TROUBLE DIAGNOSIS - INDEX

PFP:00000

Alphabetical & P No. Index for DTC

ECS002Q5

ALPHABETICAL INDEX FOR DTC

Items (CONSULT-II screen terms)	DTC	Reference page
	CONSULT-II GST*1	
A/T 1ST GR FNCTN	P0731	AT-131, "DTC P0731 A/T 1ST GEAR FUNCTION"
A/T 2ND GR FNCTN	P0732	AT-137, "DTC P0732 A/T 2ND GEAR FUNCTION"
A/T 3RD GR FNCTN	P0733	AT-142, "DTC P0733 A/T 3RD GEAR FUNCTION"
A/T 4TH GR FNCTN	P0734	AT-147, "DTC P0734 A/T 4TH GEAR FUNCTION"
A/T TCC S/V FNCTN	P0744	AT-160, "DTC P0744 A/T TCC S/V FUNCTION (LOCK-UP)"
ATF TEMP SEN/CIRC	P0710	AT-118, "DTC P0710 A/T FLUID TEMPERATURE SENSOR CIRCUIT"
ENGINE SPEED SIG	P0725	AT-127, "DTC P0725 ENGINE SPEED SIGNAL"
L/PRESS SOL/CIRC	P0745	AT-169, "DTC P0745 LINE PRESSURE SOLENOID VALVE"
O/R CLTCH SOL/CIRC	P1760	AT-193, "DTC P1760 OVER-RUN CLUTCH SOLENOID VALVE"
PNP SW/CIRC	P0705	AT-113, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH"
SFT SOL A/CIRC*2	P0750	AT-175, "DTC P0750 SHIFT SOLENOID VALVE A"
SFT SOL B/CIRC*2	P0755	AT-180, "DTC P0755 SHIFT SOLENOID VALVE B"
TCC SOLENOID/CIRC	P0740	AT-155, "DTC P0740 TORQUE CONVERTER CLUTCH SOLE-NOID VALVE"
TP SEN/CIRC A/T*2	P1705	AT-185, "DTC P1705 THROT-TLE POSITION SENSOR"
VEH SPD SEN/CIR AT*3	P0720	AT-123, "DTC P0720 VEHICLE SPEED SENSOR·A/T (REVO-LUTION SENSOR)"

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

PRECAUTIONS

PFP:00001

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

ECS002NP

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

WARNING:

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

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

ECS002NQ

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

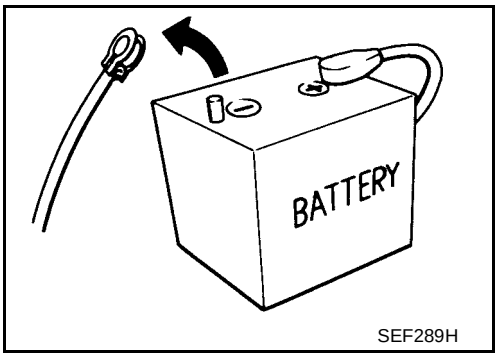
CAUTION:

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

Precautions

ECS002NR

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



SEF289H

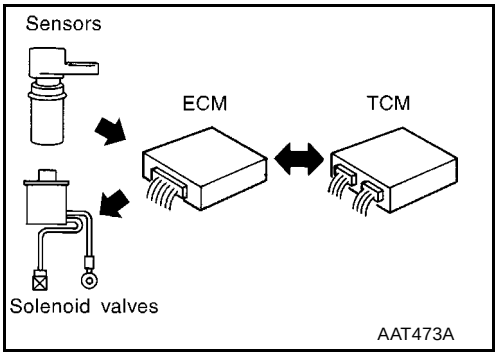
TROUBLE DIAGNOSIS — INTRODUCTION

PFP:00000

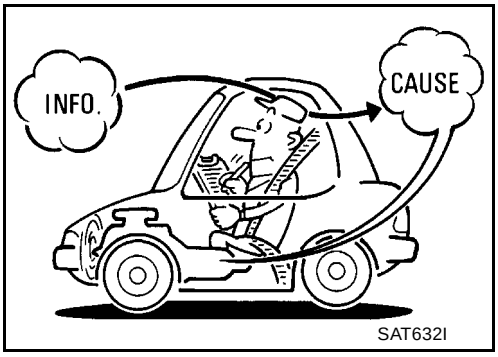
Introduction

ECS002O2

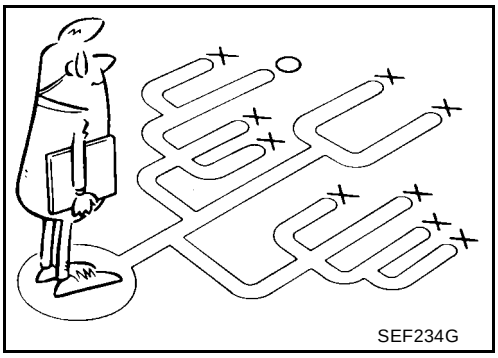
The TCM receives a signal from the vehicle speed sensor, throttle position sensor or PNP switch and provides shift control or lock-up control via A/T solenoid valves.
The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the OBD-related parts of the A/T system 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 “Work Flow”. Refer to AT-59, "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” like the example (AT-56, "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 for information.



