

SECTION CVT

CVT

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TROUBLE DIAGNOSIS - INDEX

PFP:00000

Alphabetical & P No. Index for DTC

ALPHABETICAL INDEX FOR DTC

ECS006M3

Check if the vehicle is a model with Euro-OBD system or not by the "Type approval number" on the identification plate. Refer to [GI-45, "IDENTIFICATION PLATE"](#).

Type approval number	Model
Available	With Euro-OBD system
Not available (blank)	Without Euro-OBD system

Items (CONSULT-II screen terms)	DTC		Reference page
	ECM*1	CONSULT-II GST*2	
FLUID TEMP SEN/CIRC	0710	P0710	CVT-62
ENG SPEED SIG	0725	P0725	CVT-74
LINE PRESSURE SEN	1791	P1791	CVT-103
L/PRESS SOL/CIRC	0745	P0745	CVT-82
PNP SW/CIRC	0705	P0705	CVT-57
PRI SPEED SIG/CIRC	0715	P0715	CVT-67
STEP MOTOR/CIRC	1777	P1777	CVT-97
STEP MOTOR/FNCTN	1778	P1778	CVT-101
TP SEN/CIRC A/T*3	1705	P1705	CVT-89
TCC SOLENOID/CIRC	0740	P0740	CVT-77
VEH SPD SEN/CIR A/T	0720	P0720	CVT-70

*1: In Diagnostic Test Mode II (Self-diagnostic results), these numbers are controlled by NISSAN.

*2: These numbers are prescribed by ISO15031-6.

*3: When the fail-safe operation occurs, the MI illuminates.

P. NO. INDEX FOR DTC

Check if the vehicle is a model with Euro-OBD system or not by the "Type approval number" on the identification plate. Refer to [GI-45, "IDENTIFICATION PLATE"](#).

Type approval number	Model
Available	With Euro-OBD system
Not available (blank)	Without Euro-OBD system

DTC		Items (CONSULT-II screen terms)	Reference page
CONSULT-II GST*2	ECM*1		
P0705	0705	PNP SW/CIRC	CVT-57
P0710	0710	FLUID TEMP SEN/CIRC	CVT-62
P0715	0715	PRI SPEED SIG/CIRC	CVT-67
P0720	0720	VEH SPD SEN/CIR AT	CVT-70
P0725	0725	ENG SPEED SIG	CVT-74
P0740	0740	TCC SOLENOID/CIRC	CVT-77
P0745	0745	L/PRESS SOL/CIRC	CVT-82
P1705	1705	TP SEN/CIRC A/T*3	CVT-89
P1777	1777	STEP MOTOR/CIRC	CVT-97
P1778	1778	STEP MOTOR/FNCTN	CVT-101
P1791	1791	LINE PRESSURE SEN	CVT-103

*1: In Diagnostic Test Mode II (Self-diagnostic results), these numbers are controlled by NISSAN.
*2: These numbers are prescribed by ISO15031-6.
*3: When the fail-safe operation occurs, the MI illuminates.

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PRECAUTIONS

PFP:00001

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

ECS006M4

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 (EURO-OBD) System of CVT and Engine

ECS006M5

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

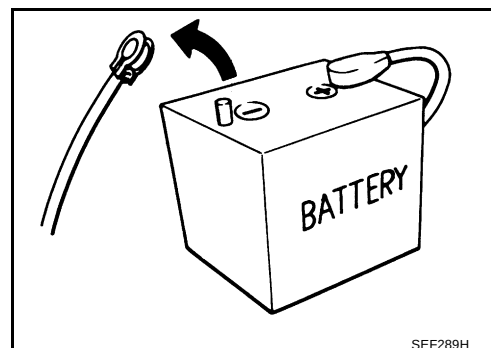
CAUTION:

- 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 MI to light up.
- Be sure to connect and lock the connectors securely after work. A loose (unlocked) connector will cause the MI 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 MI to light up due to a short circuit.
- Be sure to connect rubber tubes properly after work. A disconnected or disconnected rubber tube may cause the MI to light up due to a malfunction of the 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

ECS006M6

- 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.

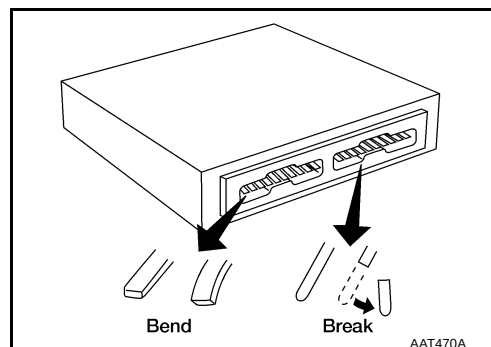


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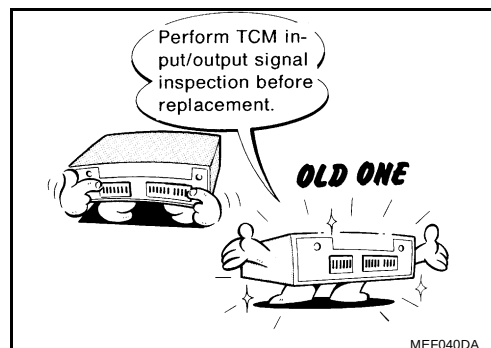
PRECAUTIONS

[ALL]

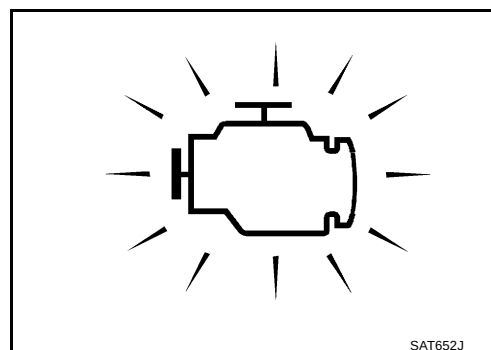
- When connecting or disconnecting pin connectors into or from TCM, take care not to damage pin terminals (bend or break). Make sure that there are not any bends or breaks on TCM pin terminal, when connecting pin connectors.



- Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not. Refer to [CVT-45, "TCM Terminals and Reference Value"](#) (with EURO-OBD) or [CVT-131, "TCM Terminals and Reference Value"](#) (with EXCEPT EURO-OBD).



- After performing each TROUBLE DIAGNOSIS, perform "DTC (Diagnostic Trouble Code) CONFIRMATION PROCEDURE". The DTC should not be displayed in the "DTC CONFIRMATION PROCEDURE" if the repair is completed.



- It is very important to perform functional tests whenever they are indicated.
- Extreme care should be taken to avoid damage to O-rings, seals and gaskets when assembling.
- When the CVT drain plug is removed, only some of the fluid is drained. Old CVT fluid will remain in torque converter and CVT fluid cooling system. Always follow the procedures under "Changing CVT Fluid" in the MA section when changing CVT fluid.

Service Notice of Precautions FAIL-SAFE

ECS006M7

The TCM has an electronic Fail-Safe (limp home mode). This allows the vehicle to be driven even if a major electrical input/output device circuit is damaged.

Under Fail-Safe, the vehicle always runs even with a shift lever position of "L" or "D". The customer may complain of sluggish or poor acceleration.

When the ignition key is turned "ON" following Fail-Safe operation, CVT indicator lamp blinks for about 8 seconds. [For "TCM SELF-DIAGNOSTIC PROCEDURE (No Tools)", refer to [CVT-29](#) .]

The blinking of the CVT indicator lamp for about 8 seconds will appear only once and be cleared. The customer may resume normal driving conditions.

Always follow the "WORK FLOW" (Refer to [CVT-34](#)).

The SELF-DIAGNOSIS results will be as follows:

The first SELF-DIAGNOSIS will indicate damage to the vehicle speed sensor or the revolution sensor.

During the next SELF-DIAGNOSIS, performed after checking the sensor, no damages will be indicated.

EURO-OBD SELF-DIAGNOSIS

- CVT self-diagnosis is performed by the TCM in combination with the ECM. The results can be read through the blinking pattern of the CVT indicator lamp. Refer to the table on for the indicator used to display each self-diagnostic result.
- The self-diagnostic results indicated by the MI are automatically stored in both the ECM and TCM memories.

Always perform the procedure “HOW TO ERASE DTC” on to complete the repair and avoid unnecessary blinking of the MI.

For details of EURO-OBD, refer to [CVT-20, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"](#) .

- Certain systems and components, especially those related to EURO-OBD, may use a new style slide-locking type harness connector.

For description and how to disconnect, refer to [PG-94, "HARNESS CONNECTOR"](#) .

Wiring Diagrams and Trouble Diagnoses

ECS006M8

- Refer to [GI-14, "How to Read Wiring Diagrams"](#) .
- Refer to [PG-3, "POWER SUPPLY ROUTING"](#) for power distribution circuit.

When you perform trouble diagnoses, refer to the following:

- Refer to [GI-10, "How to Follow Trouble Diagnoses"](#) .
- Refer to [GI-24, "How to Perform Efficient Diagnosis for an Electrical Incident"](#) .

PREPARATION

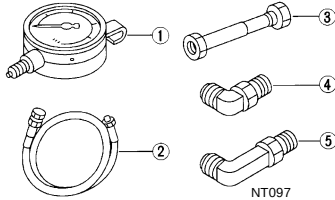
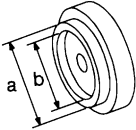
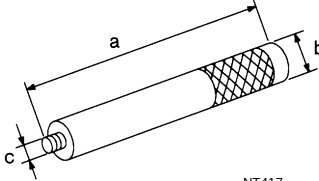
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PREPARATION

Special Service Tools

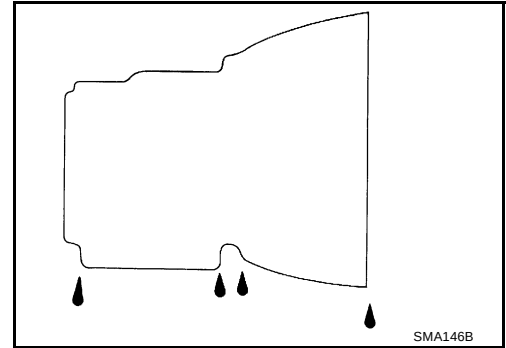
ECS006M9

Tool name Tool number	Description
ST2505S001 Oil pressure gauge set 1 ST25051001 Oil pressure gauge 2 ST25052000 Hose 3 ST25053000 Joint pipe 4 ST25054000 Adapter 5 ST25055000 Adapter	 Measuring line pressure and governor pressure
KV31103000 Drift	 Installing differential side oil seal (Use with ST35325000) a: 59 mm (2.32 in) dia. b: 49 mm (1.93 in) dia.
ST35325000 Drift	 Installing differential side oil seal (Use with KV31103000) a: 215 mm (8.46 in) b: 25 mm (0.98 in) dia. c: M12 x 1.5P

CVT FLUID

Checking CVT Fluid

1. Check for fluid leakage.



2. Check fluid level.

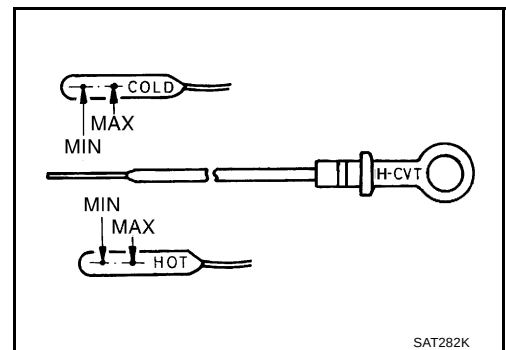
Fluid level should be checked using "HOT" range on CVT fluid level gauge at fluid temperatures of 50 to 80°C (122 to 176°F) after vehicle has been driven approximately 10 minutes in urban areas after engine is warmed up. But it can be checked at fluid temperatures of 30 to 50°C (86 to 122°F) using "COLD" range on CVT fluid level gauge for reference after engine is warmed up and before driving. However, fluid level must be rechecked using "HOT" range.

- a. Park vehicle on level surface and set parking brake.
- b. Start engine and then move selector lever through reach gear range, ending in "P".
- c. Check fluid level with engine idling.
- d. Remove CVT fluid level gauge and wipe it clean with lint-free paper.
- e. Re-insert CVT fluid level gauge into charging pipe as far as it will go.
- f. Remove CVT fluid level gauge and note reading. If level is at low side of either range, add fluid through the speedometer cable hole.

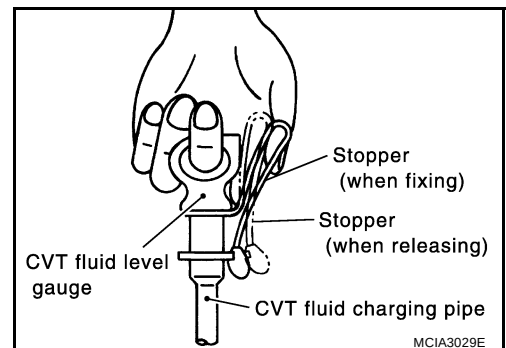
Use genuine NISSAN CVT fluid (NS-1) or exact equivalent.

CAUTION:

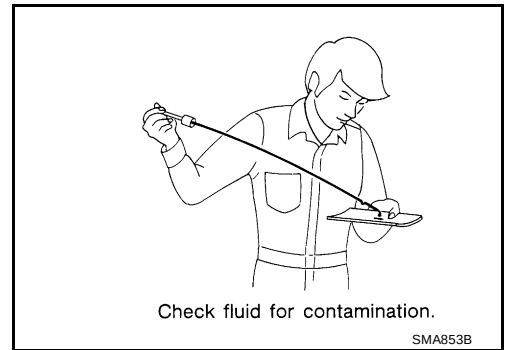
- Do not overfill.
- Firmly fix the CVT fluid level gauge using a lip attached to the fluid charging pipe.



3. Check fluid condition.



Check fluid for contamination. If fluid is very dark, smells burned or contains frictional material check operation of CVT. Refer to [CVT-14, "OVERALL SYSTEM"](#) for checking operation of CVT.



ECS006MB

Changing CVT Fluid

1. Warm up CVT fluid by driving the vehicle for 10 minutes.
2. Drain CVT fluid from radiator cooler hose (return side) and refill with new CVT fluid at charging pipe with the engine running at idle speed.
3. Refill until new CVT fluid comes out from radiator cooler hose (return side).
About 30 to 50% extra fluid will be required for this procedure.

Fluid capacity

Approx. 8.1 ℓ (7-1/8 Imp qt)

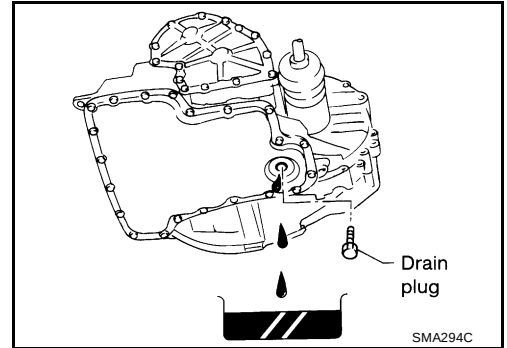
Drain plug:

: 30 - 39 N-m (3.0 - 4.0 kg-m, 22 - 28 ft-lb)

CAUTION:

Use genuine NISSAN CVT fluid (NS-1) or exact equivalent.

4. Check fluid level and condition.

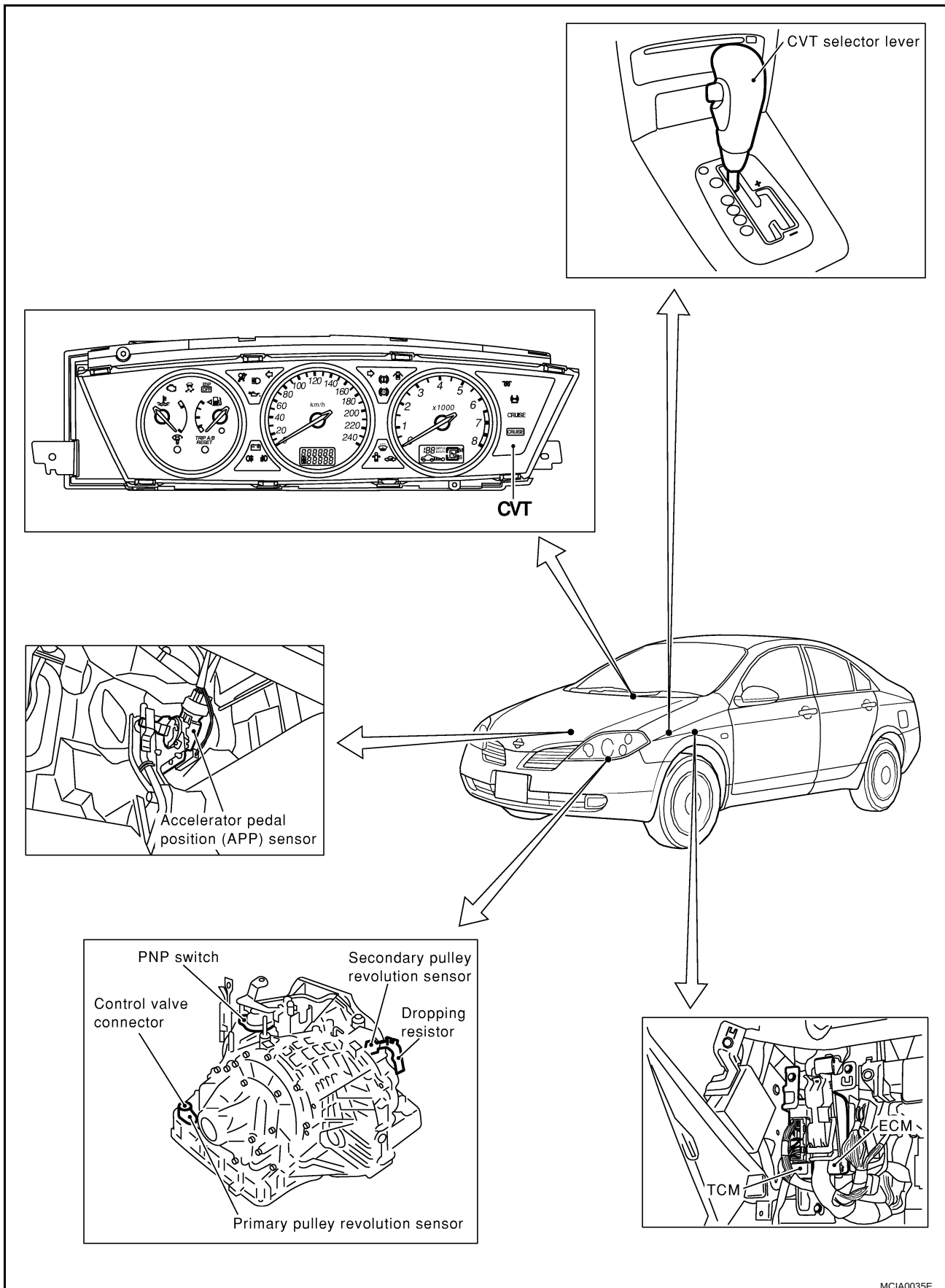


OVERALL SYSTEM

PFP:00000

CVT Electrical Parts Location

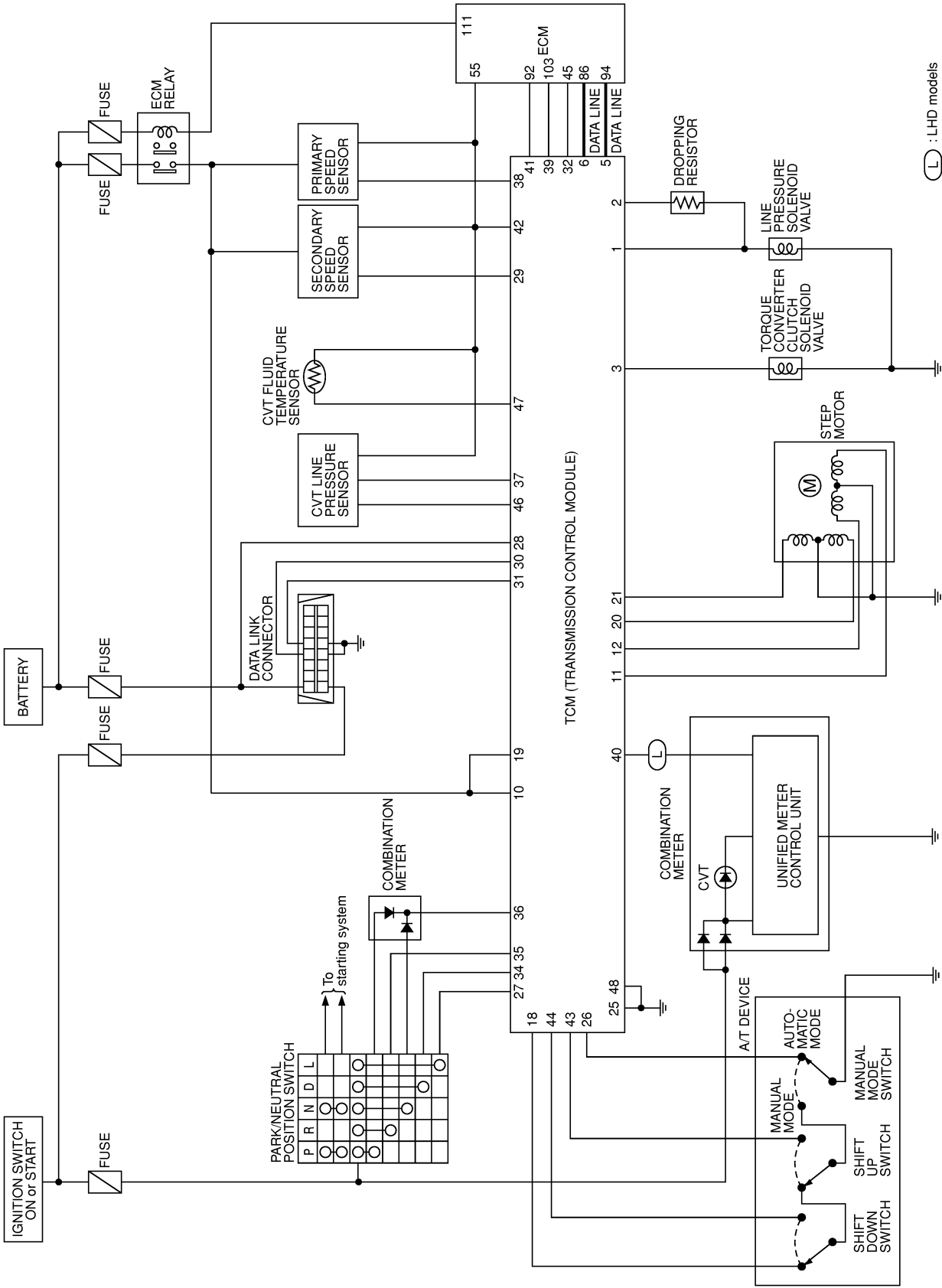
ECS006MC



MCIA0035E

Circuit Diagram

ECS006MD



(L) : LHD models

A
B
C
D
E
F
G
H
I
J
K
L
M

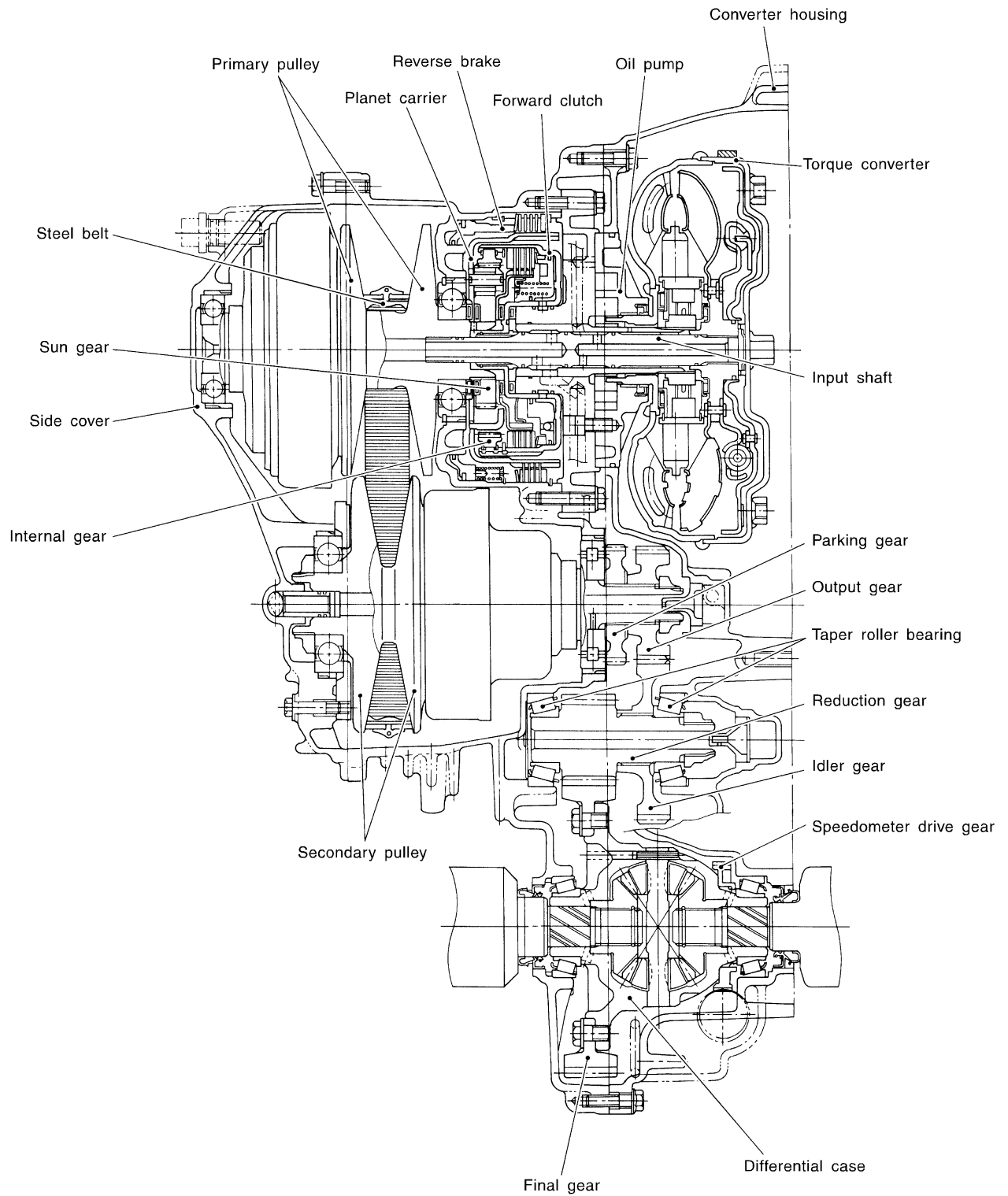
CVT

OVERALL SYSTEM

[ALL]

Cross-sectional View -RE0F06A

ECS006ME



SAT668J

Control System OUTLINE

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

SWITCHES AND SENSORS		TCM		ACTUATORS
PNP switch Throttle position sensor Closed throttle position switch Wide open throttle position switch Engine speed signal CVT fluid temperature sensor CVT line pressure sensor Primary speed sensor Secondary speed sensor Stop lamp switch O/D switch ABS control unit	▶	Shift control Line pressure control Lock-up control Fail-safe control Self-diagnosis CONSULT-II communication line control Duet-EA control On board diagnosis	▶	Step motor Torque converter clutch solenoid valve Line pressure solenoid valve CVT indicator lamp

A

B

CVT

D

E

F

G

H

I

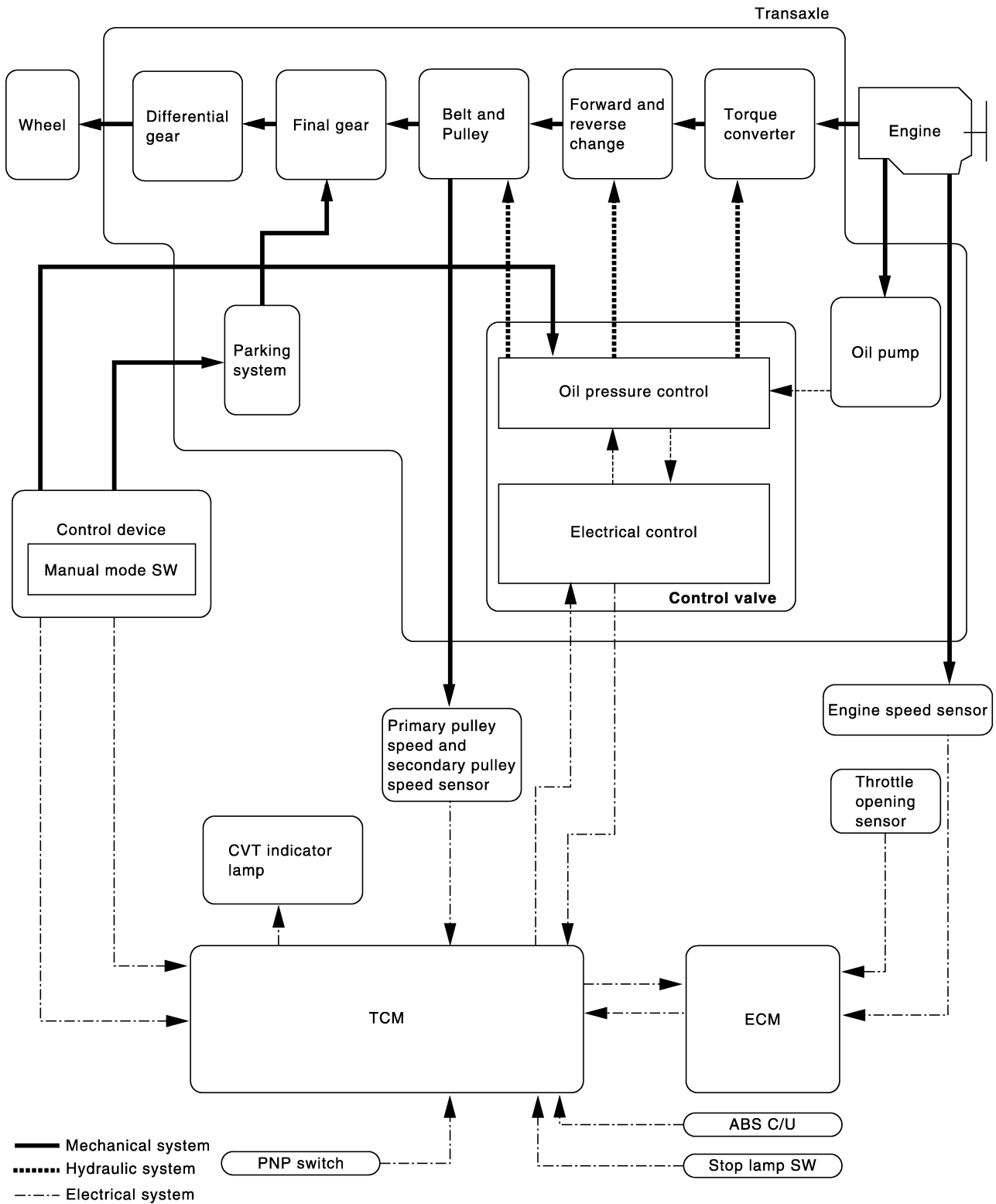
J

K

L

M

CONTROL SYSTEM



TCM FUNCTION

The function of the TCM is to:

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

INPUT/OUTPUT SIGNAL OF TCM

	Switches, sensors and actuators	Function
Input	PNP switch	Detects select lever position and sends a signal to TCM.
	Throttle position sensor	Detects throttle valve position and sends a signal to TCM.
	Closed throttle position switch	Detects throttle valve's fully-closed position and sends a signal to TCM.
	Wide open throttle position switch	Detects a throttle valve position of greater than 1/2 of full throttle and sends a signal to TCM.
	Engine speed signal	From ECM.
	CVT fluid temperature sensor	Detects transmission fluid temperature and sends a signal to TCM.
	CVT line pressure sensor	Detects transmission line pressure and sends a signal to TCM.
	Primary speed sensor	Detects primary pulley rpm and sends a signal to TCM.
	Secondary speed sensor	Detects secondary pulley rpm and sends a signal to TCM.
	Stop lamp switch	Sends a signal to the TCM relaying the operation condition of the brake pedal.
	O/D switch	Sends a signal to the TCM relaying the operation condition of the O/D switch.
	ABS control unit	Sends a signal to the TCM operation condition of the ABS.
Output	Step motor	Regulates pulley position in relation to a signal sent from TCM.
	Line pressure solenoid valve	Regulates (or decreases) line pressure suited to driving conditions in relation to a signal sent from TCM.
	Torque converter clutch solenoid valve	Regulates (or decreases) lock-up pressure suited to driving conditions in relation to a signal sent from TCM.
	CVT indicator lamp	Shows the operation condition of the CVT switch.

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

PFP:00000

Introduction

ECS0069N

The CVT system has two self-diagnostic systems.

The first is the emission-related on board diagnostic system (EURO-OBD) performed by the TCM in combination with the ECM. The malfunction is indicated by the MI (malfunction indicator) and is stored as a DTC in the ECM memory but not the TCM memory.

The second is the TCM original self-diagnosis indicated by the CVT indicator (warning) lamp or SPORT indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with EURO-OBD self-diagnostic items. For detail, refer to [CVT-24, "SELF-DIAGNOSTIC RESULT TEST MODE"](#).

EURO-OBD Function for CVT System

ECS0069O

The ECM provides emission-related on board diagnostic (EURO-OBD) functions for the CVT system. One function is to receive a signal from the TCM used with EURO-OBD-related parts of the CVT system. The signal is sent to the ECM when a malfunction occurs in the corresponding EURO-OBD-related part. The other function is to indicate a diagnostic result by means of the MI (malfunction indicator) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.

The MI automatically illuminates in Two Trip Detection Logic when a malfunction is sensed in relation to CVT system parts.

EURO-OBD Diagnostic Trouble Code (DTC)

ECS0069P

HOW TO READ DTC AND 1ST TRIP DTC

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

1.  **No Tools** The number of blinks of the malfunction indicator in the Diagnostic Test Mode II (Self-Diagnostic Results) Examples: 0705, 0710, 0715, 0720, etc. For details, refer to EC section ["Malfunction Indicator (MI)", "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"]. These DTCs are controlled by NISSAN.
2.  **With CONSULT-II or GST** CONSULT-II or GST (Generic Scan Tool) Examples: P0705, P0710, P0720, P0725, etc.
These DTCs are prescribed by ISO15031-6.
(CONSULT-II also displays the malfunctioning component or system.)
 - **1st trip DTC No. is the same as DTC No.**
 - **Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal.**
CONSULT-II can identify them as shown below. Therefore, using CONSULT-II (if available) is recommended.

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

SELECT SYSTEM
CVT
ENGINE

SAT250K

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

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

SAT015K

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

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

SAT016K

Freeze Frame Data and 1st Trip Freeze Data

The ECM has a memory function, which stores the driving condition such as fuel system status, calculated load value, engine coolant temperature, short term fuel trim, long term fuel trim, engine speed and vehicle speed at the moment the ECM detects a malfunction.

Data which are stored in the ECM memory, along with the 1st trip DTC, are called 1st trip freeze frame data, and the data, stored together with the DTC data, are called freeze frame data and displayed on CONSULT-II or GST. The 1st trip freeze frame data can only be displayed on the CONSULT-II screen, not on the GST. For detail, refer to EC section (“CONSULT-II”, “ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION”).

Only one set of freeze frame data (either 1st trip freeze frame data or freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/MI on) is stored in the ECM memory, 1st trip freeze frame data is no longer stored. Remember, only one set of freeze frame data can be stored in the ECM.

The ECM has the following priorities to update the data.

Priority	Items	
1	Freeze frame data	Misfire — DTC: P0300 - P0304 (0300 - 0304) Fuel Injection System Function — DTC: P0171 (0171), P0172 (0172), P0174 (0174), P0175 (0175)
2		Except the above items (Includes CVT related items)
3	1st trip freeze frame data	

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

HOW TO ERASE DTC

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

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

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to EURO-OBD. For details, refer to EC section ("Emission-related Diagnostic Information", "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION").

- **Diagnostic trouble codes (DTC)**
- **1st trip diagnostic trouble codes (1st trip DTC)**
- **Freeze frame data**
- **1st trip freeze frame data**
- **System readiness test (SRT) codes**
- **Test values**
- Distance traveled while MI is activated
- Others

HOW TO ERASE DTC (WITH CONSULT-II)

- **If a DTC is displayed for both ECM and TCM, it needs to be erased for both ECM and TCM.**
1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 5 seconds and then turn it "ON" (engine stopped) again.
 2. Turn CONSULT-II "ON" and touch "CVT".
 3. Touch "SELF-DIAG RESULTS".
 4. Touch "ERASE". (The DTC in the TCM will be erased.) Then touch "BACK" twice.
 5. Touch "ENGINE".
 6. Touch "SELF-DIAG RESULTS".
 7. Touch "ERASE". (The DTC in the ECM will be erased.)

How to erase DTC (With CONSULT-II)

1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 5 seconds and then turn it "ON" (engine stopped) again.

SELECT SYSTEM
CVT
ENGINE

2. Turn CONSULT-II "ON", and touch "A/T".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
DTC WORK SUPPORT
TCM PART NUMBER

3. Turn "SELF-DIAG RESULTS".

SELF-DIAG RESULTS
DTC RESULTS
T/C CLUTCH SOL/V

4. Touch "ERASE". (The DTC in the TCM will be erased.)

Touch "BACK".

Touch "BACK".

SELECT SYSTEM
CVT
ENGINE

5. Touch "ENGINE".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

6. Touch "SELF-DIAG RESULTS".

SELF-DIAG RESULTS	
DTC RESULTS	TIME
TCC SOLENOID/CIRC [P0740]	0

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

SAT251K

HOW TO ERASE DTC (WITH GST)

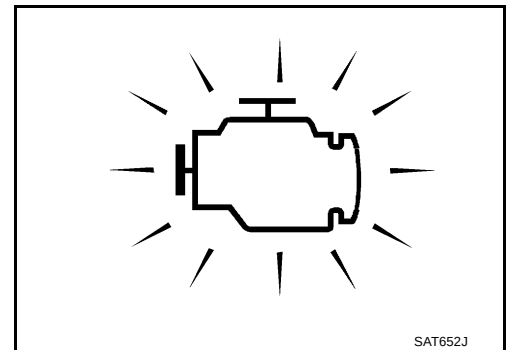
1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 5 seconds and then turn it "ON" (engine stopped) again.
2. Perform [CVT-28, "EURO-OBD Self-diagnostic Procedure \(No Tools\)"](#) . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Select Mode 4 with Generic Scan Tool (GST). For details, refer to EC section "Generic Scan Tool (GST)".

HOW TO ERASE DTC (NO TOOLS)

1. If the ignition switch stays "ON" after repair work, be sure to turn ignition switch "OFF" once. Wait at least 5 seconds and then turn it "ON" (engine stopped) again.
2. Perform [CVT-29, "TCM Self-diagnostic Procedure \(No Tools\)"](#) . (The engine warm-up step can be skipped when performing the diagnosis only to erase the DTC.)
3. Change the diagnostic test mode from Mode II to Mode I by turning the mode selector on the ECM. Refer to EC section "HOW TO SWITCH DIAGNOSTIC TEST MODES".

Malfunction Indicator (MI)

1. The malfunction indicator will light up when the ignition switch is turned ON without the engine running. This is for checking the lamp.
 - If the malfunction indicator lamp does not light up, refer to DI section ("Warning Lamps/System Description", "WARNING LAMPS AND CHIME"). (Or see MI & Data Link Connectors in EC section.)
2. When the engine is started, the malfunction indicator lamp should go off.
If the lamp remains on, the on board diagnostic system has detected an emission-related (EURO-OBD) malfunction. For detail, refer to EC section ("ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION").



CONSULT-II

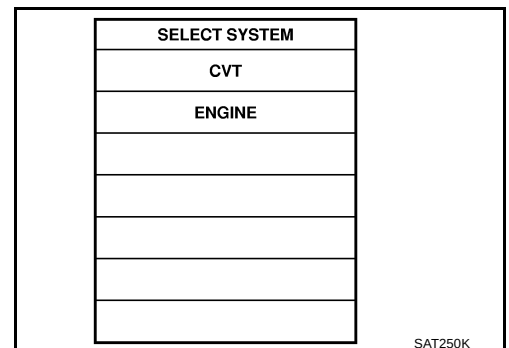
After performing [CVT-23, "SELF-DIAGNOSTIC PROCEDURE \(WITH CONSULT-II\)"](#) , place check marks for results on the [CVT-33, "DIAGNOSTIC WORKSHEET"](#) . Reference pages are provided following the items.

NOTICE:

- Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II unit.

SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

1. Turn on CONSULT-II and touch "ENGINE" for EURO-OBD detected items or touch "CVT" for TCM self-diagnosis.
If CVT is not displayed, check TCM power supply and ground circuit. Refer to [CVT-54, "TROUBLE DIAGNOSIS FOR POWER SUPPLY"](#) . If result is NG, refer to EL section ("POWER SUPPLY ROUTING").



ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

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

REAL-TIME DIAG
ENG SPEED SIG
SAT987J

SELF-DIAGNOSTIC RESULT TEST MODE

Detected items (Screen terms for CONSULT-II, “SELF-DIAG RESULTS” test mode)		Malfunction is detected when...	TCM self-diagnosis	EURO-OBD (DTC)
“CVT”	“ENGINE”		 Available by CVT indicator lamp “CVT” ^{*1}	 Available by malfunction indicator ^{*2} , “ENGINE” on CONSULT-II or GST
PNP switch circuit		● TCM does not receive the correct voltage signal (based on the gear position) from the switch.	—	P0705
PNP SW/CIRCUIT	PNP SW/CIRC			
Primary speed sensor		● TCM does not receive the proper voltage signal from the sensor.	X	P0715
I/P PULLY SPD SIG	PRI SPEED SIG/CIRC			
Output pulley speed signal		● TCM does not receive the proper voltage signal from the sensor.	X	P0720
O/P PULLY SPD SIG	VEH SPD SEN/CIR CVT			
T/C clutch solenoid valve		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0740
T/C CLUTCH SOL/V	TCC SOLENOID/CIRC			
Line pressure solenoid valve		● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	X	P0745
LINE PRESSURE S/V	L/PRESS SOL/CIRC			
Throttle position sensor		● TCM receives an excessively low or high voltage from the sensor.	X	P1705
THROTTLE POSI SEN	TP SEN/CIRC CVT			
Engine speed signal		● TCM does not receive the proper voltage signal from the ECM.	X	P0725
ENGINE SPEED SIG				
CVT fluid temperature sensor		● TCM receives an excessively low or high voltage from the sensor.	X	P0710
FLUID TEMP SEN	FLUID TEMP SEN/CIRC			
Step motor circuit		● Not proper voltage change of the TCM terminal when operating step motor.	X	P1777
STEP MOTOR	STEP MOTOR/CIRC			
Step motor function		● Step motor is not operating according to the TCM.	X	P1778
—	STEP MOTOR/FNCTN			
Line pressure sensor		● TCM receives an excessively low or high voltage from the sensor.	X	P1791
LINE PRESSURE SEN	LINE PRESS SEN			

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

Detected items (Screen terms for CONSULT-II, "SELF-DIAG RESULTS" test mode)		Malfunction is detected when...	TCM self-diagnosis	EURO-OBD (DTC)
"CVT"	"ENGINE"		 Available by CVT indicator lamp "CVT"*1	 Available by malfunction indicator*2, "ENGINE" on CONSULT-II or GST
CVT SAFE FUNCTION		● TCM is malfunctioning.	X	—
CVT SAFE FUNCTION	—			
TCM (RAM)		● TCM memory (RAM) is malfunctioning.	—	—
CONTROL UNIT (RAM)	—			
TCM (ROM)		● TCM memory (ROM) is malfunctioning.	—	—
CONTROL UNIT (ROM)	—			
TCM (EEP ROM)		● TCM memory (EEP ROM) is malfunctioning.	—	—
CONTROL UNIT (EEP ROM)	—			
Initial start		● This is not a malfunction message (Whenever shutting off a power supply to the TCM, this message appears on the screen.)	X	—
INITIAL START	—			
No failure (NO SELF DIAGNOSTIC FAILURE INDICATED FURTHER TESTING MAY BE REQUIRED)		● No failure has been detected.	X	X

X: Applicable

—: Not applicable

*1: These malfunctions cannot be displayed by MI  if another malfunction is assigned to MI.

*2: Refer to EC section ["Malfunction Indicator (MI)", "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"].

DATA MONITOR MODE (CVT)

Item	Display	Monitor item		Description	Remarks
		TCM Input signals	Main signals		
Vehicle speed sensor (Secondary speed sensor)	VHCL SPEED SE [km/h] or [mph]	X	—	● Vehicle speed computed from signal of revolution sensor is displayed.	When racing engine in "N" or "P" position with vehicle stationary, CONSULT-II data may not indicate 0 km/h (0 mph).
Throttle position sensor	THRTL POS SEN [V]	X	—	● Throttle position sensor signal voltage is displayed.	—
CVT fluid temperature sensor	FLUID TEMP SE [V]	X	—	● CVT fluid temperature sensor signal voltage is displayed. ● Signal voltage lowers as fluid temperature rises.	—
Battery voltage	BATTERY VOLT [V]	X	—	● Source voltage of TCM is displayed.	—

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

Item	Display	Monitor item		Description	Remarks
		TCM Input signals	Main signals		
Engine speed	ENGINE SPEED [rpm]	X	—	● Engine speed, computed from engine speed signal, is displayed.	Engine speed display may not be accurate under approx. 800 rpm. It may not indicate 0 rpm even when engine is not running.
P/N position switch	N POSITION SW [ON/OFF]	X	—	● ON/OFF state computed from signal of P/ N position SW is displayed.	—
R position switch	R POSITION SW [ON/OFF]	X	—	● ON/OFF state computed from signal of R position SW is displayed.	—
D position switch	D POSITION SW [ON/OFF]	X	—	● ON/OFF state computed from signal of D position SW is displayed.	—
L position switch	L POSITION SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of L position SW, is displayed.	—
Closed throttle position switch	CLOSED THL/ SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of closed throttle position SW, is displayed.	—
Wide open throttle position switch	W/O THRL/P- SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of wide open throttle position SW, is displayed.	—
Selector lever position	SLCT LVR POSI	—	X	● Selector lever position data, used for computation by TCM, is displayed.	● A specific value used for control is displayed if fail-safe is activated due to error.
Vehicle speed	VEHICLE SPEED [km/h] or [mph]	—	X	● Vehicle speed data, used for computation by TCM, is displayed.	—
Throttle position	THROTTLE POSI [/8]	—	X	● Throttle position data, used for computation by TCM, is displayed.	● A specific value used for control is displayed if fail-safe is activated due to error.
Line pressure duty	LINE PRES DTY [%]	—	X	● Control value of line pressure solenoid valve, computed by TCM from each input signal, is displayed.	—
Torque converter clutch solenoid valve duty	TCC S/V DUTY [%]	—	X	● Control value of torque converter clutch solenoid valve, computed by TCM from each input signal, is displayed.	—

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EURO-OBD]

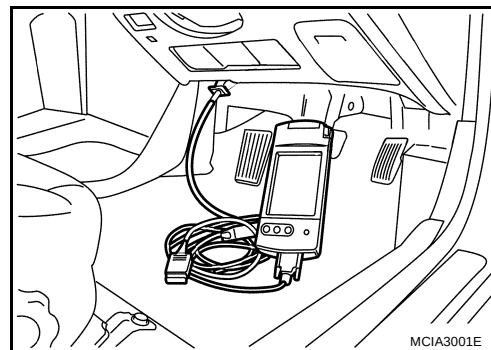
Item	Display	Monitor item		Description	Remarks
		TCM Input signals	Main signals		
Self-diagnosis display lamp	PAT MONI LAMP [ON/OFF]	—	X	● Control status of CVT indicator lamp is displayed.	—
Line pressure sensor	LINE PRESSURE SEN [V]	X	—	● Line pressure sensor signal voltage is displayed.	—
Primary pulley speed sensor	I/P PULLY SPD [rpm]	X	X	● Primary pulley speed computed from signal of primary pulley speed sensor is displayed.	—
Secondary pulley speed sensor	O/P PULLY SPD [rpm]	—	—	● Secondary pulley speed computed from signal of secondary speed sensor is displayed.	—
Stop lamp switch	BRAKE SW [ON/OFF]	X	—	● ON/OFF position signal of stop lamp switch is displayed.	—
ABS signal	ABS SIGNAL [ON/OFF]	X	—	● ABS operation signal (ON/OFF) from ABS control unit is displayed.	—
CVT ratio	CVT RATIO [—]	—	X	● Real CVT ratio operated TCM is displayed.	—
Step	PLY CONT STEP [step]	—	X	● Step motor position is displayed.	—

X: Applicable

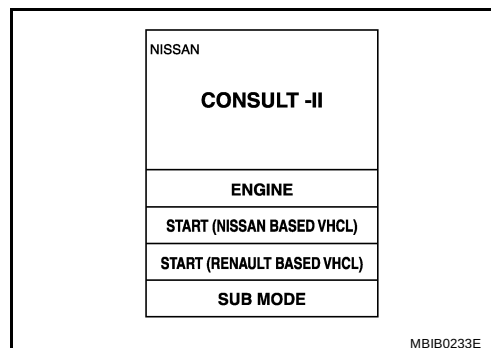
—: Not applicable

WORK SUPPORT MODE WITH CONSULT-II

1. Turn ignition switch "OFF".
2. Connect CONSULT-II to data link connector which is located in the left side lower dash panel.
3. Turn ignition switch "ON".



4. Touch "START (NISSAN BASED VHCL)".



5. Touch "CVT".

SELECT SYSTEM
CVT
ENGINE

SAT250K

6. Touch "WORK SUPPORT".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
TCM PART NUMBER

SAT252K

7. Touch "ENGINE BRAKE ADJUSTMENT".
8. Touch "START".

SELECT WORK ITEM
ENGINE BRAKE ADJ.

SAT933J

9. Set "ENGINE BRAKE LEVEL" by touching "UP" or "DOWN".

ENGINE BRAKE LEVEL

0: Initial set value (Engine brake level control is activated)

OFF: Engine brake level control is deactivated.

10. Turn ignition switch "OFF", wait at least 5 seconds and then turn ignition switch "ON".
11. Engine brake level set is completed.

CAUTION:

Mode of "+1" "0" "-1" "-2" "OFF" can be selected by pressing the "UP" "DOWN" on CONSULT screen. However, do not select mode other than "0" and "OFF". If the "+1" or "-1" or "-2" is selected, that might cause the abnormality of driveability.

DIAGNOSTIC PROCEDURE WITHOUT CONSULT-II

EURO-OBD Self-diagnostic Procedure (With GST)

Refer to EC section ["Generic Scan Tool (GST)", "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"].

EURO-OBD Self-diagnostic Procedure (No Tools)

Refer to EC section ["Malfunction Indicator (MI)", "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"].

ENGINE BRAKE ADJ.	
ADJ. MONITOR	
ENGINE BRAKE LEVEL	0
UP	DOWN

SAT934J

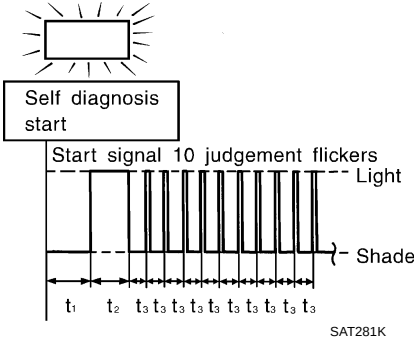
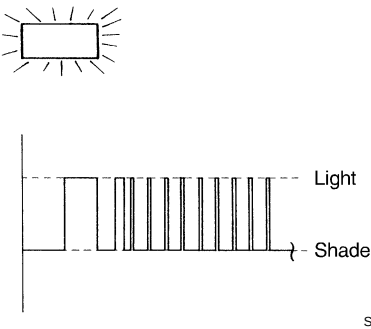
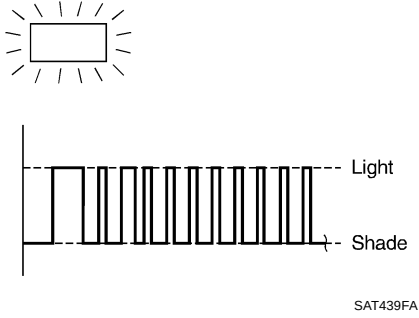
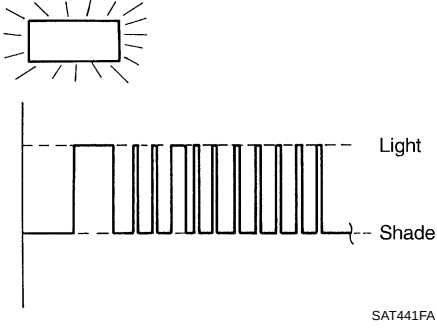


TCM Self-diagnostic Procedure (No Tools)

Preparation

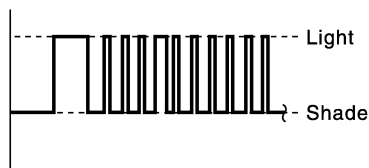
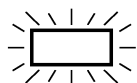
1. Warm up the engine.
2. Turn the ignition switch from ON to OFF two more times, and then turn to OFF.
3. In the "P" position of the selector lever, turn the ignition switch ON, and verify that the CVT warning lamp turns on for about 2 seconds.
4. Turn the ignition switch OFF.
5. Press the brake pedal, and shift the selector lever to the "D" position.
6. Turn the ignition switch ON.
7. Release the brake, and shift the selector lever to the "L" position.
8. Fully depress both brake and accelerator pedals all the way to the floor. Without releasing the brake and accelerator pedals, shift the selector lever to the "D" position.
9. Read the display from the CVT indicator lamp to complete the diagnosis.

