AUTOMATIC TRANSAXLE

SECTION AT (H·CVT)

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Alphabetical & P No. Index for DTC

NCAT0001

ALPHABETICAL INDEX FOR DTC

NCAT0001S01

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*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

=NCAT0001S02

DTC		Items (CONSULT-II screen terms)	Reference page
CONSULT-II GST*2	ECM*1		
P0705	0705	PNP SW/CIRC	AT-48
P0710	0710	ATF TEMP SEN/CIRC	AT-54
P0715	0715	PRI SPEED SIG/CIRC	AT-59
P0720	0720	VEH SPD SEN/CIR AT	AT-62
P0725	0725	ENG SPEED SIG	AT-66
P0740	0740	TCC SOLENOID/CIRC	AT-69
P0745	0745	L/PRESS SOL/CIRC	AT-74
P1705	1705	TP SEN/CIRC A/T*3	AT-79
P1777	1777	STEP MOTOR/CIRC	AT-86
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*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.

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

NCAT0002

The Supplemental Restraint System “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a seat belt, help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bag modules (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
In addition to the supplemental air bag modules for a frontal collision, the supplemental side air bag used along with the seat belt helps to reduce the risk or severity of injury to the driver and front passenger in a side collision. The supplemental side air bag consists of air bag modules (located in the outer side of front seats), satellite sensor, diagnosis sensor unit (one of components of supplemental air bags for a frontal collision), wiring harness, warning lamp (one of components of supplemental air bags for a frontal collision). Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses (except “SEAT BELT PRE-TENSIONER” connector) can be identified with yellow harness connector (and with yellow harness protector or yellow insulation tape before the harness connectors).**

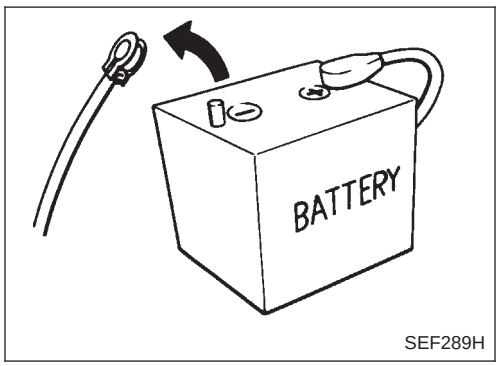
Precautions for On Board Diagnostic (OBD) System of CVT and Engine

NCAT0198

The ECM has an on board diagnostic system. It will light up the malfunction indicator (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 misconnected or disconnected rubber tube may cause the MI to light up due to a malfunction of the EGR system or fuel injection system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the TCM and ECM before returning the vehicle to the customer.**

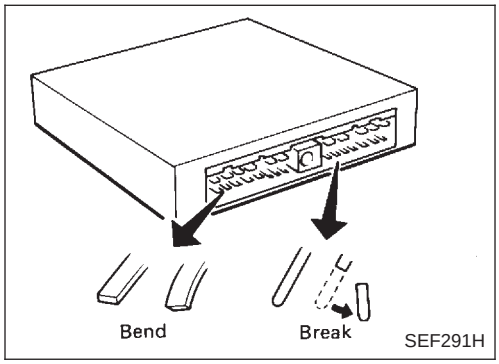


SEF289H

Precautions

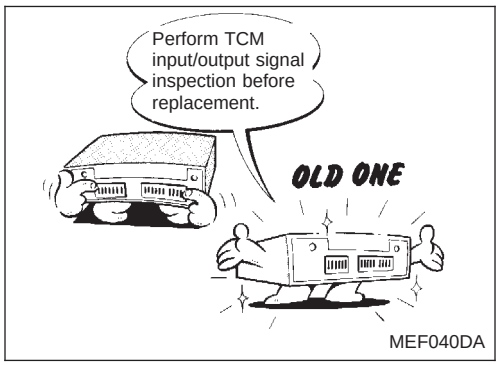
NCAT0003

- **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.**



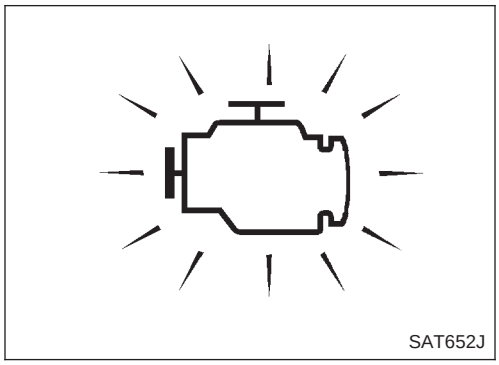
SEF291H

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



MEF040DA

- **Before replacing TCM, perform TCM input/output signal inspection and make sure whether TCM functions properly or not. (See page AT-41.)**


SAT652J

- **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 or Precautions

NCAT0004

FAIL-SAFE

NCAT0004S01

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 or SPORT indicator lamp blinks for about 8 seconds. [For "TCM SELF-DIAGNOSTIC PROCEDURE (No Tools)", refer to AT-25.]
Fail-Safe may occur without electrical circuit damage if the vehicle is driven under extreme conditions (such as excessive wheel spin followed by sudden braking). To recover normal shift pattern, turn the ignition key "OFF" for 5 seconds, then "ON".

The blinking of the CVT or SPORT indicator lamp for about 8 seconds will appear only once and be cleared. The customer may resume normal driving conditions.
Always follow the "WORK FLOW" (Refer to AT-32).
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.

OBD SELF-DIAGNOSIS

NCAT0004S04

- 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 or SPORT indicator. Refer to the table on AT-19 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 AT-16 to complete the repair and avoid unnecessary blinking of the MI.

For details of OBD, refer to EC section ("ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION").

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

Wiring Diagrams and Trouble Diagnosis

NCAT0005

When you read wiring diagrams, refer to the followings:

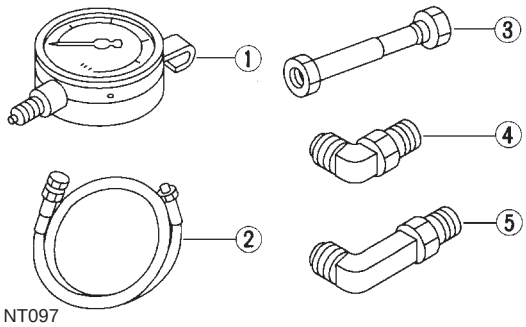
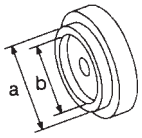
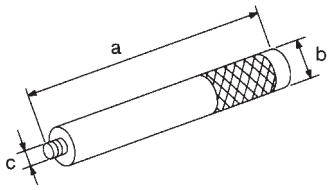
- "HOW TO READ WIRING DIAGRAMS" in GI section
- "POWER SUPPLY ROUTING" for power distribution circuit in EL section

When you perform trouble diagnosis, refer to the followings:

- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

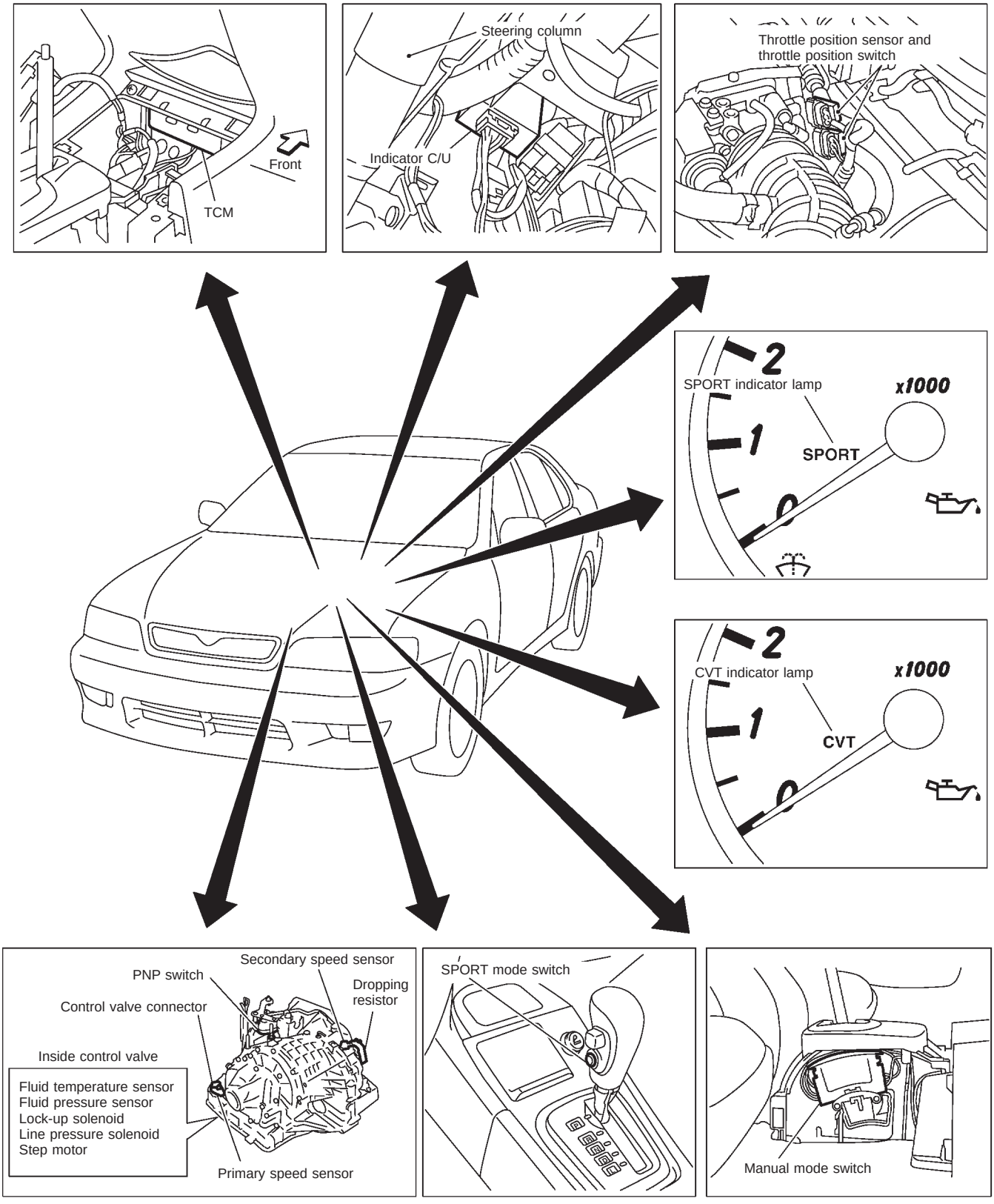
Special Service Tools

NCAT0006

Tool number Tool name	Description	
ST2505S001 Oil pressure gauge set 1 ST25051001 Oil pressure gauge 2 ST25052000 Hose 3 ST25053000 Joint pipe 4 ST25054000 Adapter 5 ST25055000 Adapter	 NT097	Measuring line pressure and governor pressure
KV31103000 Drift	 NT105	Installing differential side oil seal (Use with ST35325000) **a: 59 mm (2.32 in) dia.** **b: 49 mm (1.93 in) dia.**
ST35325000 Drift	 NT417	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 Electrical Parts Location

NCAT0008



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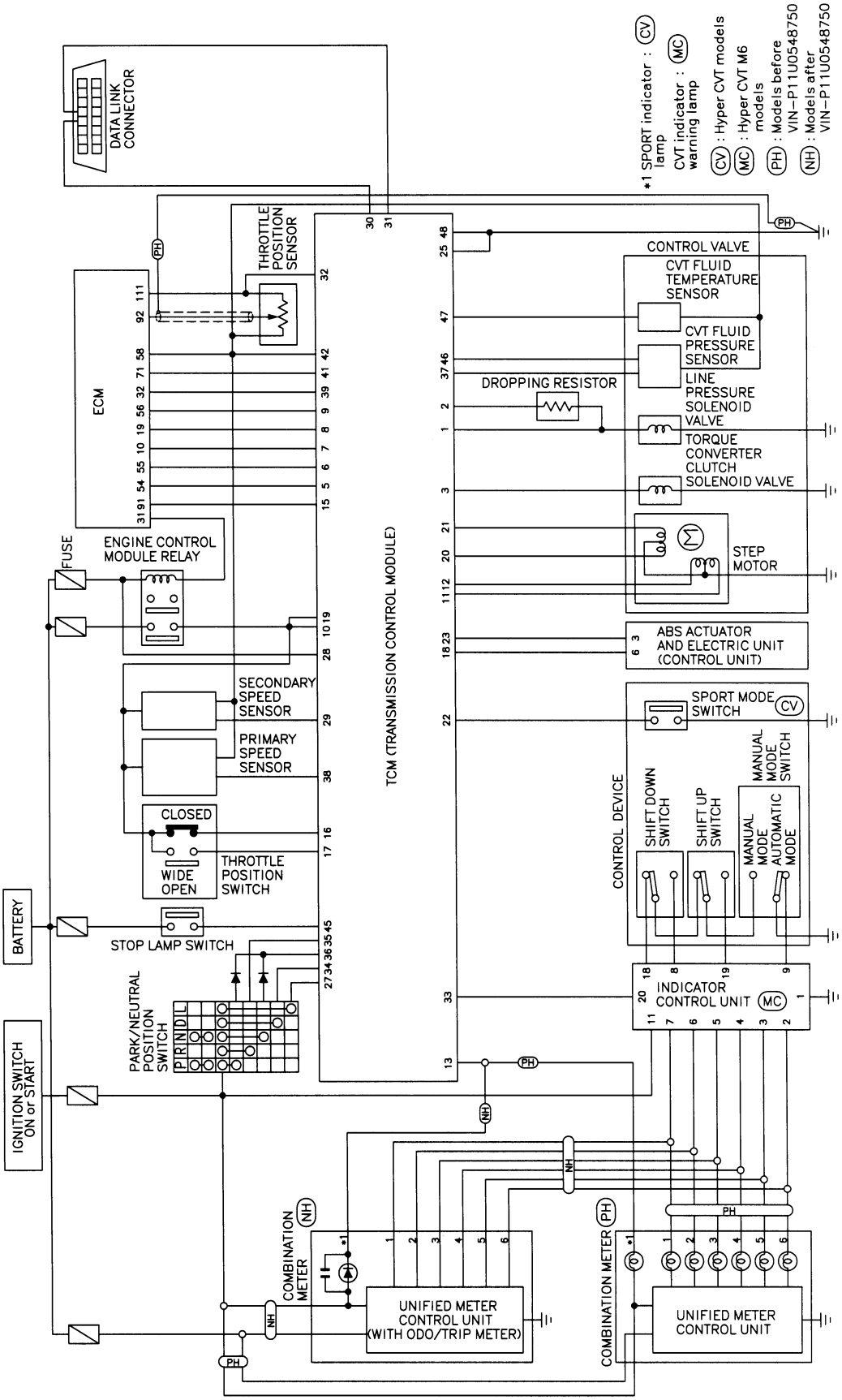
Circuit Diagram

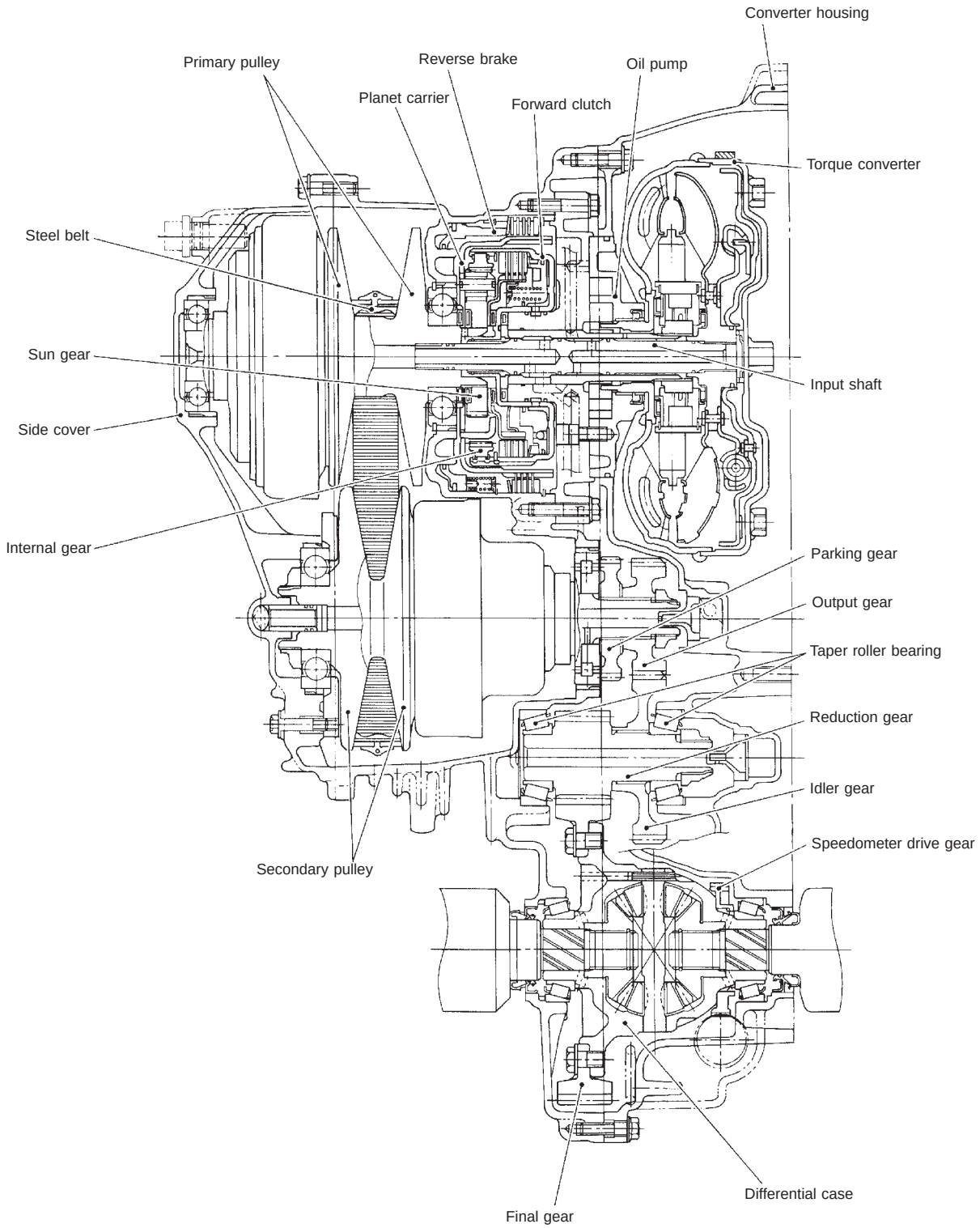
NCAT0009



YAT250

Cross-sectional View — RE0F06A

NCAT0011



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Control System

=NCAT0014

OUTLINE

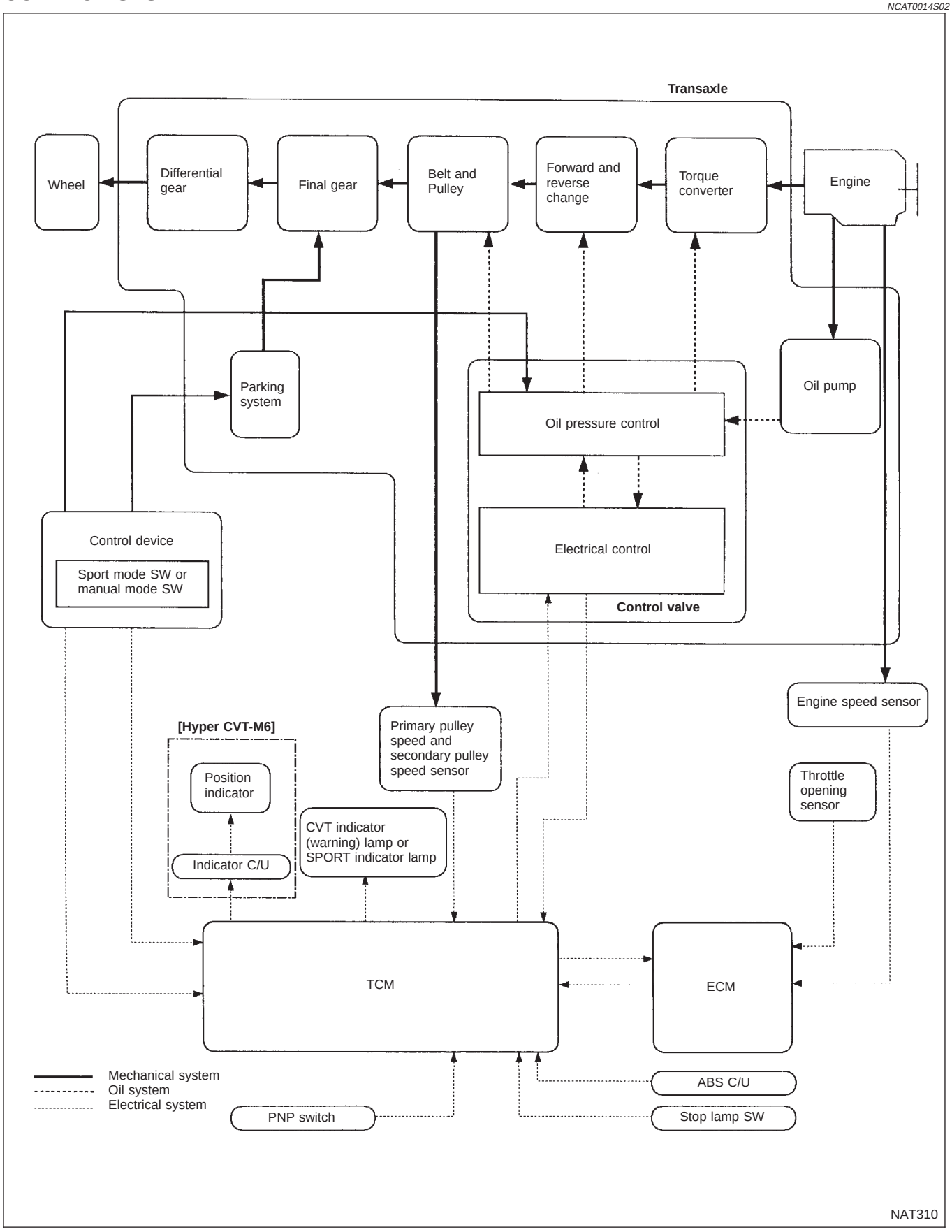
NCAT0014S01

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

SENSORS		TCM		ACTUATORS
PNP switch Throttle position sensor Closed throttle position switch Wide open throttle position switch Engine speed signal CVT fluid temperature sensor CVT fluid pressure sensor Primary speed sensor Secondary speed sensor Stop lamp switch Sport mode switch (Hyper CVT only) Indicator control unit (Hyper CVT M6 only) ABS control unit	▶	Shift control Line pressure control Lock-up control Fail-safe control Self-diagnosis CONSULT-II communication line control Duet-EU control On board diagnosis	▶	Step motor CVT indicator (warning) lamp (Hyper CVT M6 only) Torque converter clutch solenoid valve Line pressure solenoid valve SPORT indicator lamp (Hyper CVT only)

CONTROL SYSTEM

NCAT0014S02



TCM FUNCTION

=NCAT0014S03

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

NCAT0014S04

	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 fluid pressure sensor	Detects transmission fluid 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.
	Sport mode switch	Sends a signal to the TCM relaying the operation condition of the sport mode switch.
	Indicator control unit*1	Sends a signal to the TCM operation condition of the manual mode switch in control device.
	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 (warning) lamp*2	Shows TCM faults, when CVT control components malfunction.
	SPORT indicator lamp*3	Shows the operation condition of the SPORT mode switch. *3
	Indicator control unit *1	Receives the information of gear position on manual mode from TCM, and sends a signal to indicator.

*1: Hyper CVT M6 models only
*2: Hyper CVT M6 models
*3: Hyper CVT models

Introduction

NCAT0017

The CVT system has two self-diagnostic systems.
The first is the emission-related on board diagnostic system (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 OBD self-diagnostic items. For detail, refer to AT-26.

OBD Function for CVT System

NCAT0018

The ECM provides emission-related on board diagnostic (OBD) functions for the CVT system. One function is to receive a signal from the TCM used with OBD-related parts of the CVT system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the 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.

OBD Diagnostic Trouble Code (DTC)

NCAT0020

HOW TO READ DTC AND 1ST TRIP DTC

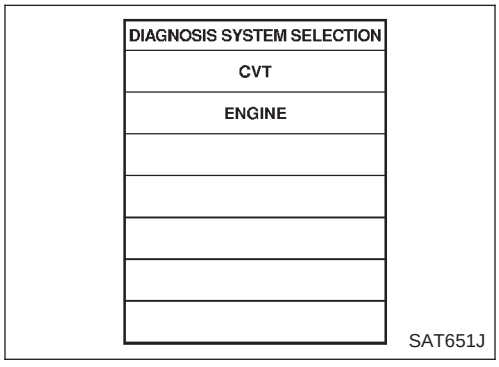
NCAT0020S01

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

1. **(NO TOOLS 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 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.



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

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

SAT581J

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]	1t

SAT582J

Freeze Frame Data and 1st Trip Freeze Frame Data

NCAT0020S0101

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 of freeze frame data) can be stored in the ECM. 1st trip freeze frame data is stored in the ECM memory along with the 1st trip DTC. There is no priority for 1st trip freeze frame data and it is updated each time a different 1st trip DTC is detected. However, once freeze frame data (2nd trip detection/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 - P0306 (0300 - 0306) 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

NCAT0020S02

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

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

The following emission-related diagnostic information is cleared from the ECM memory when erasing DTC related to OBD. 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)

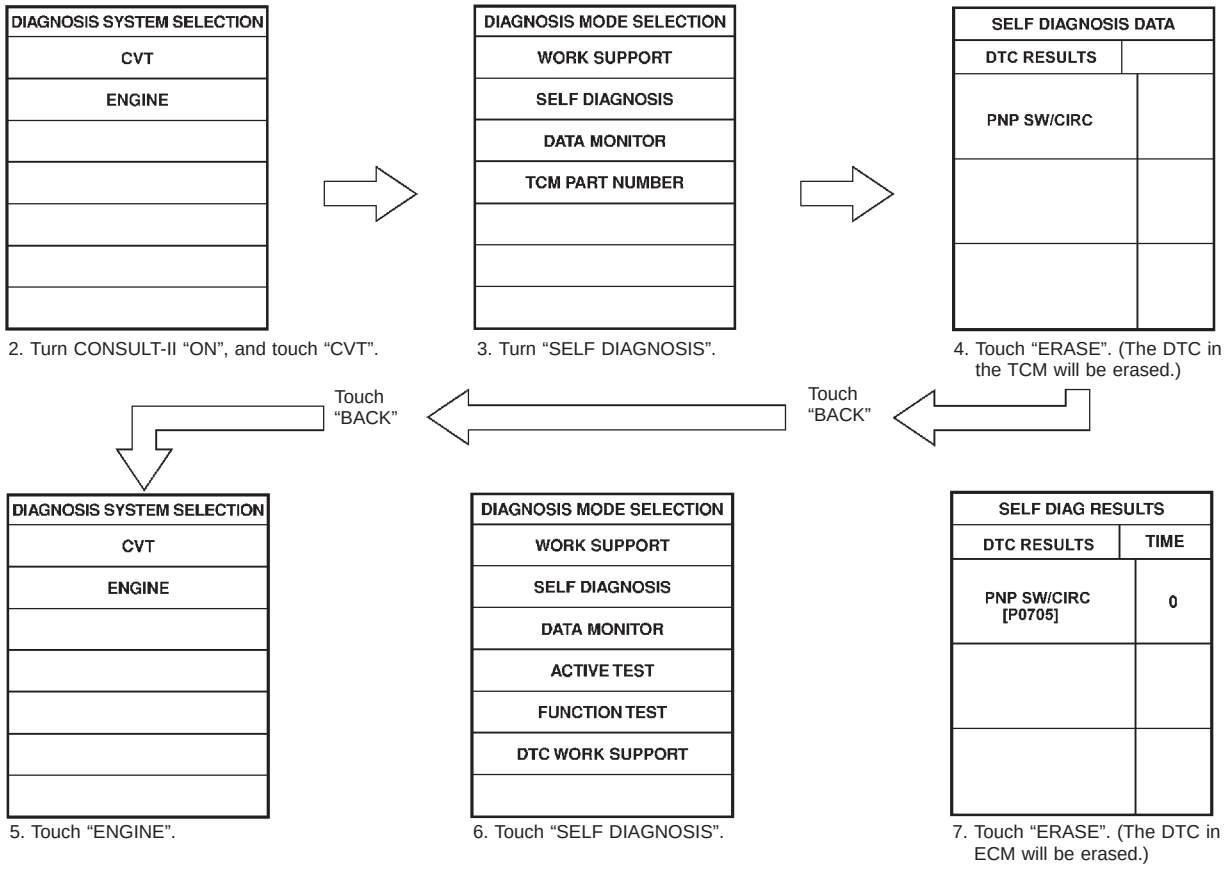
NCAT0020S03

- **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.



