure solenoid valve, or throttle position sensor?

Yes >> Check the malfunctioning system. Refer to AT-97, “DTC P0745 LINE PRESSURE SOLENOID VALVE”, AT-108, “DTC P1705 THROTTLE POSITION SENSOR”, AT-110, “DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT”.

No >> GO TO 2.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor. Refer to EC section, “DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR”.

OK or NG?

OK >> GO TO 3.

NG >> Repair or replace the accelerator pedal position sensor.

3. CHECK LINE PRESSURE

Check the line pressure with the engine idling in the “D” position. Refer to AT-52, “LINE PRESSURE TEST”.

OK or NG?

OK >> GO TO 4.

NG >> Check line pressure solenoid valve. Refer to AT-97, “DTC P0745 LINE PRESSURE SOLENOID VALVE”.

4. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Vehicle Does Not Creep Backward In “R” Position

SYMPTOM

The vehicle does not creep in the “R” position. Or an extreme lack of acceleration is observed.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVER

Check A/T fluid level again. Refer to MA section, “Checking A/T Fluid”.

OK or NG?

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

2. CHECK STALL TEST

Check the number of revolutions when the engine is stalled. Refer to AT-50, “STALL TEST”.

OK or NG?

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

3. CHECK LINE PRESSURE

Check the line pressure with the engine idling. Refer to AT-52, “LINE PRESSURE TEST”.

OK or NG?

OK >> GO TO 4.
NG >> Check line pressure solenoid valve. Refer to AT-97, “DTC P0745 LINE PRESSURE SOLENOID VALVE”.

4. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.
No >> GO TO 5.

5. CHECK SYMPTOM

Check again.

OK or NG?

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

6. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Vehicle Does Not Creep Forward In “D” Position

SYMPTOM

Vehicle does not creep forward when selecting “D” position.

DIAGNOSTIC PROCEDURE

1. CHECK A/T FLUID LEVEL

Check A/T fluid level again. Refer to MA section, “Checking A/T Fluid”.

OK or NG?

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

2. CHECK STALL TEST

Check stall revolution with selector lever in “D” position. Refer to AT-50, “STALL TEST”.

OK or NG?

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

3. CHECK LINE PRESSURE

Check line pressure at idle with selector lever in “R” position. Refer to AT-52, “LINE PRESSURE TEST”.

OK or NG?

OK >> GO TO 4.
NG >> Check line pressure solenoid valve. Refer to AT-97, “DTC P0745 LINE PRESSURE SOLENOID VALVE”.

4. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.
No >> GO TO 5.

5. CHECK SYMPTOM

Check again.

OK or NG?

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

6. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END
NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Vehicle Cannot Be Started From D_1

SYMPTOM

Vehicle cannot be started from D_1 on cruise test — Part 1.

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep in “R” position.

OK or NG?

OK >> GO TO 2.

NG >> Refer to AT-173, “Vehicle Does Not Creep Backward In “R” Position”.

2. CHECK SELF-DIAGNOSIS RESULTS

Execute self-diagnosis.

Do the self-diagnosis results indicate vehicle speed sensor A/T (revolution sensor), line pressure solenoid?

Yes >> Check the malfunctioning system. Refer to AT-86, “DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)”, AT-97, “DTC P0745 LINE PRESSURE SOLENOID VALVE”.

No >> GO TO 2.

3. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor. Refer to EC section, “DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR”.

OK or NG?

OK >> GO TO 3.

NG >> Repair or replace the accelerator pedal position sensor.

4. CHECK LINE PRESSURE

Check the line pressure at the engine stall point. Refer to AT-52, “LINE PRESSURE TEST”.

OK or NG?

OK >> GO TO 5.

NG >> Replace the transmission assembly. Refer to AT-15, Precautions for A/T Assembly Replacement”.

5. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 6.

6. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

A/T Does Not Shift: $D_1 \rightarrow D_2$ Or Does Not Kick down: $D_4 \rightarrow D_2$

SYMPTOM

The vehicle does not shift up from the D_1 to D_2 at the specified speed, or it does not kick down from the D_4 to D_2 even when the accelerator pedal is fully depressed.

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep forward in “D” position and vehicle cannot be started from D_1.

OK or NG?

OK >> GO TO 2.

NG >> Refer to AT-174, “Vehicle Does Not Creep Forward In “D” Position”, AT-175, “Vehicle Cannot Be Started From D_1”.

2. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.

No >> GO TO 3.

3. CHECK SELF-DIAGNOSIS RESULTS

Check vehicle speed sensor A/T (revolution sensor) and vehicle speed sensor MTR circuits.

Refer to AT-86, “DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)”, AT-120, “DTC P1721 VEHICLE SPEED SENSOR MTR”.

OK or NG?

OK >> GO TO 4.

NG >> Repair or replace vehicle speed sensor A/T (revolution sensor) or vehicle speed sensor MTR.

4. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor. Refer to EC section, “DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR”.

OK or NG?

OK >> GO TO 5.

NG >> Repair or replace the accelerator pedal position sensor.

5. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 6.

A/T Does Not Shift: $D_1 \rightarrow D_2$ Or Does Not Kick down: $D_4 \rightarrow D_2$ (Cont'd)

6. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

A/T Does Not Shift: $D_2 \rightarrow D_3$

SYMPTOM

A/T does not shift up from the D_2 to D_3 at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep forward in "D" position and vehicle cannot be started from D_1.

OK or NG?

OK >> GO TO 2.

NG >> Refer to AT-174, "Vehicle Does Not Creep Forward In "D" Position", AT-175, "Vehicle Cannot Be Started From D_1".

2. CHECK PNP SWITCH CIRCUIT

With CONSULT-II

Does "TCM INPUT SIGNALS" in "DATA MONITOR" show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, "DTC P0705 PARK/NEUTRAL POSITION SWITCH".

No >> GO TO 3.

3. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor. Refer to EC section, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR".

OK or NG?

OK >> GO TO 4.

NG >> Repair or replace the accelerator pedal position sensor.

4. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

A/T Does Not Shift: $D_3 \rightarrow D_4$

SYMPTOM

- **The vehicle does not shift up from the D_3 to D_4 at the specified speed.**
- **The vehicle does not shift up from the D_3 to D_4 unless A/T is warmed up.**

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep forward in “D” position and vehicle cannot be started from D_1.

OK or NG?

OK >> GO TO 2.

NG >> Refer to AT-174, “Vehicle Does Not Creep Forward In “D” Position”, AT-175, “Vehicle Cannot Be Started From D1”.

2. PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.

No >> GO TO 3.

3. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor. Refer to EC section, “DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR”.

OK or NG?

OK >> GO TO 4.

NG >> Repair or replace the accelerator pedal position sensor.

4. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

A/T Does Not Shift: $D_4 \rightarrow D_5$

SYMPTOM

- **The vehicle does not shift up from the D_4 to D_5 at the specified speed.**
- **The vehicle does not shift up from the D_4 to D_5 unless A/T is warmed up.**

DIAGNOSTIC PROCEDURE

1. CHECK CONFIRM THE PROBLEM

Vehicle does not creep forward In “D” position and vehicle cannot be started from D_1.

OK or NG?

OK >> GO TO 2.

NG >> Refer to AT-174, “Vehicle Does Not Creep Forward In “D” Position”, AT-175, “Vehicle Cannot Be Started From D_1”.

2. CHECK SELF-DIAGNOSIS RESULTS

With CONSULT-II

After executing a traveling test, confirm that the self-diagnosis results indicate the following defective items:

- PNP switch
- A/T fluid temperature sensor
- Vehicle speed sensor A/T (revolution sensor)
- Vehicle speed sensor MTR

Without CONSULT-II

Execute the self-diagnosis and confirm that a malfunction is indicated in the results.

Yes or No?

Yes >> Check the defective system(s). Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”, AT-86, “DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)”, AT-110, “DTC P1710 A/T FLUID TEMPERATURE SENSOR CIRCUIT”, AT-120, “DTC P1721 VEHICLE SPEED SENSOR MTR”.

No >> GO TO 3.

3. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor. Refer to EC section, “DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR”.

OK or NG?

OK >> GO TO 4.

NG >> Repair or replace the accelerator pedal position sensor.

4. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 5.

5. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

A/T Does Not Perform Lock-up

SYMPTOM

A/T does not lock-up at the specified speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Execute self-diagnosis results indicate TCC solenoid valve.

Yes or No?

Yes >> Check the TCC solenoid valve circuit. Refer to AT-94, “DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE”.

No >> GO TO 2.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor. Refer to EC section, “DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR”.

OK or NG?

OK >> GO TO 3.

NG >> Repair or replace the accelerator pedal position sensor.

3. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

A/T Does Not Hold Lock-up Condition

SYMPTOM

A/T lock-up condition cannot be maintained for more than 30 seconds.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Does self-diagnosis show damage to engine speed signal circuit after cruise test.

Yes or No?

Yes >> Check the engine speed signal circuit. Refer to AT-120, “DTC P0725 ENGINE SPEED SIGNAL”.

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Lock-up Is Not Released

SYMPTOM

A/T lock-up condition cannot be cancelled even after releasing the accelerator pedal.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to closed throttle position and wide open throttle position switch circuit. Refer to AT-75, “DTC U1000 CAN COMMUNICATION LINE”.

Without CONSULT-II

Execute the self-diagnosis and confirm that a malfunction in the CAN communication is indicated in the results.

Yes or No?