Judgement of Self-diagnosis Code

CVT indicator lamp	
All judgement flickers are the same.  SAT281K All circuits that can be confirmed by self-diagnosis are OK.	1st judgement flicker is longer than others.  SAT437FA Secondary speed sensor (VEHICLE SPEED SENSOR CVT) circuit is shorted or disconnected. ⇒ Go to CVT-70, "DTC P0720 VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR)".
2nd judgement flicker is longer than others.  SAT439FA Primary speed sensor circuit is shorted or disconnected. ⇒ Go to CVT-67, "DTC P0715 PRIMARY SPEED SENSOR".	3rd judgement flicker is longer than others.  SAT441FA Throttle position sensor circuit is shorted or disconnected. ⇒ Go to CVT-89, "DTC P1705 THROTTLE POSITION SENSOR".

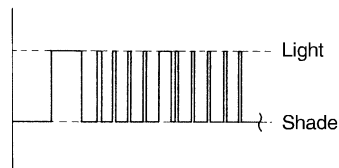
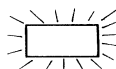
CVT indicator lamp

4th judgement flicker is longer than others.



MCIA0041E

5th judgement flicker is longer than others.



SAT445FA

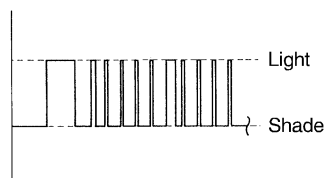
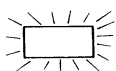
Step motor circuit is shorted or disconnected.

⇒ Go to [CVT-97, "DTC P1777 STEP MOTOR - CIRCUIT"](#).

Line pressure sensor circuit is shorted or disconnected.

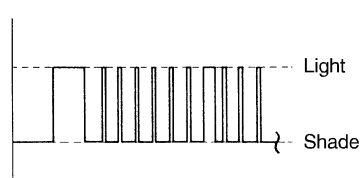
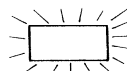
⇒ Go to [CVT-103, "DTC P1791 LINE PRESSURE SENSOR"](#).

6th judgement flicker is longer than others.



SAT447FA

7th judgement flicker is longer than others.



SAT449FA

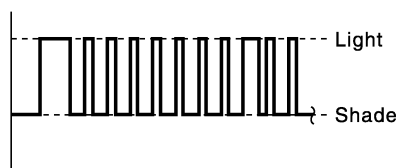
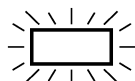
Line pressure solenoid valve circuit is shorted or disconnected.

⇒ Go to [CVT-82, "DTC P0745 LINE PRESSURE SOLENOID VALVE"](#).

Lock up solenoid valve circuit is shorted or disconnected.

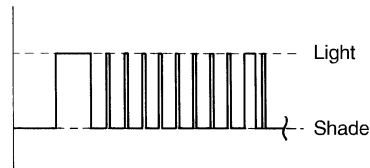
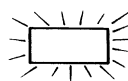
⇒ Go to [CVT-77, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE"](#).

8th judgement flicker is longer than others.



MCIA0042E

9th judgement flicker is longer than others.



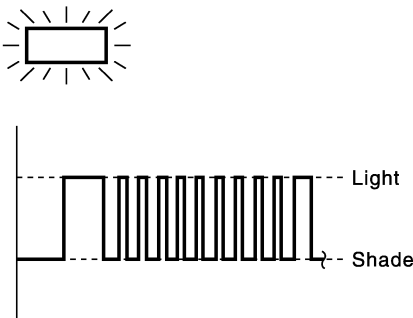
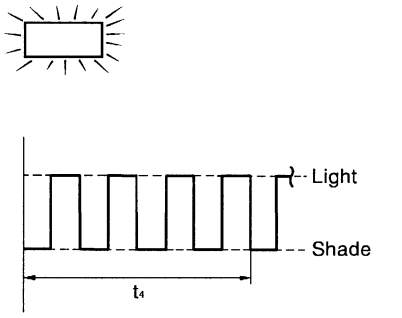
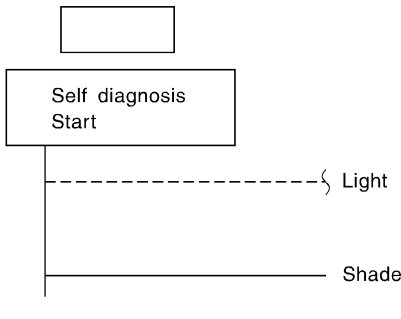
SAT453FA

CVT fluid temperature sensor is disconnected or TCM power source circuit is damaged.

⇒ Go to [CVT-62, "DTC P0710 CVT FLUID TEMPERATURE SENSOR CIRCUIT"](#).

Engine speed signal circuit is shorted or disconnected.

⇒ Go to [CVT-74, "DTC P0725 ENGINE SPEED SIGNAL"](#).

CVT indicator lamp	
10th judgement flicker is longer than others.  MCIA0043E ● When “4th judgement flicker” and/or “6th judgement flicker” is displayed, inspect “STEP MOTOR (DTC: 1777)” and/or “LINE PRESSURE SOLENOID VALVE (DTC: 0745)”. ● When neither “4th judgement flicker” nor “6th judgement flicker” are displayed, replace TCM. ⇒ Go to CVT-186, "CVT SAFE FUNCTION".	Flickers as shown below.  SAT278K Battery voltage is low. Battery has been disconnected for a long time. Battery is connected conversely. (When reconnecting TCM connectors — This is not a problem)
Lamp does not come on.  SAT653J PNP switch, overdrive control switch or throttle position switch circuit is disconnected or TCM is damaged. ⇒ Go to CVT-195, "TROUBLE DIAGNOSES FOR NON-DETECTABLE ITEMS".	

t1 = 2.5 seconds t2 = 2.0 seconds t3 = 1.0 second t4 = 1.0 second

TROUBLE DIAGNOSIS — INTRODUCTION

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 step motor and CVT solenoid valves.

The TCM also communicates with the ECM by means of a signal sent from sensing elements used with the EURO-OBD-related parts of the CVT system for malfunction-diagnostic purposes. The TCM is capable of diagnosing malfunctioning parts while the ECM can store malfunctions in its memory.

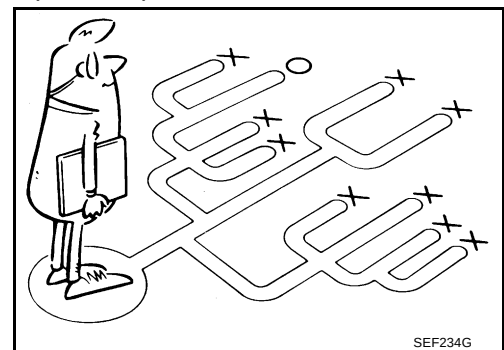
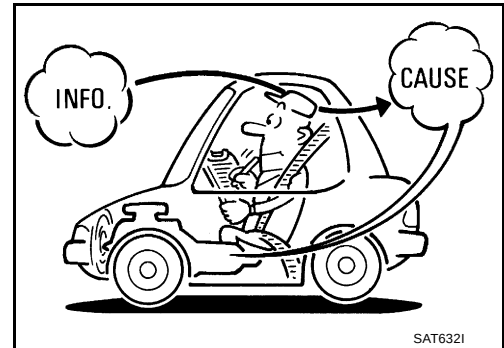
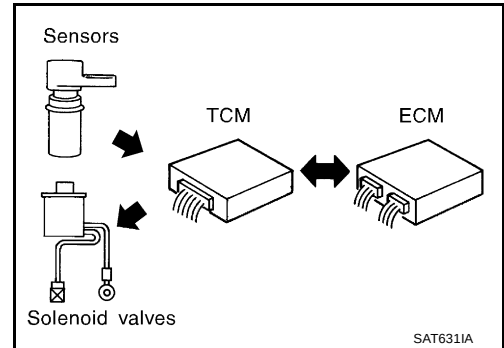
Input and output signals must always be correct and stable in the operation of the CVT system. The CVT system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.

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 [CVT-34](#).

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 ([CVT-34](#)) 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 & CVT 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	☐ Lockup malfunction		
	☐ Shift point too high or too low.		
	☐ Shift shock or slip (☐ N → D ☐ Lockup ☐ Any drive position)		
	☐ Noise or vibration		
	☐ No pattern select		
	☐ Others ()		
CVT indicator lamp	Blinks for about 8 seconds.		
	☐ Continuously lit	☐ Not lit	
Malfunction indicator (MIL)	☐ Continuously lit	☐ Not lit	

Diagnostic Worksheet

1.	☐ Read the Fail-safe and listen to customer complaints.	CVT-9 , CVT-33
2.	☐ CHECK CVT FLUID ☐ Leakage (Follow specified procedure) ☐ Fluid condition ☐ Fluid level	CVT-37
3.	☐ Perform STALL TEST and LINE PRESSURE TEST. ☐ Stall test — Mark possible damaged components/others. ☐ Forward clutch ☐ Reverse brake ☐ Engine ☐ Line pressure is low ☐ Line Pressure test — Suspected parts:	CVT-37 , CVT-38
4.	☐ Perform all ROAD TEST and mark required procedures.	CVT-39
4-1.	Check before engine is started. ☐ SELF-DIAGNOSTIC PROCEDURE — Mark detected items. ☐ PNP switch, CVT-57, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH" . ☐ CVT fluid temperature sensor, CVT-62, "DTC P0710 CVT FLUID TEMPERATURE SENSOR CIRCUIT" . ☐ Vehicle speed sensor (Output pulley speed signal), CVT-67, "DTC P0715 PRIMARY SPEED SENSOR" . ☐ Engine speed signal, CVT-74, "DTC P0725 ENGINE SPEED SIGNAL" . ☐ Torque converter clutch solenoid valve, CVT-77, "DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE" . ☐ Line pressure solenoid valve, CVT-82, "DTC P0745 LINE PRESSURE SOLENOID VALVE" . ☐ Step motor, CVT-97, "DTC P1777 STEP MOTOR - CIRCUIT" . ☐ Line pressure sensor, CVT-103, "DTC P1791 LINE PRESSURE SENSOR" . ☐ Throttle position sensor, CVT-89, "DTC P1705 THROTTLE POSITION SENSOR" . ☐ Primary speed sensor, CVT-67, "DTC P0715 PRIMARY SPEED SENSOR" . ☐ CVT-186, "CVT SAFE FUNCTION" . ☐ CVT-188, "CONTROL UNIT (RAM), CONTROL UNIT (ROM)" . ☐ CVT-190, "CONTROL UNIT (EEPROM)" . ☐ PNP switch, stop lamp switch, throttle position switch, CVT-57, "DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH" . ☐ Battery ☐ Others	CVT-41
5.	☐ For self-diagnosis NG items, inspect each component. Repair or replace the damaged parts.	CVT-29
6.	☐ Perform all ROAD TEST and re-mark required procedures.	CVT-39
7.	☐ Perform the Diagnostic Procedures for all remaining items marked NG. Repair or replace the damaged parts.	CVT-45 , CVT-57
8.	☐ Erase DTC from TCM and ECM memories.	CVT-20

Work Flow

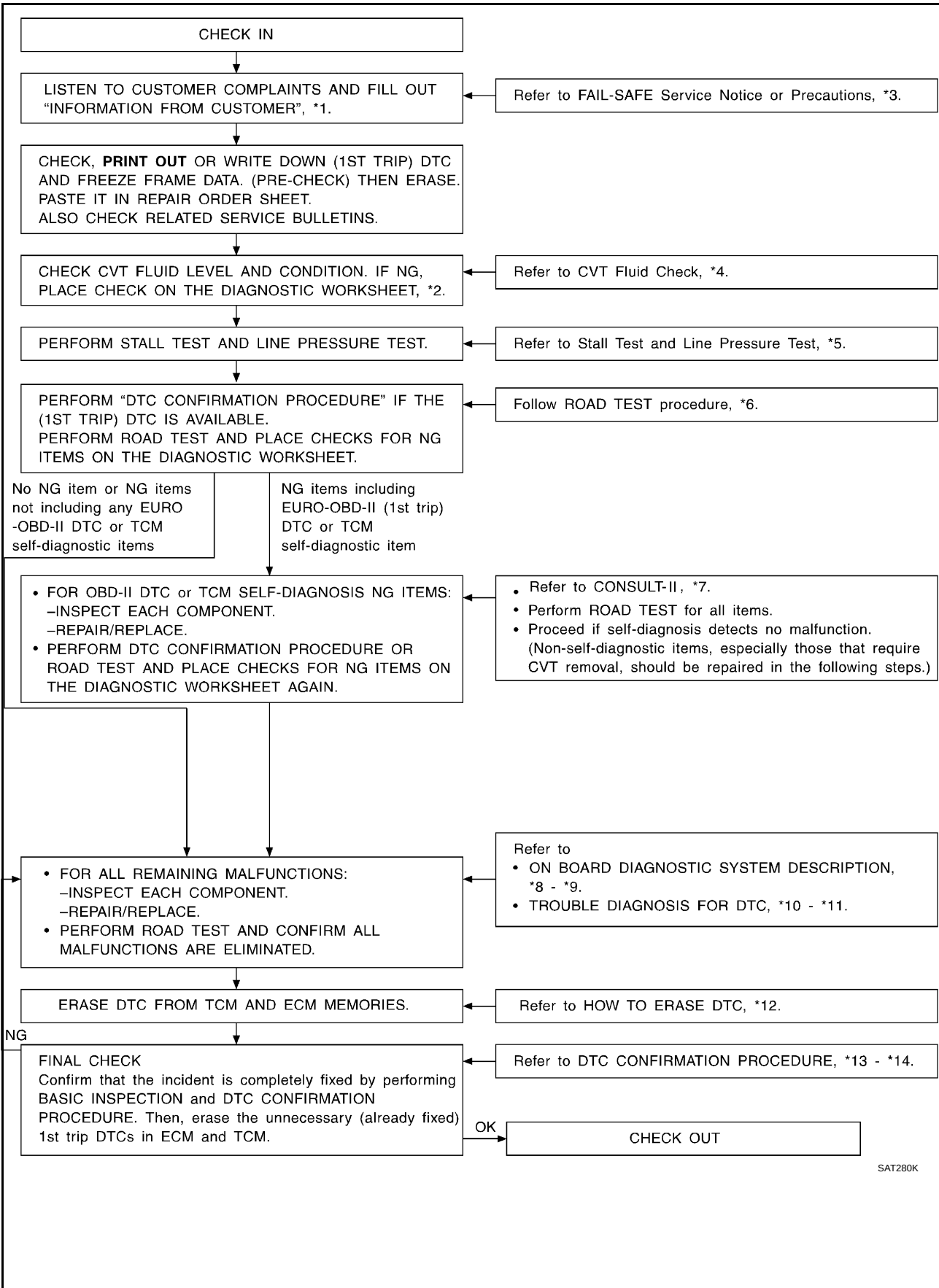
ECS006GO

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

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

Make good use of the two sheets provided, [CVT-33, "Information from Customer"](#) and [CVT-34, "Diagnostic Worksheet"](#) , to perform the best troubleshooting possible.

WORK FLOW CHART

*1: [CVT-33](#)*2: [CVT-34](#)*3: [CVT-9](#)*4: [CVT-12](#)*5: [CVT-37](#)*6: [CVT-39](#)

*7: [CVT-41](#)

*10: [CVT-20](#)

*13: [CVT-57](#)

*8: [CVT-20](#)

*11: [CVT-20](#)

*14: [CVT-108](#)

*9: [CVT-20](#)

*12: [CVT-22](#)

TROUBLE DIAGNOSIS — BASIC INSPECTION

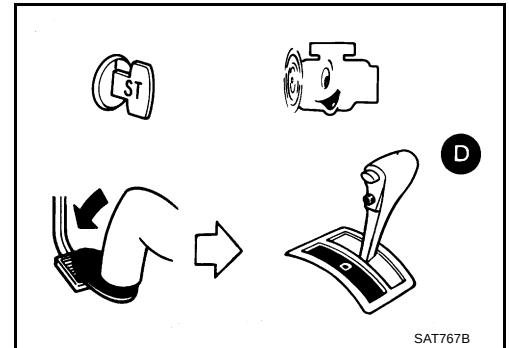
PFP:00000

CVT Fluid Check

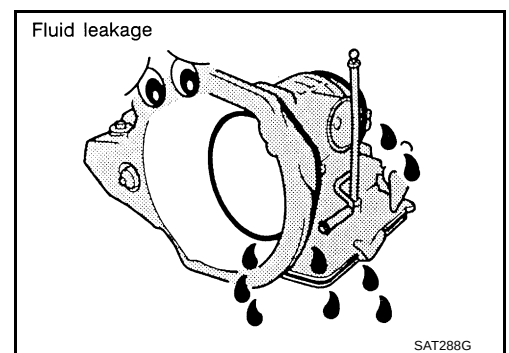
ECS006GP

FLUID LEAKAGE CHECK

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

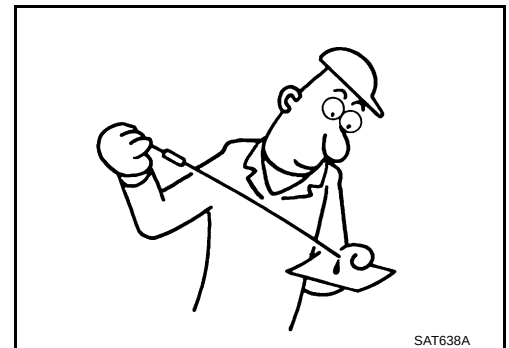


4. Check for fluid leakage.



FLUID CONDITION CHECK

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



FLUID LEVEL CHECK

Refer to [CVT-12, "Checking CVT Fluid"](#) .

Stall Test

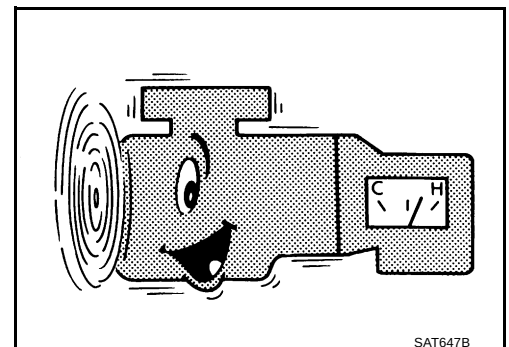
ECS006GQ

STALL TEST PROCEDURE

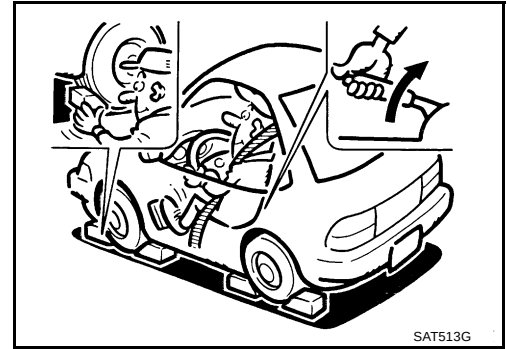
1. Check CVT fluid and engine oil levels. If necessary, add.
2. Drive vehicle for approx. 10 minutes or until engine oil and CVT fluid reach operating temperature.

CVT fluid operating temperature:

50 - 80°C (122 - 176°F)



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

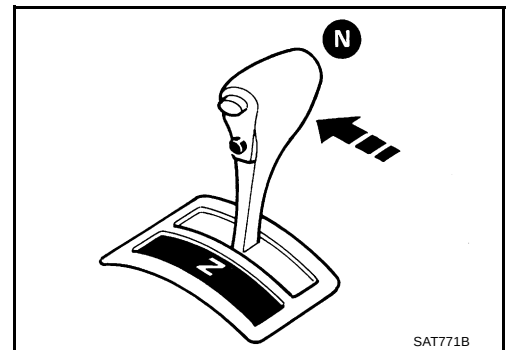
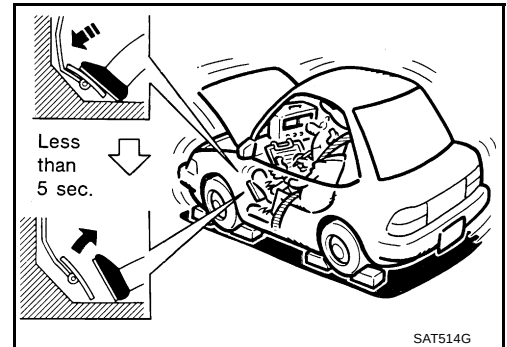


5. Start engine, apply foot brake, and place selector lever in D position.
6. Accelerate to wide open throttle gradually while applying foot brake.
7. Quickly note the engine stall revolution and immediately release throttle.
 - During test, never hold throttle wide open for more than 5 seconds.

Stall revolution:

2,350 - 2,850 rpm

8. Move selector lever to "N" position.
9. Cool off CVT fluid.
 - Run engine at idle for at least one minute.

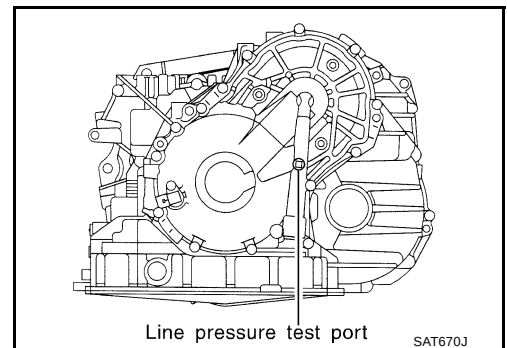


ECS006GR

Line Pressure Test LINE PRESSURE TEST PORTS

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

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



LINE PRESSURE TEST PROCEDURE

1. Check CVT fluid and engine oil levels. If necessary, add fluid or oil.
2. Drive vehicle for approx. 10 minutes or until engine oil and CVT fluid reach operating temperature.

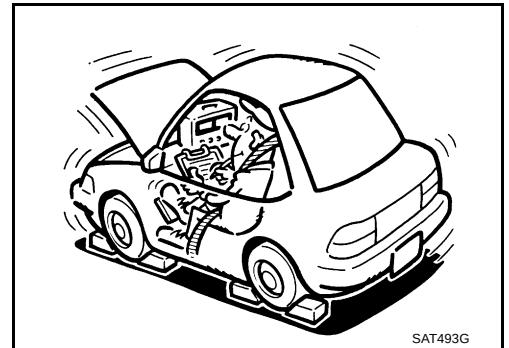
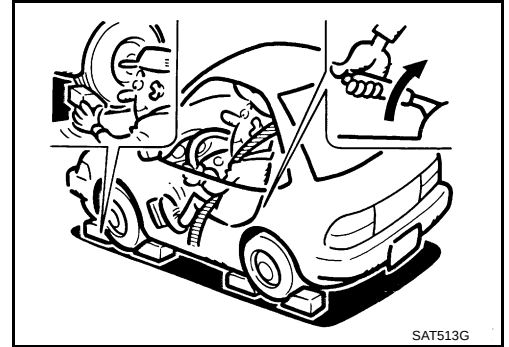
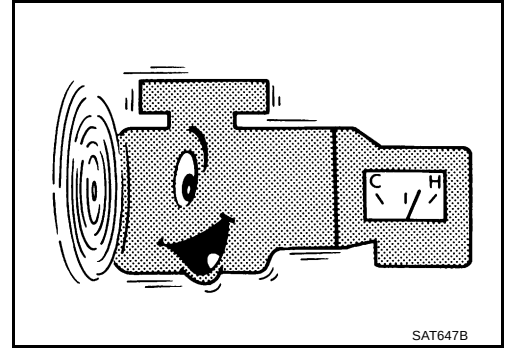
CVT fluid operating temperature:

50 - 80°C (122 - 176°F)

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

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

Line pressure: Refer to [CVT-215, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).



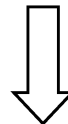
ECS006GS

Road Test DESCRIPTION

- The purpose of the test is to determine overall performance of CVT and analyze causes of problems.
- The road test consists of the following two parts:
 1. Check before engine is started
 2. Cruise test

ROAD TEST PROCEDURE

1. Check before engine is started.



2. Cruise test.

SAT692J

- Before road test, familiarize yourself with all test procedures and items to check.
- Conduct tests on all items until specified symptom is found. Troubleshoot items which check out No Good after road test. Refer to [CVT-20, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"](#) (EURO-OBD) or [CVT-111, "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"](#) (Except for EURO-OBD).



1. CHECK BEFORE ENGINE IS STARTED**1. CHECK CVT INDICATOR LAMP**

1. Park vehicle on flat surface.
2. Move selector lever to "P" position.
3. Turn ignition switch to "OFF" position. Wait at least 5 seconds.
4. Turn ignition switch to "ON" position. (Do not start engine.)
5. Does CVT indicator lamp come on for about 2 seconds?

Yes or No

- Yes >> GO TO 2.
 No >> Stop ROAD TEST.

2. CHECK CVT INDICATOR LAMP

Does CVT indicator lamp flicker for about 8 seconds?

Yes or No

Yes (EURO-OBD)>>Perform self-diagnosis and check NG items on the [CVT-33, "DIAGNOSTIC WORKSHEET"](#) . Refer to [CVT-29, "TCM Self-diagnostic Procedure \(No Tools\)"](#) .

Yes (Except for Euro-OBD)>>Perform self-diagnosis and check NG items on the [CVT-34, "Diagnostic Worksheet"](#) . Refer to [CVT-34, "Diagnostic Worksheet"](#) .

- No >> 1. Turn ignition switch to "OFF" position.
 2. Perform self-diagnosis and note NG items.
 Refer to [CVT-33, "DIAGNOSTIC WORKSHEET"](#) .

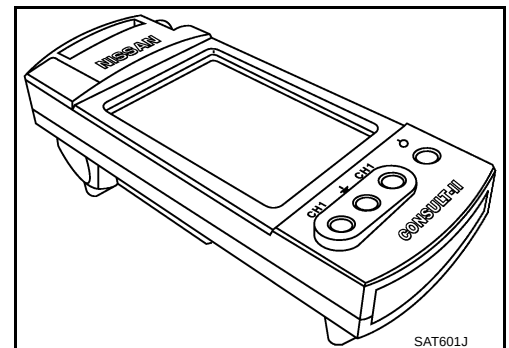
3. TEST DRIVE

Drive the vehicle and verify that there are no abnormalities.

>> TEST END

2. CRUISE TEST

- Check all items listed in Parts 1 through 3.

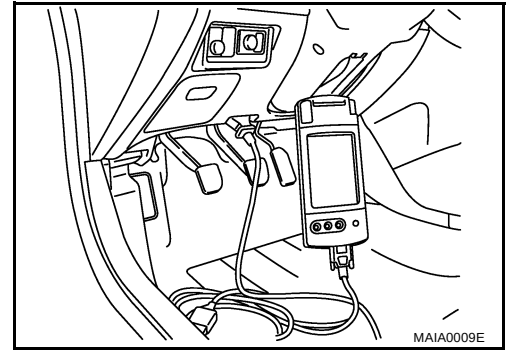


Ⓟ **With CONSULT-II**

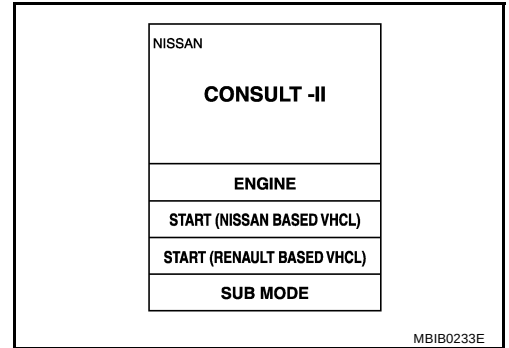
- Using CONSULT-II, conduct a cruise test and record the result.
- Print the result and ensure that shifts and lock-ups take place as per Shift Schedule.

CONSULT-II Setting Procedure

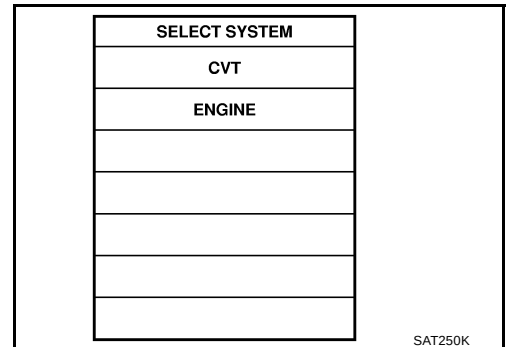
1. Turn ignition switch "OFF".
2. Connect CONSULT-II to data link connector which is located in the left side lower dash panel.



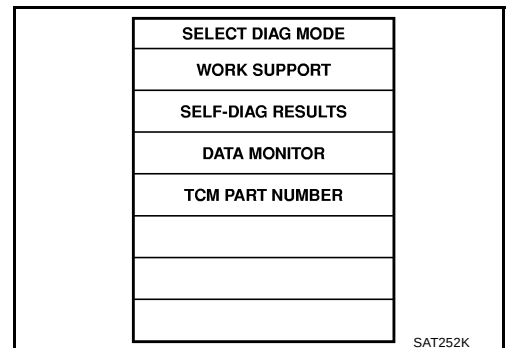
3. Turn ignition switch "ON".
4. Touch "START (NISSAN BASED VHCL)".



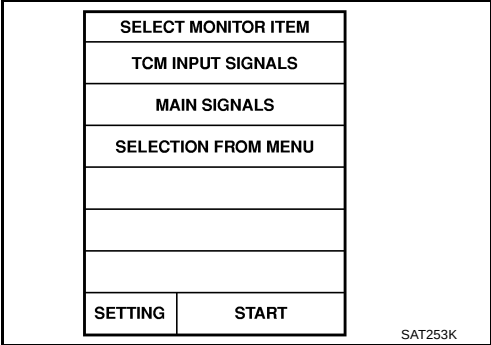
5. Touch "CVT".



6. Touch "DATA MONITOR".



- Touch “MAIN SIGNALS” to set recording condition.
- See “Numerical Display”, “Barchart Display” or “Line Graph Display”.
- Touch “START”.

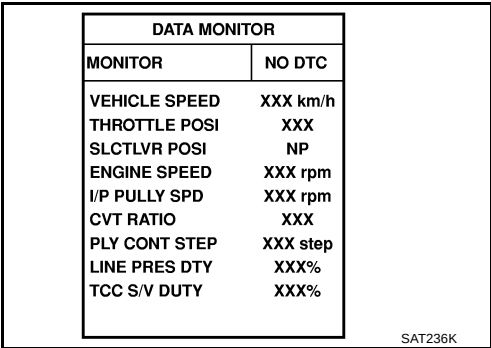


A

B

CVT

- When performing cruise test, touch “Store Data”.



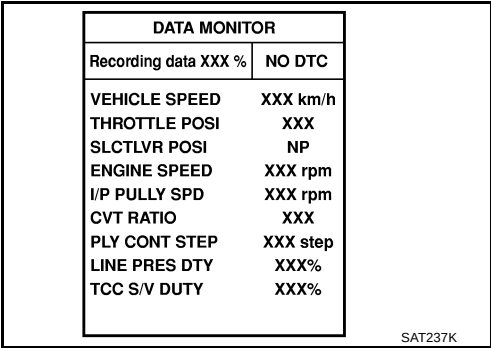
D

E

F

G

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



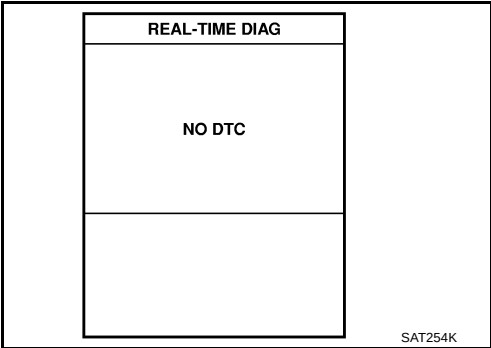
H

I

J

K

- Touch “STORE”.



L

M

13. Touch "DISPLAY".

SAVE DATA	
NOT FOUND SAVE REC DATA	
A/T	1999/1/30 19:59:18
A/T	1999/1/30 19:59:42
A/T	1999/1/30 20:01:04

SAT608J

STORE	
SYSTEM	SAVE REC DATA

SAT974J

14. Touch "PRINT".

15. Check the monitor data printed out.

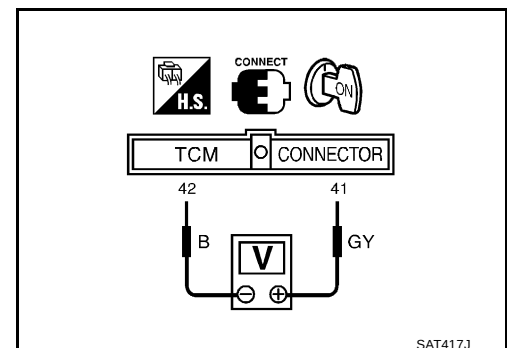
16. Continue cruise test part 2 and 3.

STORE	
SYSTEM	SAVE REC DATA
ENGINE	04/15/1999, 10:34:29
ENGINE	07/15/1999, 15:10:33

SAT238K

⊗ Without CONSULT-II

- Throttle position sensor can be checked by voltage across terminals 41 and 42 of TCM.
Refer to [CVT-39, "Road Test"](#).



TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

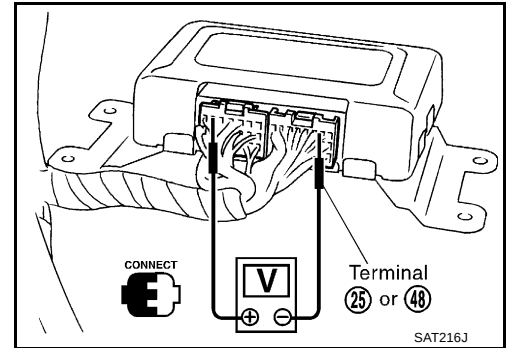
PFP:00000

TCM Terminals and Reference Value

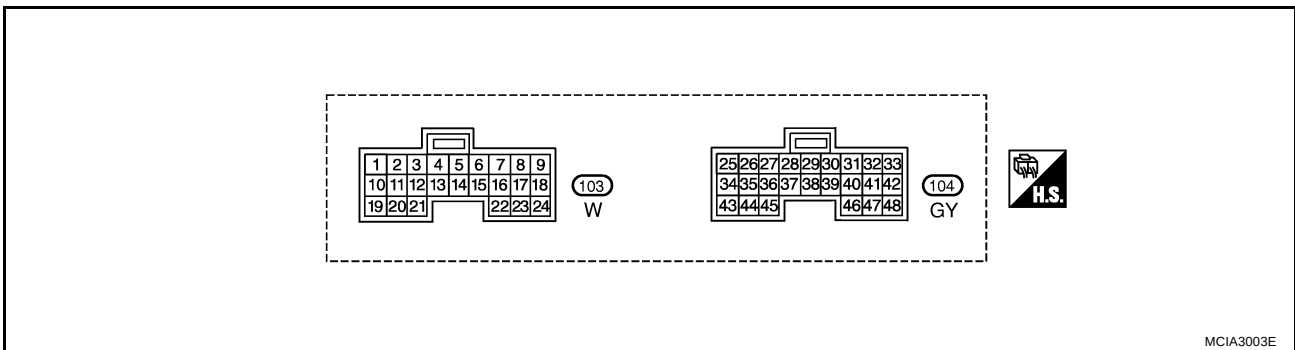
ECS006GT

PREPARATION

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



TCM HARNESS CONNECTOR TERMINAL LAYOUT



TCM INSPECTION TABLE

(Data are reference values.)

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)	
1	R/W	Line pressure solenoid valve		When releasing accelerator pedal after warming up engine.	2.8V	
				When depressing accelerator pedal fully after warming up engine.	1.4V	
2	P/B	Line pressure solenoid valve (with dropping resistor)		When releasing accelerator pedal after warming up engine.	11.0V	
				When depressing accelerator pedal fully after warming up engine.	4.0V	
3	GY/R	Torque converter clutch solenoid valve		When CVT performs lock-up.	12.0V	
				When CVT does not perform lock-up.	0V	
5	L	CAN communication line		—	—	
6	R	CAN communication line		—	—	
10	G/W	Power source			When turning ignition switch to “ON”.	Battery voltage
					When turning ignition switch to “OFF”.	0V
11	PU	Step motor A	Within 2 seconds after key switch “ON”, the time measurement by using the pulse width measurement function (Hi level) of CONSULT-II. ● CONSULT-II cable connected to data link connector. ● This inspection cannot be measured by circuit tester.		30.0 msec	
12	L/W	Step motor B			10.0 msec	

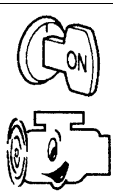
TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
18	R/B	Manual mode		When setting selector lever to “MAN-UAL MODE”	0V
				When setting selector lever to “AUTOMATIC MODE”	Battery voltage
19	G/W	Power source	 	Same as No. 10	
20	L/Y	Step motor C	Within 2 seconds after key switch “ON”, the time measurement by using the pulse width measurement function (Hi level) of CONSULT-II. ● CONSULT-II cable connected to data link connector. ● This inspection cannot be measured by circuit tester.		
21	P/L	Step motor D			
25	B	Ground	 	—	—
26	Y/L	Automatic mode		When setting selector lever to “AUTOMATIC MODE”	0V
				When setting selector lever to “MAN-UAL MODE”	Battery voltage
27	L	PNP switch “L” position		When setting selector lever to “L” position.	Battery voltage
				When setting selector lever to other positions.	0V
28	R/B	Power source (Memory back-up)	 or 	When turning ignition switch to “OFF”.	Battery voltage
				When turning ignition switch to “ON”.	Battery voltage
29	G/R	Secondary speed sensor	When driving [D position, 20 km/h (12 MPH)], the pulse measurement by using the pulse measurement function of CONSULT-II. ● CONSULT-II cable connected to data link connector. ● This inspection cannot be measured by circuit tester.		

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

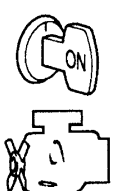
[EURO-OBD]

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
30	G/B	(RX)		—	—
31	GY/L	(TX)		—	—
32	R	Throttle position sensor (Power source)		When turning ignition switch to “ON”	4.5 - 5.5V
				When turning ignition switch to “OFF”	0V
34	W/G	PNP switch “D” position		When setting selector lever to “D” position.	Battery voltage
				When setting selector lever to other positions.	0V
35	G/W	PNP switch “R” position		When setting selector lever to “R” position.	Battery voltage
				When setting selector lever to other positions.	0V
36	G	PNP switch “N” or “P” position		When setting selector lever to “N” or “P” position.	Battery voltage
				When setting selector lever to other positions.	0V
37	W	Line pressure sensor	When engine runs at idle speed.	1.0V	
			When engine runs at stall speed.	4.0V	
38	G/Y	Primary speed sensor	When driving [L position, 20 km/h (12 MPH)], the pulse measurement by using the pulse measurement function of CONSULT-II. ● CONSULT-II cable connected to data link connector. ● This inspection cannot be measured by circuit tester.		900 Hz
39	L/OR	Engine speed signal		When engine runs at idle speed.	0.5 - 1.5V
40	SB	Vehicle speed signal		—	—

A
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CVT
D
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TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EURO-OBD]

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
41	GY	Throttle position sensor		When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: 0.3V Fully-open throttle: 3V
42	B	Sensor ground		—	—
43	Y/G	Shift up switch		When setting selector lever to “SHIFT UP” position	0V
44	L	Shift down switch		When setting selector lever to “NEUTRAL” position	Battery voltage
				When setting selector lever to “SHIFT DOWN” position	0V
				When setting selector lever to “NEUTRAL” position	Battery voltage
46	R/L	Line pressure sensor (Power source)		—	4.5 - 5.5V
47	BR	CVT fluid temperature sensor		When CVT fluid temperature is 20°C (68°F).	1.5V
				When CVT fluid temperature is 80°C (176°F).	0.5V
48	B	Ground	—	—	

CAN COMMUNICATION

PFP:23710

System Description

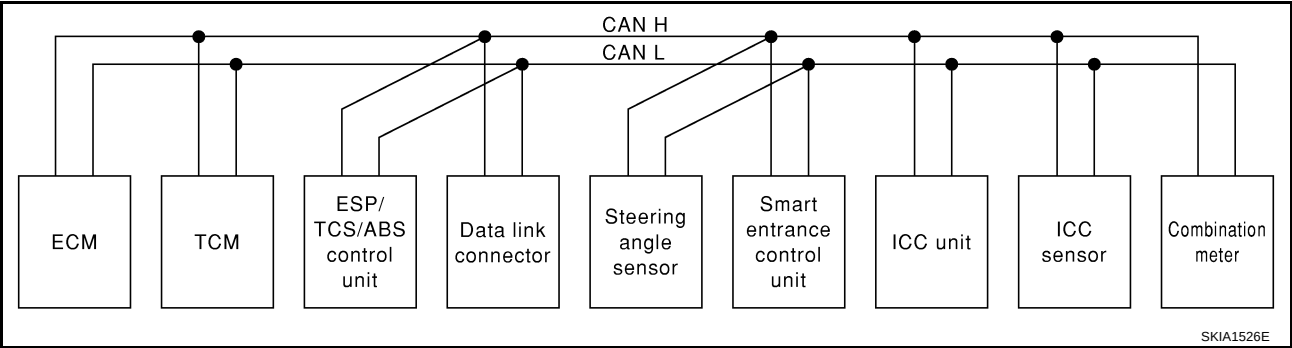
ECS006U1

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.

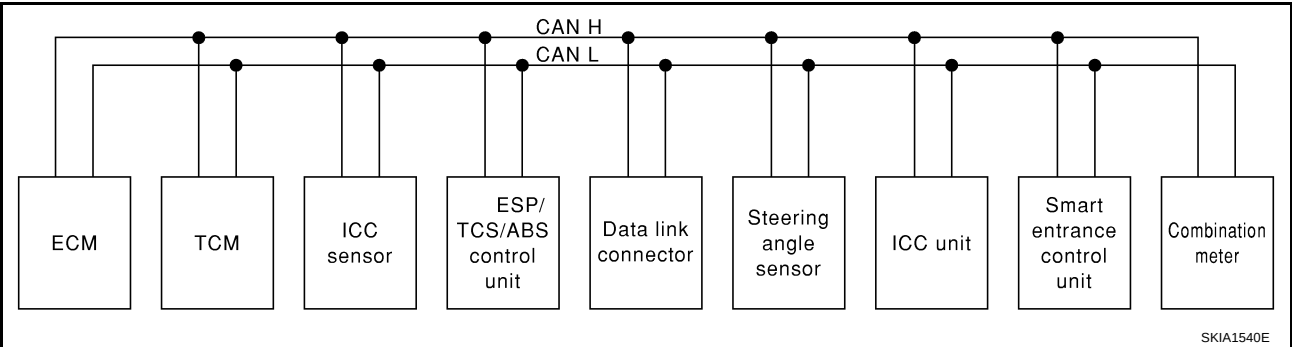
Models with ICC and ESP
SYSTEM DIAGRAM

ECS006TY

● LHD models



● RHD models



INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

Signals	ECM	TCM	ESP/ TCS / ABS con- trol unit	Steering angle sensor	Smart entrance control unit	ICC unit	ICC sen- sor	Combina- tion meter
Engine speed signal	T		R			R		R
Accelerator pedal position signal	T	R	R			R		
Closed throttle position signal	T	R				R		
ICC steering switch signal	T					R		
Shift pattern signal		T				R		
Parking brake switch signal			T			R		
ICC system display signal						T		R
ICC sensor signal						R	T	
ESP operation signal	R	R	T			R		
TCS operation signal	R	R	T			R		
ABS operation signal	R	R	T			R		
Stop lamp switch signal		R	T					

CAN COMMUNICATION

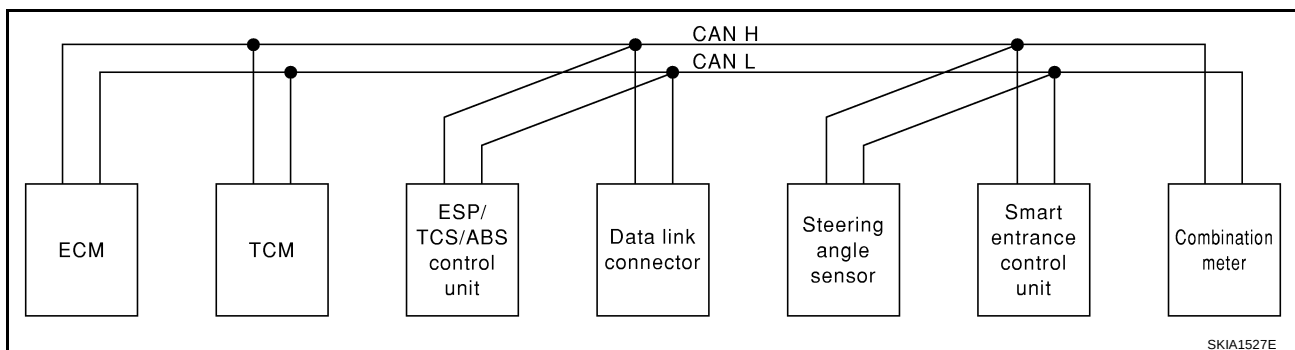
[EURO-OBD]

Signals	ECM	TCM	ESP/ TCS / ABS con- trol unit	Steering angle sensor	Smart entrance control unit	ICC unit	ICC sen- sor	Combina- tion meter
Steering wheel angle sensor signal			R	T				
Wheel speed sensor signal			T			R		
Rear window defogger signal	R				T			
Heater fan switch signal	R							T
Air conditioner switch signal	R							T
Primary pulley revolution signal	R	T	R			R		
Secondary pulley revolution signal	R	T	R			R		
ICC operation signal	R					T		
Brake switch signal		R						T
MI signal	T							R
Current gear position signal		T						R
Engine coolant temperature signal	T					R		R
Fuel consumption signal	T							R
Vehicle speed signal		R	T					
			T					R
	R							T
Seat belt reminder signal					R			T
Lighting switch position signal					T			R
Flashing indicator signal					T			R
Engine cooling fan speed signal	T				R			
Child lock indicator signal					T			R
Door switches state signal					T			R
A/C compressor signal	T				R			

Models with ESP SYSTEM DIAGRAM

ECS006TZ

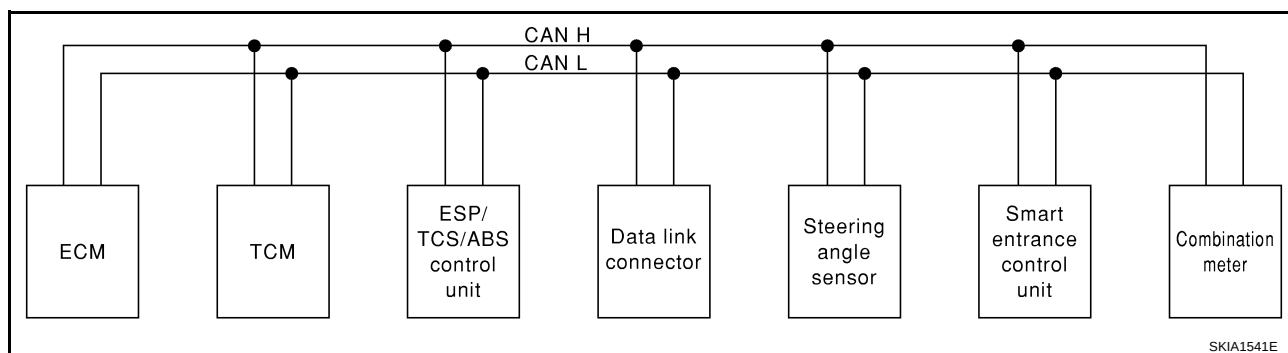
- LHD models



CAN COMMUNICATION

[EURO-OBD]

● RHD models



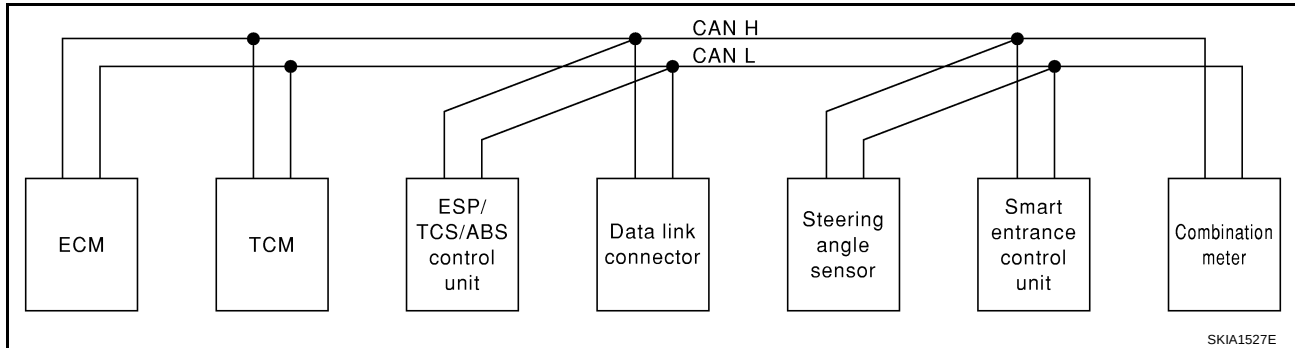
INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

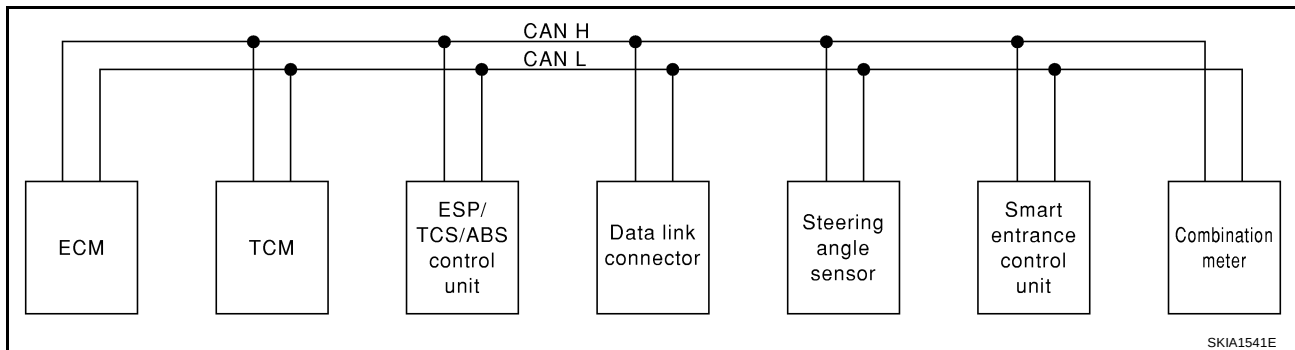
Signals	ECM	TCM	ESP/ TCS / ABS control unit	Steering angle sensor	Smart entrance control unit	Combina- tion meter
Engine speed signal	T		R			R
Accelerator pedal position signal	T	R	R			
Closed throttle position signal	T	R				
ESP operation signal	R	R	T			
TCS operation signal	R	R	T			
ABS operation signal	R	R	T			
Stop lamp switch signal		R	T			
Steering wheel angle sensor signal			R	T		
Rear window defogger signal	R				T	
Heater fan switch signal	R					T
Air conditioner switch signal	R					T
Primary pulley revolution signal	R	T				
Secondary pulley revolution signal	R	T				
MI signal	T					R
Current gear position signal		T				R
Engine coolant temperature signal	T					R
Fuel consumption signal	T					R
Vehicle speed signal		R	T			
			T			R
	R					T
Seat belt reminder signal					R	T
Lighting switch position signal					T	R
Flashing indicator signal					T	R
Engine cooling fan speed signal	T				R	
Child lock indicator signal					T	R
Door switches state signal					T	R
A/C compressor signal	T				R	
ASCD main switch signal	T					R
ASCD cruise signal	T					R

Models with ABS SYSTEM DIAGRAM

● LHD models



● RHD models



INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Combination meter
Engine speed signal	T				R
Closed throttle position signal	T	R			
ABS operation signal	R	R	T		
Stop lamp switch signal		R	T		
Rear window defogger signal	R			T	
Heater fan switch signal	R				T
Air conditioner switch signal	R				T
Primary pulley revolution signal	R	T			
Secondary pulley revolution signal	R	T			
MI signal	T				R
Current gear position signal		T			R
Engine coolant temperature signal	T				R
Fuel consumption signal	T				R
Vehicle speed signal		R	T		
			T		R
	R				T
Seat belt reminder signal				R	T
Lighting switch position signal				T	R
Flashing indicator signal				T	R
Engine cooling fan speed signal	T			R	

CAN COMMUNICATION

[EURO-OBD]

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Combination meter
Child lock indicator signal				T	R
Door switches state signal				T	R
A/C compressor signal	T			R	
ASCD main switch signal	T				R
ASCD cruise signal	T				R
Accelerator pedal position signal	T	R			

A
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CVT
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TROUBLE DIAGNOSIS FOR POWER SUPPLY

PFP:00000

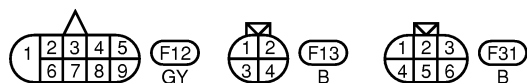
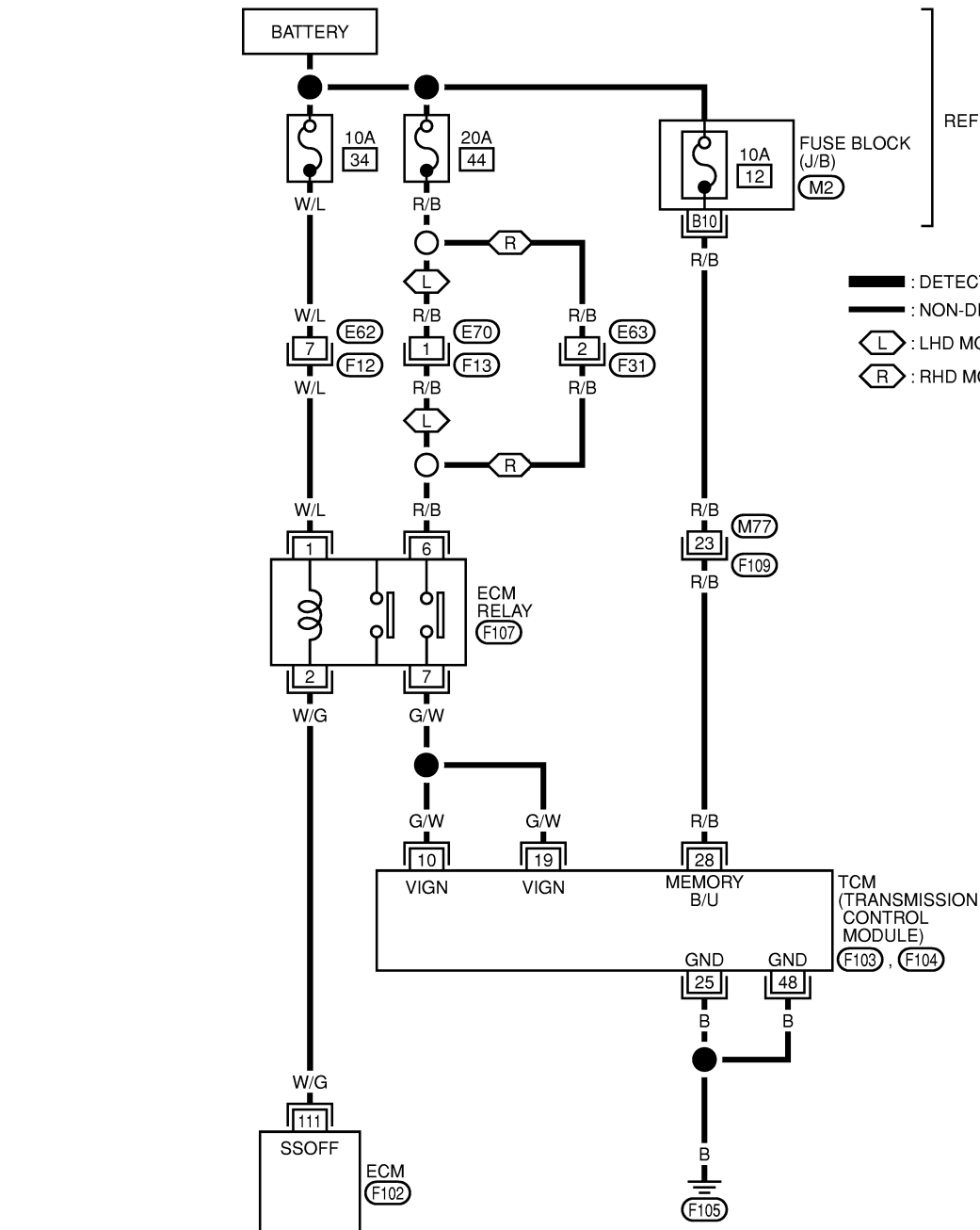
Wiring Diagram — CVT — MAIN

ECS006GU

CVT-MAIN-01

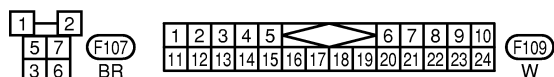
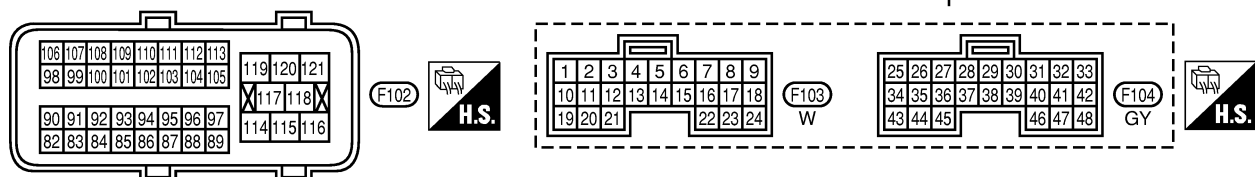
REFER TO PG-POWER.

