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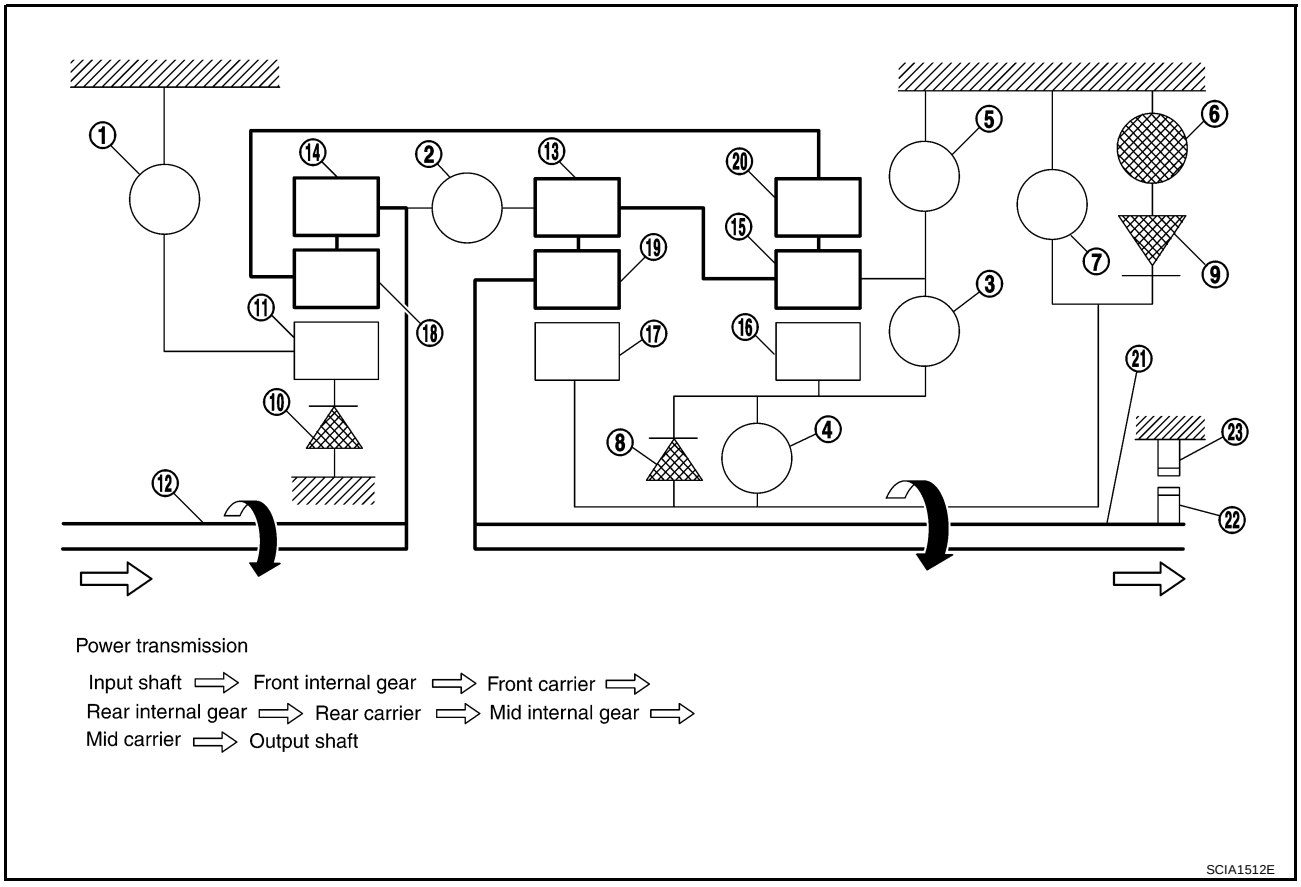
NISSAN FRONTIER

MODEL D40 SERIES

QUICK REFERENCE INDEX

“D”, “3” and “2” Positions 1st Gear

- The forward brake and the forward one-way clutch regulate reverse rotation of the mid sun gear.
- The 1st one-way clutch regulates reverse rotation of the rear sun gear.
- The 3rd one-way clutch regulates reverse rotation of the front sun gear.
- During deceleration, the mid sun gear turns forward, so the forward one-way clutch idles and the engine brake is not activated.