Yes >> Check the CAN communication line. Refer to AT-75, “DTC U1000 CAN COMMUNICATION LINE”.

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 3.

Lock-up Is Not Released (Cont'd)

3. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

Engine Speed Does Not Return To Idle

SYMPTOM

When a shift down is performed, the engine speed does not smoothly return to the idling speed.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Execute self-diagnosis.

Do the self-diagnosis results indicate a malfunction in the manual mode SW?

Yes >> Check the manual mode switch. Refer to AT-146, "DTC P1815 MANUAL MODE SWITCH".

No >> GO TO 2.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR

Check the accelerator pedal position sensor. Refer to EC section, "DTC P0121 ACCELERATOR PEDAL POSITION (APP) SENSOR".

OK or NG?

OK >> GO TO 3.

NG >> Repair or replace the accelerator pedal position sensor.

3. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 4.

4. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, "Precautions for A/T Assembly Replacement".

A/T Does Not Shift: $D_5 \rightarrow D_4$

SYMPTOM

The vehicle does not shift down from the D_5 to D_4.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS

With CONSULT-II

After executing a traveling test, confirm that the self-diagnosis results indicate the following malfunctioning items:

- Input clutch solenoid valve
- Vehicle speed sensor A/T (revolution sensor)
- Vehicle speed sensor MTR

Without CONSULT-II

Execute the self-diagnosis and confirm that a malfunction is indicated in the results.

Yes or No?

Yes >> Check the malfunctioning system(s). Refer to AT-86, “DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)”, AT-120, “DTC P1721 VEHICLE SPEED SENSOR MTR”, AT-131, “DTC P1752 INPUT CLUTCH SOLENOID VALVE”.

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

A/T Does Not Shift: $D_4 \rightarrow D_3$

SYMPTOM

The vehicle does not shift down from the D_4 to D_3.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS

With CONSULT-II

After executing a traveling test, confirm that the self-diagnosis results indicate the following malfunctioning items:

- High & low reverse clutch solenoid valve
- Vehicle speed sensor A/T (revolution sensor)
- Vehicle speed sensor MTR

Without CONSULT-II

Execute the self-diagnosis and confirm that a malfunction is indicated in the results.

Yes or No?

Yes >> Check the defective system(s). Refer to AT-86, “DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)”, AT-120, “DTC P1721 VEHICLE SPEED SENSOR MTR”, AT-140, “DTC P1767 HIGH AND LOW REVERSE CLUTCH SOLENOID VALVE”.

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

A/T Does Not Shift: $D_3 \rightarrow D_2$

SYMPTOM

The vehicle does not shift down from the D_3 to D_2.

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS

With CONSULT-II

After executing a traveling test, confirm that the self-diagnosis results indicate the following malfunctioning items:

- Direct clutch solenoid valve
- Vehicle speed sensor A/T (revolution sensor)
- Vehicle speed sensor MTR

Without CONSULT-II

Execute the self-diagnosis and confirm that a malfunction is indicated in the results.

Yes or No?

Yes >> Check the malfunctioning system(s). Refer to AT-86, “DTC P0720 VEHICLE SPEED SENSOR A/T (REVOLUTION SENSOR)”, AT-120, “DTC P1721 VEHICLE SPEED SENSOR MTR”, AT-140, “DTC P1762 DIRECT CLUTCH SOLENOID VALVE”.

No >> GO TO 2.

2. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

A/T Does Not Shift: $D_2 \rightarrow D_1$

SYMPTOM

The vehicle does not shift down from the D_2 to D_1.

DIAGNOSTIC PROCEDURE

1. PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.

No >> GO TO 3.

2. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Vehicle Does Not Decelerate By Engine Brake

SYMPTOM

No engine brake is applied when the gear is shifted from the D_2 to D_1.

DIAGNOSTIC PROCEDURE

1. PNP SWITCH CIRCUIT

With CONSULT-II

Does “TCM INPUT SIGNALS” in “DATA MONITOR” show damage to PNP switch circuit?

Without CONSULT-II

Does self-diagnosis show damage to PNP switch circuit?

Yes or No?

Yes >> Check PNP switch circuit. Refer to AT-82, “DTC P0705 PARK/NEUTRAL POSITION SWITCH”.

No >> GO TO 3.

2. CHECK SYMPTOM

Check again.

OK or NG?

OK >> INSPECTION END

NG >> GO TO 3.

3. CHECK TCM INSPECTION

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

OK or NG?

OK >> INSPECTION END

NG >> 1. Repair or replace damaged parts.
2. Replace the transmission assembly. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

Component Inspection

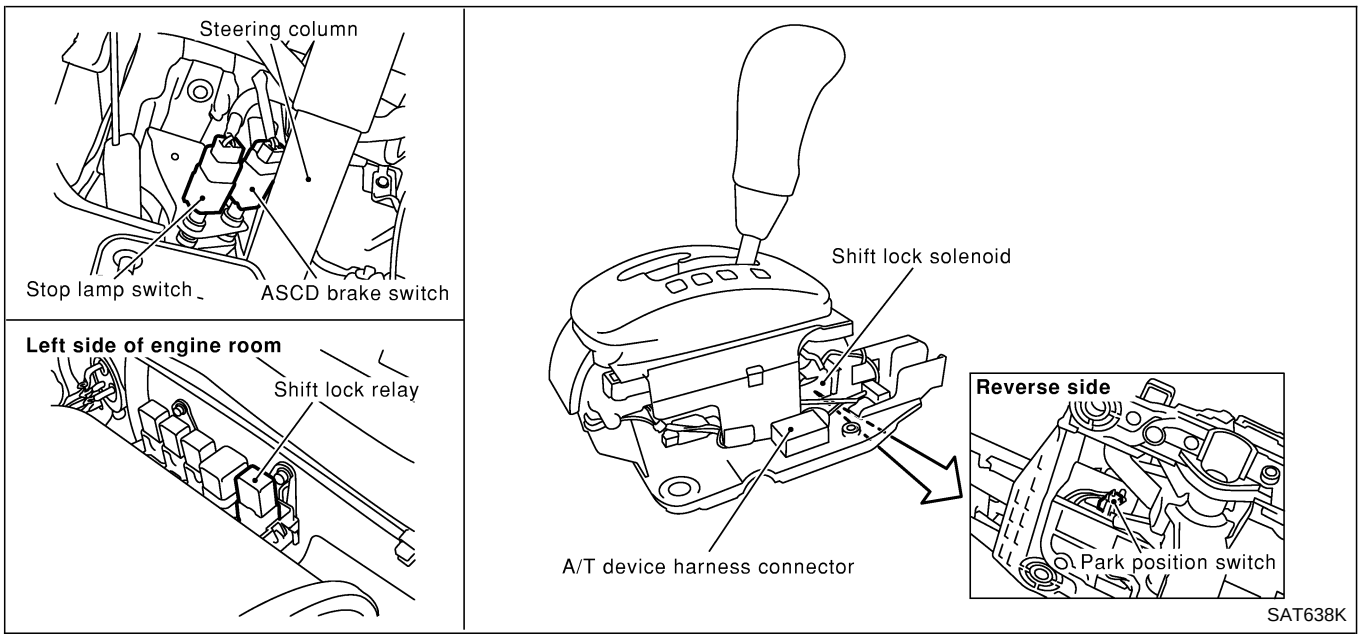
BACK-UP LAMP RELAY

Check continuity between BACK-UP LAMP relay harness connector terminals. Refer to AT-166, “Wiring Diagram — AT — NONDTC”.

Item	Ignition switch	Shift position	Connector No.	Terminal No.	Continuity
BACK-UP LAMP relay	OFF	—	E149	1 - 2	Yes
				3 - 5	No
	ON	“R” position		3 - 5	Yes
		Except “R” position			No