2. Turn CONSULT-II "ON", and touch "CVT".
3. Turn "SELF DIAGNOSIS".
4. Touch "ERASE". (The DTC in the TCM will be erased.)
5. Touch "ENGINE".
6. Touch "SELF DIAGNOSIS".
7. Touch "ERASE". (The DTC in the ECM will be erased.)

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HOW TO ERASE DTC (WITH GST)

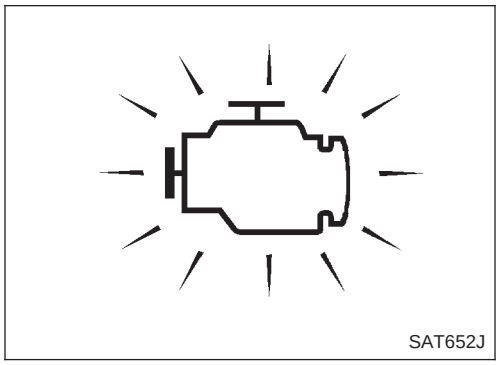
NCAT0020S04

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 "OBD SELF-DIAGNOSTIC PROCEDURE (No Tools)". Refer to AT-25. (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)

NCAT0020S05

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 "TCM SELF-DIAGNOSTIC PROCEDURE (No Tools)". Refer to AT-25. (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".


SAT652J

Malfunction Indicator (MI)

NCAT0021

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 does not light up, refer to EL 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 should go off.
   If the lamp remains on, the on board diagnostic system has detected an emission-related (OBD) malfunction. For detail, refer to EC section ("ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION").

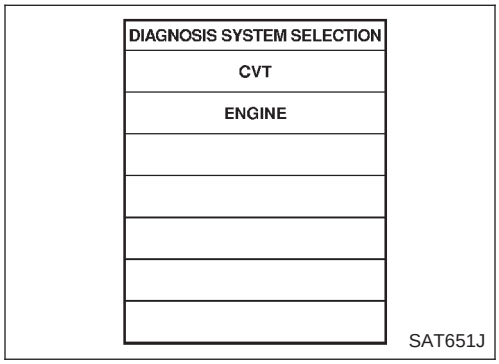
CONSULT-II

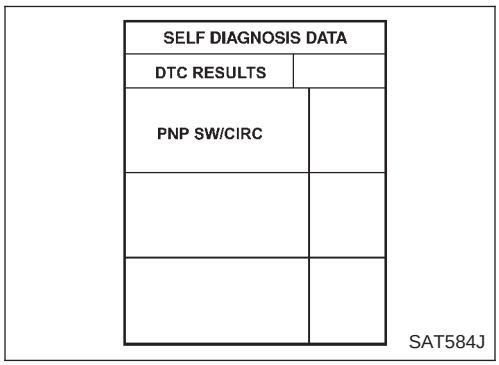
NCAT0022

After performing "SELF-DIAGNOSTIC PROCEDURE (WITH CONSULT-II)" (AT-19), place check marks for results on the "DIAGNOSTIC WORKSHEET", AT-31. 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)

NCAT0022S02

1. Turn on CONSULT-II and touch "ENGINE" for OBD detected items or touch "CVT" for TCM self-diagnosis.
   If CVT is not displayed, check TCM power supply and ground circuit. Refer to AT-41. If result is NG, refer to EL section ("POWER SUPPLY ROUTING").

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

SELF-DIAGNOSTIC RESULT TEST MODE

NCAT0022S03

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode)		Malfunction is detected when ...	TCM self-diagnosis	OBD (DTC)
"CVT"	"ENGINE"		Available by CVT or SPORT indicator lamp "CVT" on CONSULT-II	Available by malfunction indicator lamp*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			
Secondary speed sensor		• TCM does not receive the proper voltage signal from the sensor.	X	P0720
VEHICLE SPEED SIG	VEH SPD SEN/CIR A/T			
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, Throttle position switch		• TCM receives an excessively low or high voltage from the sensor.	X	P1705
THROTTLE POSI SEN	TP SEN/CIRC A/T			

CONSULT-II (Cont'd)

Detected items (Screen terms for CONSULT-II, "SELF DIAGNOSIS" test mode)		Malfunction is detected when ...	TCM self-diagnosis	OBD (DTC)
			Available by CVT or SPORT indicator lamp "CVT" on CONSULT-II	Available by malfunction indicator lamp*2, "ENGINE" on CONSULT-II or GST
"CVT"	"ENGINE"			
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
BATT/FLUID TEMP SEN	ATF TEMP SEN/ CIRC			
Stepping motor circuit		• Not proper voltage change of the TCM terminal when operating step motor.	X	P1777
STEP MOTOR	STEP MOTOR/ CIRC			
Stepping motor function		• Step motor is not operating according to the TCM.	X	P1778
—	STEP MOTOR/ FNCTN			
CVT fluid pressure sensor		• TCM receives an excessively low or high voltage from the sensor.	X	P1791
LINE PRESSURE SEN	LINE PRESS SEN			
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.	—	—
CONT UNIT (EEP ROM)	—			
Initial start		• This is not a malfunction message (Whenever shutting off a power supply to the TCM, this message appears on the screen.)	X	—
INITIAL START	—			
No failure (NO SELF DIAGNOSTIC FAILURE INDICATED FURTHER TESTING MAY BE REQUIRED**)		• No failure has been detected.	X	X

X: Applicable

—: Not applicable

*1: These malfunctions cannot be displayed by 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)

NCAT0022S04

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.	—
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.	—

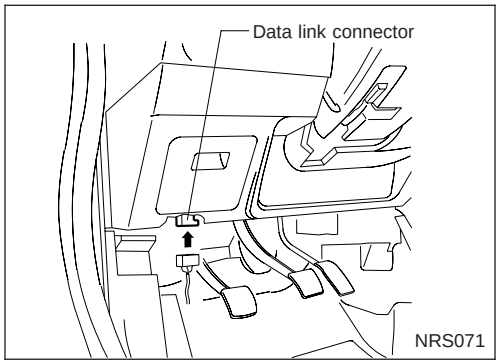
CONSULT-II (Cont'd)

Item	Display	Monitor item		Description	Remarks
		TCM input signals	Main signals		
Gear position	GEAR	—	X	• Gear position (when use manual mode) data used for computation by TCM, 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.	—
Self-diagnosis display lamp (SPORT or CVT indicator lamp)	PAT MONI LAMP [ON/OFF]	—	X	• Control status of SPORT or CVT indicator lamp is displayed.	—
CVT fluid pressure sensor	LINE PRESSURE [V]	X	—	• CVT fluid 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.	—
Idle judgement	CLSD THL POSI [ON/OFF]	—	—	• Idle status judged from throttle position sensor signal is displayed.	—
ABS signal	ABS SIGNAL [ON/OFF]	X	—	• ABS operation signal (ON/OFF) from ABS control unit is displayed.	—
Manual mode switch	MANU MODE SW [ON/OFF]	X	—	• ON/OFF position signal of manual mode switch is displayed.	—

Item	Display	Monitor item		Description	Remarks
		TCM input signals	Main signals		
Non-manual mode switch	NON M MODE SW [ON/OFF]	X	—	• ON/OFF position signal of non-manual mode switch is displayed.	—
Up switch	UP SW [ON/OFF]	X	—	• ON/OFF position signal of up switch is displayed.	—
Down switch	DOWN SW [ON/OFF]	X	—	• ON/OFF position signal of down switch is displayed.	—
Step motor coil A	S/M COIL [A] [ON/OFF]	—	—	• Control valve of step motor coil A, computed by TCM from each input signal is displayed.	—
Step motor coil B	S/M COIL [B] [ON/OFF]	—	—	• Control valve of step motor coil B, computed by TCM from each input signal is displayed.	—
Step motor coil C	S/M COIL [C] [ON/OFF]	—	—	• Control valve of step motor coil C, computed by TCM from each input signal is displayed.	—
Step motor coil D	S/M COIL [D] [ON/OFF]	—	—	• Control valve of step motor coil D, computed by TCM from each input signal 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.	—
Line pressure	LINE PRESSURE [MPa]	—	X	• Real line pressure calculated from line pressure sensor voltage with TCM is displayed.	—
Pulley rpm·in 2	T RPM [rpm]	—	—	• Target primary pulley speed operated with TCM is displayed.	—
CVT ratio 2	T RATIO [—]	—	—	• Target changing the speed ratio operated with TCM is displayed.	—
Step 2	T STEP [step]	—	—	• Target step motor position operated with TCM is displayed.	—

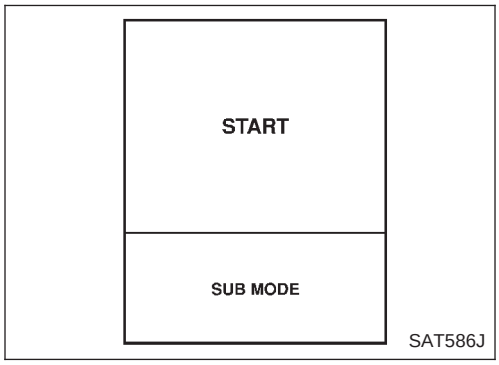
X: Applicable
—: Not applicable

CONSULT-II (Cont'd)

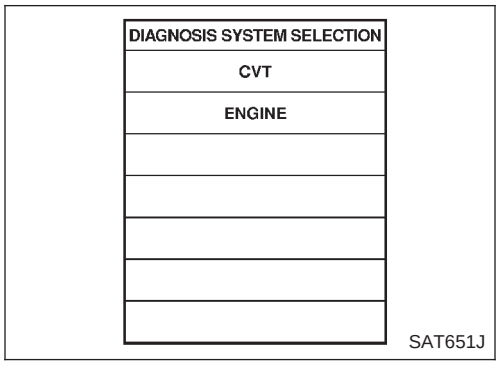


WORK SUPPORT MODE WITH CONSULT-II

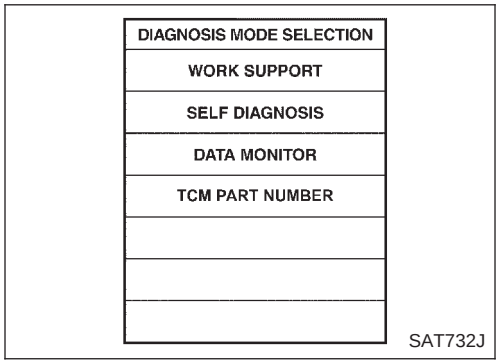
1. Turn ignition switch "OFF".
2. Connect CONSULT-II to Data link connector. Data link connector is located in left side dash panel.
3. Turn ignition switch "ON".



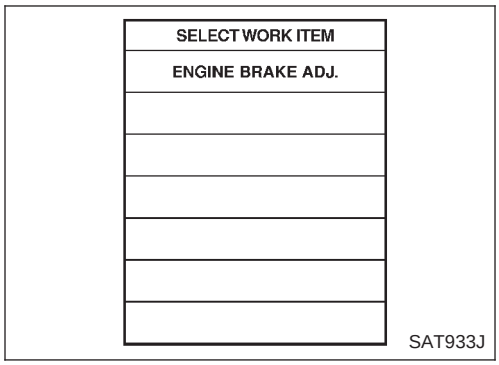
4. Touch "START".



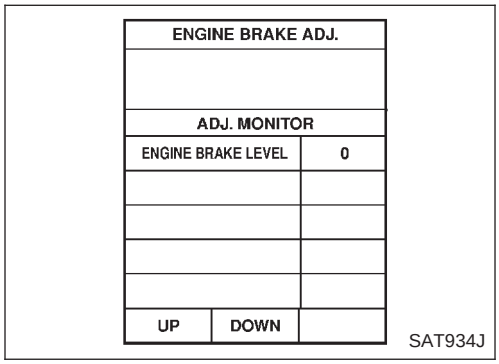
5. Touch "CVT".



6. Touch "WORK SUPPORT".



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



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 disactivated.
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 drivability.

DIAGNOSTIC PROCEDURE WITHOUT CONSULT-II

NCAT0022S07

OBD Self-diagnostic Procedure (With GST)

NCAT0022S0701

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

OBD Self-diagnostic Procedure (No Tools)

NCAT0022S0702

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

TCM Self-diagnostic Procedure (No Tools)

=NCAT0022S0703

Preparation

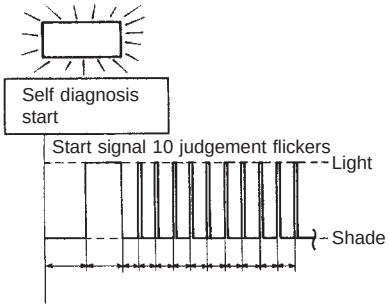
1. Turn ignition switch to "OFF" position.
2. Disconnect the throttle position switch harness connector.
3. Turn ignition switch to "ON" position.
4. Check continuity of the closed throttle position switch.
   Continuity should exist.
   (If continuity does not exist, check throttle opener and closed throttle position switch. Then increase vacuum until closed throttle position switch shows continuity.)
5. Connect the throttle position switch harness connector.
6. Warm up the engine.
7. Turn the ignition switch from ON to OFF two more times, and then turn to OFF.
8. 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.
9. Turn the ignition switch OFF.
10. Press the brake pedal, and shift the selector lever to the "D" position.
11. Turn the ignition switch ON.
12. Release the brake, and shift the selector lever to the "L" position.
13. 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.
14. Read the display from the CVT warning lamp to complete the diagnosis.

Judgement of Self-diagnosis Code

NCAT0022S0704

CVT or SPORT indicator lamp*

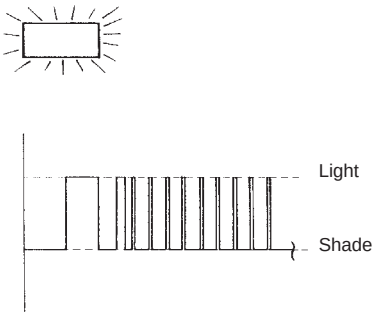
All judgement flickers are the same.



SAT436FA

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

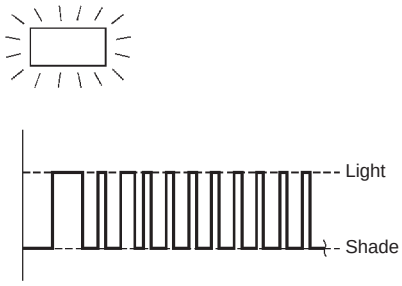
1st judgement flicker is longer than others.



SAT437FA

Secondary speed sensor (VEHICLE SPEED SENSOR CVT) circuit is short-circuited or disconnected.
⇒ **Go to VEHICLE SPEED SENSOR CVT (SECONDARY SPEED SENSOR) (DTC: 0720), AT-62.**

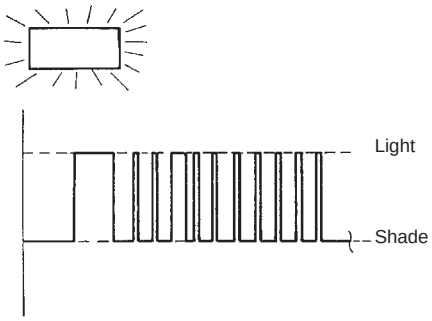
2nd judgement flicker is longer than others.



SAT439FA

Primary speed sensor circuit is short-circuited or disconnected.
⇒ **Go to PRIMARY SPEED SENSOR (DTC: 0715), AT-59.**

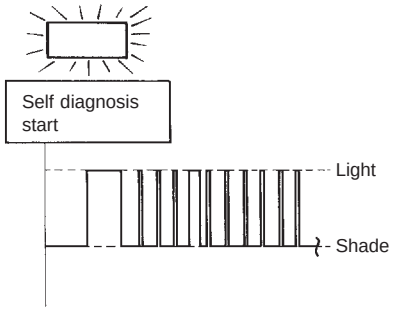
3rd judgement flicker is longer than others.



SAT441FA

Throttle position sensor circuit is short-circuited or disconnected.
⇒ **Go to THROTTLE POSITION SENSOR (DTC: 1705), AT-79.**

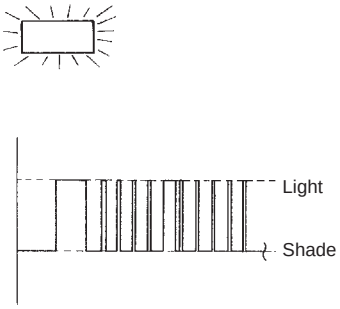
4th judgement flicker is longer than others.



SAT443FA

Step motor circuit is short-circuited or disconnected.
⇒ **Go to STEP MOTOR (DTC: 1777), AT-86.**

5th judgement flicker is longer than others.

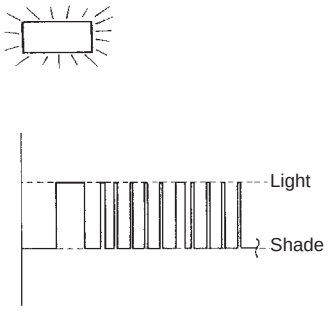


SAT445FA

CVT fluid pressure sensor circuit is short-circuited or disconnected.
⇒ **Go to CVT FLUID PRESSURE SENSOR (DTC: 1791), AT-94.**

CVT or SPORT indicator lamp*

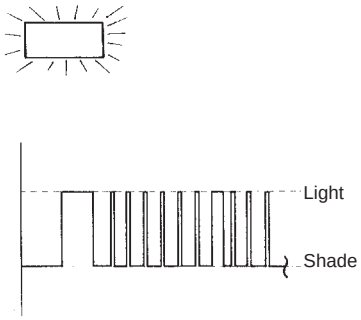
6th judgement flicker is longer than others.



SAT447FA

Line pressure solenoid valve circuit is short-circuited or disconnected.
⇒ **Go to LINE PRESSURE SOLENOID VALVE (DTC: 0745), AT-74.**

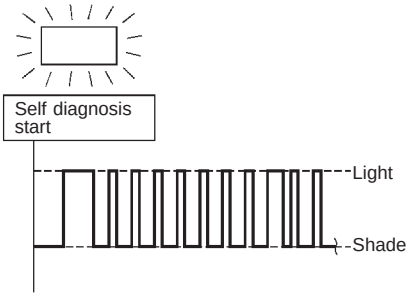
7th judgement flicker is longer than others.



SAT449FA

Lock up solenoid valve circuit is short-circuited or disconnected.
⇒ **Go to TORQUE CONVERTER CLUTCH SOLENOID VALVE (DTC: 0740), AT-69.**

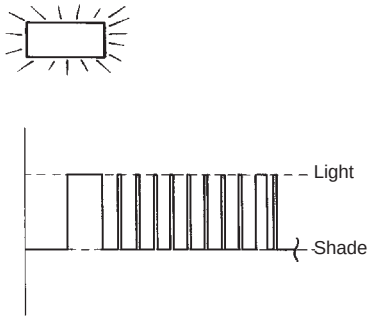
8th judgement flicker is longer than others.



SAT451FA

CVT fluid temperature sensor is disconnected or TCM power source circuit is damaged.
⇒ **Go to CVT FLUID TEMPERATURE SENSOR (DTC: 0710) AND TCM POWER SOURCE, AT-54.**

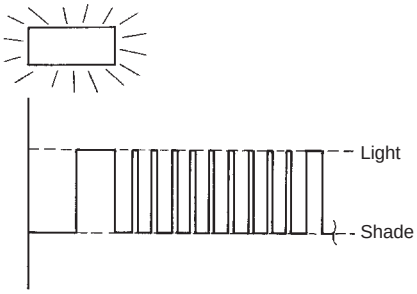
9th judgement flicker is longer than others.



SAT453FA

Engine speed signal circuit is short-circuited or disconnected.
⇒ **Go to ENGINE SPEED SIGNAL (DTC: 0725), AT-66.**

10th judgement flicker is longer than others.

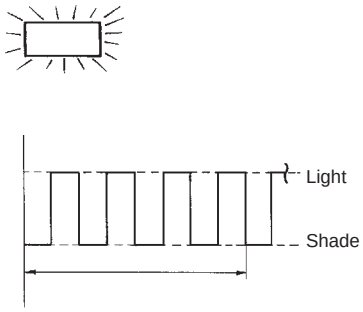


SAT455FA

- 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 SAFE FUNCTION, AT-99.**

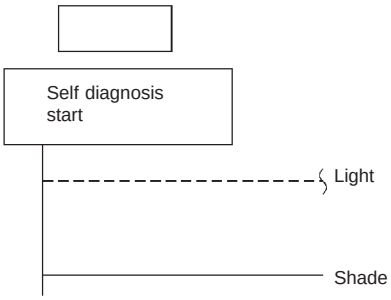
Flickers as shown below.



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)

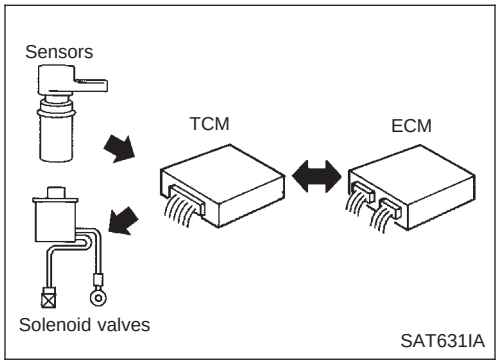
CONSULT-II (Cont'd)

CVT or SPORT indicator lamp*	
Lamp does not come on.  SAT653J PNP switch, stop lamp switch or throttle position switch circuit is disconnected or TCM is damaged. ⇒ **Go to TROUBLE DIAGNOSIS FOR NON-DETECTABLE ITEMS, AT-105.**	

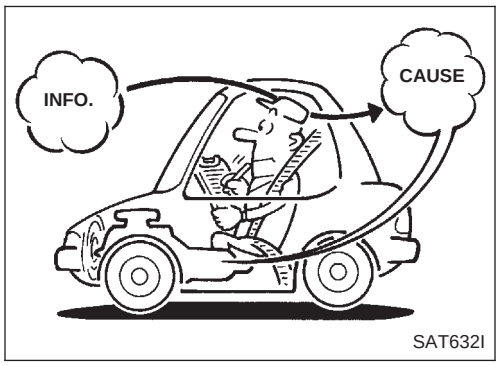
t_1 = 2.5 seconds t_2 = 2.0 seconds t_3 = 1.0 second t_4 = 1.0 second

*CVT indicator lamp: Hyper CVT M6

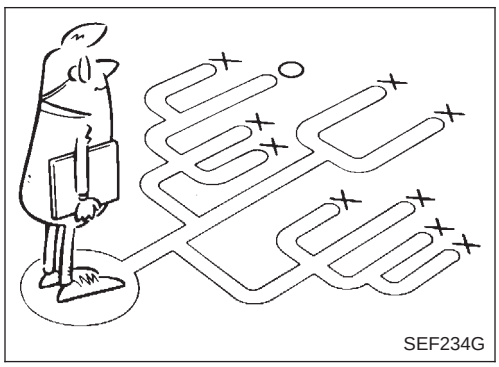
SPORT indicator lamp: Hyper CVT



SAT631IA



SAT632I


SEF234G

Introduction

NCAT0023

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 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 AT-32.

Before undertaking actual checks, take a few minutes to talk with a customer who approaches with a driveability complaint. The customer can supply good information about such problems, especially intermittent ones. Find out what symptoms are present and under what conditions they occur. A “Diagnostic Worksheet” like the example (AT-31) 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

=NCAT0023S01

Information from Customer

NCAT0023S0101

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)	
	☐ Vehicle does not move. (☐ Any position ☐ Particular position)	
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 ( )	
SPORT indicator lamp or CVT indicator (warning) lamp	Blinks for about 8 seconds.	
	☐ Continuously lit	☐ Not lit
Malfunction indicator (MI)	☐ Continuously lit	☐ Not lit

Diagnostic Worksheet

=NCAT0023S0102

1.	☐ Read the Fail-safe and listen to customer complaints.	AT-6
2.	☐ CHECK CVT FLUID	AT-34
	☐ Leakage (Follow specified procedure) ☐ Fluid condition ☐ Fluid level	
3.	☐ Perform STALL TEST and LINE PRESSURE TEST.	AT-34, 35
	☐ 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.	AT-36
	4-1. Check before engine is started.	AT-37
	☐ SELF-DIAGNOSTIC PROCEDURE — Mark detected items.	
	☐ PNP switch, AT-48. ☐ CVT fluid temperature sensor, AT-54. ☐ Vehicle speed sensor (Secondary speed sensor), AT-62. ☐ Engine speed signal, AT-66. ☐ Torque converter clutch solenoid valve, AT-69. ☐ Line pressure solenoid valve, AT-74. ☐ Step motor, AT-86, 91. ☐ CVT fluid pressure sensor, AT-94. ☐ Throttle position sensor, AT-79. ☐ Stop lamp and throttle position switches. ☐ CVT fluid temperature sensor and TCM power source, AT-54. ☐ Primary speed sensor, AT-59. ☐ PNP switch, stop lamp switch, throttle position switch AT-105. ☐ Battery ☐ Others	
5.	☐ For self-diagnosis NG items, inspect each component. Repair or replace the damaged parts.	AT-19
6.	☐ Perform all ROAD TEST and re-mark required procedures.	AT-36
7.	☐ Perform the Diagnostic Procedures for all remaining items marked NG. Repair or replace the damaged parts. Refer to the Symptom Chart when you perform the procedures. (The chart also shows some other possible symptoms and the component inspection orders.)	AT-41 AT-54
8.	☐ Erase DTC from TCM and ECM memories.	AT-16

Work Flow

=NCAT0024

HOW TO PERFORM TROUBLE DIAGNOSES FOR QUICK AND ACCURATE REPAIR

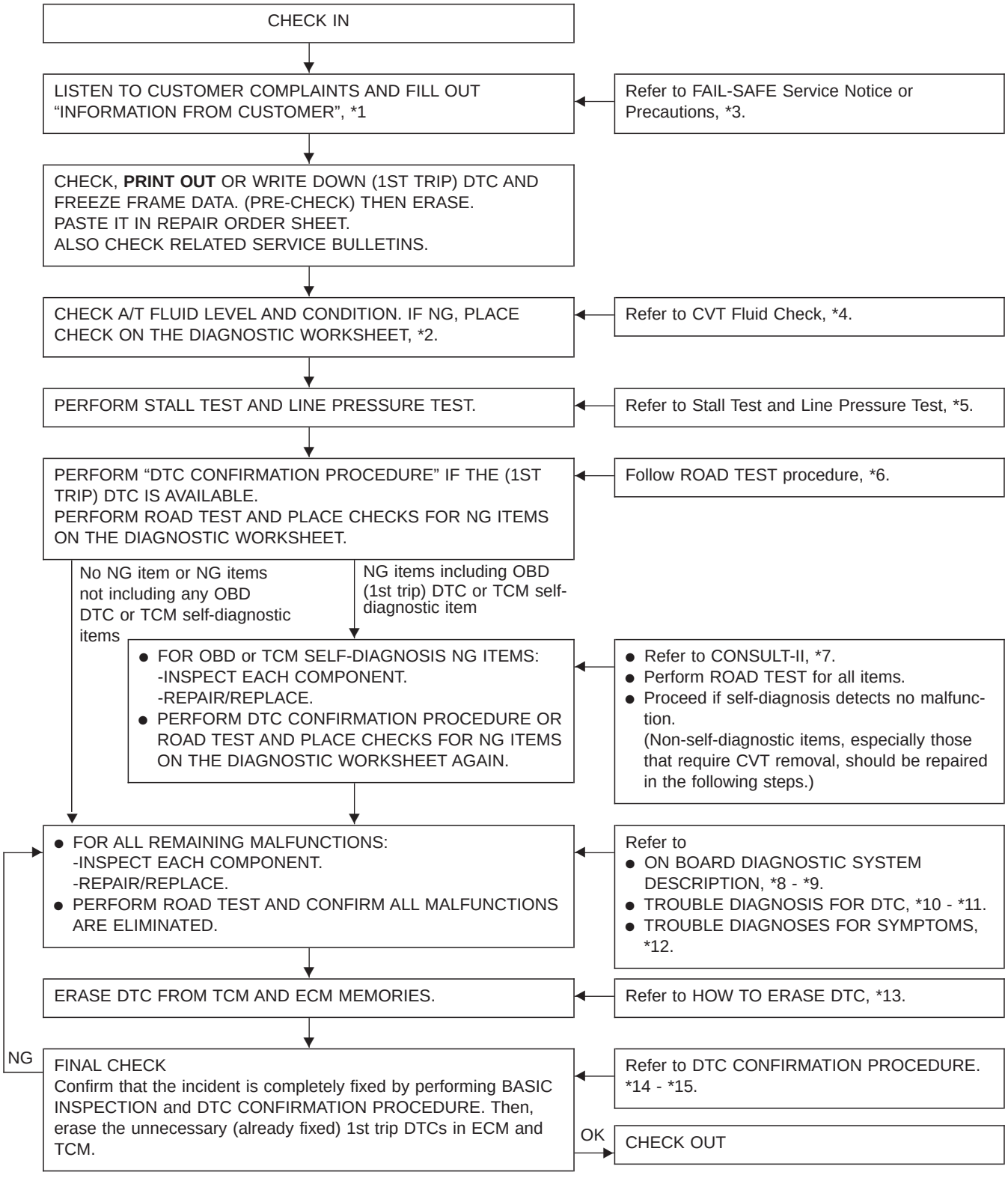
NCAT0024S01

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” (AT-30) and “DIAGNOSTIC WORKSHEET” (AT-31), to perform the best troubleshooting possible.

