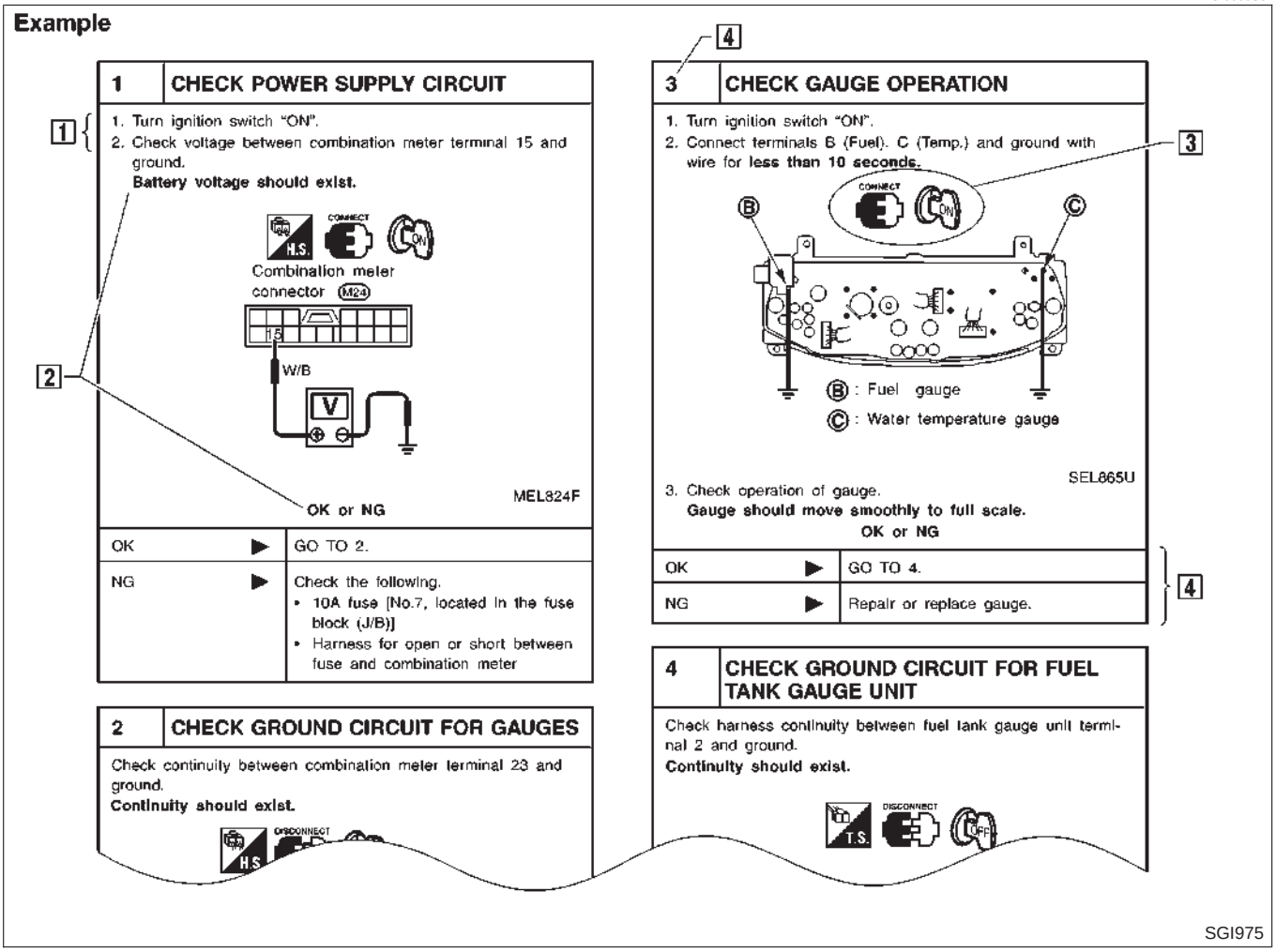
How to Follow Test Groups in Trouble Diagnoses

NLGI0006S01

Example



1) **Work and diagnostic procedure**
Start to diagnose a problem using procedures indicated in enclosed test groups.

2) **Questions and required results**
Questions and required results are indicated in bold type in test group.
The meaning of are as follows:

a. Battery voltage → 11 - 14V or approximately 12V
b. Voltage: Approximately 0V → Less than 1V

3) **Symbol used in illustration**
Symbols included in illustrations refer to measurements or procedures. Before diagnosing a problem, familiarize yourself with each symbol. Refer to "CONNECTOR SYMBOLS" (GI-15) and "Key to Symbols Signifying Measurements or Procedures" (GI-33).

4) **Action items**
Next action for each test group is indicated based on result of each question. Test group number is shown in the left upper portion of each test group.

Chassis and Body Maintenance

=NLMA0046S03

Abbreviations: I = Inspect and correct or replace as necessary, R = Replace, A = Adjust, L = Lubricate