1. Front brake	2. Input clutch	3. Direct clutch
4. High and low reverse clutch	5. Reverse brake	6. Forward brake
7. Low coast brake	8. 1st one-way clutch	9. Forward one-way clutch
10. 3rd one-way clutch	11. Front sun gear	12. Input shaft
13. Mid internal gear	14. Front internal gear	15. Rear carrier
16. Rear sun gear	17. Mid sun gear	18. Front carrier
19. Mid carrier	20. Rear internal gear	21. Output shaft
22. Parking gear	23. Parking pawl	

4WD MODELS

A/T model code number			98X0B							
Final gear ratio	Tire size	Throttle position	Vehicle speed km/h (MPH)							
			D1 →D2	D2 →D3	D3 →D4	D4 →D5	D5 →D4	D4 →D3	D3 →D2	D2 →D1
3.357	P265/75R16	Full throttle	60 - 68 (37 - 42)	99 - 110 (61 - 69)	153 - 170 (95 - 107)	234 - 259 (146 - 162)	230 - 255 (143 - 160)	142 - 158 (88 - 99)	87 - 97 (54 - 61)	41- 47 (25 - 30)
		Half throttle	49 - 55 (30 - 35)	80 - 90 (50 - 57)	123 - 137 (76 - 86)	149 - 165 (93 - 103)	115 - 128 (71 - 80)	71 - 79 (44 - 50)	51 - 57 (31 - 36)	12 - 14 (7 - 9)
	P265/70R16 P265/65R17	Full throttle	58 - 65 (36 - 41)	94 - 104 (58 - 65)	144 - 160 (90 - 100)	221 - 245 (138 - 154)	218 - 241 (136 - 151)	135 - 150 (84 - 94)	82 - 92 (51-58)	40 - 45 (25 - 29)
		Half throttle	46 - 52 (28 - 33)	76 - 84 (47 - 53	117 - 130 (73 - 82)	140 -156 (88 - 98)	109 - 121 (68 - 76)	67 - 75 (41 - 47)	48 - 54 (30 - 34)	12 - 14 (7 - 9)
3.133	P265/70R16 P265/65R17	Full throttle	60 - 68 (37 - 43)	99 - 110 (61 - 69)	153 - 170 (95 - 107)	234 - 259 (146 - 162)	230 - 255 (143 - 160)	142 - 158 (88 - 99)	87 - 97 (54 - 61)	41- 47 (25 - 30)
		Half throttle	49 - 55 (30 - 35)	80 - 90 (50 - 57)	123 - 137 (76 - 85)	149 - 165 (93 - 103)	115 - 128 (71 - 80)	71 - 79 (44 - 50)	51 - 57 (31 - 36)	12 - 14 (7 - 9)

- At half throttle, the accelerator opening is 1/2 of the full opening.

Vehicle Speed at Which Lock-up Occurs/Releases

ECS00IQA

2WD MODELS

A/T model code number		97X9E	
Tire size	Throttle position	Vehicle speed km/h (MPH)	
		Lock-up “ON”	Lock-up “OFF”
P235/75R15	Closed throttle	56 - 64 (35 - 40)	53 - 61 (33 - 37)
P265/70R16	Half throttle	161 - 169 (101 - 106)	126 - 134 (78 - 83)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 1/2 of the full opening.

2WD MODELS

A/T model code number		98X0A		
Final gear ratio	Tire size	Throttle position	Vehicle speed km/h (MPH)	
			Lock-up “ON”	Lock-up “OFF”
3.133	P265/75R16	Closed throttle	71 - 79 (44 - 49)	68 - 76 (43 -48)
		Half throttle	175 - 195 (109 - 122)	144 - 160 (90 - 100)
	P265/70R16 P265/65R17	Closed throttle	66 - 74 (41 - 46)	63 - 71 (39 - 44)
		Half throttle	166 - 186 (104 - 116)	132 - 148 (83 - 93)
2.937	P265/65R17 P265/70R16	Closed throttle	71 - 79 (44 - 49)	68 - 76 (43 -48)
		Half throttle	175 - 195 (109 - 122)	144 - 160 (90 - 100)

- At closed throttle, the accelerator opening is less than 1/8 condition. (Closed throttle position signal: OFF)
- At half throttle, the accelerator opening is 1/2 of the full opening.

DTC P0615 START SIGNAL CIRCUIT

PFP:25230

Description

UCS0042O

- TCM prohibits cranking other than at “P” or “N” position.