DIAGNOSTIC WORKSHEET

Information from Customer

KEY POINTS

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

Customer name MR/MS	Model & Year	VIN
Trans. model	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	❑ Continuous ❑ Intermittent (times a day)	

Items	Symptom	Condition	Diagnostic Item	Reference Page	
				QG18DE (Calif. CA Model)	QG18DE (Except Calif. CA Model)
Slips/Will Not Engage	Vehicle will not run in any position.	ON vehicle	1. Fluid level	AT-62, "FLUID LEVEL CHECK"	
			2. Control cable adjustment	AT-260, "Control Cable Adjustment"	
			3. Line pressure test	AT-66, "Line Pressure Test"	
			4. Line pressure solenoid valve	AT-169, "DTC P0745 LINE PRESSURE SOLENOID VALVE"	
		OFF vehicle	5. Oil pump	AT-291, "OIL PUMP"	
			6. High clutch	AT-317, "HIGH CLUTCH"	
			7. Brake band	AT-347, "Components"	
			8. Low & reverse brake	AT-331, "LOW & REVERSE BRAKE"	
			9. Torque converter	AT-265, "Components"	
			10. Parking components	AT-265, "Components"	
Not Used	Transmission noise in “D”, “2”, “1” and “R” positions.	ON vehicle	1. Fluid level	AT-62, "FLUID LEVEL CHECK"	
		OFF vehicle	2. Torque converter	AT-265, "Components"	
No Down Shift	Failure to change from “D_3” to “2_2” when changing lever into “2” position. AT-240, "18. A/T Does Not Shift: $D_3 \rightarrow 2_2$, When Selector Lever “D” → “2” Position"	ON vehicle	1. PNP switch adjustment	AT-260, "Park/Neutral Position (PNP) Switch Adjustment"	
			2. Throttle position sensor (Adjustment)	EC-743, "DTC P0121, P0122, P0123 TP SENSOR"	EC-185, "DTC P0121, P0122, P0123 TP SENSOR"
			3. Overrun clutch solenoid valve	AT-193, "DTC P1760 OVERRUN CLUTCH SOLENOID VALVE"	
			4. Shift solenoid valve B	AT-180, "DTC P0755 SHIFT SOLENOID VALVE B"	
			5. Shift solenoid valve A	AT-175, "DTC P0750 SHIFT SOLENOID VALVE A"	
			6. Control valve assembly	AT-296, "CONTROL VALVE ASSEMBLY"	
			7. Control cable adjustment	AT-260, "Control Cable Adjustment"	
No Down Shift	Failure to change from “D_3” to “2_2” when changing lever into “2” position. AT-240, "18. A/T Does Not Shift: $D_3 \rightarrow 2_2$, When Selector Lever “D” → “2” Position"	OFF vehicle	8. Brake band	AT-347, "Components"	
			9. Overrun clutch	AT-323, "FORWARD CLUTCH AND OVER-RUN CLUTCH"	

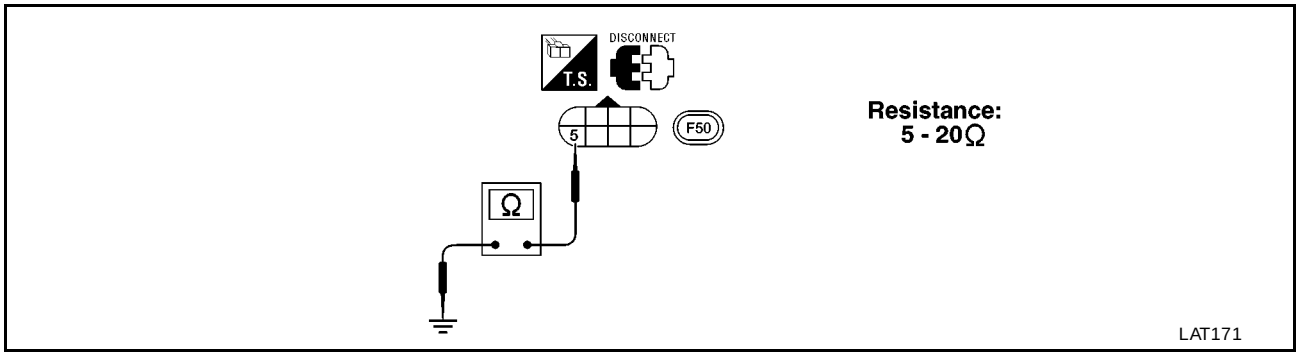
TCM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND GROUND				
TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
3	GY/R or Y/G	TORQUE CONVERTER CLUTCH SOLENOID VALVE	WHEN A/T PERFORMS LOCK-UP	8 - 15V
			WHEN A/T DOES NOT PERFORM LOCK-UP	0V