MAINTENANCE OPERATION		MAINTENANCE INTERVAL									Reference page
Perform either at number of kilometers (miles) or months, whichever comes first.	km × 1,000	1	10	20	30	40	50	60	70	80	
	(mile × 1,000)	(0.6)	(6)	(12)	(18)	(24)	(30)	(36)	(42)	(48)	
	Months	—	6	12	18	24	30	36	42	48	
Underhood and under vehicle											
Brake & clutch fluid (For level & leaks)★			I	I	I	I	I	I	I	I	BR-10
Brake fluid★						R				R	BR-10
Brake booster vacuum hoses, connections & check valve						I				I	BR-19
Power steering fluid & lines (For level & leaks)			I*1	I	I*1	I	I*1	I	I*1	I	ST-7
Brake, clutch & exhaust systems			I	I	I	I	I	I	I	I	BR-10, CL-5, FE-11, FE-24
Manual transaxle gear oil (For level & leaks)			I*1	I	I*1	I	I*1	I	I*1	I	MT-11, MT-12
Steering gear & linkage, axle & suspension parts & drive shafts★		I*2		I		I		I		I	ST-7, SU-5, SU-18
Outside and inside											
Wheel alignment (if necessary, rotate & balance wheels)				I		I		I		I	SU-15, SU-27
Brake pads, rotors & other brake components★			I	I	I	I	I	I	I	I	BR-27, BR-31
Lock, hinges & hoods latch★			L*1	L	L*1	L	L*1	L	L*1	L	BT-7, BT-13
Seat belts, buckles, retractors, anchors & adjuster				I		I		I		I	RS-3
Foot brake, parking brake & clutch (For free play, stroke & operation)			I*1	I	I*1	I	I*1	I	I*1	I	BR-14, BR-43, CL-5
Ventilation air filter★		Replace every 12,000 km (7,500 miles) or 12 months									ATC-124
Supplemental air bag systems	See NOTE (1)										RS-16

NOTE:

(1) Inspect at the first 10 years, and then every 2 years.

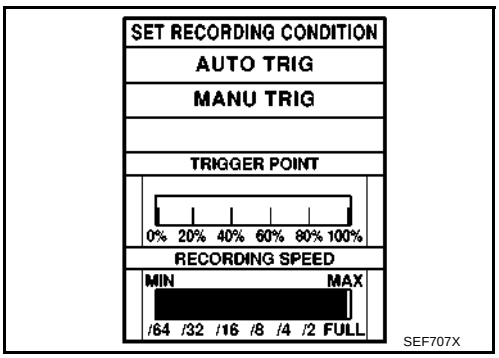
Maintenance item with "★" should be performed more frequently according to "Maintenance Under Severe Driving Conditions".

*1: Models except for Australia

*2: Models without three way catalyst

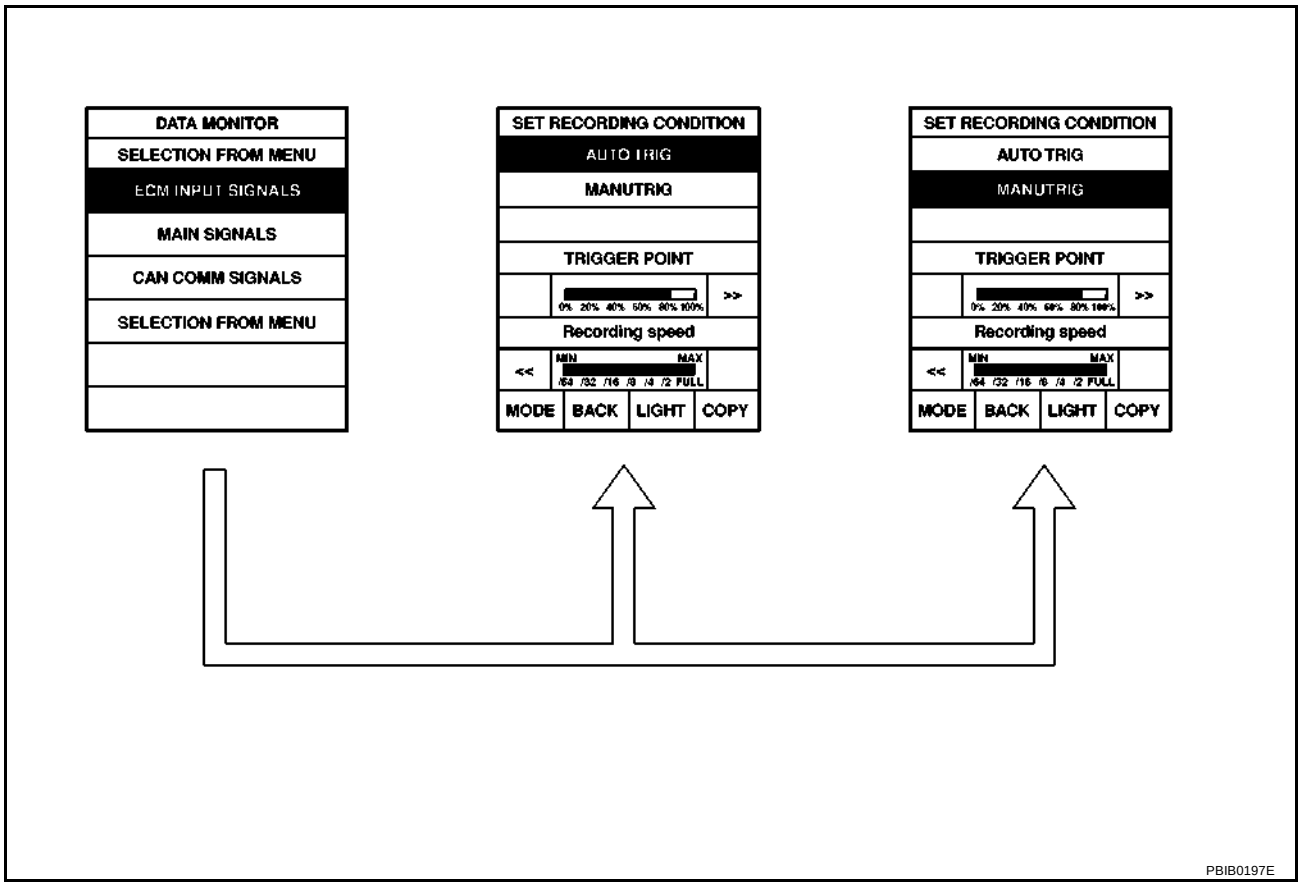
recording speed can be changed by “TRIGGER POINT” and “Recording Speed”. Refer to CONSULT-II OPERATION MANUAL.

