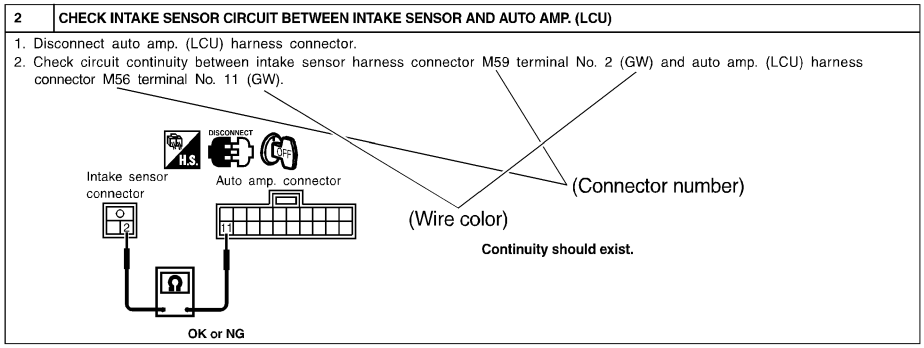
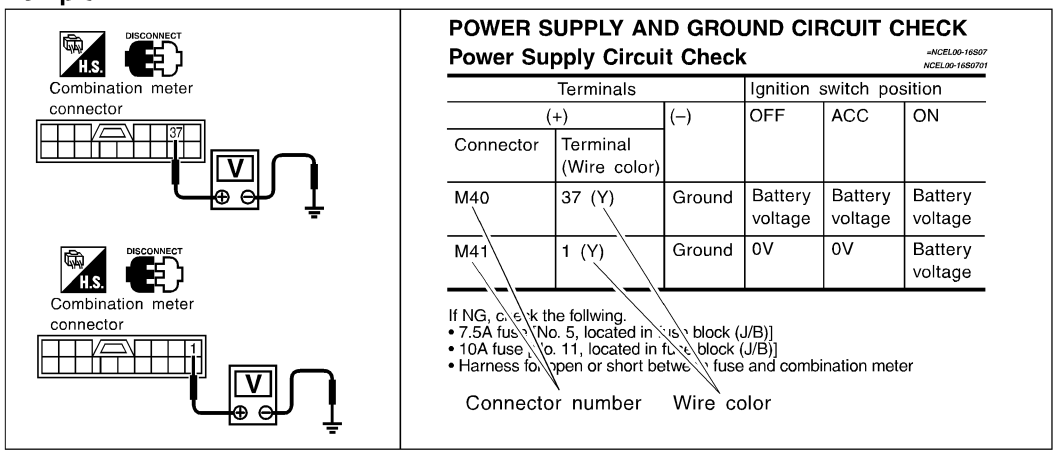
TYPE 2: Harness Wire Color and Connector Number are Shown in Text

Example 1:



Example 2:



SGI144A

KEY TO SYMBOLS SIGNIFYING MEASUREMENTS OR PROCEDURES

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	Check after disconnecting the connector to be measured.	GST	Procedure with Generic Scan Tool. (GST, OBD-II scan tool)
	Check after connecting the connector to be measured.	NO TOOLS	Procedure without CONSULT, CONSULT-II or GST
	Insert key into ignition switch.	A/C OFF	A/C switch is “OFF”.
	Remove key from ignition switch.	A/C ON	A/C switch is “ON”.
	Insert and remove key repeatedly.		REC switch is “ON”.
OFF	Turn ignition switch to “OFF” position.		REC switch is “OFF”.
ACC	Turn ignition switch to “ACC” position.		Fan switch is “ON”. (At any position except for “OFF” position)
ON	Turn ignition switch to “ON” position.		Fan switch is “OFF”.
ST	Turn ignition switch to “START” position.	FUSE	Apply fuse.
OFF → ACC	Turn ignition switch from “OFF” to “ACC” position.	FUSE / BAT	Apply positive voltage from battery with fuse directly to components.
ACC → ON	Turn ignition switch from “ACC” to “ON” position.		
ACC → OFF	Turn ignition switch from “ACC” to “OFF” position.		

SAIA0750E

no voltage; short is further down the circuit than the relay.

- With SW1 closed, relay contacts jumped with fused jumper wire check for voltage.
  voltage; short is down the circuit of the relay or between the relay and the disconnected solenoid (point C).
  no voltage; retrace steps and check power to fuse block.

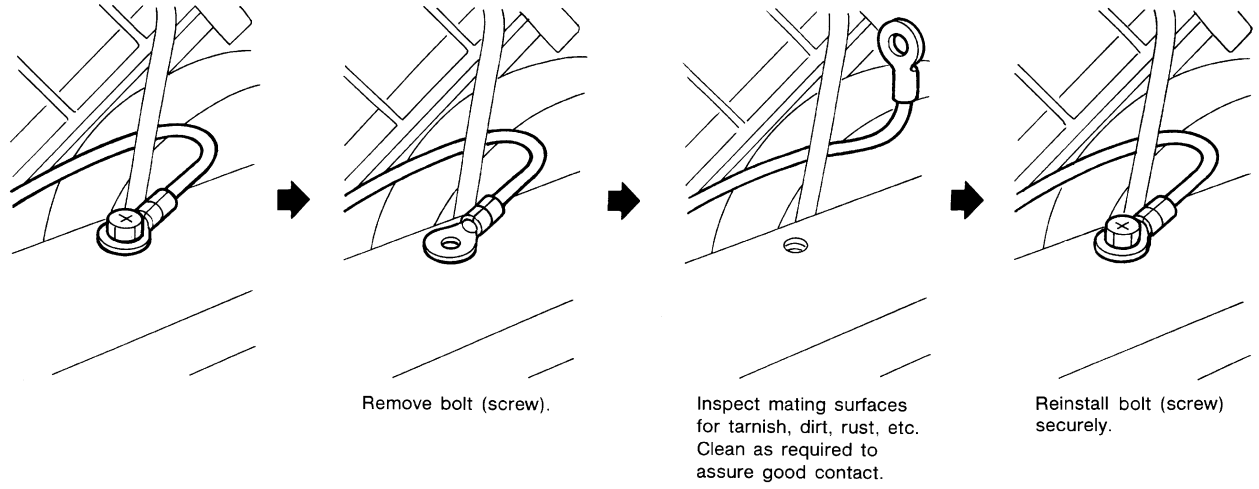
Ground Inspection

Ground connections are very important to the proper operation of electrical and electronic circuits. Ground connections are often exposed to moisture, dirt and other corrosive elements. The corrosion (rust) can become an unwanted resistance. This unwanted resistance can change the way a circuit works.
Electronically controlled circuits are very sensitive to proper grounding. A loose or corroded ground can drastically affect an electronically controlled circuit. A poor or corroded ground can easily affect the circuit. Even when the ground connection looks clean, there can be a thin film of rust on the surface.
When inspecting a ground connection follow these rules:

- Remove the ground bolt or screw.
- Inspect all mating surfaces for tarnish, dirt, rust, etc.
- Clean as required to assure good contact.
- Reinstall bolt or screw securely.
- Inspect for “add-on” accessories which may be interfering with the ground circuit.
- If several wires are crimped into one ground eyelet terminal, check for proper crimps. Make sure all of the wires are clean, securely fastened and providing a good ground path. If multiple wires are cased in one eyelet make sure no ground wires have excess wire insulation.

For detailed ground distribution information, refer to “Ground Distribution” in PG section.