Diagnostic Procedure

ECS002JA

1. CHECK VALVE RESISTANCE

1. Turn ignition switch to “OFF” position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal 5 and ground.



OK or NG

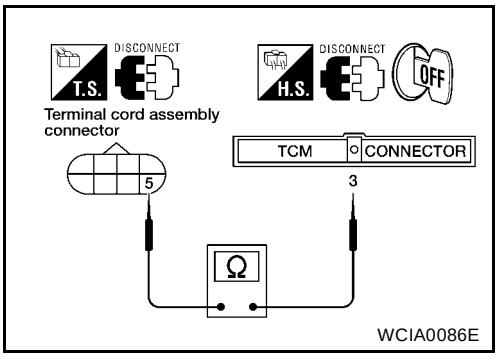
OK >> GO TO 2.
NG >> 1. Remove oil pan. Refer to AT-257, "REMOVAL" .
2. Check the following items:
- Torque converter clutch solenoid valve
Refer to AT-158, "TORQUE CONVERTER CLUTCH SOLENOID VALVE" .
- Harness of terminal cord assembly for short or open

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “OFF” position.
2. Disconnect TCM harness connector F56.
3. Check continuity between terminal cord assembly F50 terminal 5 GY/R (Calif. CA Model) or Y/G (exc. Calif. CA Model) and TCM harness connector terminal 3 GY/R (Calif. CA Model) or Y/G (exc. Calif. CA Model).

Continuity should exist.

If OK, check harness for short to ground and short to power.
4. 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.

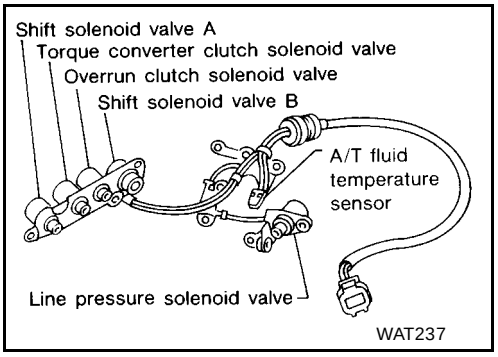
DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

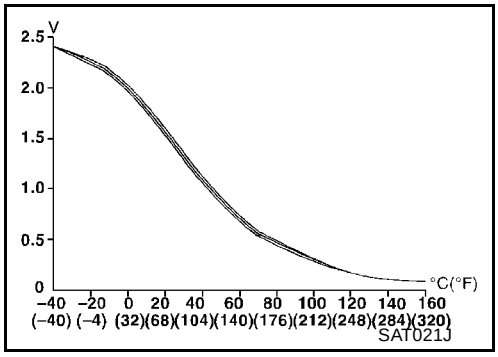
PFP:31940

Description

ECS002K0

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





CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when ...	Check items (Possible cause)
: BATT/FLUID TEMP SEN : 8th judgement flicker	TCM receives an excessively low or high voltage from the sensor.	● Harness or connectors (The sensor circuit is open or shorted.) ● A/T fluid temperature sensor

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

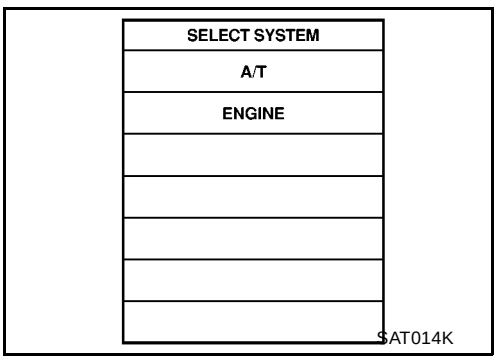
After the repair, perform the following procedure to confirm the malfunction is eliminated.

With CONSULT-II

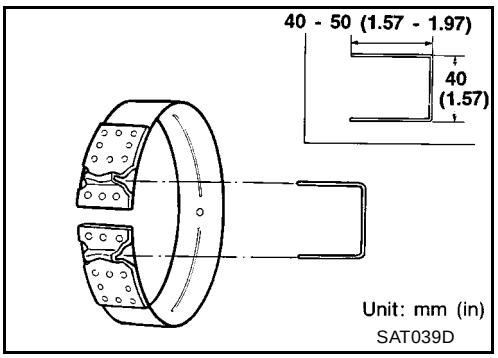
1. Start engine.
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Drive vehicle under the following conditions:
   Selector lever in “D”, vehicle speed higher than 20 km/h (12 MPH).