2. “MANU TRIG” (Manual trigger):
   - DTC/1st trip DTC and malfunction item will not be displayed automatically on CONSULT-II screen even though a malfunction is detected by ECM.
     DATA MONITOR can be performed continuously even though a malfunction is detected.



Operation

1. “AUTO TRIG”
   - While trying to detect the DTC/1st trip DTC by performing the “DTC Confirmation Procedure”, be sure to select to “DATA MONITOR (AUTO TRIG)” mode. You can confirm the malfunction at the moment it is detected.
   - While narrowing down the possible causes, CONSULT-II should be set in “DATA MONITOR (AUTO TRIG)” mode, especially in case the incident is intermittent.
     When you are inspecting the circuit by gently shaking (or twisting) the suspicious connectors, components and harness in the “DTC Confirmation Procedure”, the moment a malfunction is found the DTC/1st trip DTC will be displayed. (Refer to “Incident Simulation Tests” in “HOW TO PERPERFORM EFFICIENT DIAGNOSES FOR AN ELECTRICAL INCIDENT”, GI-21.)
2. “MANU TRIG”
   - If the malfunction is displayed as soon as “DATA MONITOR” is selected, reset CONSULT-II to “MANU TRIG”. By selecting “MANU TRIG” you can monitor and store the data. The data can be utilized for further diagnosis, such as a comparison with the value for the normal operating condition.



DTC P0227, P0228 APP SENSOR

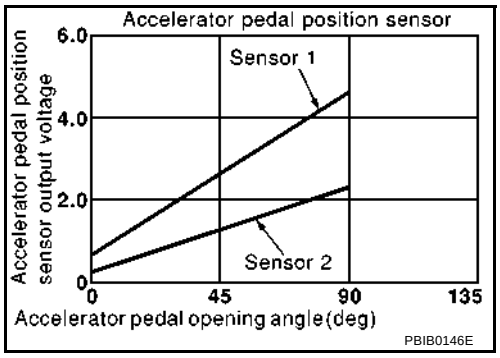
PFP:18002

Component Description

EBS00QMR

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensor detects the accelerator position and sends a signal to the ECM.

Accelerator pedal position sensor has two sensors. These sensors are a kind of potentiometers which transform the accelerator pedal position into output voltage, and emit the voltage signal to the ECM. In addition, these sensors detect the opening and closing speed of the accelerator pedal and feed the voltage signals to the ECM. The ECM judges the current opening angle of the accelerator pedal from these signals and controls the throttle control motor based on these signals.



Idle position of the accelerator pedal is determined by the ECM receiving the signal from the accelerator pedal position sensor. The ECM uses this signal for the engine operation such as fuel cut.

CONSULT-II Reference Value in Data Monitor Mode

EBS00QMS

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL SEN1 ACCEL SEN2*	● Ignition switch: ON (engine stopped)	Accelerator pedal: Fully released	0.35 - 0.67V
		Accelerator pedal: Fully depressed	More than 3.9V
CLSD THL POS	● Ignition switch: ON	Accelerator pedal: Fully released	ON
		Accelerator pedal: Slightly depressed	OFF

*: Accelerator pedal position sensor 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.

On Board Diagnosis Logic

EBS00QMT

These self-diagnoses have the one trip detection logic.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P0227 0227	Accelerator pedal position sensor 1 circuit low input	An excessively low voltage from the APP sensor 1 is sent to ECM.	● Harness or connectors (The APP sensor 1 circuit is open or shorted.) ● Accelerator pedal position sensor (Accelerator pedal position sensor 1)
P0228 0228	Accelerator pedal position sensor 1 circuit high input	An excessively high voltage from the APP sensor 1 is sent to ECM.	

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode and the MI lights up.

Engine operating condition in fail-safe mode
The ECM controls the electric throttle control actuator in regulating the throttle opening in order for the idle position to be within +10 degrees. The ECM regulates the opening speed of throttle valve to be slower than the normal condition. So, the acceleration will be poor.

DTC Confirmation Procedure

EBS00QMU

NOTE:

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

TESTING CONDITION:

Before performing the following procedure, confirm that battery voltage is more than 10V at idle.

PRECAUTIONS

PFP:00001

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

EBS0137K

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

WARNING:

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

On Board Diagnostic (OBD) System of Engine

EBS0137L

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.

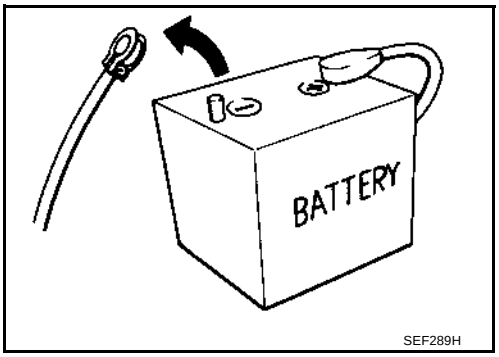
CAUTION:

- **Be sure to turn the ignition switch OFF and disconnect the battery ground cable 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 the open circuit. (Be sure the connector is free from water, grease, dirt, bent terminals, etc.)**
- **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-7, HARNESS CONNECTOR.**
- **Be sure to route and secure the harnesses properly after work. The interference of the harness with a bracket, etc. may cause the MI to light up due to the 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 the malfunction of the fuel system, etc.**
- **Be sure to erase the unnecessary malfunction information (repairs completed) from the ECM before returning the vehicle to the customer.**

Precautions

EBS0137M

- **Always use a 12 volt battery as power source.**
- **Do not attempt to disconnect battery cables while engine is running.**
- **Before connecting or disconnecting the ECM harness connector, turn ignition switch OFF and disconnect battery ground cable. Failure to do so may damage the ECM because battery voltage is applied to ECM even if ignition switch is turned off.**
- **Before removing parts, turn ignition switch OFF and then disconnect battery ground cable.**