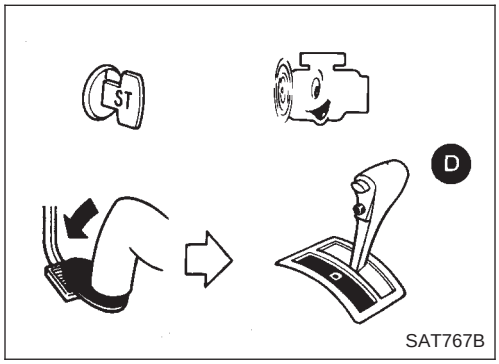
WORK FLOW CHART

=NCAT0024S02



SAT086JC

*1: AT-30
*2: AT-31
*3: AT-6
*4: AT-34
*5: AT-34, 35
*6: AT-36
*7: AT-18
*8: AT-15
*9: AT-26
*10: AT-48
*11: AT-94
*12: AT-110
*13: AT-16
*14: AT-49
*15: AT-95



SAT767B

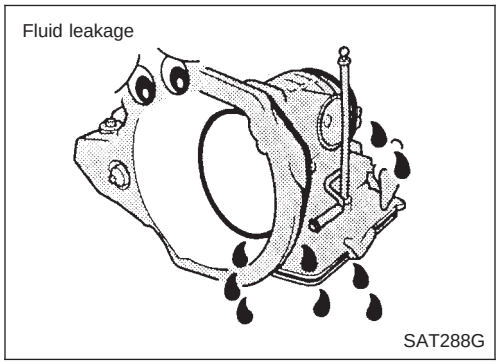
CVT Fluid Check

NCAT0025

FLUID LEAKAGE CHECK

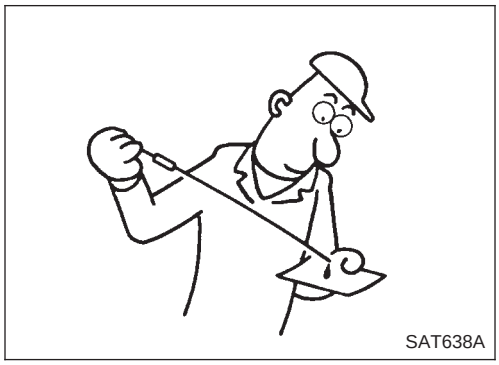
NCAT0025S01

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.



SAT288G

4. Check for fluid leakage.


SAT638A

FLUID CONDITION CHECK

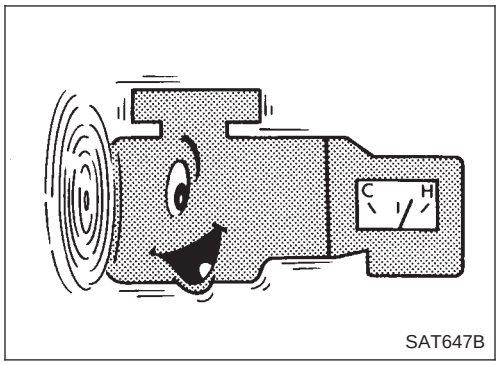
NCAT0025S02

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

NCAT0025S03

Refer to MA section (“Checking CVT Fluid”, “CHASSIS AND BODY MAINTENANCE”).



SAT647B

Stall Test

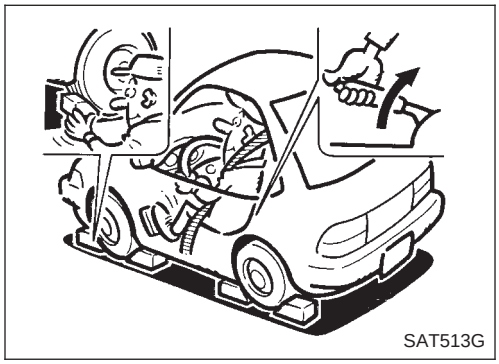
NCAT0026

STALL TEST PROCEDURE

NCAT0026S01

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.

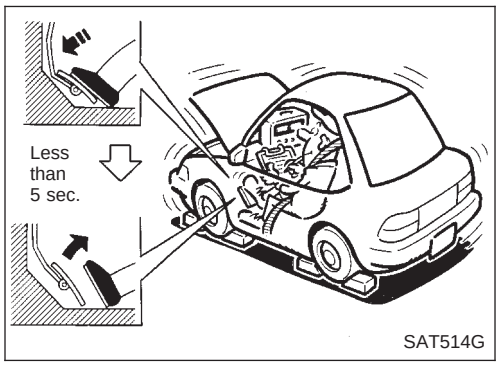
CVT fluid operating temperature:
50 - 80°C (122 - 176°F)



SAT513G

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.**

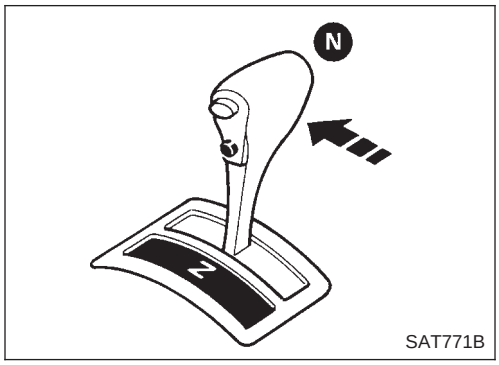


SAT514G

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.**

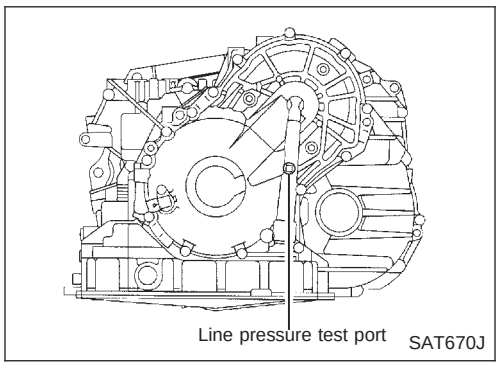
Stall revolution:
2,350 - 2,850 rpm



SAT771B

8. Move selector lever to "N" position.
9. Cool off CVT fluid.

- **Run engine at idle for at least one minute.**



SAT670J

Line Pressure Test

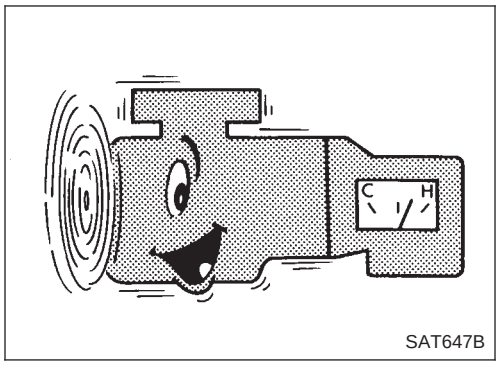
NCAT0027

LINE PRESSURE TEST PORTS

NCAT0027S01

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

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



SAT647B

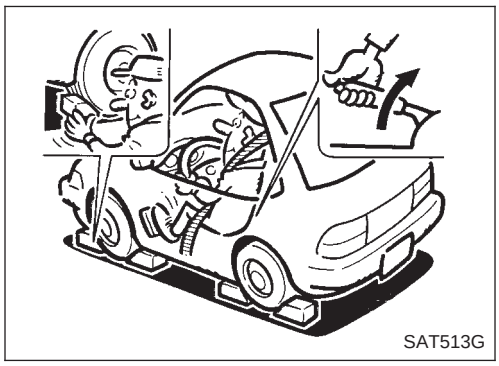
LINE PRESSURE TEST PROCEDURE

NCAT0027S02

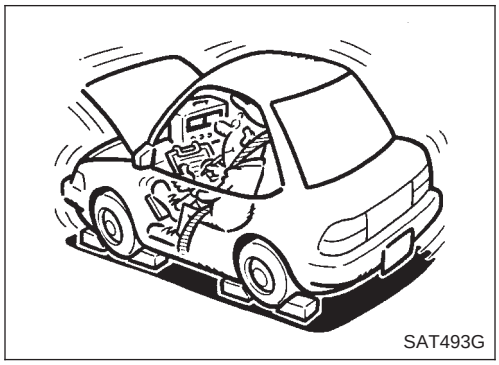
1. Check CVT fluid and engine oil levels. If necessary, add fluid or oil.
2. Drive vehicle for approx. 10 minutes or until engine oil and CVT fluid reach operating temperature.

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

3. Install pressure gauge to corresponding line pressure port.

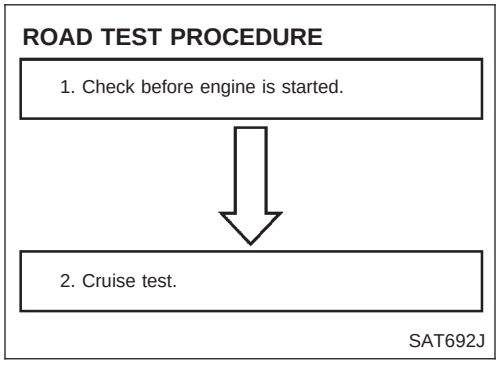

SAT513G

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


SAT493G

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 SDS, AT-120.



SAT692J

Road Test

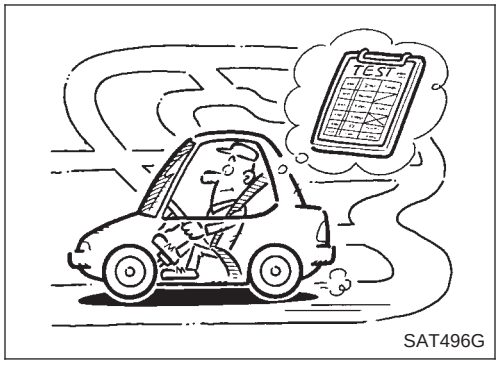
NCAT0028

DESCRIPTION

NCAT0028S01

- 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



SAT496G

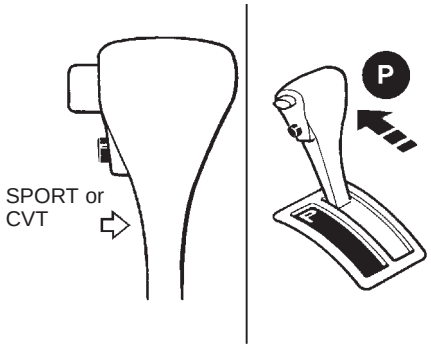
- Before road test, familiarize yourself with all test procedures and items to check.
- Conduct tests on all items until specified symptom is found. Troubleshoot items which check out No Good after road test. Refer to "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION" and "TROUBLE DIAGNOSIS FOR SYMPTOMS", AT-15, AT-26 and AT-110.

1. CHECK BEFORE ENGINE IS STARTED

=NCAT0028S02

1	CHECK SPORT OR CVT INDICATOR LAMP

1. Park vehicle on flat surface.
2. Move selector lever to "P" position.



SAT967IA

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 or SPORT indicator lamp come on for about 2 seconds?

Yes or No

Yes	▶	GO TO 2.
No	▶	Stop ROAD TEST.

2	CHECK CVT OR SPORT INDICATOR LAMP

Does CVT or SPORT indicator lamp flicker for about 8 seconds?

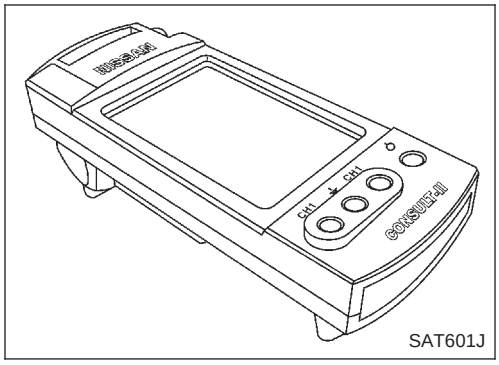
Yes or No

Yes	▶	Perform self-diagnosis and check NG items on the DIAGNOSTIC WORKSHEET, AT-31. Refer to TCM SELF-DIAGNOSIS PROCEDURE (NO TOOLS), AT-25.
No	▶	1. Turn ignition switch to "OFF" position. 2. Perform self-diagnosis and note NG items. Refer to TCM SELF-DIAGNOSIS PROCEDURE (NO TOOLS), AT-25.

3	TEST DRIVE

Drive the vehicle and verify that there are no abnormalities.

	▶	TEST END



SAT601J

2. CRUISE TEST

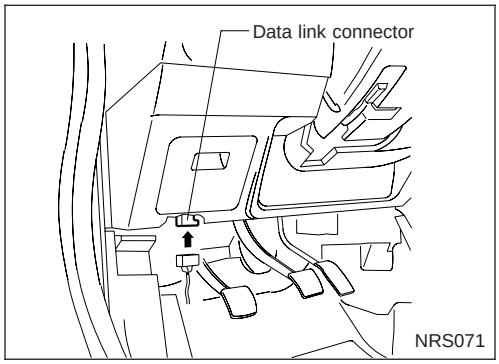
NCAT0028S04

- Check all items listed in Parts 1 through 3.

With CONSULT-II

NCAT0028S0401

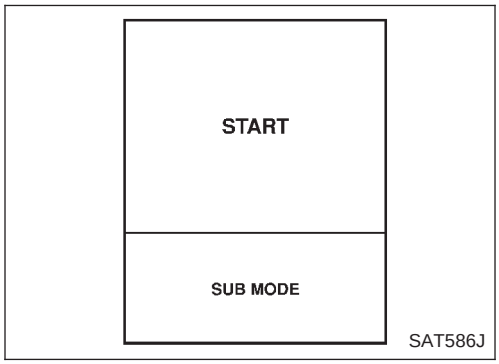
- Using CONSULT-II, conduct a cruise test and record the result.
- Print the result and ensure that shifts and lock-ups take place as per Shift Schedule.



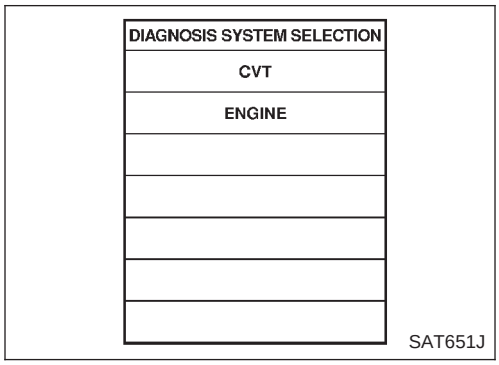
CONSULT-II Setting Procedure

NCAT0028S0402

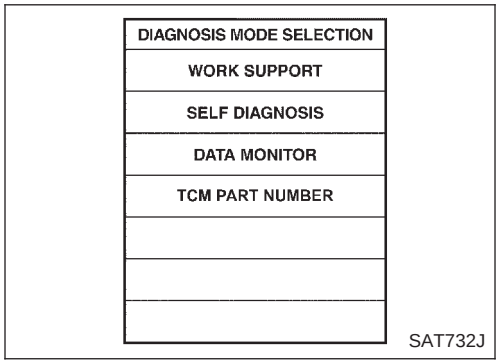
1. Turn ignition switch "OFF".
2. Connect CONSULT-II to Data link connector. Data link connector is located in left side dash panel.



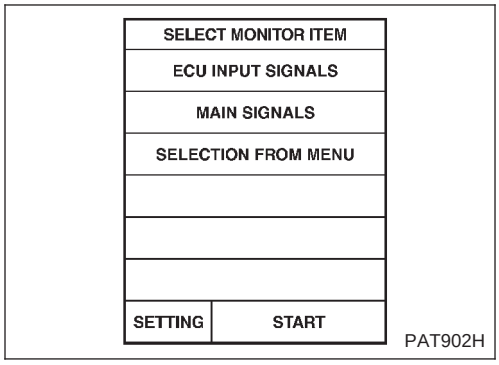
3. Turn ignition switch "ON".
4. Touch "START".



5. Touch "CVT".



6. Touch "DATA MONITOR".



7. Touch "MAIN SIGNALS" to set recording condition.
8. See "Numerical Display", "Barchart Display" or "Line Graph Display".
9. Touch "START".

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

DATA MONITOR	
MONITORING	NO FAIL
ENGINE SPEED	XXX rpm
GEAR	XXX
SLCT LVR POSI	N~P
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
LINE PRES DTY	XXX %
TCC S/V DUTY	XXX %
SHIFT S/V A	ON
SHIFT S/V B	ON

PAT071H

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

DATA MONITOR	
RECORD 4/8	NO FAIL
ENGINE SPEED	XXX rpm
GEAR	XXX
SLCT LVR POSI	N~P
VEHICLE SPEED	XXX km/h
THROTTLE POSI	XXX
LINE PRES DTY	XXX %
TCC S/V DUTY	XXX %
SHIFT S/V A	ON
SHIFT S/V B	ON

PAT072H

12. Touch “STORE”.

REAL-TIME DIAG
NO FAILURE

PAT301C

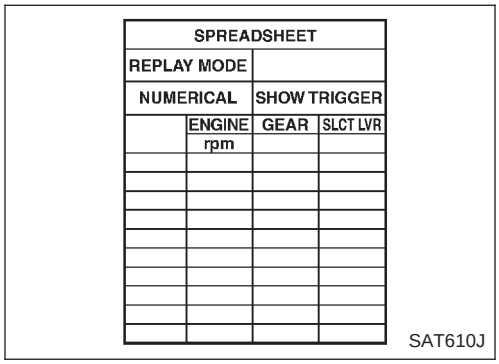
13. Touch “DISPLAY”.

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

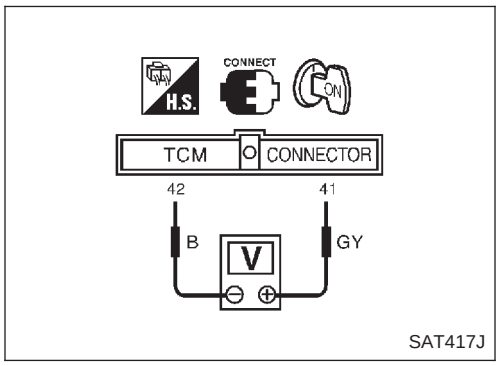
SAT608J

SPREADSHEET	
LOADING	
PLEASE WAIT, FILLING SPREADSHEET.	

SAT609J



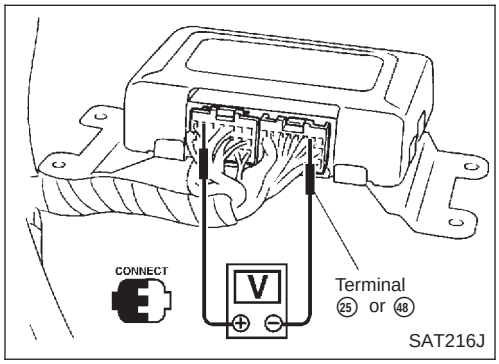
14. Touch "PRINT".
15. Check the monitor data printed out.
16. Continue cruise test part 2 and 3.



Without CONSULT-II

NCAT0028S0403

- Throttle position sensor can be checked by voltage across terminals 41 and 42 of TCM.
  Refer to "Road Test", AT-36.



TCM Terminals and Reference Value

NCAT0030

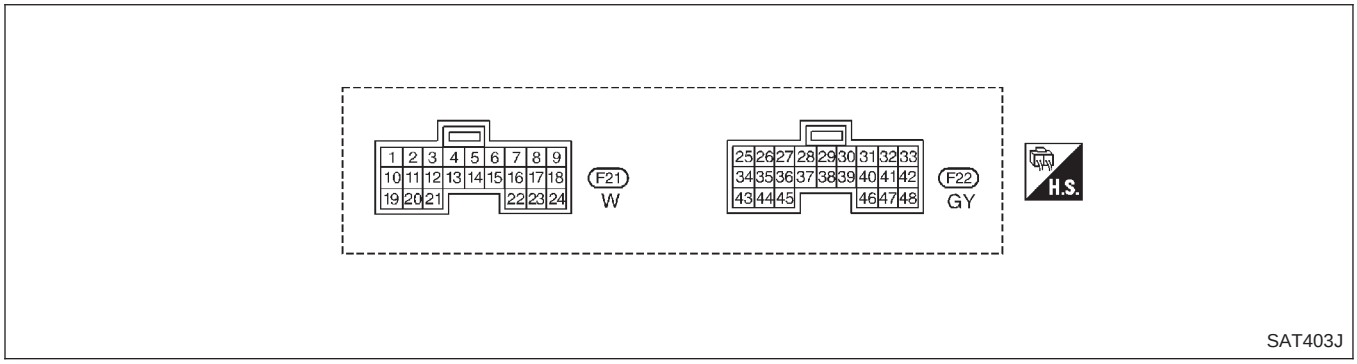
PREPARATION

NCAT0030S01

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

TCM HARNESS CONNECTOR TERMINAL LAYOUT

NCAT0030S02



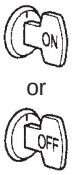
TCM INSPECTION TABLE
(Data are reference values.)

NCAT0030S03

Terminal No.	Wire color	Item	Condition		Judgement standard
1	OR/L	Line pressure solenoid valve		When releasing accelerator pedal after warming up engine.	Approx. 2.8V
				When depressing accelerator pedal fully after warming up engine.	Approx. 1.4V
2	P/B	Line pressure solenoid valve (with dropping resistor)		When releasing accelerator pedal after warming up engine.	Approx. 11.0V
				When depressing accelerator pedal fully after warming up engine.	Approx. 4.0V
3	GY/R	Torque converter clutch solenoid valve		When CVT performs lock-up.	Approx. 12.0V
				When CVT does not perform lock-up.	Approx. 0V
5 *1	W/L	DT1		—	—
6 *1	W/PU	DT2		—	—
7 *1	R/W	DT3		—	—
8 *1	L/R	DT5		—	—
9 *1	LG/B	DT4		—	—
10	G/W	Power source		When turning ignition switch to “ON”.	Battery voltage
				When turning ignition switch to “OFF”.	Approx. 0V

TCM Terminals and Reference Value (Cont'd)

Terminal No.	Wire color	Item	Condition		Judgement standard
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
13	OR/B	CVT or SPORT indicator lamp		When CVT or SPORT indicator lamp illuminates	Approx. 0V
				When CVT or SPORT indicator lamp does not illuminate	Battery voltage
15 *1	PU/Y	—		—	—
16	Y	Closed throttle position switch (in throttle position switch)		When releasing accelerator pedal after warming up engine.	Battery voltage
				When depressing accelerator pedal after warming up engine.	Approx. 0V
17	LG	Wide open throttle position switch (in throttle position switch)		When depressing accelerator pedal more than half-way after warming up engine.	Battery voltage
				When releasing accelerator pedal after warming up engine.	Approx. 0V
18	SB	ABS control unit		When driving slowly.	Change 0 - 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.
22	GY	Sport mode switch		When SPORT mode switch in "ON" position.	Approx. 0V
				When SPORT mode switch in "OFF" position.	Approx. 10V
23	BR/Y	ABS control unit		When ABS operates.	Approx. 0V
				When ABS does not operate.	5.6 - 10.0V
25	B	Ground		—	—
27	L/OR	PNP switch "L" position		When setting selector lever to "L" position.	Battery voltage
				When setting selector lever to other positions.	Approx. 0V

Terminal No.	Wire color	Item	Condition		Judgement standard
28	W/L	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), 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.		Approx. 600 Hz
30 *2	G/B	—		—	—
31 *2	GY/L	—		—	—
32	G	Throttle position sensor (Power source)		When turning ignition switch to "ON"	4.5 - 5.5V
				When turning ignition switch to "OFF"	Approx. 0V
33	PU/W	Indicator control unit		When setting selector lever to any position.	1.5 - 2.0V
34	LG	PNP switch "D" position		When setting selector lever to "D" position.	Battery voltage
				When setting selector lever to other positions.	Approx. 0V
35	G/W	PNP switch "R" position		When setting selector lever to "R" position.	Battery voltage
				When setting selector lever to other positions.	Approx. 0V
36	G/R	PNP switch "N" or "P" position		When setting selector lever to "N" or "P" position.	Battery voltage
				When setting selector lever to other positions.	Approx. 0V
37	W/G	CVT fluid pressure sensor		When engine runs at idle speed.	Approx. 1.0V
				When engine runs at stall speed.	Approx. 4.0V
38	G/Y	Primary speed sensor	When driving (L position, 20 km/h), 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.		Approx. 900 Hz
39	L/OR	Engine speed signal		When engine runs at idle speed.	0.5 - 1.5V

TCM Terminals and Reference Value (Cont'd)

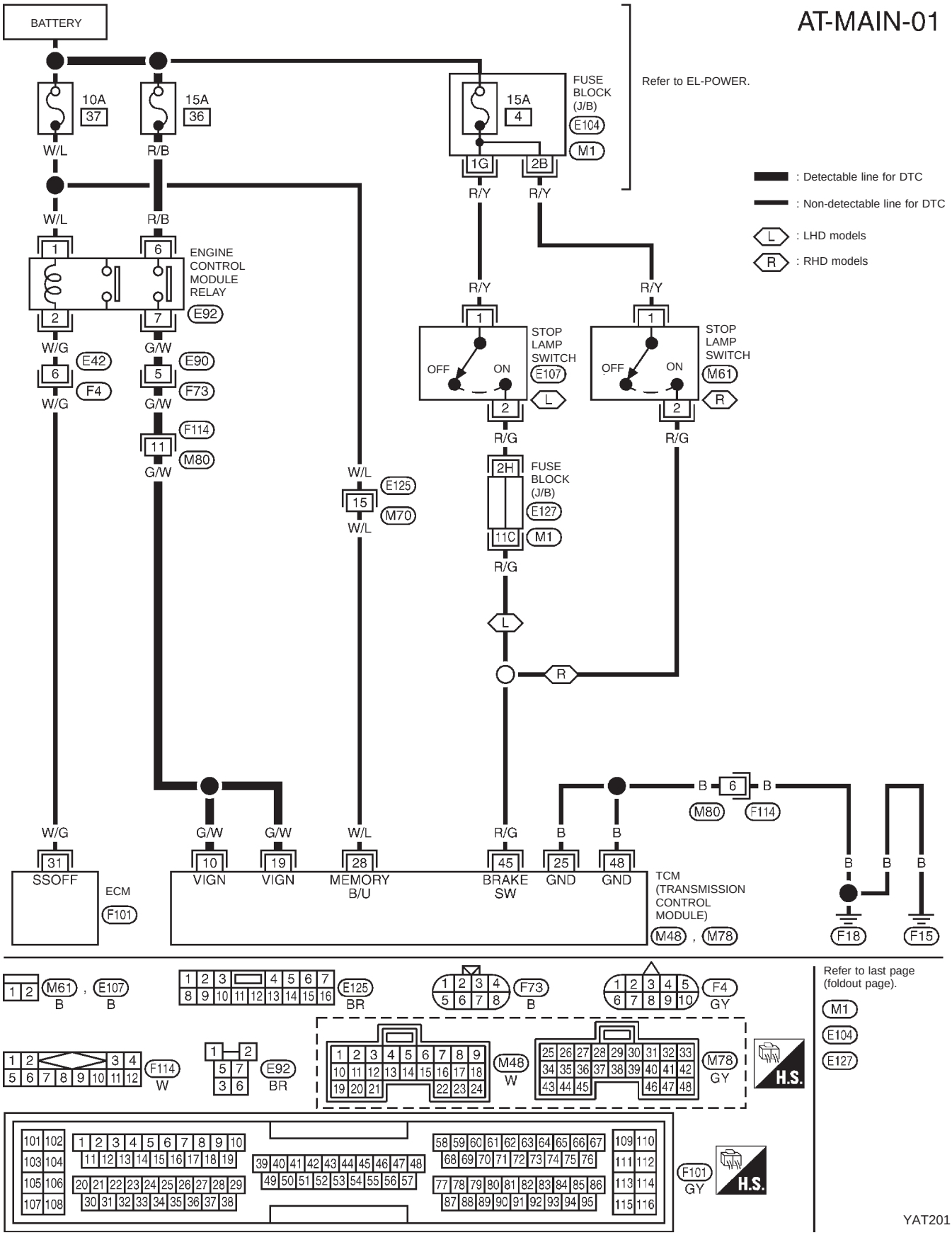
Terminal No.	Wire color	Item	Condition		Judgement standard
41	GY	Throttle position sensor		When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to throttle position.)	Fully-closed throttle: Approximately 0.3V Fully-open throttle: Approximately 3V
42	B/W	Throttle position sensor (Ground)		—	—
45	R/G	Stop lamp switch		When depressing brake pedal	Battery voltage
				When releasing brake pedal	Approx. 0V
46	P/L	CVT fluid pressure sensor (Power source)		—	4.5 - 5.5V
47	Y/PU	CVT fluid temperature sensor		When CVT fluid temperature is 20°C (68°F).	Approximately 1.5V
				When CVT fluid temperature is 80°C (176°F).	Approximately 0.5V
48	B	Ground		—	—

*1: This terminal is connected to the ECM.