Ground Inspection



Voltage Drop Tests

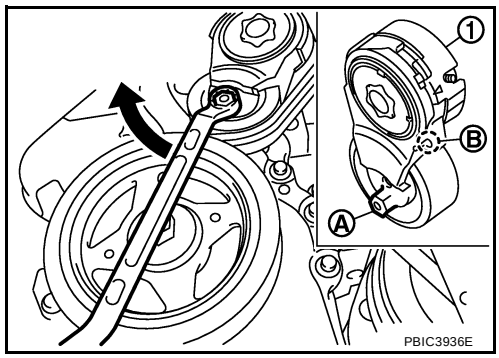
Voltage drop tests are often used to find components or circuits which have excessive resistance. A voltage drop in a circuit is caused by a resistance when the circuit is in operation.
Check the wire in the illustration. When measuring resistance with DMM, contact by a single strand of wire will give reading of 0 ohms. This would indicate a good circuit. When the circuit operates, this single strand of wire is not able to carry the current. The single strand will have a high resistance to the current. This will be picked up as a slight voltage drop.
Unwanted resistance can be caused by many situations as follows:

- Undersized wiring (single strand example)
- Corrosion on switch contacts
- Loose wire connections or splices.

If repairs are needed always use wire that is of the same or larger gauge.

MEASURING VOLTAGE DROP — ACCUMULATED METHOD

INSTALLATION



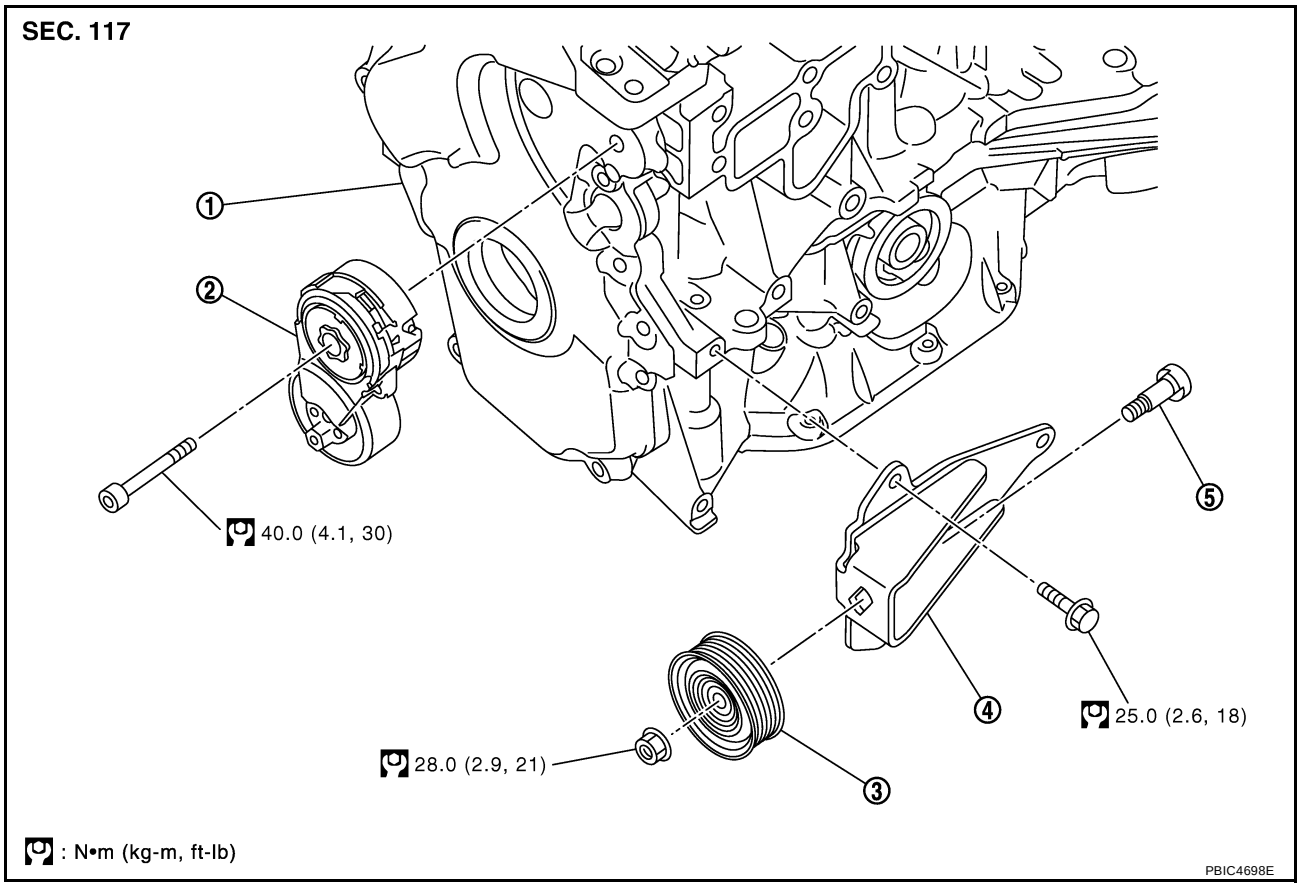
1. Hold the hexagonal part (A) of drive belt auto-tensioner (1) with a box wrench securely. Then move the wrench handle in the direction of arrow (loosening direction of tensioner).

   CAUTION:
   Never place hand in a location where pinching may occur if the holding tool accidentally comes off.
2. Insert a rod such as short-length screwdriver approximately 6 mm (0.24 in) in diameter into the hole (B) of retaining boss to fix drive belt auto-tensioner.
3. Install drive belt.

   CAUTION:
   - **Confirm drive belt is completely set to pulleys.**
   - **Check for engine oil, working fluid and engine coolant are not adhered to drive belt and each pulley groove.**
4. Release drive belt auto-tensioner, and apply tension to drive belt.
5. Turn crankshaft pulley clockwise several times to equalize tension between each pulley.
6. Confirm tension of drive belt at indicator (notch on fixed side) is within the possible use range. Refer to EM-13, "Checking Drive Belts" .

Components

EBS00U73



1. Front cover
2. Drive belt auto–tensioner
3. Idler pulley (models without A/C)
4. Bracket (models without A/C)
5. Shaft (models without A/C)

Removal and Installation of Drive Belt Auto-Tensioner

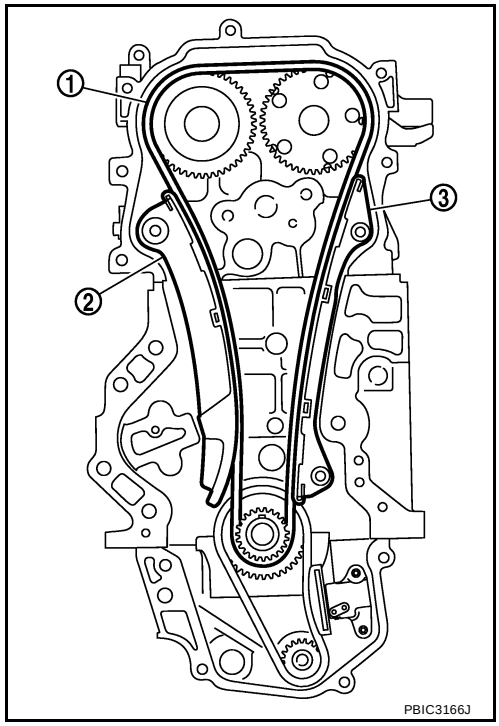
EBS00U74

REMOVAL

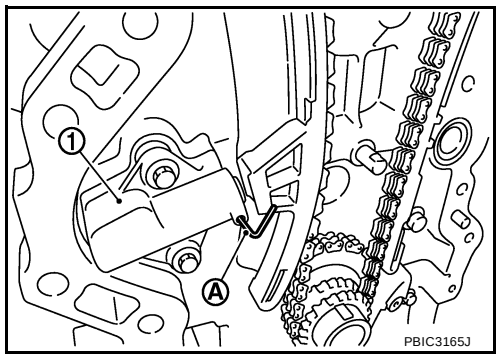
1. Remove drive belt. Refer to EM-13, "Removal and Installation" .
2. Release the fixed drive belt auto-tensioner pulley.
3. Loosen bolt and remove drive belt auto-tensioner.