— : DETECTABLE LINE FOR DTC
 — : NON-DETECTABLE LINE FOR DTC
 L : LHD MODELS
 R : RHD MODELS



REFER TO THE FOLLOWING.

(M2) - FUSE BLOCK-
 JUNCTION BOX (J/B)



TCM TERMINALS AND REFERENCE VALUE

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
10	G/W	Power source	 and 	When turning ignition switch to "ON". Battery voltage
				When turning ignition switch to "OFF". 0V
19	G/W	Power source	 and 	Same as No. 10
25	B	Ground		—
28	R/B	Power source (Memory back-up)	 or 	When turning ignition switch to "OFF". Battery voltage
				When turning ignition switch to "ON". Battery voltage
48	B	Ground	 and 	—
				—

DIAGNOSTIC PROCEDURE

1. CHECK TCM POWER SOURCE

- Turn ignition switch to "ON" position.
(Do not start engine.)
- Check voltage between TCM terminals 10, 19, 28 and ground.

Voltage: Battery voltage

- Turn ignition switch to "OFF" position.
- Check voltage between TCM terminal 28 and ground.

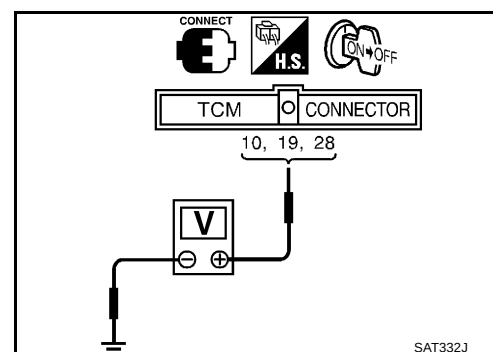
Voltage: Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check the following items:

- Harness for short or open between ignition switch and TCM terminals 10, 19 and 25 (Main harness)
- Ignition switch and fuse
Refer to [PG-3, "POWER SUPPLY ROUTING"](#).



2. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Disconnect TCM harness connector.
3. Check continuity between terminals 25, 48 and ground.

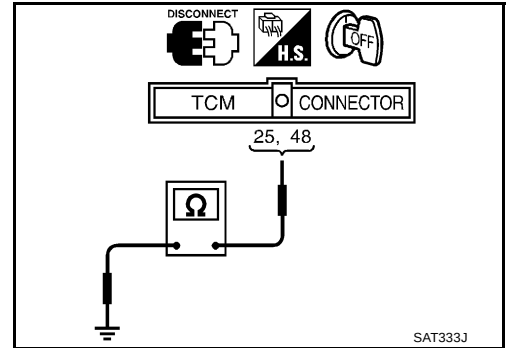
Continuity should exist.

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

OK or NG

OK >> **INSPECTION END**

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



DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[EURO-OBD]

DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

PFP:32006

Description

ECS006GV

- The PNP switch assembly includes a transmission range switch.
- The transmission range switch detects the selector lever position and sends a signal to the TCM.

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
27	L	PNP switch "L" position	When setting selector lever to "L" position.	Battery voltage
			When setting selector lever to other positions.	0V
34	W/G	PNP switch "D" position	When setting selector lever to "D" position.	Battery voltage
			When setting selector lever to other positions.	0V
35	G/W	PNP switch "R" position	When setting selector lever to "R" position.	Battery voltage
			When setting selector lever to other positions.	0V
36	G	PNP switch "N" or "P" position	When setting selector lever to "N" or "P" position.	Battery voltage
			When setting selector lever to other positions.	0V



ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
: PNP SW/CIRC : P0705 : MI Code No. 0705	TCM does not receive the correct voltage signal from the switch based on the gear position.	• Harness or connectors (The PNP switch circuit is open or shorted.) • PNP switch

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

If "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test. After the repair, perform the following procedure to confirm the malfunction is eliminated.

With CONSULT-II

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "CVT" with CONSULT-II.
2. Make sure that output voltage of CVT fluid temperature sensor is within the range below.
FLUID TEMP SEN: 0.5 - 1.5V
If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid)
3. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
4. Start engine and maintain the following conditions for at least 15 consecutive seconds.

SELECT SYSTEM
CVT
ENGINE

SAT250K

DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[EURO-OBD]

VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.0/8

Selector lever: D position

ENG SPEED: 450 rpm or more

If the check result is "NG", go to [CVT-60, "Diagnostic Procedure"](#) .



With GST

Follow the procedure "With CONSULT-II".

DTC P0705 PARK/NEUTRAL POSITION (PNP) SWITCH

[EURO-OBD]

Wiring Diagram - CVT - PNP/SW

ECS006GW

CVT-PNP/SW-01

A

B

CVT

D

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F

G

H

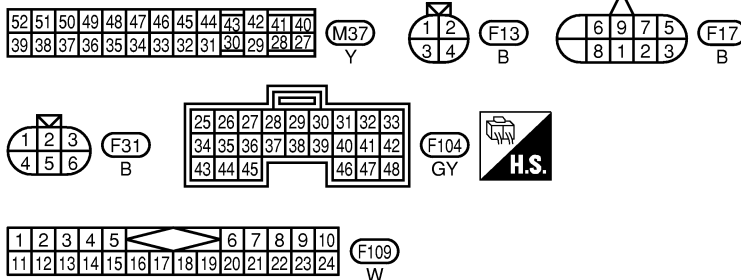
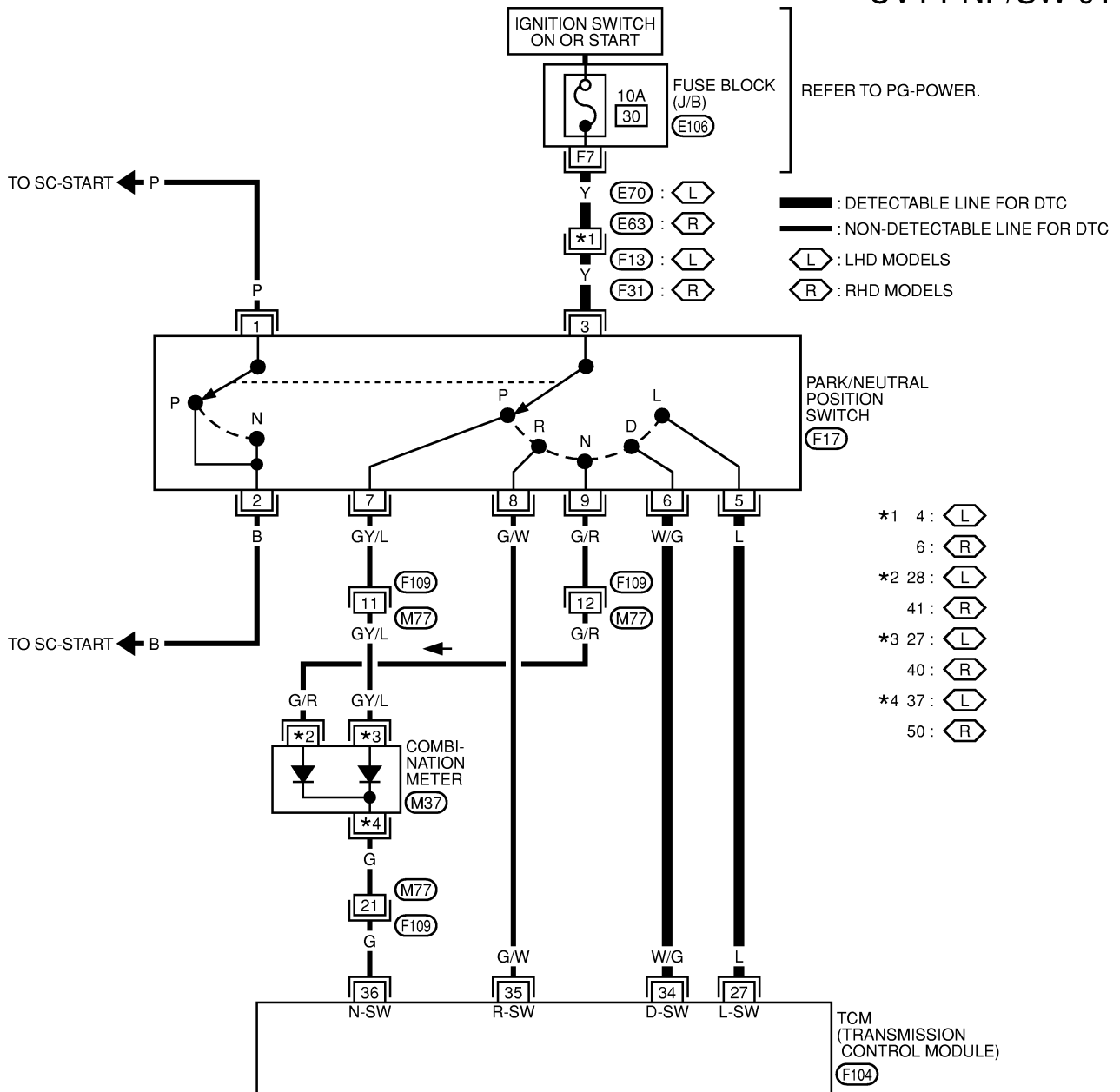
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REFER TO THE FOLLOWING.
E106 - FUSE BLOCK JUNCTION BOX (J/B)

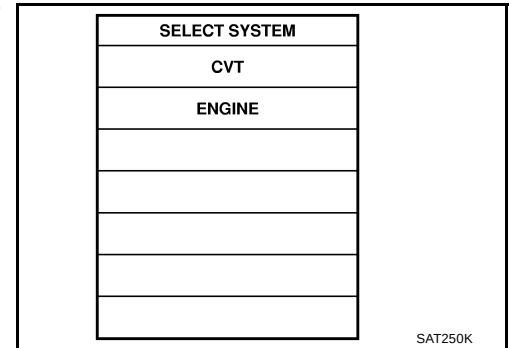
MCWA0062E

Diagnostic Procedure

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

① With CONSULT-II

1. Turn ignition switch to "ON" position.
(Do not start engine.)
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out "P/N", "R", "D" and "L" position switches moving selector lever to each position.
Check the signal of the selector lever position is indicated properly.



OK or NG

OK >> GO TO 3.

NG >> Check the following items:

- PNP switch
Refer to [CVT-61, "Component Inspection"](#) .
- Harness for short or open between ignition switch and PNP switch (Main harness)
- Harness for short or open between PNP switch and TCM (Main harness)
- Ignition switch and fuse
Refer to [PG-3, "POWER SUPPLY ROUTING"](#) .

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

⊗ Without CONSULT-II

1. Turn ignition switch to "ON" position.
(Do not start engine.)
2. Check voltage between TCM terminals 27, 34, 35, 36 and ground while moving selector lever through each position.

Voltage:**B: Battery voltage****0: 0V**

Lever position	Terminal No.			
	36	35	34	27
P, N	B	0	0	0
R	0	B	0	0
D	0	0	B	0
L	0	0	0	B

MTBL0312

OK or NG

OK >> GO TO 3.

NG >> Check the following items:

- PNP switch
Refer to [CVT-61, "Component Inspection"](#) .
- Harness for short or open between ignition switch and PNP switch (Main harness)
- Harness for short or open between PNP switch and TCM (Main harness)
- Ignition switch and fuse
Refer to [PG-3, "POWER SUPPLY ROUTING"](#) .

3. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-57](#) .

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

Component Inspection PARK/NEUTRAL POSITION SWITCH

ECS006GY

1. Check continuity between terminal 3 and terminals 5, 6, 7, 8 and 9 while moving manual shaft through each position.

Lever position	Terminal No.
P	3 — 7
R	3 — 8
N	3 — 9
D	3 — 6
L	3 — 5

2. If NG, check again with control cable disconnected from manual shaft of CVT assembly. Refer to step 1.
3. If OK on step 2, adjust control cable. Refer to [CVT-209, "Control Cable Adjustment"](#) .
4. If NG on step 2, remove PNP switch from CVT and check continuity of PNP switch terminals. Refer to [CVT-209, "Park/Neutral Position \(PNP\) Switch Adjustment"](#) .
5. If OK on step 4, adjust PNP switch.
6. If NG on step 4, replace PNP switch.

DTC P0710 CVT FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

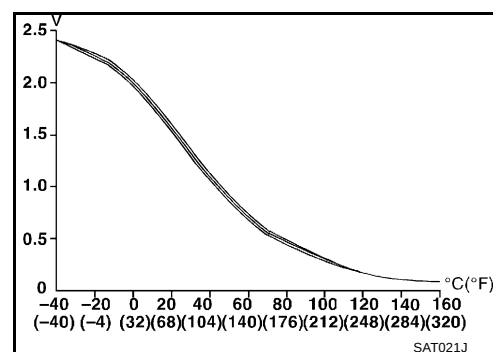
DTC P0710 CVT FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31020

Description

ECS006GZ

The CVT fluid temperature sensor detects the CVT 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)	
CVT fluid temperature sensor	Cold [20°C (68°F)]	1.5V	2.5 kΩ
	Hot [80°C (176°F)]	0.5V	0.3 kΩ

TCM TERMINAL SIGNALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
42	B	Sensor ground	—	—
47	BR	CVT fluid temperature sensor	When CVT fluid temperature is 20°C (68°F).	1.5V
			When CVT fluid temperature is 80°C (176°F).	0.5V

ON BOARD AND DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
: FLUID TEMP SEN/CIRC : P0710 : MI Code No. 0710	TCM receives an excessively low or high voltage from the sensor.	- Harness or connectors (The sensor circuit is open or shorted.) - CVT fluid temperature sensor

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

DTC P0710 CVT FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

With CONSULT-II

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
2. Start engine and maintain the following conditions for at least 10 minutes (Total). (It is not necessary to maintain continuously.)

CMPS·RPM (REF): 450 rpm or more

VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.3V

Selector lever: D position

If the check result is NG, go to "Diagnostic Procedure", [CVT-65](#).

SELECT SYSTEM
CVT
ENGINE

SAT250K

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT255K

With GST

Follow the procedure "With CONSULT-II".

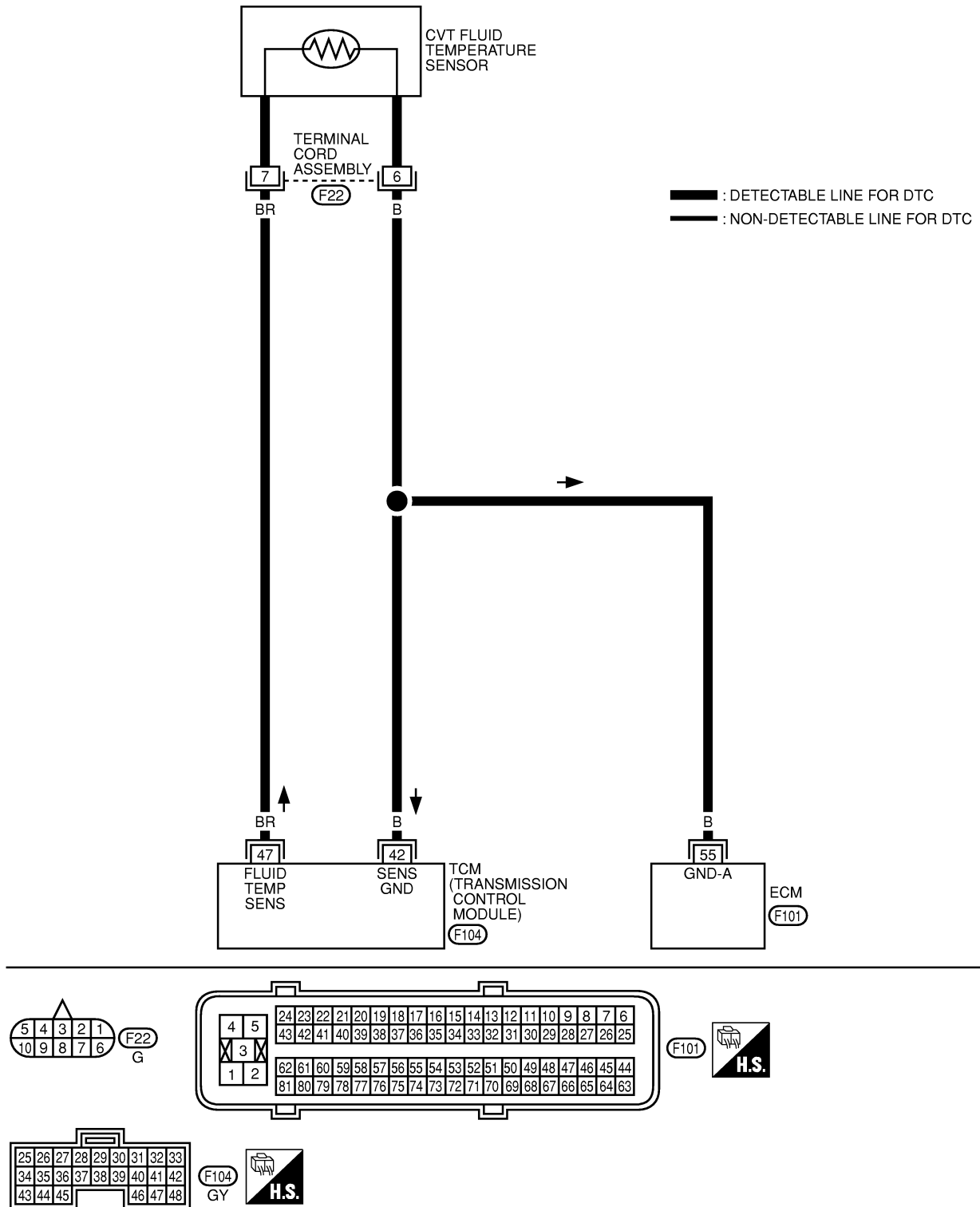
DTC P0710 CVT FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

Wiring Diagram - CVT - FTS

ECS006H0

CVT-FTS-01



MCWA0026E

Diagnostic Procedure

ECS006H1

1. CHECK CVT FLUID TEMPERATURE SENSOR WITH TERMINAL CORD ASSEMBLY

1. Turn ignition switch to "OFF" position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Read out the resistance between terminals 6 and 7.

Resistance:**Cold [20°C (68°F)]****Approximately 2.5 kΩ**

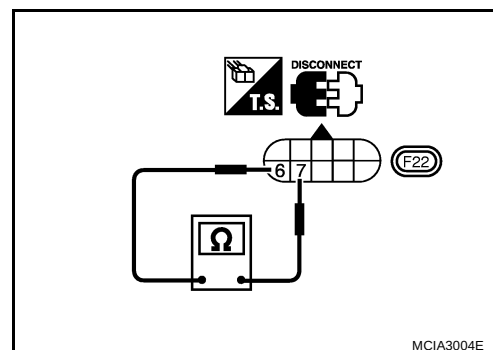
4. Reinstall any part removed.

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Replace CVT assembly.



2. CHECK INPUT SIGNAL OF CVT FLUID TEMPERATURE SENSOR (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "FLUID TEMP SE".

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

OK >> GO TO 4.

NG >> Check the following item:

- Harness for short to ground or short to power or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM
Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").

DTC P0710 CVT FLUID TEMPERATURE SENSOR CIRCUIT

[EURO-OBD]

3. CHECK INPUT SIGNAL OF CVT FLUID TEMPERATURE SENSOR (WITHOUT CONSULT-II)

⊗ Without CONSULT-II

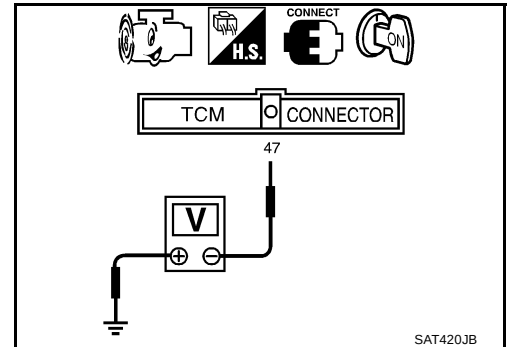
1. Start engine.
2. Check voltage between TCM terminal 47 and ground while warming up CVT.

Voltage:

Cold [20°C (68°F)] → Hot [80°C (176°F)]:

Approximately 1.5V → 0.5V

3. Turn ignition switch to "OFF" position.
4. Disconnect TCM harness connector.



5. Check continuity between terminal 42 and ground.

Continuity should exist.

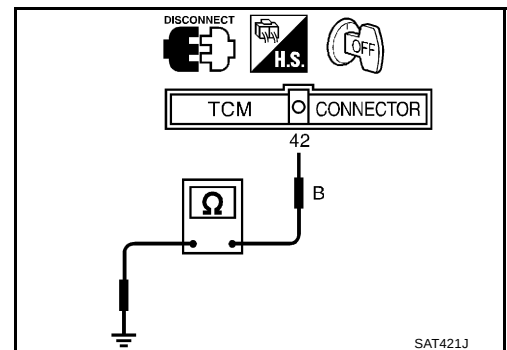
If OK, check harness for short to ground and short to power.

OK or NG

OK >> GO TO 4.

NG >> Check the following item:

- Harness for short to ground or short to power or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM
Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").



4. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-62](#) .

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

DTC P0715 PRIMARY SPEED SENSOR

Description

The primary speed sensor detects the primary pulley revolution speed sends a signal to the ECM.

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
38	G/Y	Primary speed sensor	When driving [L position, 20 km/h (12 MPH)], the pulse measurement by using the pulse measurement function of CONSULT-II. - CONSULT-II cable connected to data link connector. - This inspection cannot be measured by circuit tester.	900 Hz

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : PRI SPEED SIG/CIRC  : P0715  : MIL Code No. 0715	TCM does not receive the proper voltage signal from the sensor.	- Harness or connectors (The sensor circuit is open or shorted.) - Primary speed sensor

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

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

 With CONSULT-II

- Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- Start engine and maintain the following conditions for at least 5 consecutive seconds.

VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.3V

Selector lever: D position

ENG SPEED: 450 rpm or more

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 "Diagnostic Procedure", [CVT-69](#).

SELECT SYSTEM
CVT
ENGINE
SAT250K

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER
SAT255K

[EURO-OBD]

Wiring Diagram - CVT - PSSAT-P

CVT-VSSAT-01



Diagnostic Procedure**1. CHECK PRIMARY SPEED SENSOR**

Refer to "Component Inspection", [CVT-69](#).

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Repair or replace primary speed sensor.

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

 **With CONSULT-II**

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "I/P PULLY SPD" while driving.
Check the value changes according to driving speed. (Almost same value as engine speed)

OK or NG

OK >> GO TO 3.

NG >> Check the following items:

- Harness for short or open between TCM, ECM and primary speed sensor (Main harness)
- Ground circuit for ECM
Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").

3. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-67](#).

OK or NG

OK >> **INSPECTION END**

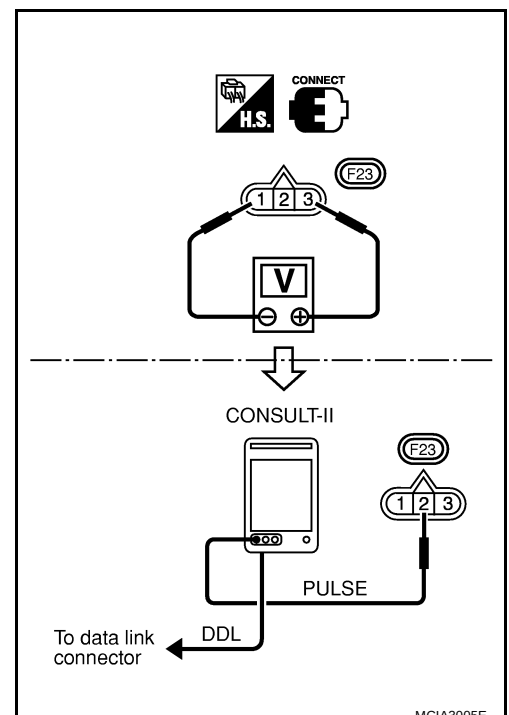
NG >> 1. Perform TCM input/output signal inspection.

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

**Component Inspection
PRIMARY SPEED SENSOR**

1. Jacking up the vehicle.
 2. Check pulse by using the pulse measurement function of CONSULT-II when front wheel rotating.
- CONSULT-II cable connected to data link connector.

At front wheel rotating [L position 20 km/h (12 MPH)]: Approx. 900 Hz



DTC P0720 VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR) [EURO-OBD]

PFP:31935

Description

ECS006H6

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

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
29	G/R	Secondary speed sensor	When driving [D position, 20 km/h (12 MPH)], the pulse measurement by using the pulse measurement function of CONSULT-II. - CONSULT-II cable connected to data link connector. - This inspection cannot be measured by circuit tester.	600 Hz
42	B	Sensor ground		—

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : VEH SPD SEN/CIR AT	TCM does not receive the proper voltage signal from the sensor.	- Harness or connectors (The sensor circuit is open or shorted.) - Secondary speed sensor
 : P0720		
 : MI Code No. 0720		

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

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

With CONSULT-II

- Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- Start engine and maintain the following conditions for at least 12 consecutive seconds.

THRTL POS SEN: More than 1.3V

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 "DIAGNOSTIC PROCEDURE", [CVT-73](#).

SELECT SYSTEM
CVT
ENGINE

SAT250K

DTC P0720 VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR)
[EURO-OBDD]

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT255K



With GST
Follow the procedure “With CONSULT-II”.

A

B

CVT

D

E

F

G

H

I

J

K

L

M

DTC P0720 VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR) [EURO-OBd]

Diagnostic Procedure

ECS006H8

1. CHECK SECONDARY SPEED SENSOR

Refer to [CVT-73, "Component Inspection"](#).

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Repair or replace secondary speed sensor.

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

 **With CONSULT-II**

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "VHCL SPEED SE" while driving.
Check the value changes according to driving speed.

OK or NG

OK >> GO TO 3.

NG >> Check the following items:

- Harness for short or open between TCM, ECM and secondary speed sensor (Main harness)
- Ground circuit for ECM
Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").

3. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-70](#).

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

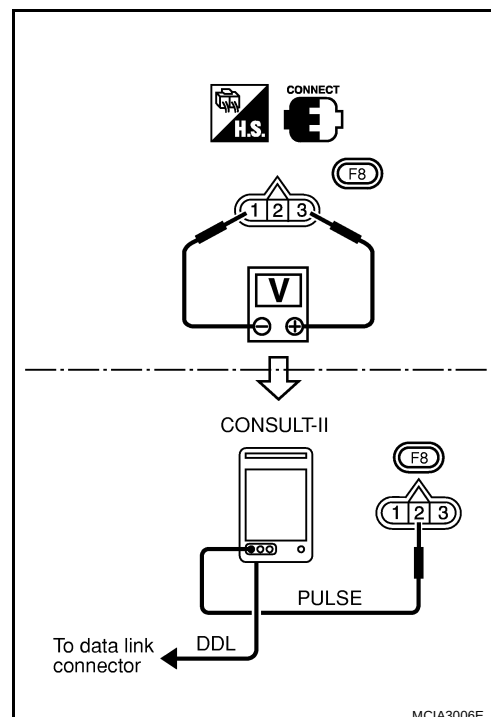
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

Component Inspection SECONDARY SPEED SENSOR

ECS006H9

1. Jacking up the vehicle.
 2. Check pulse by using the pulse measurement function of CONSULT-II when front wheel rotating.
- CONSULT-II cable connected to data link connector.

At front wheel rotating [D position, 20 km/h (12 MPH)]: Approx. 600 Hz



MCIA3006E

DTC P0725 ENGINE SPEED SIGNAL

PFP:24825

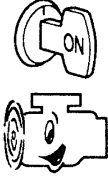
Description

ECS006HA

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

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
39	L/OR	Engine speed signal	 When engine runs at idle speed.	0.5 - 1.5V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check item (Possible cause)
 : ENGINE SPEED SIG  : P0725  : MI Code No. 0725	TCM does not receive the proper voltage signal from ECM.	Harness or connectors (The sensor circuit is open or shorted.)

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

SELECT SYSTEM
CVT
ENGINE

SAT250K

 With CONSULT-II

- Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
- Start engine and maintain the following conditions for at least 10 consecutive seconds.

VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: More than 1.3V

Selector lever: D position

If the check result is "NG", go to "Diagnostic Procedure", [CVT-76](#)

SELECT SYSTEM
CVT
ENGINE

SAT250K

 With GST

Follow the procedure "With CONSULT-II".

DTC P0725 ENGINE SPEED SIGNAL

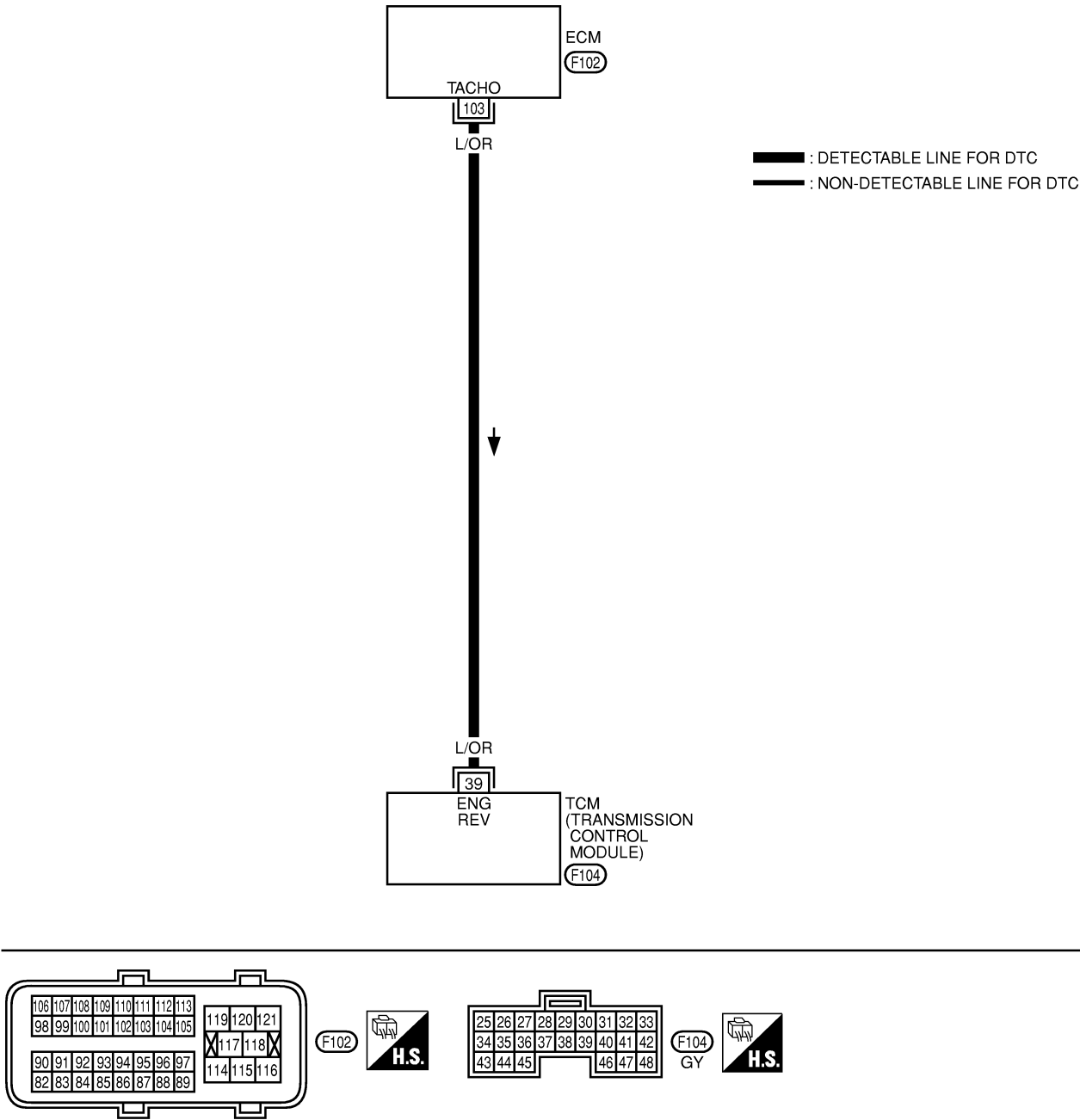
[EURO-OBD]

Wiring Diagram - CVT - ENGSS

ECS006HB

CVT-ENGSS-01

A
B
CVT
D
E
F
G
H
I
J
K
L
M



Diagnostic Procedure

1. CHECK DTC WITH ECM

Perform diagnostic test mode II (self-diag results) for engine control. Check ignition signal circuit condition.

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Check ignition signal circuit for engine control. Refer to EC section (IGNITION SIGNAL).

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "ENGINE SPEED".
Check engine speed changes according to throttle position.

OK or NG

OK >> GO TO 4.

NG >> Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil
Refer to EC section (IGNITION SIGNAL).

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

Without CONSULT-II

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

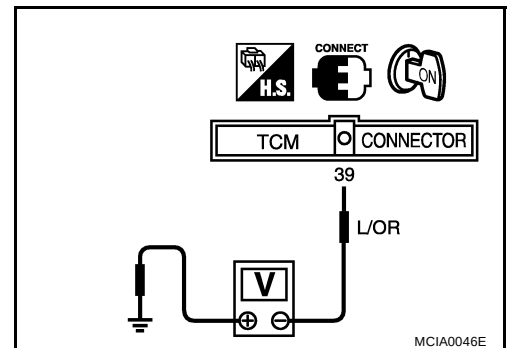
Voltage (Idle speed): 0.5 - 1.5V

OK or NG

OK >> GO TO 4.

NG >> Check the following items:

- Harness for short or open between TCM and ECM
- Resistor and ignition coil
Refer to EC section (IGNITION SIGNAL).



4. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-74](#).

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EURO-OBD]

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

Description

ECS006HD

The torque converter clutch solenoid valve is activated 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 CVT fluid temperature is too low.

When the accelerator pedal is depressed (less than 2/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
3	GY/R	Torque converter clutch solenoid valve		When CVT performs lock-up.	12.0V
				When CVT does not perform lock-up.	0V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : TCC SOLENOID/CIRC	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	- Harness or connectors (The solenoid circuit is open or shorted.) - T/C clutch solenoid valve
 : P0740		
 : MI Code No. 0740		

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NOTE:

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

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

With CONSULT-II

- Turn ignition switch "ON".
- Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II and wait at least 10 seconds.

If the check result is "NG", go to "Diagnostic Procedure", [CVT-80](#)

SELECT SYSTEM
CVT
ENGINE

SAT250K

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EURO-OBD]

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT255K



With GST

Follow the procedure "With CONSULT-II".

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

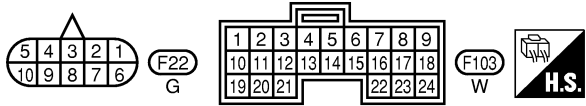
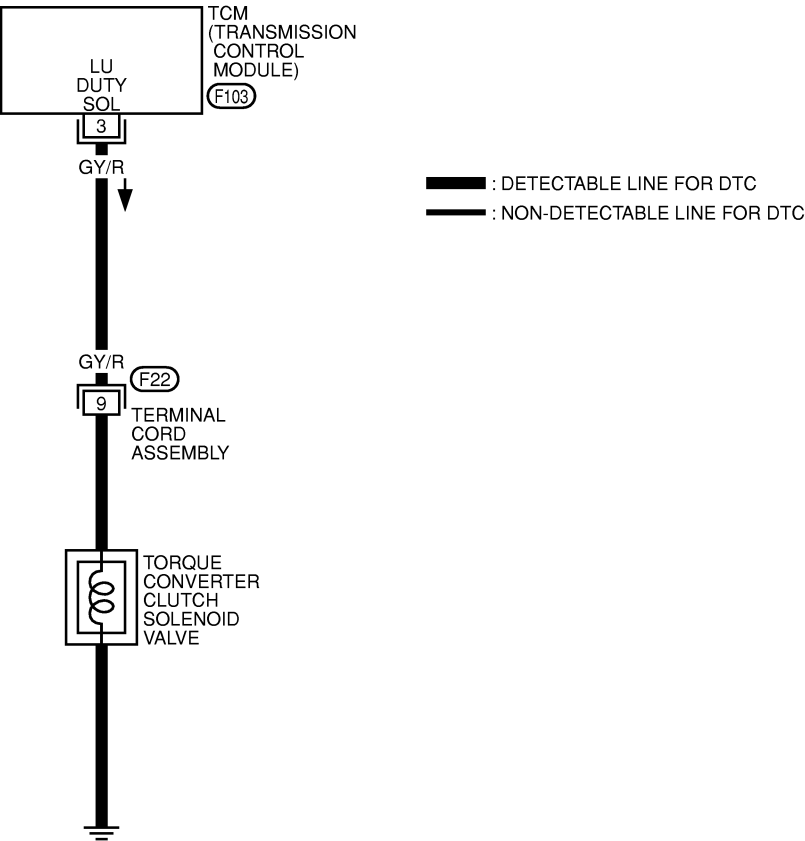
[EURO-OBD]

Wiring Diagram - CVT - TCV

ECS006HE

CVT-TCV-01

A
B
CVT
D
E
F
G
H
I
J
K
L
M



Diagnostic Procedure

ECS006HF

1. CHECK GROUND CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal 9 and ground.

Resistance: 10 - 20Ω

OK or NG

- OK >> GO TO 2.
 NG >> Replace CVT assembly.

2. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal 9 and TCM harness connector terminal 3.

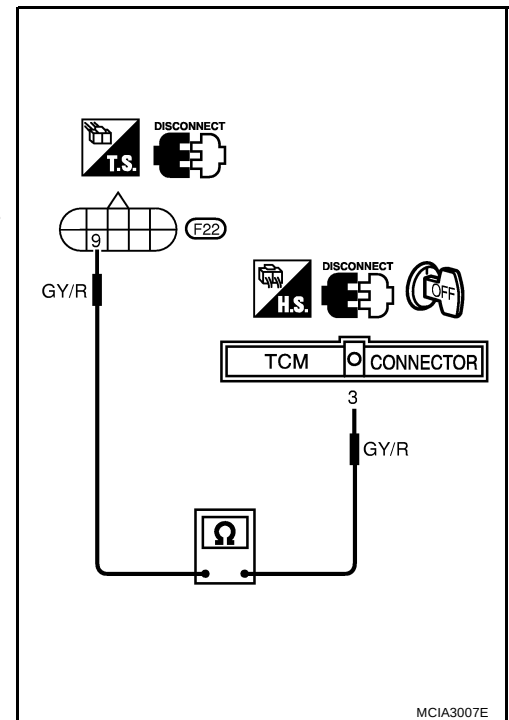
Continuity should exist.

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.

**3. CHECK DTC**Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-77](#).

OK or NG

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

DTC P0740 TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EURO-OBD]

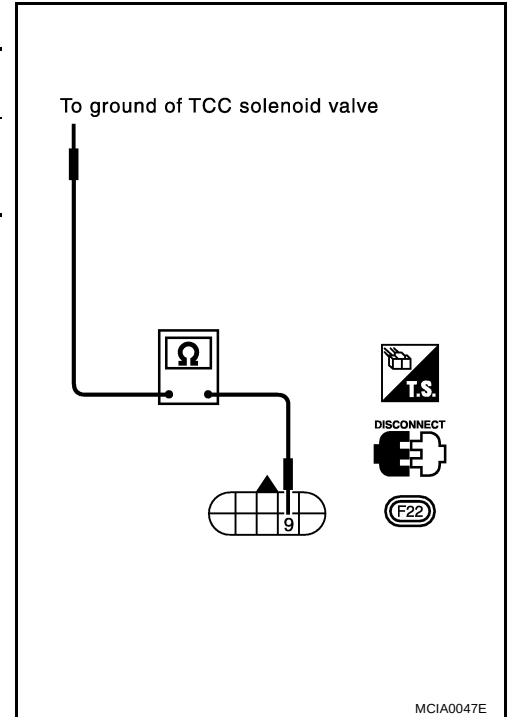
Component Inspection

TORQUE CONVERTER CLUTCH SOLENOID VALVE

Resistance Check

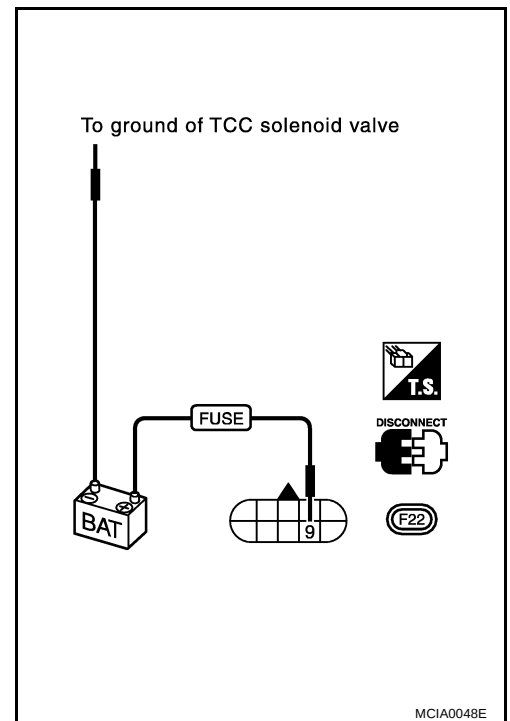
- Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Torque converter clutch solenoid valve	9	Ground of TCC solenoid valve	10 - 20Ω



Operation Check

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



DTC P0745 LINE PRESSURE SOLENOID VALVE

PFP:31940

Description

ECS006KR

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

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

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Line pressure solenoid valve duty	Small throttle opening (Low line pressure)	Approximately 4%
	↓ Large throttle opening (High line pressure)	↓ Approximately 94%

NOTE:

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".

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
1	R/W	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	2.8V
			When depressing accelerator pedal fully after warming up engine.	1.4V
2	P/B	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	11.0V
			When depressing accelerator pedal fully after warming up engine.	4.0V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : L/PRESS SOL/CIRC	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	● Harness or connectors (The solenoid circuit is open or shorted.) ● Line pressure solenoid valve
 : P0745		
 : MI Code No. 0745		

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NOTE:

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

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

 With CONSULT-II

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
2. Depress accelerator pedal completely and wait at least 5 seconds.
If the check result is "NG", go to "Diagnostic Procedure", [CVT-85](#).

SELECT SYSTEM
CVT
ENGINE

SAT250K

DTC P0745 LINE PRESSURE SOLENOID VALVE

[EURO-OBD]

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT255K

A

B

CVT



With GST
Follow the procedure “With CONSULT-II”.

D

E

F

G

H

I

J

K

L

M

DTC P0745 LINE PRESSURE SOLENOID VALVE

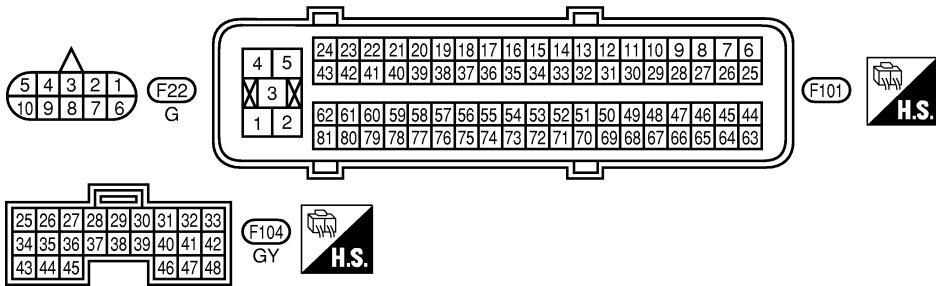
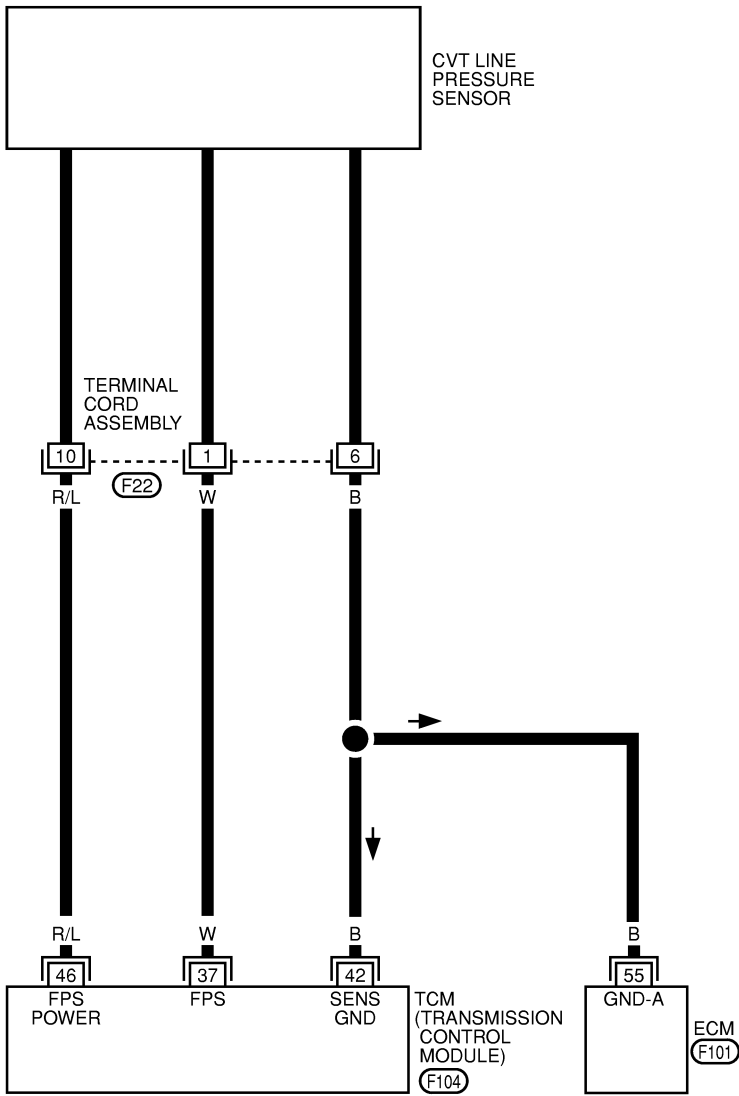
[EURO-OBD]

Wiring Diagram - CVT - LPSV

ECS006KS

CVT-LPS-01

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



MCWA0069E

Diagnostic Procedure

ECS006KT

1. CHECK GROUND CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminal 8 and ground.

Resistance: 2.5 - 5Ω

OK or NG

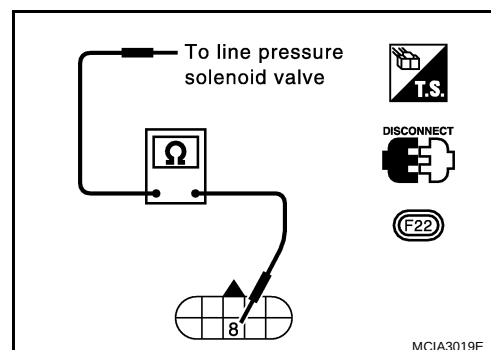
OK >> GO TO 2.

NG >> 1. Remove control valve assembly.

Refer to [CVT-211, "REMOVAL AND INSTALLATION"](#)

2. Check the following items:

- Line pressure solenoid valve
Refer to "Component Inspection", [CVT-87](#).
- 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.
3. Check resistance between terminal 8 and TCM harness connector terminal 2.

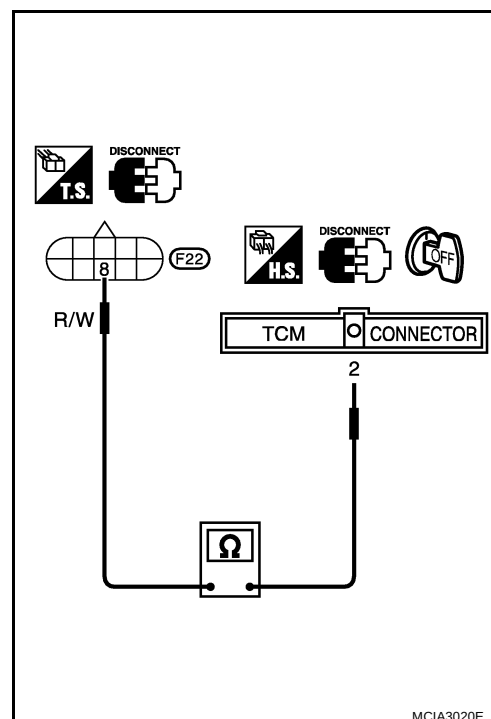
Resistance: 11.2 - 12.8Ω

OK or NG

OK >> GO TO 3.