*2: These terminals are connected to the Data link connector for CONSULT-II.

Wiring Diagram — CVT — MAIN

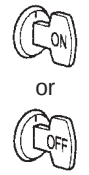
NCAT0031



TCM TERMINALS AND REFERENCE VALUE

NCAT0031S01

Remarks: Specification data are reference values.

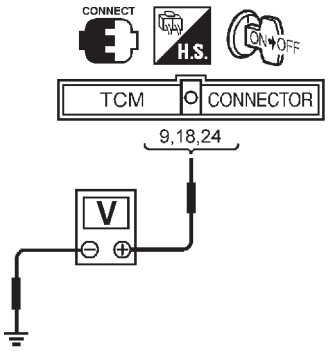
Terminal No.	Wire color	Item	Condition		Judgement standard
10	G/W	Power source		When turning ignition switch to "ON".	Battery voltage
				When turning ignition switch to "OFF".	Approx. 0V
19	G/W	Power source		Same as No. 10	
25	B	Ground		—	—
28	W/L	Power source (Memory back-up)		When turning ignition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

DIAGNOSTIC PROCEDURE

NCAT0031S03

1 CHECK TCM POWER SOURCE

1. Turn ignition switch to "ON" position. (Do not start engine.)
2. Check voltage between TCM terminals 10, 19, 28 and ground.
   Voltage: Battery voltage
3. Turn ignition switch to "OFF" position.
4. Check voltage between TCM terminal 28 and ground.
   Voltage: Battery voltage



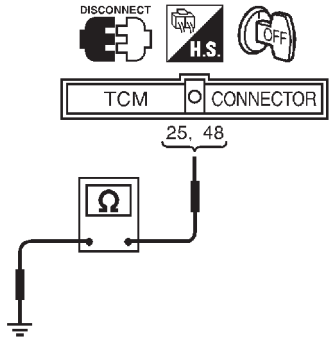
SAT332J

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 EL section ("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.



SAT333J

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.

Description

NCAT0032

- 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

NCAT0032S01

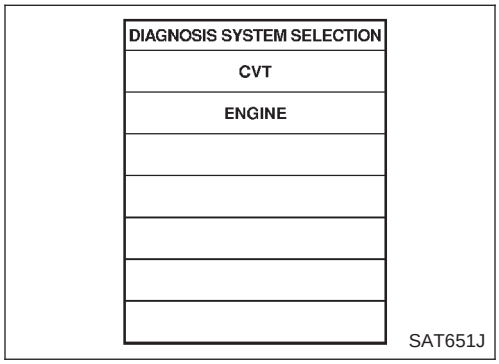
Remarks: Specification data are reference values.

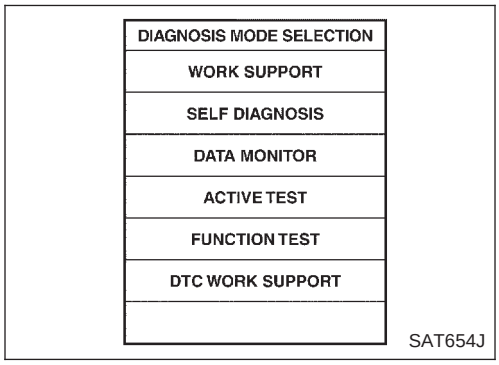
Terminal No.	Wire color	Item	Condition		Judgement standard
27	L/OR	PNP switch “L” position		When setting selector lever to “L” position.	Battery voltage
				When setting selector lever to other positions.	Approx. 0V
34	LG	PNP switch “D” position		When setting selector lever to “D” position.	Battery voltage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

ON BOARD DIAGNOSIS LOGIC

NCAT0032S02

Diagnostic trouble code	Malfunction is detected when ...	Check items (Possible cause)
: PNP SW/CIRC	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
: P0705		
: MI Code No. 0705		





DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0032S03

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.

   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 "Diagnostic Procedure", AT-51.

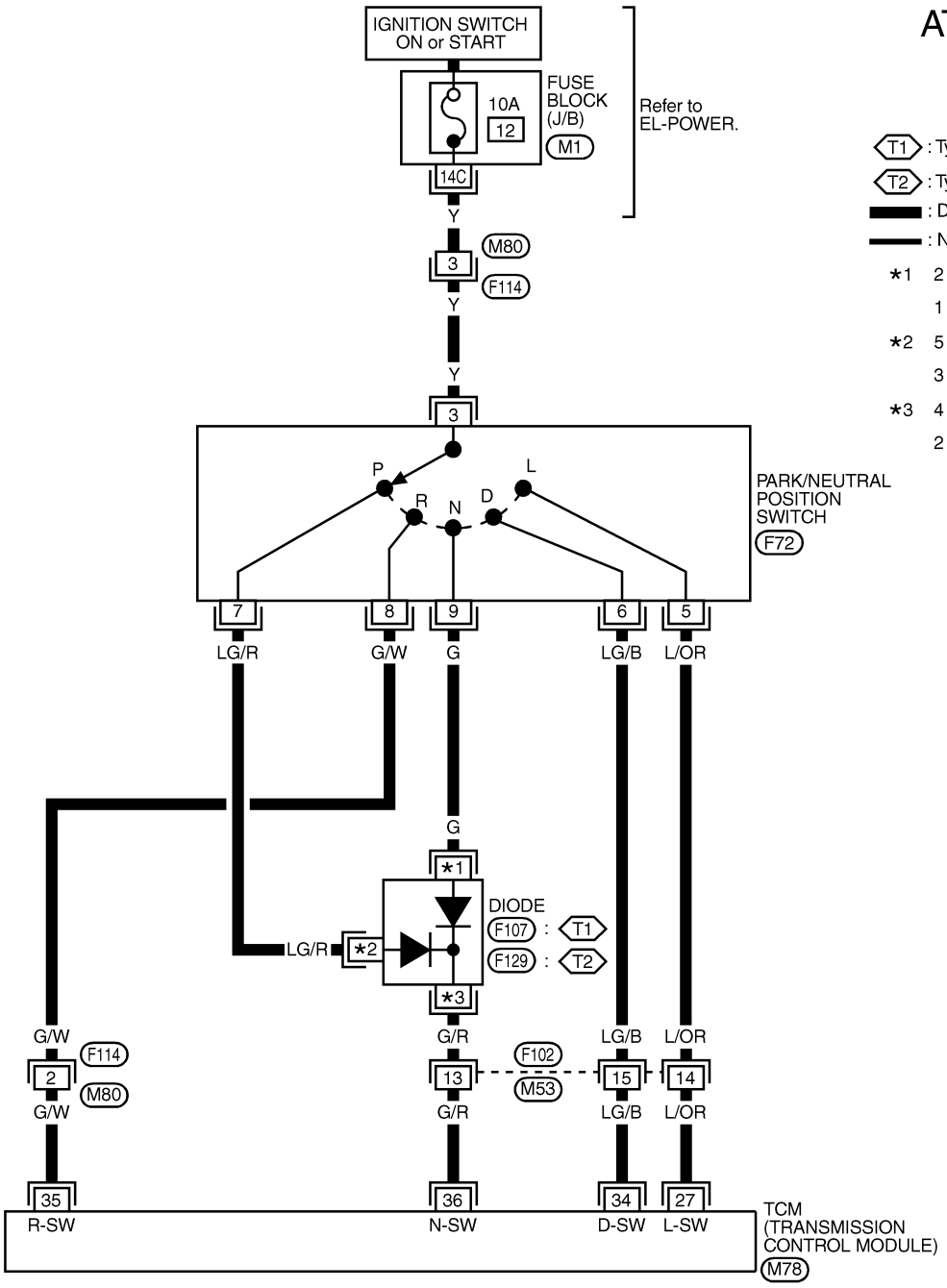
With GST

Follow the procedure "With CONSULT-II".

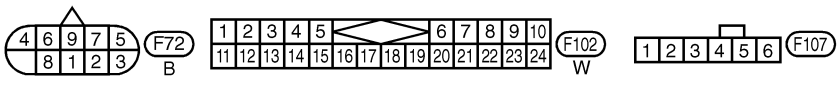
Wiring Diagram — AT — PNP/SW

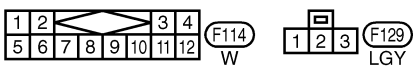
NCAT0199

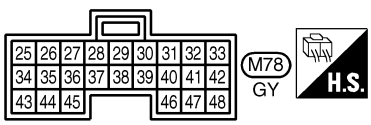
AT-PNP/SW-01



T1 : Type-1
T2 : Type-2
: Detectable line for DTC
: Non-detectable line for DTC
*1 2 : T1
1 : T2
*2 5 : T1
3 : T2
*3 4 : T1
2 : T2







REFFER TO THE FOLLOWING.
M1 FUSE BLOCK-JUNCTION BOX (J/B)

YAT251

Diagnostic Procedure

NCAT0033

1 CHECK PNP SWITCH CIRCUIT (With CONSULT-II)

With CONSULT-II

1. Turn ignition switch to “ON” position.
   (Do not start engine.)
2. Select “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “CVT” with CONSULT-II.

DIAGNOSIS SYSTEM SELECTION
CVT
ENGINE

SAT651J

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 “Component Inspection”, AT-53. ● 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 EL section (“POWER SUPPLY ROUTING”). ● Diode (P, N positions)

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 “Component Inspection”, AT-53. ● 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 EL section (“POWER SUPPLY ROUTING”). ● Diode (P, N positions)

Diagnostic Procedure (Cont'd)

3	CHECK DTC	
Perform Diagnostic Trouble Code (DTC) confirmation procedure, AT-49.		
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

=NCAT0034

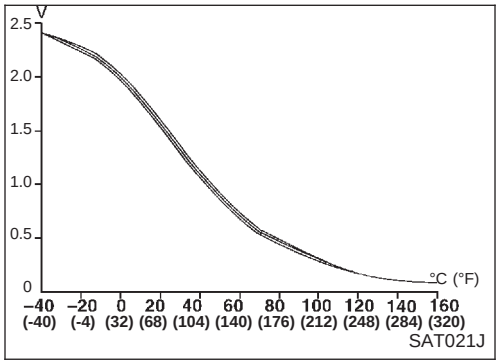
PARK/NEUTRAL POSITION SWITCH

NCAT0034S01

1. Check continuity between terminals 1 and 2 and between terminals 3 and 5, 6, 7, 8, 9 while moving manual shaft through each position.

Lever position	Terminal No.	
P	3 — 7	1 — 2
R	3 — 8	
N	3 — 9	1 — 2
D	3 — 6	
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 AT-114.
4. If NG on step 2, remove PNP switch from CVT and check continuity of PNP switch terminals. Refer to step 1.
5. If OK on step 4, adjust PNP switch. Refer to AT-114.
6. If NG on step 4, replace PNP switch.



Description

NCAT0035

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

NCAT0035S01

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
CVT fluid temperature sensor	Cold [20°C (68°F)] ↓ Hot [80°C (176°F)]	Approximately 1.5V ↓ Approximately 0.5V

TCM TERMINALS AND REFERENCE VALUE

NCAT0035S02

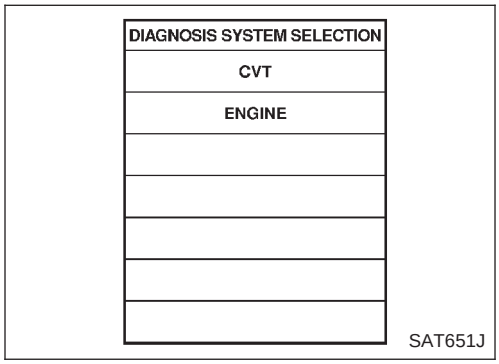
Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard
42	B	Throttle position sensor (Ground)		—	—
47	Y/PU	CVT fluid temperature sensor		When CVT fluid temperature is 20°C (68°F).	Approximately 1.5V
				When CVT fluid temperature is 80°C (176°F).	Approximately 0.5V

ON BOARD DIAGNOSIS LOGIC

NCAT0035S03

Diagnostic trouble code	Malfunction is detected when ...	Check items (Possible cause)
: ATF TEMP SEN/CIRC	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
: P0710		
: MI Code No. 0710		



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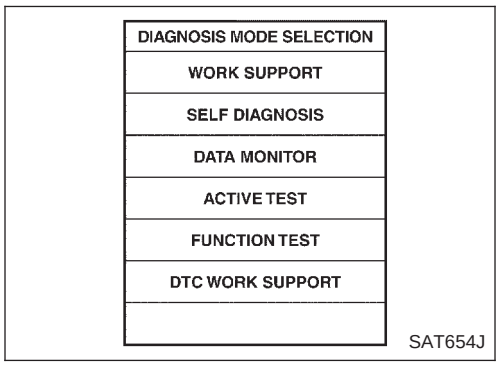


SAT654J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0035S04

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 "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.)
   ENG SPEED: 450 rpm or more
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   THRTL POS SEN: More than 1.3 V
   Selector lever: D position
   If the check result is NG, go to "Diagnostic Procedure", AT-57.

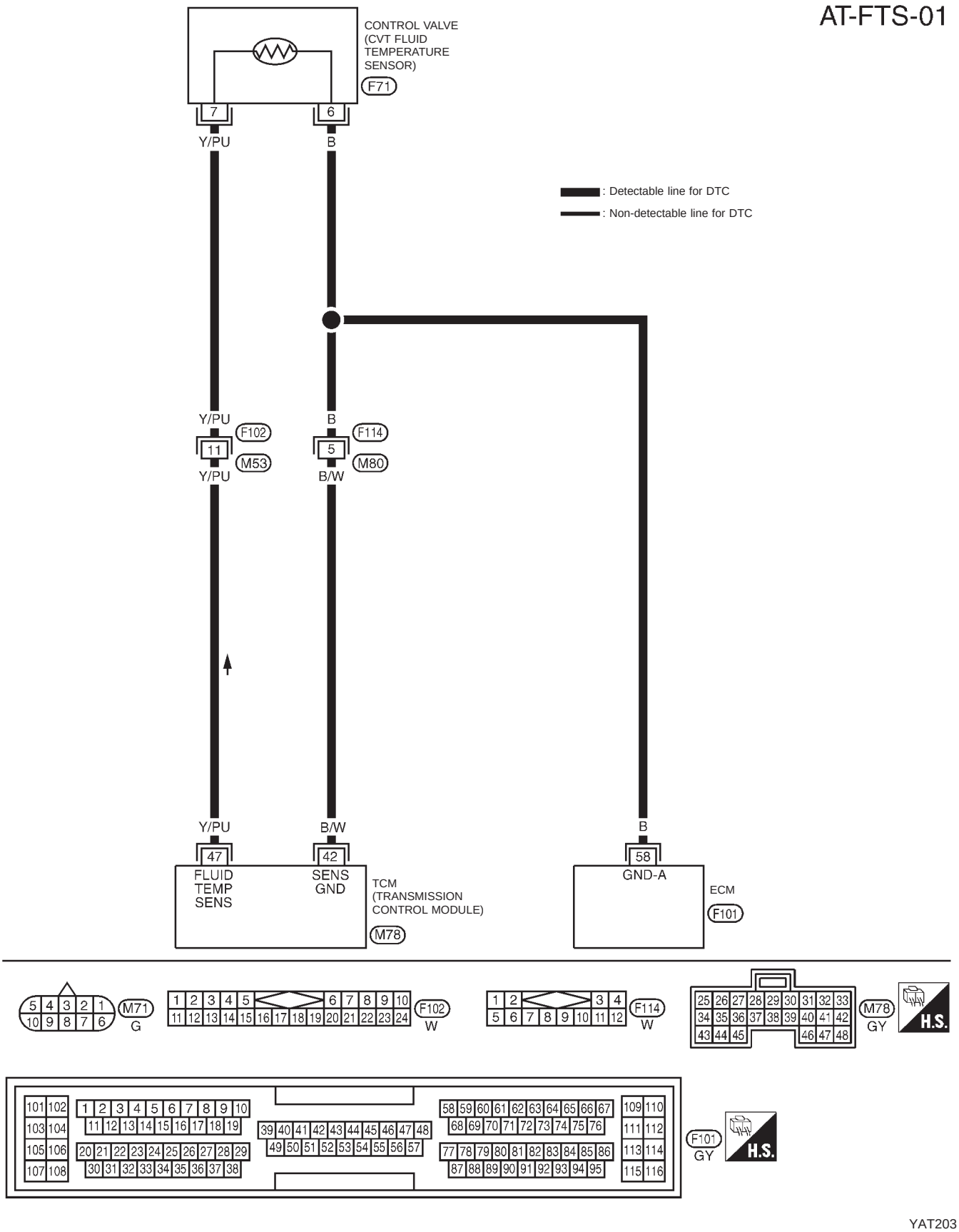
With GST

Follow the procedure "With CONSULT-II".

Wiring Diagram — AT — FTS

NCAT0200

AT-FTS-01



YAT203

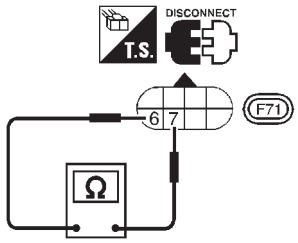
Diagnostic Procedure

NCAT0036

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



SAT419JA

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 “ECU 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

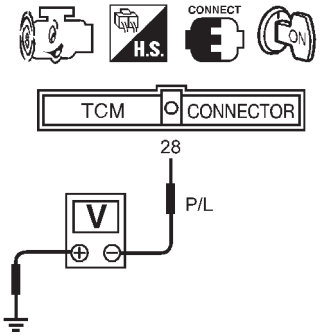
OK	▶	GO TO 4.
NG	▶	**Check the following item:** • Harness for short to ground or short to power or open between TCM, ECM and terminal cord assembly (Main harness) • Ground circuit for ECM Refer to EC section (“TROUBLE DIAGNOSIS FOR POWER SUPPLY”).

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.

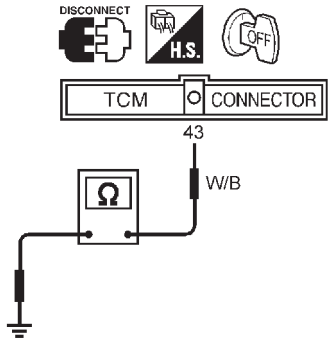
Voltage:
Cold [20°C (68°F)] → Hot [80°C (176°F)]:
Approximately 1.5V → 0.5V



SAT420JA

3. Turn ignition switch to "OFF" position.
4. Disconnect TCM harness connector.
5. Check continuity between terminal 42 and ground.

Continuity should exist.



SAT421J

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, AT-55.

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.

Description

NCAT0220

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

TCM TERMINALS AND REFERENCE VALUE

NCAT0220S01

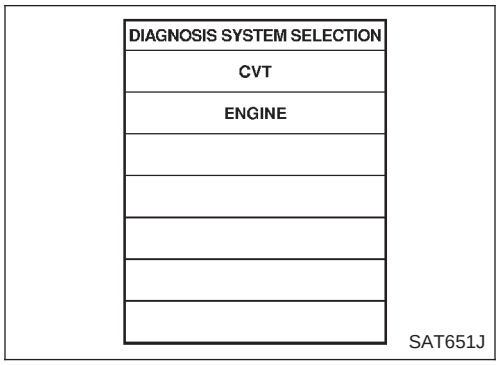
Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard
38	G/Y	Primary speed sensor	When driving (L position, 20 km/h), the pulse measurement by using the pulse measurement function of CONSULT-II.	Approx. 900 Hz

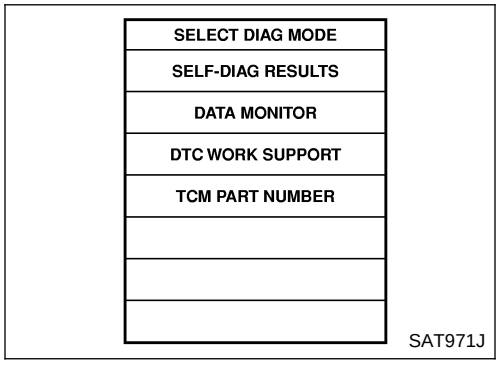
ON BOARD DIAGNOSIS LOGIC

NCAT0220S02

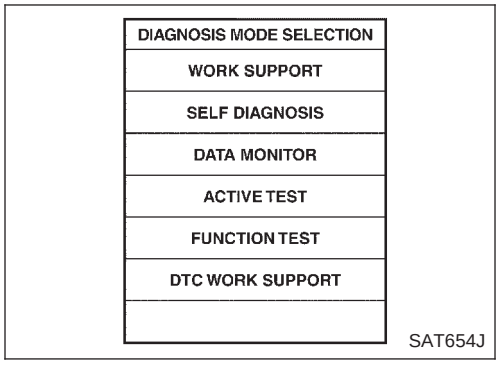
Diagnostic trouble code	Malfunction is detected when ...	Check items (Possible cause)
: PRI SPEED SIG/CIRC	TCM does not receive the proper voltage signal from the sensor.	• Harness or connectors (The sensor circuit is open or shorted.) • Primary speed sensor
: P0715		
: MI Code No. 0715		



SAT651J



SAT971J



SAT654J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0220S03

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

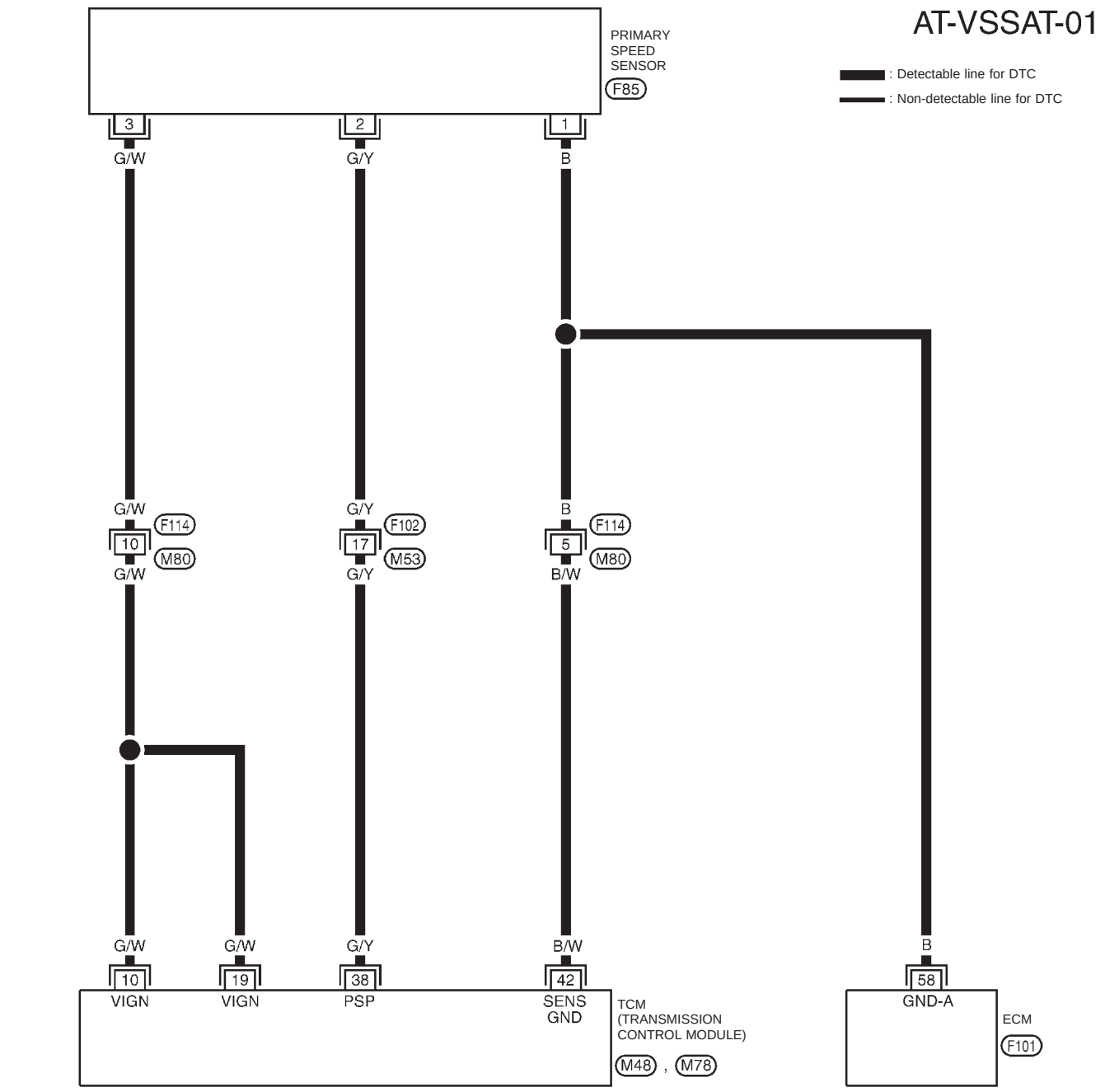
1) Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
2) Start engine and maintain the following conditions for at least 5 consecutive seconds.
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   THRTL POS SEN: More than 1.3V
   Selector lever: D position
   ENG SPEED: 450 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", AT-61.