Without CONSULT-II

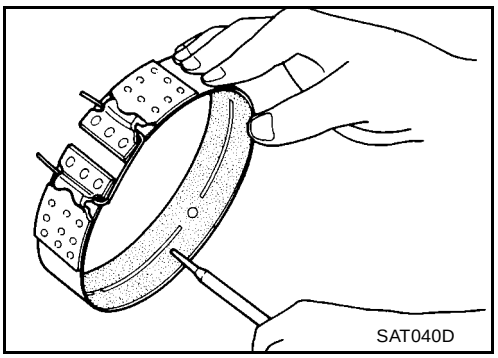
1. Start engine.



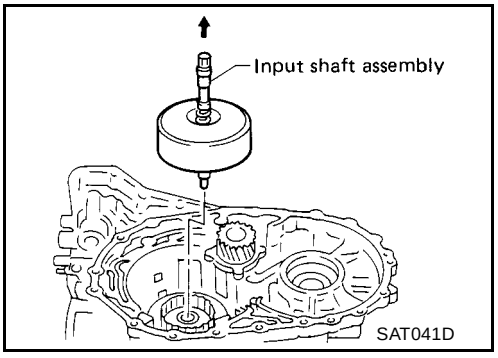
- **To prevent brake linings from cracking or peeling, do not stretch the flexible band unnecessarily. When removing the brake band, always secure it with a clip as shown. Leave the clip in position after removing the brake band.**



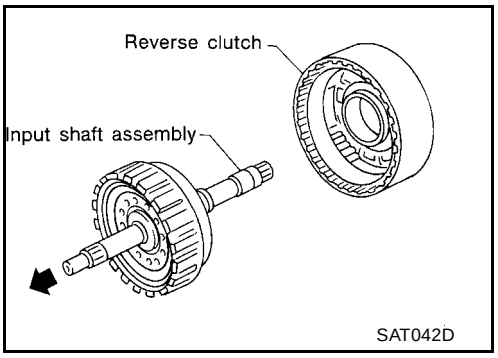
c. Check brake band facing for damage, cracks, wear or burns.



29. Remove input shaft assembly (high clutch) and reverse clutch according to the following procedures.



a. Remove input shaft assembly (high clutch) with reverse clutch.
b. Remove input shaft assembly (high clutch) from reverse clutch.