SEF289H

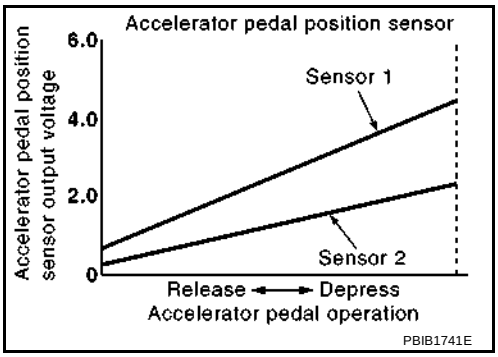
DTC P0652, P0653 SENSOR POWER SUPPLY

PFP:18002

Description

EBS013ES

The accelerator pedal position sensor is installed on the upper end of the accelerator pedal assembly. The sensors detect the accelerator pedal position and sends a signal to the ECM. The ECM uses the signal to determine the amount of fuel to be injected.



CONSULT-II Reference Value in Data Monitor Mode

EBS013ET

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
ACCEL POS SEN*	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.2 - 0.7V
		Accelerator pedal: Fully depressed	3.9 - 4.9V
ACCEL SEN 2*	● Ignition switch: ON (Engine stopped)	Accelerator pedal: Fully released	0.1 - 0.4V
		Accelerator pedal: Fully depressed	1.9 - 2.4V

*: This signal is converted by ECM internally. Thus, it differs from ECM terminal voltage.

ECM Terminals and Reference Value

EBS013EU

Specification data are reference values and are measured between each terminal and ground.

CAUTION:

Do not use ECM ground terminals when measuring input/output voltage. Doing so may result in damage to the ECM's transistor. Use a ground other than ECM terminals, such as the ground.

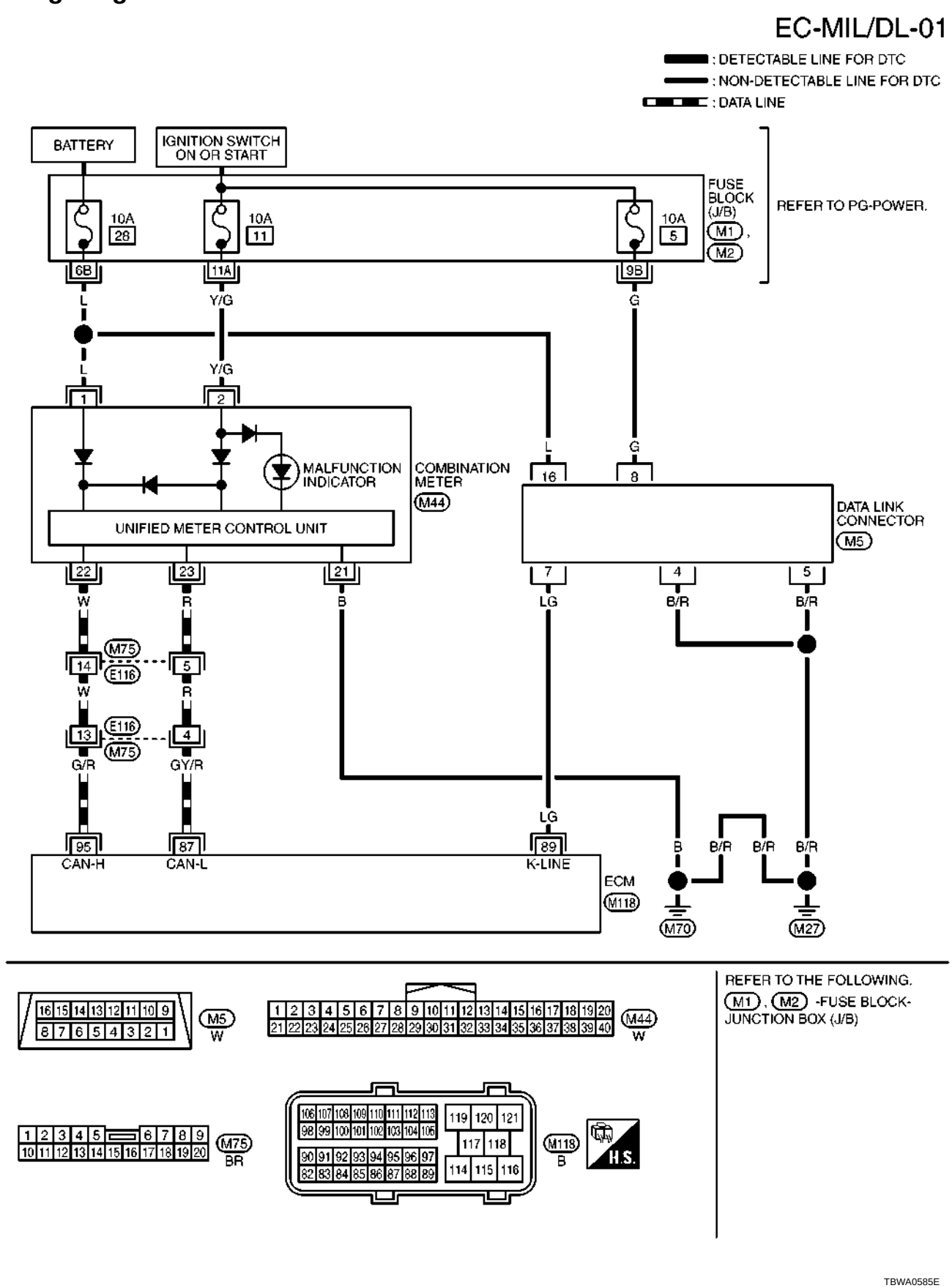
TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
82	L	Accelerator pedal position sensor 1 power supply	**[Ignition switch ON]**	Approximately 5.3V
83	L/R	Accelerator pedal position sensor 1	**[Ignition switch ON]** ● Engine stopped ● Accelerator pedal: Fully released	0.5 - 1.0V
			[Ignition switch ON] ● Engine stopped ● Accelerator pedal: Fully depressed	4.2 - 5.2V
84	L/W	Accelerator pedal position sensor 1 ground	**[Ignition switch ON]**	Approximately 0.3V
85	—	Sensor ground (Accelerator pedal position sensor shield circuit)	**[Ignition switch ON]**	Approximately 0.3V
90	R	Accelerator pedal position sensor 2 power supply	**[Ignition switch ON]**	Approximately 5.3V