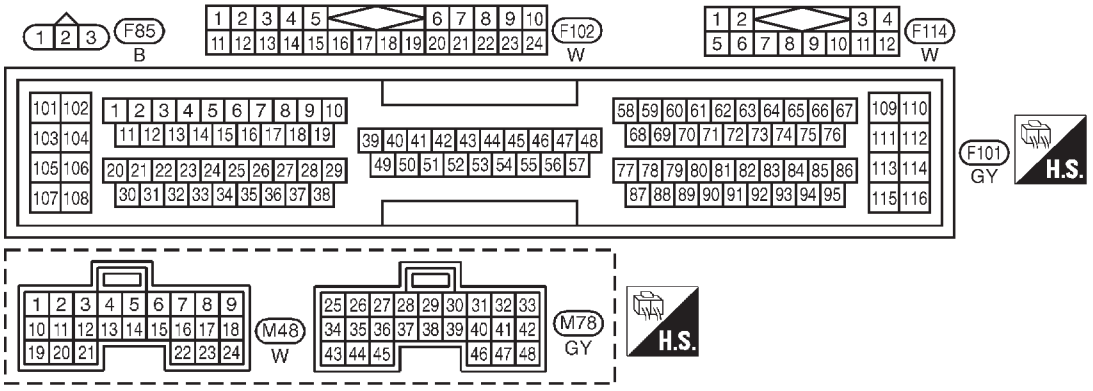
With GST

Follow the procedure "With CONSULT-II".

Wiring Diagram — AT — VSSA/T

NCAT0221





YAT204

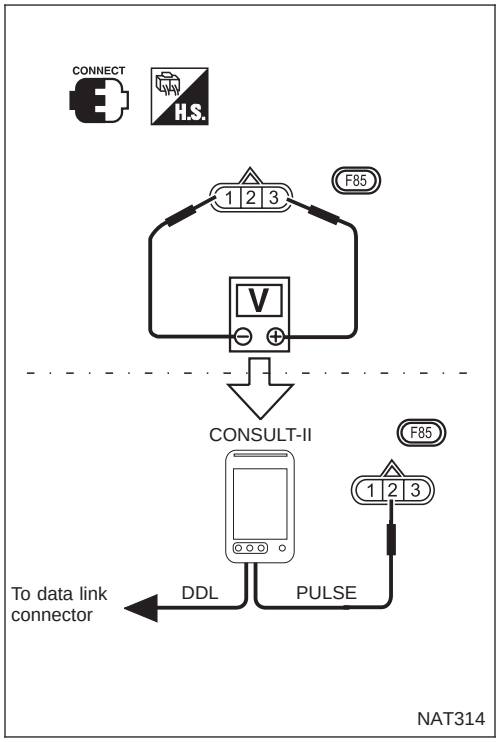
Diagnostic Procedure

NCAT0222

1	CHECK PRIMARY SPEED SENSOR
Refer to “Component Inspection” AT-65.	
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 “ECU 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 4.
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, AT-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.



Component Inspection

NCAT0223

REVOLUTION SENSOR

NCAT0223S01

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): Approx. 900 Hz

Description

NCAT0038

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

NCAT0038S01

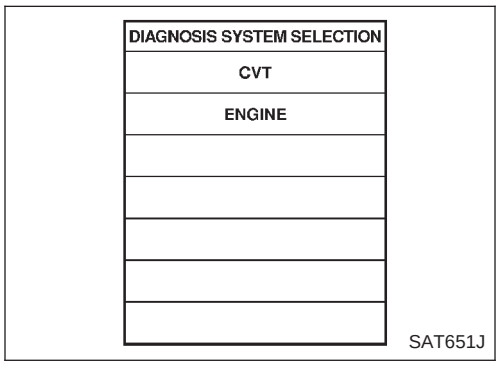
Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard
29	G/R	Secondary speed sensor	When driving (D position, 20 km/h), 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.		Approx. 600 Hz
42	B	Throttle position sensor (Ground)		—	—

ON BOARD DIAGNOSIS LOGIC

NCAT0038S02

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		



SAT651J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0038S03

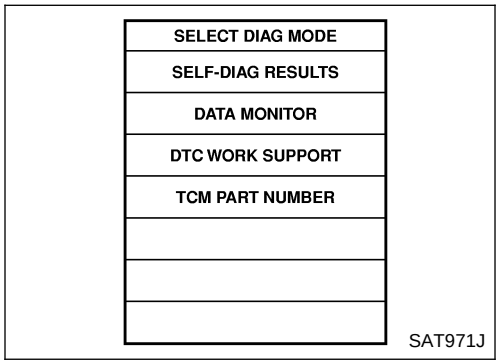
CAUTION:

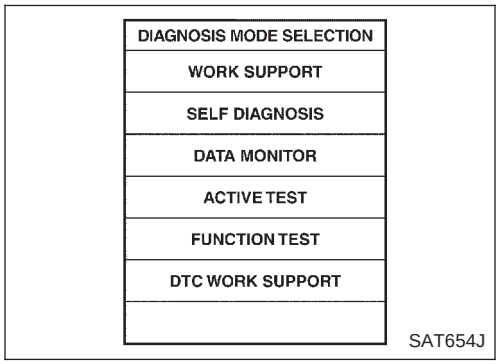
- **Always drive vehicle at a safe speed.**
- **Be careful not to rev engine into the red zone on the tachometer.**

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

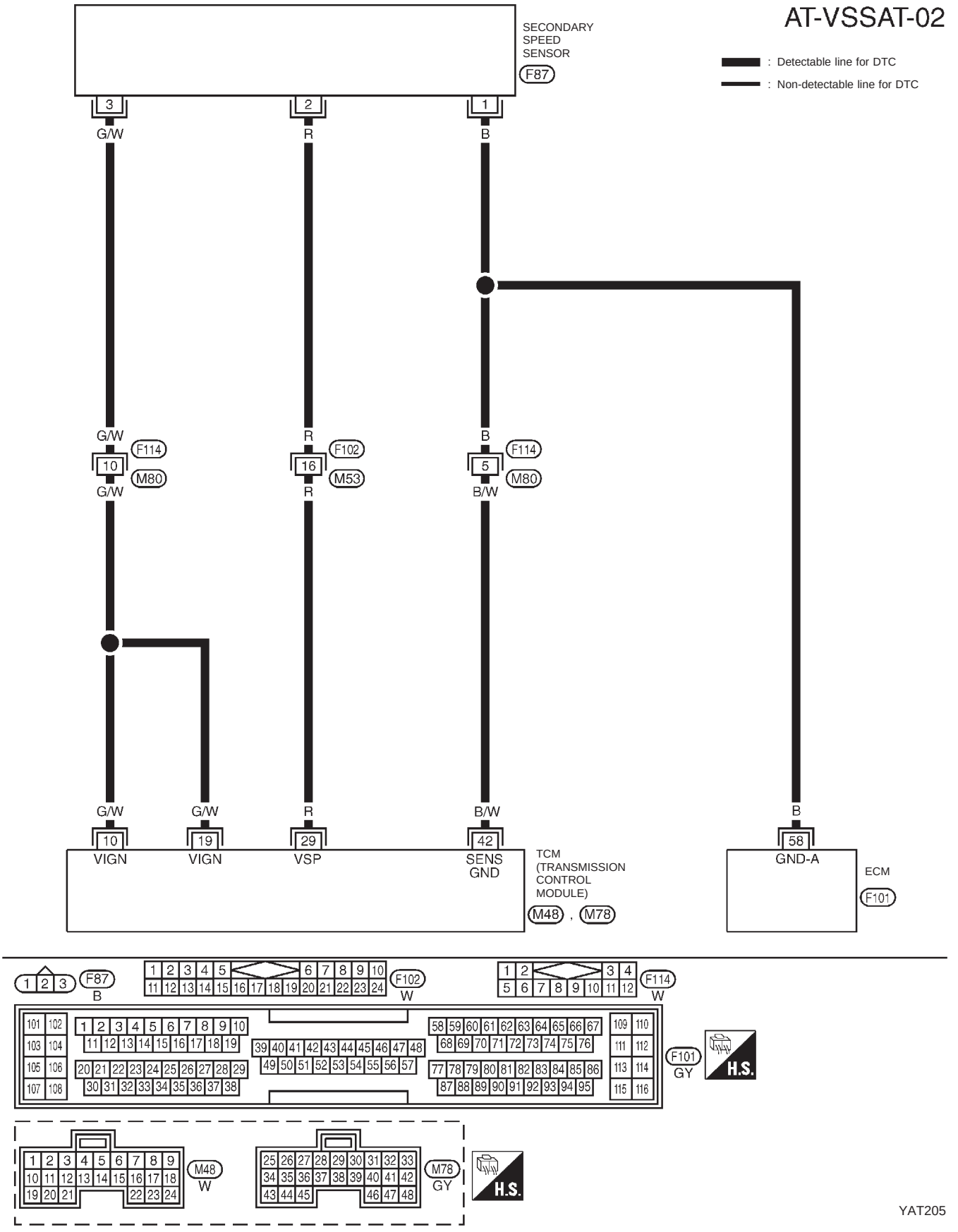
1) Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
2) Start engine and maintain the following conditions for at least 12 consecutive seconds.
   THRTL POS SEN: More than 1.3V
   Selector lever: D position
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
   If the check result is NG, go to "DIAGNOSTIC PROCEDURE", AT-65.

With GST

Follow the procedure "With CONSULT-II".

Wiring Diagram — AT — VSSA/T

NCAT0201



YAT205

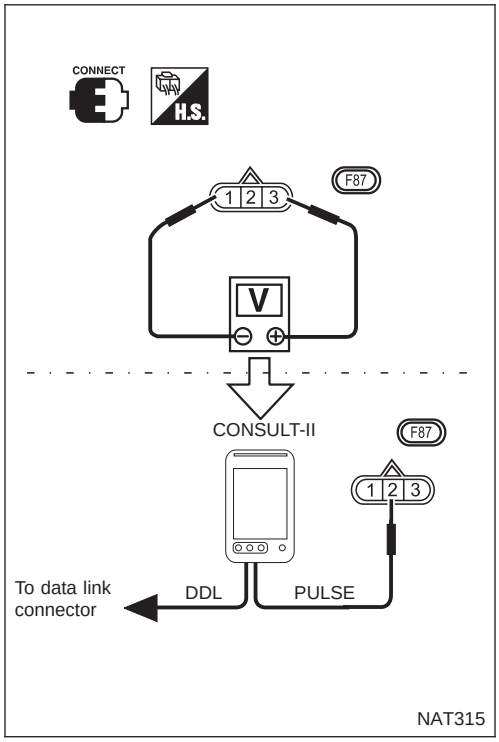
Diagnostic Procedure

NCAT0039

1	CHECK SECONDARY SPEED SENSOR
Refer to “Component Inspection” AT-65.	
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 “ECU INPUT SIGNALS” in “DATA MONITOR” mode for “CVT” with CONSULT-II. 3. Read out the value of “VEHICLE SPEED” while driving. Check the value changes according to driving speed.	
OK or NG	
OK ▶	GO TO 4.
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, AT-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.



Component Inspection

NCAT0040

SECONDARY SPEED SENSOR

NCAT0040S01

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): Approx. 600 Hz

Description

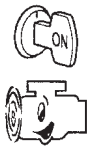
NCAT0041

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

TCM TERMINALS AND REFERENCE VALUE

NCAT0041S01

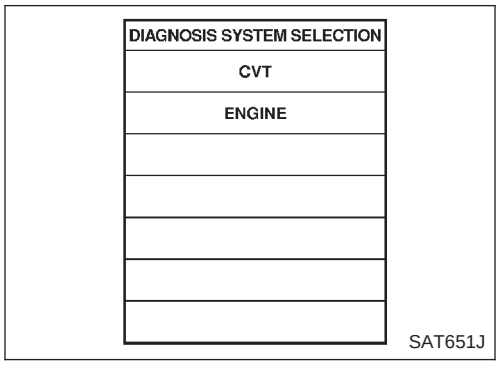
Remarks: Specification data are reference values.

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

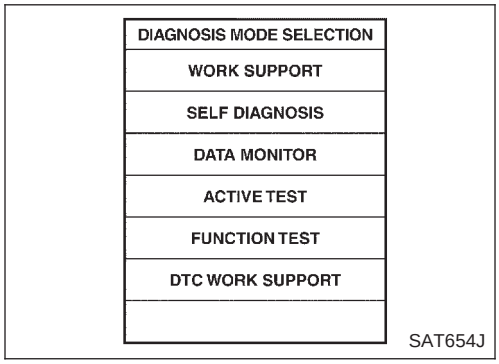
ON BOARD DIAGNOSIS LOGIC

NCAT0041S02

Diagnostic trouble code	Malfunction is detected when ...	Check item (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.)
: P0725		
: MI Code No. 0725		



SAT651J



SAT654J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0041S03

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 "ENGINE" with CONSULT-II.
2) Start engine and maintain the following conditions for at least 10 consecutive seconds.
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   THRTL POS SEN: More than 1.3V
   Selector lever: D position
   If the check result is "NG", go to "Diagnostic Procedure", AT-68.

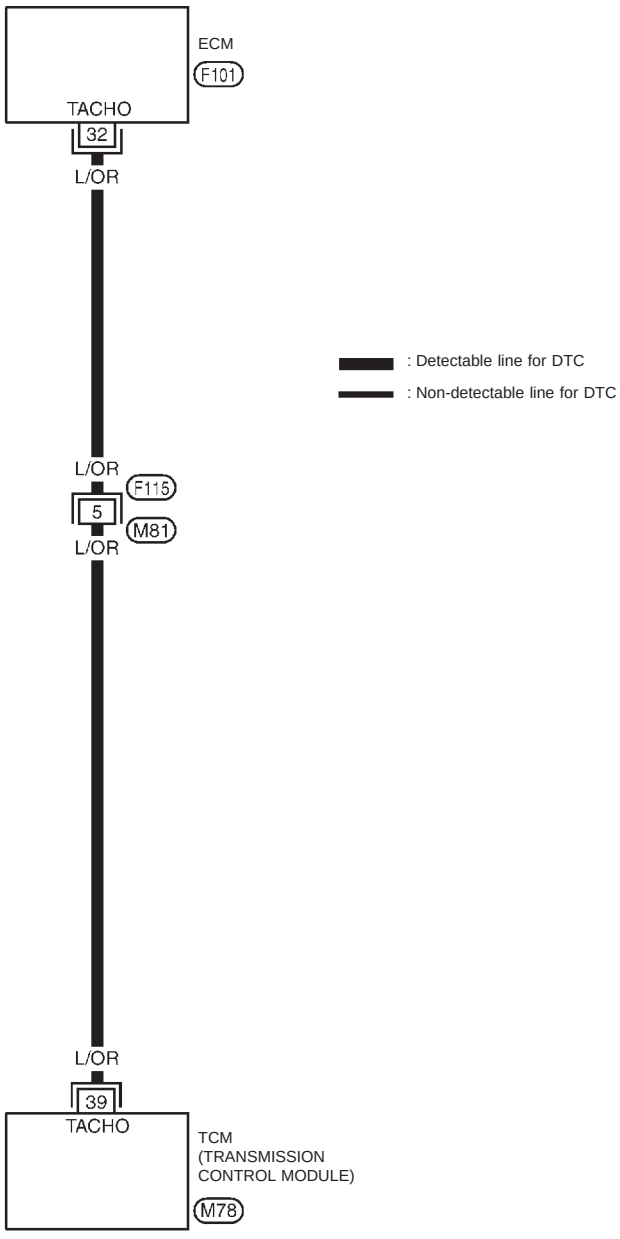
With GST

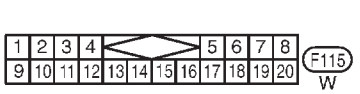
Follow the procedure "With CONSULT-II".

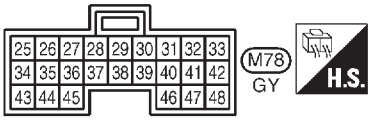
Wiring Diagram — AT — ENGSS

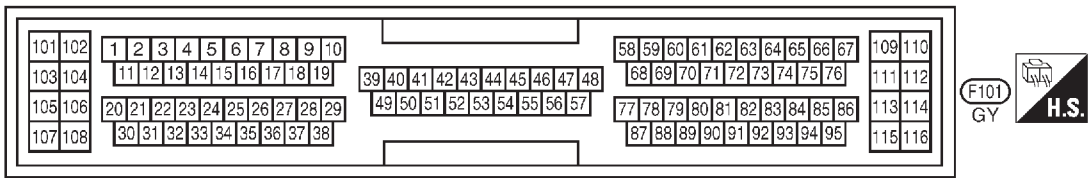
NCAT0202

AT-ENGSS-01









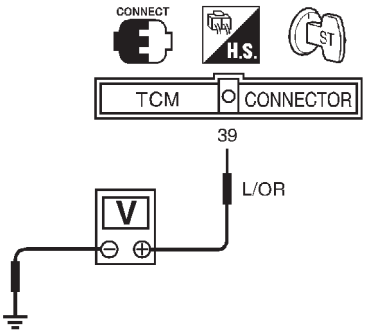
YAT206

Diagnostic Procedure

NCAT0042

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 “ECU 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**		
 SAT424JA		
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, AT-66.		
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.

Description

NCAT0055

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

NCAT0055S01

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

NCAT0055S02

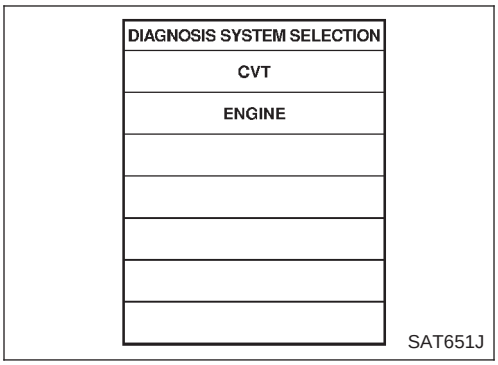
Remarks: Specification data are reference values.

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

ON BOARD DIAGNOSIS LOGIC

NCAT0055S03

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		



SAT651J

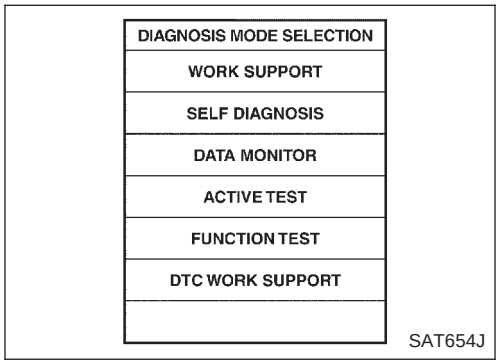
DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0055S04

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.

Description (Cont'd)



With CONSULT-II

1) Turn ignition switch "ON".
2) 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", AT-72.

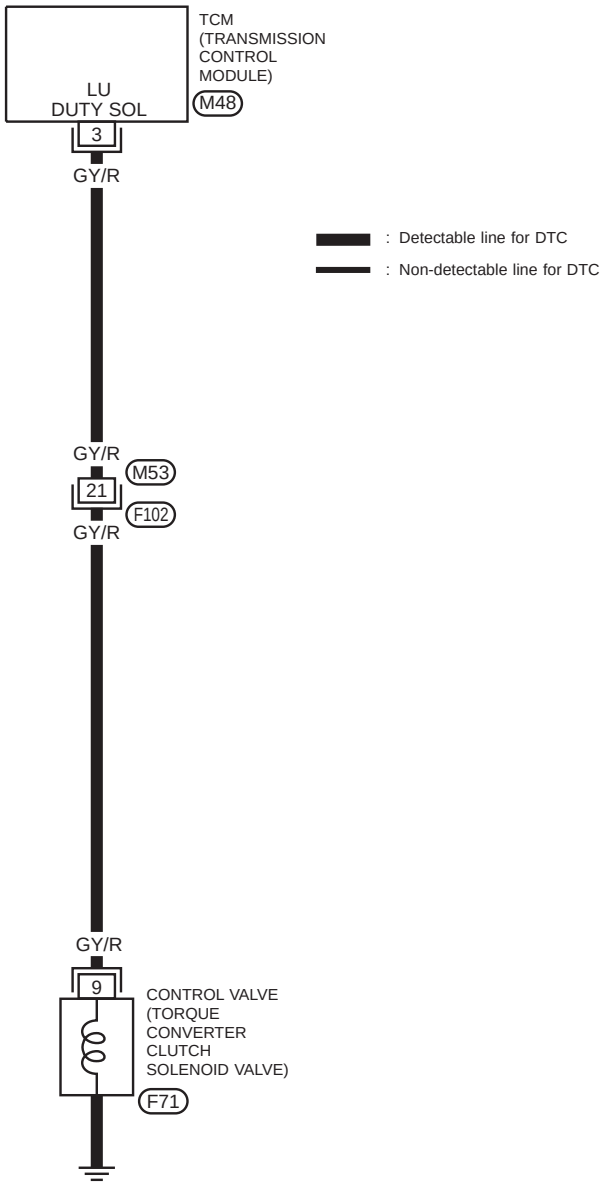
With GST

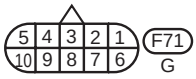
Follow the procedure "With CONSULT-II".

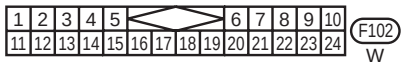
Wiring Diagram — AT — TCV

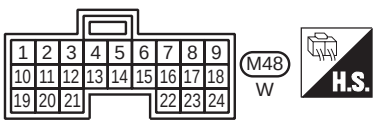
NCAT0207

AT-TCV-01









YAT149

Diagnostic Procedure

NCAT0056

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

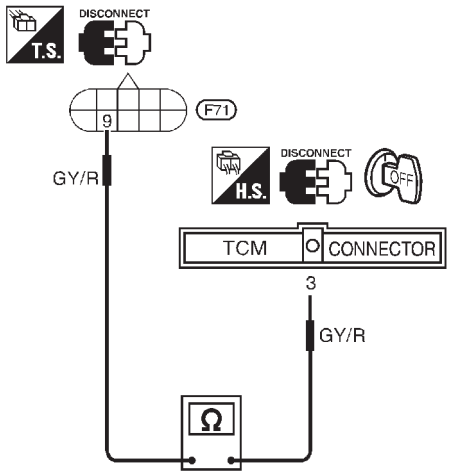
OK or NG

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.



SAT683J

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

4. Reinstall any part removed.

OK or NG

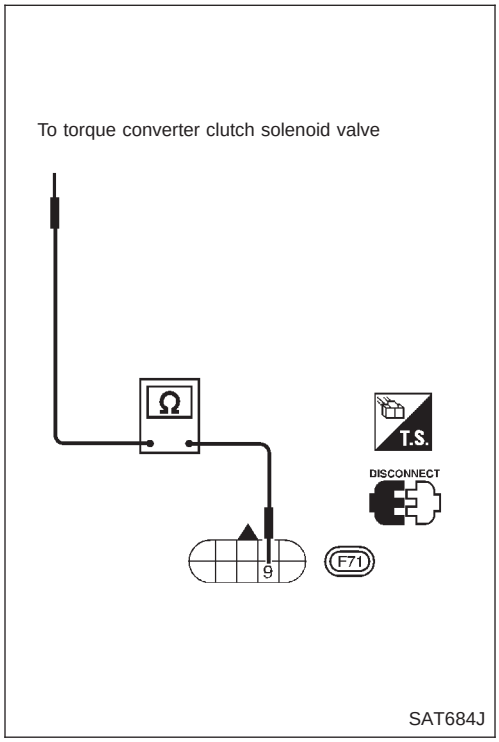
OK	▶	GO TO 3.
NG	▶	Repair open circuit or short to ground or short to power in harness or connectors.

3	CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, AT-69.

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

NCAT0057

TORQUE CONVERTER CLUTCH SOLENOID VALVE

NCAT0057S01

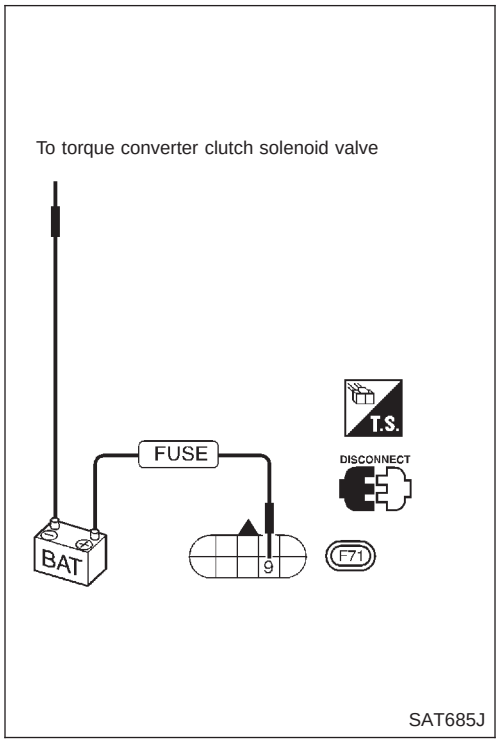
- For removal, refer to AT-116.

Resistance Check

NCAT0057S0101

- Check resistance between two terminals.

Solenoid valve	Terminal No.		Resistance (Approx.)
Torque converter clutch solenoid valve	9	Ground of TCC solenoid valve	10 - 16Ω



Operation Check

NCAT0057S0102

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

Description

NCAT0061

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

NCAT0061S01

Remarks: Specification data are reference values.

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

NCAT0061S02

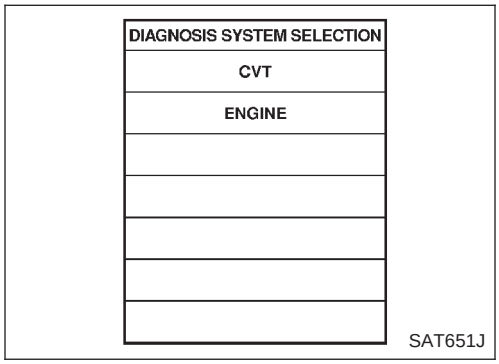
Remarks: Specification data are reference values.

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

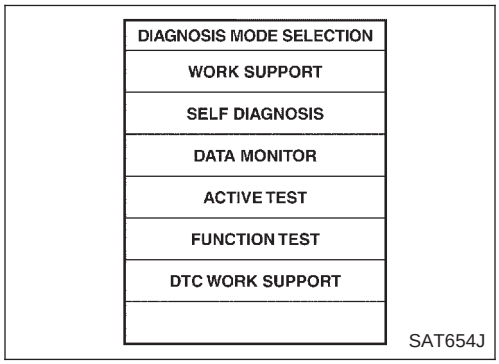
ON BOARD DIAGNOSIS LOGIC

NCAT0061S03

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		



SAT651J



SAT654J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0061S04

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", AT-77.