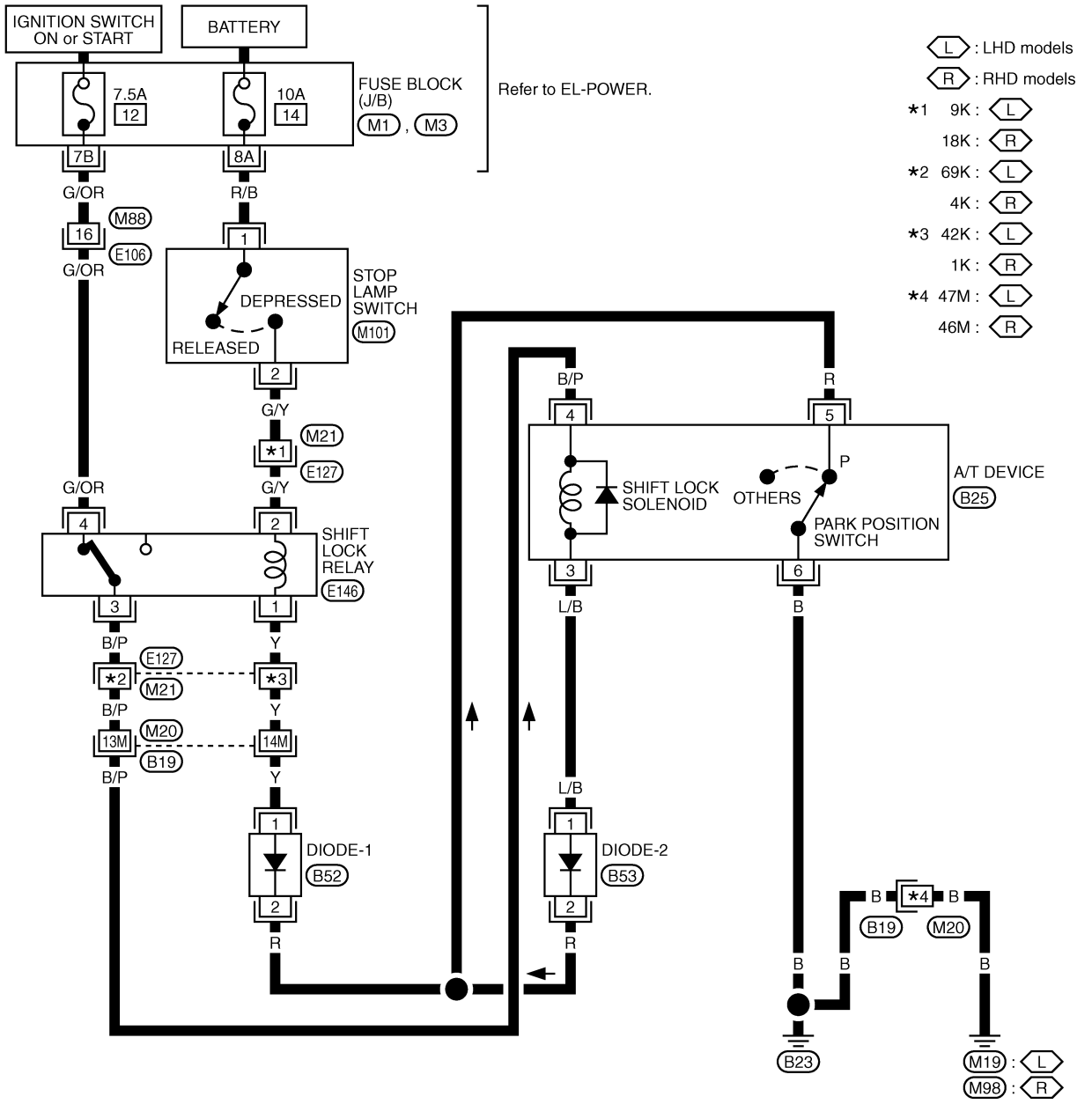
Description

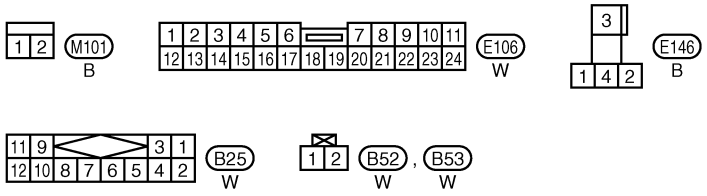
- The mechanical key interlock mechanism also operates as a shift lock:
  With the key switch turned to “ON”, the selector lever cannot be shifted from “P” (parking) to any other position unless the brake pedal is depressed.
  With the key removed, the selector lever cannot be shifted from “P” to any 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, respectively.



Wiring Diagram — SHIFT —

AT-SHIFT-01





Refer to last page (Foldout page).

M20 , B19

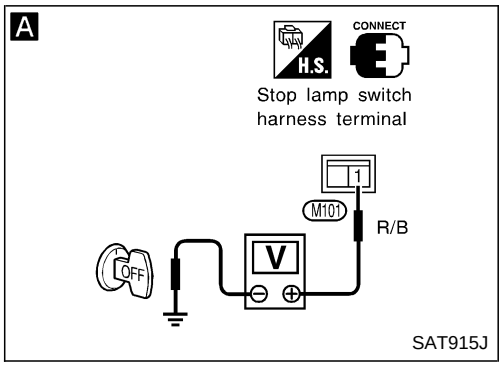
M21 , E127

M1

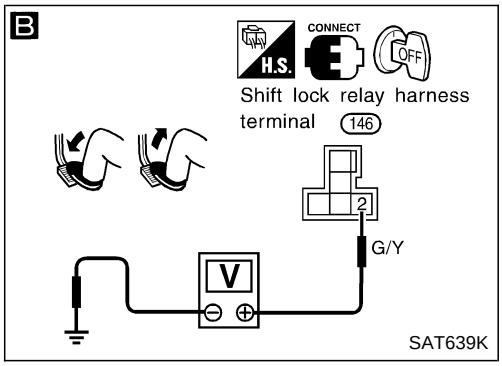
M3

TAT117M

A



B



Diagnostic Procedure

SYMPTOM 1:

- **Selector lever cannot be moved from “P” position with key in “ON” position and brake pedal applied.**
- **Selector lever can be moved from “P” position with key in “ON” position and brake pedal released.**
- **Selector lever can be moved from “P” position when key is removed from key cylinder.**

SYMPTOM 2:

Ignition key cannot be removed when selector lever is set to “P” position. It can be removed when selector lever is set to any position except “P”.

Check key interlock cable for damage.
NG → Repair key interlock cable. Refer to “Key Interlock Cable”, AT-194.
OK ↓

Check selector lever position for damage.
NG → Check selector lever. Refer to “Control Linkage Adjustment”.
OK ↓

A

CHECK POWER SOURCE.
1. Turn ignition switch to “OFF” position. (Do not start engine.)
2. Check voltage between stop lamp switch harness terminal ① and ground.
   Voltage: Battery voltage

NG → Check the following items:
1. Harness for short or open between battery and stop lamp switch harness terminal ①
2. 10A fuse

OK ↓

B

CHECK INPUT SIGNAL (STOP LAMP SWITCH).
Turn ignition switch to “OFF” position. (Do not start engine.)
- Check voltage between shift lock relay harness terminal ② and ground.

Brake pedal	Voltage
Released	0V
Depressed	Battery voltage

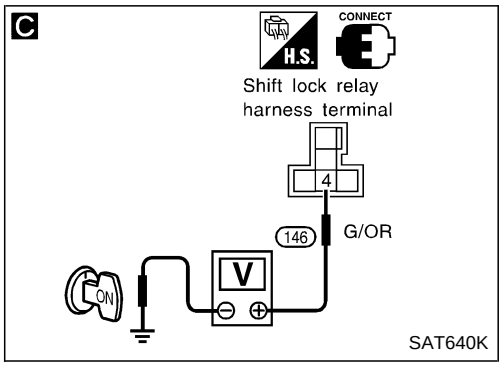
NG → Check the following items:
1. Harness for short or open between shift lock relay harness connector ② and stop lamp switch harness connector ②
2. Stop lamp switch (Refer to “Component Check”, AT-193.)

OK ↓

Ⓐ

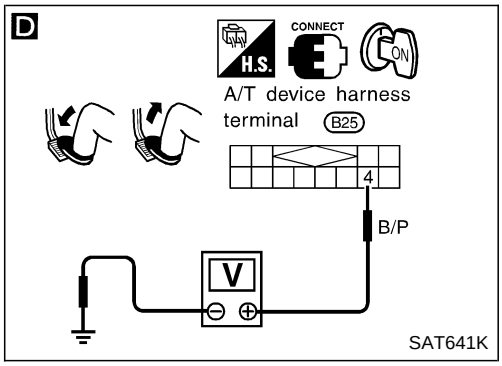
Diagnostic Procedure (Cont'd)

C



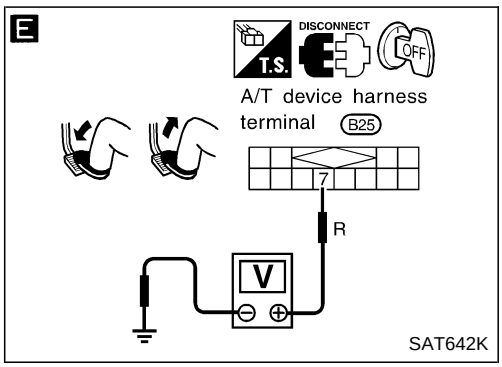
SAT640K

D



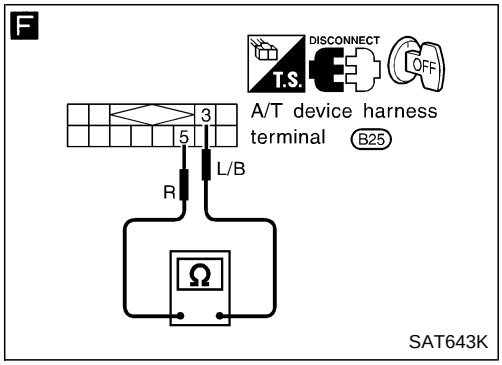
SAT641K

E



SAT642K

F



SAT643K

Ⓐ

C

CHECK POWER SOURCE.
1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Check voltage between shift lock relay harness terminal ④ and ground.
   Voltage: Battery voltage

NG →
Check the following items:
1. Harness for short or open between battery and shift lock relay harness terminal ④
2. 7.5A fuse
3. Ignition switch (Refer to EL section.)

OK ↓

D

CHECK INPUT SIGNAL-1 (SHIFT LOCK RELAY).
Turn ignition switch to "ON" position. (Do not start engine.)
- Check voltage between A/T device harness terminal ④ and ground.

Brake pedal	Voltage
Released	Battery voltage
Depressed	0V

NG →
Check the following items:
1. Harness for short or open between A/T device harness connector ④ and shift lock relay harness connector ③
2. Shift lock relay (Refer to EL section.)

OK ↓

E

CHECK INPUT SIGNAL-2 (SHIFT LOCK RELAY).
Turn ignition switch to "OFF" position.
- Check voltage between A/T device harness terminal ⑤ and ground.