7. Install the timing chain tension guide (3) and the timing chain slack guide (2).

   1 : Timing chain

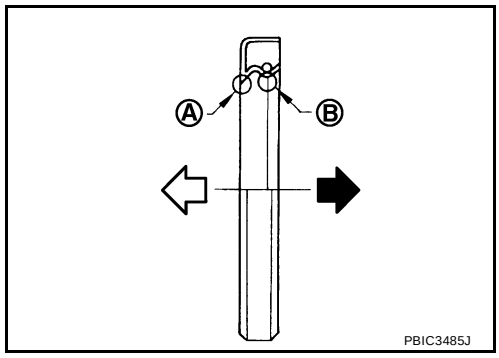


8. Install timing chain tensioner (1).
   - Fix the plunger at the most compressed position using a stopper pin (A), and then install it.
   - Securely pull out the stopper pin after installing the timing chain tensioner.



9. Check matching mark position of timing chain and each sprocket again.
10. Apply new engine oil to new front oil seal joint surface.
11. Using a suitable tool install front oil seal so that each seal lip is oriented as shown.

    A : Dust seal lip
    B : Oil seal lip
    ⇦ : Engine front
    ⬅ : Engine rear



   - Press-fit front oil seal until it is flush with front end surface of front cover as shown below with a suitable tool.

     Within 0.3 mm (0.012 in) toward engine front

     Within 0.5 mm (0.020 in) toward engine rear

     CAUTION:
     - **Be careful not to damage front cover and crankshaft.**
     - **Press-fit oil seal straight to avoid causing burrs or tilting.**
     - **Never touch grease applied onto oil seal lip.**

12. Install new O-ring to cylinder block.

Therefore, when electrical controlled throttle and part of ECM related diagnoses are continuously detected as NG for 5 trips, ECM warns the driver that engine control system malfunctions and MIL circuit is open by means of operating fail-safe function.
The fail-safe function also operates when above diagnoses except MIL circuit are detected, and demands the driver to repair the malfunction.

Engine operating condition in fail-safe mode	Engine speed will not rise more than 2,500 rpm due to the fuel cut

Emission-related Diagnostic Information

UBS00QBH

EMISSION-RELATED DIAGNOSTIC INFORMATION ITEMS

×: Applicable —: Not applicable

Items (CONSULT-II screen terms)	DTC*1		SRT code	Test value/ Test limit (GST only)	Trip	MIL lighting up	Reference page
	CONSULT-II GST*2	ECM*3					
CAN COMM CIRCUIT	U1000	1000*4	—	—	1 (CVT) 1 (A/T) 2 (M/T)	× (CVT) × (A/T) — (M/T)	EC-151
CAN COMM CIRCUIT	U1001	1001*4	—	—	2	—	EC-151
CONTROL UNIT(CAN)	U1010	1010	—	—	1 (CVT) 1 (A/T) 2 (M/T)	× (CVT) × (A/T) — (M/T)	EC-154
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	**P0000**	**0000**	—	—	—	**Flashing***5	EC-62
INT/V TIM CONT-B1	P0011	0011	—	—	2	×	EC-156
A/F SEN1 HTR (B1)	P0031	0031	—	×	2	×	EC-161
A/F SEN1 HTR (B1)	P0032	0032	—	×	2	×	EC-161
HO2S2 HTR (B1)	P0037	0037	—	×	2	×	EC-166
HO2S2 HTR (B1)	P0038	0038	—	×	2	×	EC-166
INT/V TIM V/CIR-B1	P0075	0075	—	—	2	×	EC-173
MAF SEN/CIRCUIT	P0101	0101	—	—	2	×	EC-178
MAF SEN/CIRCUIT	P0102	0102	—	—	1	×	EC-187
MAF SEN/CIRCUIT	P0103	0103	—	—	1	×	EC-187
IAT SEN/CIRCUIT	P0112	0112	—	—	2	×	EC-195
IAT SEN/CIRCUIT	P0113	0113	—	—	2	×	EC-195
ECT SEN/CIRC	P0117	0117	—	—	1	×	EC-200
ECT SEN/CIRC	P0118	0118	—	—	1	×	EC-200
TP SEN 2/CIRC	P0122	0122	—	—	1	×	EC-206
TP SEN 2/CIRC	P0123	0123	—	—	1	×	EC-206
ECT SENSOR	P0125	0125	—	—	1	×	EC-212
IAT SENSOR	P0127	0127	—	—	2	×	EC-215
THERMSTAT FNCTN	P0128	0128	—	—	2	×	EC-218
A/F SENSOR1 (B1)	P0130	0130	—	×	2	×	EC-220
A/F SENSOR1 (B1)	P0131	0131	—	×	2	×	EC-227
A/F SENSOR1 (B1)	P0132	0132	—	×	2	×	EC-233
A/F SENSOR1 (B1)	P0133	0133	×	×	2	×	EC-239
HO2S2 (B1)	P0137	0137	×	×	2	×	EC-248
HO2S2 (B1)	P0138	0138	×	×	2	×	EC-257
HO2S2 (B1)	P0139	0139	×	×	2	×	EC-267
FUEL SYS-LEAN-B1	P0171	0171	—	—	2	×	EC-276
FUEL SYS-RICH-B1	P0172	0172	—	—	2	×	EC-284

DIAGNOSTIC WORKSHEET

Information from Customer

KEY POINTS

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

Customer name MR./MS	Model & Year	VIN
Trans. model	Engine	Mileage
Incident Date	Manuf. Date	In Service Date
Frequency	❑ Continuous ❑ Intermittent (times a day)	
Symptoms	❑ Vehicle does not move. (❑ Any position ❑ Particular position)	
	❑ No up-shift (❑ 1st → 2nd ❑ 2nd → 3rd ❑ 3rd → 4th)	
	❑ No down-shift (❑ 4th → 3rd ❑ 3rd → 2nd ❑ 2nd → 1st)	
	❑ Lock-up malfunction	
	❑ Shift point too high or too low.	
	❑ Shift shock or slip (❑ N → D ❑ Lock-up ❑ Any drive position)	
	❑ Noise or vibration	
	❑ No kick down	
	❑ No pattern select	
	❑ Others ( )	

Diagnostic Worksheet Chart

1.	❑ Read the Fail-safe and listen to customer complaints.			AT-43, AT-47
2.	❑ Check A/T fluid			AT-16
		❑ Leakage (Follow specified procedure) ❑ Fluid condition ❑ Fluid level		
3.	❑ Perform “STALL TEST” and “LINE PRESSURE TEST”.			AT-53, AT-56
		❑ “STALL TEST” — Mark possible damaged components/others.		
			❑ Torque converter one-way clutch ❑ Reverse clutch ❑ Forward clutch ❑ Overrun clutch ❑ Forward one-way clutch	❑ Low & reverse brake ❑ Low one-way clutch ❑ Engine ❑ Line pressure is low ❑ Clutches and brakes except high clutch and brake band are OK
		❑ “LINE PRESSURE TEST” — Suspected parts:		

DTC P1760 OVERRUN CLUTCH SOLENOID VALVE

PFP:31940

Description

UCS005Q1

The overrun clutch solenoid valve is activated by the TCM in response to signals sent from the PNP switch, overdrive control switch, vehicle speed and ECM (throttle opening). The overrun clutch operation will then be controlled.