NG >> Check the following items:

- Dropping resistor
Refer to "Component Inspection", [CVT-87](#).
- Harness for short or open between TCM terminal 2 and terminal cord assembly (Main harness)



3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Check continuity between terminal 8 and TCM harness connector terminal 1.

Continuity should exist.

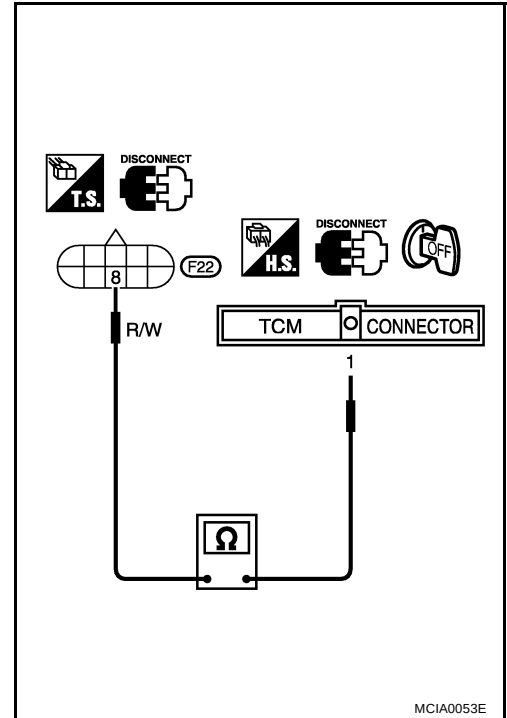
If OK, check harness for short to ground and short to power.

3. Reinstall any part removed.

OK or NG

OK >> GO TO 4.

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



4. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-82](#).

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

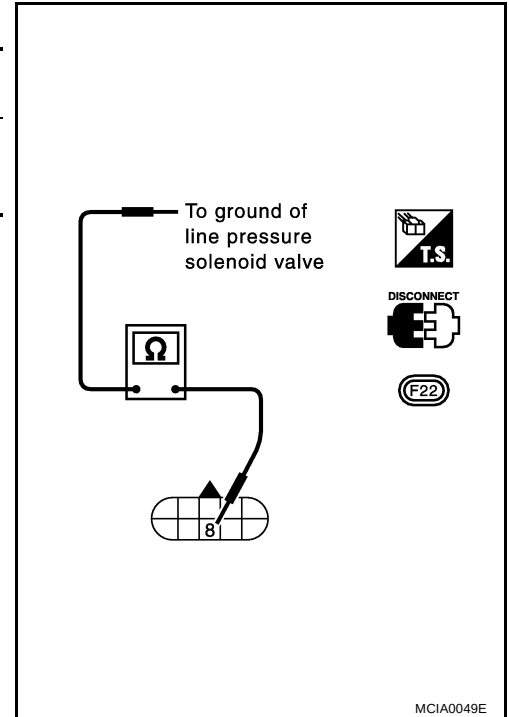
Component Inspection

LINE PRESSURE SOLENOID VALVE

Resistance Check

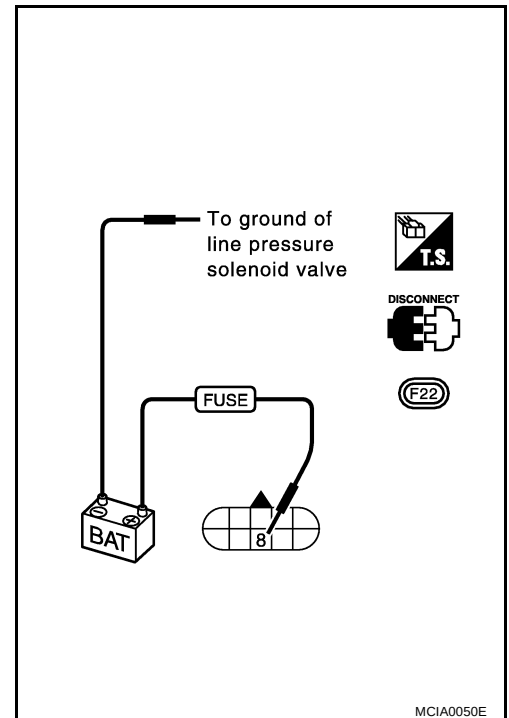
- Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Line pressure solenoid valve	8	Ground of line pressure solenoid valve	2.5 - 5Ω



Operation Check

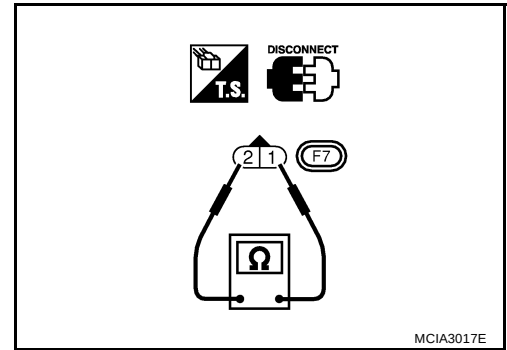
- Check solenoid valve by listening for its operating sound while applying battery voltage to the terminal and ground of line pressure solenoid valve.



DROPPING RESISTOR

- Check resistance between two terminals.

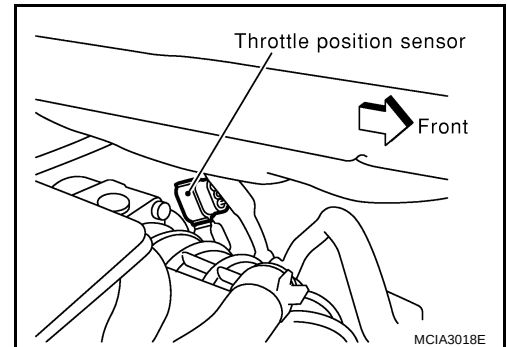
Resistance: 11.2 - 12.8Ω



DTC P1705 THROTTLE POSITION SENSOR

Description

- Throttle position sensor
The throttle position sensor detects the throttle valve position and sends a signal to the TCM.
- Throttle position switch
Consists of a wide open throttle position switch and a closed throttle position switch.
The wide open throttle position switch sends a signal to the TCM when the throttle valve is open at least 1/2 of the full throttle position. The closed throttle position switch sends a signal to the TCM when the throttle valve is fully closed.



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Throttle position sensor	Fully-closed throttle	Approximately 0.5V
	Fully-open throttle	Approximately 4V

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
32	R	Throttle position sensor (Power source)	When turning ignition switch to "ON".	4.5 - 5.5V
			When turning ignition switch to "OFF".	0V
41	GY	Throttle position sensor	When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: 0.3V Fully-open throttle: 3V
42	B	Sensor ground	—	—

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : TP SEN/CIRC CVT  : P1705  : MI Code No. 1705	TCM receives an excessively low or high voltage from the sensor.	- Harness or connectors (The sensor circuit is open or shorted.) - Throttle position sensor - Throttle position switch

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

Always drive vehicle at a safe speed.

NOTE:

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

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

 With CONSULT-II

DTC P1705 THROTTLE POSITION SENSOR

[EURO-OBD]

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "CVT" with CONSULT-II.
2. Check the following.

Accelerator pedal condition	THRTL POS SEN	CLOSED THL/SW	W/O THRL/P-SW
Fully released	Less than 0.5V	ON	OFF
Partially depressed	0.5 - 1.9V	OFF	OFF
Fully depressed	1.9 - 4.0V	OFF	ON

SELECT SYSTEM
CVT
ENGINE

SAT250K

If the check result is NG, go to [CVT-85, "Diagnostic Procedure"](#) .
If the check result is OK, go to following step.

3. Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds. Then release accelerator pedal completely.

VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POSI SEN: Approximately 3V or less

Selector lever: D position

If the check result is NG, go to [CVT-85, "Diagnostic Procedure"](#) .

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT255K



With GST

Follow the procedure "With CONSULT-II".

DTC P1705 THROTTLE POSITION SENSOR

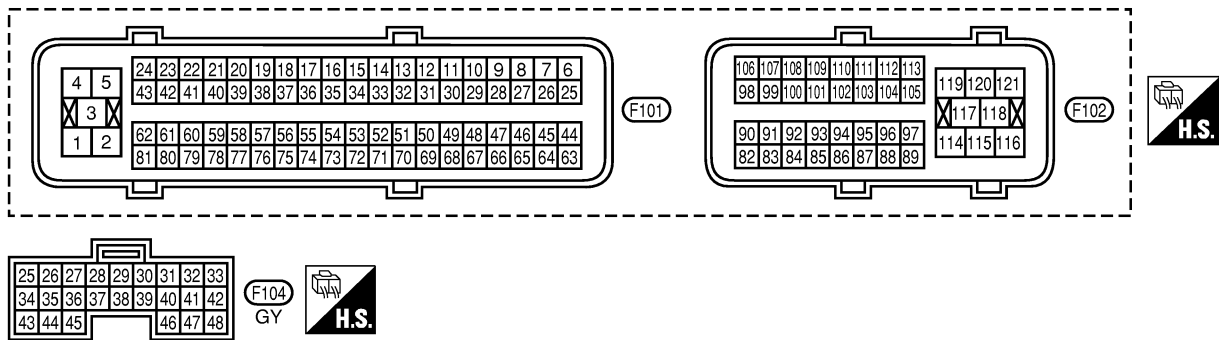
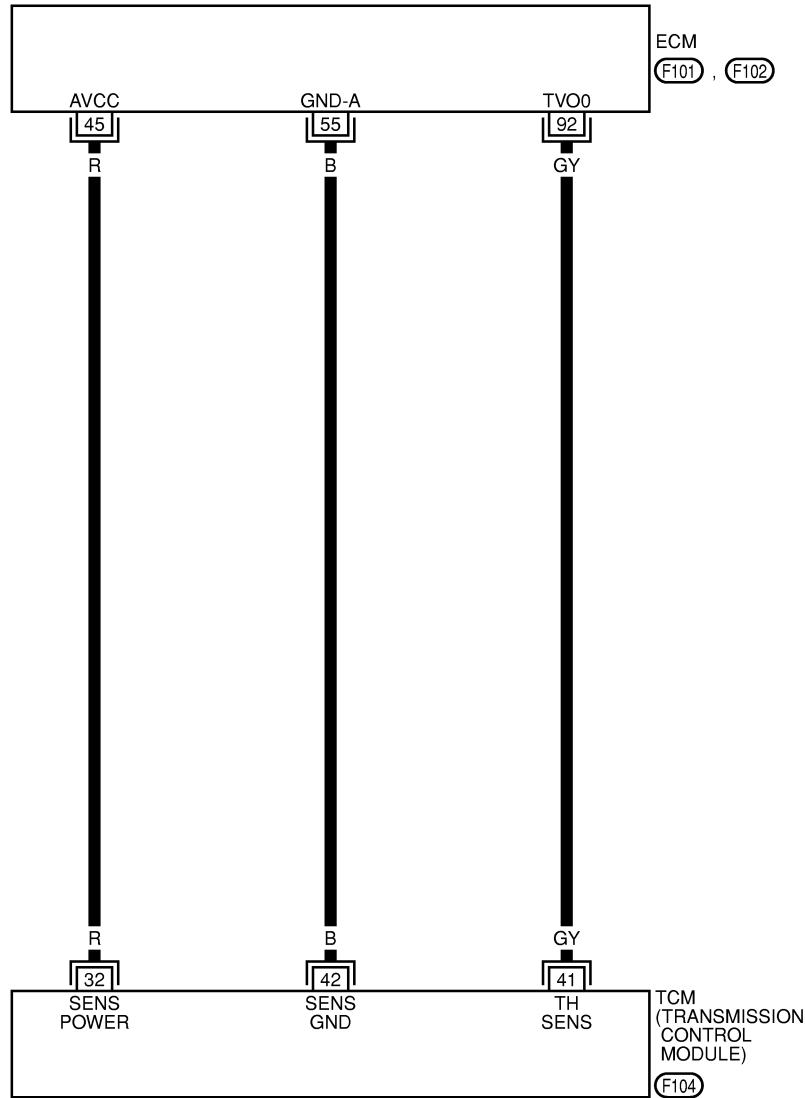
[EURO-OBD]

Wiring Diagram - CVT - TPS

ECS006HM

CVT-TPS-01

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



Diagnostic Procedure**1. CHECK DTC WITH ECM**

Perform diagnostic test mode II (self-diagnostic results) for engine control.

Refer to EC section ["Malfunction Indicator (MI)", "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION"].

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Check throttle position sensor circuit for engine control. Refer to EC section ("DTC P0120 THROTTLE POSITION SENSOR").

2. CHECK INPUT SIGNAL (WITH CONSULT-II)**With CONSULT-II**

1. Turn ignition switch to "ON" position.
(Do not start engine.)
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "THRTL POS SEN".

Voltage:

Fully-closed throttle:

Approximately 0.5V

Fully-open throttle:

Approximately 4V

OK or NG

OK >> GO TO 4.

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

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)**Without CONSULT-II**

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

Voltage:

Fully-closed throttle valve:

Approximately 0.5V

Fully-open throttle valve:

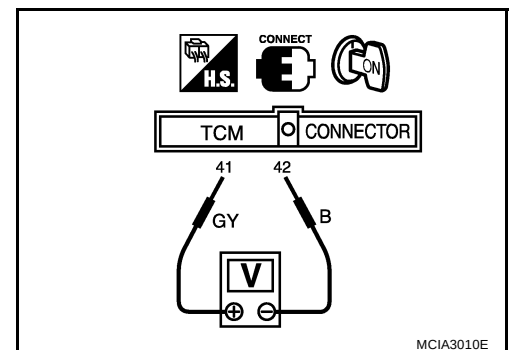
Approximately 4V

(Voltage rises gradually in response to throttle position)

OK or NG

OK >> GO TO 5.

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



4. CHECK THROTTLE POSITION SWITCH CIRCUIT (WITH CONSULT-II)

With CONSULT-II

1. Refer to steps 1 to 7 of "Preparation", "TCM Self-diagnostic Procedure (No Tools)", [CVT-29](#).
2. Turn ignition switch to "OFF" position.
3. Turn ignition switch to "ON" position.
(Do not start engine.)
4. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
5. Read out "CLOSED THL/SW" and "W/O THRL/P-SW" depressing and releasing accelerator pedal.
Check the signal of throttle position switch is indicated properly.

Accelerator pedal condition	Data monitor	
	CLOSED THL/SW	W/O THRL/P-SW
Released	ON	OFF
Fully depressed	OFF	ON

MTBL0011

OK or NG

OK >> GO TO 5.

NG >> Check the following items:

- Throttle position switch — Refer to "EC section"
- Harness for short or open between ECM and TCM

5. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-89](#).

OK or NG

OK >> **INSPECTION END**

NG >> Check the following items:

- Throttle position switch — Refer to "EC section"
- Harness for short or open between ECM and TCM

DTC P1715 PRIMARY SPEED SENSOR

PFP:31935

Description

ECS006LC

The primary speed sensor detects the primary pulley revolution speed and sends a signal to the ECM.

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
38	G/Y	Primary speed sensor	 When driving [L position, 20 km/h (12 MPH)], the pulse measurement by using the pulse measurement function of CONSULT-II. - CONSULT-II cable connected to data link connector. - This inspection cannot be measured by circuit tester.	900 Hz

ON BOARD DIAGNOSIS LOGIC

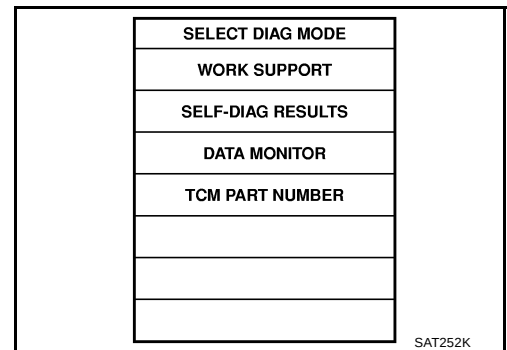
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : I/P PULLY SPD  : 2nd judgement flicker	TCM does not receive the proper voltage signal from the sensor.	- Harness or connectors (The sensor circuit is open or shorted.) - Vehicle speed sensor

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

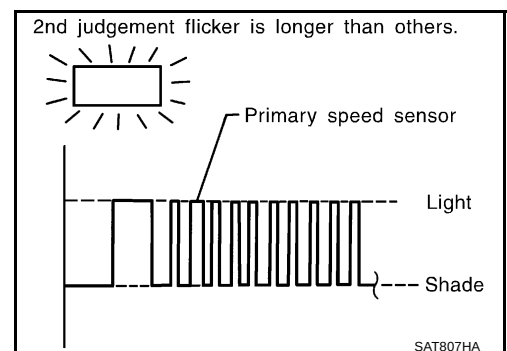
With CONSULT-II

- Start engine.
- Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
- Drive vehicle under the following conditions:
Selector lever in "D" position and vehicle speed higher than 20 km/h (12 MPH).



Without CONSULT-II

- Start engine.
- Drive vehicle under the following conditions:
Selector lever in "D" position and vehicle speed higher than 20 km/h (12 MPH).
- Perform self-diagnosis.
Refer to "SELF-DIAGNOSTIC PROCEDURE (Without CONSULT-II)", [CVT-28](#).



DTC P1715 PRIMARY SPEED SENSOR

[EURO-OBD]

Wiring Diagram - CVT - PSSAT

ECS006LD

CVT-VSSAT-01

A

B

CVT

D

E

F

G

H

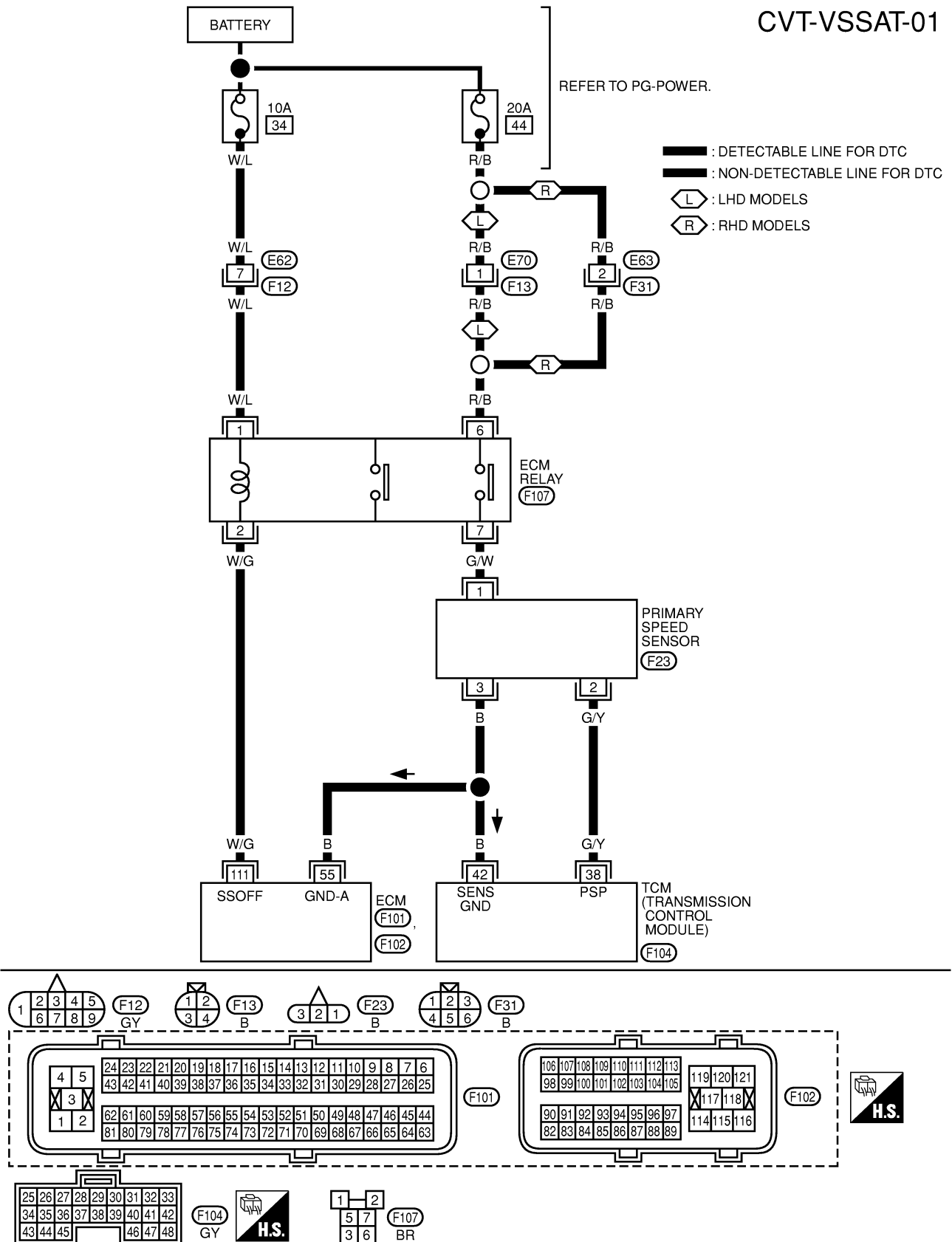
I

J

K

L

M



Diagnostic Procedure

1. CHECK INPUT SIGNAL

With CONSULT-II

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "I/P PULLY SPD" while driving.
Check the value changes according to driving speed.

DATA MONITOR	
MONITOR	NO DTC
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
SLCTLVR POSI	NP
ENGINE SPEED	XXX rpm
I/P PULLY SPD	XXX rpm
CVT RATIO	XXX
PLY CONT STEP	XXX step
LINE PRES DTY	XXX%
TCC S/V DUTY	XXX%

SAT236K

Without CONSULT-II

1. Start engine.
2. Check pulse between TCM terminal 38 and ground while driving at 20 km/h (12 MPH).

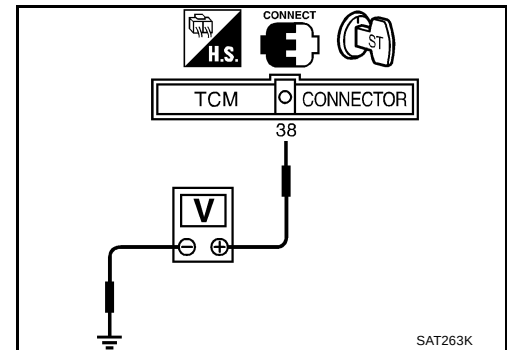
Approx. 900 Hz

OK or NG

OK >> GO TO 2.

NG >> Check the following items:

1. Harness for short or open between TCM, ECM and primary speed sensor (Main harness)
2. Ground circuit for ECM
Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").



SAT236K

2. CHECK DTC

Perform Self-diagnosis Code confirmation procedure, [CVT-94](#).

OK or NG

OK >> **INSPECTION END**

NG >> ● Perform TCM input/output signal inspection.

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

DTC P1777 STEP MOTOR - CIRCUIT

Description

ECS006HO

- The step motor is ON/OFF of 4 aspects changes according to the signal from TCM.
As a result, the flow of line pressure to primary pulley is changed and pulley ratio is controlled.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Step motor	The vehicle runs a safe condition and press/depress accelerator pedal.	ON/OFF

TCM TERMINALS AND REFERENCE VALUE

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
11	PU	Step motor	Within 2 seconds after key switch "ON", the time measurement by using the pulse width measurement function (Hi level) of CONSULT-II. ● CONSULT-II cable connect to data link connector. ● This inspection cannot be measured by circuit tester.	30.0 msec
12	L/W			10.0 msec
20	L/Y			30.0 msec
21	P/L			10.0 msec

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : STEP MOTOR/CIRC  : P1777  : MI Code No. 1777	When in operating step motor ON and OFF, there is no proper change in the voltage of the terminal TCM which corresponds to it.	- Harness or connectors (The step motor circuit is open or shorted.) - Step motor

DIAGNOSTIC TROUBLE CODE (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 "DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE" has been previously conducted, always turn ignition switch "OFF" and wait at least 5 seconds before conducting the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

 With CONSULT-II

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

SELECT SYSTEM
CVT
ENGINE

SAT250K

2. Drive vehicle for at least 5 consecutive seconds.
If the check result is “NG”, go to “Diagnostic Procedure”, [CVT-100](#).

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
TCM PART NUMBER

SAT252K

**With GST**

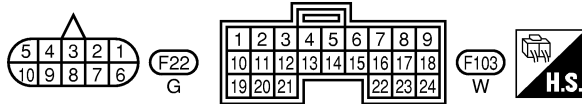
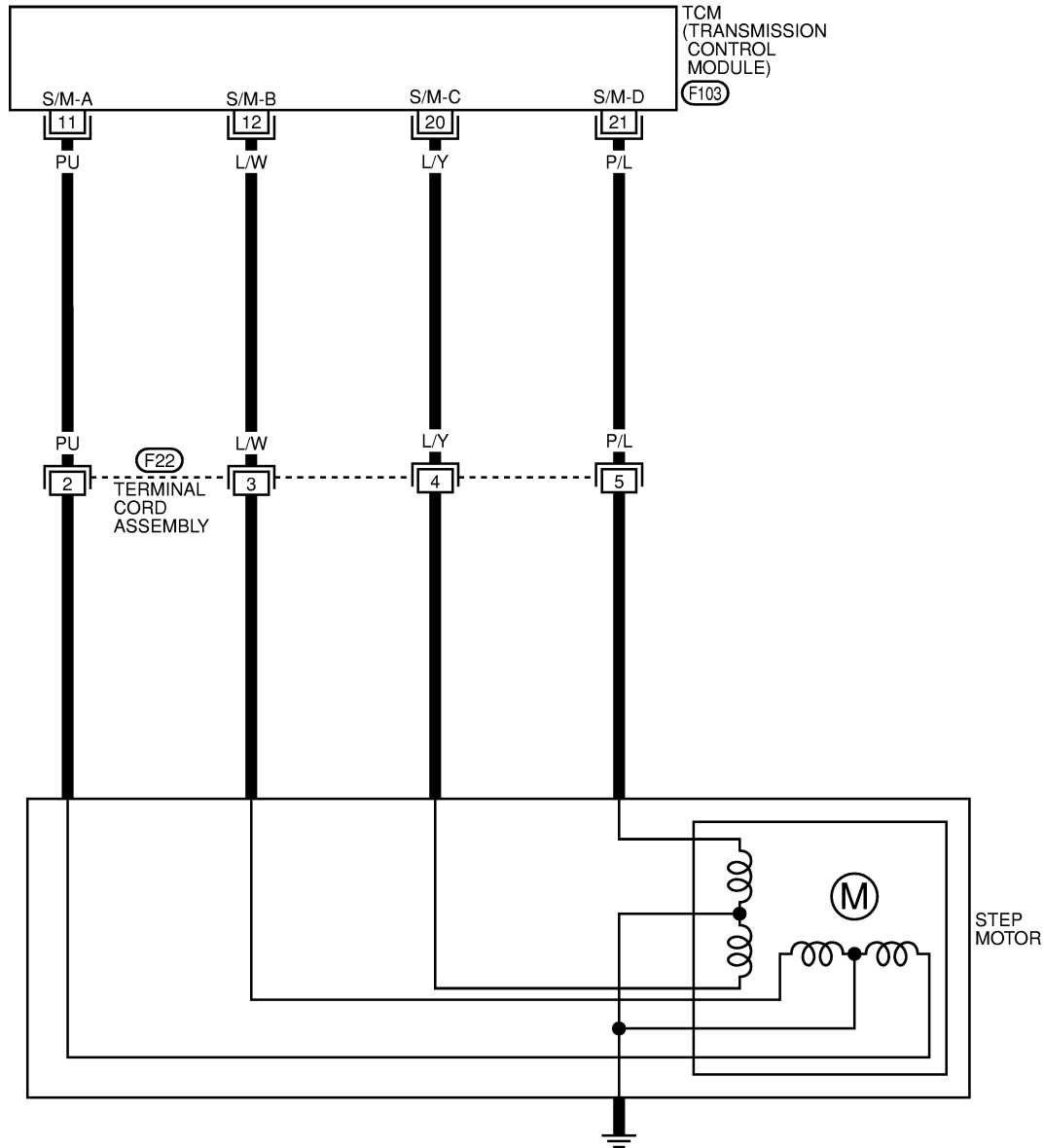
Follow the procedure “With CONSULT-II”.

Wiring Diagram - CVT - STM

ECS006HP

CVT-STM-01

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



Diagnostic Procedure

1. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to "ON" position.
2. Check "SELF-DIAG RESULTS" with CONSULT-II.
3. If "CVT SAFE FUNCTION" activate, refer to "CVT SAFE FUNCTION", [CVT-186, "CVT SAFE FUNCTION"](#).
4. Turn ignition switch to "OFF" position.
5. Disconnect TCM harness connector.
6. Check continuity between terminal 2, 3, 4, 5 and TCM harness connector terminal 11, 12, 20, 21.

Continuity should exist.

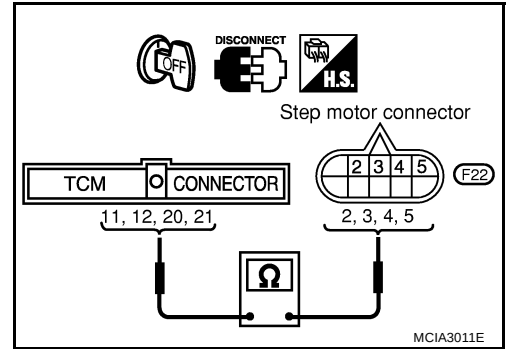
If OK, check harness for short to ground and short to power.

7. Reinstall any part removed.

OK or NG

OK >> GO TO 2.

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



2. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-97](#).

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

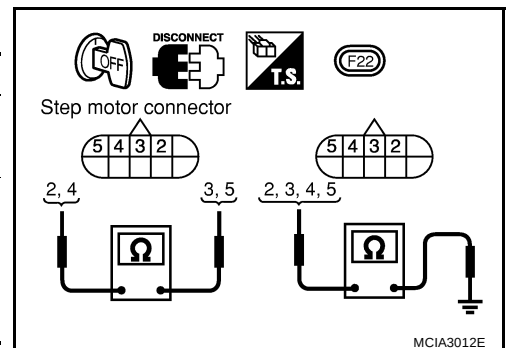
Component Inspection

STEP MOTOR

Resistance Check

- Check resistance between terminals.

Control valve	Terminal No.	Resistance (Approx.)
Step motor	2 and 3	28Ω
	4 and 5	
	2 and ground	14Ω
	3 and ground	
	4 and ground	
	5 and ground	



DTC P1778 STEP MOTOR - FUNCTION

PFP:31947

Description

ECS006HS

- The step motor is ON/OFF of 4 aspects changes according to the signal from TCM. As a result, the flow of line pressure to primary pulley is changed and pulley ratio is controlled.
- This diagnosis item detects when electrical system is OK but, mechanical system is NG.
- This diagnosis item detects when the state that the changing the speed mechanism in unit does not operate normally.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

It is monitoring whether "CVT RATIO: 2.32 - 0.47" changes similarly to "PLY CONT STEP: 3 - 200" by DATA MONITOR mode.

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : STEP MOTOR/FNCTN	When not changing the speed according to the instruction of TCM.	• Step motor
 : P1778		
 : MI Code No. 1778		

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

CAUTION:

- Always drive vehicle at a safe speed.
- Be careful not to rev engine into the red zone on the tachometer.
- Before start "DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE", confirm "Hi" or "Mid" or "Low" fixation by "I/P PULLY SPD" and "VHCL SPEED SE" on "DATA MONITOR MODE".
- If hi-geared fixation, go to diagnostic procedure soon.

NOTE:

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

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

 With CONSULT-II

SELECT SYSTEM
CVT
ENGINE

SAT250K

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for "CVT" with CONSULT-II.
2. Make sure that output voltage of CVT fluid temperature sensor is within the range below.
FLUID TEMP SEN: 0.5 - 1.5V
 If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid)

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
TCM PART NUMBER

SAT252K

DTC P1778 STEP MOTOR - FUNCTION

[EURO-OBD]

3. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
4. Start engine and maintain the following conditions for at least 30 consecutive seconds.
TEST START FROM 0 km/h (0 MPH)
CONSTANT ACCELERATION: Keep 30 sec or more
VHCL SPEED SE: 10 km/h (6 MPH) or more
THRTL POS SEN: More than 1.3V
Selector lever: D position
ENG SPEED: 450 rpm or more
If the check result is NG, go to [CVT-102, "Diagnostic Procedure"](#)

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT255K



With GST

Follow the procedure "With CONSULT-II".

Diagnostic Procedure

ECS006HT

1. CHECK STEP MOTOR

- It is monitoring whether "CVT ratio: 2.32 - 0.47" changes similarly to "PLY CONT STEP: -3 - 200" by DATA MONITOR mode.
- If no CONSULT-II, inspect the engine speed (rise and descend) about vehicle speed and throttle opening angle, and check shift change.

OK or NG

- OK >> **INSPECTION END**
NG >> Replace CVT assembly.

DTC P1791 LINE PRESSURE SENSOR

Description

- The line pressure sensor detects line pressure of CVT, and sends TCM the signal.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Line pressure solenoid valve duty	Throttle valve fully closed (PL Duty: 4%)	Approx. 1.0V
	↓ Throttle valve fully depressed (PL Duty: 94%)	↓ Approx. 4.0V

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
37	W	Line pressure sensor	 When engine runs at idle speed.	1.0V
			 When engine runs at stall speed.	4.0V
42	B		—	—
46	R/L		 —  —	4.5 - 5.5V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : LINE PRESS SEN	TCM receives an excessively low or high voltage from the step motor.	- Harness or connectors (The sensor circuit is open or shorted.) - Line pressure sensor
 : P1791		
 : MI Code No. 1791		

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

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

DTC P1791 LINE PRESSURE SENSOR

[EURO-OBD]

With CONSULT-II

1. Turn ignition switch “ON” and select “DATA MONITOR” mode for “CVT” with CONSULT-II.
2. Make sure that output voltage of line temperature sensor is within the range below.

FLUID TEMP SEN: 0.5 - 1.5V

If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine to increase the voltage (cool down the fluid)

SELECT SYSTEM
CVT
ENGINE

SAT250K

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
TCM PART NUMBER

SAT252K

3. Select “DATA MONITOR” mode for “ENGINE” with CONSULT-II.
4. Start engine and maintain the following conditions for at least 5 consecutive seconds.

VHCL SPEED SE: 10 km/h (6 MPH) or more

THRTL POS SEN: 1.3V

Selector lever: D position

ENG SPEED: 450 rpm or more

If the check result is NG, go to “Diagnostic Procedure”, [CVT-106](#)

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
ACTIVE TEST
DTC & SRT CONFIRMATION
ECM PART NUMBER

SAT255K

With GST

Follow the procedure “With CONSULT-II”.

DTC P1791 LINE PRESSURE SENSOR

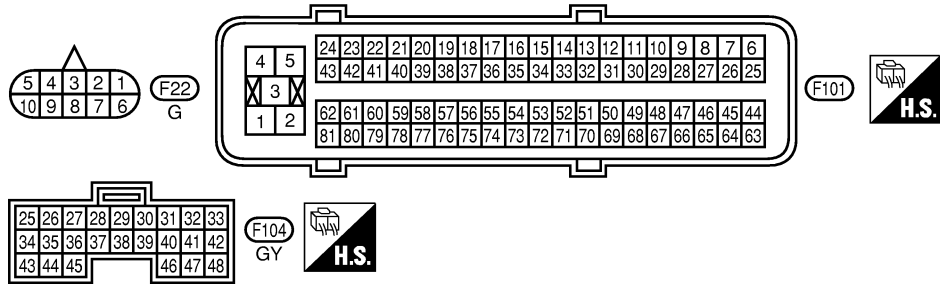
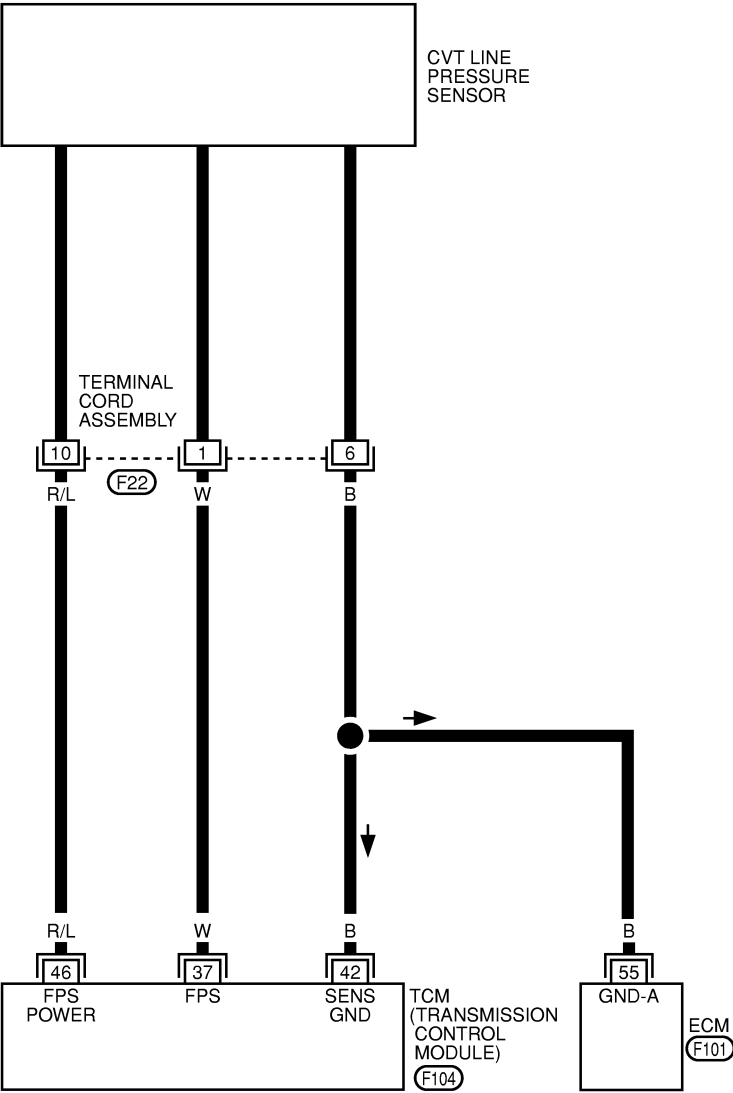
[EURO-OBD]

Wiring Diagram - CVT - FPS

ECS006HV

CVT-LPS-01

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



Diagnostic Procedure**1. CHECK LINE PRESSURE SENSOR**

Refer to "Component Inspection", [CVT-107](#) .

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Repair or replace pressure sensor.

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

 With CONSULT-II

1. Start engine.
2. Select "TCM input signals" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "LINE PRES SEN" while driving.
 - Throttle valve fully closed (PL Duty: 4%): Approx. 1.0V
 - Throttle valve fully depressed (PL Duty: 94%): Approx. 4.0V

OK or NG

OK >> GO TO 3.

NG >> Check the following items:

- Harness for short or open between TCM, ECM and line pressure sensor (Main harness)
 - Ground circuit for ECM
- Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

 Without CONSULT-II

1. Turn ignition switch to "OFF" position.
2. Disconnect TCM harness connector.
3. Check continuity between terminal 1 and TCM harness connector terminal 37.

Continuity should exist.

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

4. Reinstall any part removed.

Refer to "Component Inspection", [CVT-107](#) .

OK or NG

OK >> GO TO 4.

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

4. CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, [CVT-103](#) .

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

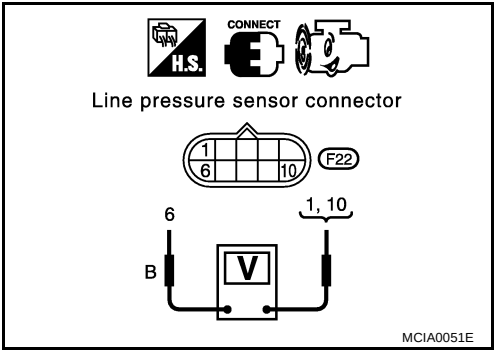
2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

Component Inspection
LINE PRESSURE SENSOR

ECS006HX

- Start engine.
- Check voltage between terminals 1 and 6, 6 and 10.

Terminal No.		Voltage
1	6	Approx. 0.5 - 4.5V
10	6	Approx. 4.5 - 5.5V



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CVT

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DTC U1000 CAN COMMUNICATION LINE

PFP:31940

Description

ECS006LK

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.

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
5	L	CAN communication line	—	—	—
6	R	CAN communication line	—	—	—

On Board Diagnosis Logic

ECS006LL

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
Ⓟ:CVT COMM LINE**	The ECM-CVT communication line is open or shorted.	● Harness or connectors (The solenoid circuit is open or shorted.) ● Overrun clutch solenoid valve
ⓧ:Judgement flicker		

**CVT COMMLINE means DTE U1000 CAN communication line.

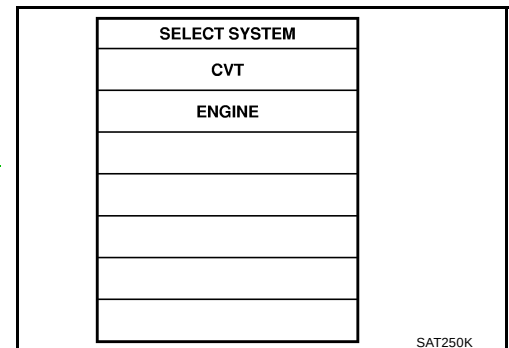
DTC Confirmation Procedure

ECS006LM

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

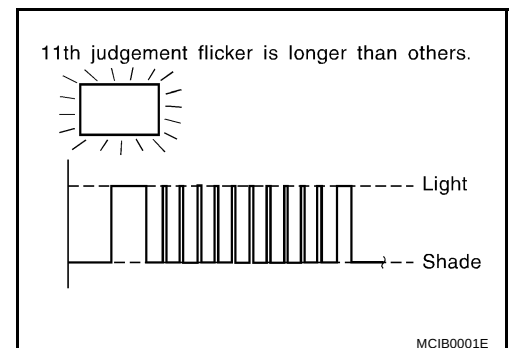
WITH CONSULT-II

1. Turn ignition switch "ON".
2. Select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
3. Wait at least 6 seconds or start engine and wait for at least 6 seconds.
If the check result is "NG", go to "Diagnostic procedure", [CVT-110](#).



WITHOUT CONSULT-II

1. Turn ignition switch "ON".
2. Wait at least 6 seconds or start engine and wait at least 6 seconds.
3. Perform self-diagnosis.
If the check result is "NG", refer to "LAN section".

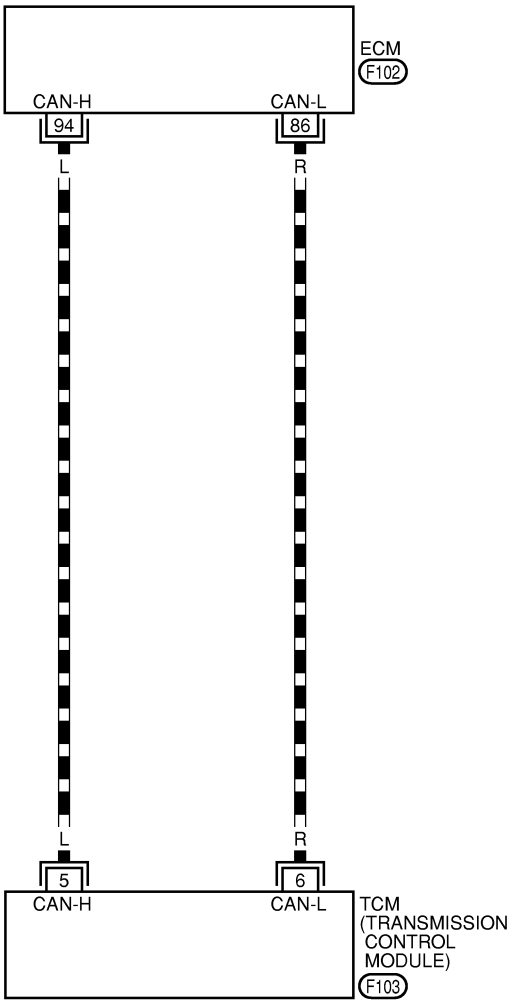


Wiring Diagram — CVT

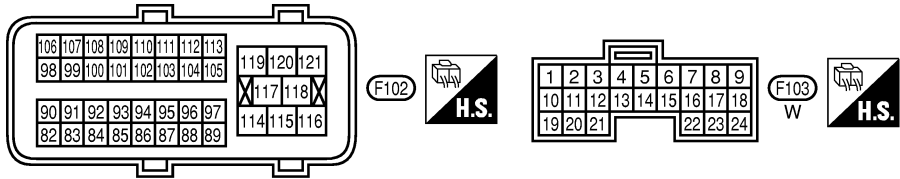
ECS006LN

CVT-CAN-01

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DATA LINE



Diagnostic Procedure**1. CHECK CAN COMMUNICATION CIRCUIT****With CONSULT-II**

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. The "CAN COMM CIRCUIT" is detected.

Yes or No

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

SELF-DIAG RESULTS			
DTC RESULTS			
CAN COMM CIRCUIT [U1000]			
ERASE		PRINT	
MODE	BACK	LIGHT	COPY

PCIA0061E

2. CHECK CAN COMMUNICATION SIGNALS**With CONSULT-II**

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

>> Print out CONSULT-II screen, go to "LAN section", [LAN-7, "CAN COMMUNICATION"](#) .

CAN Communication Signals

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

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

PFP:00000

CONSULT-II

ECS0069S

After performing Refer to Service Manual , place check marks for results on the [CVT-121, "Diagnostic Worksheet"](#) . Reference pages are provided following the items.

NOTICE:

- Additional CONSULT-II information can be found in the Operation Manual supplied with the CONSULT-II unit.

 SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)

- Turn on CONSULT-II and touch "CVT" for TCM self-diagnosis. If CVT is not displayed, check TCM power supply and ground circuit. Refer to [CVT-140, "TROUBLE DIAGNOSIS FOR POWER SUPPLY"](#) . If result is NG, refer to EL section ("POWER SUPPLY ROUTING").

SELECT SYSTEM
CVT
ENGINE

SAT250K

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

REAL-TIME DIAG
ENG SPEED SIG

SAT987J

SELF-DIAGNOSTIC RESULT TEST MODE

Detected items (Screen terms for CONSULT-II, "SELF-DIAG RESULTS" test mode)		Malfunction is detected when...	Remarks
Item	Display		
No failure (NO SELF DIAGNOSTIC FAILURE INDICATED FURTHER TESTING MAY BE REQUIRED**)		No failure has been detected.	
Initial start		This is not a malfunction message (Whenever shutting off a power supply to the TCM, this message appears on the screen.)	
INITIAL START	—		
Output pulley speed signal	O/P PULLY SPD SIG	TCM does not receive the proper voltage signal from the sensor.	
Primary speed sensor	I/P PULLY SPD SIG	TCM does not receive the proper voltage signal from the sensor.	
Throttle position sensor	THROTTLE POSI SEN	TCM receives an excessively low or high voltage from the sensor.	
Stepping motor circuit	STEP MOTOR	Not proper voltage change of the TCM terminal when operating step motor.	
Stepping motor function	—	Step motor is not operating according to the TCM.	
Line pressure sensor	LINE PRESSURE SEN	TCM receives an excessively low or high voltage from the sensor.	

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXCEPT FOR EURO-OBD]

Detected items (Screen terms for CONSULT-II, "SELF-DIAG RESULTS" test mode)		Malfunction is detected when...	Remarks
Item	Display		
T/C clutch solenoid valve	T/C CLUTCH SOL/V	● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	
CVT fluid temperature sensor	FLUID TEMP SEN	● TCM receives an excessively low or high voltage from the sensor.	
CVT SAFE FUNCTION	CVT SAFE FUNCTION	● TCM is malfunctioning.	
Engine speed signal	ENGINE SPEED SIG	● TCM does not receive the proper voltage signal from the ECM.	
Line pressure solenoid valve	LINE PRESSURE S/V	● TCM detects an improper voltage drop when it tries to operate the solenoid valve.	
TCM (RAM)	CONTROL UNIT (RAM)	● TCM memory (RAM) is malfunctioning.	
TCM (ROM)	CONTROL UNIT (ROM)	● TCM memory (ROM) is malfunctioning.	
TCM (EEP ROM)	CONT UNIT (EEP ROM)	● TCM memory (EEP ROM) is malfunctioning.	

DATA MONITOR MODE (CVT)

Item	Display	Monitor item		Description	Remarks
		TCM Input signals	Main signals		
Vehicle speed sensor (Secondary speed sensor)	VHCL SPEED SE [km/h] or [mph]	X	—	● Vehicle speed computed from signal of revolution sensor is displayed.	When racing engine in "N" or "P" position with vehicle stationary, CONSULT-II data may not indicate 0 km/h (0 mph).
Throttle position sensor	THRTL POS SEN [V]	X	—	● Throttle position sensor signal voltage is displayed.	—
CVT fluid temperature sensor	FLUID TEMP SE [V]	X	—	● CVT fluid temperature sensor signal voltage is displayed. ● Signal voltage lowers as fluid temperature rises.	—
Battery voltage	BATTERY VOLT [V]	X	—	● Source voltage of TCM is displayed.	—
Engine speed	ENGINE SPEED [rpm]	X	X	● Engine speed, computed from engine speed signal, is displayed.	Engine speed display may not be accurate under approx. 800 rpm. It may not indicate 0 rpm even when engine is not running.
P/N position switch	N POSITION SW [ON/OFF]	X	—	● ON/OFF state computed from signal of P/ N position SW is displayed.	—
R position switch	R POSITION SW [ON/OFF]	X	—	● ON/OFF state computed from signal of R position SW is displayed.	—

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXCEPT FOR EURO-OBD]

Item	Display	Monitor item		Description	Remarks
		TCM Input signals	Main signals		
D position switch	D POSITION SW [ON/OFF]	X	—	● ON/OFF state computed from signal of D position SW is displayed.	—
Sport mode switch	S POSITION SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of Sport mode SW, is displayed.	—
L position switch	L POSITION SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of L position SW, is displayed.	—
Closed throttle position switch	CLOSED THL/ SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of closed throttle position SW, is displayed.	—
Wide open throttle position switch	W/O THRL/P-SW [ON/OFF]	X	—	● ON/OFF status, computed from signal of wide open throttle position SW, is displayed.	—
Selector lever position	SLCT LVR POSI	—	X	● Selector lever position data, used for computation by TCM, is displayed.	● A specific value used for control is displayed if fail-safe is activated due to error.
Vehicle speed	VEHICLE SPEED [km/h] or [mph]	—	X	● Vehicle speed data, used for computation by TCM, is displayed.	—
Throttle position	THROTTLE POSI [°]	—	X	● Throttle position data, used for computation by TCM, is displayed.	● A specific value used for control is displayed if fail-safe is activated due to error.
Line pressure duty	LINE PRES DTY [%]	—	X	● Control value of line pressure solenoid valve, computed by TCM from each input signal, is displayed.	—
Torque converter clutch solenoid valve duty	TCC S/V DUTY [%]	—	X	● Control value of torque converter clutch solenoid valve, computed by TCM from each input signal, is displayed.	—
Self-diagnosis display lamp (CVT indicator lamp)	PAT MONI LAMP [ON/OFF]	—	X	● Control status of CVT indicator lamp is displayed.	—
Line pressure sensor	LINE PRES SEN [V]	X	—	● CVT line pressure sensor signal voltage is displayed.	—
Primary pulley speed sensor	I/P PULLY SPD [rpm]	X	X	● Primary pulley speed computed from signal of primary pulley speed sensor is displayed.	—

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ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXCEPT FOR EURO-OBD]

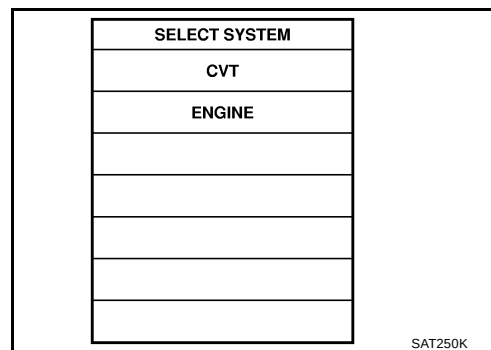
Item	Display	Monitor item		Description	Remarks
		TCM Input signals	Main signals		
Secondary pulley speed sensor	O/P PULLY SPD [rpm]	—	—	Secondary pulley speed computed from signal of secondary speed sensor is displayed.	—
Stop lamp switch	BRAKE SW [ON/OFF]	X	—	ON/OFF position signal of stop lamp switch is displayed.	—
ABS signal	ABS SIGNAL [ON/OFF]	X	—	ABS operation signal (ON/OFF) from ABS control unit is displayed.	—
CVT ratio	CVT RATIO [—]	—	X	Real CVT ratio operated TCM is displayed.	—
Step	PLY CONT STEP [step]	—	X	Step motor position is displayed.	—

X: Applicable

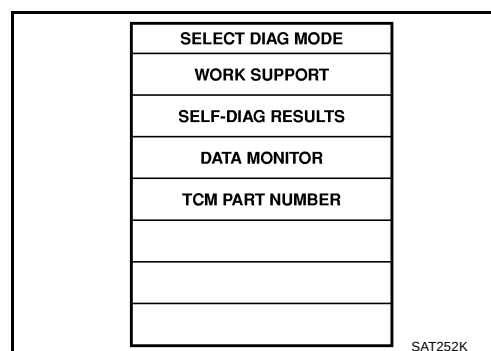
—: Not applicable

⑧ 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 for at least 3 seconds and then turn it “ON” again.
2. Turn CONSULT-II “ON”, and touch “CVT”.