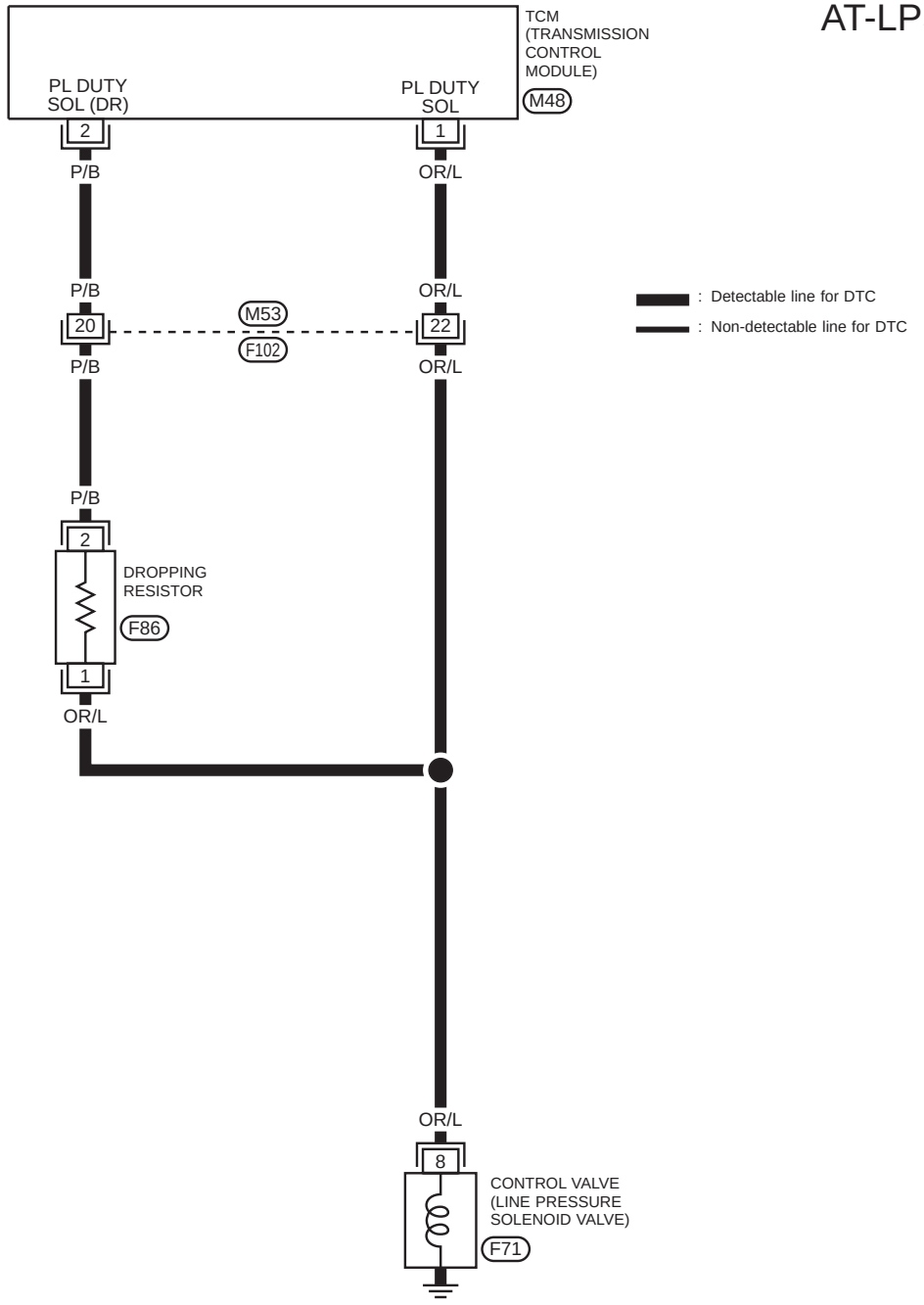
With GST

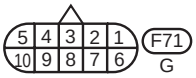
Follow the procedure "With CONSULT-II".

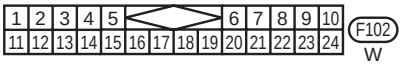
Wiring Diagram — AT — LPSV

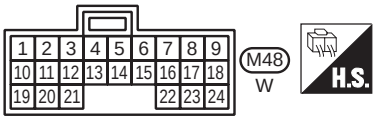
NCAT0209

AT-LPSV-01









YAT150

Diagnostic Procedure

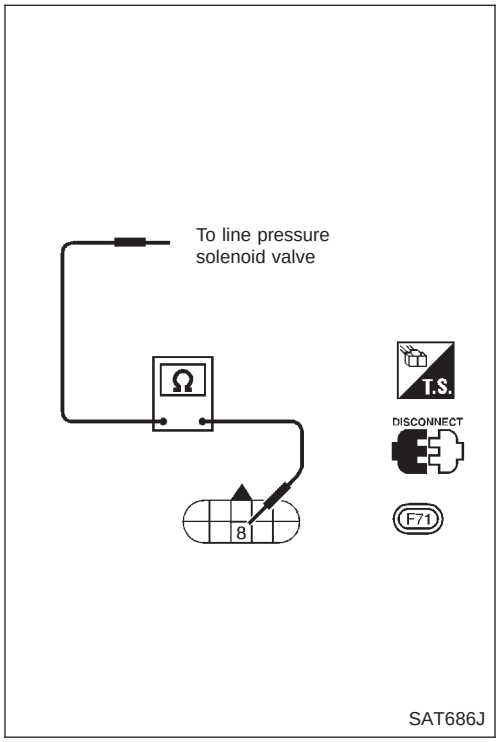
NCAT0062

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 ▶	**Check the following items:** ● Line pressure solenoid valve Refer to “Component Inspection”, AT-78. ● 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”, AT-78. ● 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, AT-75. **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.



SAT686J

Component Inspection

LINE PRESSURE SOLENOID VALVE

=NCAT0063

NCAT0063S01

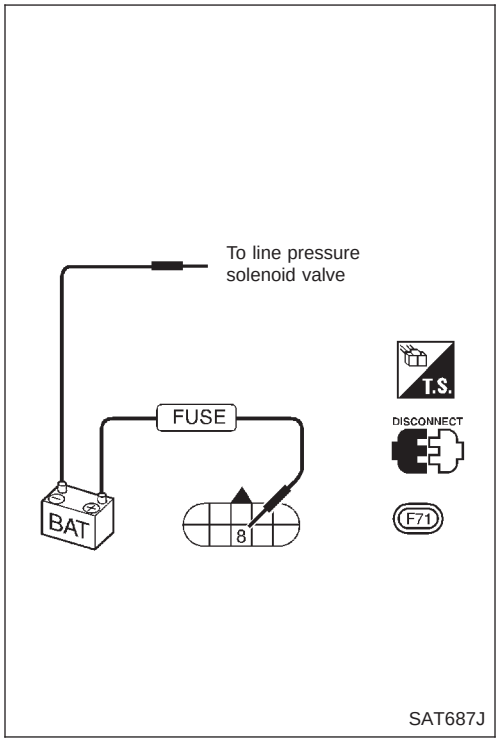
- For removal, refer to AT-116.

Resistance Check

NCAT0063S0101

- 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

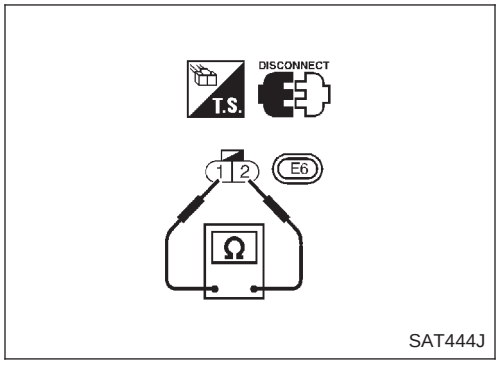


SAT687J

Operation Check

NCAT0063S0102

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



SAT444J

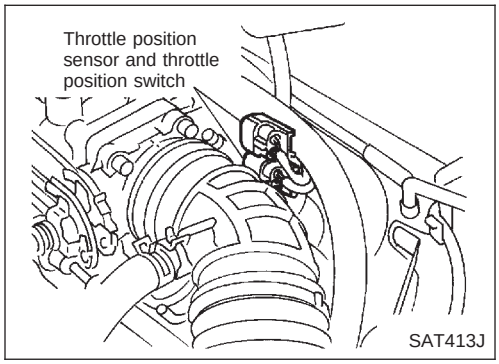
DROPPING RESISTOR

NCAT0063S02

- Check resistance between two terminals.

Resistance:

11.2 - 12.8Ω



Description

NCAT0070

- 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

NCAT0070S01

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

NCAT0070S02

Remarks: Specification data are reference values.

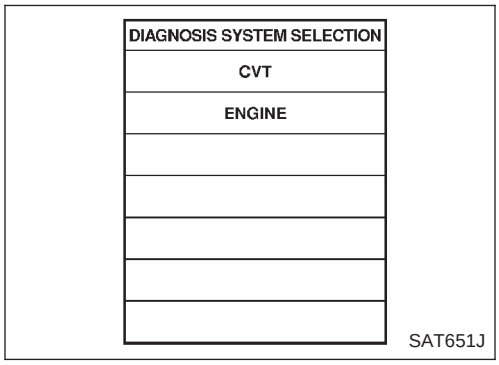
Terminal No.	Wire color	Item	Condition		Judgement standard
16	Y	Closed throttle position switch (in throttle position switch)		When releasing accelerator pedal after warming up engine.	Battery voltage
				When depressing accelerator pedal after warming up engine.	Approx. 0V
17	LG	Wide open throttle position switch (in throttle position switch)		When depressing accelerator pedal more than half-way after warming up engine.	Battery voltage
				When releasing accelerator pedal after warming up engine.	Approx. 0V
32	G	Throttle position sensor (Power source)		When turning ignition switch to “ON”.	4.5 - 5.5V
				When turning ignition switch to “OFF”.	Approx. 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: Approximately 0.3V Fully-open throttle: Approximately 3V
42	B	Ground (Throttle position sensor)		—	—

Description (Cont'd)

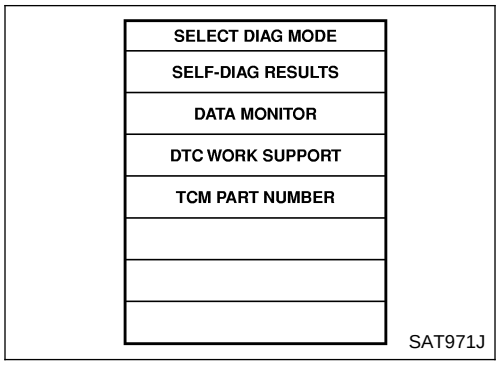
ON BOARD DIAGNOSIS LOGIC

NCAT0070S03

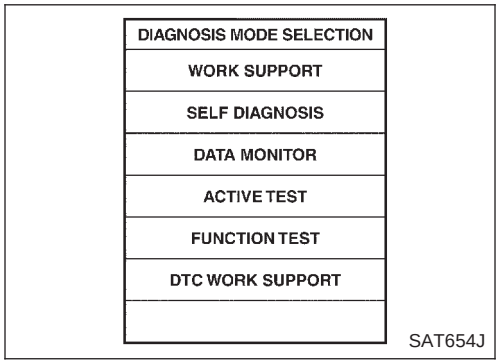
Diagnostic trouble code	Malfunction is detected when ...	Check items (Possible cause)
: TP SEN/CIRC A/T	TCM receives an excessively low or high voltage from the sensor.	• Harness or connectors (The sensor circuit is open or shorted.) • Throttle position sensor • Throttle position switch
: P1705		
: MI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



SAT651J



SAT971J



SAT654J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0070S04

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) Check the following.

Acceleratr 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

If the check result is NG, go to "DIAGNOSTIC PROCEDURE", AT-82.
If the check result is OK, go to following step.

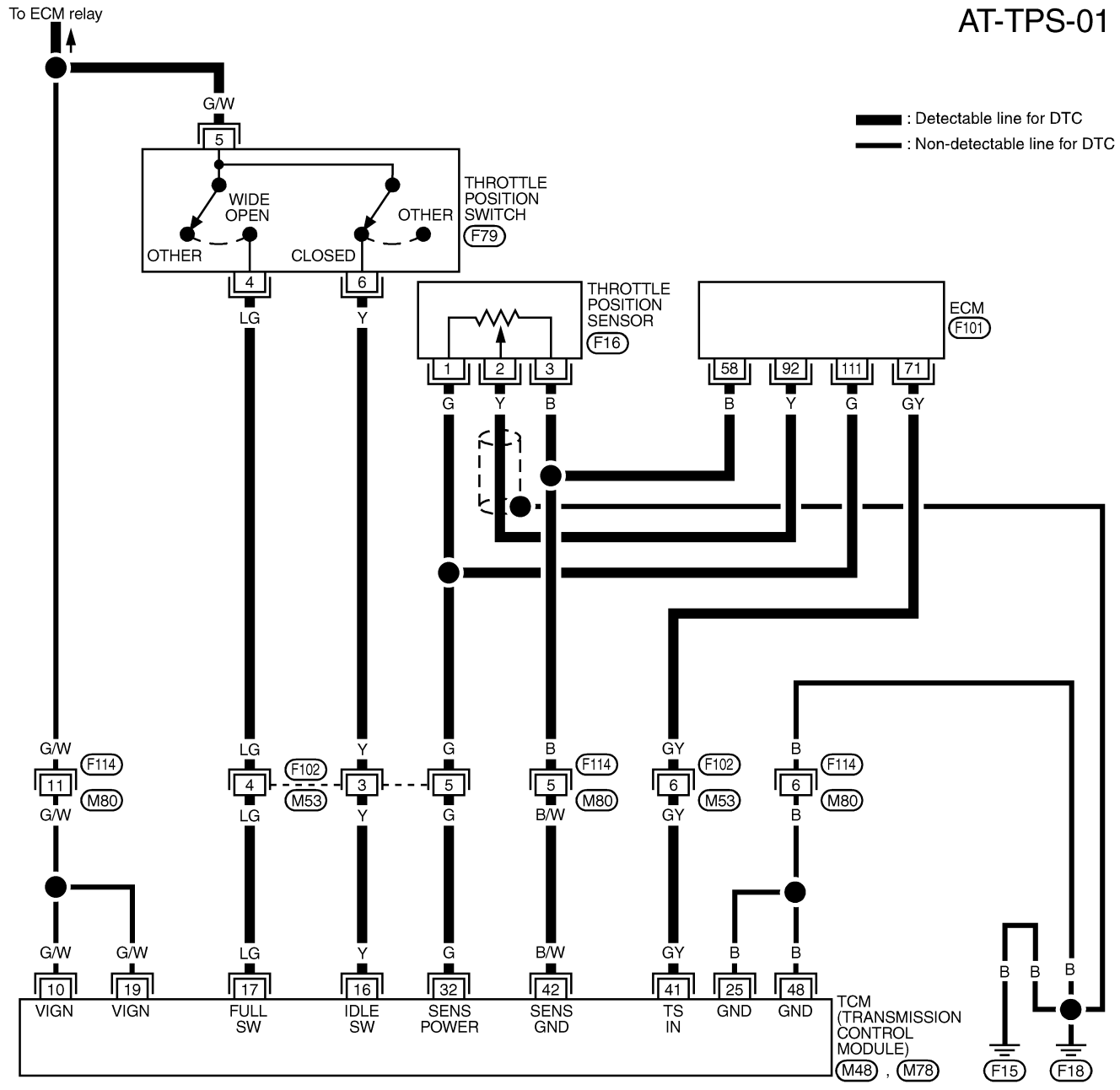
3) Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
4) Start engine and maintain the following conditions for at least 5 consecutive seconds. Then release accelerator pedal completely.
   VHCL SPEED SE: 10 km/h (6 MPH) or more
   THRTL POSI SEN: Approximately 3V or less
   Selector lever: D position
   If the check result is NG, go to "DIAGNOSTIC PROCEDURE", AT-82.

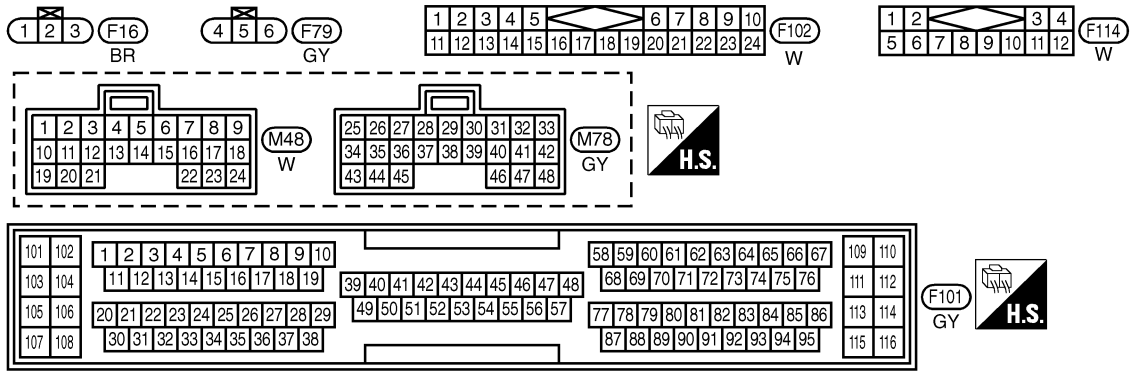
With GST

Follow the procedure "With CONSULT-II".

Wiring Diagram — AT — TPS

NCAT0212





" THE SHIELD CIRCUIT IS APPLIED FOR THE MODELS BEFORE VIN-P11U0548750 "

YAT252

Diagnostic Procedure

NCAT0071

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 “ECU 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

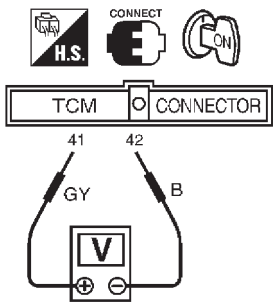
OK	▶	GO TO 4.
NG	▶	Check harness for short or open between ECM and TCM regarding throttle position sensor circuit. (Main harness)

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)



SAT453J

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. Turn ignition switch to "ON" position.
   (Do not start engine.)
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. 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

MTLB0011

OK or NG

OK	▶	GO TO 6.
NG	▶	**Check the following items:** ● Throttle position switch — Refer to "Components Inspection", AT-85. ● Harness for short or open between ignition switch and throttle position switch (Main harness) ● Harness for short or open between throttle position switch and TCM (Main harness)

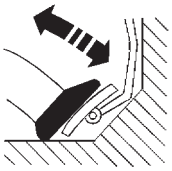
5	CHECK THROTTLE POSITION SWITCH CIRCUIT (Without CONSULT-II)

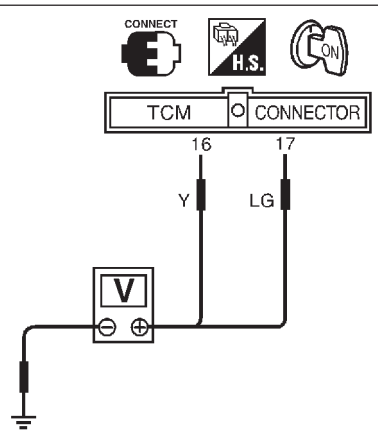
Without CONSULT-II

1. Turn ignition switch to "ON" position.
   (Do not start engine.)
2. Check voltage between TCM terminals 16, 17 and ground while depressing, and releasing accelerator pedal slowly. (After warming up engine)

Accelerator pedal condition	Voltage	
	Terminal No. 16	Terminal No. 17
Released	Battery voltage	1V or less
Fully depressed	1V or less	Battery voltage

MTBL0137





SAT454J

OK or NG

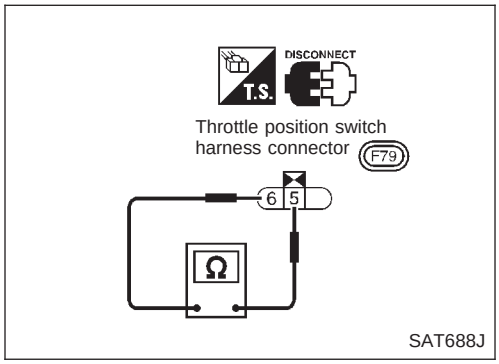
OK	▶	GO TO 6.
NG	▶	**Check the following items:** ● Throttle position switch — Refer to "Components Inspection", AT-85. ● Harness for short or open between ignition switch and throttle position switch (Main harness) ● Harness for short or open between throttle position switch and TCM (Main harness)

6	CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, AT-80.

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

=NCAT0072

THROTTLE POSITION SWITCH

NCAT0072S01

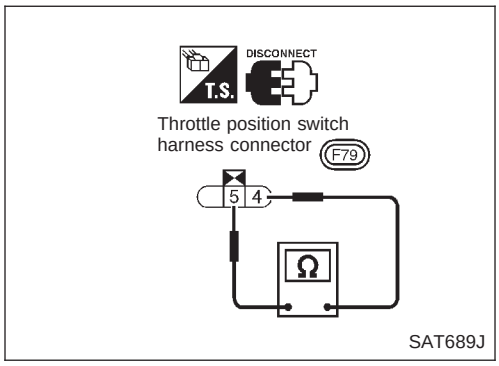
Closed Throttle Position Switch (Idle position)

NCAT0072S0101

- Check continuity between terminals 5 and 6.

Accelerator pedal condition	Continuity
Released	Yes
Depressed	No

- To adjust closed throttle position switch, refer to EC section (“Basic Inspection”, “TROUBLE DIAGNOSIS — Basic Inspection”).



Wide Open Throttle Position Switch

NCAT0072S0102

- Check continuity between terminals 5 and 4.

Accelerator pedal condition	Continuity
Released	No
Depressed	Yes

Description

NCAT0224

- 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

NCAT0224S01

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

NCAT0224S02

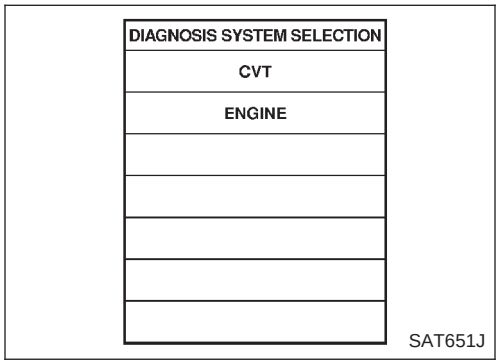
Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard
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

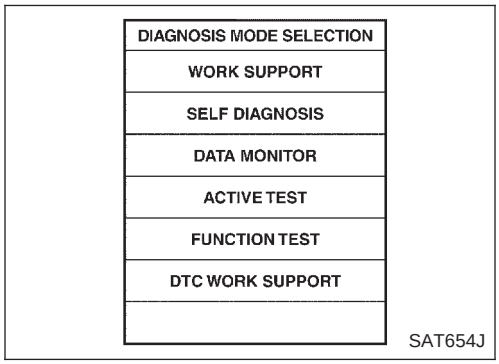
ON BOARD DIAGNOSIS LOGIC

NCAT0224S03

Diagnostic trouble code	Malfunction is detected when ...	Check items (Possible cause)
: STEP MOTOR/CIRC	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
: P1777		
: MI Code No. 1777		



SAT651J



SAT654J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0224S04

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

1) Turn ignition switch "ON" and select "DATA MONITOR" mode for "ENGINE" with CONSULT-II.
2) Drive vehicle for at least 5 consecutive seconds.
   If the check result is "NG", go to "Diagnostic Procedure", AT-89.

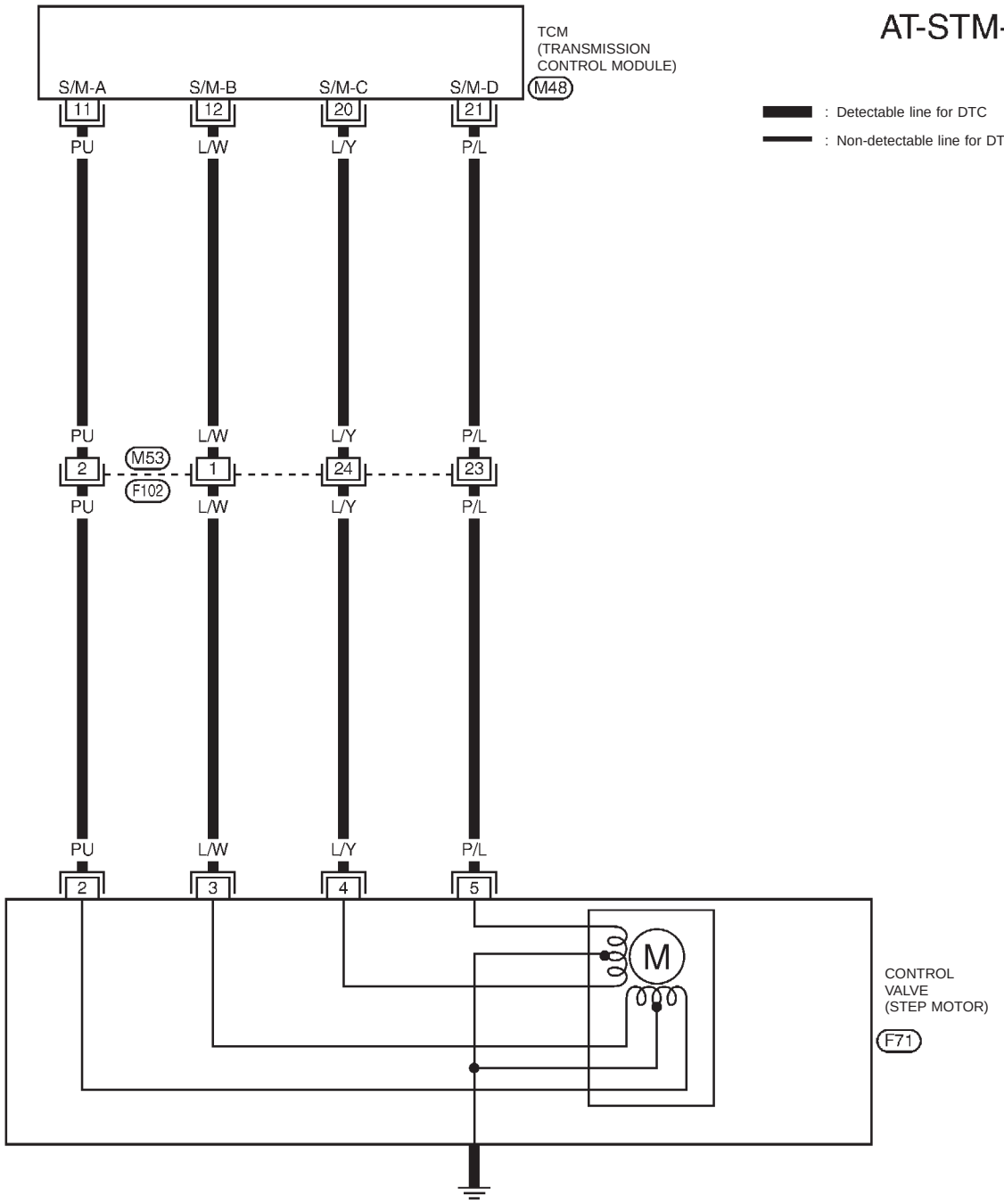
With GST

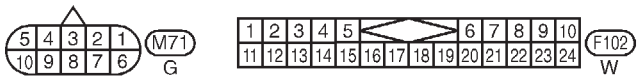
Follow the procedure "With CONSULT-II".

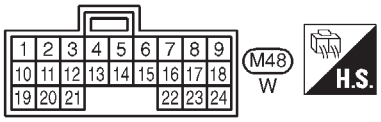
Wiring Diagram — AT — STM

NCAT0225

AT-STM-01







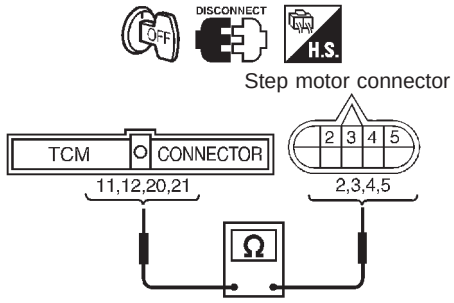
YAT208

Diagnostic Procedure

NCAT0226

1	CHECK POWER SOURCE CIRCUIT

1. Turn ignition switch to “ON” position.
2. Check “SELF-DIAGNOSIS” with CONSULT-II.
3. If “CVT SAFE FUNCTION” activate, refer to “CVT SAFE FUNCTION” AT-99.
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.