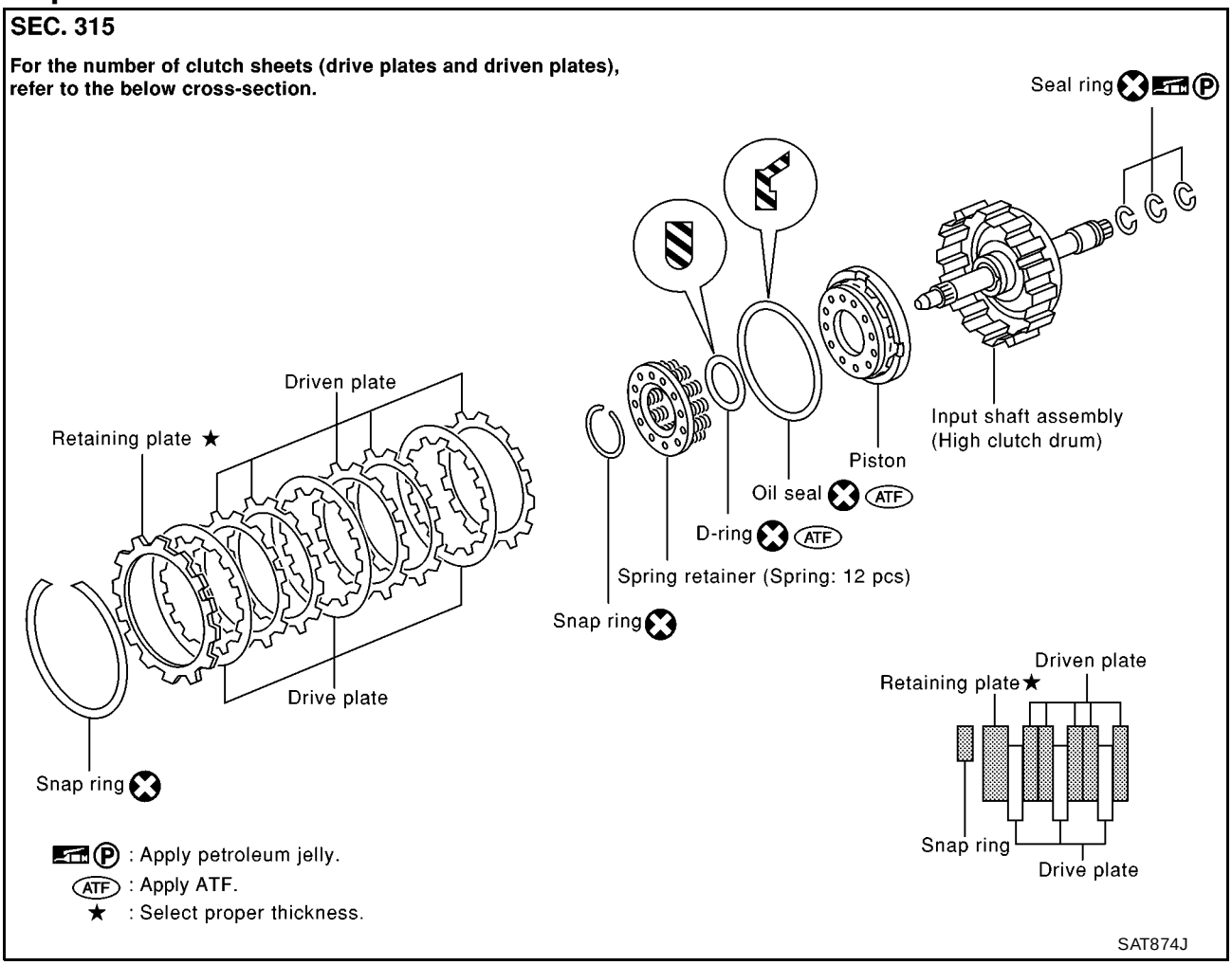


HIGH CLUTCH

PFP:31410

Components

ECS002M3



Disassembly

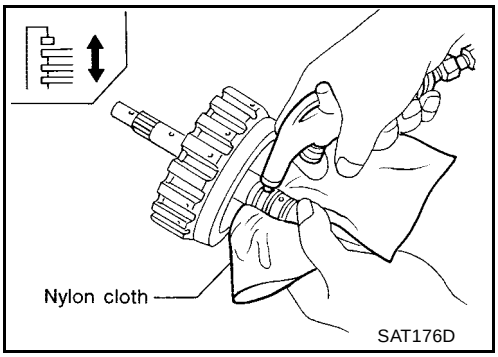
ECS002M4

1. Check operation of high clutch.

a. Apply compressed air to oil hole of input shaft.
   - **Stop up a hole on opposite side of input shaft.**

b. Check to see that retaining plate moves to snap ring.

c. If retaining plate does not contact snap ring:
   - D-ring might be damaged.
   - Oil seal might be damaged.
   - Fluid might be leaking past piston check ball.



	Thickness mm (in)	Part number*
Thickness of retaining plate	3.6 (0.142) 3.8 (0.150) 4.0 (0.157) 4.2 (0.165) 4.4 (0.173) 4.6 (0.181)	31667-31X16 31667-31X17 31667-31X18 31667-31X19 31667-31X20 31667-31X21

*: Always check with the Parts Department for the latest parts information.

BRAKE BAND

Anchor end pin tightening torque	3.5 - 5.9 N-m (0.35 - 0.6 kg-m, 31 - 52 in-lb)
Number of returning revolutions for anchor end pin	2.5±0.125
Lock nut tightening torque	31 - 36 N-m (3.2 - 3.7 kg-m, 23 - 27 ft-lb)

Clutch and Brake Return Springs

ECS002N7

Unit: mm (in)

Parts		Free length	Outer diameter	Part number*
Forward clutch (Overrun clutch)	Outer (16 pcs)	26.6 (1.047)	10.6 (0.417)	31505-31X02
	Inner (16 pcs)	26.3 (1.035)	7.7 (0.303)	31505-31X03
Reverse clutch (16 pcs)		18.6 (0.732)	8.0 (0.315)	31505-31X00
High clutch (12 pcs)		19.7 (0.776)	11.1 (0.437)	31505-31X01
Low reverse brake (20 pcs)		25.1 (0.988)	7.6 (0.299)	31505-31X04

*: Always check with the Parts Department for the latest parts information.

Oil Pump

ECS002N8

Oil pump side clearance mm (in)		0.02 - 0.04 (0.0008 - 0.0016)	
Thickness of inner gears and outer gears		Inner gear	
		Thickness mm (in)	Part number*
		9.99 - 10.00 (0.3933 - 0.3937) 9.98 - 9.99 (0.3929 - 0.3933) 9.97 - 9.98 (0.3925 - 0.3929)	31346-31X00 31346-31X01 31346-31X02
		Outer gear	
		Thickness mm (in)	Part number*
		9.99 - 10.00 (0.3933 - 0.3937) 9.98 - 9.99 (0.3929 - 0.3933) 9.97 - 9.98 (0.3925 - 0.3929)	31347-31X00 31347-31X01 31347-31X02
Clearance between oil pump housing and outer gear mm (in)	Standard	0.08 - 0.15 (0.0031 - 0.0059)	
	Allowable limit	0.15 (0.0059)	
Oil pump cover seal ring clearance mm (in)	Standard	0.1 - 0.25 (0.0039 - 0.0098)	
	Allowable limit	0.25 (0.0098)	

*: Always check with the Parts Department for the latest parts information.