CONSULT-II Reference Value

UCS005Q2

Item name	Condition	Display value
OVERRUN/C S/V	When overrun clutch solenoid valve operates. (When overrun clutch disengaged. Refer to AT-22 .)	ON
	When overrun clutch solenoid valve does not operate. (When overrun clutch engaged. Refer to AT-22 .)	OFF

On Board Diagnosis Logic

UCS005Q3

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1760 OVERRUN CLUTCH S/V” with CONSULT-II or 6th judgement flicker without CONSULT-II is detected when TCM detects an improper voltage drop when it tries to operate solenoid valve.

Possible Cause

UCS005Q4

- Harness or connector
  (The solenoid circuit is open or shorted.)
- Overrun clutch solenoid valve

DTC Confirmation Procedure

UCS005Q5

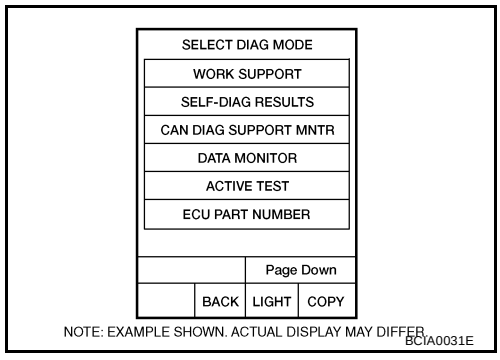
CAUTION:

- **Always drive vehicle at a safe speed.**
- **If performing this “DTC Confirmation Procedure” again, always turn ignition switch OFF and wait at least 10 seconds before continuing.**

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 “A/T” with CONSULT-II.
2. Touch “START”.
3. Start engine.
4. Accelerate vehicle to a speed of more than 10 km/h (6 MPH) with “D” position (OD ON).
5. Release accelerator pedal completely with “D” position (OD OFF).
6. If the check result is NG, go to AT-163, "Diagnostic Procedure" .



NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER
BCIA0031E

WITH GST

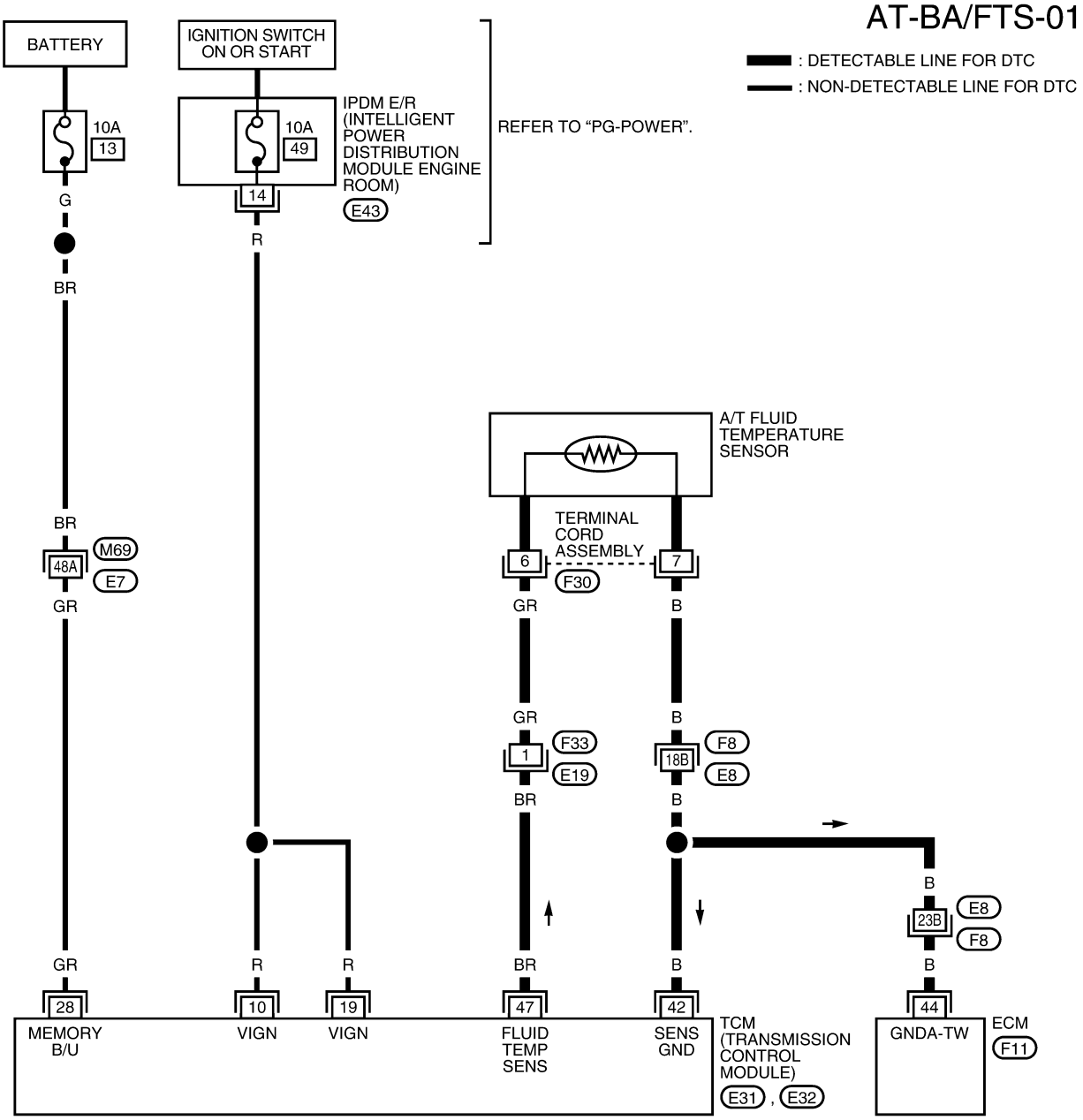
Follow the procedure “WITH CONSULT-II”.

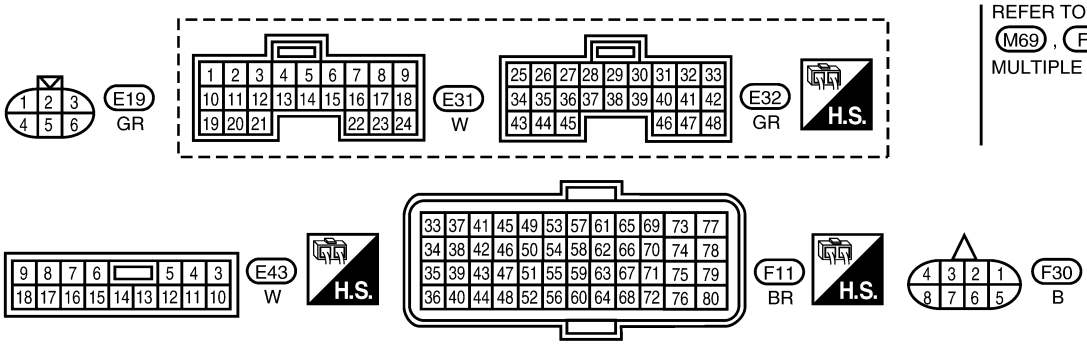
WITHOUT CONSULT-II

1. Start engine.
2. Drive vehicle under the following conditions:
   Selector lever position: “D” position (OD ON)
   Vehicle speed: Higher than 10 km/h (6 MPH)
3. Perform self-diagnosis. Refer to AT-90, "Diagnostic Procedure Without CONSULT-II" .
4. If the check result is NG, go to AT-163, "Diagnostic Procedure" .