SAT655J

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

7. Reinstall any part removed.

OK or NG

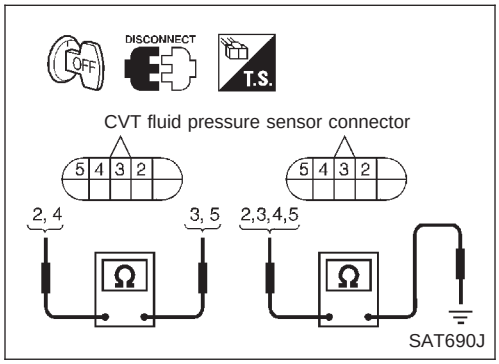
OK	▶	GO TO 2.
NG	▶	Repair open circuit or short to ground or short to power in harness or connectors.

2	CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, AT-91.

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

=NCAT0227

STEP MOTOR

NCAT0227S01

Resistance Check

NCAT0227S0101

- 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	

Description

NCAT0228

- 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

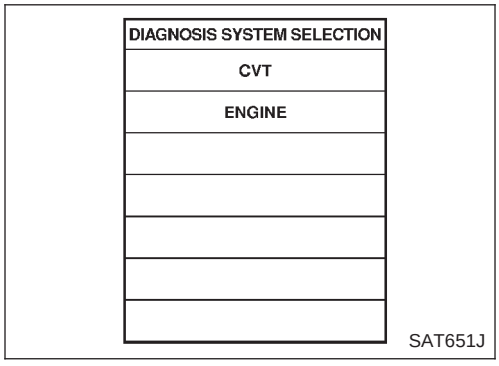
NCAT0228S01

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

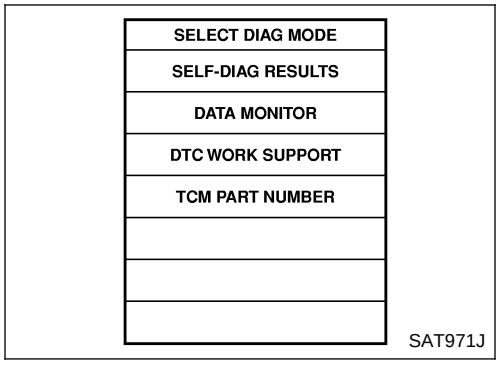
ON BOARD DIAGNOSIS LOGIC

NCAT0228S03

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		



SAT651J



SAT971J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0228S04

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:

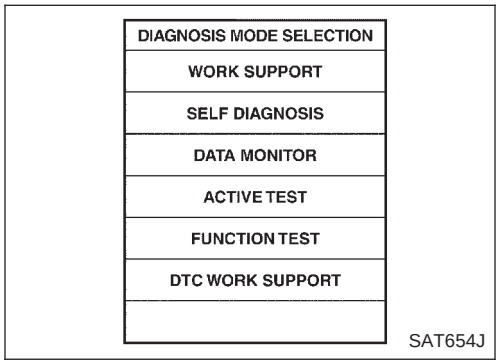
If “DIAGNOSTIC TROUBLE CODE CONFIRMATION PROCEDURE” has been previously conducted, always turn ignition switch “OFF” and wait at least 5 seconds before conducting the next test.

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

With CONSULT-II

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

Description (Cont'd)



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 "ENGINE" 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 "DIAGNOSTIC PROCEDURE", AT-93.

With GST

Follow the procedure "With CONSULT-II".

Diagnostic Procedure

NCAT0230

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.

Description

NCAT0232

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

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

NCAT0232S01

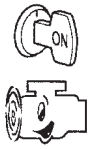
Remarks: Specification data are reference values.

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

TCM TERMINALS AND REFERENCE VALUE

NCAT0232S02

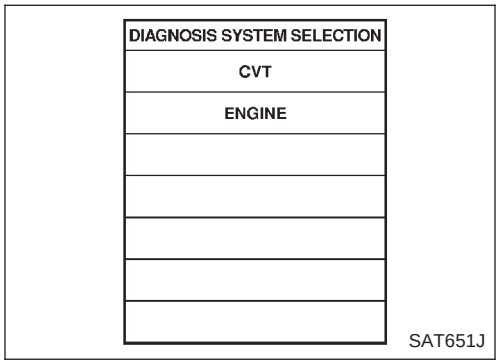
Remarks: Specification data are reference values.

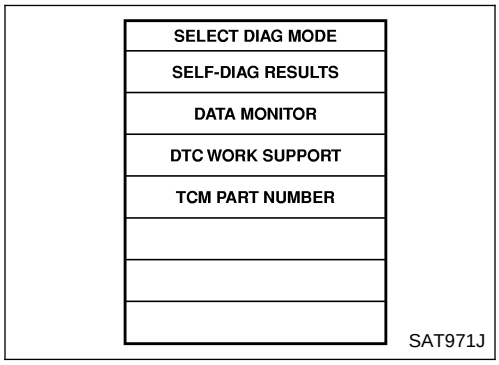
Terminal No.	Wire color	Item	Condition		Judgement standard
37	W/G	CVT fluid pressure sensor		When engine runs at idle speed.	Approx. 1.0 V
				When engine runs at stall speed.	Approx. 4.0V
42	B			—	—
46	P/L			—	4.5 - 5.5 V

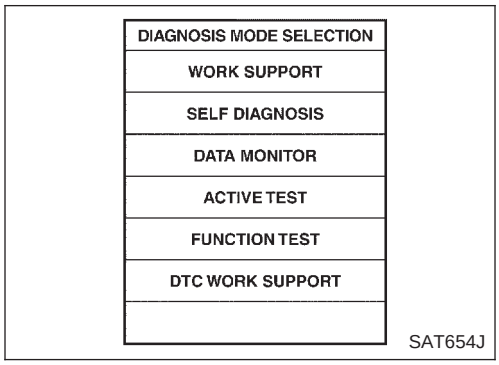
ON BOARD DIAGNOSIS LOGIC

NCAT0232S03

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.) • CVT fluid pressure sensor
: P1791		
: MI Code No. 1791		







DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0232S04

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

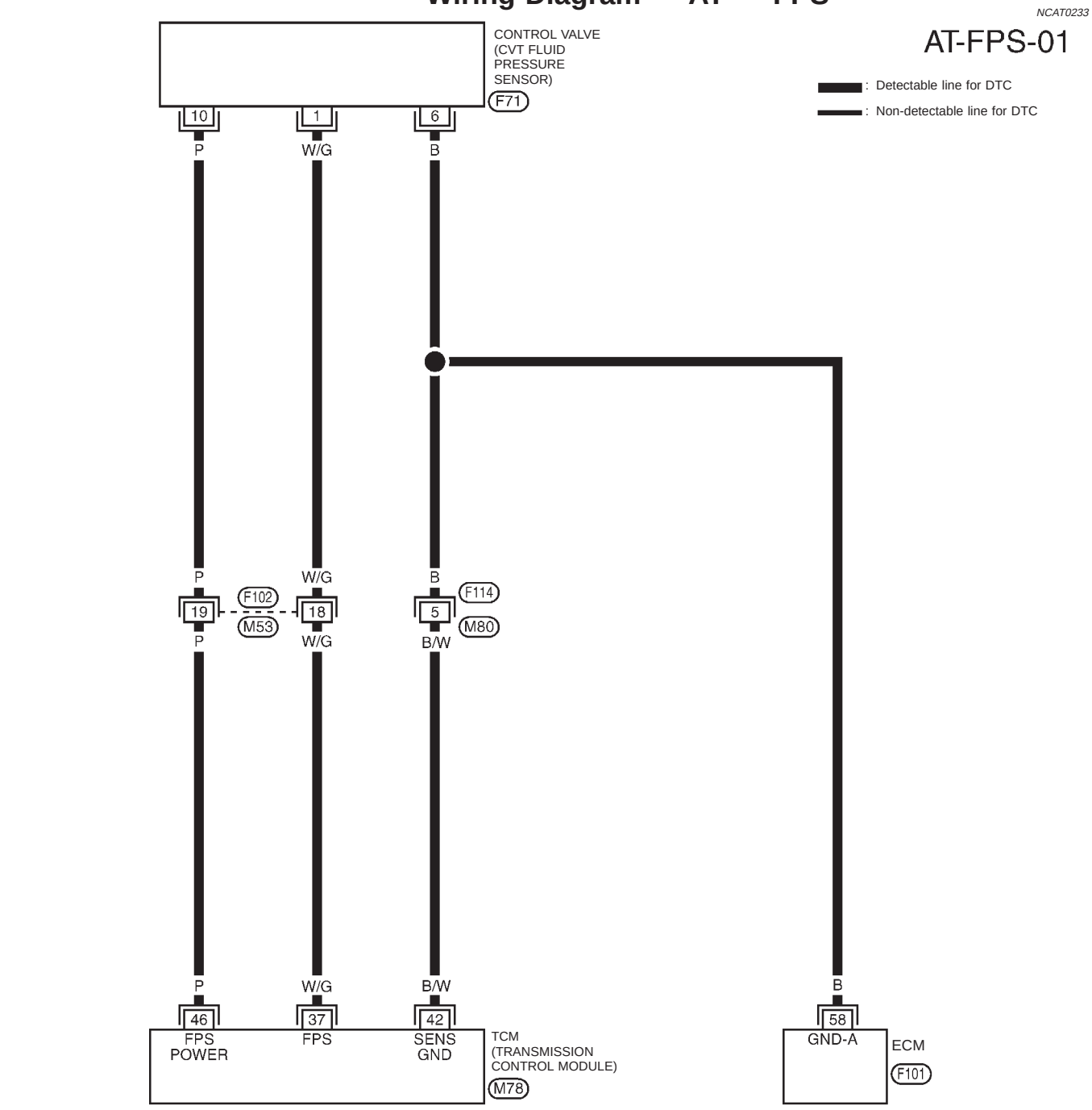
1) Turn ignition switch "ON" and select "DATA MONITOR" mode for "CVT" with CONSULT-II.
2) Make sure that output voltage of CVT fluid temperature sensor is within the range below.
   FLUID TEMP SEN: 0.5 - 1.5V
   If out of range, drive the vehicle to decrease the voltage (warm up the fluid) or stop engine 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 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", AT-97.

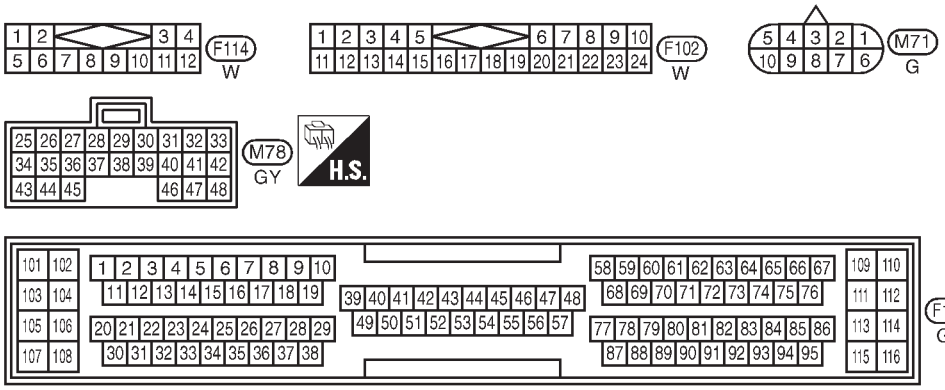
With GST

Follow the procedure "With CONSULT-II".

Wiring Diagram — AT — FPS

NCAT0233





YAT209

Diagnostic Procedure

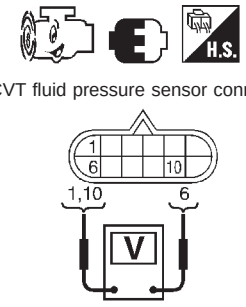
NCAT0234

1	CHECK PRESSURE SENSOR
Refer to “Component Inspection”, AT-98.	
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 “ECU Input Item Parameter List” 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 4.
NG ▶	**Check the following items:** ● Harness for short or open between TCM, ECM and CVT fluid 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 Refer to “Component Inspection”, AT-98.	
OK or NG	
OK ▶	GO TO 4.
NG ▶	**Check the following items:** ● Harness for short or open between TCM, ECM and CVT fluid pressure sensor (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, AT-95.	
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

=NCAT0235

CVT FLUID PRESSURE SENSOR

NCAT0235S01

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

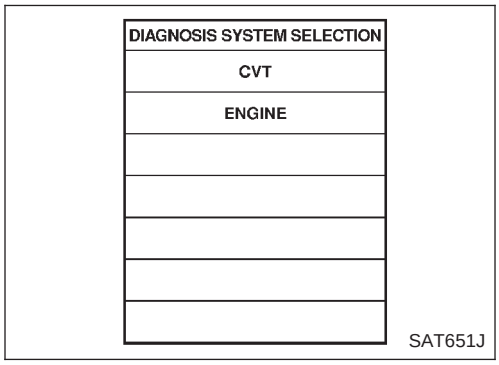
Terminal No.		Voltage
1	6	Approx. 0.5 - 4.5V
6	10	Approx. 4.5 - 5.5V

Description

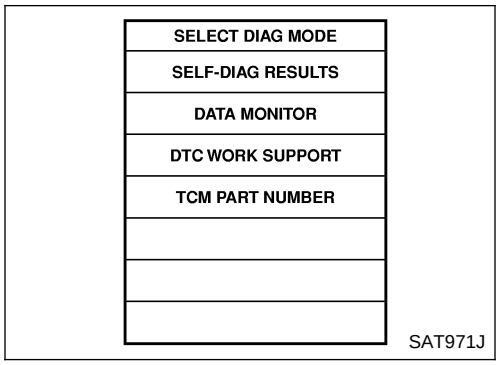
“CVT SAFE FUNCTION” is function to protect CVT.

ON BOARD DIAGNOSIS LOGIC

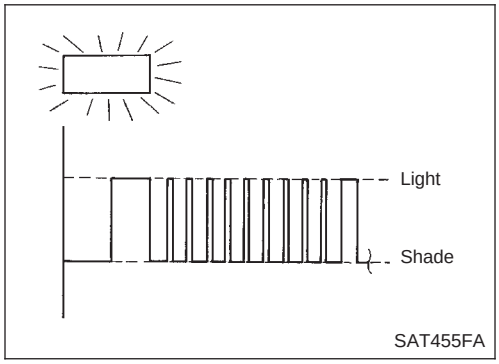
Diagnostic trouble code	Malfunction is detected when ...	Check items (Possible cause)
: CVT SAFE FUNCTION	TCM is malfunctioning	TCM
: 10th judgement flicker		



SAT651J



SAT971J



SAT455FA

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

With CONSULT-II

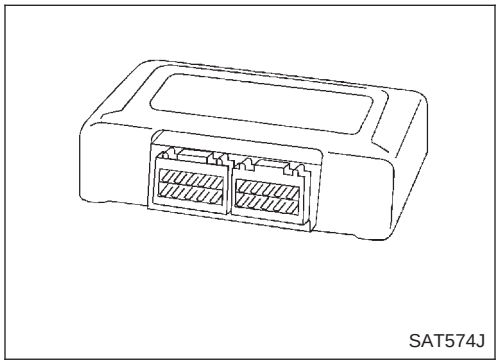
1) Turn ignition switch “ON” and select “DATA MONITOR” mode for CVT with CONSULT-II.
2) Start engine.
3) Run engine for at least 2 seconds at idle speed.

Without CONSULT-II

1) Start engine.
2) Perform self-diagnosis. Refer to SELF-DIAGNOSTIC PROCEDURE (Without CONSULT-II), AT-25.

Diagnostic Procedure

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”. See previous page. **Is the “CVT SAFE FUNCTION” displayed again?**		
YES	▶	Replace TCM
NO	▶	**INSPECTION END**



SAT574J

Description

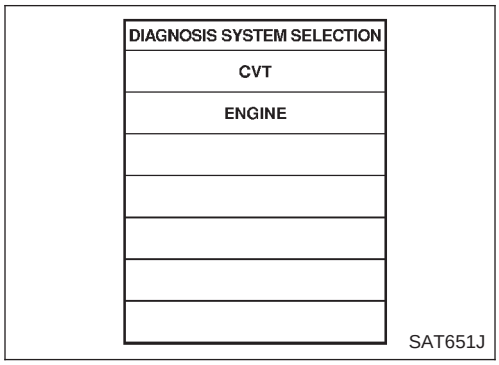
NCAT0239

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

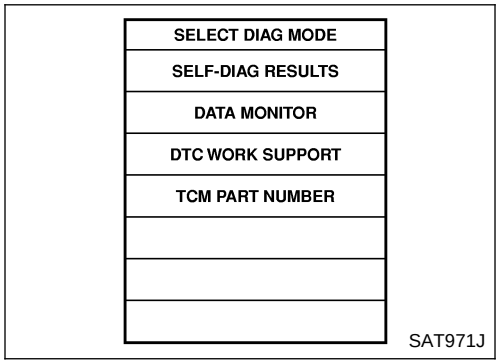
ON BOARD DIAGNOSIS LOGIC

NCAT0239S01

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



SAT651J



SAT971J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0239S02

NOTE:

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

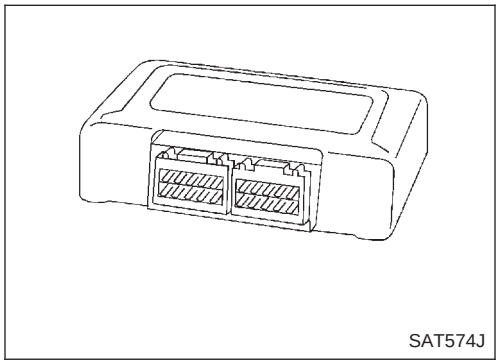
With CONSULT-II

1) Turn ignition switch "ON" and select "DATA MONITOR" mode for CVT with CONSULT-II.
2) Start engine.
3) Run engine for at least 2 seconds at idle speed.

Diagnostic Procedure

=NCAT0240

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. See previous page. **Is the “CONTROL UNIT (RAM) or CONTROL UNIT (ROM)” displayed again?**		
Yes	▶	Replace TCM.
No	▶	**INSPECTION END**



SAT574J

Description

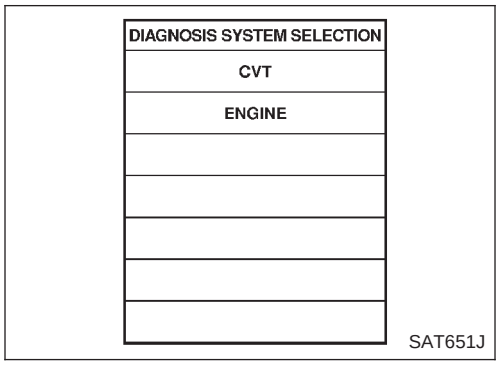
NCAT0241

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

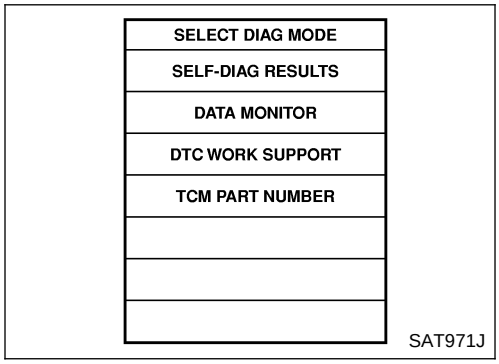
ON BOARD DIAGNOSIS LOGIC

NCAT0241S01

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



SAT651J



SAT971J

DIAGNOSTIC TROUBLE CODE (DTC) CONFIRMATION PROCEDURE

NCAT0241S02

NOTE:

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

With CONSULT-II

1) Turn ignition switch "ON" and select "DATA MONITOR" mode for CVT with CONSULT-II.
2) Start engine.
3) Run engine for at least 2 seconds at idle speed.

Diagnostic Procedure

=NCAT0242

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. See previous page. **Is the “CONT UNIT (EEPROM)” displayed again?**		
Yes	▶	Replace TCM.
No	▶	**INSPECTION END**

PNP Switch, Stop Lamp Switch and Throttle Position Switch

NAAT0204

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

DESCRIPTION

NAT0204S01

- PNP switch
- The PNP switch assemble includes a transmission range switch. The transmission range 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.

1	CHECK PNP SWITCH CIRCUIT (With CONSULT-II)

With CONSULT-II

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

DIAGNOSIS SYSTEM SELECTION
CVT
ENGINE

SAT651J

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 "Component Inspection", AT-53. ● 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 EL section ("POWER SUPPLY ROUTING"). ● Diode (P, N positions)

2	CHECK PNP SWITCH CIRCUIT (Without CONSULT-II)

With 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 "Component Inspection", AT-53. ● 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 EL section ("POWER SUPPLY ROUTING"). ● Diode (P, N positions)

3	CHECK PNP SWITCH CIRCUIT (With CONSULT-II)

With CONSULT-II

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

DIAGNOSIS SYSTEM SELECTION
CVT
ENGINE

SAT651J

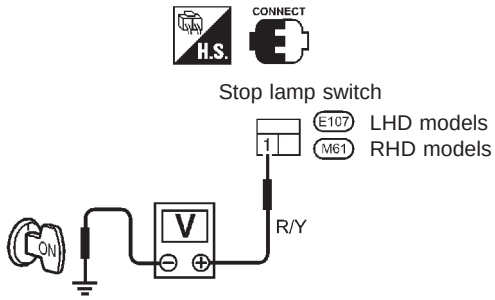
3. Read out "BRAKE SW" moving brake pedal to each position.
   Check the signal of the brake pedal is indicated properly.

OK or NG

OK	▶	GO TO 5.
NG	▶	**Check the following items:** ● Harness for short or open between fuse block and PNP switch harness terminal 3 ● Fuse ● Ignition switch (Refer to EL section.)

4	CHECK STOP LAMP SWITCH CIRCUIT (Without CONSULT-II)

1. Turn ignition switch to "ON" position.
   (Do not start engine.)
2. Check voltage between stop lamp switch harness terminal 1 and ground. Refer to "Wiring Diagram — CVT — MAIN", AT-45.



SAT733J

Does battery voltage exist?

OK	▶	GO TO 5.
NG	▶	**Check the following items:** ● Harness for short or open between battery and stop lamp switch harness terminal 1 ● Fuse ● Ignition switch (Refer to EL section.)

5	CHECK THROTTLE POSITION SWITCH CIRCUIT (With CONSULT-II)

With CONSULT-II

1. Turn ignition switch to "ON" position.
   (Do not start engine.)
2. Select "ECU INPUT SIGNALS" in "DATA MONITOR" mode for "CVT" with CONSULT-II.
3. 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

MTLB0011

OK or NG

OK	▶	GO TO 7.
NG	▶	**Check the following items:** ● Throttle position switch — Refer to "Components Inspection", AT-85. ● Harness for short or open between ignition switch and throttle position switch (Main harness) ● Harness for short or open between throttle position switch and TCM (Main harness)

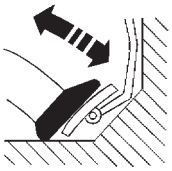
6	CHECK THROTTLE POSITION SWITCH CIRCUIT (Without CONSULT-II)

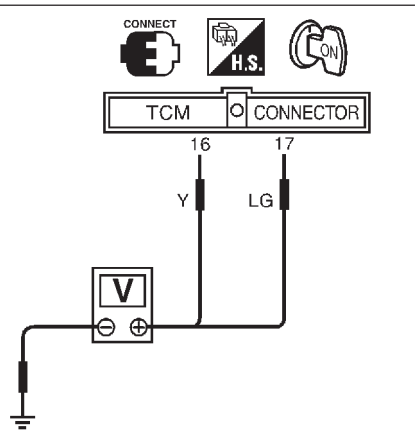
Without CONSULT-II

1. Turn ignition switch to "ON" position.
   (Do not start engine.)
2. Check voltage between TCM terminals 16, 17 and ground while depressing, and releasing accelerator pedal slowly. (After warming up engine)

Accelerator pedal condition	Voltage	
	Terminal No. 16	Terminal No. 17
Released	Battery voltage	1V or less
Fully depressed	1V or less	Battery voltage

MTBL0137





SAT454J

OK or NG

OK	▶	GO TO 7.
NG	▶	**Check the following items:** • Throttle position switch — Refer to "Components Inspection", AT-85. • Harness for short or open between ignition switch and throttle position switch (Main harness) • Harness for short or open between throttle position switch and TCM (Main harness)

7	CHECK DTC

Perform Diagnostic Trouble Code (DTC) confirmation procedure, AT-103.

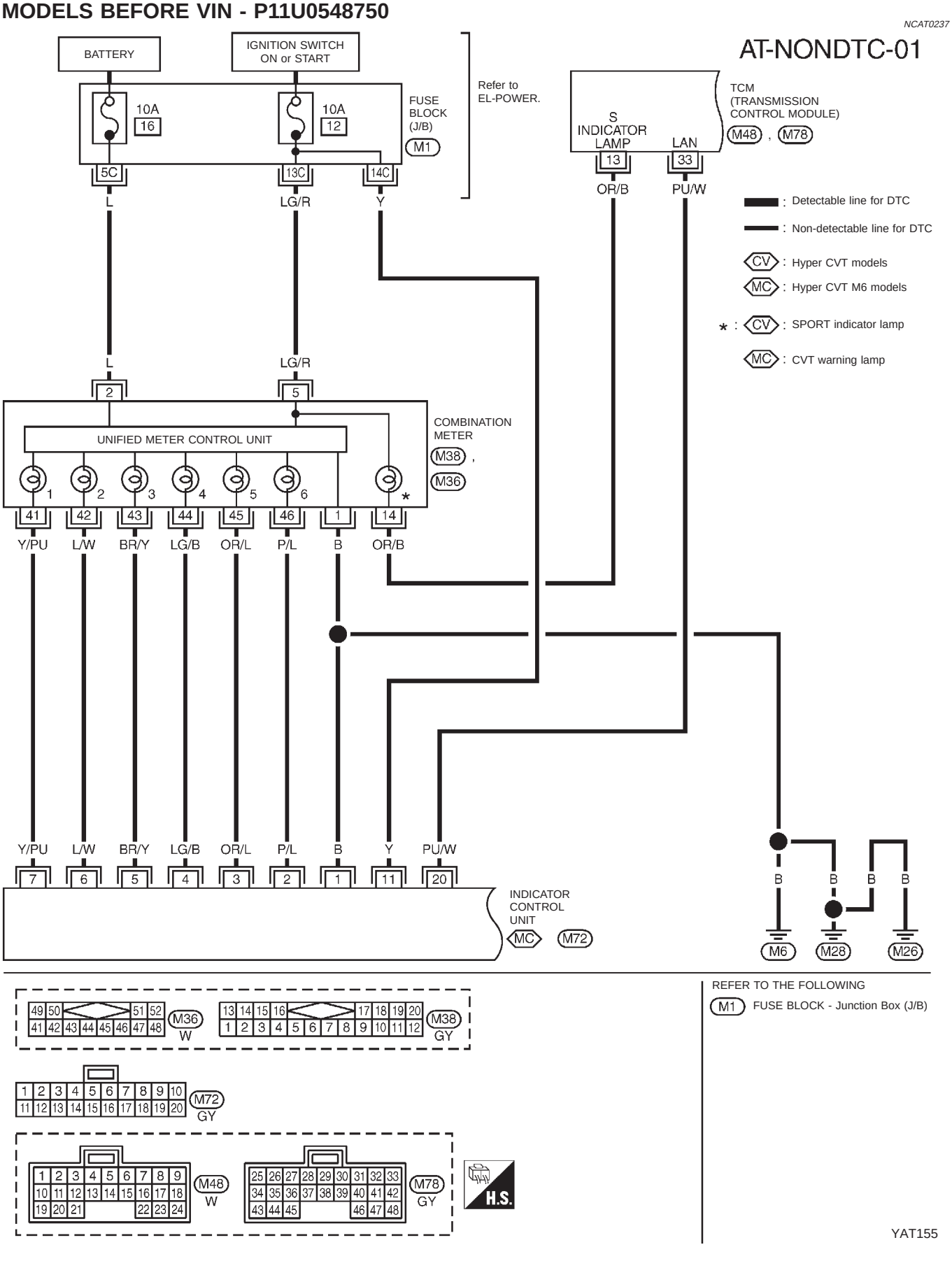
OK or NG

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.