Brake pedal	Voltage
Released	0V
Depressed	Battery voltage

NG →
Check the following items:
1. Harness for short or open between A/T device harness connector ⑤ and shift lock relay harness connector ①
2. Shift lock relay (Refer to EL section.)
3. Diode-1

OK ↓

F

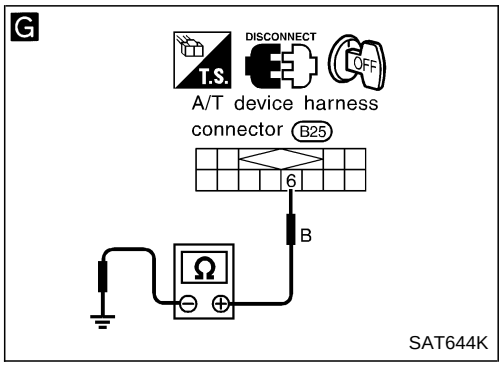
CHECK INPUT SIGNAL (DIODE-2).
Turn ignition switch to "OFF" position. (Do not start engine.)
- Check continuity between A/T device harness terminals ③ and ⑤.

NG →
Check the following item:
1. Diode-2

OK ↓

Ⓑ

Diagnostic Procedure (Cont'd)



Ⓑ

G

CHECK GROUND CIRCUIT.
1. Turn ignition switch to "OFF" position.
2. Disconnect A/T device harness connector.
3. Check continuity between A/T device harness terminal ⑥ and ground.

NG → Repair harness or connector.

OK ↓

CHECK PARK POSITION SWITCH.
(Refer to "Component Check", AT-193.)

NG → Replace park position switch.

OK ↓

CHECK SHIFT LOCK SOLENOID.
(Refer to "Component Check", AT-193.)

NG → Replace shift lock solenoid.

OK ↓

Reconnect shift lock harness connector.

↓

Turn ignition switch from "OFF" to "ON" position. (Do not start engine.)

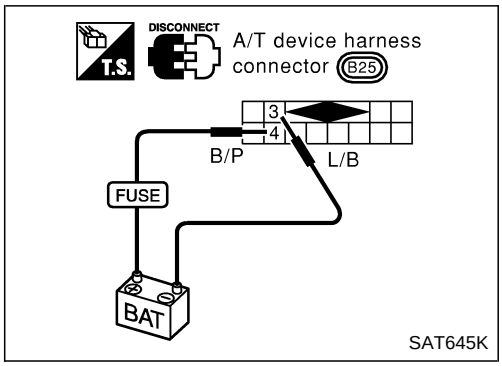
↓

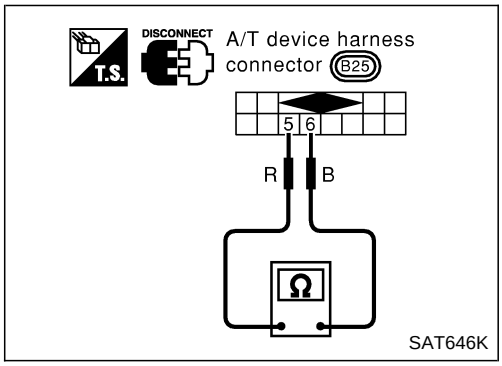
Recheck shift lock operation.

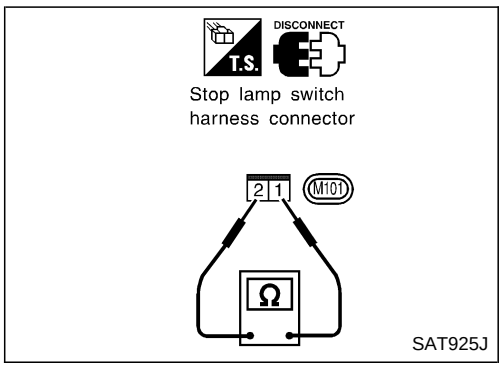
NG → 1. Perform A/T device input/output signal inspection test.
2. If NG, recheck harness connector connection.

OK ↓

INSPECTION END







Component Check

SHIFT LOCK SOLENOID

- Check operation by applying battery voltage between A/T device harness connector terminals ③ and ④.

PARK POSITION SWITCH

- Check continuity between A/T device harness connector terminals ⑤ and ⑥.

Condition	Continuity
When selector lever is set in “P” position and selector lever button is released	Yes
Except above	No

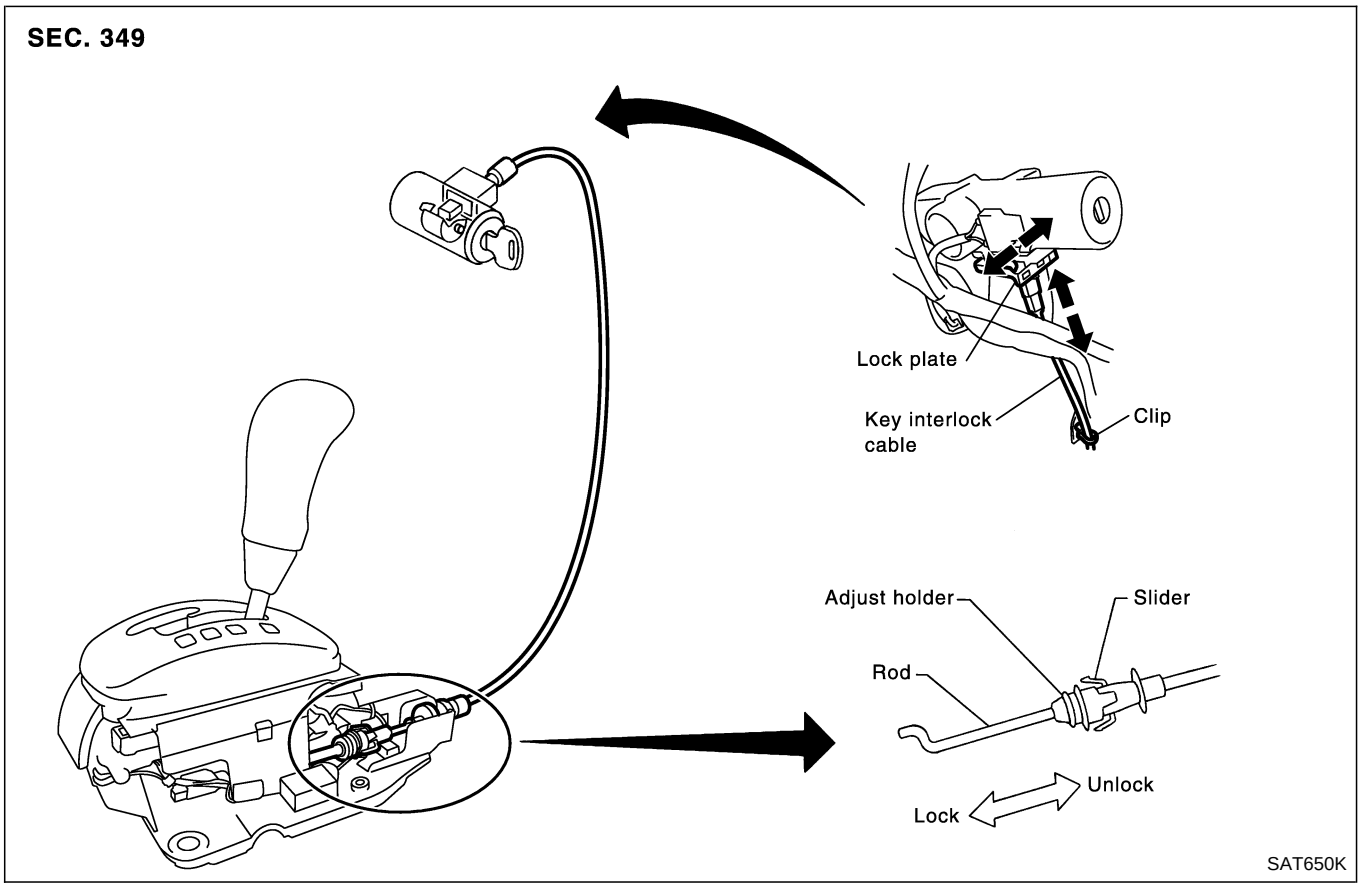
STOP LAMP SWITCH

- Check continuity between stop lamp switch harness connector terminals ① and ②.

Condition	Continuity
When brake pedal is released	No
When brake pedal is depressed	Yes

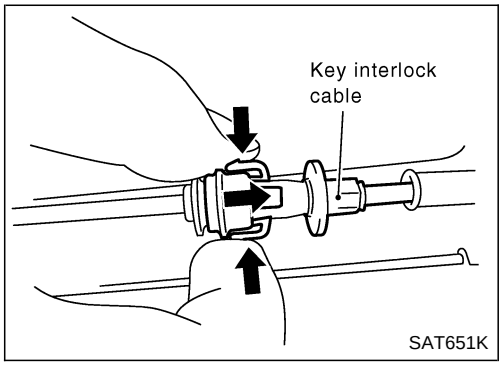
Check stop lamp switch after adjusting brake pedal — refer to BR section.