MI & DATA LINK CONNECTORS

PFP:24814

Wiring Diagram

EBS01528



TBWA0585E

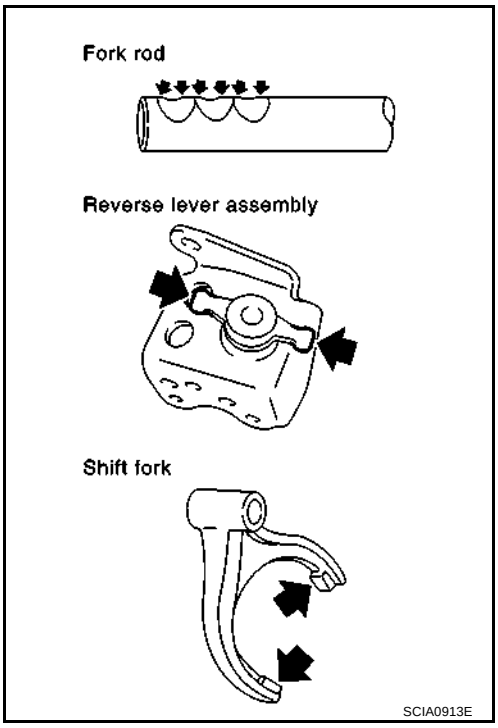
SHIFT CONTROL

PFP:32982

Inspection

ECS00961

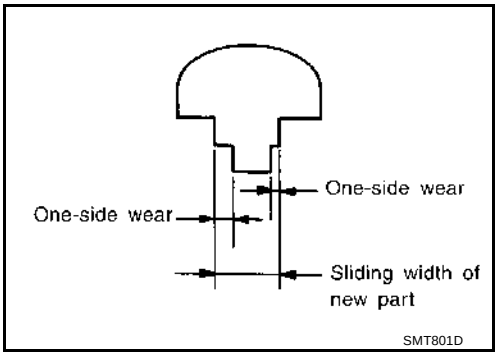
- Check contact surfaces and sliding area for wear, damage, bending, etc. If necessary, replace parts.



SHIFT FORK

- Check if the width of shift fork hook (sliding area with coupling sleeve) is within allowable specification below.

Item	One-side wear specification	Sliding width of new part
1st & 2nd	0.2 mm (0.008 in)	7.80 - 7.93 mm (0.3071 - 0.3122 in)
3rd & 4th	0.2 mm (0.008 in)	7.80 - 7.93 mm (0.3071 - 0.3122 in)
5th & 6th	0.2 mm (0.008 in)	6.10 - 6.23 mm (0.2402 - 0.2453 in)
Reverse	0.2 mm (0.008 in)	12.80 - 12.93 mm (0.5039 - 0.5091 in)



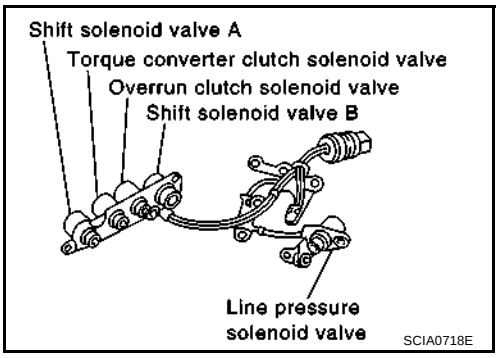
SHIFT SOLENOID VALVE B

PFP:31940

Description

ECS009B7

Shift solenoid valves A and B are turned “ON” or “OFF” by the TCM in response to signals sent from the PNP switch, vehicle speed and throttle position sensors. Gears will then be shifted to the optimum position.



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

TCM TERMINALS AND REFERENCE VALUE

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
12	L/Y	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in “D_1 ” or “D_2 ”.)	Battery voltage
				When shift solenoid valve B does not operate. (When driving in “D_3 ” or “D_4 ”.)	0V

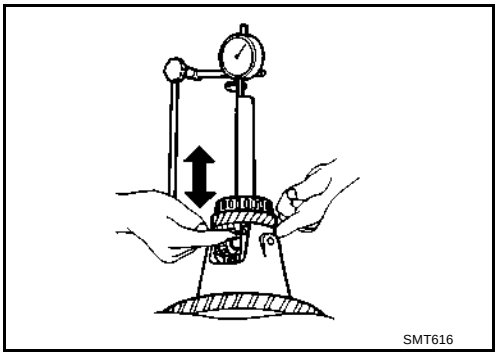
ON BOARD DIAGNOSIS LOGIC

Diagnostic trouble code	Malfunction is detected when...	Check items (Possible cause)
: SHIFT SOLENOID/VB	TCM detects an improper voltage drop when it tries to operate the solenoid valve.	● Harness or connectors (The solenoid circuit is open or shorted.) ● Shift solenoid valve B
: 5th judgement flicker		

b. Move side gear up and down to measure dial indicator deflection. Always measure indicator deflection on both side gears.