Wiring Diagram — AT — NONDTC

MODELS BEFORE VIN - P11U0548750

NCAT0237

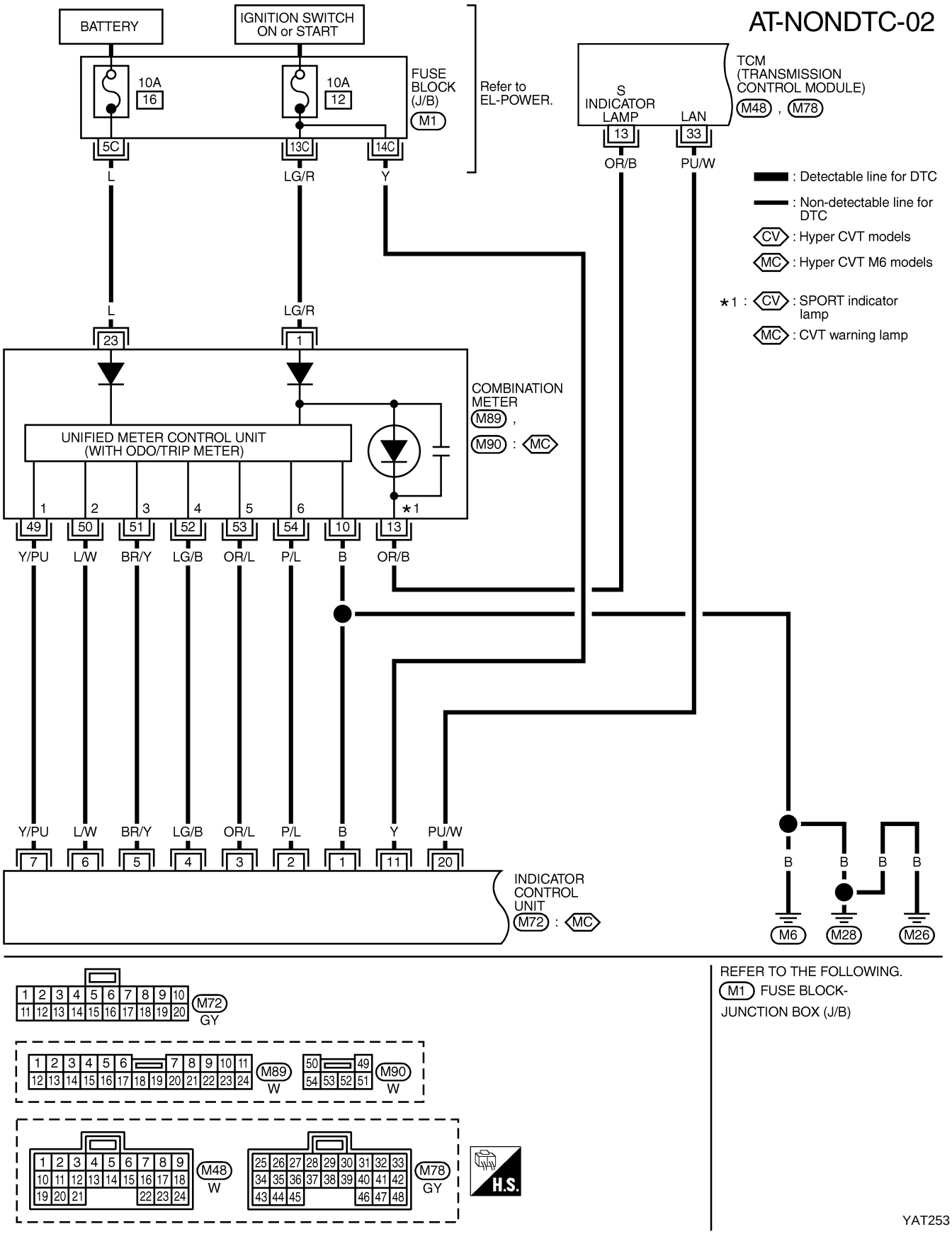


REFER TO THE FOLLOWING

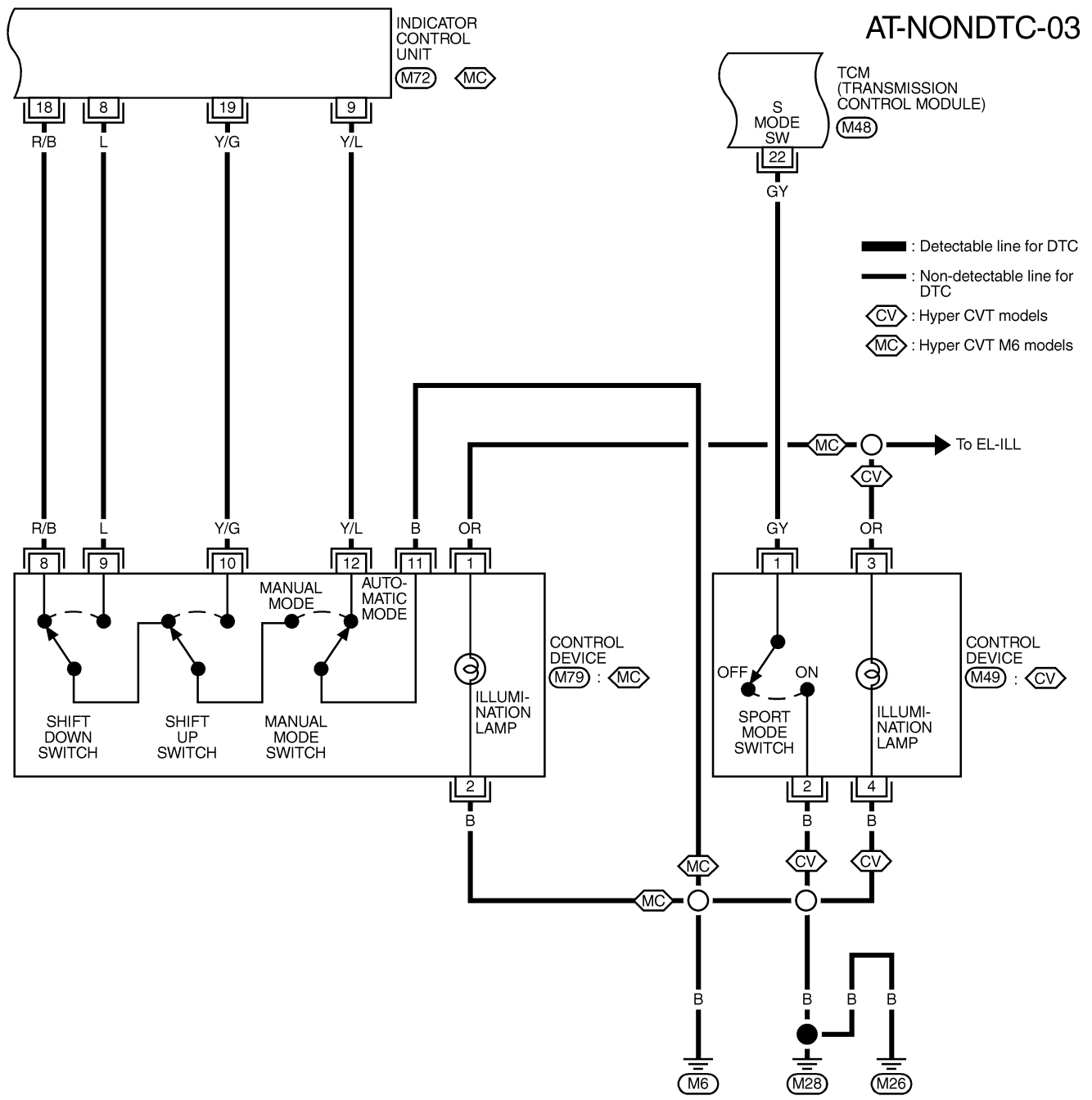
M1 FUSE BLOCK - Junction Box (J/B)

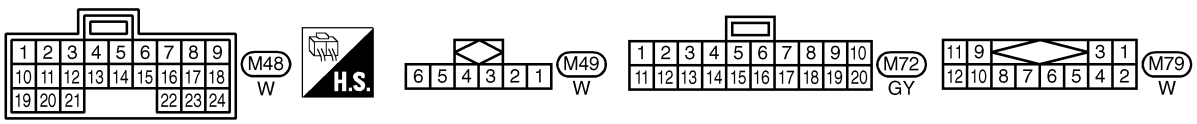
YAT155

MODELS AFTER VIN - P11U0548750



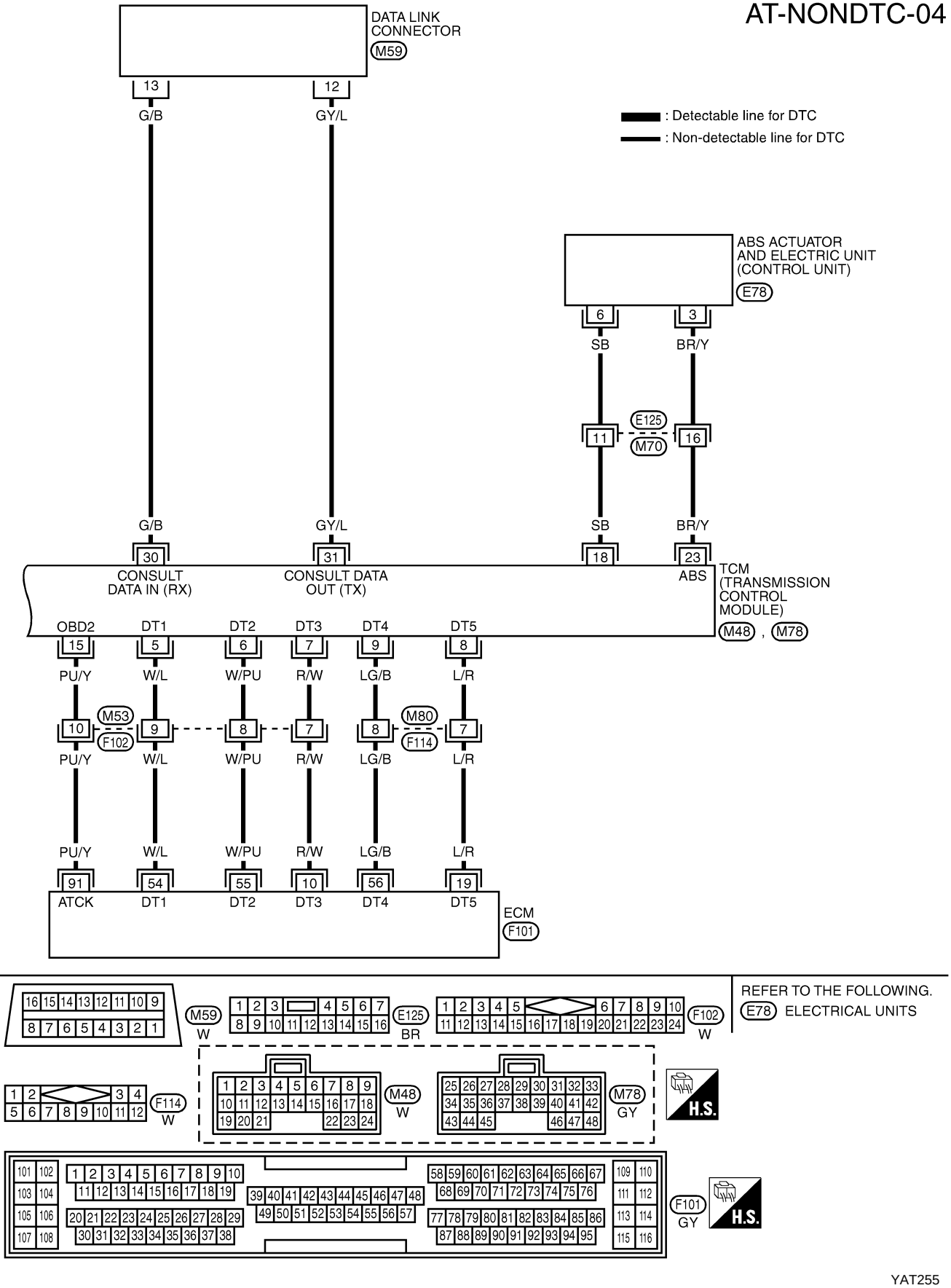
Wiring Diagram — AT — NONDTC (Cont'd)



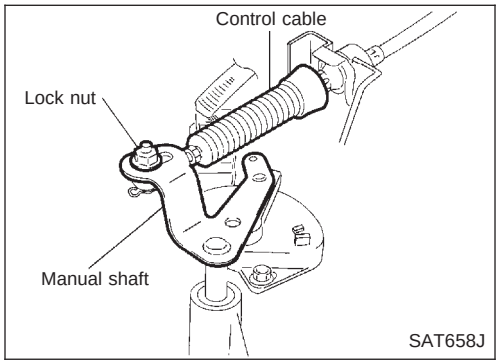


YAT254

AT-NONDTC-04



YAT255



Control Cable Adjustment

NCAT0111

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

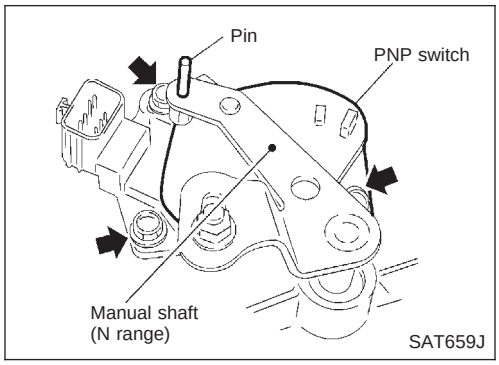
1. Place selector lever in “P” position.
2. Loosen control cable lock nut and place manual shaft in “P” position.

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

NCAT0112

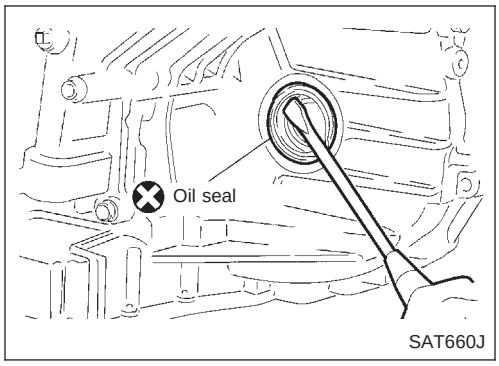
1. Remove control cable end from manual shaft.
2. Set manual shaft in “N” position.
3. Loosen PNP switch fixing bolts.
4. Use a 4 mm (0.157 in) pin for this adjustment.

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.

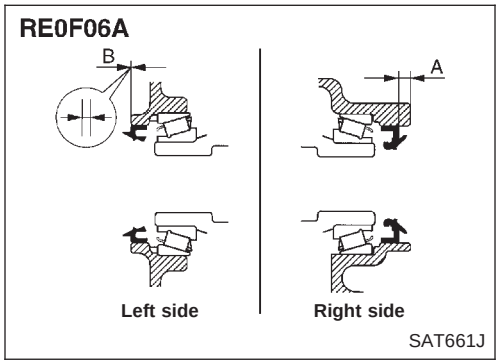
   : 4.9 - 6.8 N·m (0.5 - 0.7 kg-m, 44 - 60 in-lb)
6. Remove pin from adjustment hole after adjusting PNP switch.
7. Reinstall any part removed.
8. Adjust control cable. Refer to “Control Cable Adjustment”.
9. Check continuity of PNP switch. Refer to AT-53.



Differential Side Oil Seal Replacement

NCAT0113

1. Remove drive shaft assemblies. Refer to FA section (“Drive Shaft”, “FRONT AXLE”).
2. Remove oil seals.

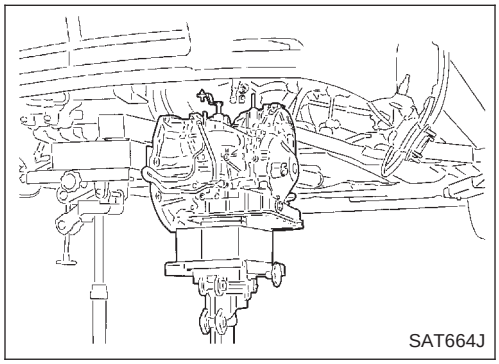


3. Install oil seals.
- **Apply CVT fluid to oil seal surface before installing.**
- **Install oil seals so that dimensions "A" and "B" are within specifications.**

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.


SAT664J

Removal

NCAT0115

CAUTION:

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

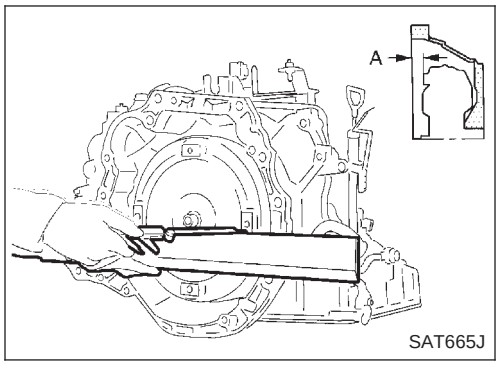
1. Remove battery and bracket.
2. Remove air duct between throttle body and air cleaner.
3. Disconnect control valve harness connector, PNP switch harness connector, secondary speed sensor harness connector, dropping resistor harness connector, primary speed sensor harness connector and body earth harness connector.
4. Remove crankshaft position sensor (OBD) from transaxle.
5. Drain CVT fluid from transaxle.
6. Disconnect control cable from transaxle.
7. Remove exhaust front tube. Refer to FE section (“EXHAUST SYSTEM”).
8. Remove drive shafts. Refer to FA 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.



SAT665J

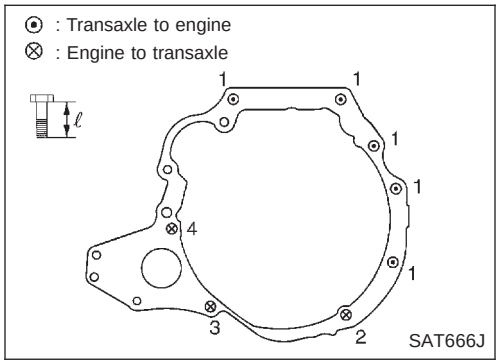
Inspection

NCAT0236

- 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

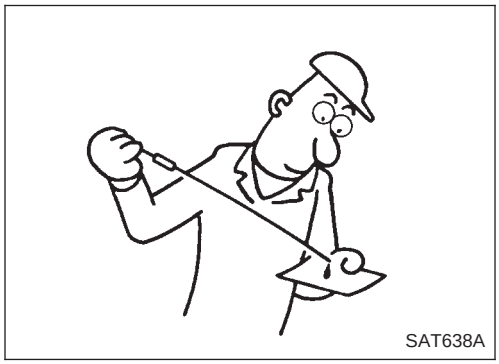
NCAT0116

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)

2. Install torque converter to drive plate.

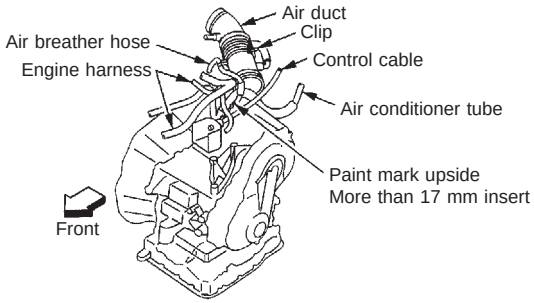
- **With converter installed, rotate crankshaft several turns to check that transaxle rotates freely without binding.**



3. Reinstall any part removed.
4. Adjust control cable. Refer to AT-114.
5. Check continuity of PNP switch. Refer to AT-53.
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 AT-36.

Air Breather Hose

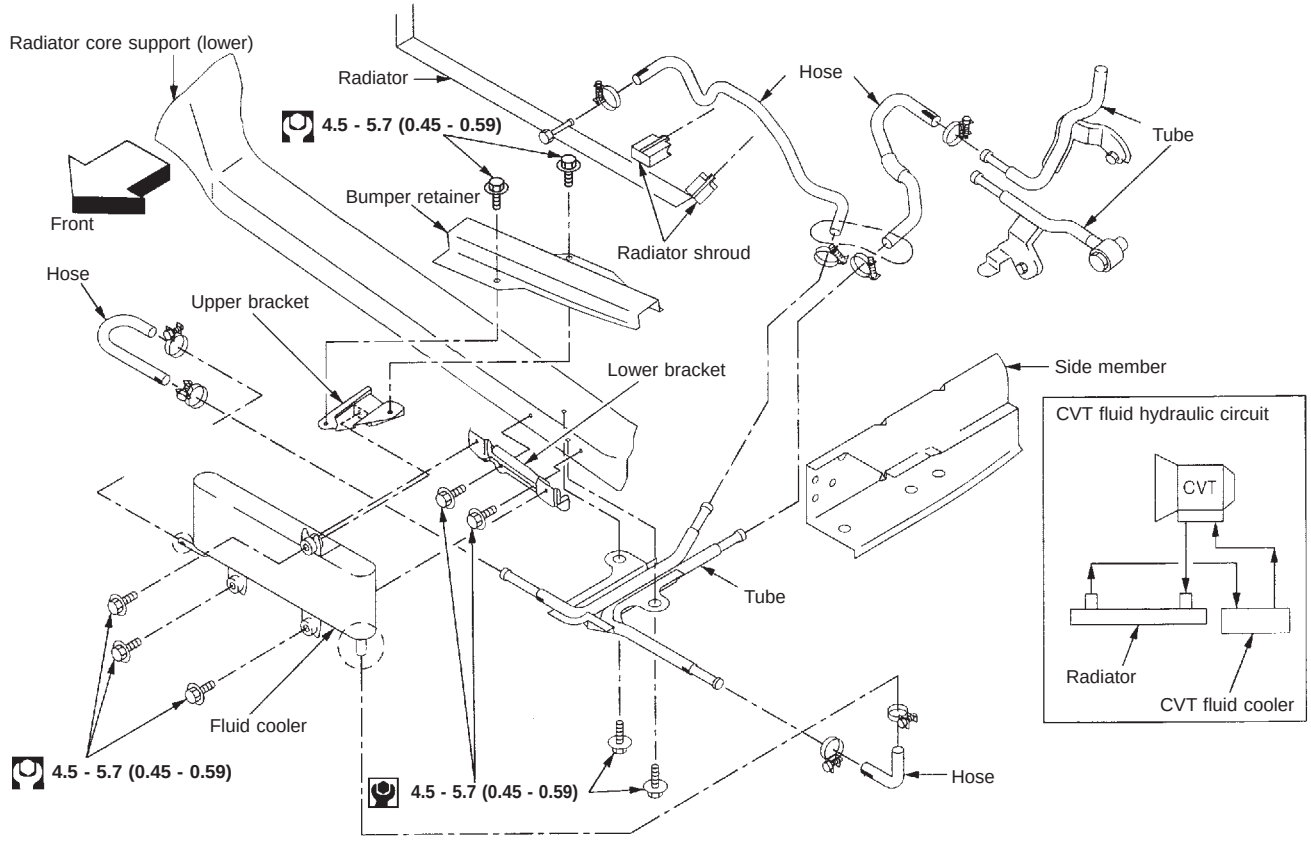
SR20DE



NAT312

CVT Fluid Cooler (Hyper CVT-M6)

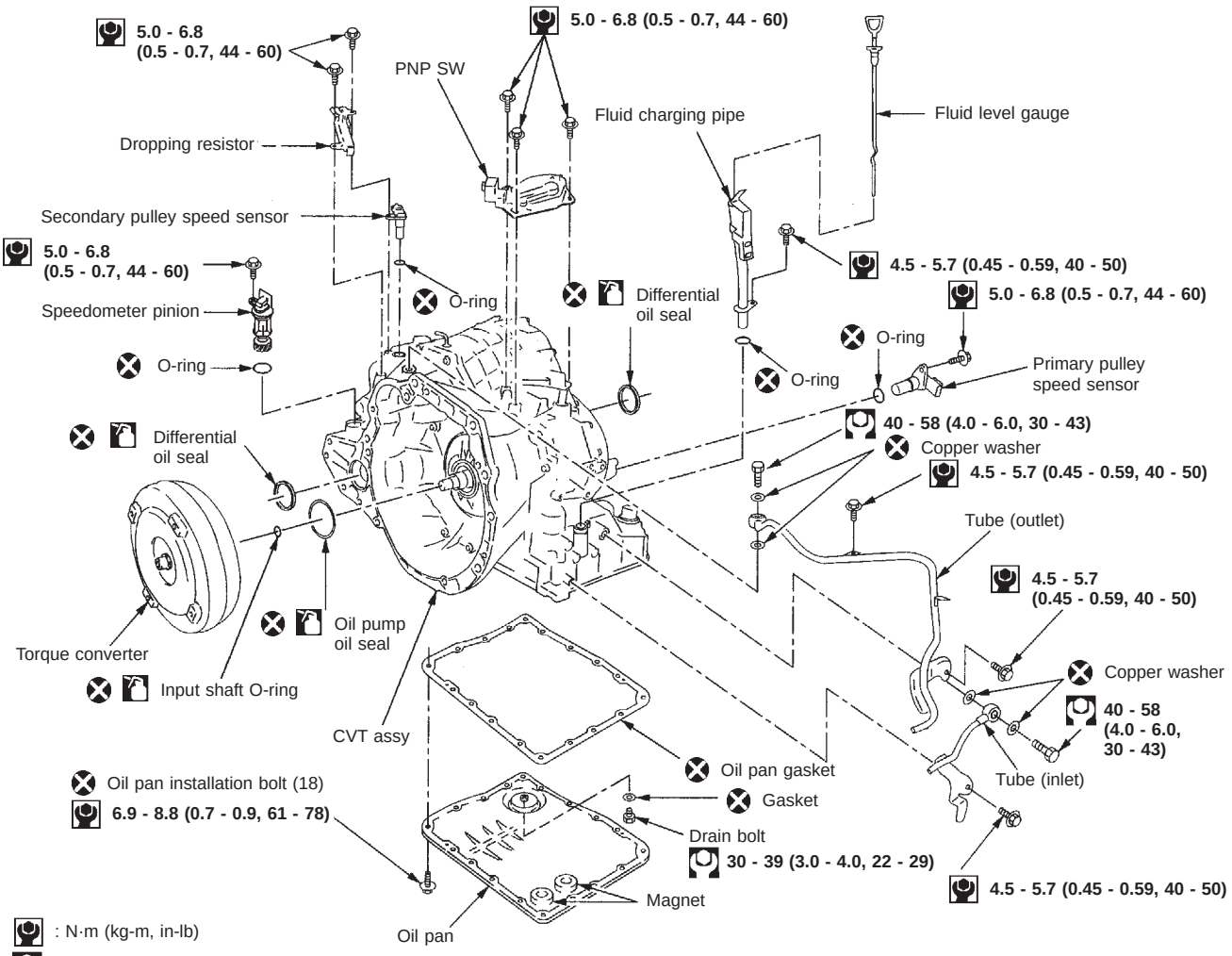
SEC. 310



NAT313

Components

SEC. 310·311·312·319



General Specifications

NCAT0179

Engine		SR20DE
Automatic transaxle model		RE0F06A
Automatic transaxle assembly	Model code number	8E020
Transaxle gear ratio	D range	Variable
	Reverse	1.586
	Final drive	5.473
Recommended fluid		Nissan CVT fluid NS-1*1
Fluid capacity		8.1ℓ (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

NCAT0181

Engine	Stall revolution rpm
(SR20DE)	2,350 - 2,850

Line Pressure

NCAT0182

Engine speed rpm	Line pressure MPa (kg/cm^2, psi)		
	R position	D position	L position
Idle	0.6 (6.1, 87)		
Stall	4.1 (42, 595)		

Removal and Installation

NCAT0197

Unit: mm (in)

Distance between end of converter housing and torque converter	15.9 (0.626) or more