Wiring Diagram — AT — BA/FTS

UCS005QL





BCWA0659E

COIL SPRING

PFP:55020

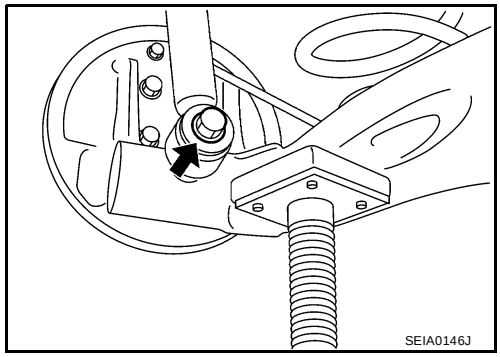
Removal and Installation

EES002D1

REMOVAL

1. Remove rear tires from vehicle using power tool.
2. Remove wheel sensor from wheel hub and bearing assembly. Refer to BRC-33, "WHEEL SENSORS" .

   CAUTION:
   Do not pull on wheel sensor harness.
3. Separate brake tube from wheel cylinder. Refer to BR-11, "BRAKE TUBE AND HOSE" .
4. Set jack under rear suspension beam.
5. Remove shock absorber lower side bolt. Refer to RSU-9, "SHOCK ABSORBER" .
6. Gradually lower the jack, and then remove coil spring and rear spring rubber seat (upper and lower).

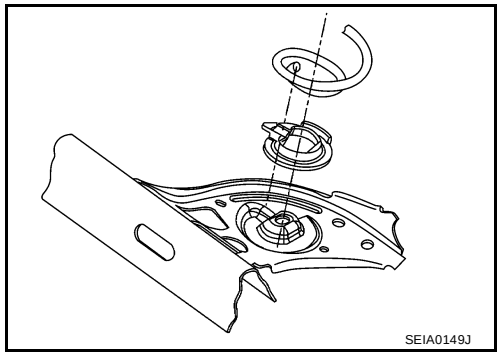


INSPECTION AFTER REMOVAL

Check coil spring and spring rubber seat for deformation, cracks, and damage, and replace it if a malfunction is detected.

INSTALLATION

- Installation is in the reverse order of removal. For tightening torque, refer to RSU-8, "Components" .
- When installing spring, be sure to securely install the spring end position aligned to flush of rear spring rubber seat (lower) as shown.

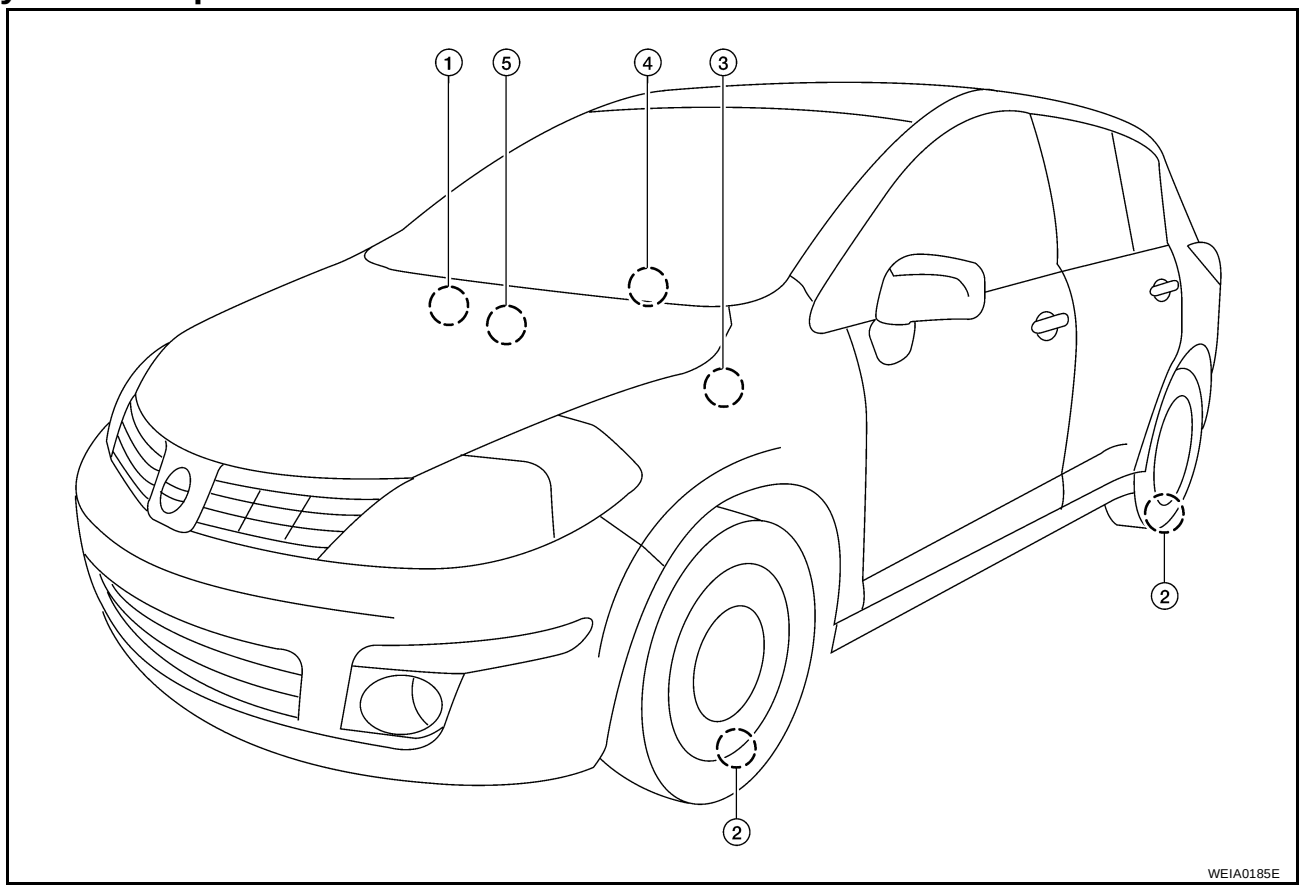


LOW TIRE PRESSURE WARNING SYSTEM

PFP:40300

System Components

EES002FF



1. BCM
   M18, M20
2. Transmitters
3. Tire pressure warning check connector
   M39
4. Combination meter
   M24
5. Remote keyless entry receiver
   M23

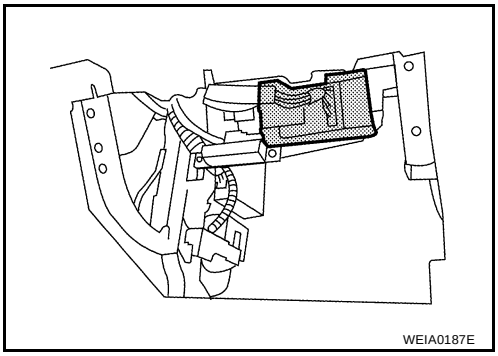
System Description

EES002FG

BODY CONTROL MODULE (BCM)