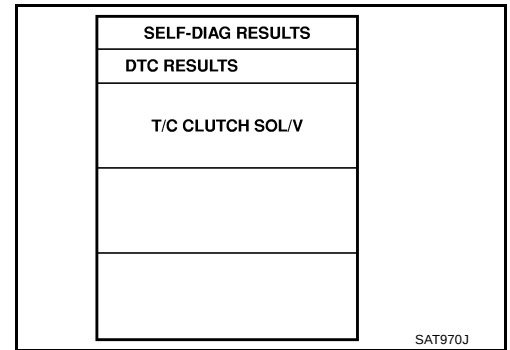
3. Touch “SELF-DIAG RESULTS”.



ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXCEPT FOR EURO-OBD]

4. Touch "ERASE". (The self-diagnostic results will be erased.)



Diagnostic Procedure Without CONSULT-II

⊗ SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-II)

Preparation

1. CHECK CVT INDICATOR LAMP

1. Start engine and warm it up to normal operating temperature.
2. Turn ignition switch ON and OFF more than two times, and then turn OFF.
3. Move selector lever to "P" position, and then turn ignition switch ON. Then make sure CVT indicator lamp turns ON for approximately 2 seconds.

Yes or No

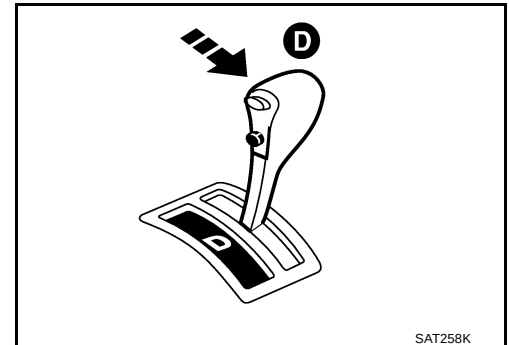
Yes >> GO TO 2.

No >> Go to "CVT Indicator Lamp Does Not Come On", [CVT-200, "TROUBLE DIAGNOSIS FOR SYMPTOMS"](#).

2. JUDGEMENT PROCEDURE STEP 1

1. Turn ignition switch to "OFF" position.
2. Depress brake pedal and simultaneously release accelerator pedal fully. Then, move selector lever to "D" position.
3. Turn ignition switch to "ON" position. (Do not start engine.)

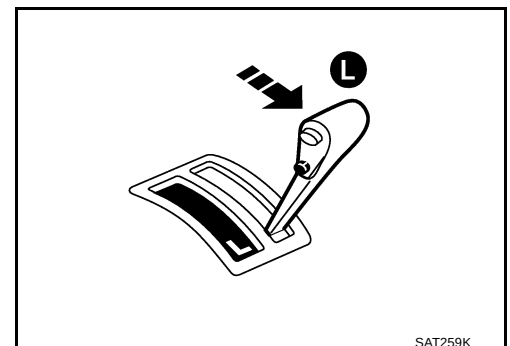
>> GO TO 3.



3. JUDGEMENT PROCEDURE STEP 2

Release brake pedal and move selector lever to "L" position.

>> GO TO 4.



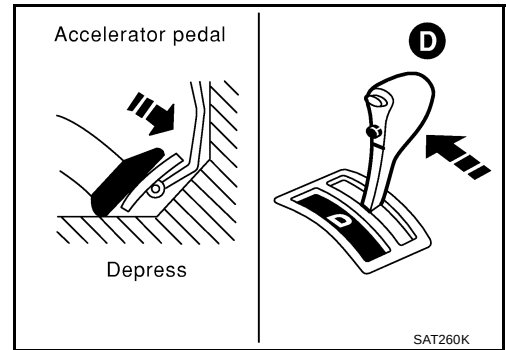
ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXCEPT FOR EURO-OBD]

4. JUDGEMENT PROCEDURE STEP 3

While depressing brake pedal with your left foot, depress accelerator to WOT with your right foot. Then, move selector lever to "D" position.

>> GO TO 5.



5. CHECK SELF-DIAGNOSIS CODE

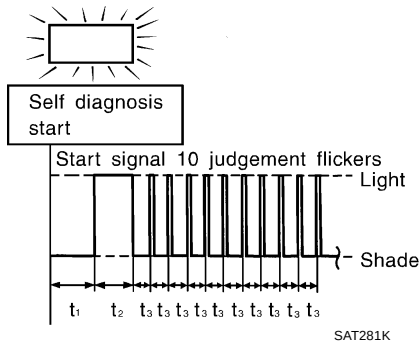
Check CVT indicator lamp in the combination meter.

>> DIAGNOSIS END

JUDGEMENT OF SELF-DIAGNOSIS CODE

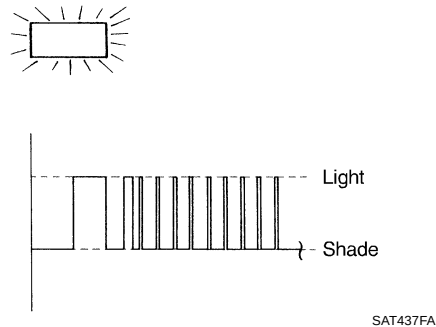
CVT indicator lamp

All judgement flickers are the same.



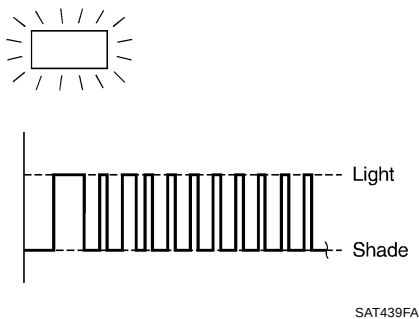
All circuits that can be confirmed by self-diagnosis are OK.

1st judgement flicker is longer than others.



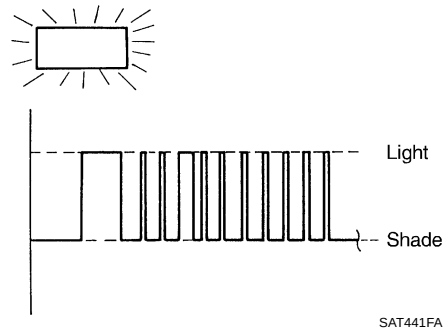
Secondary speed sensor (VEHICLE SPEED SENSOR CVT) circuit is shorted or disconnected.
⇒ Go to **CVT-143, "VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR)".**

2nd judgement flicker is longer than others.



Primary speed sensor circuit is shorted or disconnected.
⇒ Go to **CVT-147, "PRIMARY SPEED SENSOR".**

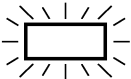
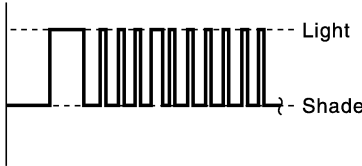
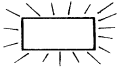
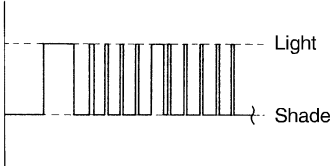
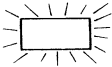
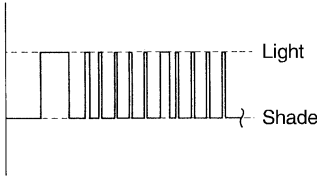
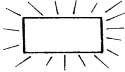
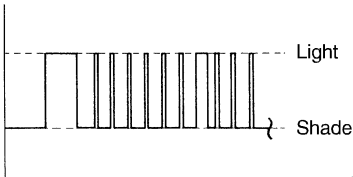
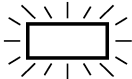
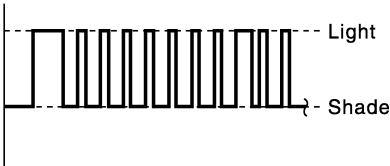
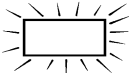
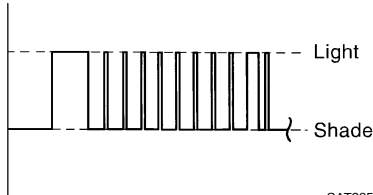
3rd judgement flicker is longer than others.



Throttle position sensor circuit is shorted or disconnected.
⇒ Go to **CVT-150, "THROTTLE POSITION SENSOR".**

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXCEPT FOR EURO-OBD]

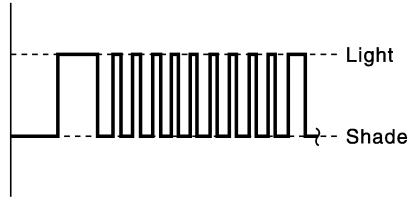
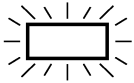
CVT indicator lamp	
4th judgement flicker is longer than others.   MCIA0041E Step motor circuit is shorted or disconnected. ⇒ Go to CVT-155, "STEPPING MOTOR - CIRCUIT".	5th judgement flicker is longer than others.   SAT445FA Line pressure sensor circuit is shorted or disconnected. ⇒ Go to CVT-160, "LINE PRESSURE SENSOR".
6th judgement flicker is longer than others.   SAT447FA Line pressure solenoid valve circuit is shorted or disconnected. ⇒ Go to CVT-165, "LINE PRESSURE SOLENOID VALVE".	7th judgement flicker is longer than others.   SAT449FA Lock up solenoid valve circuit is shorted or disconnected. ⇒ Go to CVT-172, "TORQUE CONVERTER CLUTCH SOLENOID VALVE".
8th judgement flicker is longer than others.   MCIA0042E CVT fluid temperature sensor is disconnected or TCM power source circuit is damaged. ⇒ Go to CVT-177, "CVT FLUID TEMPERATURE SENSOR CIRCUIT".	9th judgement flicker is longer than others.   SAT285K Engine speed signal circuit is shorted or disconnected. ⇒ Go to CVT-182, "ENGINE SPEED SIGNAL".

ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION

[EXCEPT FOR EURO-OBD]

CVT indicator lamp

10th judgement flicker is longer than others.

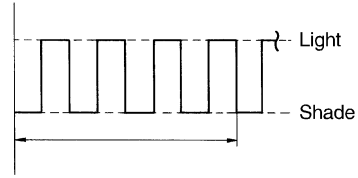
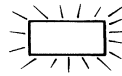


MCIA0043E

- When "4th judgement flicker" and/or "6th judgement flicker" is displayed, inspect "STEP MOTOR" and/or "LINE PRESSURE SOLENOID VALVE".
- When neither "4th judgement flicker" nor "6th judgement flicker" are displayed, replace TCM.

⇒ Go to **CVT-186, "CVT SAFE FUNCTION"**.

Flickers as shown below.



SAT457FA

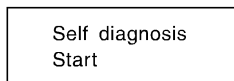
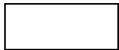
Battery voltage is low.

Battery has been disconnected for a long time.

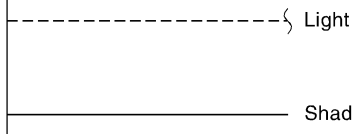
Battery is connected conversely.

(When reconnecting TCM connectors. — This is not a problem.)

Lamp does not come on.



Self diagnosis
Start



SAT653J

PNP switch, stop lamp switch or throttle position switch circuit is disconnected or TCM is damaged.

⇒ Go to **CVT-195, "TROUBLE DIAGNOSES FOR NON-DETECTABLE ITEMS"**.

t₁ = 2.5 seconds t₂ = 2.0 seconds t₃ = 1.0 second t₄ = 1.0 second

TROUBLE DIAGNOSIS — INTRODUCTION

PFP:00000

Introduction

ECS006HY

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 CVT solenoid valves.

Input and output signals must always be correct and stable in the operation of the CVT system. The CVT system must be in good operating condition and be free of valve seizure, solenoid valve malfunction, etc.

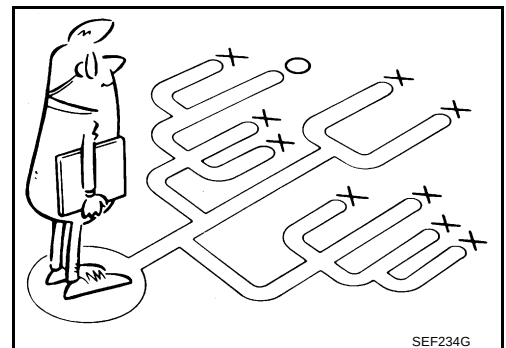
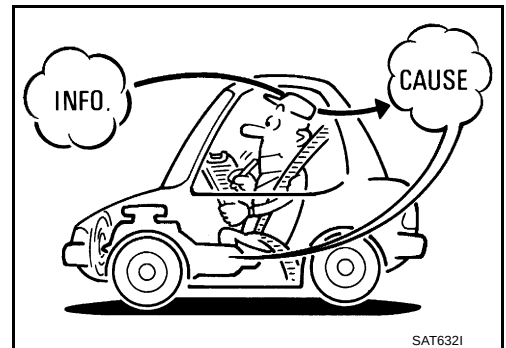
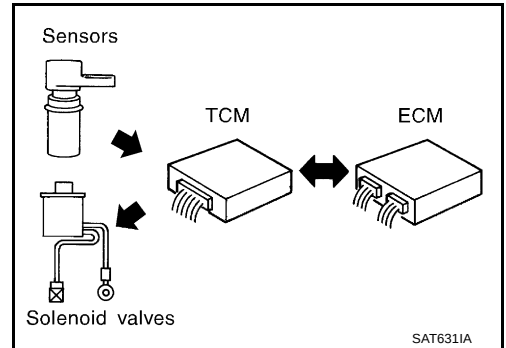
It is much more difficult to diagnose a problem that occurs intermittently rather than continuously. Most intermittent problems are caused by poor electric connections or improper wiring. In this case, careful checking of suspected circuits may help prevent the replacement of good parts.

A visual check only, may not find the cause of the problems. A road test with CONSULT-II or a circuit tester connected should be performed. Follow the "Work Flow". Refer to [CVT-121](#).

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 ([CVT-121](#)) 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.



[EXCEPT FOR EURO-OBD]

- **WHAT** Vehicle & CVT 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)	
		☐ Lockup malfunction	
		☐ Shift point too high or too low.	
		☐ Shift shock or slip (☐ N → D ☐ Lockup ☐ Any drive position)	
		☐ Noise or vibration	
		☐ No pattern select	
		☐ Others ()	
O/D OFF indicator lamp		Blinks for about 8 seconds.	
		☐ Continuously lit	☐ Not lit

TROUBLE DIAGNOSIS — INTRODUCTION

[EXCEPT FOR EURO-OBID]

Diagnostic Worksheet

1.	☐ Read the Fail-safe and listen to customer complaints.	CVT-9 , CVT-120
2.	☐ CHECK CVT FLUID	CVT-123
	☐ Leakage (Follow specified procedure) ☐ Fluid condition ☐ Fluid level	
3.	☐ Perform STALL TEST and LINE PRESSURE TEST.	CVT-123 , CVT-124
	☐ Stall test — Mark possible damaged components/others. ☐ Forward clutch ☐ Reverse brake ☐ Engine ☐ Line pressure is low ☐ Line Pressure test — Suspected parts:	
4.	☐ Perform all ROAD TEST and mark required procedures.	CVT-125
4-1.	Check before engine is started. ☐ SELF-DIAGNOSTIC PROCEDURE/DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE. — Mark detected items.	CVT-127
	☐ CVT fluid temperature sensor, CVT-177 , "CVT FLUID TEMPERATURE SENSOR CIRCUIT" . ☐ Vehicle speed sensor (Output pulley speed signal), CVT-143 , "VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR)" . ☐ Engine speed signal, CVT-182 , "ENGINE SPEED SIGNAL" . ☐ Torque converter clutch solenoid valve, CVT-172 , "TORQUE CONVERTER CLUTCH SOLENOID VALVE" . ☐ Line pressure solenoid valve, CVT-165 , "LINE PRESSURE SOLENOID VALVE" . ☐ Step motor, CVT-159 , "STEPPING MOTOR - FUNCTION" . ☐ Line pressure solenoid valve, CVT-165 , "LINE PRESSURE SOLENOID VALVE" . ☐ Throttle position sensor, CVT-150 , "THROTTLE POSITION SENSOR" . ☐ Primary speed sensor, CVT-147 , "PRIMARY SPEED SENSOR" . ☐ CVT safe function, CVT-186 , "CVT SAFE FUNCTION" . ☐ Control unit (RAM), control unit (ROM), CVT-188 , "CONTROL UNIT (RAM). CONTROL UNIT (ROM)" . ☐ Control unit (EEP ROM), AT-209 , "DTC CONTROL UNIT(EEPROM)" . ☐ Battery ☐ Others	
5.	☐ For self-diagnosis NG items, inspect each component. Repair or replace the damaged parts.	CVT-116
6.	☐ Perform all ROAD TEST and re-mark required procedures.	CVT-125
7.	☐ Perform the Diagnostic Procedures for all remaining items marked NG. Repair or replace the damaged parts.	CVT-131
8.	☐ Erase self-diagnosis code from TCM memories.	CVT-114

Work Flow

ECS006HZ

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

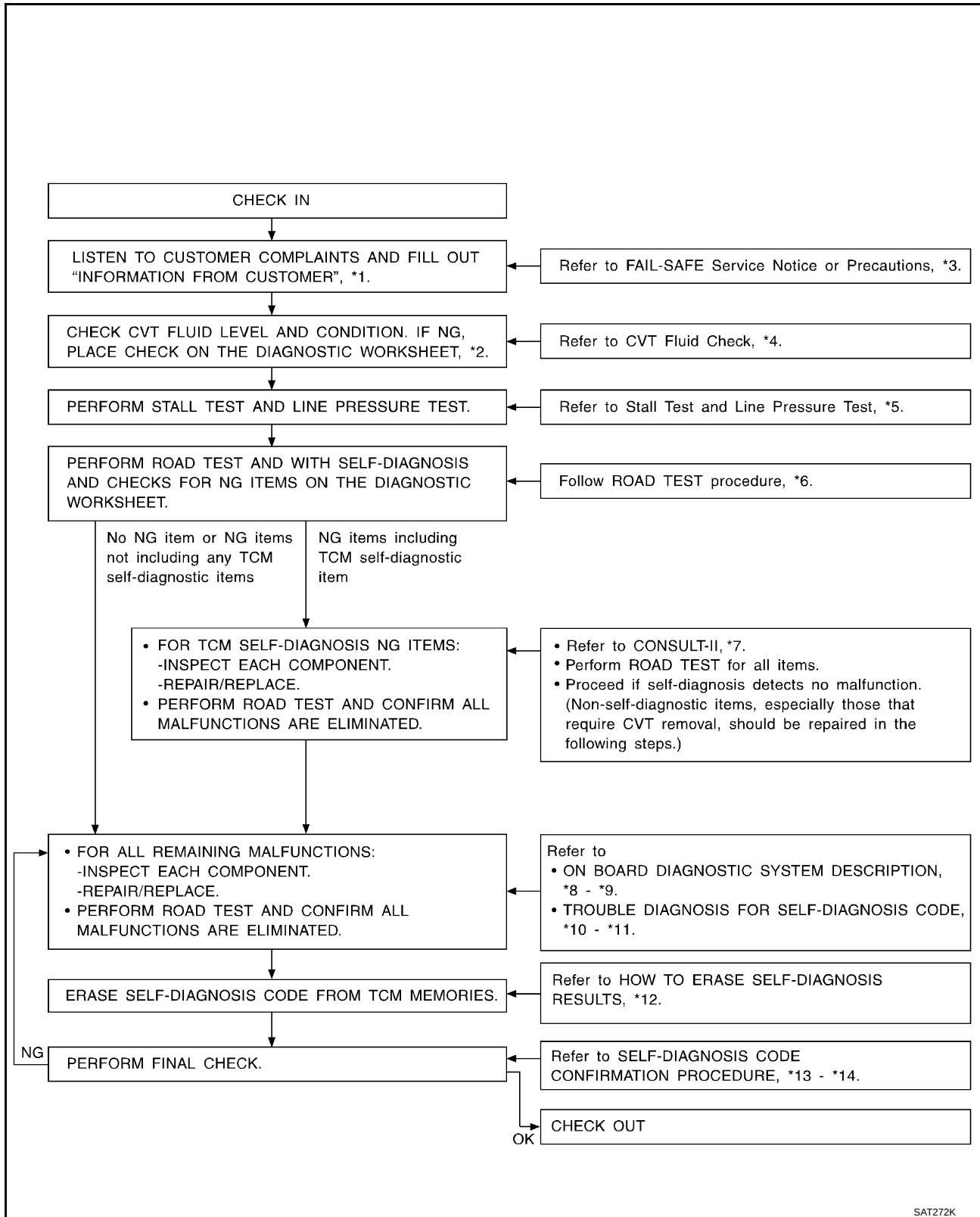
A good understanding of the malfunction conditions can make troubleshooting faster and more accurate. In general, each customer feels differently about a problem. It is important to fully understand the symptoms or conditions for a customer complaint.

Make good use of the two sheets provided, "INFORMATION FROM CUSTOMER" ([CVT-120](#)) and "DIAGNOSTIC WORKSHEET" ([CVT-121](#)), to perform the best troubleshooting possible.

TROUBLE DIAGNOSIS — INTRODUCTION

[EXCEPT FOR EURO-OBD]

WORK FLOW CHART



SAT272K

*1: [CVT-120](#)

*2: [CVT-121](#)

*3: [CVT-9](#)

*4: [CVT-12](#)

*5: [CVT-123](#)

*6: [CVT-125](#)

*7: [CVT-111](#)

*8: [CVT-111](#)

*9: [CVT-111](#)

*10: [CVT-20](#)

*11: [CVT-20](#)

*12: [CVT-114](#)

*13: [CVT-143](#)

*14: [CVT-192](#)

TROUBLE DIAGNOSIS — BASIC INSPECTION

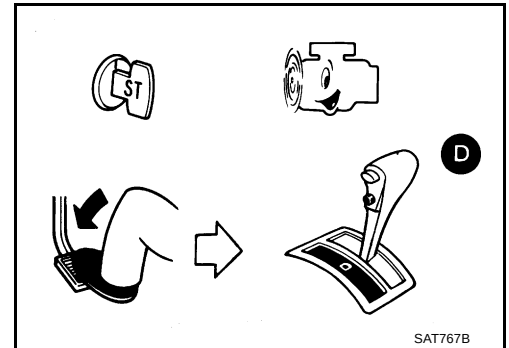
PFP:00000

CVT Fluid Check

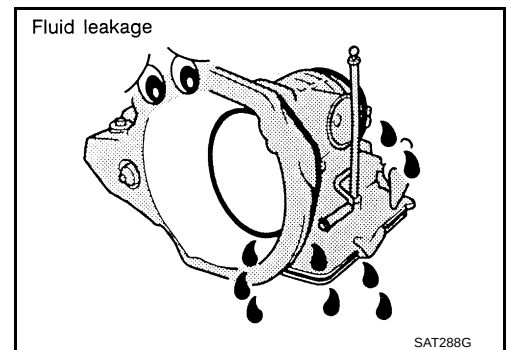
ECS00610

FLUID LEAKAGE CHECK

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

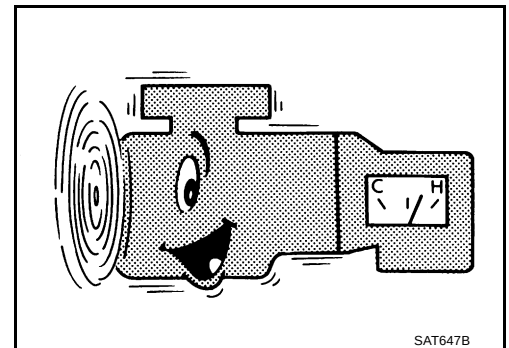


4. Check for fluid leakage.



FLUID CONDITION CHECK

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



FLUID LEVEL CHECK

Refer to [CVT-12, "Checking CVT Fluid"](#) .

Stall Test

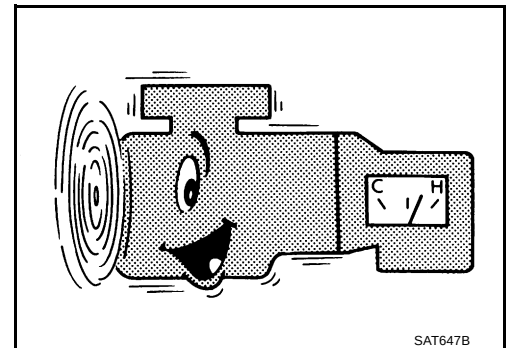
ECS00611

STALL TEST PROCEDURE

1. Check CVT fluid and engine oil levels. If necessary, add.
2. Drive vehicle for approx. 10 minutes or until engine oil and CVT fluid reach operating temperature.

CVT fluid operating temperature:

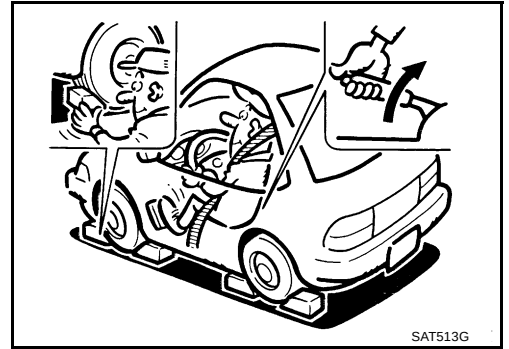
50 - 80°C (122 - 176°F)



TROUBLE DIAGNOSIS — BASIC INSPECTION

[EXCEPT FOR EURO-OBD]

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

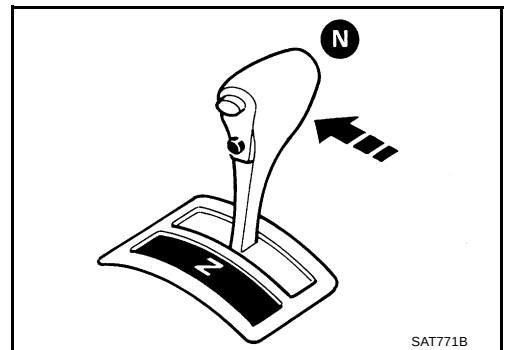
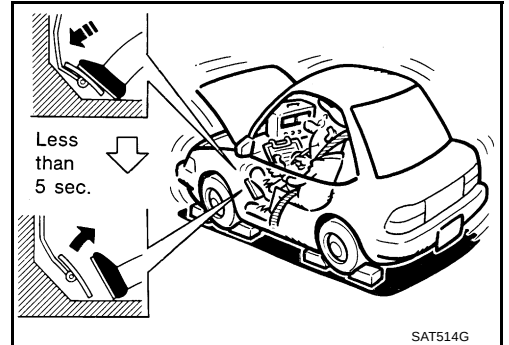


5. Start engine, apply foot brake, and place selector lever in D position.
6. Accelerate to wide open throttle gradually while applying foot brake.
7. Quickly note the engine stall revolution and immediately release throttle.
 - During test, never hold throttle wide open for more than 5 seconds.

Stall revolution:

2,350 - 2,850 rpm

8. Move selector lever to "N" position.
9. Cool off CVT fluid.
 - Run engine at idle for at least one minute.

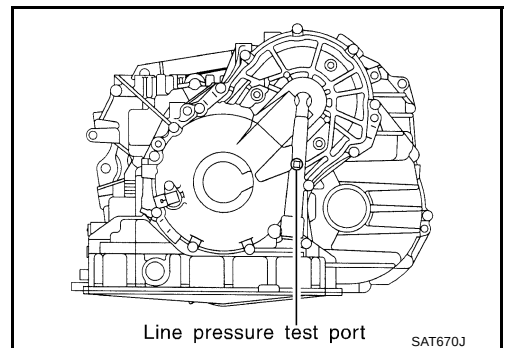


ECS006I2

Line Pressure Test LINE PRESSURE TEST PORTS

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

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



TROUBLE DIAGNOSIS — BASIC INSPECTION

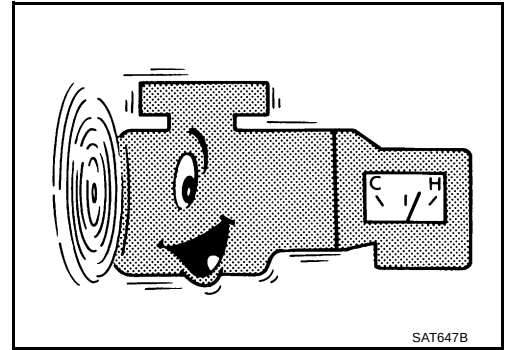
[EXCEPT FOR EURO-OBD]

LINE PRESSURE TEST PROCEDURE

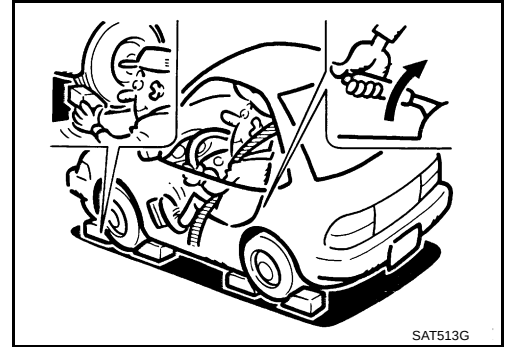
1. Check CVT fluid and engine oil levels. If necessary, add fluid or oil.
2. Drive vehicle for approx. 10 minutes or until engine oil and CVT fluid reach operating temperature.

CVT fluid operating temperature:

50 - 80°C (122 - 176°F)

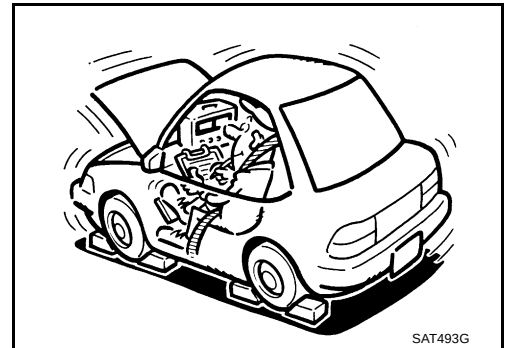


3. Install pressure gauge to corresponding line pressure port.
4. Set parking brake and block wheels.
 - **Continue to depress brake pedal fully while line pressure test is being performed at stall speed.**



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

Line pressure: Refer to [CVT-215, "SERVICE DATA AND SPECIFICATIONS \(SDS\)"](#).



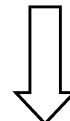
ECS006/3

Road Test DESCRIPTION

- The purpose of the test is to determine overall performance of CVT and analyze causes of problems.
- The road test consists of the following three parts:
 1. Check before engine is started
 2. Cruise test

ROAD TEST PROCEDURE

1. Check before engine is started.



2. Cruise test.

SAT692J

TROUBLE DIAGNOSIS — BASIC INSPECTION

[EXCEPT FOR EURO-OBD]

- Before road test, familiarize yourself with all test procedures and items to check.
- Conduct tests on all items until specified symptom is found. Troubleshoot items which check out No Good after road test. Refer to “ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION” [CVT-20](#) (EURO-OBD) or [CVT-111](#) (Except for EURO-OBD).



TROUBLE DIAGNOSIS — BASIC INSPECTION

[EXCEPT FOR EURO-OBDM]

1. CHECK BEFORE ENGINE IS STARTED

1. CHECK CVT INDICATOR LAMP

1. Park vehicle on flat surface.
2. Move selector lever to "P" position.
3. Turn ignition switch to "OFF" position. Wait at least 5 seconds.
4. Turn ignition switch to "ON" position. (Do not start engine.)
5. Does CVT indicator lamp flicker for about 8 seconds?

Yes or No

- Yes >> Perform self-diagnosis and check NG items on the DIAGNOSTIC WORKSHEET, [CVT-121](#) . Refer to TCM SELF-DIAGNOSIS PROCEDURE (NO TOOLS), [CVT-115](#).
- >> 1. Turn ignition switch to "OFF" position.
2. Perform self-diagnosis and note NG items.
- Refer to TCM SELF-DIAGNOSIS PROCEDURE (NO TOOLS), [CVT-115](#) .

2. TEST DRIVE

Drive the vehicle and verify that there are no abnormalities.

>> TEST END

2. CRUISE TEST

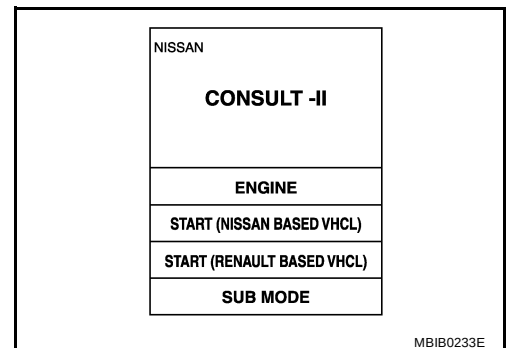
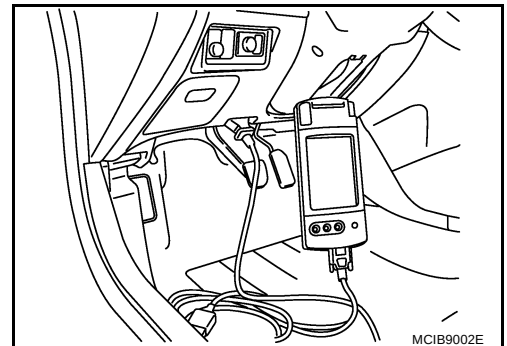
- Check all items listed in Parts 1 and 2.

With CONSULT-II

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

CONSULT-II Setting Procedure

1. Turn ignition switch "OFF".
 2. Connect CONSULT-II to data link connector which is located in the left side lower dash panel.
3. Turn ignition switch "ON".
 4. Touch "START (NISSAN BASE VHCL)".



TROUBLE DIAGNOSIS — BASIC INSPECTION

[EXCEPT FOR EURO-OBD]

5. Touch "CVT".

SELECT SYSTEM
CVT
ENGINE

SAT250K

6. Touch "DATA MONITOR".

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
TCM PART NUMBER

MCIA0052E

7. Touch "MAIN SIGNALS" to set recording condition.

8. See "Numerical Display", "Barchart Display" or "Line Graph Display".

9. Touch "START".

SELECT MONITOR ITEM	
TCM INPUT SIGNALS	
MAIN SIGNALS	
SELECTION FROM MENU	
SETTING	START

SAT253K

10. When performing cruise test, touch "Store Data".

DATA MONITOR	
MONITOR	NO DTC
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
SLCTLVR POSI	NP
ENGINE SPEED	XXX rpm
I/P PULLY SPD	XXX rpm
CVT RATIO	XXX
PLY CONT STEP	XXX step
LINE PRES DTY	XXX%
TCC S/V DUTY	XXX%

SAT236K

TROUBLE DIAGNOSIS — BASIC INSPECTION
[EXCEPT FOR EURO-OBD]

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

DATA MONITOR	
Recording data XXX %	NO DTC
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
SLCTLVR POSI	NP
ENGINE SPEED	XXX rpm
I/P PULLY SPD	XXX rpm
CVT RATIO	XXX
PLY CONT STEP	XXX step
LINE PRES DTY	XXX%
TCC S/V DUTY	XXX%

SAT237K

12. Touch “STORE”.

REAL-TIME DIAG
NO DTC

SAT254K

13. Touch “DISPLAY”.

SAVE DATA	
NOT FOUND SAVE REC DATA	
A/T	1999/1/30 19:59:18
A/T	1999/1/30 19:59:42
A/T	1999/1/30 20:01:04

SAT608J

STORE	
SYSTEM	SAVE REC DATA

SAT974J

A
B
CVT
D
E
F
G
H
I
J
K
L
M

TROUBLE DIAGNOSIS — BASIC INSPECTION

[EXCEPT FOR EURO-OBD]

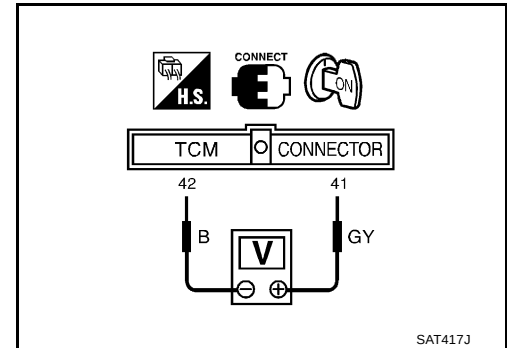
14. Touch "PRINT".
15. Check the monitor data printed out.
16. Continue cruise test part 2 and 3.

STORE	
SYSTEM	SAVE REC DATA
ENGINE	04/15/1999, 10:34:29
ENGINE	07/15/1999, 15:10:33

SAT238K

⊗ Without CONSULT-II

- Throttle position sensor can be checked by voltage across terminals 41 and 42 of TCM.
Refer to [CVT-150, "THROTTLE POSITION SENSOR"](#) .



TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXCEPT FOR EURO-OBD]

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

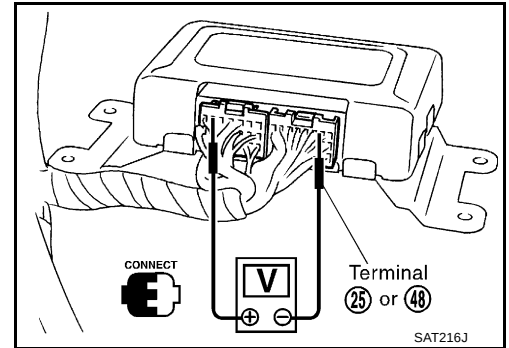
PFP:00000

TCM Terminals and Reference Value

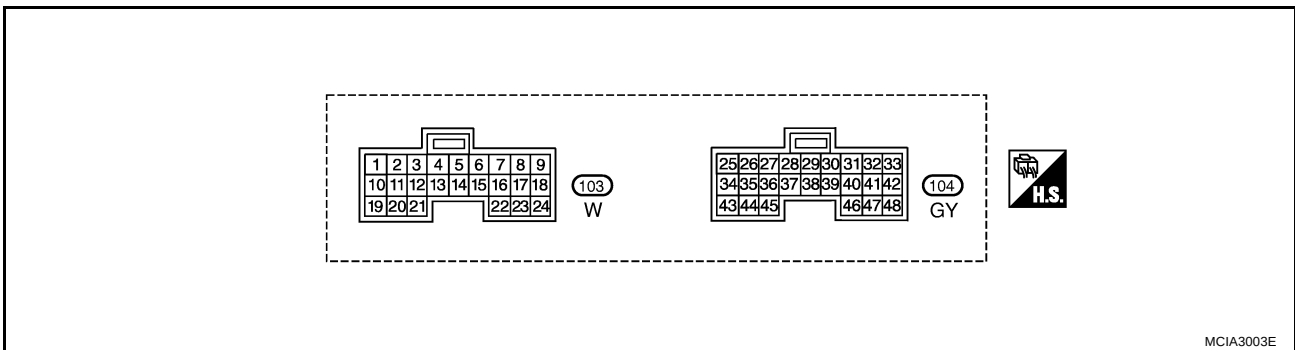
ECS00614

PREPARATION

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



TCM HARNESS CONNECTOR TERMINAL LAYOUT



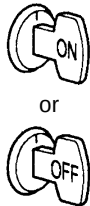
TCM INSPECTION TABLE

(Data are reference values.)

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
1	R/W	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	2.8V
			When depressing accelerator pedal fully after warming up engine.	1.4V
2	P/B	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	11.0V
			When depressing accelerator pedal fully after warming up engine.	4.0V
3	GY/R	Torque converter clutch solenoid valve	When CVT performs lock-up.	12.0V
			When CVT does not perform lock-up.	0V
5	L	CAN communication line	—	—
6	R	CAN communication line	—	—
10	G/W	Power source	When turning ignition switch to "ON".	Battery voltage
			When turning ignition switch to "OFF".	0V

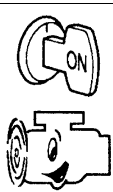
TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXCEPT FOR EURO-OBD]

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
11	PU	Step motor A	Within 2 seconds after key switch "ON", the time measurement by using the pulse width measurement function (Hi level) of CONSULT-II. ● CONSULT-II cable connected to data link connector. ● This inspection cannot be measured by circuit tester.		30.0 msec
12	L/W	Step motor B			10.0 msec
18	R/B	Manual mode		When setting selector lever to "MANUAL MODE"	0V
				When setting selector lever to "AUTOMATIC MODE"	Battery voltage
19	G/W	Power source		Same as No. 10	
20	L/Y	Step motor C	Within 2 seconds after key switch "ON", the time measurement by using the pulse width measurement function (Hi level) of CONSULT-II. ● CONSULT-II cable connected to data link connector. ● This inspection cannot be measured by circuit tester.		30.0 msec
21	P/L	Step motor D			10.0 msec
25	B	Ground		—	—
26	Y/L	Automatic mode		When setting selector lever to "AUTOMATIC MODE"	0V
				When setting selector lever to "MANUAL MODE"	Battery voltage
27	L	PNP switch "L" position		When setting selector lever to "L" position.	Battery voltage
				When setting selector lever to other positions.	0V
28	R/B	Power source (Memory back-up)		When turning ignition switch to "OFF".	Battery voltage
				When turning ignition switch to "ON".	Battery voltage
29	G/R	Secondary speed sensor	When driving [D position, 20 km/h (12 MPH)], the pulse measurement by using the pulse measurement function of CONSULT-II. ● CONSULT-II cable connected to data link connector. ● This inspection cannot be measured by circuit tester.		600 Hz

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXCEPT FOR EURO-OBD]

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
30	G/B	(RX)		—	—
31	GY/L	(TX)		—	—
32	R	Throttle position sensor (Power source)		When turning ignition switch to “ON”	4.5 - 5.5V
				When turning ignition switch to “OFF”	0V
34	W/G	PNP switch “D” position		When setting selector lever to “D” position.	Battery voltage
				When setting selector lever to other positions.	0V
35	G/W	PNP switch “R” position		When setting selector lever to “R” position.	Battery voltage
				When setting selector lever to other positions.	0V
36	G	PNP switch “N” or “P” position		When setting selector lever to “N” or “P” position.	Battery voltage
				When setting selector lever to other positions.	0V
37	W	Line pressure sensor	When engine runs at idle speed.	1.0V	
			When engine runs at stall speed.	4.0V	
38	G/Y	Primary speed sensor	When driving [L position, 20 km/h (12 MPH)], the pulse measurement by using the pulse measurement function of CONSULT-II. ● CONSULT-II cable connected to data link connector. ● This inspection cannot be measured by circuit tester.		900 Hz
39	L/OR	Engine speed signal		When engine runs at idle speed.	0.5 - 1.5V
40	SB	Vehicle speed signal		—	—

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

[EXCEPT FOR EURO-OBD]

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
41	GY	Throttle position sensor		When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: 0.3V Fully-open throttle: 3V
42	B	Sensor ground		—	—
43	Y/G	Shift up switch		When setting selector lever to “SHIFT UP” position	0V
44	L	Shift down switch		When setting selector lever to “NEUTRAL” position	Battery voltage
				When setting selector lever to “SHIFT DOWN” position	0V
46	R/L	Line pressure sensor (Power source)		When setting selector lever to “NEUTRAL” position	Battery voltage
				—	4.5 - 5.5V
47	BR	CVT fluid temperature sensor		When CVT fluid temperature is 20°C (68°F).	1.5V
				When CVT fluid temperature is 80°C (176°F).	0.5V
48	B	Ground		—	—

CAN COMMUNICATION

PFP:23710

System Description

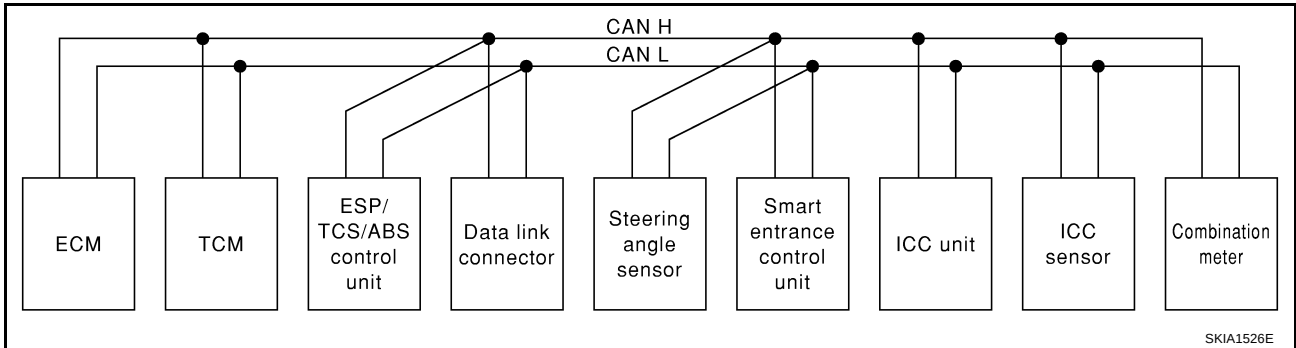
ECS006U2

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.

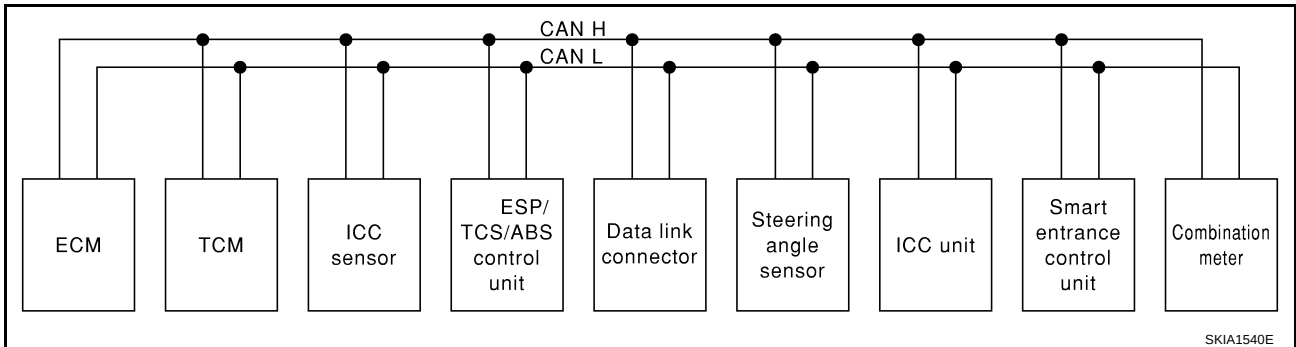
Models with ICC and ESP
SYSTEM DIAGRAM

ECS006U3

● LHD models



● RHD models



INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

Signals	ECM	TCM	ESP/ TCS / ABS con- trol unit	Steering angle sensor	Smart entrance control unit	ICC unit	ICC sen- sor	Combina- tion meter
Engine speed signal	T		R			R		R
Accelerator pedal position signal	T	R	R			R		
Closed throttle position signal	T	R				R		
ICC steering switch signal	T					R		
Shift pattern signal		T				R		
Parking brake switch signal			T			R		
ICC system display signal						T		R
ICC sensor signal						R	T	
ESP operation signal	R	R	T			R		
TCS operation signal	R	R	T			R		
ABS operation signal	R	R	T			R		
Stop lamp switch signal		R	T					

CAN COMMUNICATION

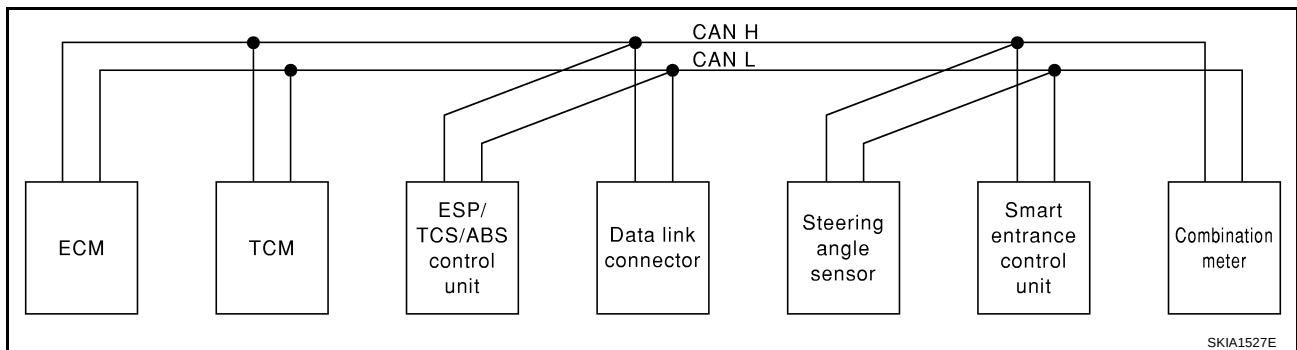
[EXCEPT FOR EURO-OBD]

Signals	ECM	TCM	ESP/ TCS / ABS con- trol unit	Steering angle sensor	Smart entrance control unit	ICC unit	ICC sen- sor	Combina- tion meter
Steering wheel angle sensor signal			R	T				
Wheel speed sensor signal			T			R		
Rear window defogger signal	R				T			
Heater fan switch signal	R							T
Air conditioner switch signal	R							T
Primary pulley revolution signal	R	T	R			R		
Secondary pulley revolution signal	R	T	R			R		
ICC operation signal	R					T		
Brake switch signal		R						T
MI signal	T							R
Current gear position signal		T						R
Engine coolant temperature signal	T					R		R
Fuel consumption signal	T							R
Vehicle speed signal		R	T					
			T					R
	R							T
Seat belt reminder signal					R			T
Lighting switch position signal					T			R
Flashing indicator signal					T			R
Engine cooling fan speed signal	T				R			
Child lock indicator signal					T			R
Door switches state signal					T			R
A/C compressor signal	T				R			

Models with ESP SYSTEM DIAGRAM

EC5006U4

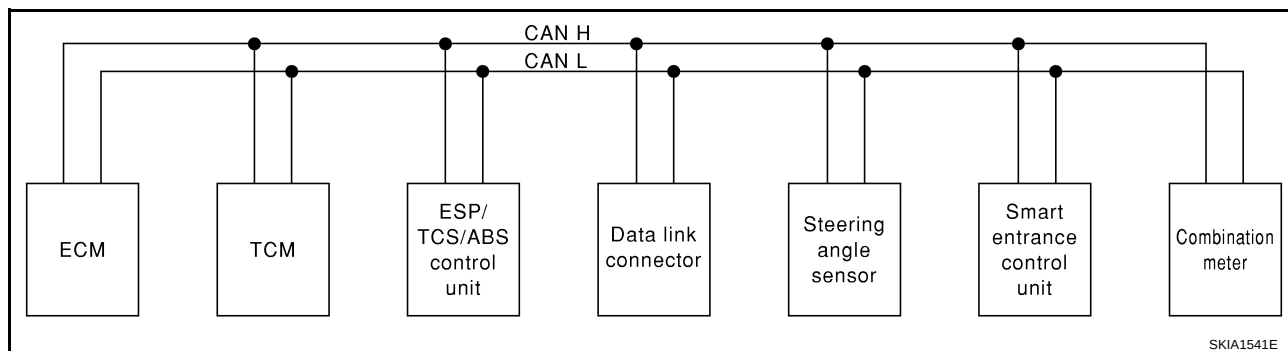
- LHD models



CAN COMMUNICATION

[EXCEPT FOR EURO-OBD]

● RHD models



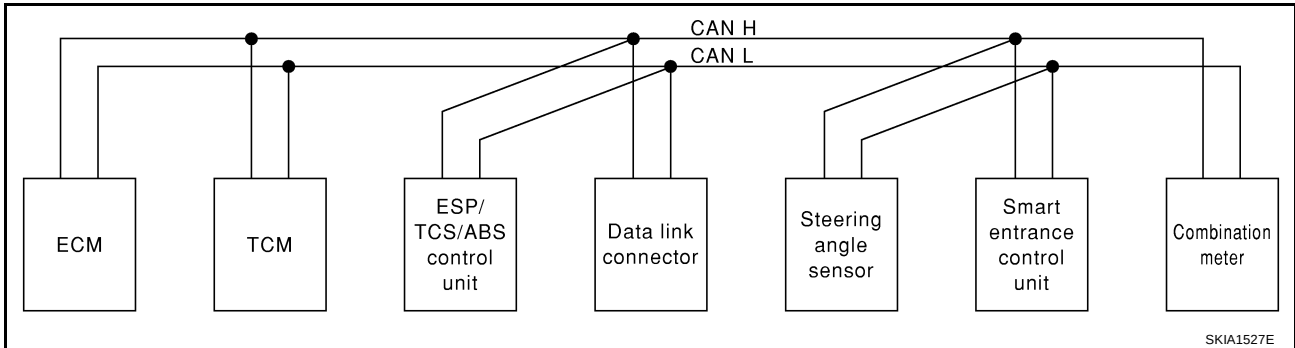
INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