Input Shaft

ECS002N9

Unit: mm (in)

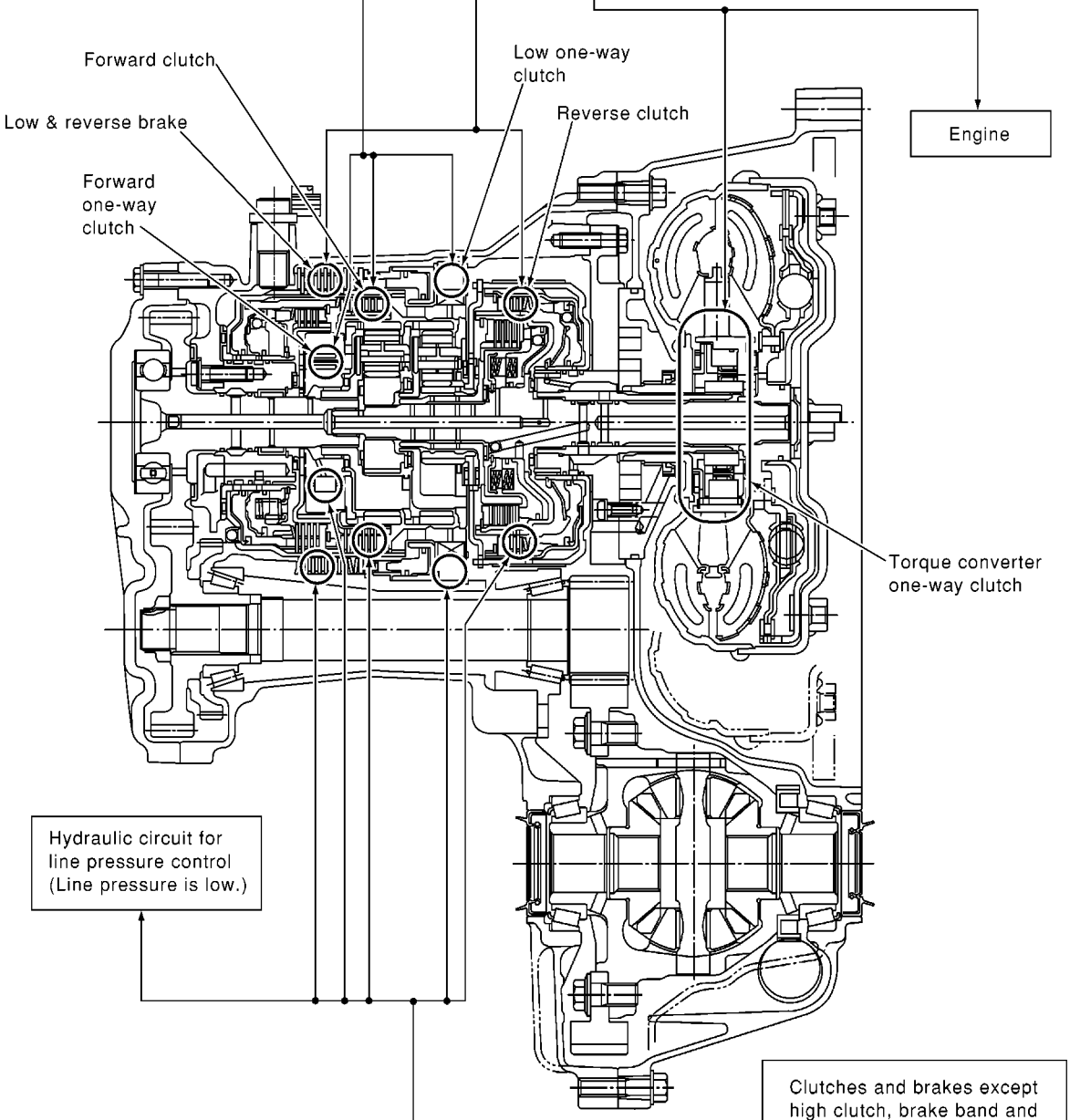
Input shaft seal ring clearance	Standard	0.08 - 0.23 (0.0031 - 0.0091)
	Allowable limit	0.23 (0.0091)

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

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

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

Damaged components



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

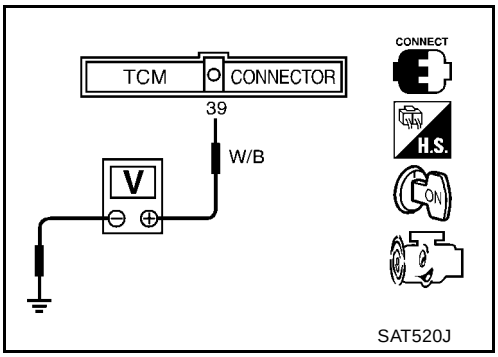
SAT499K

4. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

Without CONSULT-II

1. Start engine.
2. Check voltage between TCM connector F57 terminal 39 and ground.

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



OK or NG

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

5. DETECT MALFUNCTIONING ITEM

Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil
  Refer to EC-1757, "IGNITION SIGNAL" .