Key Interlock Cable



CAUTION:

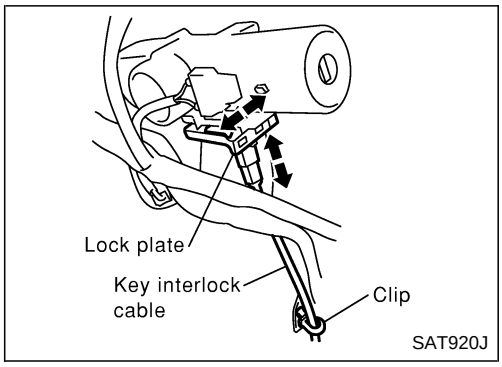
- **Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.**
- **After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions. If casing cap can be removed with an external load of less than 39.2 N (4.0 kg, 8.8 lb), replace key interlock cable with new one.**



REMOVAL

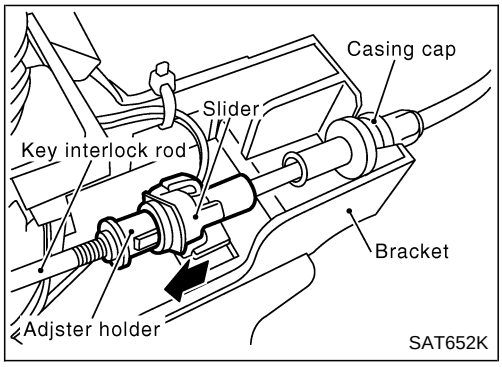
Unlock slider from adjuster holder and remove rod from cable.

Key Interlock Cable (Cont'd)



INSTALLATION

1. Set key interlock cable to steering lock assembly and install lock plate.
2. Clamp cable to steering column and fix to control cable with band.
3. Set selector lever to P position.



4. Insert interlock rod into adjuster holder.
5. Install casing cap to bracket.
6. Move slider in order to fix adjuster holder to interlock rod.

ON-VEHICLE SERVICE

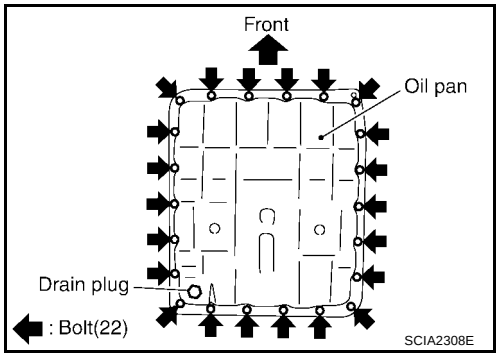
PFP:31020

Control Valve Assembly

ACS004LN

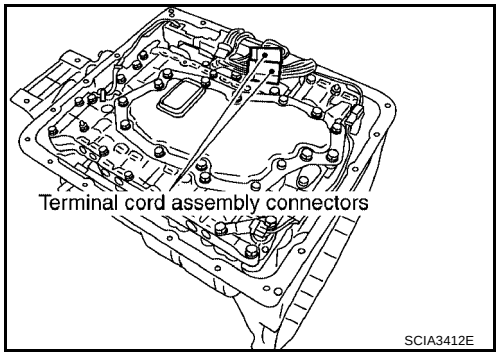
REMOVAL

1. Disconnect the negative battery terminal
2. Disconnect heated oxygen sensor 2 harness connector.
3. Drain ATF through drain plug.
4. Remove oil pan and oil pan gasket.



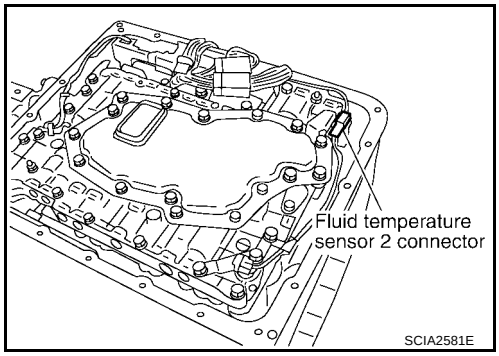
5. Disconnect terminal cord assembly connectors.

CAUTION:
Be careful not to damage connector.



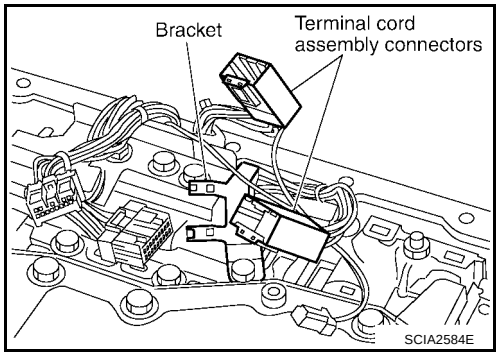
6. Disconnect fluid temperature sensor 2 connector.

CAUTION:
Be careful not to damage connector.



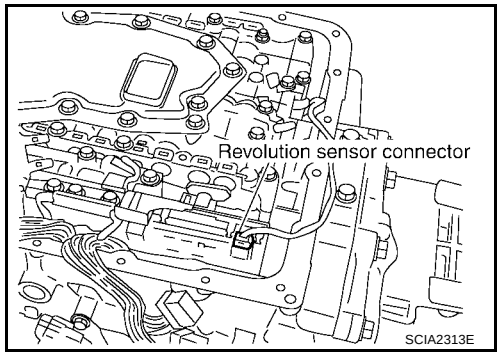
7. Remove terminal cord assembly connectors from bracket.

CAUTION:
Be careful not to damage connector.



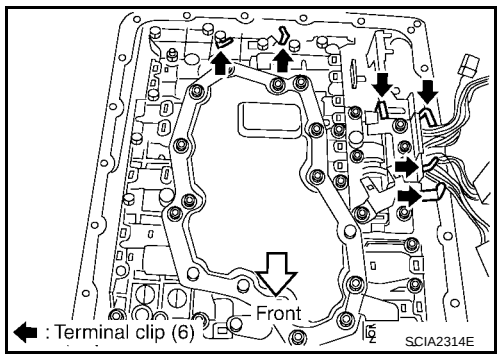
8. Disconnect revolution sensor connector.

CAUTION:
Be careful not to damage connector.



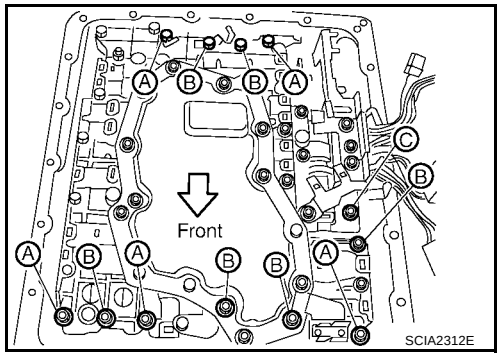
9. Straighten terminal clips to free terminal cord assembly and revolution sensor harness then remove terminal clips.

CAUTION:
Hang down terminal cord assembly and revolution sensor harness toward outside so as not to disturb removal of control valve assembly.



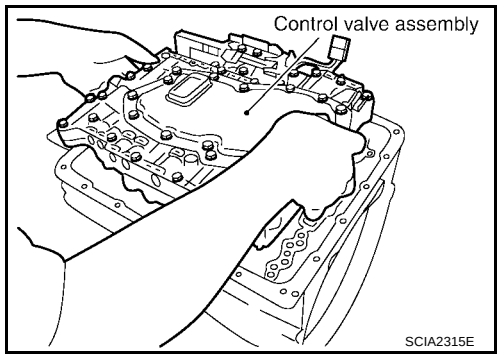
10. Remove bolts A, B and C from control valve assembly.

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1

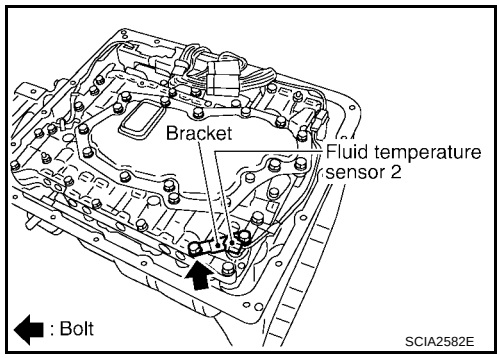


11. Remove control valve assembly from transmission case.

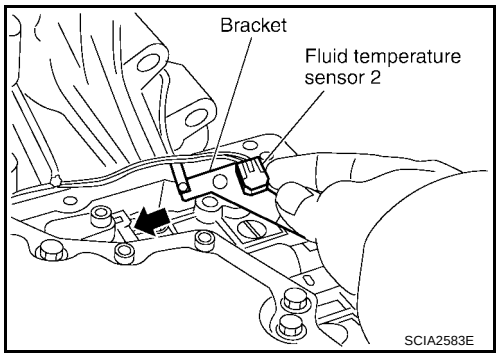
CAUTION:
When removing, be careful with the manual valve notch and manual plate height. Remove it vertically.



12. Remove fluid temperature sensor 2 with bracket from control valve assembly.

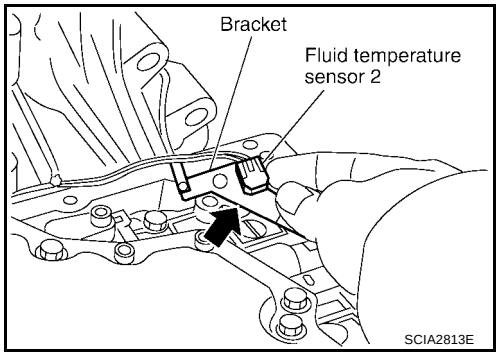


13. Remove bracket from fluid temperature sensor 2.



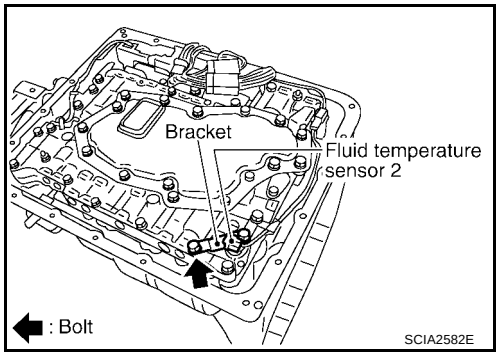
INSTALLATION

1. Install fluid temperature sensor 2 in bracket.



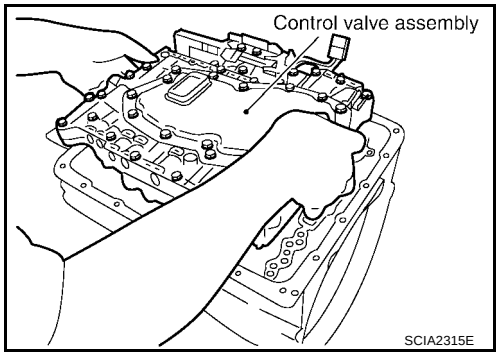
2. Install fluid temperature sensor 2 in control valve assembly. (With bracket.)