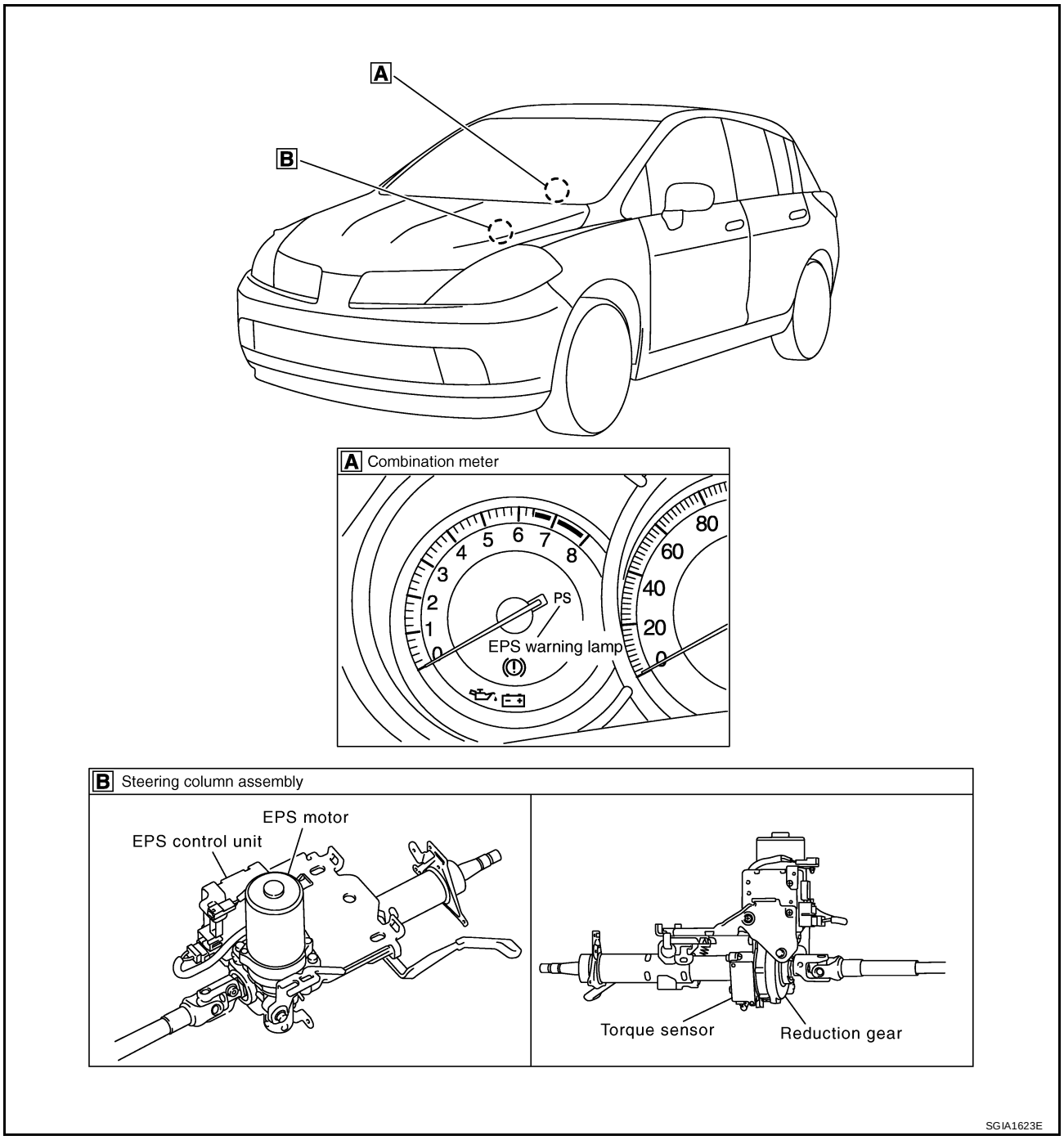
The BCM is shown with the glove box removed. The BCM reads the air pressure signal received by the remote keyless entry receiver, and controls the low tire pressure warning lamp as shown below. It also has a self-diagnosis function to detect a system malfunction.

Condition	Low tire pressure warning lamp
System normal	On for 1 second after ignition ON
Tire less than 193 kPa (2.0 kg/cm^2 , 28 psi) [Flat tire]	ON
Low tire pressure warning system malfunction	After key ON, flashes once per second for 1 minute, then stays ON