OK or NG

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

6. CHECK DTC

Perform AT-500, "Diagnostic Trouble Code (DTC) Confirmation Procedure" .

OK or NG

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

7. CHECK TCM INSPECTION

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

OK or NG

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

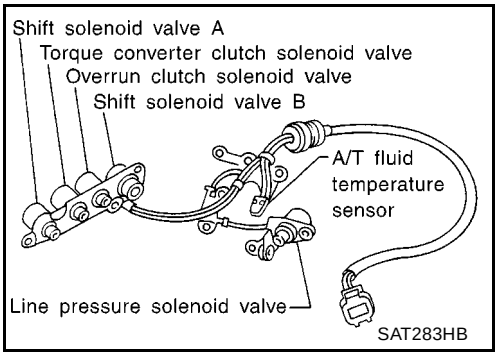
DTC BATT/FLUID TEMP SEN (A/T FLUID TEMP SENSOR CIRCUIT AND TCM POWER SOURCE)

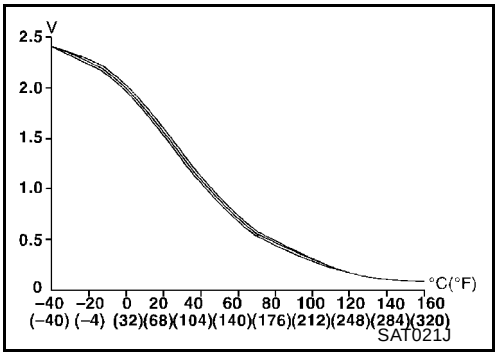
PFP:31940

Description

ECS003OH

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





CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

On Board Diagnosis Logic

ECS003OI

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

Possible Cause

ECS003OJ

Check the following items.

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

Diagnostic Trouble Code (DTC) Confirmation Procedure

ECS003OK

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

WITH CONSULT-II

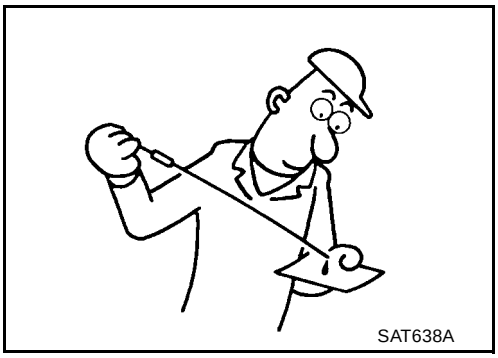
1. Start engine.

1. CHECK A/T FLUID LEVEL

Check A/T fluid level.

OK or NG

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

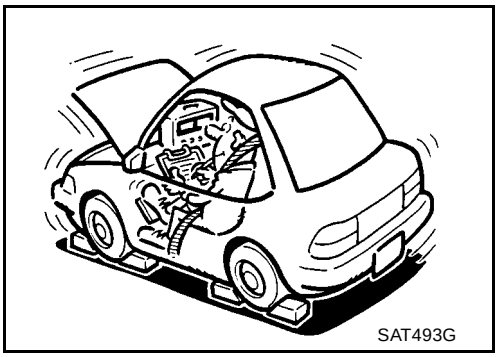

SAT638A

2. CHECK STALL REVOLUTION

Check stall revolution with selector lever in D position. Refer to AT-446, "Stall Test" .

OK or NG

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


SAT493G

3. DETECT MALFUNCTIONING ITEM

1. Remove control valve assembly. Refer to AT-636, "REMOVAL" .
2. Check the following items:

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

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

- Oil pump assembly
- Forward clutch assembly
- Forward one-way clutch
- Low one-way clutch
- Low & reverse brake assembly
- Torque converter