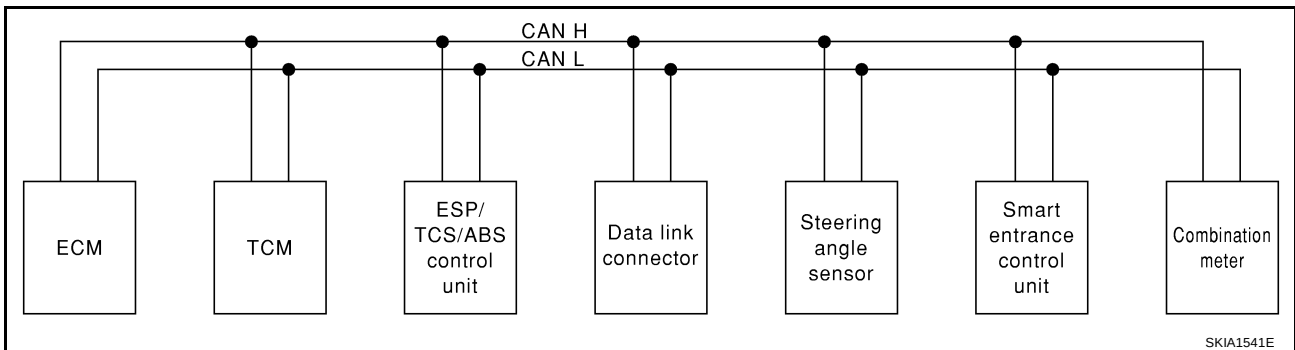
Signals	ECM	TCM	ESP/ TCS / ABS control unit	Steering angle sensor	Smart entrance control unit	Combina- tion meter
Engine speed signal	T		R			R
Accelerator pedal position signal	T	R	R			
Closed throttle position signal	T	R				
ESP operation signal	R	R	T			
TCS operation signal	R	R	T			
ABS operation signal	R	R	T			
Stop lamp switch signal		R	T			
Steering wheel angle sensor signal			R	T		
Rear window defogger signal	R				T	
Heater fan switch signal	R					T
Air conditioner switch signal	R					T
Primary pulley revolution signal	R	T				
Secondary pulley revolution signal	R	T				
MI signal	T					R
Current gear position signal		T				R
Engine coolant temperature signal	T					R
Fuel consumption signal	T					R
Vehicle speed signal		R	T			
			T			R
	R					T
Seat belt reminder signal					R	T
Lighting switch position signal					T	R
Flashing indicator signal					T	R
Engine cooling fan speed signal	T				R	
Child lock indicator signal					T	R
Door switches state signal					T	R
A/C compressor signal	T				R	
ASCD main switch signal	T					R
ASCD cruise signal	T					R

Models with ABS SYSTEM DIAGRAM

● LHD models



● RHD models



INPUT/OUTPUT SIGNAL CHART

T: Transmit R: Receive

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance control unit	Combination meter
Engine speed signal	T				R
Closed throttle position signal	T	R			
ABS operation signal	R	R	T		
Stop lamp switch signal		R	T		
Rear window defogger signal	R			T	
Heater fan switch signal	R				T
Air conditioner switch signal	R				T
Primary pulley revolution signal	R	T			
Secondary pulley revolution signal	R	T			
MI signal	T				R
Current gear position signal		T			R
Engine coolant temperature signal	T				R
Fuel consumption signal	T				R
Vehicle speed signal		R	T		
			T		R
	R				T
Seat belt reminder signal				R	T
Lighting switch position signal				T	R
Flashing indicator signal				T	R
Engine cooling fan speed signal	T			R	

CAN COMMUNICATION

[EXCEPT FOR EURO-OBD]

Signals	ECM	TCM	ABS actuator and electric unit (control unit)	Smart entrance con- trol unit	Combination meter
Child lock indicator signal				T	R
Door switches state signal				T	R
A/C compressor signal	T			R	
ASCD main switch signal	T				R
ASCD cruise signal	T				R
Accelerator pedal position signal	T	R			

A
B
CVT
D
E
F
G
H
I
J
K
L
M

TROUBLE DIAGNOSIS FOR POWER SUPPLY

[EXCEPT FOR EURO-OBD]

TROUBLE DIAGNOSIS FOR POWER SUPPLY

PFP:00000

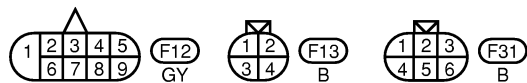
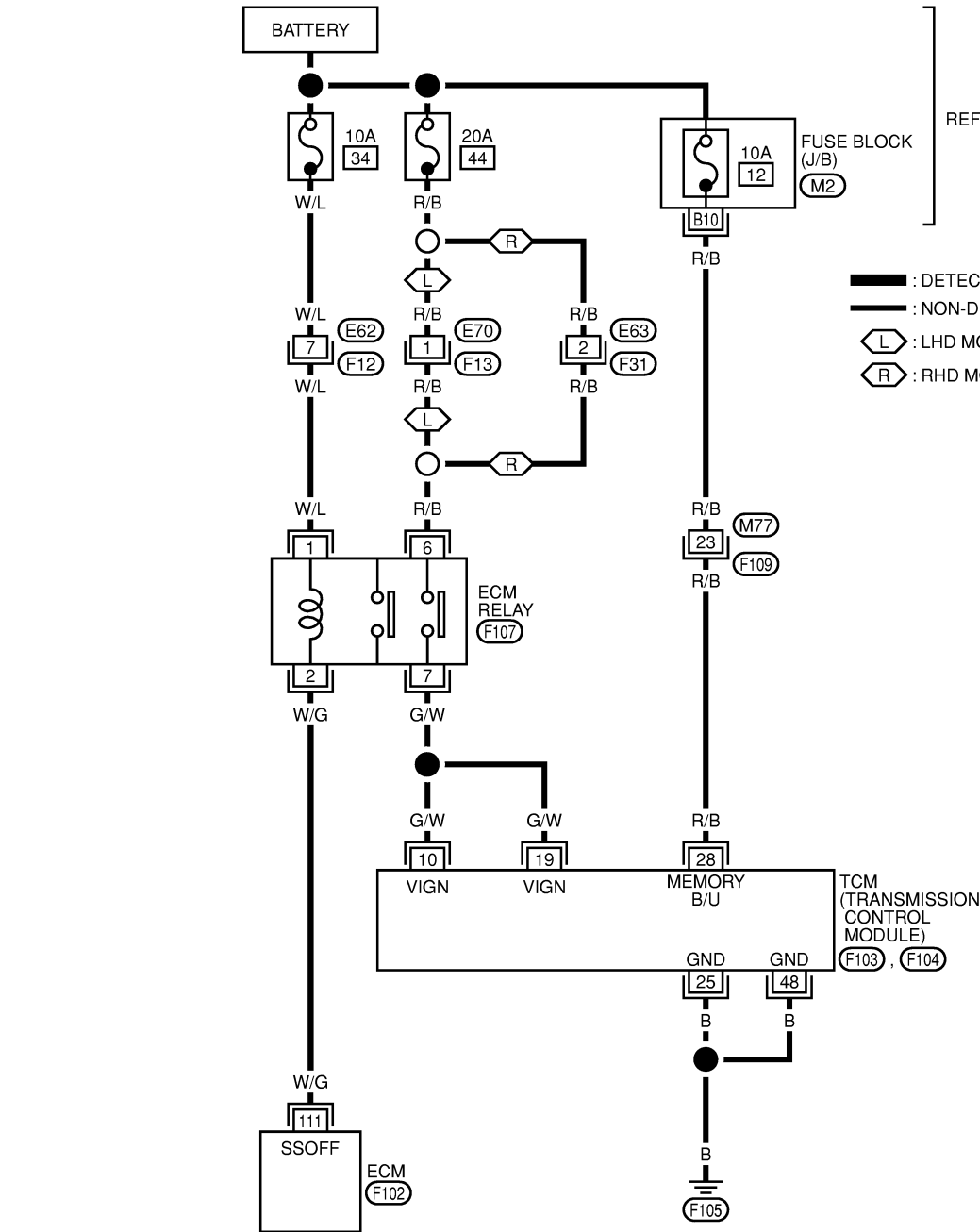
Wiring Diagram — CVT — MAIN

ECS00615

CVT-MAIN-01

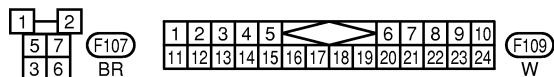
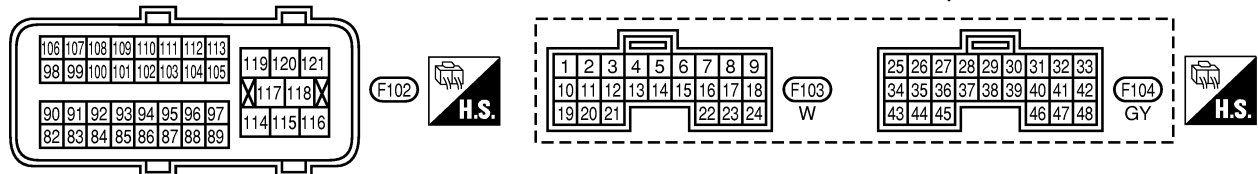
REFER TO PG-POWER.

- : DETECTABLE LINE FOR DTC
- : NON-DETECTABLE LINE FOR DTC
- L : LHD MODELS
- R : RHD MODELS



REFER TO THE FOLLOWING.

(M2) - FUSE BLOCK-JUNCTION BOX (J/B)



TROUBLE DIAGNOSIS FOR POWER SUPPLY

[EXCEPT FOR EURO-OBD]

TCM TERMINALS AND REFERENCE VALUE

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
10	G/W	Power source	 and 	Battery voltage
				0V
19	G/W	Power source	Same as No. 10	
25	B	Ground	—	—
28	R/B	Power source (Memory back-up)	 or 	Battery voltage
				Battery voltage
48	B	Ground	 and 	—

DIAGNOSTIC PROCEDURE

1. CHECK TCM POWER SOURCE

- Turn ignition switch to "ON" position.
(Do not start engine.)
- Check voltage between TCM terminals 10, 19, 28 and ground.

Voltage: Battery voltage

- Turn ignition switch to "OFF" position.
- Check voltage between TCM terminal 28 and ground.

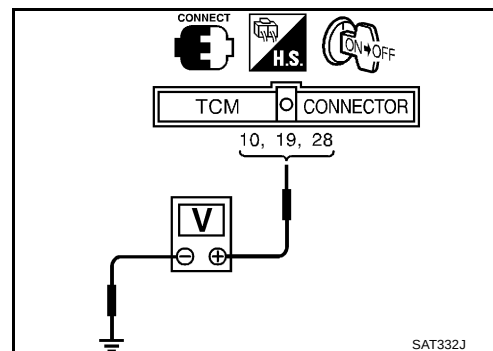
Voltage: Battery voltage

OK or NG

OK >> GO TO 2.

NG >> Check the following items:

- Harness for short or open between ignition switch and TCM terminals 10, 19 and 25 (Main harness)
- Ignition switch and fuse
Refer to PG section ("POWER SUPPLY ROUTING").



TROUBLE DIAGNOSIS FOR POWER SUPPLY

[EXCEPT FOR EURO-OBD]

2. CHECK TCM GROUND CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Disconnect TCM harness connector.
3. Check continuity between terminals 25, 48 and ground.

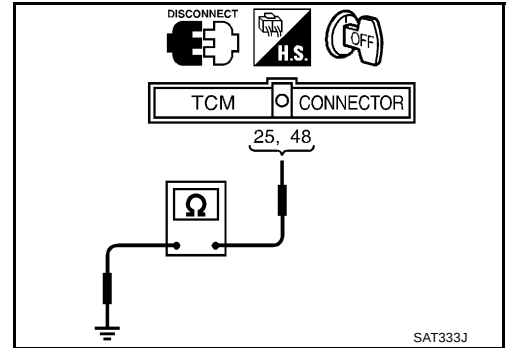
Continuity should exist.

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

OK or NG

OK >> **INSPECTION END**

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



VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR) [EXCEPT FOR EURO-OBD]

VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR)

PFP:31935

Description

ECS00616

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

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
29	G/R	Secondary speed sensor	 When moving at 20 km/h (12 MPH), use the CONSULT-II pulse frequency measuring function. - CONSULT-II cable connected to data link connector. - This inspection cannot be measured by circuit tester.	600 Hz
42	B	Sensor ground	 —	—

ON BOARD DIAGNOSIS LOGIC

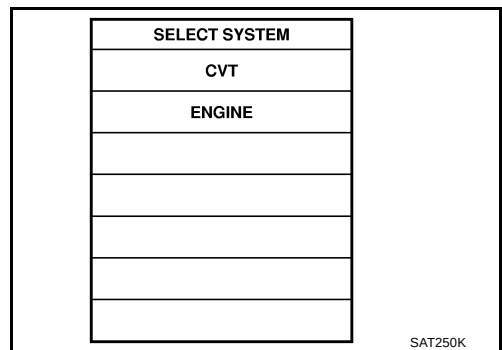
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : O/P PULLY SPD SIG  : 1st judgement flicker	TCM does not receive the proper voltage signal from the sensor.	- Harness or connectors (The sensor circuit is open or shorted.) - Revolution sensor

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

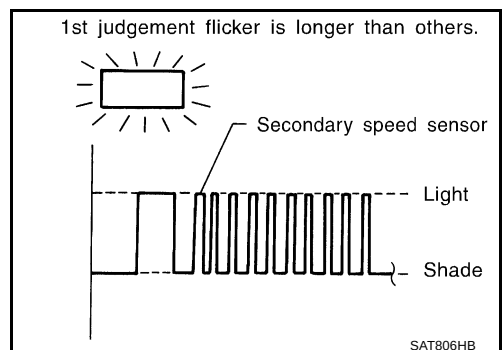
With CONSULT-II

- Start engine.
- Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
- Drive vehicle under the following conditions:
Selector lever in "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 more than 5 seconds.
If the check result is "NG", go to [CVT-145, "Diagnostic Procedure"](#).



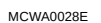
Without CONSULT-II

- Start engine.
- Drive vehicle under the following conditions:
Selector lever in "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 more than 5 seconds.
- Perform self-diagnosis.
Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).
If the check result is "NG", go to [CVT-145, "Diagnostic Procedure"](#).



Wiring Diagram - CVT - VSSA/T

CVT-VSSAT-02



VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR) [EXCEPT FOR EURO-OBD]

Diagnostic Procedure

ECS00618

1. CHECK INPUT SIGNAL (WITH CONSULT-II)

With CONSULT-II

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.

SELECT SYSTEM
CVT
ENGINE

SAT250K

3. Read out the value of "VEHICLE SPEED" while driving.
Check the value changes according to driving speed.

OK or NG

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

DATA MONITOR	
MONITOR	NO DTC
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
SLCTLVR POSI	NP
ENGINE SPEED	XXX rpm
I/P PULLY SPD	XXX rpm
CVT RATIO	XXX
PLY CONT STEP	XXX step
LINE PRES DTY	XXX%
TCC S/V DUTY	XXX%

SAT236K

2. CHECK SECONDARY SPEED SENSOR (WITH CONSULT-II)

With CONSULT-II

1. Start engine.

Condition	Judgement standard (Approx.)
When driving (D position, 20km/h), the measurement by using the pulse measurement function of CONSULT-II. • CONSULT-II cable connected to data link connector. • This inspection cannot be measured by circuit tester.	600 Hz

MTBL0550

- Harness for short or open between TCM and secondary speed sensor (Main harness)

OK or NG

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

3. CHECK DTC

Perform Self-diagnosis Code confirmation procedure, [CVT-143](#).

OK or NG

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

VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR) [EXCEPT FOR EURO-OBD]

4. CHECK TCM INSPECTION

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

OK or NG

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

PRIMARY SPEED SENSOR

[EXCEPT FOR EURO-OBD]

PRIMARY SPEED SENSOR

PFP:31935

Description

ECS00619

The primary speed sensor detects the primary pulley revolution speed and sends a signal to the ECM.

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
38	G/Y	Primary speed sensor	 - When driving at 20 km/h (12 MPH) with "L" position, use the CONSULT-II pulse frequency measuring function. - CONSULT-II cable connected to data link connector. - This inspection cannot be measured by circuit tester.	900 Hz

ON BOARD DIAGNOSIS LOGIC

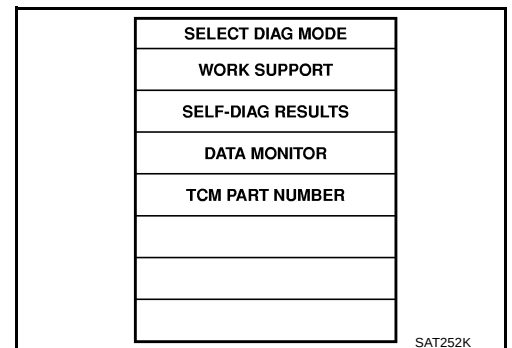
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : I/P PULLY SPD	TCM does not receive the proper voltage signal from the sensor.	- Harness or connectors (The sensor circuit is open or shorted.) - Vehicle speed sensor
 : 2nd judgement flicker		

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

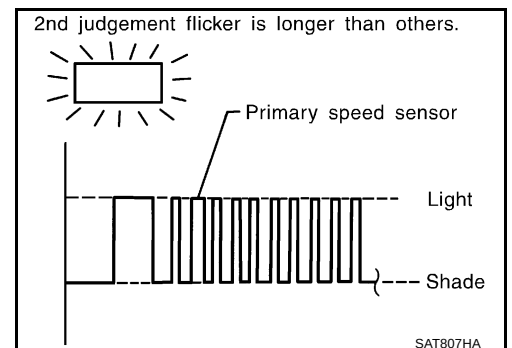
With CONSULT-II

- Start engine.
- Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
- Drive vehicle under the following conditions:
Selector lever in "D" position and vehicle speed higher than 20 km/h (12 MPH).
If the check result is "NG", go to [CVT-149, "Diagnostic Procedure"](#).



Without CONSULT-II

- Start engine.
- Drive vehicle under the following conditions:
Selector lever in "D" position and vehicle speed higher than 20 km/h (12 MPH).
- Perform self-diagnosis.
Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).
If the check result is "NG", go to [CVT-149, "Diagnostic Procedure"](#).



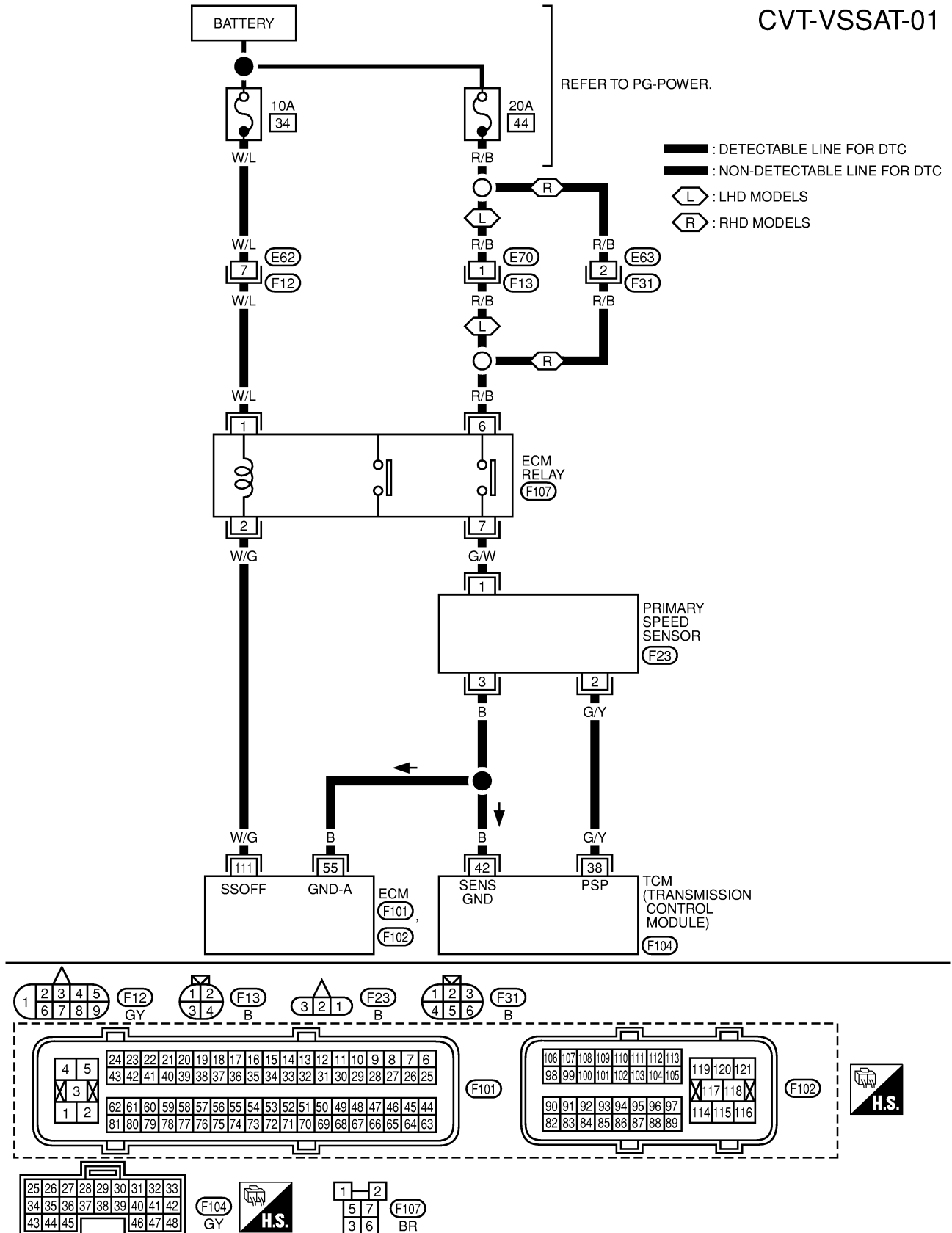
PRIMARY SPEED SENSOR

[EXCEPT FOR EURO-OBD]

Wiring Diagram - CVT - VSSAT

ECS0061A

CVT-VSSAT-01



MCWA0027E

Diagnostic Procedure

ECS0061B

1. CHECK INPUT SIGNAL

① With CONSULT-II

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "I/P PULLY SPD" while driving.
Check the value changes according to driving speed.

DATA MONITOR	
MONITOR	NO DTC
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
SLCTLVR POSI	NP
ENGINE SPEED	XXX rpm
I/P PULLY SPD	XXX rpm
CVT RATIO	XXX
PLY CONT STEP	XXX step
LINE PRES DTY	XXX%
TCC S/V DUTY	XXX%

SAT236K

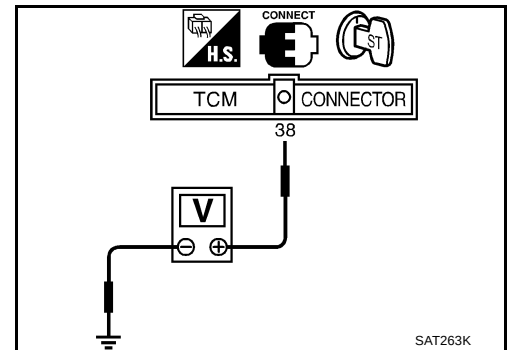
⊗ Without CONSULT-II

1. Start engine.
2. Check voltage between TCM terminal 38 and ground while driving at 20 km/h (12 MPH).

Approx. 900 Hz

OK or NG

- OK >> GO TO 2.
- NG >> Check the following items:
1. Harness for short or open between TCM, ECM and primary speed sensor (Main harness)
 2. Ground circuit for ECM
Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").



SAT263K

2. CHECK DTC

Perform Self-diagnosis Code confirmation procedure, [CVT-147](#).

OK or NG

- OK >> **INSPECTION END**
- NG >> ● Perform TCM input/output signal inspection.
- If NG, recheck TCM pin terminals for damage or loose connection with harness connector.

THROTTLE POSITION SENSOR

[EXCEPT FOR EURO-OBD]

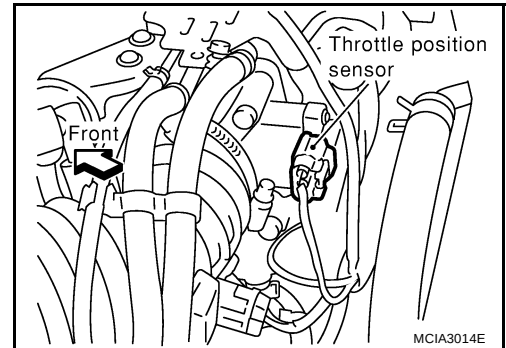
THROTTLE POSITION SENSOR

PFP:22620

Description

ECS006/C

- Throttle position sensor
The throttle position sensor detects the throttle valve position and sends a signal to the TCM.
- Throttle position switch
Consists of a wide open throttle position switch and a closed throttle position switch.
The wide open throttle position switch sends a signal to the TCM when the throttle valve is open at least 1/2 of the full throttle position. The closed throttle position switch sends a signal to the TCM when the throttle valve is fully closed.



CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Throttle position sensor	Fully-closed throttle	Approximately 0.5V
	Fully-open throttle	Approximately 4V

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
32	R	Throttle position sensor (Power source)	When turning ignition switch to "ON".	4.5 - 5.5V
			When turning ignition switch to "OFF".	0V
41	GY	Throttle position sensor	When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: 0.3V Fully-open throttle: 3V
42	B	Sensor ground	—	—

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
Ⓟ : THROTTLE POSI SEN	TCM receives an excessively low or high voltage from the sensor.	• Harness or connectors (The sensor circuit is open or shorted.) • Throttle position sensor • Throttle position switch
ⓧ : 3rd judgement flicker		

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

SELECT SYSTEM
CVT
ENGINE

SAT250K

Ⓟ With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.

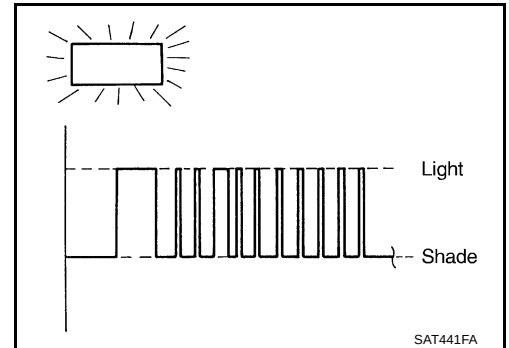
THROTTLE POSITION SENSOR

[EXCEPT FOR EURO-OBD]

3. Drive vehicle under the following conditions:
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/2 of the full throttle position and driving for more than 3 seconds.
If the check result is "NG", go to [CVT-153, "Diagnostic Procedure"](#).

⊗ Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/2 of the full throttle position and driving for more than 3 seconds.
3. Perform self-diagnosis.
Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).
If the check result is "NG", go to [CVT-153, "Diagnostic Procedure"](#).



THROTTLE POSITION SENSOR

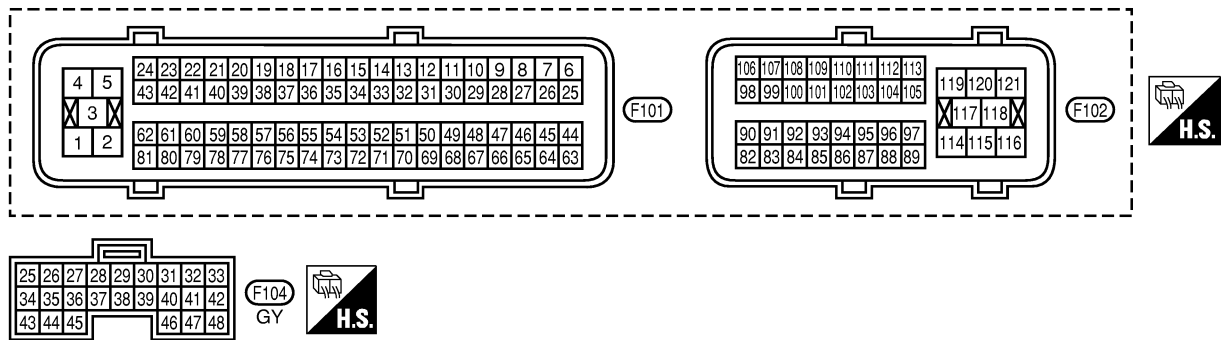
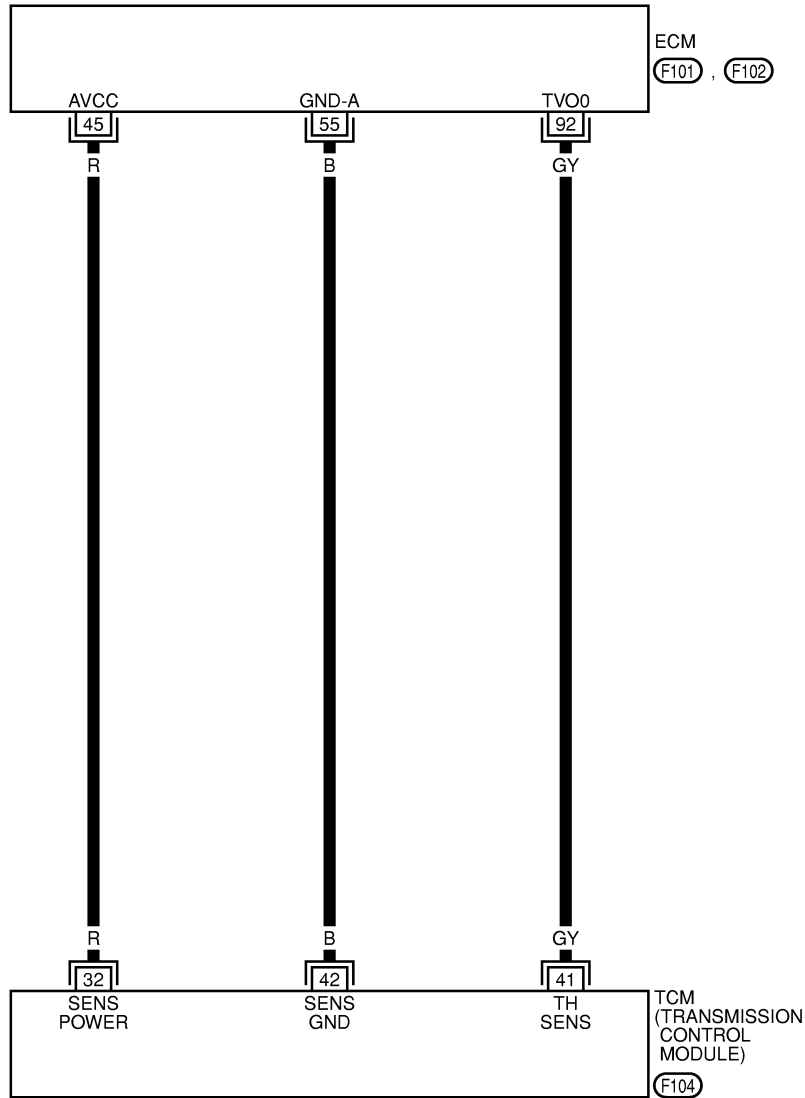
[EXCEPT FOR EURO-OBD]

Wiring Diagram - CVT - TPS

ECS0061D

CVT-TPS-01

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



THROTTLE POSITION SENSOR

[EXCEPT FOR EURO-OBD]

Diagnostic Procedure

ECS0061E

A

1. CHECK DTC WITH ECM

B

Perform diagnostic test mode II (self-diagnostic results) for engine control.

Refer to EC SECTION, "Malfunction Indicator (MI)", "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION".

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Check throttle position sensor circuit for engine control. Refer to EC section, "DTC P0120 THROTTLE POSITION SENSOR".

CVT

D

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

E

 **With CONSULT-II**

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

2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.

SELECT SYSTEM
CVT
ENGINE

SAT250K

F

G

H

I

3. Read out the value of "THRTL POSI SEN".

Voltage:

Fully-closed throttle:

Approximately 0.5V

Fully-open throttle:

Approximately 4V

OK or NG

OK >> GO TO 4.

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

DATA MONITOR	
MONITOR	NO DTC
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
SLCTLVR POSI	NP
ENGINE SPEED	XXX rpm
I/P PULLY SPD	XXX rpm
CVT RATIO	XXX
PLY CONT STEP	XXX step
LINE PRES DTY	XXX%
TCC S/V DUTY	XXX%

SAT236K

J

K

L

M

THROTTLE POSITION SENSOR

[EXCEPT FOR EURO-OBD]

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

⊗ Without CONSULT-II

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

Voltage:

Fully-closed throttle valve:

Approximately 0.5V

Fully-open throttle valve:

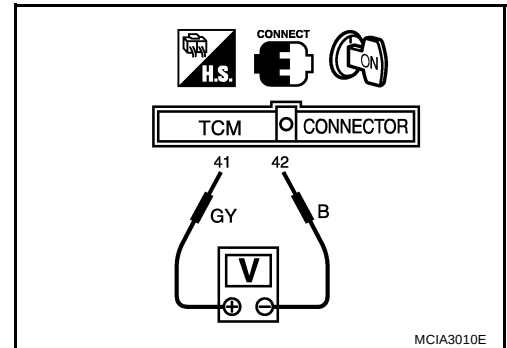
Approximately 4V

(Voltage rises gradually in response to throttle position)

OK or NG

OK >> GO TO 5.

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



STEPPING MOTOR - CIRCUIT

PFP:31947

Description

ECS0061F

The step motor is turned ON/OFF 4 times according to the signal from TCM. As a result, the flow of line pressure to primary pulley is changed and pulley ratio is controlled.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Step motor	The vehicle runs a safe condition and press/depress accelerator pedal.	ON/OFF

TCM TERMINALS AND REFERENCE VALUE

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
11	PU	Step motor	Within 2 seconds after key switch "ON", the time measurement by using the pulse width measurement function (Hi level) of CONSULT-II. ● CONSULT-II cable connect to data link connector. ● This inspection cannot be measured by circuit tester.	30.0 msec
12	L/W			10.0 msec
20	L/Y			30.0 msec
21	P/L			10.0 msec

ON BOARD DIAGNOSIS LOGIC

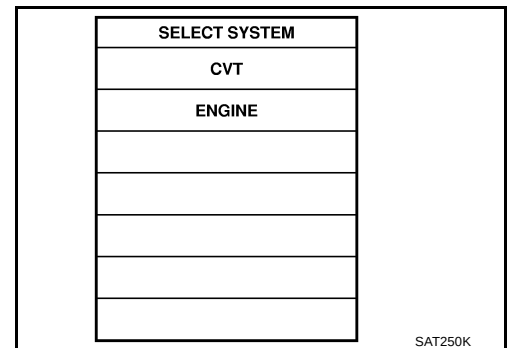
Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
① : STEP MOTOR ② : 4th judgement flicker	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	● Harness or connectors (The solenoid circuit is open or shorted.) ● Stepping motor circuit

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

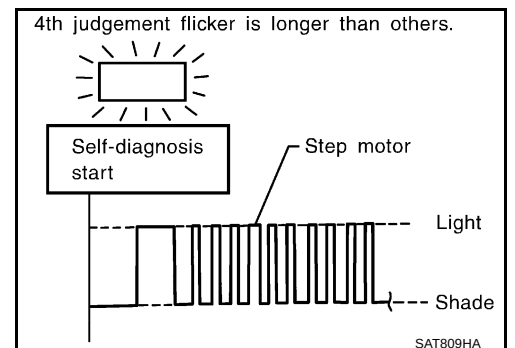
① With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
3. Drive vehicle in D position.
If the check result is "NG", go to [CVT-157, "Diagnostic Procedure"](#).



② Without CONSULT-II

1. Start engine.
2. Drive vehicle in D position.
3. Perform self-diagnosis.
Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).
If the check result is "NG", go to [CVT-157, "Diagnostic Procedure"](#).



STEPPING MOTOR - CIRCUIT

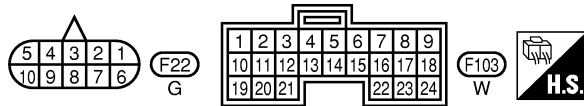
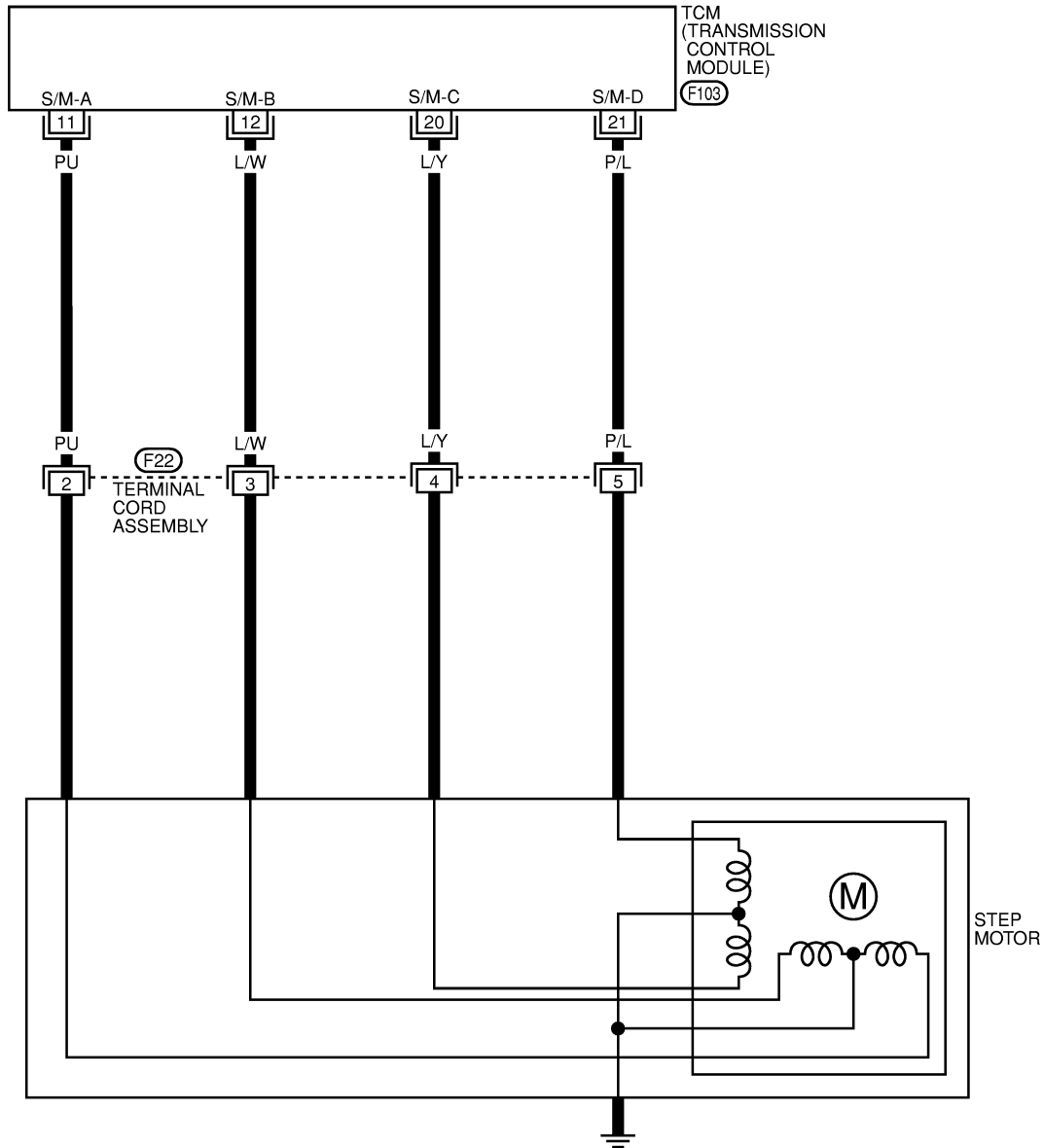
[EXCEPT FOR EURO-OBD]

Wiring Diagram - CVT - STM

ECS006/G

CVT-STM-01

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



MCWA0033E

Diagnostic Procedure

ECS006IH

1. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to "ON" position.
2. Check "SELF-DIAG RESULTS" with CONSULT-II.
3. If "CVT SAFE FUNCTION" activate, refer to "CVT SAFE FUNCTION", [CVT-186](#).
4. Turn ignition switch to "OFF" position.
5. Disconnect TCM harness connector.
6. Check continuity between terminal 2, 3, 4, 5 and TCM harness connector terminal 11, 12, 20, 21.

Continuity should exist.

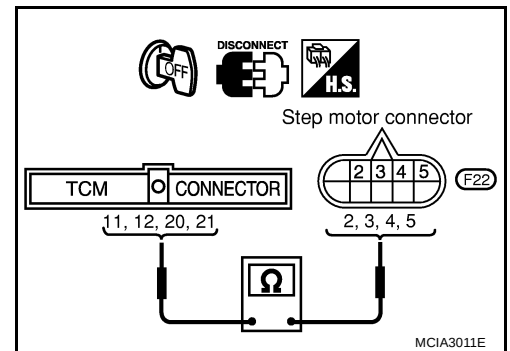
If OK, check harness for short to ground and short to power.

7. Reinstall any part removed.

OK or NG

OK >> GO TO 2.

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



2. CHECK DTC

Perform "SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE", [CVT-155](#).

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

STEPPING MOTOR - CIRCUIT

[EXCEPT FOR EURO-OBD]

Component Inspection

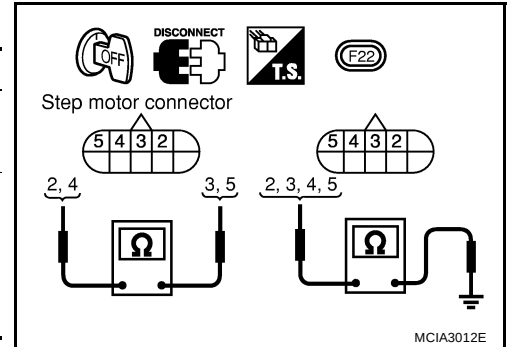
ECS006II

STEP MOTOR

Resistance Check

- Check resistance between terminals.

Control valve	Terminal No.	Resistance (Approx.)
Step motor	2 and 3	28Ω
	4 and 5	
	2 and ground	14Ω
	3 and ground	
	4 and ground	
	5 and ground	



MCIA3012E

STEPPING MOTOR - FUNCTION

PFP:31947

Description

ECS006IJ

- The step motor is ON/OFF of 4 aspects changes according to the signal from TCM.
As a result, the flow of line pressure to primary pulley is changed and pulley ratio is controlled.
- This diagnosis item detects when electrical system is OK but, mechanical system is NG.
- This diagnosis item detects when the state that the changing the speed mechanism in unit does not operate normally.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

It is monitoring whether "CVT RATIO: 2.32 - 0.47" changes similarly to "PLY CONT STEP: 3 - 200" by DATA MONITOR mode.

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
Ⓐ : STEP MOTOR/FNCTN*	• Step motor is not operating according to the TCM.	• Step motor

*: This detected item is according to the "SELF-DIAG RESULTS" for "ENGINE" on CONSULT-II.

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

SELECT SYSTEM
CVT
ENGINE

SAT250K

Ⓐ With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for ENGINE with CONSULT-II.
3. Drive vehicle in D position.

Diagnostic Procedure

ECS006IK

1. CHECK STEP MOTOR

- It is monitoring whether "CVT ratio: 2.32 - 0.47" changes similarly to "PLY CONT STEP: -3 - 200" by DATA MONITOR mode.
- If no CONSULT-II, inspect the engine speed (rise and descend) about vehicle speed and throttle opening angle, and check shift change.

OK or NG

- OK >> **INSPECTION END**
 NG >> Replace CVT assembly.

LINE PRESSURE SENSOR

[EXCEPT FOR EURO-OBD]

LINE PRESSURE SENSOR

PFP:31936

Description

ECS006/L

- The line pressure sensor detects line pressure of CVT, and sends TCM the signal.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Line pressure sensor	Throttle valve fully closed (PL Duty: 4%) ↓	Approx. 1.0V
	Throttle valve fully depressed (PL Duty: 94%)	↓ Approx. 4.0V

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
37	W	Line pressure sensor	 When engine runs at idle speed.	1.0V
			 When engine runs at stall speed.	4.0V
42	B		—	—
46	R/L		 —	4.5 - 5.5V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : LINE PRESSURE SEN	TCM receives an excessively low or high voltage from the sensor.	- Harness or connectors (The sensor circuit is open or shorted.) - Line pressure sensor
 : 5th judgement flicker		

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

SELECT SYSTEM
CVT
ENGINE

SAT250K

With CONSULT-II

- Start engine.
- Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
- Drive vehicle in D position.
If the check result is "NG", go to [CVT-163, "Diagnostic Procedure"](#).

LINE PRESSURE SENSOR

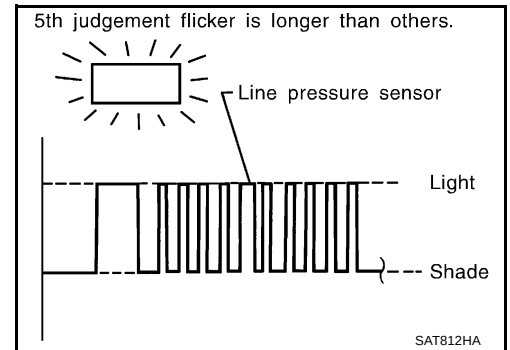
[EXCEPT FOR EURO-OBD]

⊗ Without CONSULT-II

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

Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).

If the check result is "NG", go to [CVT-163, "Diagnostic Procedure"](#).



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CVT

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LINE PRESSURE SENSOR

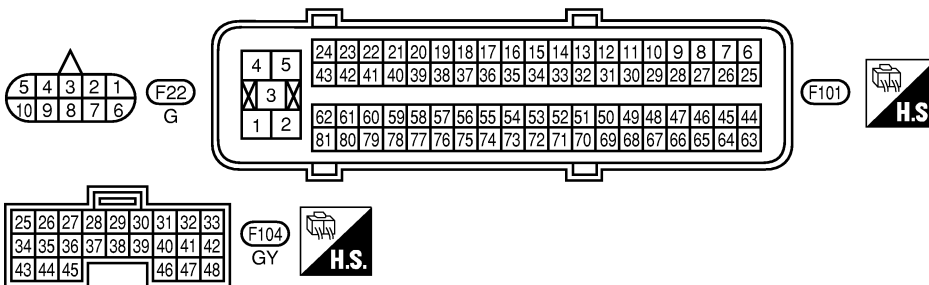
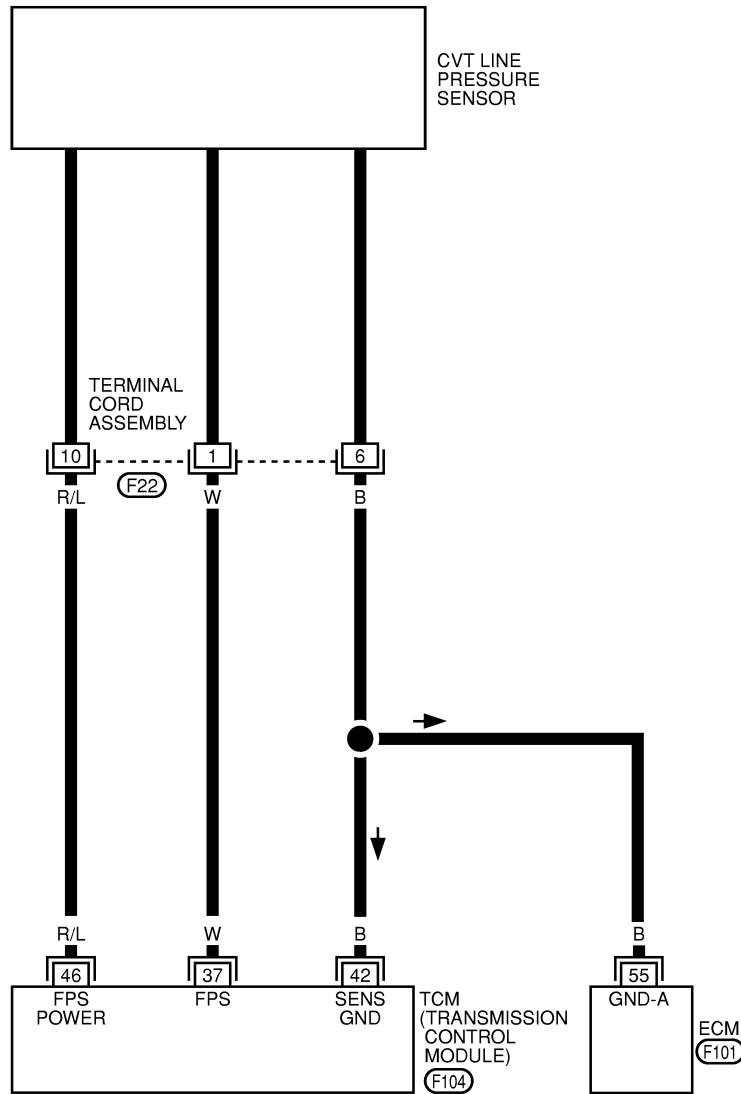
[EXCEPT FOR EURO-OBD]

Wiring Diagram - CVT - FPS

ECS0061M

CVT-LPS-01

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



MCWA0069E

Diagnostic Procedure

ECS0061N

A

1. CHECK PRESSURE SENSOR

B

Refer to [CVT-164, "Component Inspection"](#) .

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Repair or replace pressure sensor.

CVT

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

D

With CONSULT-II

1. Start engine.

2. Select "TCM Input Item Parameter List" in "DATA MONITOR" mode for "CVT" with CONSULT-II.

3. Read out the value of "LINE PRES DTY" while driving.

- Throttle valve fully closed (PL Duty: 4%): Approx. 1.0V
- Throttle valve fully depressed (PL Duty: 94%): Approx. 4.0V

E

F

OK or NG

OK >> GO TO 4.

NG >> Check the following items:

- Harness for short or open between TCM, ECM and CVT line pressure sensor (Main harness)
- Ground circuit for ECM
Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").

G

H

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

I

Without CONSULT-II

Refer to [CVT-164, "Component Inspection"](#) .

OK or NG

OK >> GO TO 4.

NG >> Check the following items:

- Harness for short or open between TCM, ECM and CVT line pressure sensor (Main harness).
- Ground circuit for ECM
Refer to EC section ("TROUBLE DIAGNOSIS FOR POWER SUPPLY").

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4. CHECK DTC

M

Perform [CVT-160, "SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE"](#) .

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

LINE PRESSURE SENSOR

[EXCEPT FOR EURO-OBD]

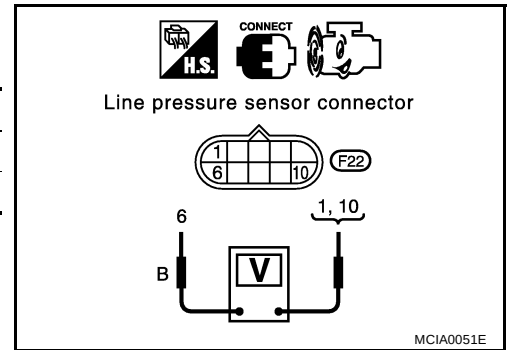
Component Inspection

LINE PRESSURE SOLENOID VALVE

ECS00610

- Start engine.
- Check voltage between terminals 1 and 6, 10 and 6.

Terminal No.		Voltage
1	6	Approx. 0.5 - 4.5V
10	6	Approx. 4.5 - 5.5V



LINE PRESSURE SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

LINE PRESSURE SOLENOID VALVE

PFP:31940

Description

ECS006KV

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

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

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Line pressure solenoid valve duty	Small throttle opening (Low line pressure)	Approximately 4%
	↓ Large throttle opening (High line pressure)	↓ Approximately 94%

NOTE:

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".

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
1	R/W	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	2.8V
			When depressing accelerator pedal fully after warming up engine.	1.4V
2	P/B	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	11.0V
			When depressing accelerator pedal fully after warming up engine.	4.0V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
Ⓐ : LINE PRESSURE S/V	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	● Harness or connectors (The solenoid circuit is open or shorted.) ● Line pressure solenoid valve
Ⓑ : 6th judgement flicker		

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

Ⓐ With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
3. With brake pedal depressed, shift the lever from "P" → "N" → "D" → "N" → "P" positions.
If the check result is "NG", go to [CVT-168, "Diagnostic Procedure"](#).

SELECT SYSTEM
CVT
ENGINE

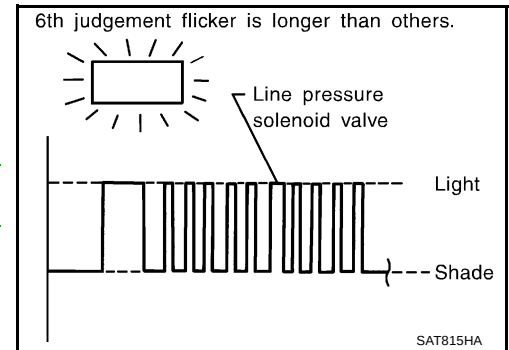
SAT250K

LINE PRESSURE SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

⊗ Without CONSULT-II

1. Start engine.
2. With brake pedal depressed, shift the lever from "P" → "N" → "D" → "N" → "P" positions.
3. Perform self-diagnosis.
Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).
If the check result is "NG", go to [CVT-168, "Diagnostic Procedure"](#).