CONSULT-II Reference Value

UCS0042P

Item name	Condition	Display value
STARTER RELAY	Selector lever in “N”, “P” positions.	ON
	Selector lever in other position.	OFF

On Board Diagnosis Logic

UCS0042Q

- This is not an OBD-II self-diagnostic item.
- Diagnostic trouble code “P0615 STARTER RELAY/CIRC” with CONSULT-II or 14th judgement flicker without CONSULT-II is detected when park/neutral (PNP) relay (starter relay) is switched “ON” other than at “P” or “N” position. (Or when switched “OFF” at “P” or “N” position).

Possible Cause

UCS0042R

- Harness or connectors
  [The park/neutral position (PNP) relay (starter relay) and TCM circuit is open or shorted.]
- Park/neutral position (PNP) relay (starter relay)

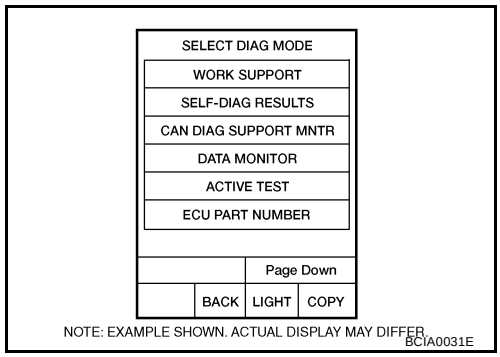
DTC Confirmation Procedure

UCS0042S

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle for at least 2 consecutive seconds.
5. If DTC is detected, go to AT-103, "Diagnostic Procedure" .



DTC P1752 INPUT CLUTCH SOLENOID VALVE

PFP:31940

Description

UCS0045E

Input clutch solenoid valve is controlled by the TCM in response to signals sent from the PNP switch, vehicle speed sensor and accelerator pedal position sensor (throttle position sensor). Gears will then be shifted to the optimum position.

CONSULT-II Reference Value

UCS0045F

Item name	Condition	Display value (Approx.)
I/C SOLENOID	Input clutch disengaged. Refer to AT-21 .	0.6 - 0.8 A
	Input clutch engaged. Refer to AT-21 .	0 - 0.05 A

On Board Diagnosis Logic

UCS0045G

- This is an OBD-II self-diagnostic item.
- Diagnostic trouble code “P1752 I/C SOLENOID/CIRC” with CONSULT-II or 5th judgement flicker without CONSULT-II is detected under the following conditions.
  - When TCM detects an improper voltage drop when it tries to operate the solenoid valve.
  - When TCM detects as irregular by comparing target value with monitor value.

Possible Cause

UCS0045H

- Harness or connectors
  (The solenoid circuit is open or shorted.)
- Input clutch solenoid valve

DTC Confirmation Procedure

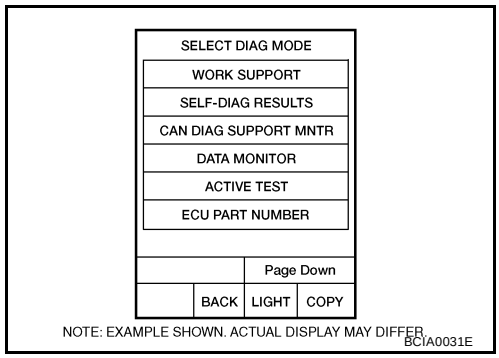
UCS0045I

CAUTION:
Always drive vehicle at a safe speed.

NOTE:
If “DTC Confirmation Procedure” has been previously performed, always turn ignition switch “OFF” and wait at least 10 seconds before performing the next test.
After the repair, perform the following procedure to confirm the malfunction is eliminated.

WITH CONSULT-II

1. Turn ignition switch “ON”. (Do not start engine.)
2. Select “DATA MONITOR” mode for “A/T” with CONSULT-II.
3. Start engine.
4. Drive vehicle and maintain the following conditions for at least 5 consecutive seconds.
   ACCELE POS: 1.5/8 - 2.0/8
   Selector lever: “D” position
   Gear position: 3rd ⇒ 4th Gear (I/C ON/OFF)
   Driving location: Driving the vehicle uphill (increased engine load) will help maintain the driving conditions required for this test.
5. If DTC is detected go to AT-141, "Diagnostic Procedure" .



NOTE: EXAMPLE SHOWN. ACTUAL DISPLAY MAY DIFFER.
BCIA0031E

WITH GST

Follow the procedure “WITH CONSULT-II”.

Engine Cannot Be Started In “P” or “N” Position

UCS00480

SYMPTOM:

- **Engine cannot be started with selector lever in “P” or “N” position.**
- **Engine can be started with selector lever in “D”, “3”, “2”, “1”or “R” position.**

DIAGNOSTIC PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis. Refer to AT-89, "SELF-DIAGNOSTIC RESULT MODE" .