Component Parts Location

UGS0007U

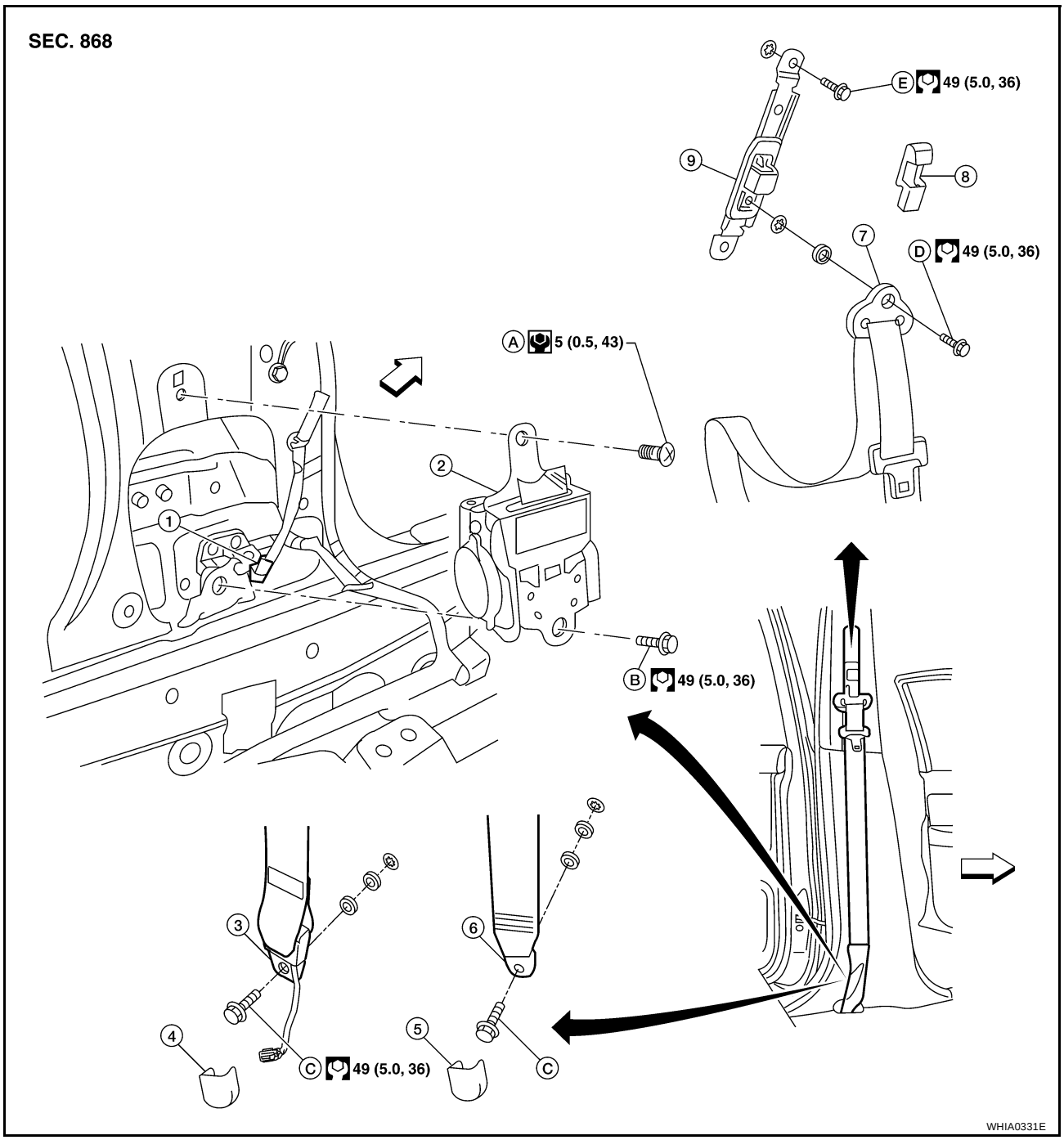


SEAT BELTS

PFP:86884

Removal and Installation of Front Seat Belt

EHS001TR



1. Seat belt pre-tensioner connector	2. Seat belt retractor	3. Outer anchor RH (belt tension sensor)
4. Anchor cover (belt tension sensor)	5. Anchor cover	6. Outer anchor LH
7. D-ring anchor	8. Adjuster cover	9. Seat belt adjuster
A. Retractor bolt upper	B. Retractor anchor bolt	C. Outer anchor bolt
D. D-ring anchor bolt	E. Adjuster anchor bolt	⇐ Vehicle front

CAUTION:

Before servicing the SRS, turn the ignition switch off, disconnect both battery cables and wait at least 3 minutes.

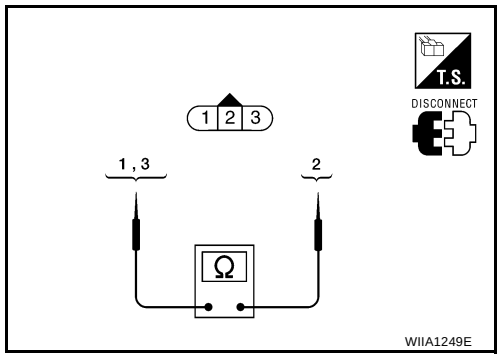
REMOVAL OF SEAT BELT RETRACTOR

1. Disconnect both the negative and positive battery cables, then wait at least 3 minutes.

3. CHECK DOOR KEY CYLINDER SWITCH LH

Check continuity between front door key cylinder switch LH terminals.

Terminals	Door key cylinder switch position	Continuity
2 – 1	Neutral/Unlock	No
	Lock	Yes
2 – 3	Neutral/Lock	No
	Unlock	Yes



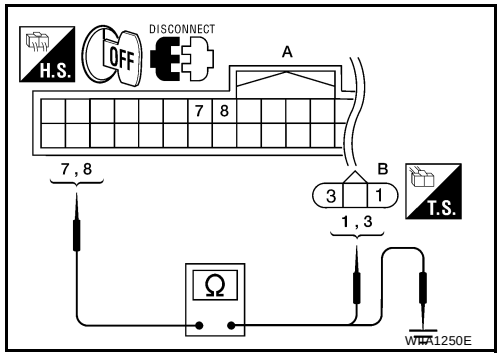
OK or NG

OK >> GO TO 4.
NG >> Replace front door key cylinder switch LH. Refer to BL-169, "FRONT DOOR LOCK" .

4. CHECK DOOR KEY CYLINDER HARNESS

1. Disconnect BCM connector M18.
2. Check continuity between BCM connector (A) M18 terminals 7, 8 and front door key cylinder switch LH connector (B) D14 terminals 1, 3 and body ground.

Connector	Terminal	Connector	Terminal	Continuity
A: M18	7	B: D14	3	Yes
	8		1	Yes
	7	Ground		No
	8	Ground		No



OK or NG

OK >> Front door key cylinder switch LH circuit is OK.
NG >> Repair or replace harness.

Passenger Select Unlock Relay Circuit Check (With Intelligent Key)

EIS009CD

1. CHECK PASSENGER SELECT UNLOCK RELAY CIRCUIT

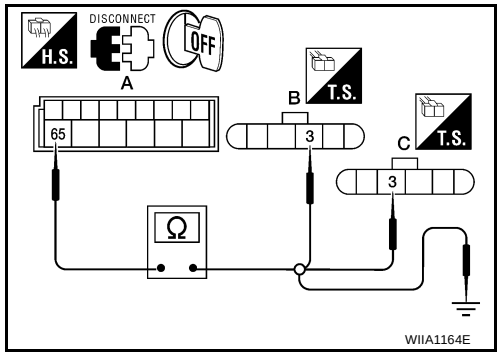
NOTE:
Passenger select unlock relay must remain connected during this step.

1. Turn ignition switch OFF.
2. Disconnect BCM and inoperative rear door lock actuator.
3. Check continuity between BCM connector (A) M20 terminal 65 and rear door lock actuator LH connector (B) D205 terminal 3 or rear door lock actuator RH connector (C) D305 Terminal 3.

65 - 3 : Continuity should exist.

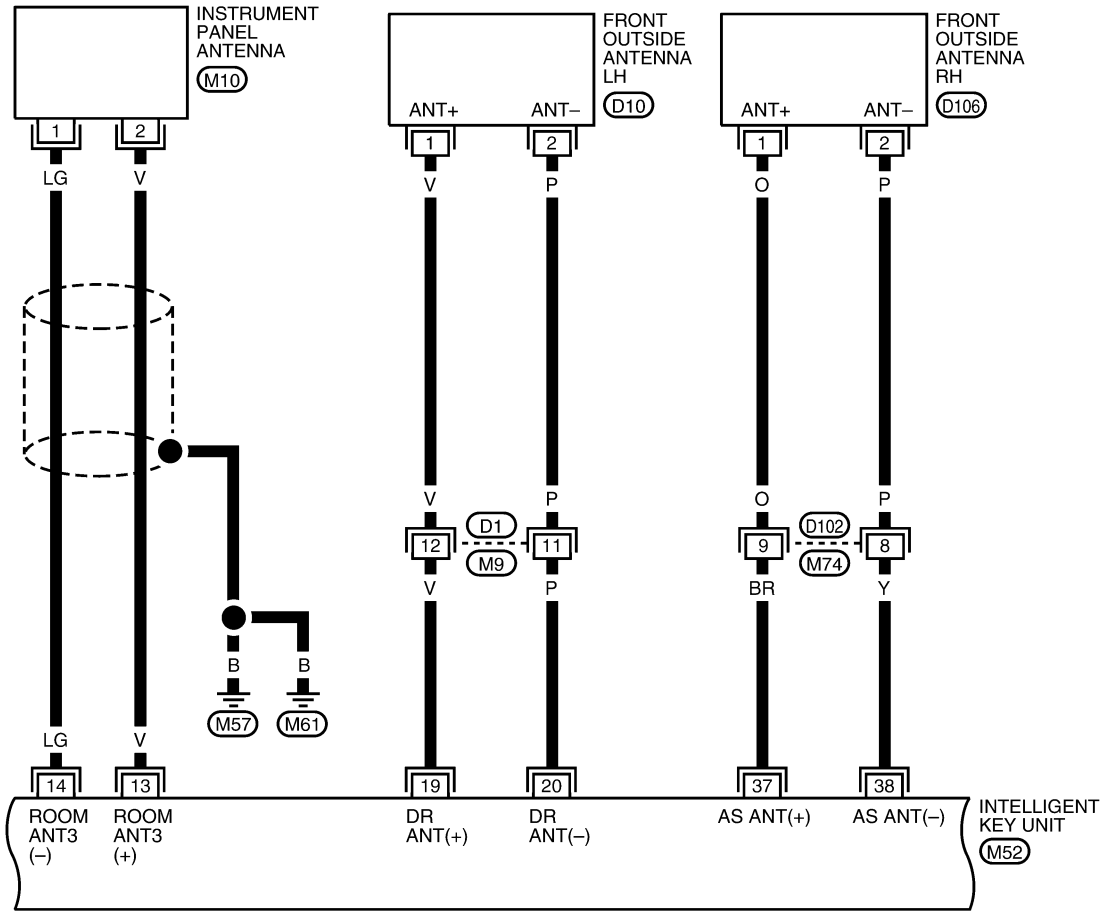
4. Check continuity between BCM connector M20 terminal 65 and body ground.