: 6.9 - 8.8 N·m (0.71 - 0.89 kg-m, 61 - 77 in-lb)



3. Install control valve assembly.

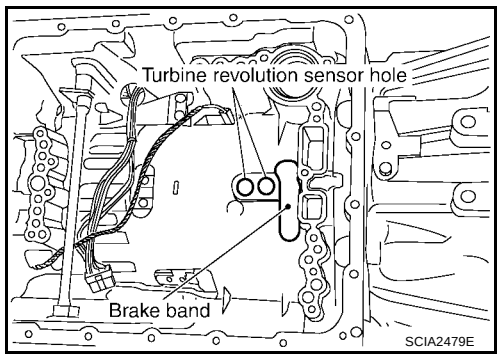
a. Install control valve assembly in transmission case.



CAUTION:

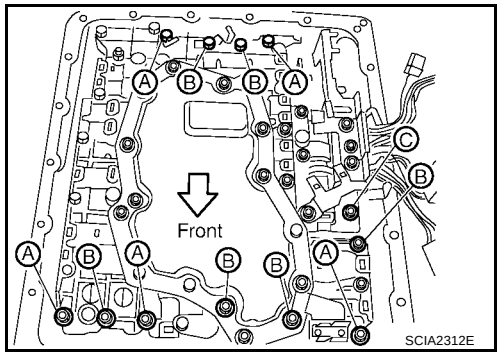
- **Hang down terminal cord assembly and revolution sensor harness toward outside so as not to disturb installation of control valve assembly.**
- **Make sure that turbine revolution sensor securely installs turbine revolution sensor hole.**

- **Assemble it so that manual valve cutout is engaged with manual plate projection.**



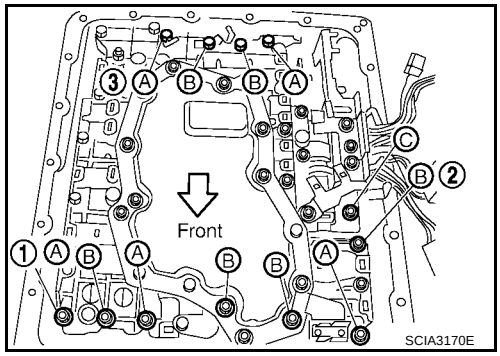
b. Install bolts A, B and C in control valve assembly.

Bolt symbol	Length mm (in)	Number of bolts
A	42 (1.65)	5
B	55 (2.17)	6
C	40 (1.57)	1

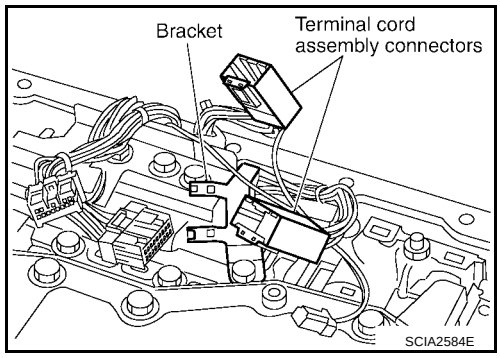


c. Tighten bolt 1, 2 and 3 temporarily to prevent dislocation. After that tighten them in order (1 → 2 → 3), and then tighten other bolts.

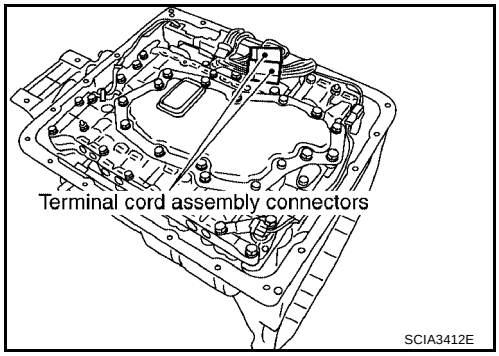
: **6.9 - 8.8 N·m (0.71 - 0.89 kg-m, 61 - 77 in-lb)**



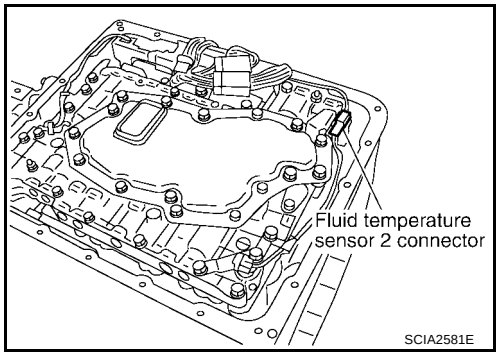
4. Install terminal cord assembly connectors in bracket.



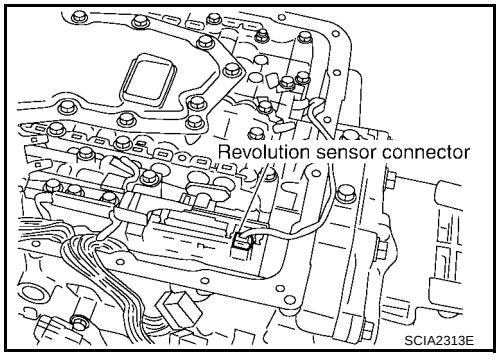
5. Connect terminal cord assembly connectors.



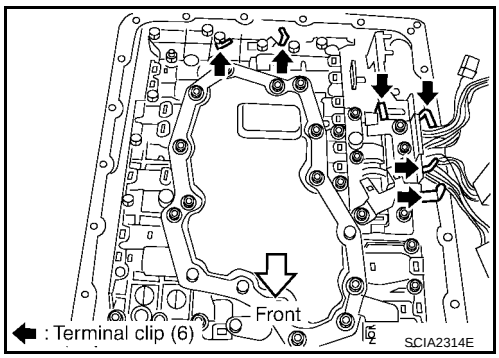
6. Connect fluid temperature sensor 2 connector.



7. Connect revolution sensor connector.



8. Securely fasten terminal harness with terminal clips.



9. Install oil pan in transmission case.

a. Install oil pan gasket in oil pan.

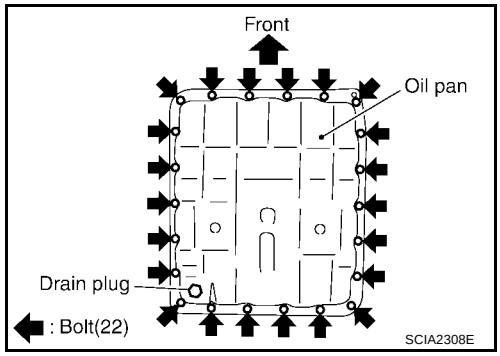
CAUTION:

- **Do not reuse oil pan gasket.**
- **Install it in the direction to align hole positions.**

b. Install oil pan (with oil pan gasket) in transmission case.

CAUTION:

- **Install it so that drain plug comes to the position as shown in the figure.**
- **Be careful not to pinch harnesses.**

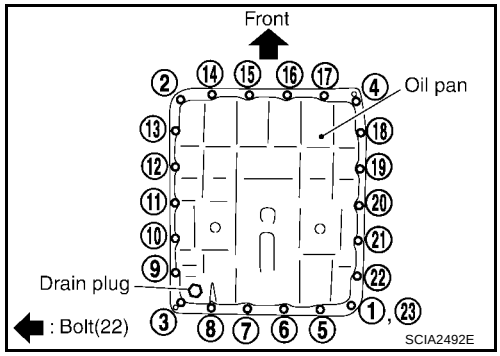


c. Tighten oil pan mounting bolts to the specified torque in numerical order shown in the figure after temporarily tightening them.

CAUTION:

Do not reuse oil pan mounting bolts.

: 6.9 - 8.8 N·m (0.71 - 0.89 kg-m, 61 - 77 in-lb)



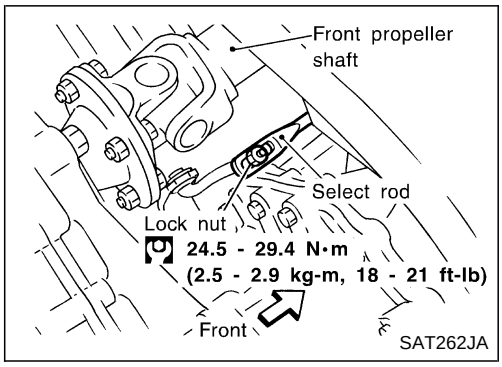
10. Install drain plug in oil pan.

CAUTION:

Do not reuse drain plug gasket.