OK or NG

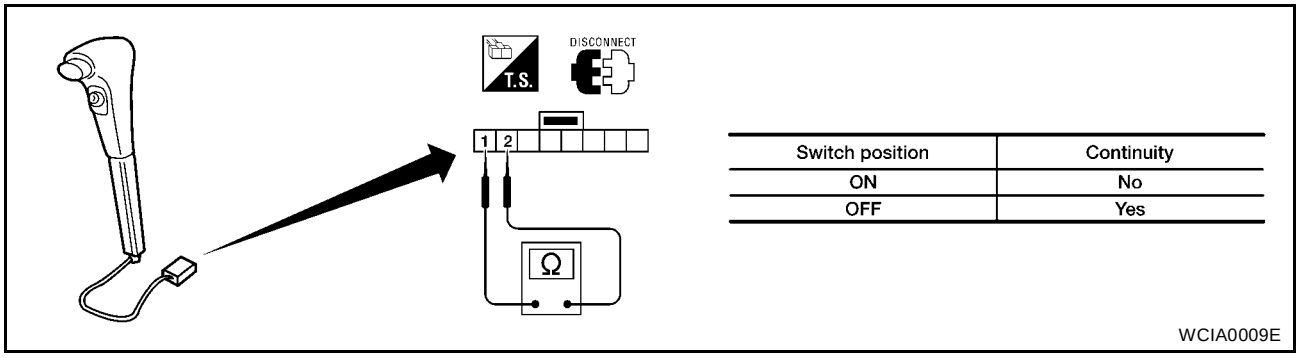
OK >> GO TO 4.
NG >> Repair or replace damaged parts.

6. DETECT MALFUNCTIONING ITEM

Check the following items:

- Overdrive control switch M44.

– Check continuity between two terminals.



Switch position	Continuity
ON	No
OFF	Yes

- Harness for short or open between TCM and overdrive control switch (Main harness)
- Harness of ground circuit for overdrive control switch (Main harness) for short or open

OK or NG

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

7. CHECK THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]

- Perform throttle position sensor [accelerator pedal position (APP) sensor] inspection. Refer to AT-555, "DTC P1705 THROTTLE POSITION SENSOR [ACCELERATOR PEDAL POSITION (APP) SENSOR]" .

OK or NG

OK >> GO TO 8.
NG >> Repair or replace damaged parts.

8. CHECK TCM INSPECTION

1. Perform TCM input/output inspection. Refer to AT-479, "Input/Output Signal Chart" .

OK or NG

OK >> INSPECTION END.
NG >> Inspect TCM terminals and related wiring harnesses for damage or loose connections. Repair or replace damaged parts.

INSPECTION

High Clutch Snap Ring, Spring Retainer and Return Springs

- Check for deformation, fatigue or damage.
  If necessary, replace.
- **When replacing spring retainer and return springs, replace them as a set.**

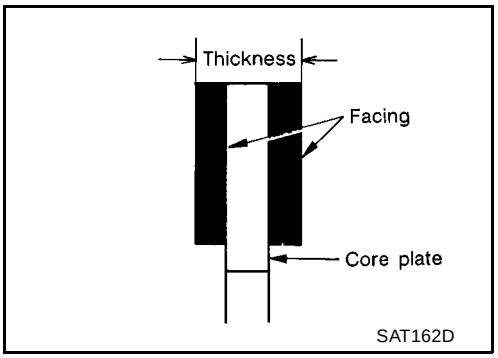
High Clutch Drive Plates

- Check facing for burns, cracks or damage.
- Measure thickness of facing.

Thickness of drive plate:

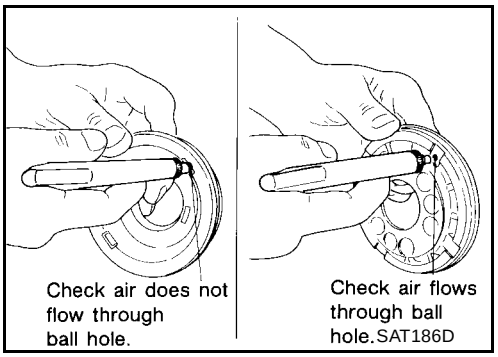
Standard value	**: 1.6 mm (0.063 in)**
Wear limit	**: 1.4 mm (0.055 in)**

- If not within wear limit, replace.



High Clutch Piston

- Make sure that check balls are not fixed.
- Apply compressed air to check ball oil hole opposite the return spring. Make sure there is no air leakage.
- Apply compressed air to oil hole on return spring side to make sure that air leaks past ball.

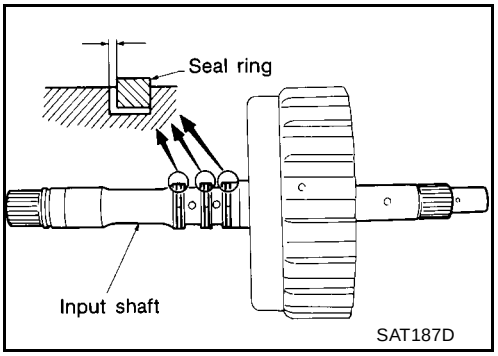


Seal Ring Clearance

- Install new seal rings onto input shaft.
- Measure clearance between seal ring and ring groove.

Standard clearance	**: 0.08 - 0.23 mm (0.0031 - 0.0091 in)**
Allowable limit	**: 0.23 mm (0.0091 in)**

- If not within allowable limit, replace input shaft assembly.



ASSEMBLY

1. Install D-rings on piston.
   - **Apply ATF to both parts.**