Clearance between side gear and differential case with washer:

0.1 - 0.2 mm (0.004 - 0.008 in)

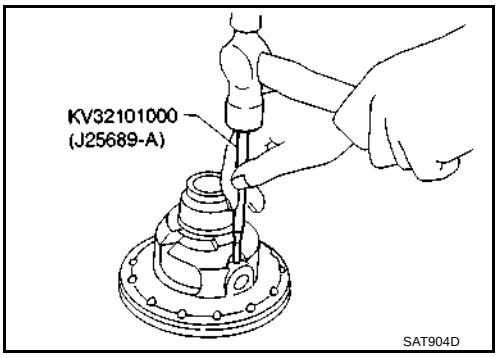


c. If not within specification, adjust clearance by changing thickness of differential side gear thrust washers.

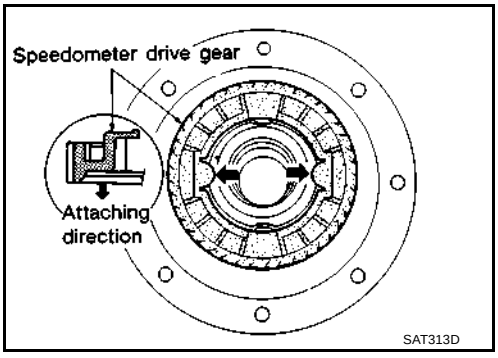
Differential side gear thrust washers:

Refer to AT-519, "SERVICE DATA AND SPECIFICATIONS (SDS)" **.**

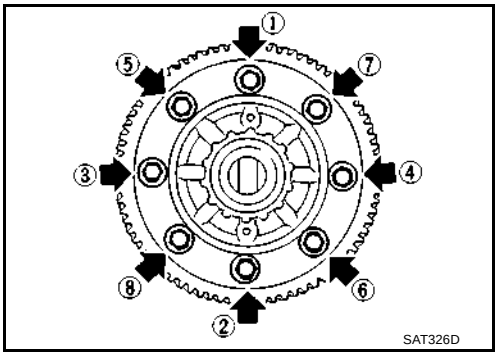
4. Install lock pin.
   - **Make sure that lock pin is flush with case.**



5. Install speedometer drive gear on differential case.
   - **Align the projection of speedometer drive gear with the groove of differential case.**



6. Install final gear and tighten fixing bolts in a numerical order.



3	CHECK FUNCTION
Disconnect ABS actuator and electric unit (control unit) connector E143 and make sure the braking force is sufficient when ABS is not operating. After the inspection, reconnect connector.	
OK or NG	
Yes ▶	GO TO 4.
No ▶	Check brake system.

4	CHECK ABS WARNING LAMP DISPLAY
Make sure ABS warning lamp turns OFF approximately 2 sec. after ignition switch is turned ON or when driving.	
OK or NG	
Yes ▶	Normal
No ▶	GO TO 5.

5	CHECK WHEEL SENSOR
Check the following: ● Sensor mount and damage ● Sensor rotor mount and damage ● Sensor connector connection ● Sensor harness	
OK or NG	
Yes ▶	Normal
No ▶	Replace sensor or sensor rotor.

Symptom 3 The Braking Distance Is Long

NLBR0199

CAUTION:

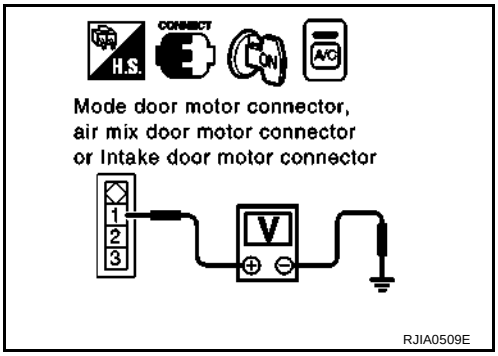
On slippery road surfaces, the stopping distance might be longer with ABS operating than when ABS is not operating.

1	CHECK FUNCTION
Disconnect ABS actuator and electric unit (control unit) connector E143 to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.	
Is stopping distance still long?	
Yes ▶	● Bleed air from the brake piping. ● Check brake system.
No ▶	GO TO 2.

2	CHECK ABS WARNING LAMP DISPLAY
Make sure ABS warning lamp turns OFF approximately 2 sec. after ignition switch is turned ON or when driving.	
OK or NG	
Yes ▶	Normal
No ▶	GO TO 3.

3. CHECK POWER SUPPLY FOR MOTOR

Door motor	Terminal			Voltage
	(+)		(-)	
	Connector	Terminal No. (Wire color)		
Mode	M89	1 (G/Y)	Ground	Approx. 12V
Air mix	M88	1 (G/Y)		
Intake	M98	1 (G/Y)		

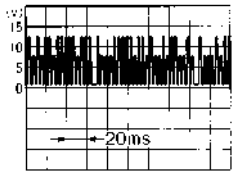


OK or NG

OK >> GO TO 4.
NG >> Replace harness or connector.

4. CHECK SIGNAL FOR MOTOR

Confirm A/C LAN signal using an oscilloscope.

Door motor	Terminal			Voltage
	(+)		(-)	
	Connector	Terminal No. (Wire color)		
Mode	M89	3 (R/Y)	Ground	
Air mix	M88	3 (R/Y)		
Intake	M98	3 (R/Y)		

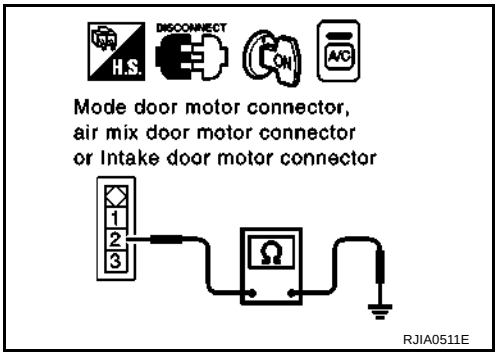
HAK0652D

OK or NG

OK >> GO TO 5.
NG >> Replace harness or connector.