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

11. Connect heated oxygen sensor 2 harness connector.
12. Connect the negative battery terminal

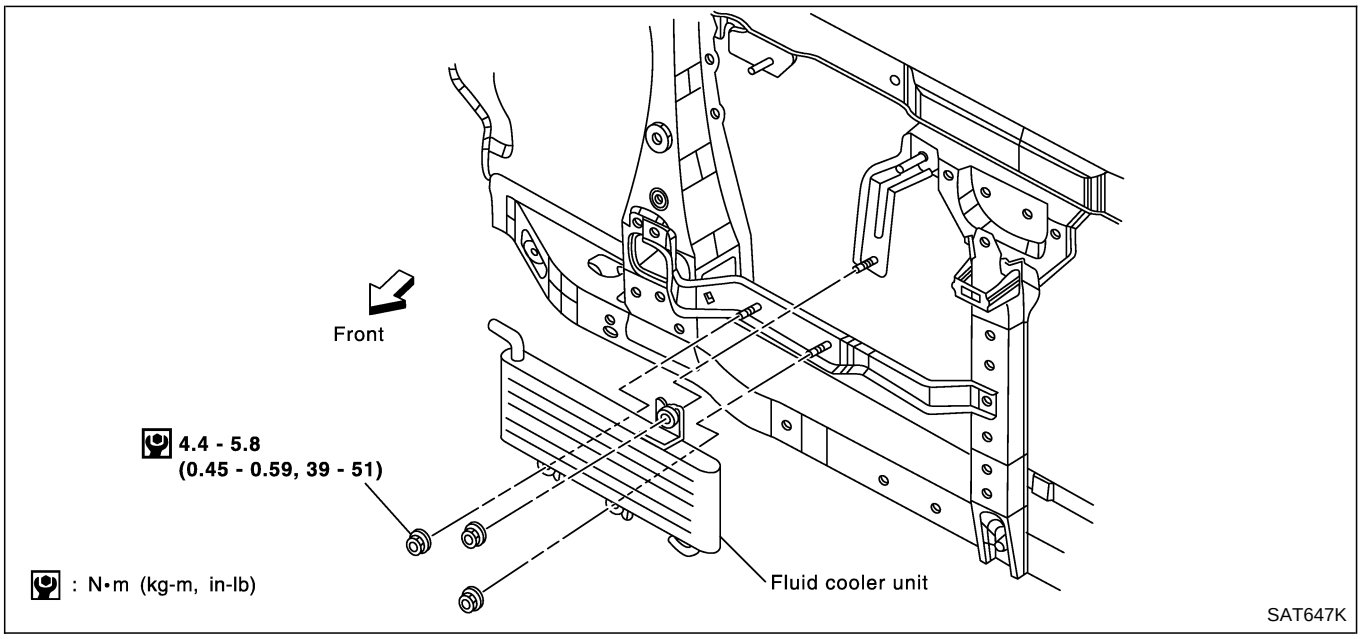


Control Linkage Adjustment

Move selector lever from “P” position to “D” position. You should be able to feel the detents in each position.
If the detents cannot be felt or the pointer indicating the position is improperly aligned, the linkage needs adjustment.

1. Place selector lever in “P” position.
2. Loosen lock nut.
3. Place manual shaft in “P” position.
4. Tighten lock nut to the specified torque.
5. Move selector lever from “P” position to “D” position. Make sure that selector lever can move smoothly.

A/T Fluid Cooler

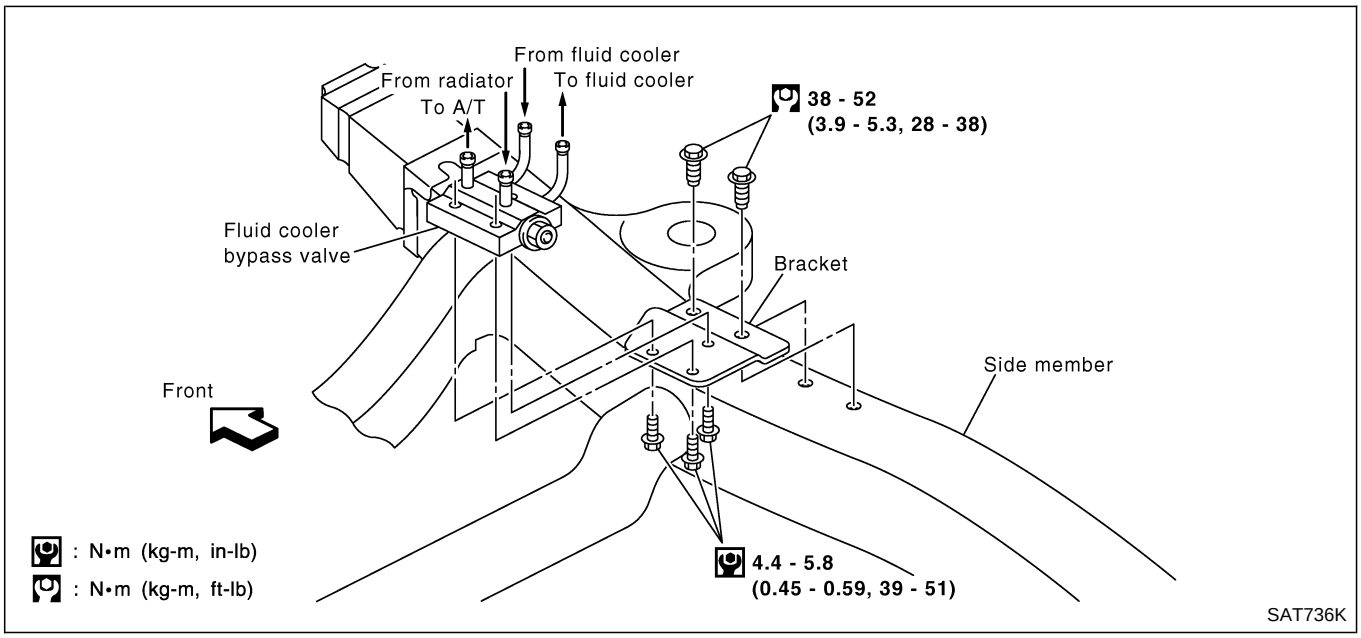


REMOVAL AND INSTALLATION

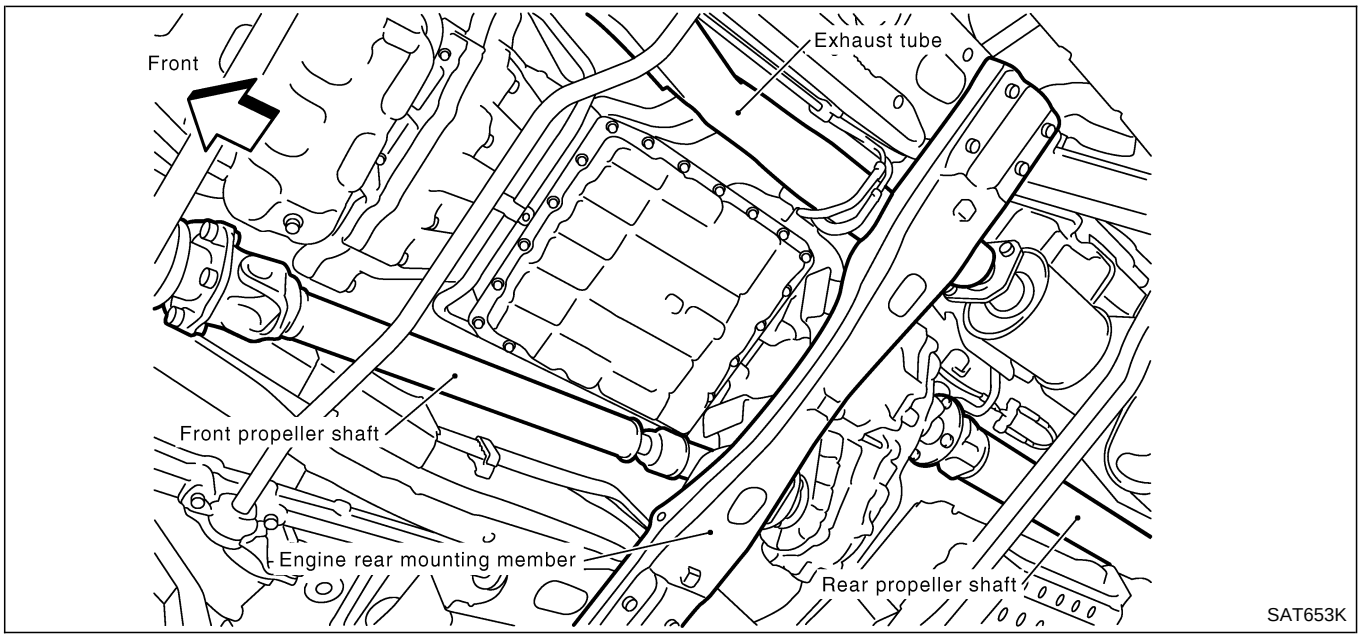
1. Remove front radiator grill. Refer to BT section.
2. Disconnect fluid hoses from A/T fluid cooler unit.
3. Remove A/T fluid cooler unit.
4. Remove clips securing fluid hose (A/T fluid cooler unit to radiator) and loosen hose clamps, then remove the fluid hose.
5. Loosen clamps securing fluid hose (A/T assembly to A/T fluid cooler unit), then remove the fluid hose.
6. Remove bolts securing A/T fluid cooler tube bracket.
7. Remove fluid hose with bracket.