LINE PRESSURE SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

Wiring Diagram - CVT - FPSV

ECS006KW

CVT-LPSV-01

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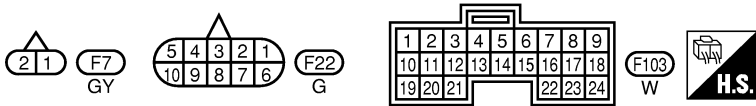
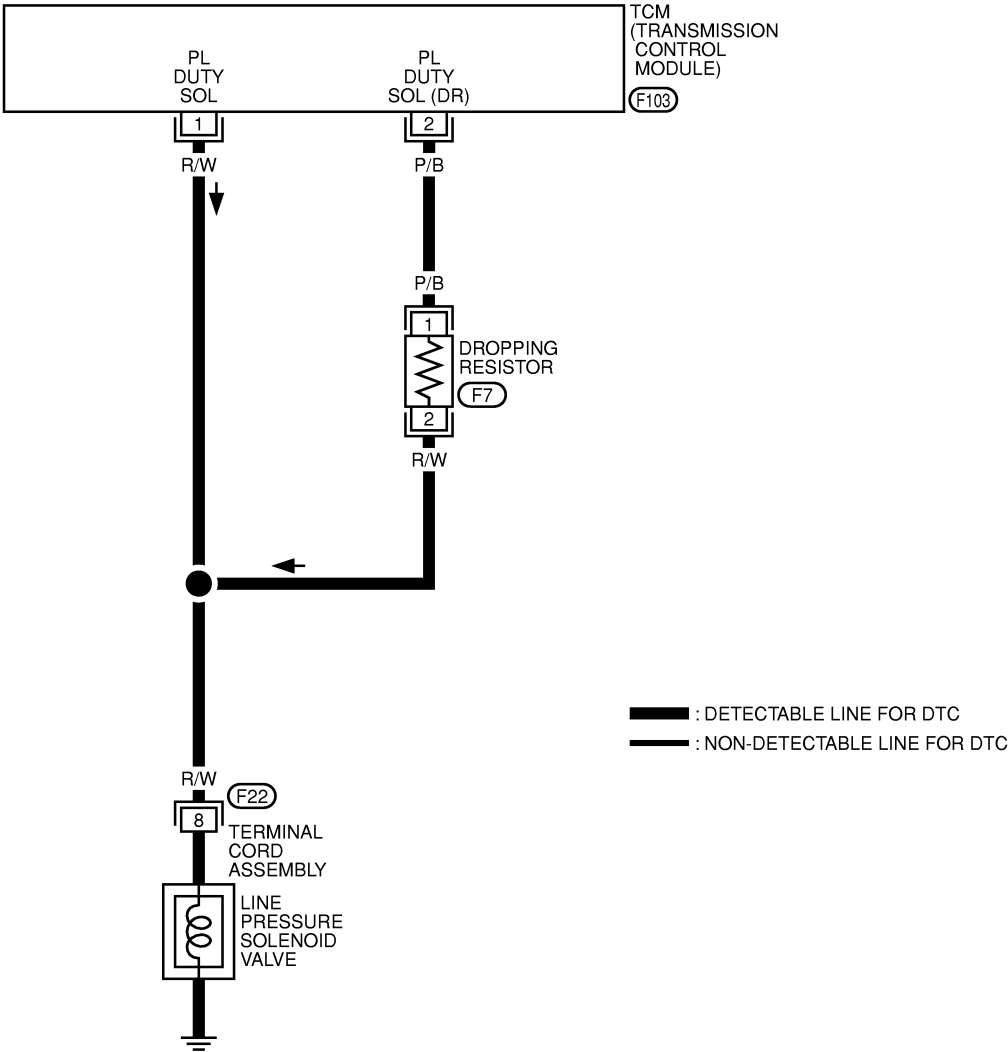
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LINE PRESSURE SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

Diagnostic Procedure

ECS006KX

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 8 and ground.

Resistance: 2.5 - 5Ω

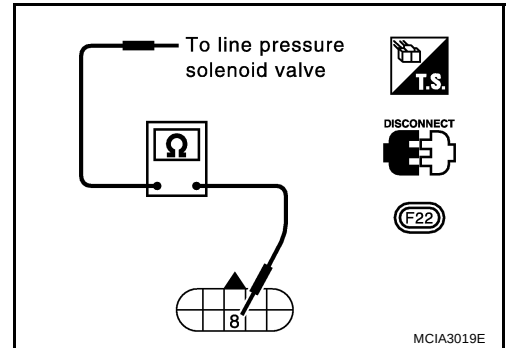
OK or NG

OK >> GO TO 2.

NG >> 1. Remove control valve assembly. Refer to [CVT-211](#),
"REMOVAL AND INSTALLATION" .

2. Check the following items:

- Line pressure solenoid valve
Refer to "Component Inspection", [CVT-170](#) .
- 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.
3. Check resistance between terminal 8 and TCM harness connector terminal 2.

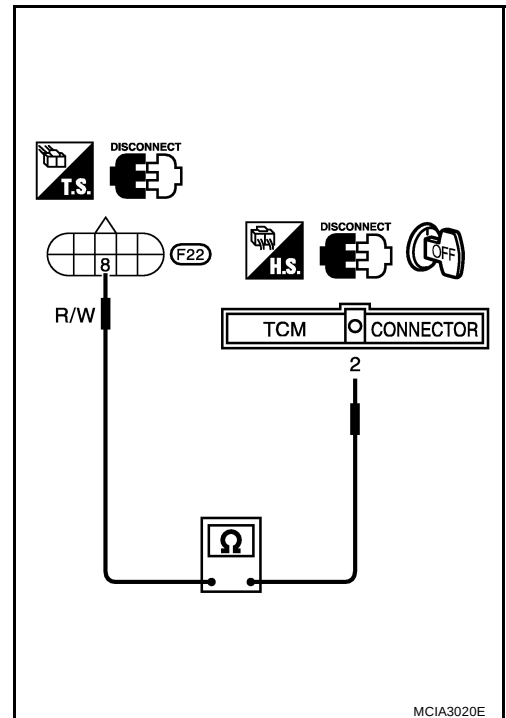
Resistance: 11.2 - 12.8Ω

OK or NG

OK >> GO TO 3.

NG >> Check the following items:

- Dropping resistor
Refer to "Component Inspection", [CVT-170](#) .
- Harness for short or open between TCM terminal 2
and terminal cord assembly (Main harness)



LINE PRESSURE SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

3. CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to "OFF" position.
2. Check continuity between terminal 8 and TCM harness connector terminal 1.

Continuity should exist.

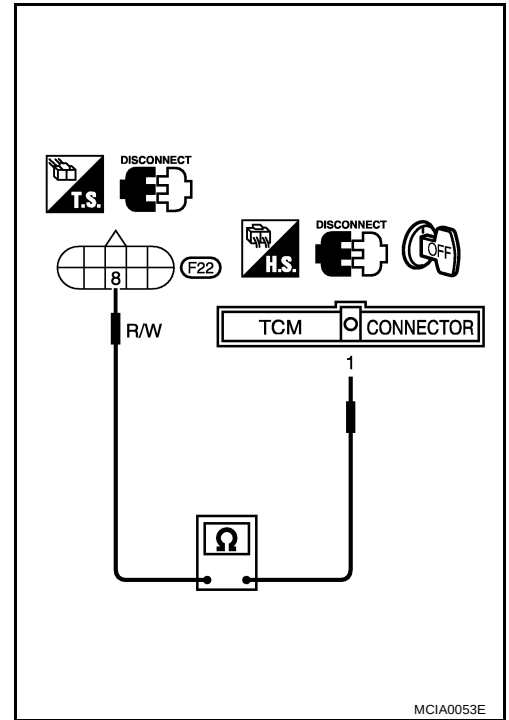
If OK, check harness for short to ground and short to power.

3. Reinstall any part removed.

OK or NG

OK >> GO TO 4.

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



4. CHECK DTC

Perform Self-diagnosis Code confirmation procedure, [CVT-165](#).

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

LINE PRESSURE SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

Component Inspection

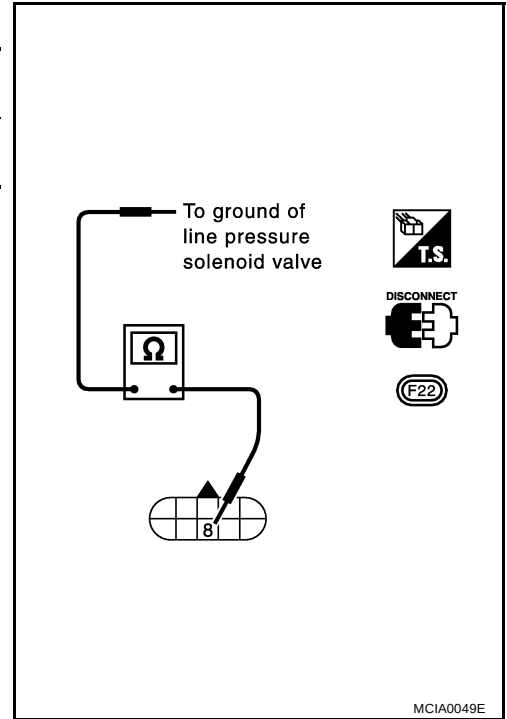
LINE PRESSURE SOLENOID VALVE

ECS006KY

Resistance Check

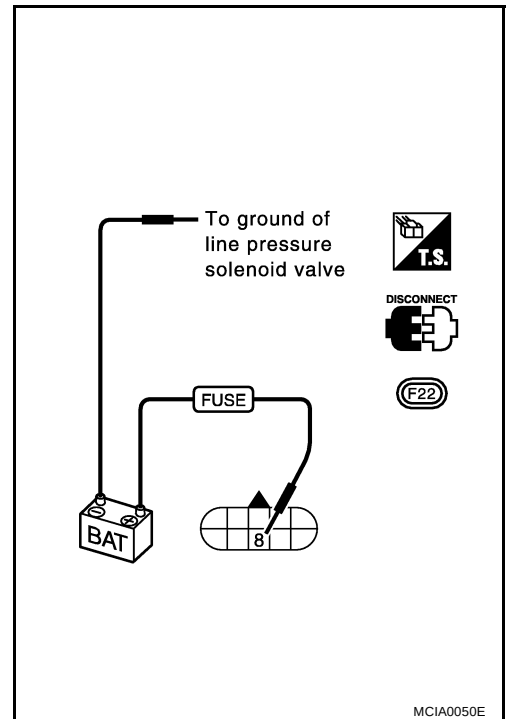
- Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Line pressure solenoid valve	8	Ground	2.5 - 5Ω



Operation Check

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



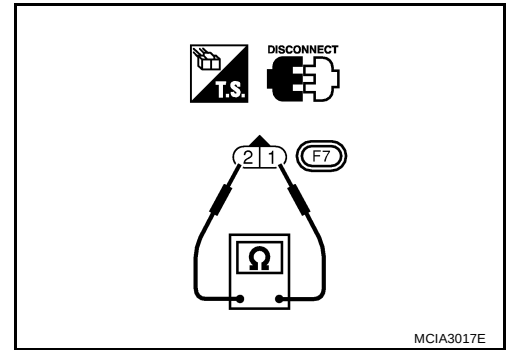
LINE PRESSURE SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

DROPPING RESISTOR

- Check resistance between two terminals.

Resistance: 11.2 - 12.8Ω



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TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

TORQUE CONVERTER CLUTCH SOLENOID VALVE

PFP:31940

Description

ECS00617

The torque converter clutch solenoid valve is activated, with the gear in "D4 ", by the TCM in response to signals sent from the vehicle speed and throttle position sensors. Lock-up piston operation will then be controlled. Lock-up operation, however, is prohibited when CVT fluid temperature is too low.

When the accelerator pedal is depressed (less than 2/8) in lock-up condition, the engine speed should not change abruptly. If there is a big jump in engine speed, there is no lock-up.

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Remarks: Specification data are reference values.

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

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
3	GY/R	Torque converter clutch solenoid valve	 When CVT performs lock-up.	12.0V
			When CVT does not perform lock-up.	0V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
☐ : T/C CLUTCH SOL/V ☒ : 7th judgement flicker	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	● Harness or connectors (The solenoid circuit is open or shorted.) ● T/C clutch solenoid valve

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
3. Drive vehicle in D → D lock-up position.
If the check result is "NG", go to [CVT-175, "Diagnostic Procedure"](#).

SELECT SYSTEM
CVT
ENGINE

SAT250K

TORQUE CONVERTER CLUTCH SOLENOID VALVE

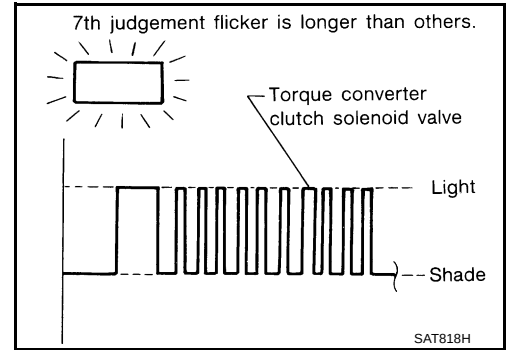
[EXCEPT FOR EURO-OBD]

⊗ Without CONSULT-II

1. Start engine.
2. Drive vehicle in D → D lock-up position.
3. Perform self-diagnosis.

Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).

If the check result is "NG", go to [CVT-175, "Diagnostic Procedure"](#).



A

B

CVT

D

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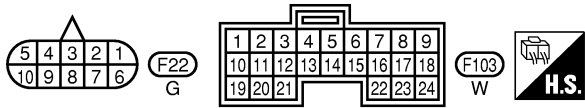
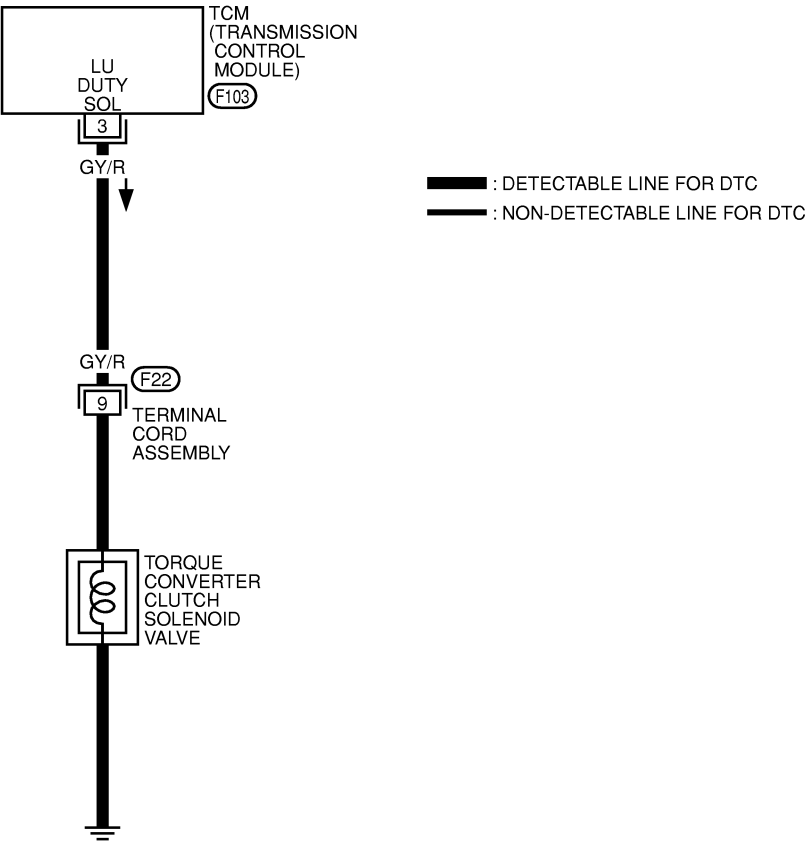
M

TORQUE CONVERTER CLUTCH SOLENOID VALVE
[EXCEPT FOR EURO-OBD]

Wiring Diagram - CVT - TCV

ECS006IU

CVT-TCV-01



MCWA0030E

TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

Diagnostic Procedure

ECS006IV

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 9 and ground.

Resistance: 10 - 20Ω

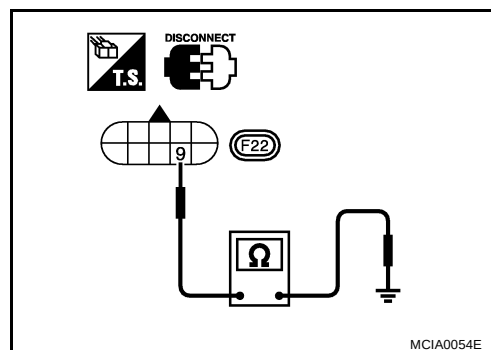
OK or NG

OK >> GO TO 2

NG >> 1. Remove oil pan. Refer to [EM-130, "OIL PAN AND OIL STRAINER"](#).

2. Check the following items:

- Torque converter clutch solenoid valve
Refer to "Component Inspection", [CVT-176](#).
- 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.
3. Check continuity between terminal 9 and TCM harness connector terminal 3.

Continuity should exist.

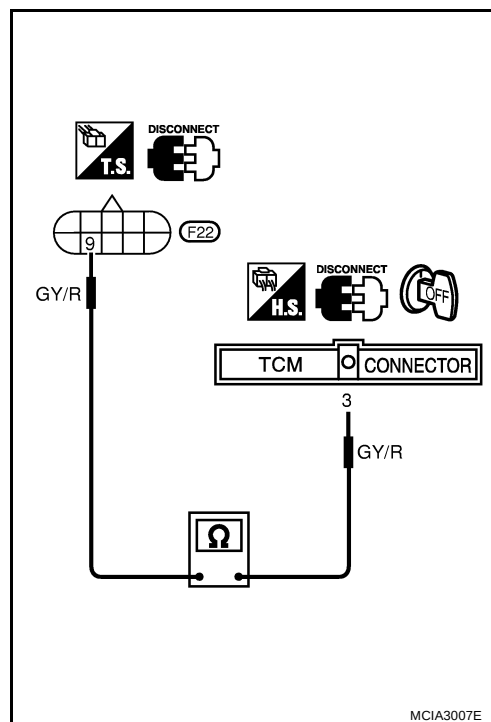
If OK, check harness for short to ground and short to power.

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.



3. CHECK DTC

Perform Self-diagnosis Code confirmation procedure, [CVT-172](#).

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

TORQUE CONVERTER CLUTCH SOLENOID VALVE

[EXCEPT FOR EURO-OBD]

Component Inspection

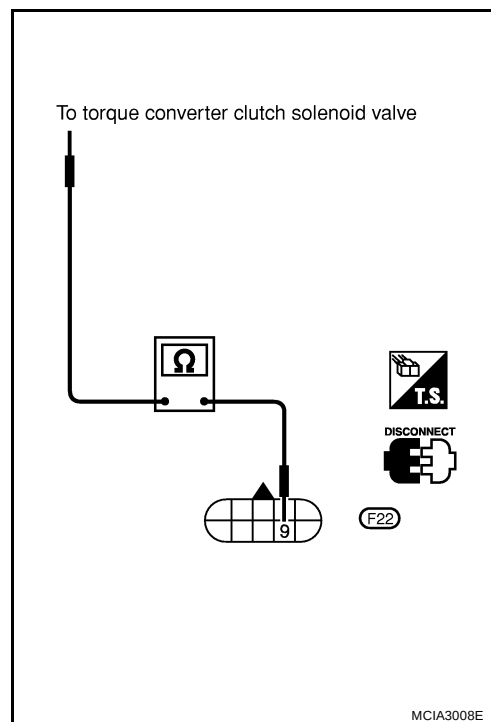
TORQUE CONVERTER CLUTCH SOLENOID VALVE

ECS0061W

Resistance Check

- Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Torque converter clutch solenoid valve	9	Ground	10 - 20Ω



Operation Check

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

CVT FLUID TEMPERATURE SENSOR CIRCUIT

[EXCEPT FOR EURO-OBD]

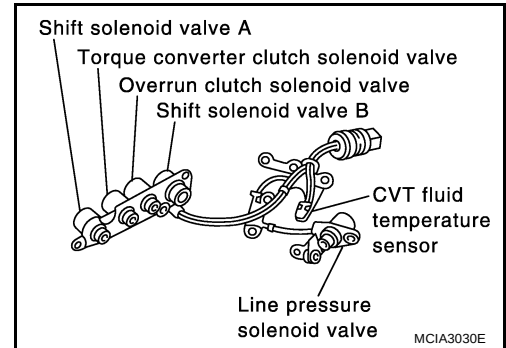
CVT FLUID TEMPERATURE SENSOR CIRCUIT

PFP:31937

Description

ECS006IX

The CVT fluid temperature sensor detects the CVT 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)	
CVT temperature sensor	Cold [20°C (68°F)]	1.5V	2.5 kΩ
	Hot [80°C (176°F)]	0.5V	0.3 kΩ

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
42	B	Sensor ground	—	—
47	BR	CVT fluid temperature sensor	When CVT fluid temperature is 20°C (68°F).	1.5V
			When CVT fluid temperature is 80°C (176°F).	0.5V

ON BOARD DIAGNOSIS LOGIC

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

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

SELECT SYSTEM
CVT
ENGINE

SAT250K

Ⓐ With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
3. Drive vehicle under the following conditions:
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/8 of the full open position, engine speed higher than 450 rpm and driving for more than 10 minutes.

CVT FLUID TEMPERATURE SENSOR CIRCUIT

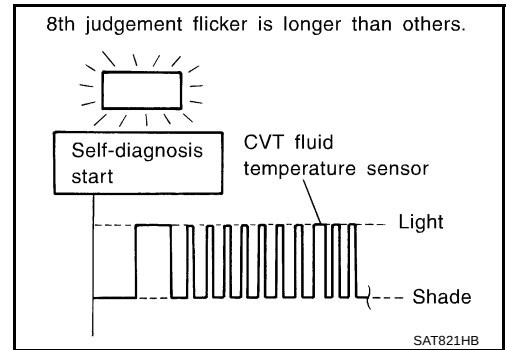
[EXCEPT FOR EURO-OBD]

If the check result is "NG", go to [CVT-180, "Diagnostic Procedure"](#).



Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
Selector lever in "D" position, vehicle speed higher than 10 km/h (6 MPH), throttle opening greater than 1/8 of the full open position, engine speed higher than 450 rpm and driving for more than 10 minutes.
3. Perform self-diagnosis.
Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).
If the check result is "NG", go to [CVT-180, "Diagnostic Procedure"](#).



CVT FLUID TEMPERATURE SENSOR CIRCUIT

[EXCEPT FOR EURO-OBD]

Wiring Diagram - CVT - FTS

ECS0061Y

CVT-FTS-01

A

B

CVT

D

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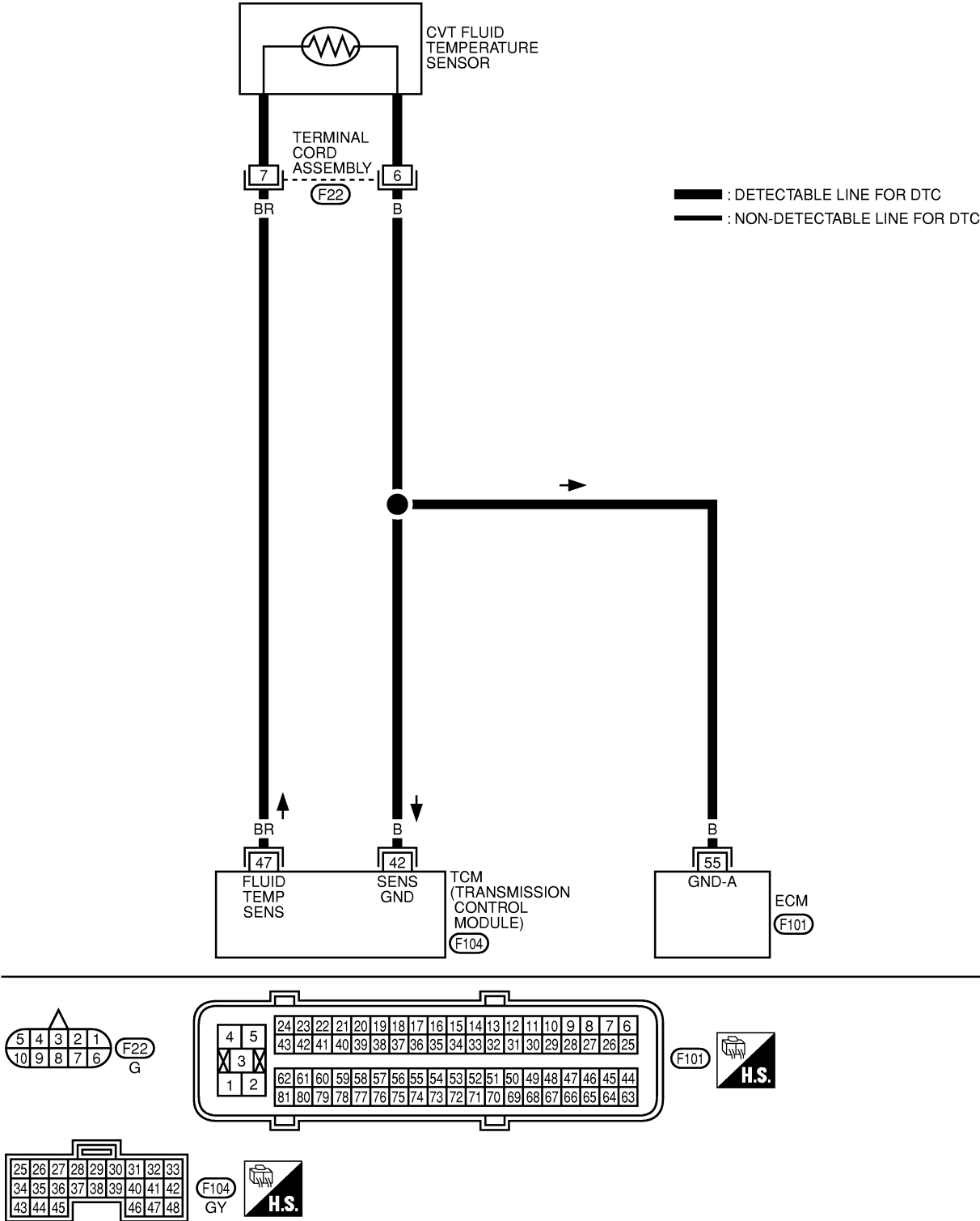
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MCWA0026E

CVT FLUID TEMPERATURE SENSOR CIRCUIT

[EXCEPT FOR EURO-OBD]

Diagnostic Procedure

ECS0061Z

1. CHECK CVT FLUID TEMPERATURE SENSOR WITH TERMINAL CORD ASSEMBLY

1. Turn ignition switch to "OFF" position.
2. Disconnect terminal cord assembly connector in engine compartment.
3. Check resistance between terminals 6 and 7 when CVT is cold.

Resistance:

Cold [20°C (68°F)]

Approximately 2.5 kΩ

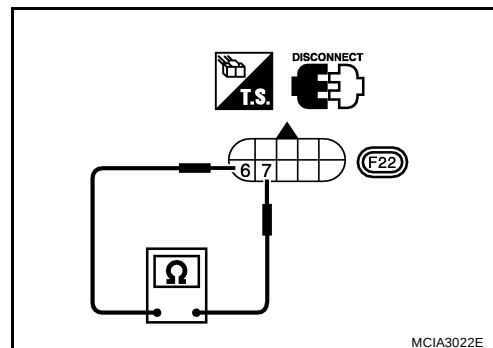
4. Reinstall any part removed.

OK or NG

OK (With CONSULT-II)>>GO TO 2.

OK (Without CONSULT-II)>>GO TO 3.

NG >> Replace CVT assembly.



2. CHECK INPUT SIGNAL OF CVT FLUID TEMPERATURE SENSOR (WITH CONSULT-II)

 **With CONSULT-II**

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out the value of "FLUID TEMP SE".

Voltage:

Cold [20°C (68°F)] → Hot [80°C (176°F)]:

Approximately 1.5V → 0.5V

OK or NG

OK >> GO TO 4.

NG >> Check the following item:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM
Refer to EC section, "TROUBLE DIAGNOSIS FOR POWER SUPPLY".

DATA MONITOR	
MONITOR	NO DTC
VHCL SPEED SE	XXX km/h
THRTL POS SEN	XXX V
FLUID TEMP SE	XXX V
BATTERY VOLT	XXX V
LINE PRES SEN	XXX V
ENGINE SPEED	XXX rpm
I/P PULLY SPD	XXX rpm
L POSITION SW	OFF
D POSITION SW	OFF

SAT271K

CVT FLUID TEMPERATURE SENSOR CIRCUIT

[EXCEPT FOR EURO-OBD]

3. CHECK INPUT SIGNAL OF CVT FLUID TEMPERATURE SENSOR (WITHOUT CONSULT-II)

⊗ Without CONSULT-II

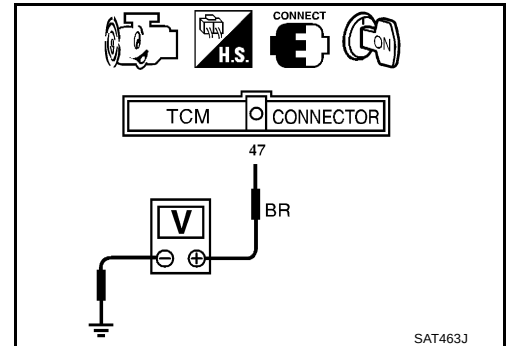
1. Start engine.
2. Check voltage between TCM terminal 47 and ground while warming up CVT.

Voltage:

Cold [20°C (68°F)] → Hot [80°C (176°F)]:

Approximately 1.5V → 0.5V

3. Turn ignition switch to "OFF" position.
4. Disconnect TCM harness connector.



5. Check resistance between terminal 42 and ground.

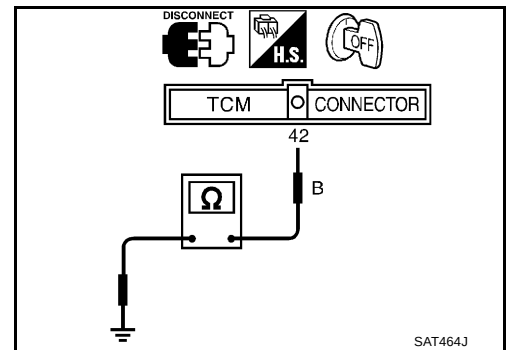
Continuity should exist.

OK or NG

OK >> GO TO 4.

NG >> Check the following item:

- Harness for short or open between TCM, ECM and terminal cord assembly (Main harness)
- Ground circuit for ECM
Refer to EC section, "TROUBLE DIAGNOSIS FOR POWER SUPPLY".



4. CHECK DTC

Perform Self-diagnosis Code confirmation procedure, [CVT-177](#).

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

ENGINE SPEED SIGNAL

[EXCEPT FOR EURO-OBD]

ENGINE SPEED SIGNAL

PFP:24825

Description

ECS006J1

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

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
39	L/OR	Engine speed signal	 When engine runs at idle speed.	0.5 - 1.5V

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : ENGINE SPEED SIG	TCM does not receive the proper voltage signal from ECM.	● Harness or connectors (The sensor circuit is open or shorted.)
 : 9th judgement flicker		

SELF-DIAGNOSIS CODE CONFIRMATION PROCEDURE

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

SELECT SYSTEM
CVT
ENGINE

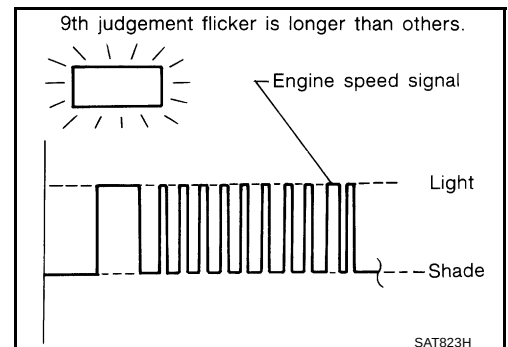
SAT250K

With CONSULT-II

1. Start engine.
2. Select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
3. Drive vehicle under the following conditions:
Selector lever in "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 more than 10 seconds.
If the check result is "NG", go to [CVT-184, "Diagnostic Procedure"](#).

Without CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
Selector lever in "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 more than 10 seconds.
3. Perform self-diagnosis.
Refer to [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#).
If the check result is "NG", go to [CVT-184, "Diagnostic Procedure"](#).



ENGINE SPEED SIGNAL

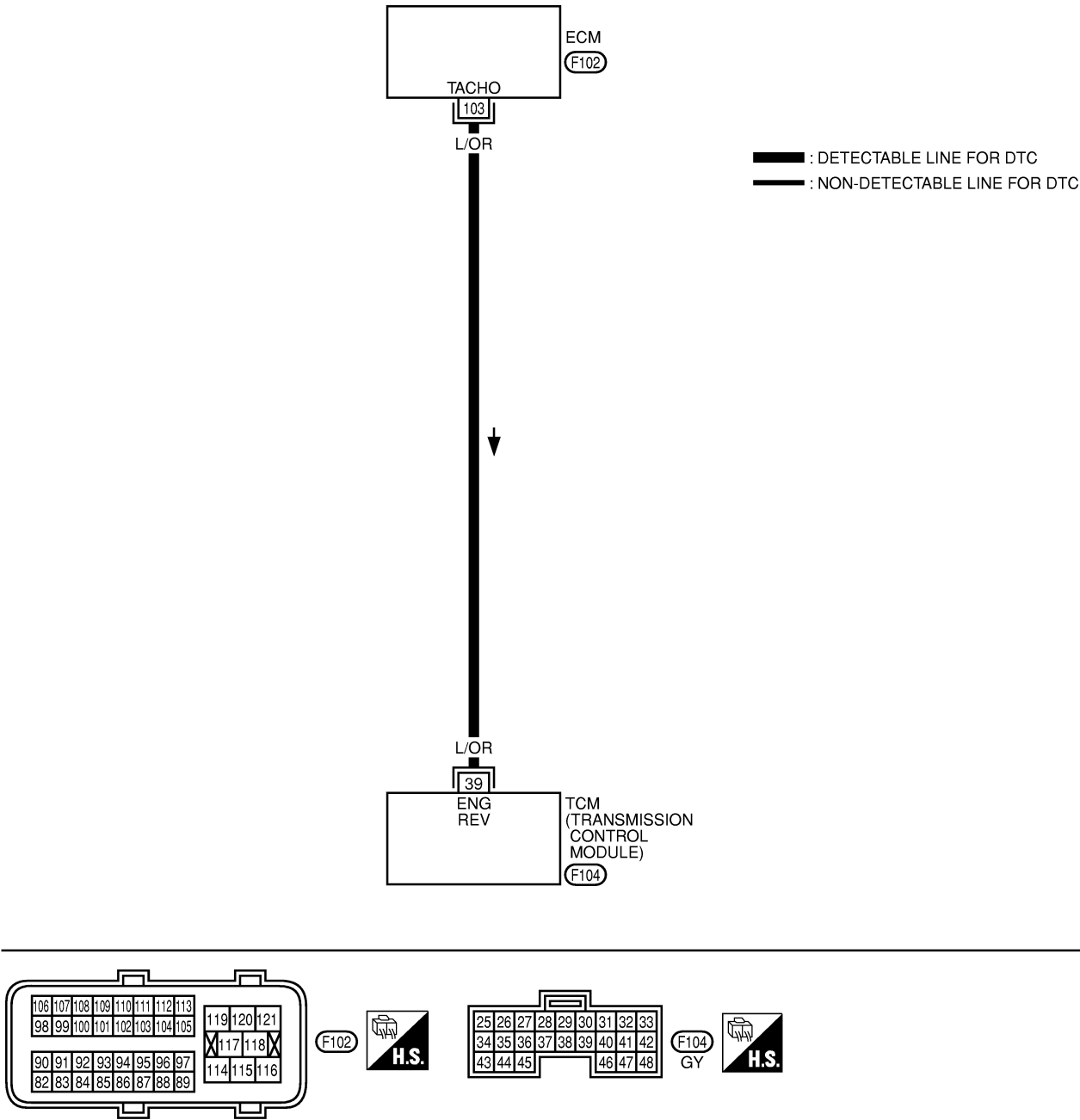
[EXCEPT FOR EURO-OBD]

Wiring Diagram - CVT - ENGSS

ECS006J2

CVT-ENGSS-01

- A
- B
- CVT
- D
- E
- F
- G
- H
- I
- J
- K
- L
- M



Diagnostic Procedure

1. CHECK DTC WITH ECM

Perform diagnostic test mode II (self-diagnostic results) for engine control. Check ignition signal circuit condition.

OK or NG

OK (With CONSULT-II)>>GO TO 2.

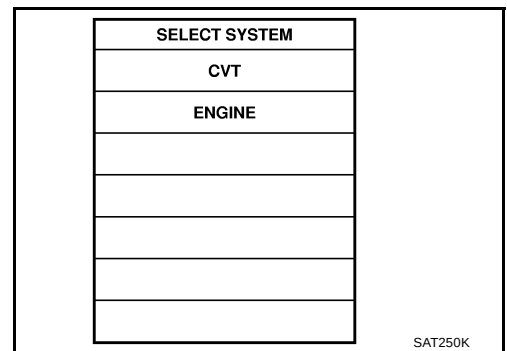
OK (Without CONSULT-II)>>GO TO 3.

NG >> Check ignition signal circuit for engine control. Refer to EC section, "IGNITION SIGNAL".

2. CHECK INPUT SIGNAL (WITH CONSULT-II)

 **With CONSULT-II**

1. Start engine.
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.



3. Read out the value of "ENGINE SPEED".
Check engine speed changes according to throttle position.

OK or NG

OK >> GO TO 4.

NG >> Check the following items:

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

DATA MONITOR	
MONITOR	NO DTC
VHCL SPEED SE	XXX km/h
THRTL POS SEN	XXX V
FLUID TEMP SE	XXX V
BATTERY VOLT	XXX V
LINE PRES SEN	XXX V
ENGINE SPEED	XXX rpm
I/P PULLY SPD	XXX rpm
L POSITION SW	OFF
D POSITION SW	OFF

SAT271K

3. CHECK INPUT SIGNAL (WITHOUT CONSULT-II)

 **Without CONSULT-II**

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

Voltage (Idle speed):

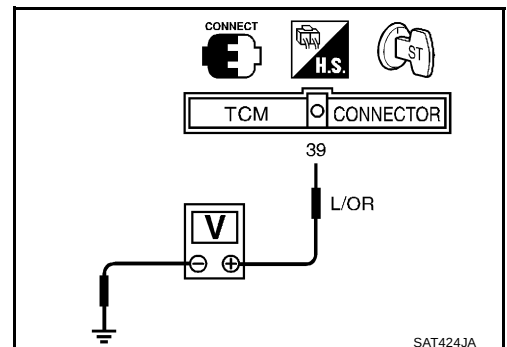
Refer to EC section, "IGNITION SIGNAL".

OK or NG

OK >> GO TO 4.

NG >> Check the following items:

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



4. CHECK DTC

Perform Self-diagnosis Code confirmation procedure, [CVT-182](#) .

OK or NG

OK >> **INSPECTION END**

NG >> 1. Perform TCM input/output signal inspection.

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

A

B

CVT

D

E

F

G

H

I

J

K

L

M

CVT SAFE FUNCTION

Description

"CVT SAFE FUNCTION" is function to protect CVT.

ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : CVT SAFE FUNCTION	TCM is malfunctioning	TCM
 : 10th judgement flicker		

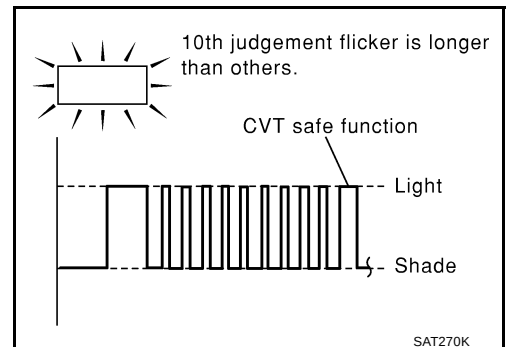
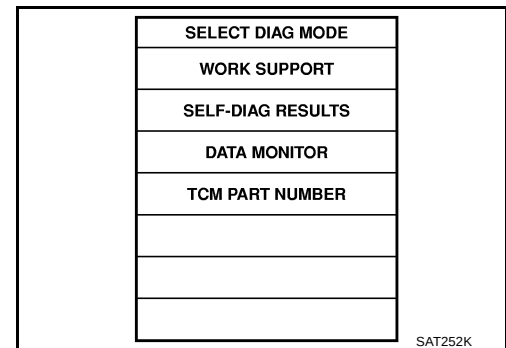
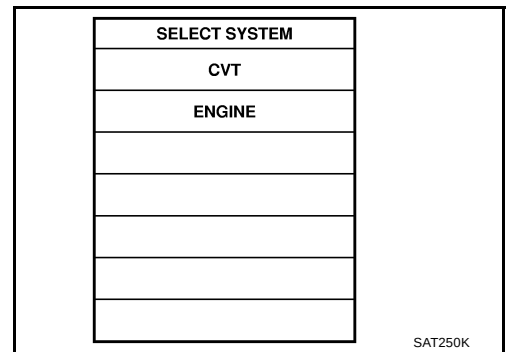
DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

With CONSULT-II

- Turn ignition switch "ON" and select "DATA MONITOR" mode for CVT with CONSULT-II.
- Start engine.
- Run engine for at least 2 seconds at idle speed.
If the check result is "NG", go to [CVT-187, "Diagnostic Procedure"](#).

Without CONSULT-II

- Start engine.
- Perform self-diagnosis. Refer to [CVT-29, "TCM Self-diagnostic Procedure \(No Tools\)"](#) (EURO-OBD) or [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#) (Except for EURO-OBD).
If the check result is "NG", go to [CVT-187, "Diagnostic Procedure"](#).



Diagnostic Procedure

ECS006JI

1. CHECK INPUT SIGNAL (WITH CONSULT-II)

1. Turn ignition switch to “ON” and select “SELF-DIAG RESULTS” mode for CVT with CONSULT-II.
2. Touch “ERASE”.
Perform “DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE”, [CVT-186](#).

Is the “CVT SAFE FUNCTION” displayed again?

OK >> Replace TCM.
NG >> **INSPECTION END**

A

B

CVT

D

E

F

G

H

I

J

K

L

M

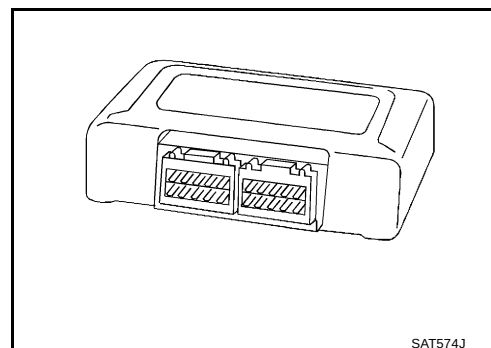
CONTROL UNIT (RAM), CONTROL UNIT (ROM)

PFP:31036

Description

ECS006JJ

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



ON BOARD DIAGNOSIS LOGIC

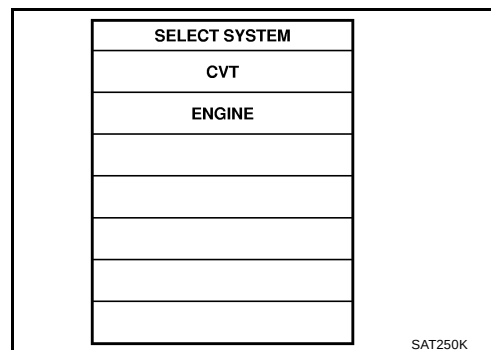
Remarks: Specification data are reference values.

Diagnostic trouble code	Malfunction is detected when ...	Check item (Possible cause)
① : CONTROL UNIT (RAM) ② : CONTROL UNIT (ROM)	TCM memory (RAM) or (ROM) is malfunctioning.	TCM

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

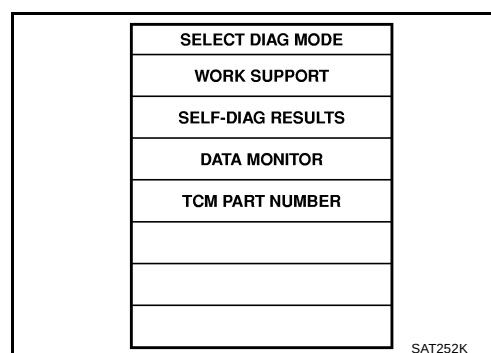
NOTE:

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



① With CONSULT-II

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for CVT with CONSULT-II.
2. Start engine.
3. Run engine for at least 2 seconds at idle speed.
If the check result is "NG", go to [CVT-189, "Diagnostic Procedure"](#).



Diagnostic Procedure

ECS006JK

1. CHECK DTC

With CONSULT-II

1. Turn ignition switch "ON" and select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
2. Touch "ERASE".

PERFORM DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE, [CVT-188](#) .

See previous page.

Is the "CONTROL UNIT (RAM) or CONTROL UNIT (ROM)" displayed again?

- OK >> Replace TCM.
NG >> **INSPECTION END**

A

B

CVT

D

E

F

G

H

I

J

K

L

M

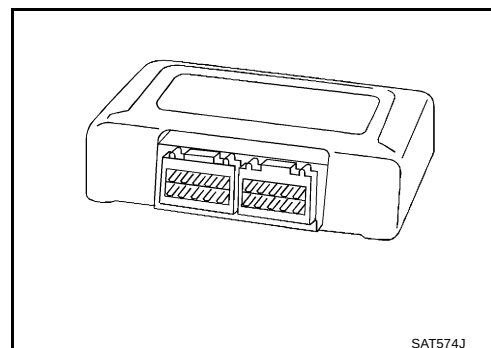
CONTROL UNIT (EEPROM)

PFP:31036

Description

ECS006JL

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



ON BOARD DIAGNOSIS LOGIC

Remarks: Specification data are reference values.

Diagnostic trouble code	Malfunction is detected when ...	Check item (Possible cause)
Ⓐ :CONT UNIT (EEPROM)	TCM memory (EEPROM) is malfunctioning.	TCM

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NOTE:

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

SELECT SYSTEM
CVT
ENGINE

SAT250K

Ⓐ With CONSULT-II

1. Turn ignition switch "ON" and select "DATA MONITOR" mode for CVT with CONSULT-II.
2. Start engine.
3. Run engine for at least 2 seconds at idle speed.
If the check result is "NG", go to [CVT-191, "Diagnostic Procedure"](#).

SELECT DIAG MODE
WORK SUPPORT
SELF-DIAG RESULTS
DATA MONITOR
TCM PART NUMBER

SAT252K

Diagnostic Procedure

ECS006JM

1. CHECK DTC

With CONSULT-II

1. Turn ignition switch "ON" and select "SELF-DIAG RESULTS" mode for CVT with CONSULT-II.
2. Move selector lever to "R" position.
3. Depress accelerator pedal (Full throttle position).
4. Touch "ERASE".
5. Turn ignition switch "OFF" position for 10 seconds.

PERFORM DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE, [CVT-190](#) .
See previous page.

Is the "CONT UNIT (EEPROM)" displayed again?

- OK >> Replace TCM.
NG >> **INSPECTION END**

A

B

CVT

D

E

F

G

H

I

J

K

L

M

CAN COMMUNICATION LINE

PFP:31940

Description

ECS006LF

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.

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
5	L	CAN communication line	—	—	—
6	R	CAN communication line	—	—	—

On Board Diagnosis Logic

ECS006LG

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
 : CVT COMM LINE**  : 11th judgement flicker	The ECM-CVT communication line is open or shorted.	● Harness or connectors (The solenoid circuit is open or shorted.) ● Line pressure solenoid valve

**: CVT COMM LINE means CAN communication line.

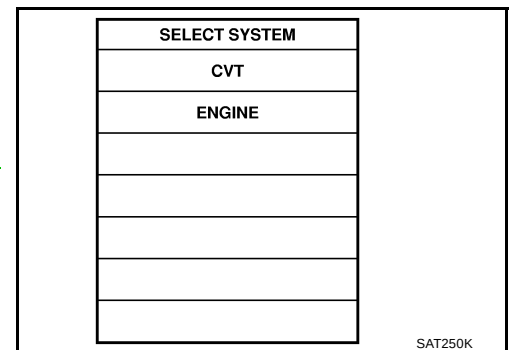
Self-Diagnosis Code Confirmation Procedure

ECS006LH

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

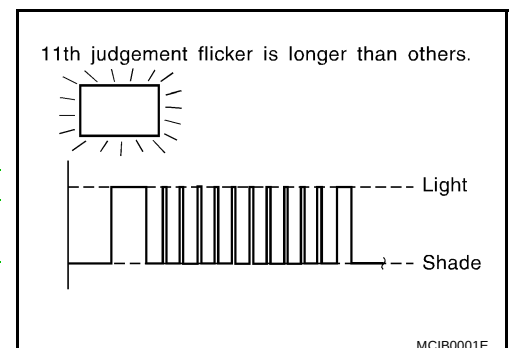
WITH CONSULT-II

1. Turn ignition switch "ON".
2. Select "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Wait at least 6 seconds or start engine and wait for at least 6 seconds.
If the check result is "NG", go to [CVT-194, "Diagnostic Procedure"](#).



WITHOUT CONSULT-II

1. Turn ignition switch "ON".
2. Wait at least 6 seconds or start engine and wait at least 6 seconds.
3. Perform self-diagnosis.
Refer to [CVT-29, "TCM Self-diagnostic Procedure \(No Tools\)"](#) (EURO-OBD) or [CVT-115, "SELF-DIAGNOSTIC PROCEDURE \(WITHOUT CONSULT-II\)"](#) (EXCEPT FOR EURO-OBD).
If the check result is "NG", go to [CVT-194, "Diagnostic Procedure"](#).

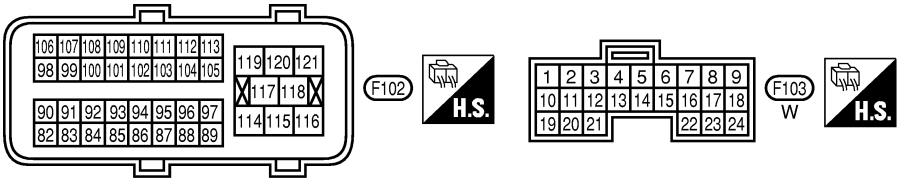
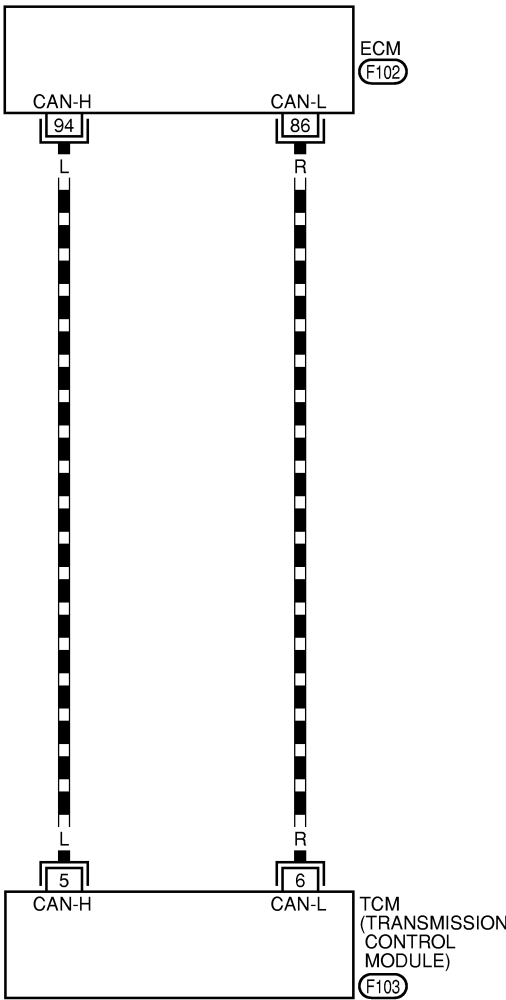


Wiring Diagram — CVT — CAN

ECS006LI

CVT-CAN-01

- A
- B
- CVT
- D
- E
- F
- G
- H
- I
- J
- K
- L
- M



Diagnostic Procedure

ECS006LJ

1. CHECK CAN COMMUNICATION CIRCUIT

① With CONSULT-II

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Select "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. The "CON COMM CIRCUIT" is detected.

Yes or No

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

SELF-DIAG RESULTS			
DTC RESULTS			
CAN COMM CIRCUIT [U1000]			
ERASE		PRINT	
MODE	BACK	LIGHT	COPY

PCIA0061E

2. CHECK CAN COMMUNICATION SIGNALS

① With CONSULT-II

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

>> Print out CONSULT-II screen, go to [LAN-7, "CAN COMMUNICATION"](#) .

CAN Communication Signals

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

TROUBLE DIAGNOSES FOR NON-DETECTABLE ITEMS

PFP:00000

PNP Switch, Stop Lamp Switch and Throttle Position Switch

ECS006JN

SYMPTOM:

CVT indicator lamp does not come on in TCM self-diagnostic procedure even the lamp circuit is good.

DESCRIPTION

- PNP switch
- The PNP switch assemble includes a transmission position switch. The transmission position switch detects the selector position and sends a signal to the TCM.
- Stop lamp switch
Detects the stop lamp switch position (ON or OFF) and sends a signal to the TCM
- Throttle position switch.
Consists of a wide open throttle position switch and a closed throttle position switch.
The wide open throttle position switch sends a signal to the TCM when the throttle valve is open at least 1/2 of the full throttle position. The closed throttle position switch sends a signal to the TCM when the throttle valve is fully closed.