Do the self-diagnosis results indicate PNP switch?

YES >> Check the malfunctioning system. Refer to AT-106, "DTC P0705 PARK/NEUTRAL POSITION SWITCH" .

NO >> GO TO 2.

2. CHECK CONTROL CABLE

Check the control cable.

- Refer to AT-217, "Checking of A/T Position" .

OK or NG

OK >> GO TO 3.

NG >> Adjust control cable. Refer to AT-217, "Adjustment of A/T Position" .

3. CHECK STARTING SYSTEM

Check the starting system. Refer to SC-10, "STARTING SYSTEM" .

OK or NG

OK >> **INSPECTION END**

NG >> Repair or replace damaged parts.

A/T SHIFT LOCK SYSTEM

PFP:34950

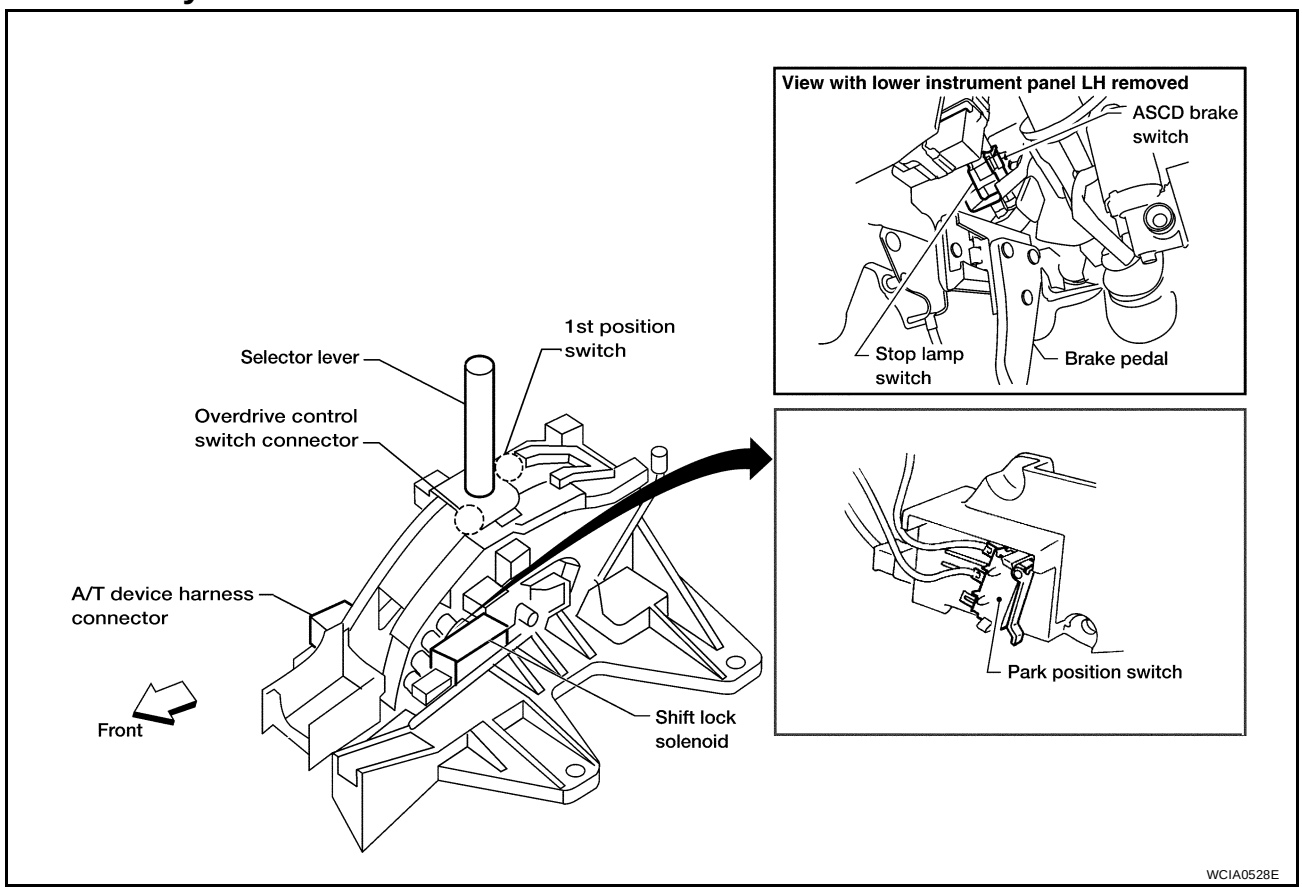
Description

UCS0048N

- The mechanical key interlock mechanism also operates as a shift lock:
  With the ignition switch turned to ON, the selector lever cannot be shifted from “P” (parking) to any other position unless the brake pedal is depressed.
  With the key removed, the selector lever cannot be shifted from “P” to any other position.