- Reverse the removal procedure to install the A/T fluid cooler unit. Refer to the component drawing and specified tightening torque.
- Check A/T fluid level and refill if necessary. Refer to MA section (“CHASSIS AND BODY MAINTENANCE”).

A/T Fluid Cooler Bypass Valve/For Europe

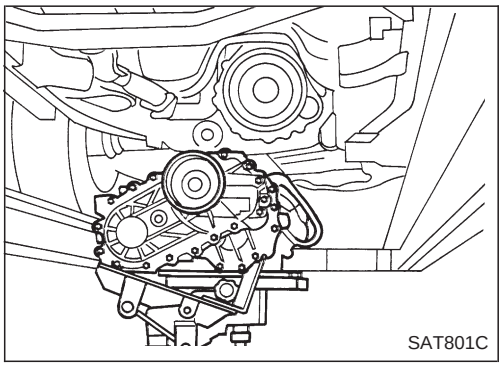


Removal



1. Remove battery negative terminal.
2. Remove exhaust tube.
3. Remove fluid charging pipe from A/T assembly.
4. Remove oil cooler pipe from A/T assembly.
5. Plug up openings such as the fluid charging pipe hole, etc.
6. Remove propeller shaft. Refer to PD section.
7. Remove transfer control linkage and transfer harness connectors from transfer. Refer to TF section.
8. Remove A/T control linkage from A/T assembly.
9. Disconnect A/T solenoid valve (A/T unit assembly) harness connectors.
10. Remove starter motor. Refer to EL section.
11. Remove bolts securing torque converter to drive plate.

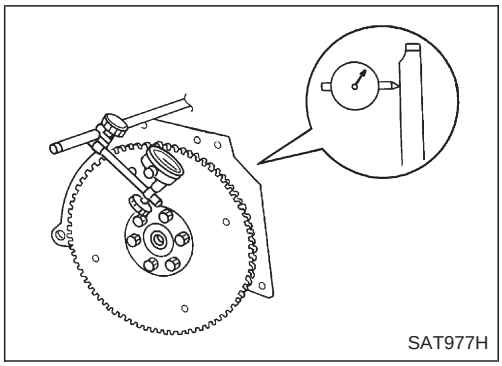
- **Remove the bolts by turning crankshaft.**



12. Support A/T and transfer assembly with a jack.
13. Remove engine rear mounting member from body and A/T assembly. Refer to EM section.
14. Remove bolts securing A/T assembly to engine.

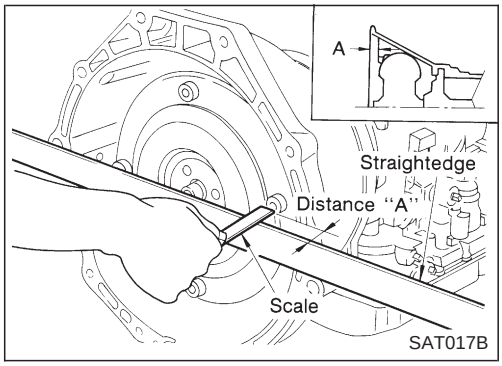
- **Secure torque converter to prevent it from dropping.**
- **Secure A/T assembly to a jack.**

15. Lower A/T assembly with transfer.


SAT977H

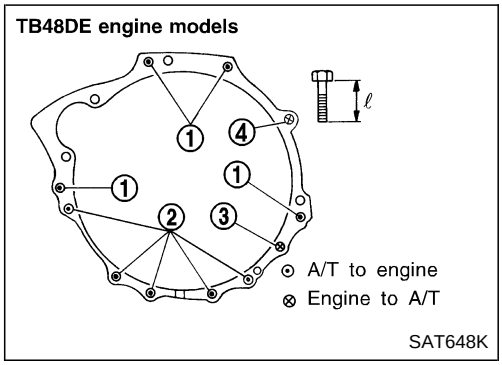
Installation

- Drive plate runout
  Maximum allowable runout:
  Refer to EM section, “DRIVE PLATE RUNOUT”.
  If this runout is out of specification, replace drive plate with ring gear.



SAT017B

- When connecting torque converter to transmission, measure distance “A” to be certain that they are correctly assembled.
  Distance “A”:
  25.0 mm (0.984 in) or more
- Install converter to drive plate.
- **After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.**



SAT648K

- Tighten bolts securing transmission.

Bolt No.	Tightening torqueN·m (kg-m, ft-lb)	Bolt length “ℓ”mm (in)
①	83 - 113 (8.5 - 11.5, 62 - 83)	62 (2.44)
②	29 - 39 (3.0 - 3.9, 22 - 28)	63 (2.48)
③	29 - 39 (3.0 - 3.9, 22 - 28)	43 (1.69)
④	29 - 39 (3.0 - 3.9, 22 - 28)	50 (1.97)

- Reinstall any part removed.
- Check fluid level in transmission.
- Check fluid leakage.
- Move selector lever through all positions to be sure that transmission operates correctly.
  With parking brake applied, rotate engine at idling. Move selector lever through “N” to “D” and to “R” positions. A slight shock should be felt by hand gripping selector each time transmission is shifted.
- Perform road test. Refer to “ROAD TEST”, AT-53.
- When replacing the A/T assembly, erase EFP ROM in TCM. Refer to AT-15, “Precautions for A/T Assembly Replacement”.

General Specifications

Engine		TB48DE	
Automatic transmission model		RE5R05A	
Destination		Except for Europe	For Europe
Transmission model code number		90X07	90X21
Stall torque ratio		2.0 : 1	
Transmission gear ratio	1st	3.540	
	2nd	2.264	
	3rd	1.471	
	4th	1.000	
	5th	0.834	
	Reverse	2.370	
Recommended fluid		Nissan Matic Fluid J*1	
Fluid capacity		10.4 - 10.7 liter (9-1/8 - 9-3/8 Imp qt)	

CAUTION:
- **Use only Nissan Genuine ATF Matic Fluid J. Do not mix with other fluid.**
- **Using automatic transmission fluid other than Nissan Genuine ATF Matic Fluid J will deteriorate in driveability and automatic transmission durability, and may damage the automatic transmission, which is not covered by the warranty.**

*1: Refer to MA section, “Fluids and Lubricants”.

Vehicle Speed When Shifting Gears

Throttle position	Vehicle Speed km/h (MPH)							
	$D_1 \rightarrow D_2$	$D_2 \rightarrow D_3$	$D_3 \rightarrow D_4$	$D_4 \rightarrow D_5$	$D_5 \rightarrow D_4$	$D_4 \rightarrow D_3$	$D_3 \rightarrow D_2$	$D_2 \rightarrow D_1$
Full throttle	52 - 56 (32 - 35)	81 - 89 (50 - 55)	126 - 136 (78 - 85)	188 - 198 (117 - 123)	184 - 194 (114 - 121)	116 - 126 (72 - 78)	70 - 78 (43 - 48)	36 - 40 (22 - 25)
Half throttle	32 - 36 (20 - 22)	62 - 68 (39 - 42)	104 - 112 (65 - 70)	126 - 134 (78 - 83)	100 - 108 (62 - 67)	61 - 69 (38 - 43)	37 - 43 (23 - 27)	10 - 14 (6 - 9)

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

Vehicle Speed When Performing and Releasing Lock-up

Throttle position	Vehicle speed km/h (MPH)	
	Lock-up “ON”	Lock-up “OFF”
Closed throttle	64 - 72 (39 - 45)	61 - 69 (38 - 43)
Half throttle	164 - 172 (102 - 107)	130 - 138 (81 - 86)

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

Stall Revolution

Stall revolution	1,900 - 2,200 rpm

Line Pressure

Engine speed (rpm)	Line Pressure kpa (bar, kg/cm^2, psi)	
	“R” position	“D”, “M” positions
Idling Revolution	392 - 441 (3.9 - 4.4, 4.0 - 4.5, 57 - 64)	373 - 422 (3.7 - 4.2, 3.8 - 4.3, 54 - 61)
Stall Revolution	1,310 - 1,500 (13.1 - 15.0, 13.4 - 15.3, 191 - 218)	

Solenoid Valves

Name	Resistance (Approx.) (Ω)	Terminal No.
Line pressure solenoid valve	3 - 9	7
Torque converter clutch solenoid valve		8
Input clutch solenoid valve		6
High & low reverse clutch solenoid valve		3
Front brake solenoid valve		5
Direct clutch solenoid valve		4
Low coast brake solenoid valve	20 - 40	2

A/T Fluid Temperature Sensor

Name	Condition	CONSULT-II “DATA MONITOR” (Approx.) (V)	Resistance (Approx.) (kΩ)
A/T fluid temperature sensor-1	0°C (32°F)	2.2	15
	20°C (68°F)	1.8	0.6
	80°C (176°F)	0.6	0.9
A/T fluid temperature sensor-2	0°C (32°F)	2.2	10
	20°C (68°F)	1.7	4
	80°C (176°F)	0.45	0.5

Turbine Revolution Sensor

Name	Condition	Data (Approx.)
Turbine revolution sensor-1	When moving at 50 km/h (31 MPH) in 4th gear with the closed throttle position signal “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	1.1 (kHz)
Turbine revolution sensor-2	When running at 20 km/h (12 MPH) in 1st gear with the closed throttle position signal “OFF”, use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	

Revolution Sensor

Name	Condition	Data (Approx.)
Revolution sensor	When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. **CAUTION:** **Connect the diagnosis data link connector to the vehicle diagnosis connector.**	149 (Hz)