A

B

CVT

D

E

F

G

H

I

J

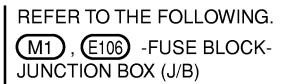
K

L

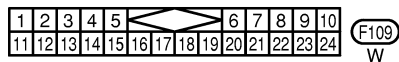
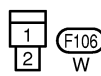
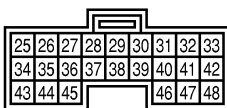
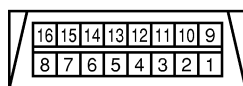
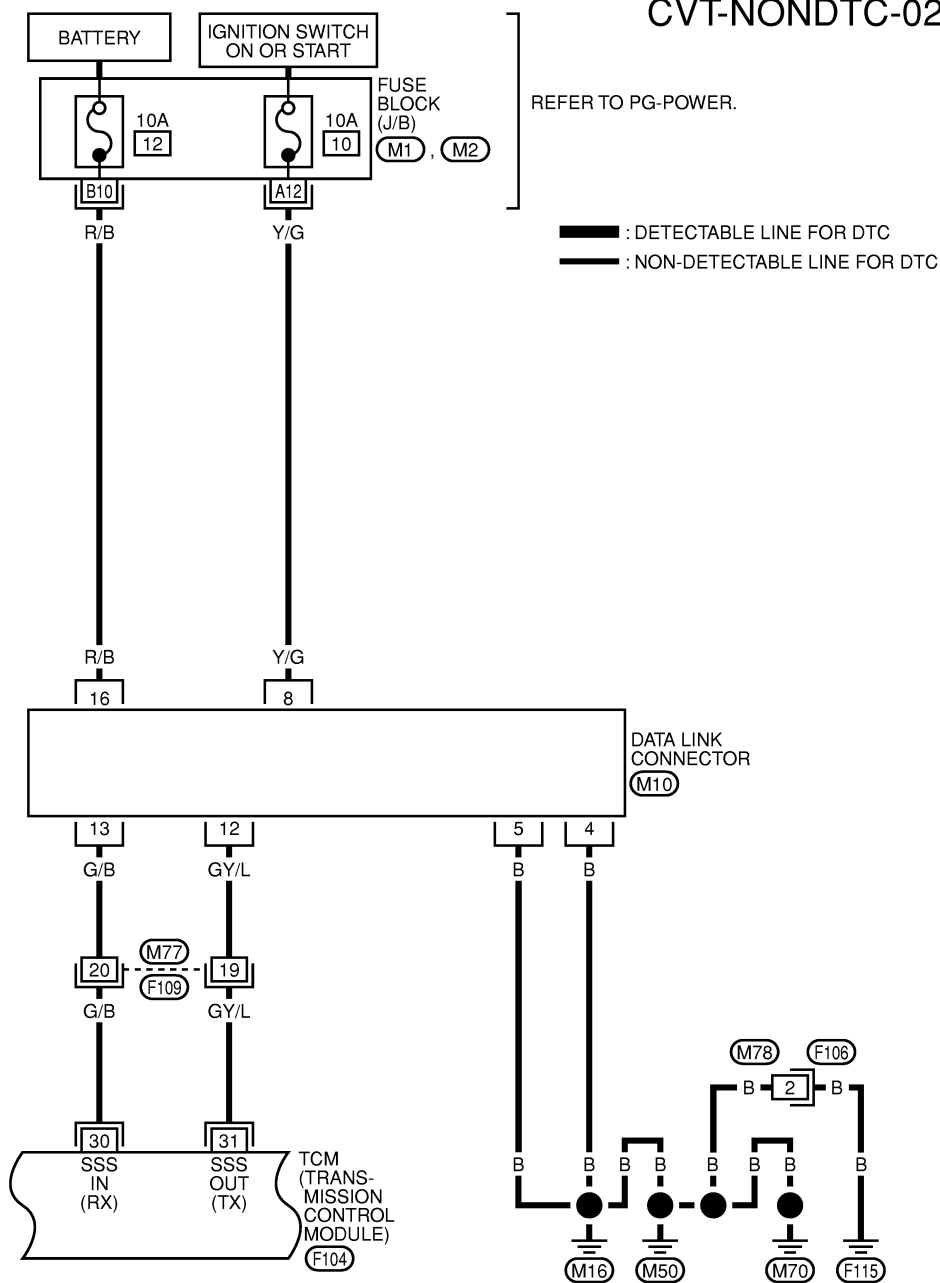
M

[ALL]

ECS006JP



CVT-NONDTTC-02

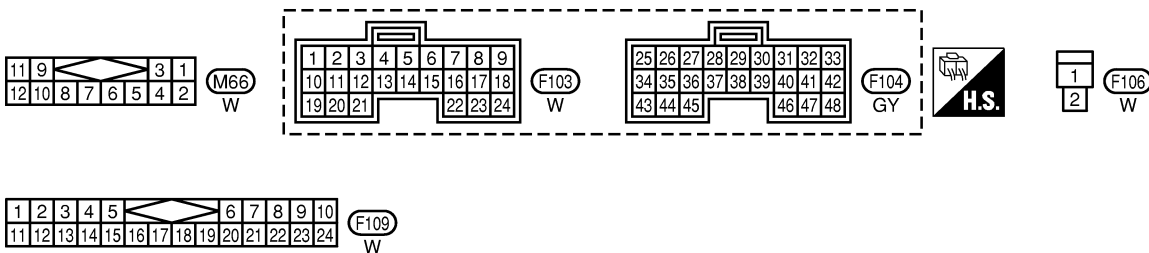
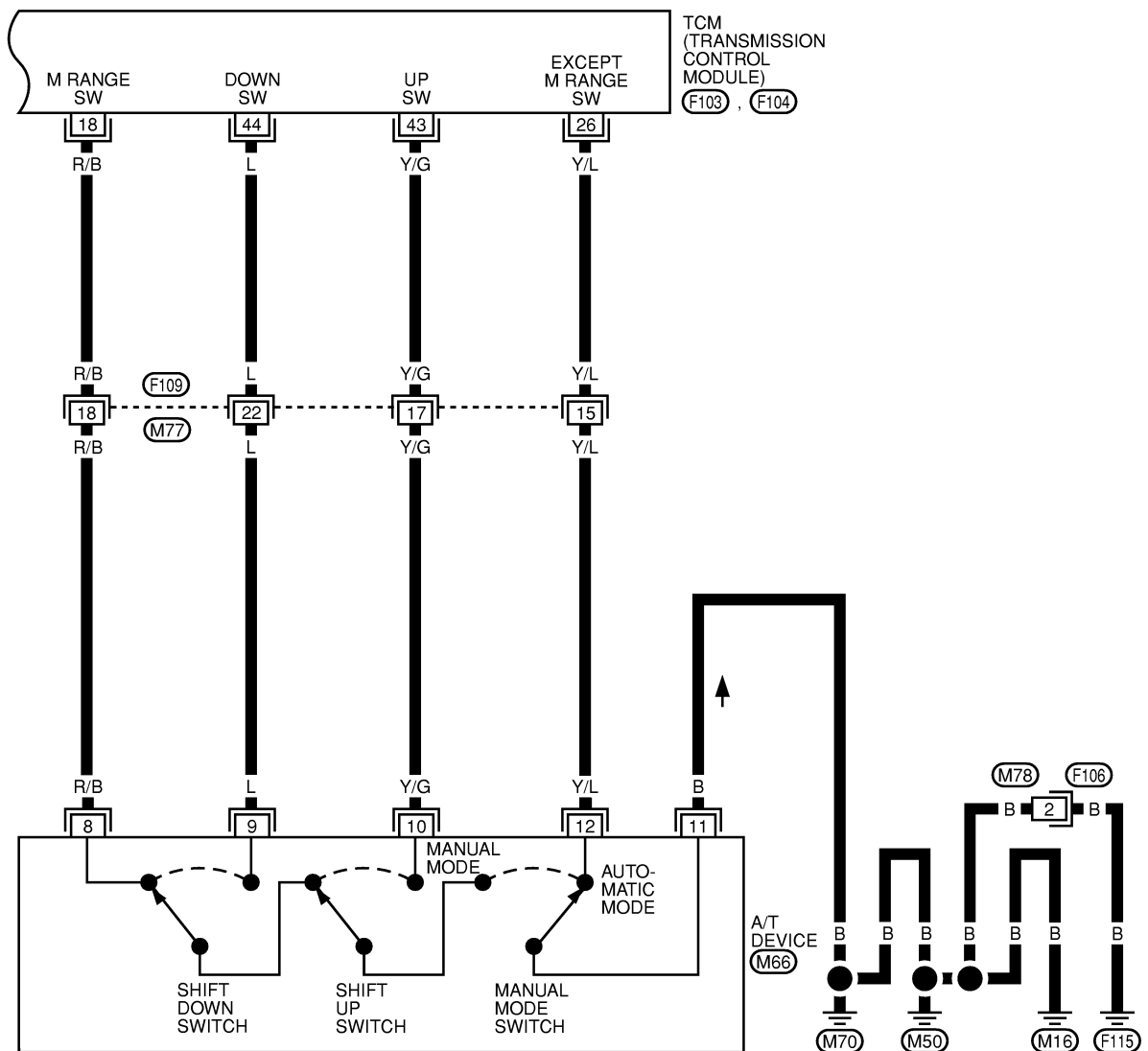


REFER TO THE FOLLOWING.
M1 , **M2** -FUSE BLOCK-JUNCTION BOX (J/B)

CVT-NONDTC-03

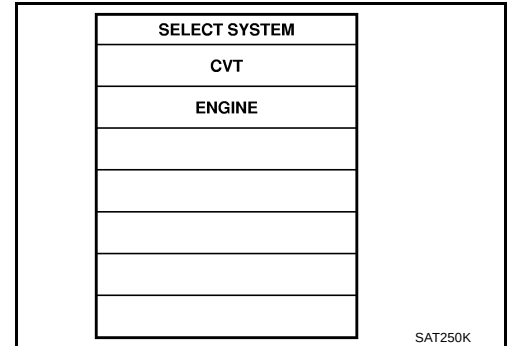
— : DETECTABLE LINE FOR DTC

— : NON-DETECTABLE LINE FOR DTC



Diagnostic Procedure**1. CHECK PNP SWITCH CIRCUIT (WITH CONSULT-II)****With CONSULT-II**

1. Turn ignition switch to "ON" position.
(Do not start engine.)
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. Read out "P/N", "R", "D" and "L" position switches moving selector lever to each position.
Check the signal of the selector lever position is indicated properly.

**OK or NG**

OK >> INSPECTION END.

NG >> Check the following items:

- PNP switch
Refer to "Component Inspection", [CVT-61](#).
- Harness for short or open between ignition switch and PNP switch (Main harness)
- Harness for short or open between PNP switch and TCM (Main harness)
- Ignition switch and fuse
Refer to PG section ("POWER SUPPLY ROUTING").

2. CHECK PNP SWITCH CIRCUIT (WITHOUT CONSULT-II)**Without CONSULT-II**

1. Turn ignition switch to "ON" position.
(Do not start engine.)
2. Check voltage between TCM terminals 27, 34, 35, 36 and ground while moving selector lever through each position.

Voltage:**B: Battery voltage****0: 0V**

Lever position	Terminal No.			
	36	35	34	27
P, N	B	0	0	0
R	0	B	0	0
D	0	0	B	0
L	0	0	0	B

OK or NG

OK >> INSPECTION END.

NG >> Check the following items:

- PNP switch
Refer to "Component Inspection", [CVT-61](#).
- Harness for short or open between ignition switch and PNP switch (Main harness)
- Harness for short or open between PNP switch and TCM (Main harness)
- Ignition switch and fuse
Refer to PG section ("POWER SUPPLY ROUTING").

TROUBLE DIAGNOSIS FOR SYMPTOMS

PFP:00007

CVT Indicator Lamp Does Not Come On

ECS006JQ

SYMPTOM:

CVT indicator lamp does not come on for about 2 seconds when turning ignition switch to "ON".

1. CHECK CAN COMMUNICATION LINE

1. Turn ignition switch to "ON" and wait at least 3 seconds.
2. Select "DATA MONITOR" mode with CONSULT-II.
3. Is DTC U1000 detected ?

Yes or No

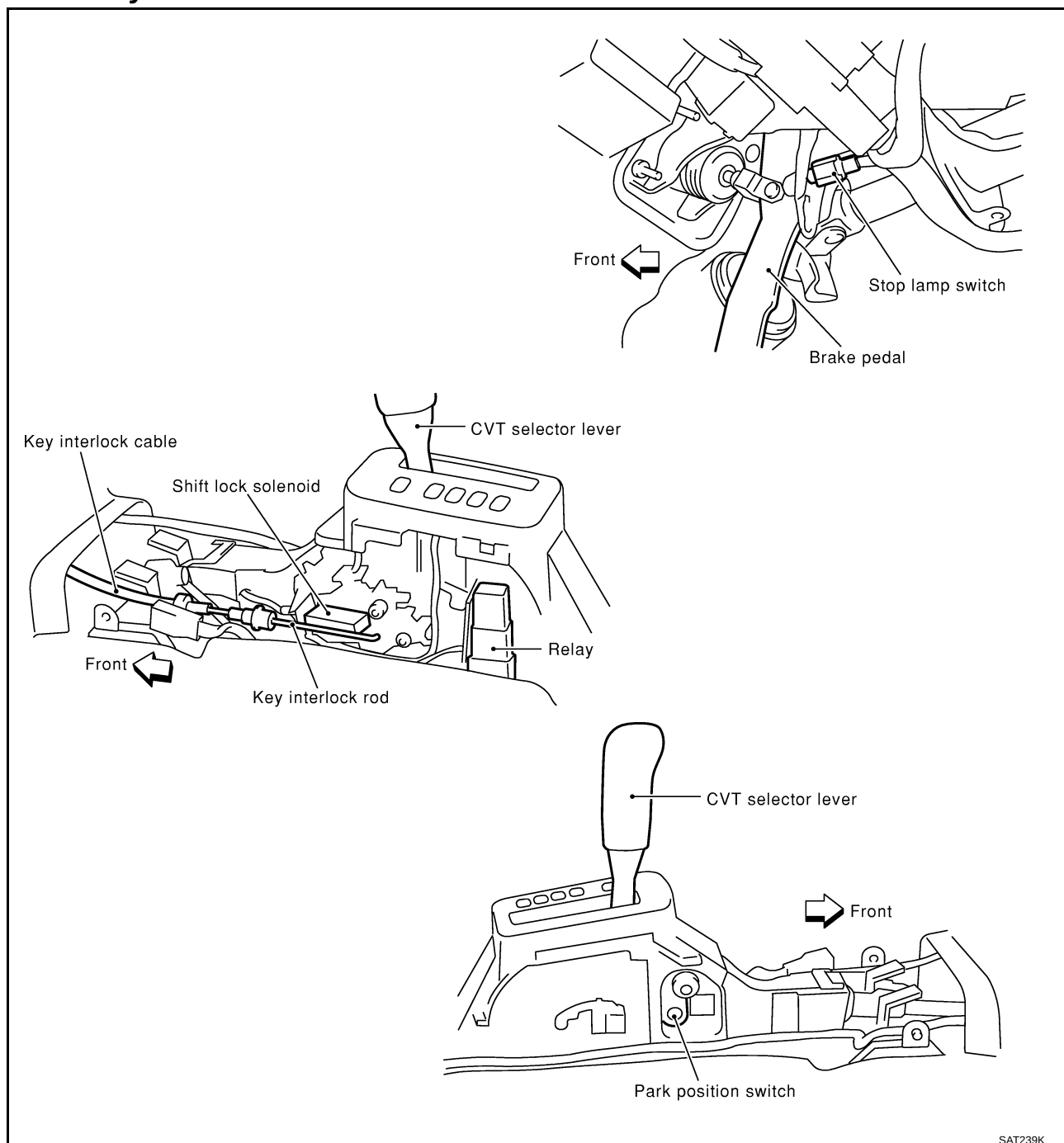
- | | |
|-----|---|
| Yes | >> Refer to CVT-108, "DTC U1000 CAN COMMUNICATION LINE" . |
| No | >> Replace combination meter assembly. |

CVT SHIFT LOCK SYSTEM

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.

Shift Lock System Electrical Parts Location



CVT SHIFT LOCK SYSTEM

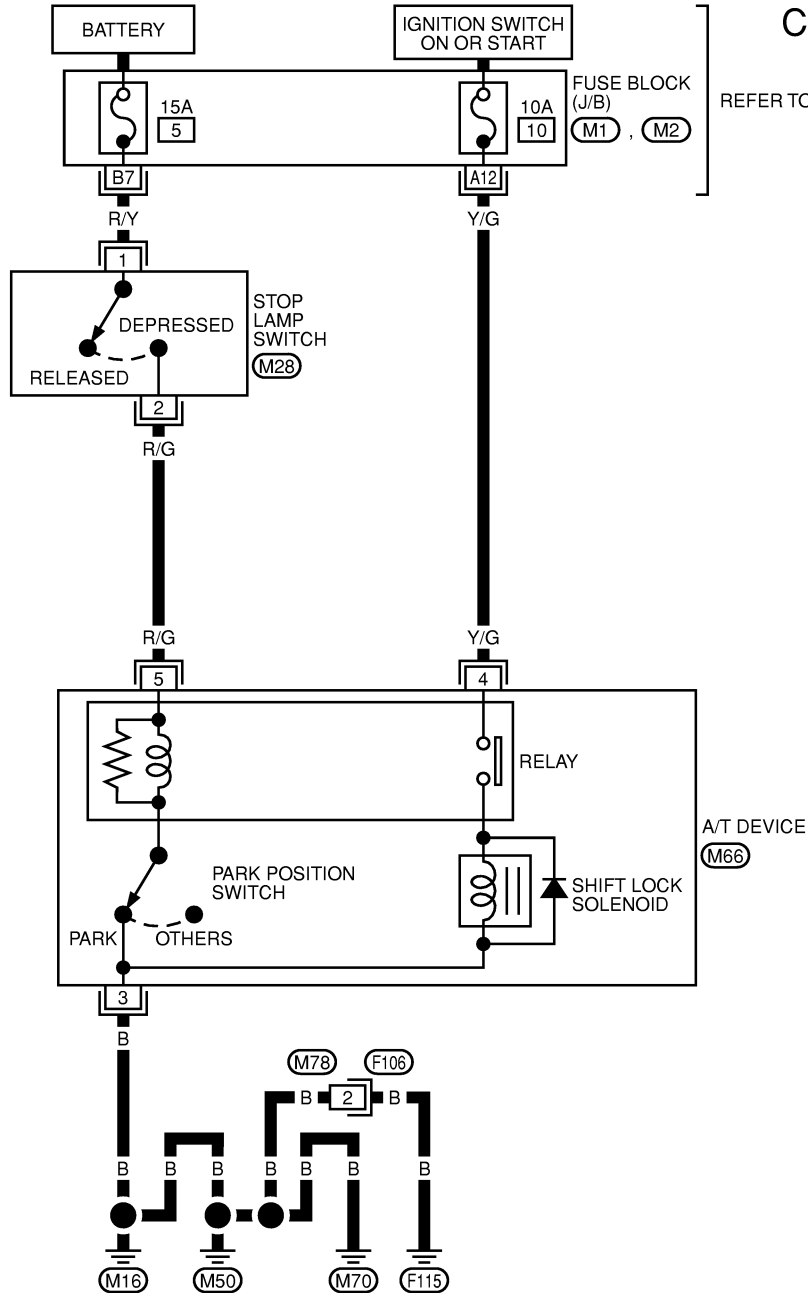
[ALL]

Wiring Diagram - SHIFT LOCK -

ECS006JT

CVT-SHIFT-01

REFER TO PG-POWER.



1 2 (M28) B

11 9 3 1 (M66) W
12 10 8 7 6 5 4 2

1 (F106) W
2

REFER TO THE FOLLOWING.
(M1), (M2) - FUSE BLOCK-
JUNCTION BOX (J/B)

MCWA0066E

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”.

1. CHECK KEY INTERLOCK CABLE

Check key interlock cable for damage.

OK or NG

- OK >> GO TO 2.
 NG >> Repair key interlock cable. Refer to [CVT-207](#).

2. CHECK SELECTOR LEVER POSITION

Check selector lever position for damage.

OK or NG

- OK >> GO TO 3.
 NG >> Check selector lever. Refer to “ON-VEHICLE SERVICE — PNP Switch and Control Cable Adjustment”, [CVT-209](#).

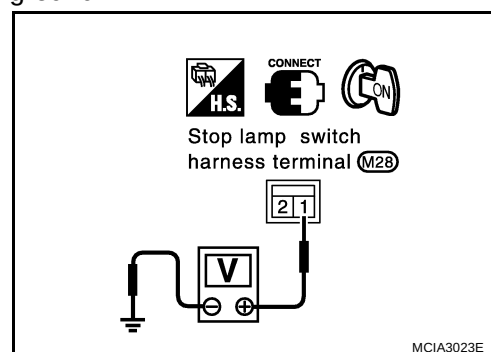
3. CHECK POWER SOURCE

1. Turn ignition switch to “ON” position.
(Do not start engine.)
2. Check voltage between stop lamp switch harness terminal 1 and ground.

Voltage: Battery voltage

OK or NG

- OK >> GO TO 4.
 NG >> Check the following items:
1. Harness for short or open between battery and stop lamp switch harness terminal 1
 2. Fuse
 3. Ignition switch (Refer to PG section, “POWER SUPPLY ROUTING”).



4. CHECK INPUT SIGNAL (A/T DEVICE)

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

- Check voltage between A/T device harness terminal 5 and ground.

Voltage:

Brake pedal depressed:

Battery voltage

Brake pedal released:

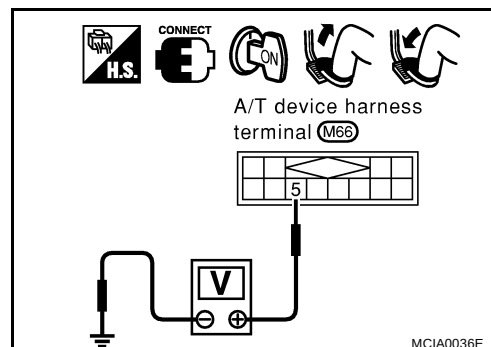
0V

OK or NG

OK >> GO TO 5.

NG >> Check the following items:

- Harness for short and open between battery and stop lamp switch harness connector 1.
- Harness for short or open between stop lamp switch harness connector 2 and A/T device harness connector 5.
- Fuse
- Stop lamp switch (Refer to [CVT-205, "CVT DEVICE CHECK"](#) .)



5. CHECK GROUND CIRCUIT

- Turn ignition switch to "OFF" position.
- Disconnect A/T device harness connector.
- Check continuity between A/T device harness terminal 3 and ground.

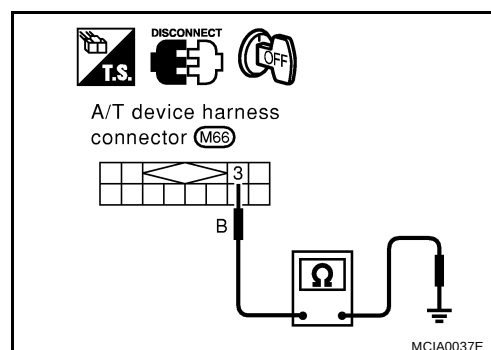
Continuity should exist.

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

OK or NG

OK >> GO TO 6.

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



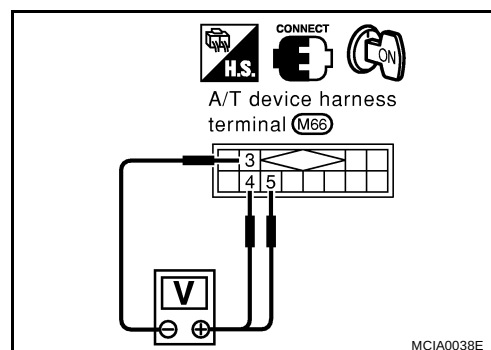
6. CHECK RELAY CIRCUIT

- Turn ignition switch to ON.
- Check voltage between terminal 5 - 3 and 4 - 3.

OK or NG

OK >> GO TO 7.

NG >> Replace A/T device.



7. CHECK PARK POSITION SWITCH

Refer to [CVT-205, "CVT DEVICE CHECK"](#) .

OK or NG

- OK >> GO TO 8.
NG >> Replace A/T device.

8. CHECK SHIFT LOCK SOLENOID

Refer to [CVT-205, "CVT DEVICE CHECK"](#) .

OK or NG

- OK >> GO TO 9.
NG >> Replace A/T device.

9. SHIFT LOCK OPERATION

1. Reconnect shift lock harness connector.
2. Turn ignition switch from "OFF" to "ON" position. (Do not start engine.)
3. Recheck shift lock operation.

OK or NG

- OK >> **INSPECTION END**
NG >> 1. Perform A/T device input/output signal inspection test.
2. If NG, recheck harness connector connection.

CVT DEVICE CHECK

1. Shift Lock Solenoid

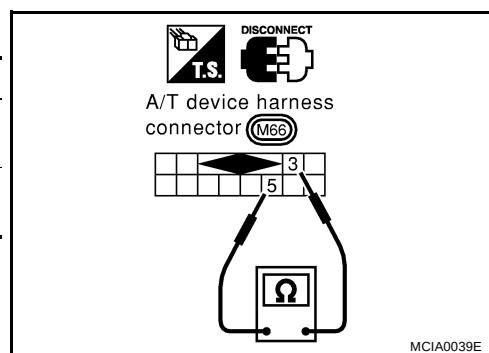
- Check operation sound.
When ignition switch is turned to "ON" position and selector lever is set in "P" position.

Brake pedal	Operation sound
Depressed	Yes
Released	No

2. Park Position Switch

- Check resistance between A/T device harness terminal 3 and 5.

Condition	Resistance
When selector lever is set in "P" position and selector lever button is released	111Ω
When selector lever is not set in "P" position and selector lever button is released	0Ω

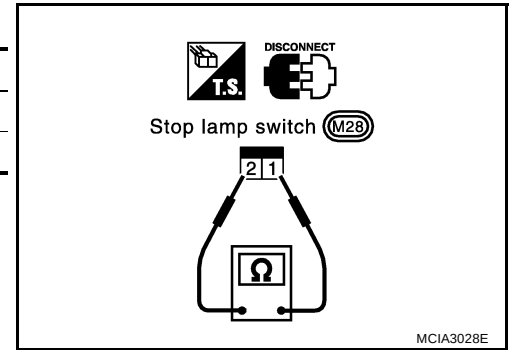


STOP LAMP SWITCH

- Check continuity between terminals 1 and 2.

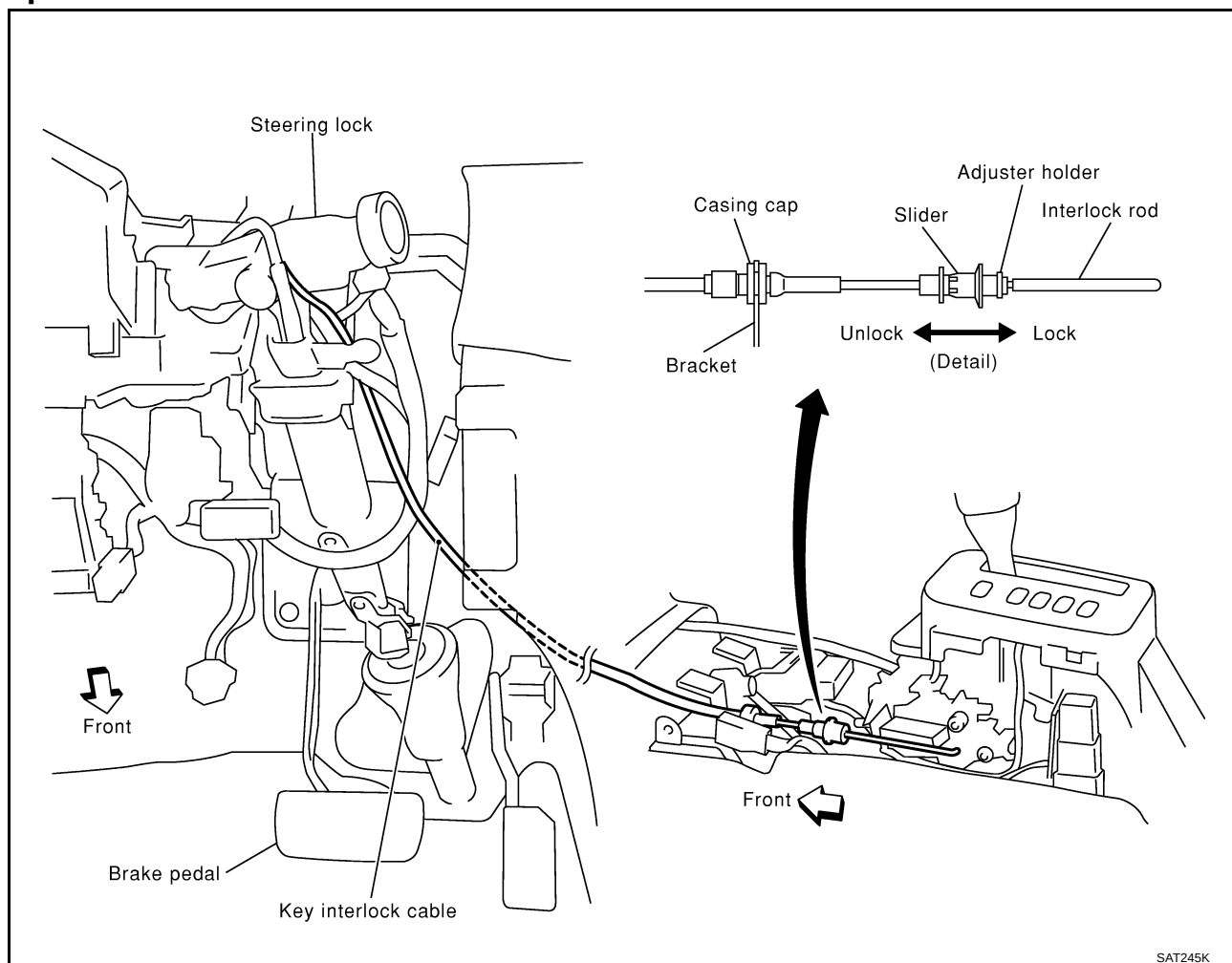
Condition	Resistance
When brake pedal is depressed	Yes
When brake pedal is released	No

Check stop lamp switch after adjusting brake pedal — refer to BR section, “BRAKE PEDAL AND BRACKET”.



KEY INTERLOCK CABLE

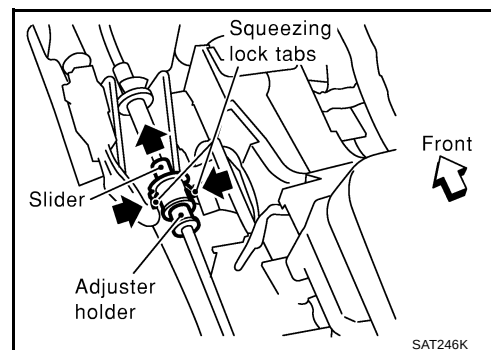
Components

**CAUTION:**

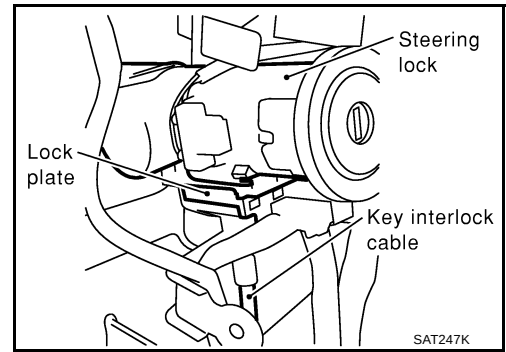
- Install key interlock cable in such a way that it will not be damaged by sharp bends, twists or interference with adjacent parts.
- After installing key interlock cable to control device, make sure that casing cap and bracket are firmly secured in their positions.

Removal

1. Unlock slider by squeezing lock tabs on slider from adjuster holder and remove interlock rod from cable.



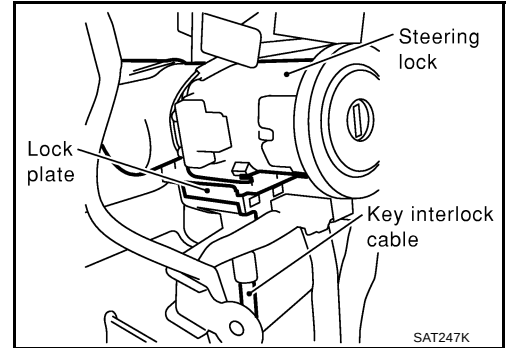
2. Remove lock plate from steering lock assembly and remove key interlock cable.



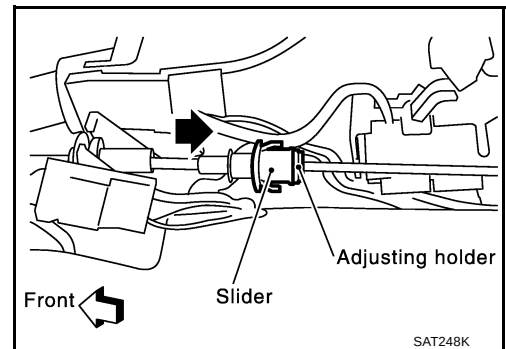
ECS006JX

Installation

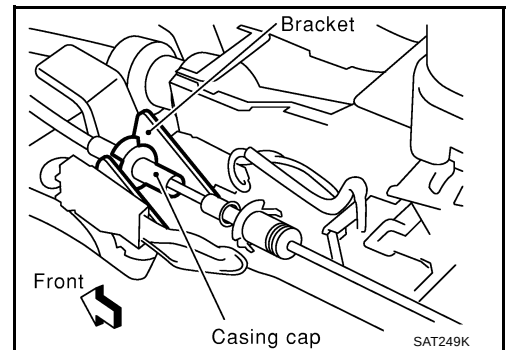
1. Turn ignition key to lock position.
2. Set CVT selector lever to P position.
3. Set key interlock cable to steering lock assembly and install lock plate.
4. Clamp cable to steering column and fix to control cable with band.



5. Insert interlock rod into adjuster holder.



6. Install casing cap to bracket.
7. Move slider in order to fix adjuster holder to interlock rod.



ON-VEHICLE SERVICE

Control Cable Adjustment

ECS006JY

Move selector lever from the "P" position to the "L" position. You should be able to feel the detentes in each position. If the detentes cannot be felt or if the pointer indicating the position is improperly aligned, the control cable needs adjustment.

1. Place selector lever in "P" position.
2. Loosen control cable lock nut and place manual shaft in "P" position.

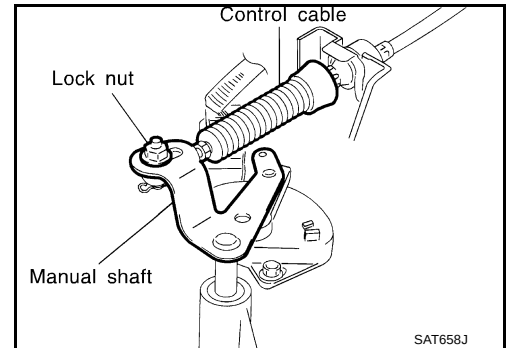
CAUTION:

Turn wheels more than 1/4 rotations and apply the park lock.

3. Tighten control cable lock nut.

 : 12 - 14 N-m (1.2 - 1.5 kg-m, 9 - 10 ft-lb)

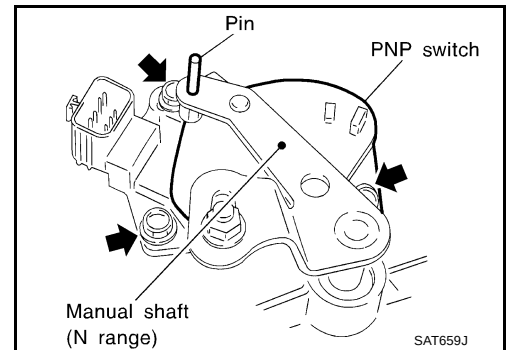
4. Move selector lever from "P" to "L" position again. Make sure that selector lever moves smoothly.
5. Apply grease to contacting areas of selector lever and control cable. Install any part removed.



Park/Neutral Position (PNP) Switch Adjustment

ECS006JZ

1. Remove control cable end from manual shaft.
2. Set manual shaft in "N" position.
3. Loosen PNP switch fixing bolts.



4. Use a 4 mm (0.157 in) pin for this adjustment.
 - a. Insert the pin straight into the manual shaft adjustment hole.
 - b. Rotate PNP switch until the pin can also be inserted straight into hole in PNP switch.
5. Tighten PNP switch fixing bolts.

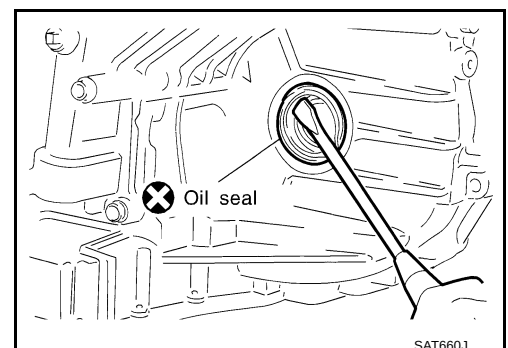
 : 4.9 - 6.8 N-m (0.5 - 0.7 kg-m, 44 - 60 in-lb)

6. Remove pin from adjustment hole after adjusting PNP switch.
7. Reinstall any part removed.
8. Adjust control cable. Refer to "Control Cable Adjustment".
9. Check continuity of PNP switch. Refer to [CVT-61, "Component Inspection"](#).

Differential Side Oil Seal Replacement

ECS006K0

1. Remove drive shaft assemblies. Refer to [FAX-11, "FRONT DRIVE SHAFT"](#)).
2. Remove oil seals.



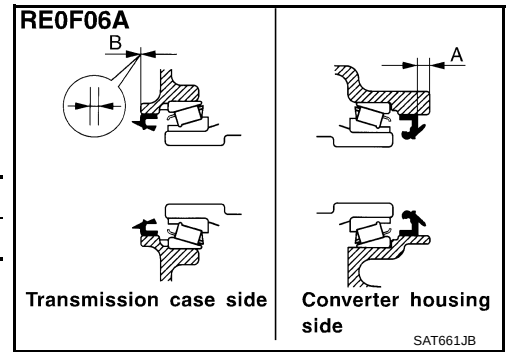
3. Install oil seals.

- Apply CVT fluid to oil seal surface before installing.
- Install oil seals so that dimensions “A” and “B” are within specifications.

Unit: mm (in)

A	B
5.5 - 6.5 (0.217 - 0.256)	-0.5 to 0.5 (-0.020 to 0.020)

4. Reinstall any part removed.



REMOVAL AND INSTALLATION

PFP:00000

Removal

ECS006MK

CAUTION:

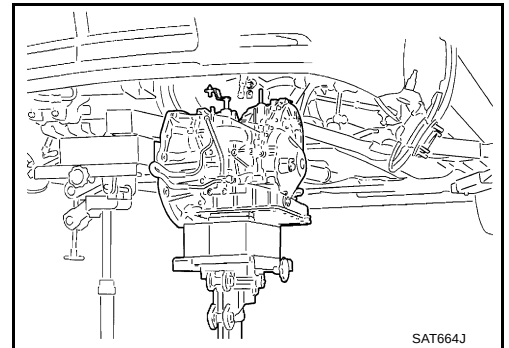
Before separating transaxle from engine, remove the crankshaft position sensor (Models with OBD-II) from transaxle. Be careful not to damage sensor.

1. Remove battery and bracket.
2. Remove air duct between throttle body and air cleaner.
3. Disconnect control valve harness connector, PNP switch harness connector, secondary speed sensor harness connector, dropping resistor harness connector, primary speed sensor harness connector and body earth harness connector.
4. Remove crankshaft position sensor (Models with OBD-II) from transaxle.
5. Drain CVT fluid from transaxle.
6. Disconnect control cable from transaxle.
7. Remove exhaust front tube. Refer to EX section ("EXHAUST SYSTEM").
8. Remove drive shafts. Refer to FAX section ("Drive Shaft", "FRONT AXLE").
9. Disconnect oil cooler hoses.
10. Remove starter motor from transaxle.

Tighten bolts to specified torque.

 **41 - 52 N·m (4.2 - 5.3 kg-m, 30 - 38 ft-lb)**

11. Support transaxle with a jack.
12. Remove center member.
 - Tighten center member fixing bolts to specified torque, Refer to EM section ("ENGINE REMOVAL").
13. Remove rear plate cover.
14. Remove torque converter bolts.
Rotate crankshaft to gain access to securing bolts.
15. Support engine with a jack.
16. Remove transaxle mount bolt. Refer to EM section ("ENGINE REMOVAL").
17. Remove oil cooler tube (outlet side).
18. Remove transaxle.



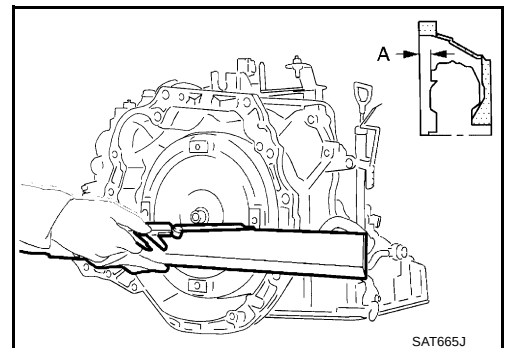
Inspection

ECS006ML

- When connecting torque converter to transaxle, measure distance "A" to be certain that they are correctly assembled.

Distance "A":

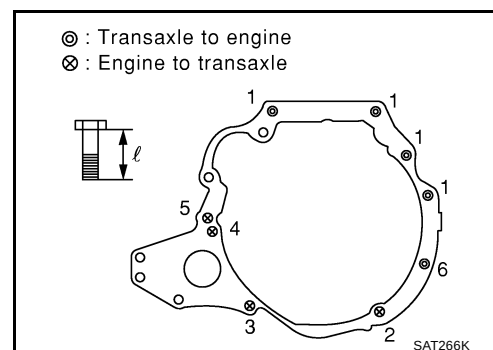
15.9 mm (0.626 in) or more



Installation

1. Tighten bolts fixing transaxle.

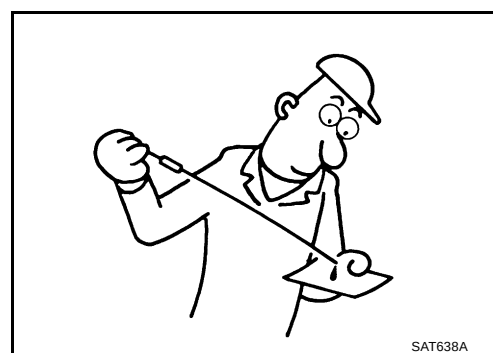
Bolt No.	Tightening torque N-m (kg-m, ft-lb)	Bolt length "ℓ" mm (in)
1	70 - 79 (7.1 - 8.1, 51 - 59)	40 (1.57)
2	31 - 36 (3.1 - 3.7, 23 - 26)	35 (1.38)
3	31 - 36 (3.1 - 3.7, 23 - 26)	47 (1.85)
4	70 - 79 (7.1 - 8.1, 52 - 58)	65 (2.56)
5	75 - 85 (7.6 - 8.7, 55 - 62)	65 (2.56)
6	70 - 79 (7.1 - 8.1, 52 - 58)	45 (1.77)



2. Install torque converter to drive plate.

- **With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.**

3. Reinstall any part removed.
4. Adjust control cable. Refer to [CVT-209](#).
5. Check continuity of PNP switch. Refer to [CVT-195](#).
6. Refill transaxle with CVT fluid and check fluid level.
7. Move selector lever through all positions to be sure that transaxle operates correctly. With parking brake applied, idle engine. A slight shock should be felt through the hand gripping the selector each time the transaxle is shifted.
8. Perform road test. Refer to [CVT-39](#) (EURO-OBD), [CVT-125](#) (EXCEPT FOR EURO-OBD).



REMOVAL AND INSTALLATION

[ALL]

CVT Fluid Cooler

ECS006MN

A

B

CVT

D

E

F

G

H

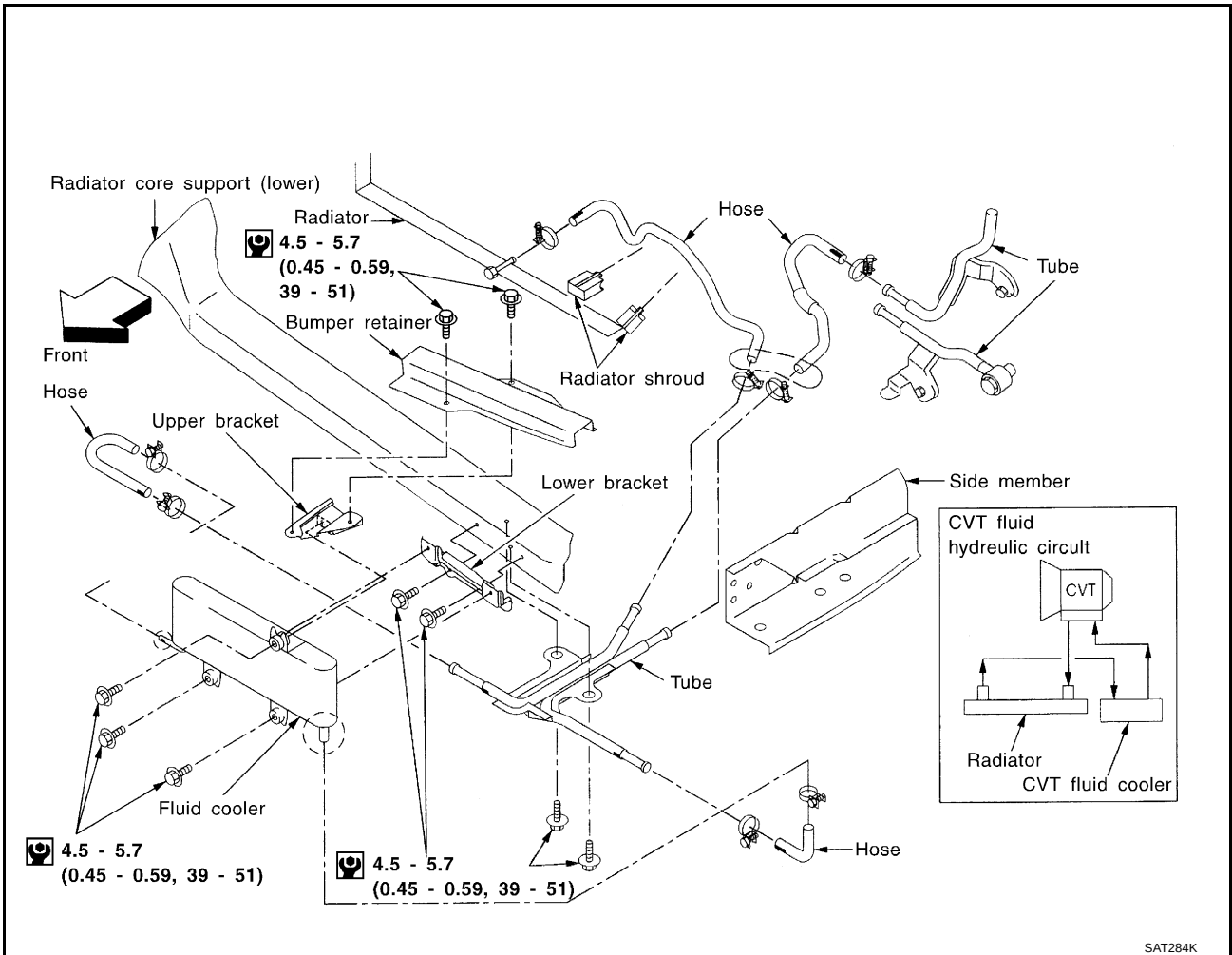
I

J

K

L

M

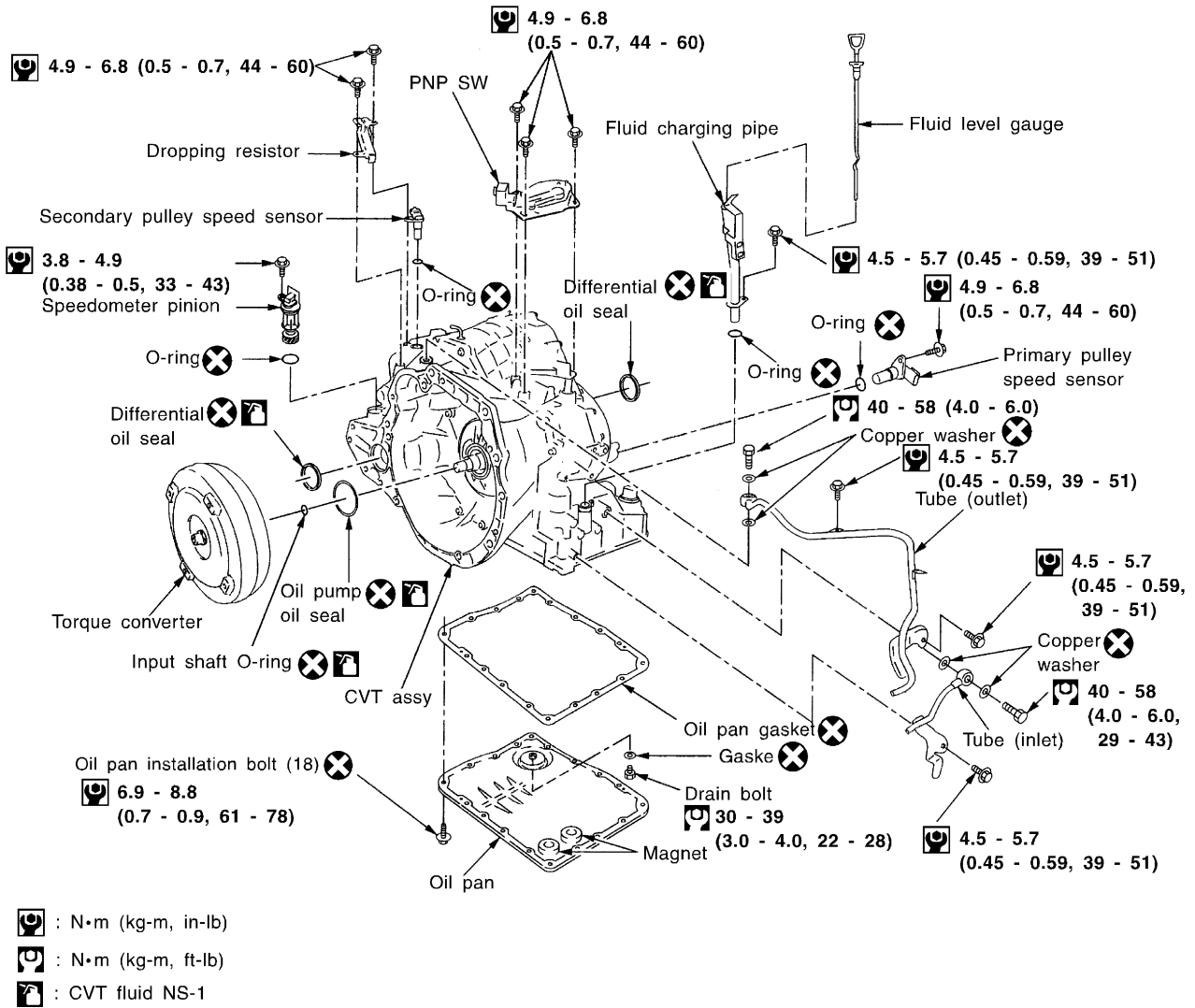


SAT284K

Components

ECS006MO

SEC. 310•311•312•319



SAT273K

SERVICE DATA AND SPECIFICATIONS (SDS)

[ALL]

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

ECS006K4

Engine		QR20DE
Automatic transaxle model		RE0F06A
Automatic transaxle assembly	Model code number	8E020
	D range	Variable
	Reverse	1.586
Transaxle gear ratio	Final drive	5.473
Recommended fluid		Nissan CVT fluid NS-1*1
Fluid capacity		8.1 ℓ (7-1/8 Imp qt)

*1: Refer to MA section ("Fluids and Lubricants", "RECOMMENDED FLUIDS AND LUBRICANTS").

Any other fluid will damage the CVT.

Stall Revolution

ECS006K5

Engine	Stall revolution rpm
QR20DE	2,350 - 2,850

Line Pressure

ECS006K6

Engine speed rpm	Line pressure kPa (bar, kg/cm ² , psi)		
	R position	D position	L position
Idle	598 (5.98, 6.1, 87)		
Stall	4,119 (41.2, 42, 597)		

Removal and Installation

ECS006K7

Unit: mm (in)

Distance between end of converter housing and torque converter	15.9 (0.626) or more
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CVT Fluid Temperature Sensor

ECS006K8

Condition	Specification (Approximately)	
Cold [20°C (68°F)]	1.5V	2.5 kΩ
↓	↓	↓
Hot [80°C (176°F)]	0.5V	0.3 kΩ

Solenoid Valves

ECS006K9

Solenoid valve	Resistance (Approx.)	Terminal number
Line pressure solenoid	2.5 - 5Ω	8
Torque converter clutch solenoid	10 - 20Ω	9

Dropping Resistor

ECS006KA

Resistance	11.2 - 12.8Ω
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