  The key cannot be removed unless the selector lever is placed in “P” position.
- The shift lock and key interlock mechanisms are controlled by the ON-OFF operation of the shift lock solenoid and by the operation of the rotator and slider located inside the key cylinder, respectively.

Shift Lock System Electrical Parts Location

UCS0048O

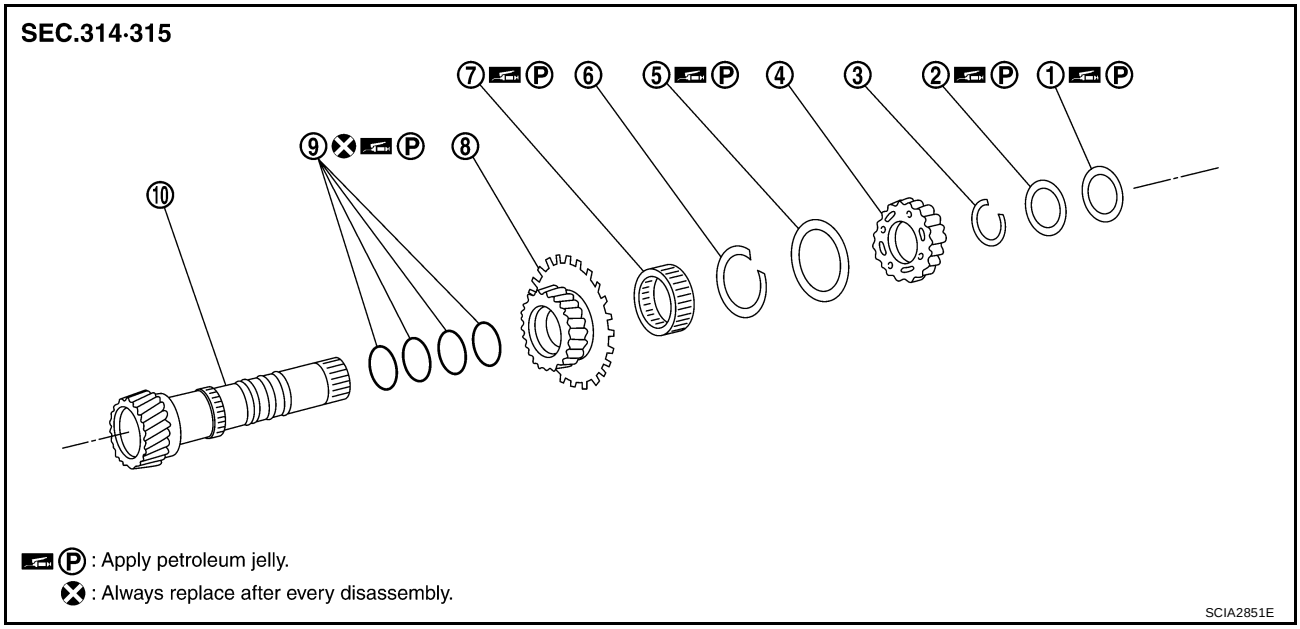


7. Reverse brake dish plate
8. Reverse brake driven plate
9. N-spring
10. Reverse brake drive plate
11. Reverse brake retaining plate
12. Snap ring
13. D-ring
14. D-ring
15. Reverse brake piston
16. Return spring
17. Spring retainer
18. Snap ring

Mid Sun Gear, Rear Sun Gear, High and Low Reverse Clutch Hub

UCS00496

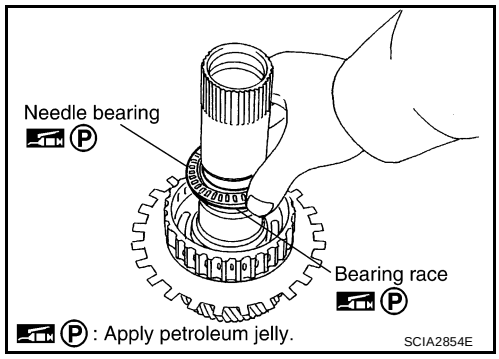
COMPONENTS



1. Needle bearing
2. Bearing race
3. Snap ring
4. High and low reverse clutch hub
5. Needle bearing
6. Snap ring
7. 1st one-way clutch
8. Rear sun gear
9. Seal ring
10. Mid sun gear