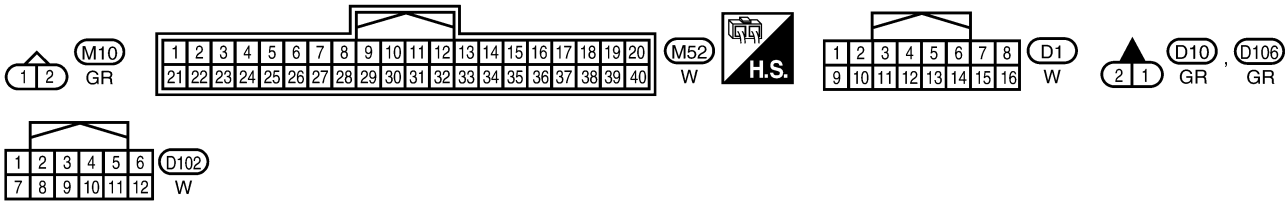
65 - Ground : Continuity should not exist.



OK or NG

OK >> GO TO 4.
NG >> GO TO 2.


INSTRUMENT PANEL ANTENNA
M10
1
2
LG
V
FRONT OUTSIDE ANTENNA LH
D10
ANT+
ANT–
FRONT OUTSIDE ANTENNA RH
D106
O
P
D1
M9
D102
M74
B
M57
M61
BR
Y
14
13
19
20
37
38
ROOM ANT3 (–)
ROOM ANT3 (+)
DR ANT(+)
DR ANT(–)
AS ANT(+)
AS ANT(–)
INTELLIGENT KEY UNIT
M52


M10
GR
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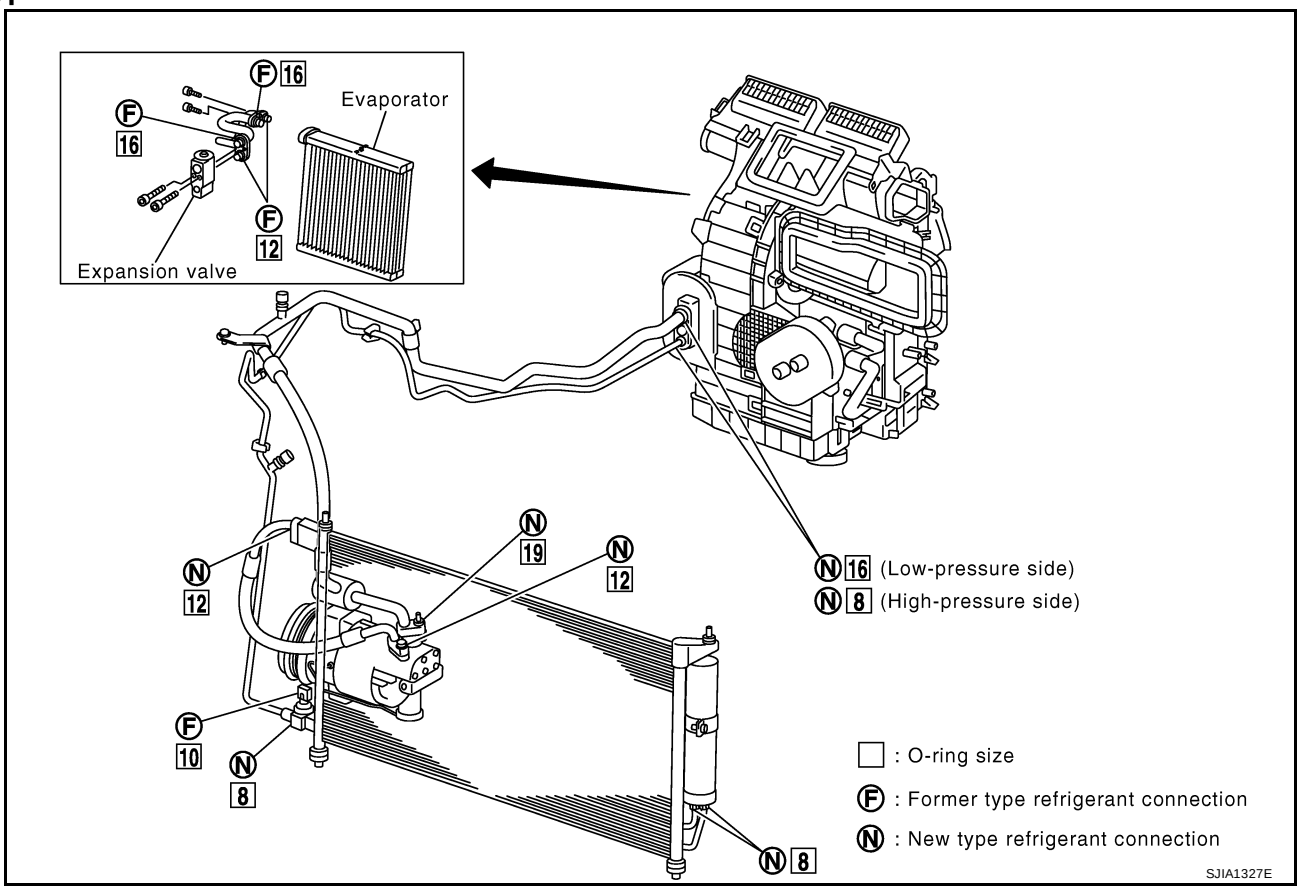
Type 2



CAUTION:

The new and former refrigerant connections use different O-ring configurations. Do not confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant will leak at, or around, the connection.

O-Ring Part Numbers and Specifications

Connection type	Piping connection point		Part number	QTY	O-ring size
New	Condenser to high-pressure flexible hose		92472 N8210	1	12
	Condenser to high-pressure pipe		92471 N8210	1	8
	Low-pressure flexible hose to expansion valve		92473 N8210	1	16
	High-pressure pipe to expansion valve		92471 N8210	1	8
	Compressor to low-pressure flexible hose		92474 N8210	1	19
	Compressor to high-pressure flexible hose		92472 N8210	1	12
	Liquid tank to condenser pipe	Inlet	92471 N8210	1	8
		Outlet		1	
Former	Refrigerant pressure sensor to condenser		J2476 89956	1	10
	Expansion valve to evaporator	Inlet	92471 N8200	2	12
		Outlet	92473 N8200	2	16

WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

CAUTION:

When replacing or cleaning refrigerant cycle components, observe the following.

- **When the compressor is removed, store it in the same position as it is when mounted on the vehicle. Doing so will cause oil to enter the low-pressure chamber.**
- **When connecting tubes, always use a torque wrench and a back-up wrench.**