5. CHECK MOTOR GROUND CIRCUIT

Door motor	Terminal			Continuity
	(+)		(-)	
	Connector	Terminal No. (Wire color)		
Mode	M89	2 (B)	Ground	Yes
Air mix	M88	2 (B)		
Intake	M98	2 (B)		

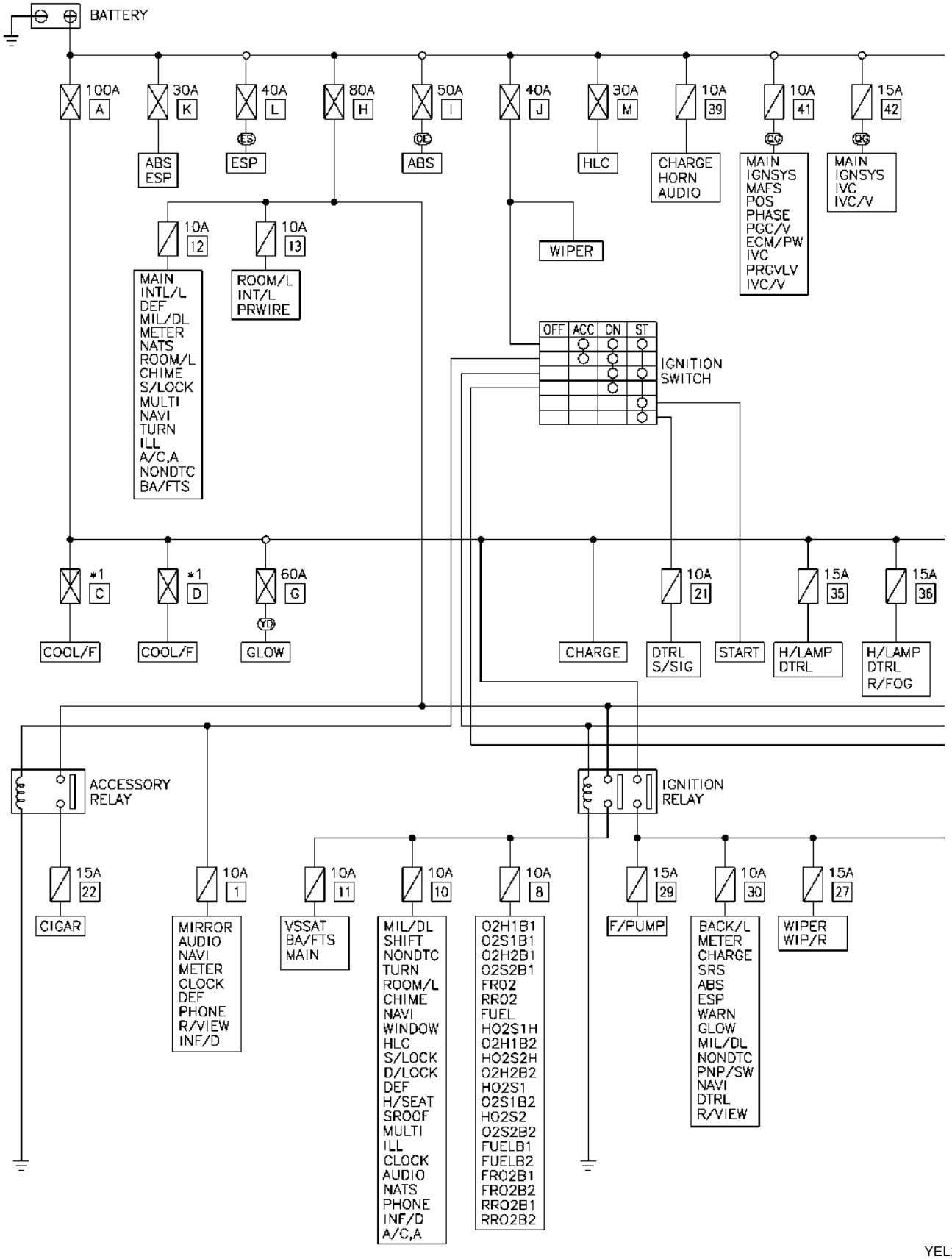


OK or NG

OK >> GO TO 6.
NG >> Replace harness or connector.

Schematic

NLEL0418



YEL109E

been fitted in another vehicle.
"SECURE" on a green background indicates that there is a malfunction in the link between NATS IMMU and audio, suggesting that there is an audio malfunction or the audio unit has previously been fitted in another vehicle.
"SECURE" on a yellow background indicates that the transponder (NATS key) is not working correctly or it has previously been fitted in another vehicle.
When a "SECURE" message (of any type) is displayed, it can be cleared by re-initializing the NATS system using CONSULT-II and the associated Immobilizer PIN code (there is no need to return the audio to a Clarion service centre). If re-initializing fails to clear a "SECURE" message then the component (identified by background color) is malfunction and should be replaced.

NOTE:
When the "SECURE" is displayed on VFD display or audio unit, the communication of IMMU and radio, radio unit or transponder has malfunction.

Service Procedure

NLEL0542S0502

Item	Service procedure	Description
Battery disconnection	No additional action required.	—
Radio needs repair	Repair needs to be done by authorized representative of radio manufacturer since radio cannot be operated unless it is reset to NEW state, using special decoding equipment.	—
Replacement of radio by new part	No additional action required.	Radio is delivered in NEW state.
Transferring radio to another vehicle/ replacement of radio by an "old" part	Radio needs to be reset by using CONSULT-II and the associated immobilizer PIN code (there is no need to return the audio or NAVI units to a Clarion service center).	—
Replacement of IMMU	The communication between IMMU and radio need to be reset by using CONSULT-II and the associated immobilizer PIN code.	After switching on the radio, it will display "SECURE" on a green background.
No communication from IMMU to radio	1. If NATS is malfunctioning, check NATS system. 2. After NATS is repaired, reset radio to "SECURE" on a green background state by using CONSULT-II and the associated immobilizer PIN code (there is no need to return the audio to a Clarion service center).	After switching on the radio, the display unit will display "SECURE" on a green background. Further use of radio is impossible until communication is established again, or after radio is reset by using CONSULT-II and the associated Immobilizer PIN code (there is no need to return the audio to a Clarion service centre).

SPEED DEPENDENT VOLUME CONTROL

NLEL0542S06

Description

NLEL0542S0601

If activated, the radio output volume will be automatically adjusted to compensate for increased driving noises at higher driving speeds.
The radio receives a speed signal from the combination meter and selects the output volume.

PERSONAL AUDIO SETTINGS

NLEL0542S07

Description

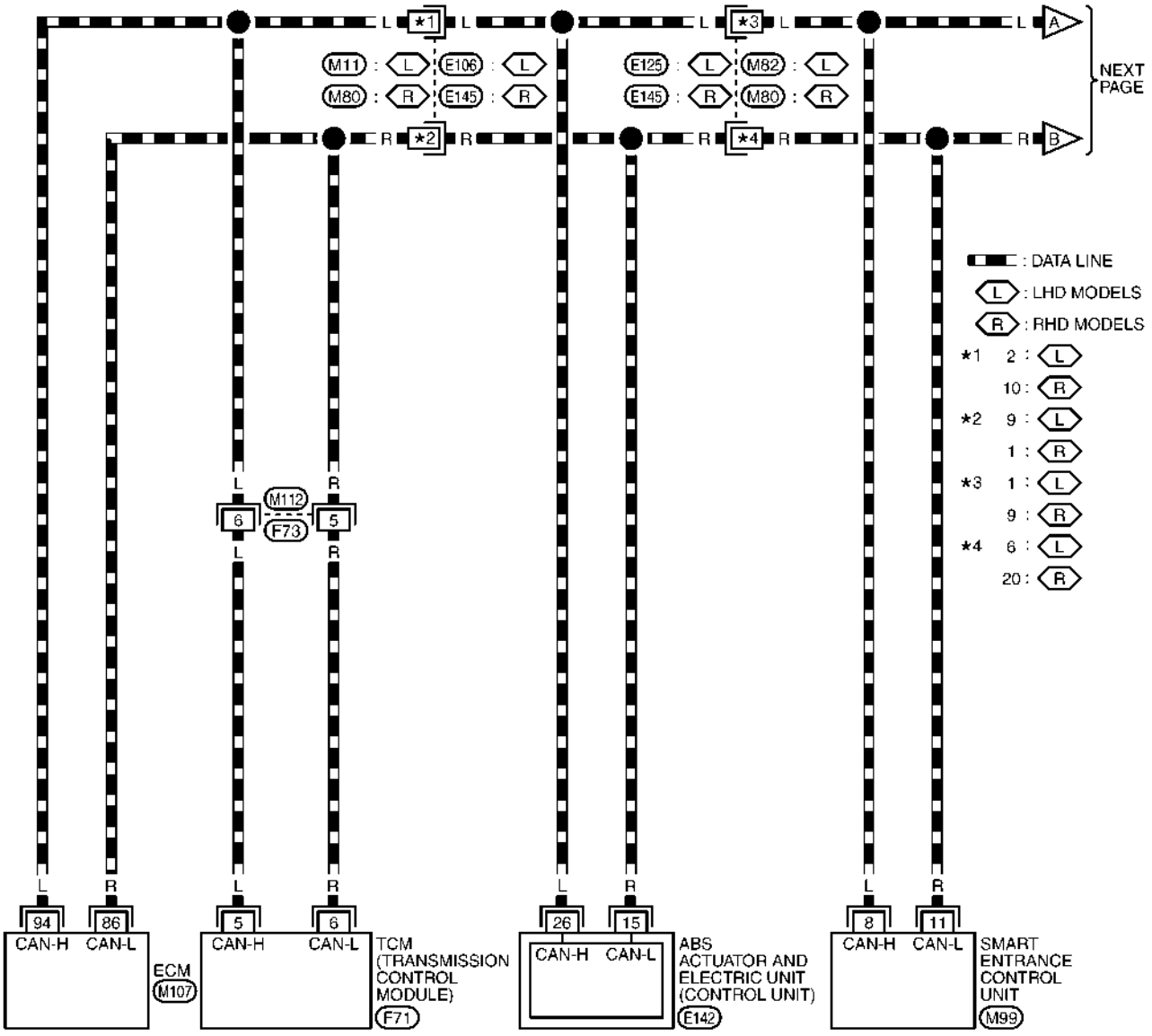
NLEL0542S0701

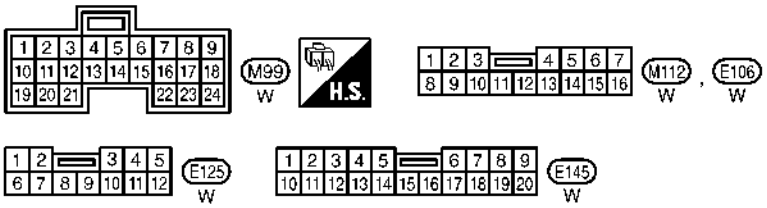
The radio is designed to store several settings (volume, bass, treble, preset stations and level of speed dependent volume control) with every NATS ignition key used. Up to a maximum of 4 NATS keys can be registered. During the communication mentioned under "Anti-Theft System", the radio will recognize the used ignition key and select the accompanying settings.

Wiring Diagram — CAN —

NLEL0655

EL-CAN-07





REFER TO THE FOLLOWING.
M107 , E142 , F71
-ELECTRICAL UNITS

YEL127E