DISASSEMBLY

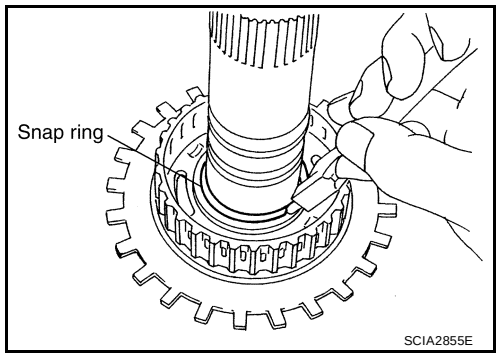
1. Remove needle bearing and bearing race from high and low reverse clutch hub.



2. Remove snap ring from mid sun gear assembly using suitable tool.

CAUTION:

Do not expand snap ring excessively.



SECTION AV

AUDIO, VISUAL, NAVIGATION & TELEPHONE SYSTEM

CONTENTS

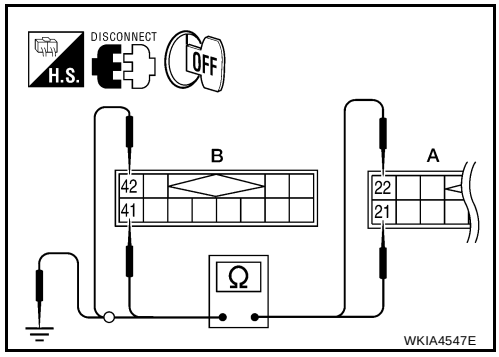
Satellite Radio Tuner (Factory Installed) Left Channel Audio Signal Circuit Inspection

EKS00HLX

1. CHECK HARNESS

1. Turn ignition switch OFF.
2. Disconnect satellite radio tuner (factory installed) connector M41 (A) and audio unit connector M42 (B).
3. Check continuity between satellite radio tuner (factory installed) and audio unit.

Terminals				Continuity
Satellite radio tuner (factory installed)		Audio unit		
Connector	Terminal	Connector	Terminal	
A: M41	21	B: M42	41	Yes
	22		42	



4. Check continuity between satellite radio tuner (factory installed) and ground.

Terminals			Continuity
Satellite radio tuner (factory installed)		—	
Connector	Terminal		
A: M41	21	Ground	No
	22		

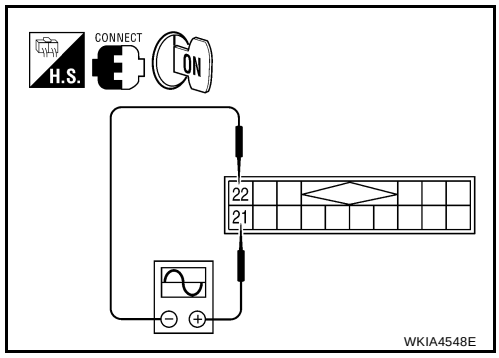
OK or NG

OK >> GO TO 2.
NG >> Repair harness or connector.

2. CHECK LEFT CHANNEL AUDIO SIGNAL

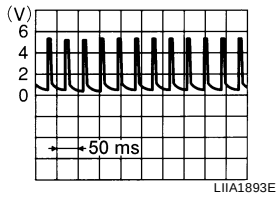
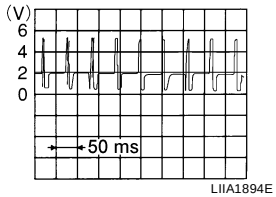
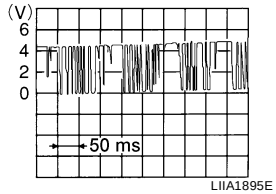
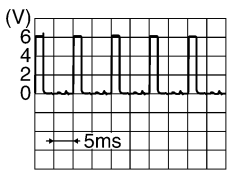
1. Connect satellite radio tuner (factory installed) and audio unit.
2. Turn ignition switch ON.
3. Check signal between satellite radio tuner (factory installed) connector M41 terminals 21 and 22 with CONSULT-II or oscilloscope.

21 - 22 **: Refer to AV-31, "Terminals and Reference Value for Satellite Radio Tuner" .**



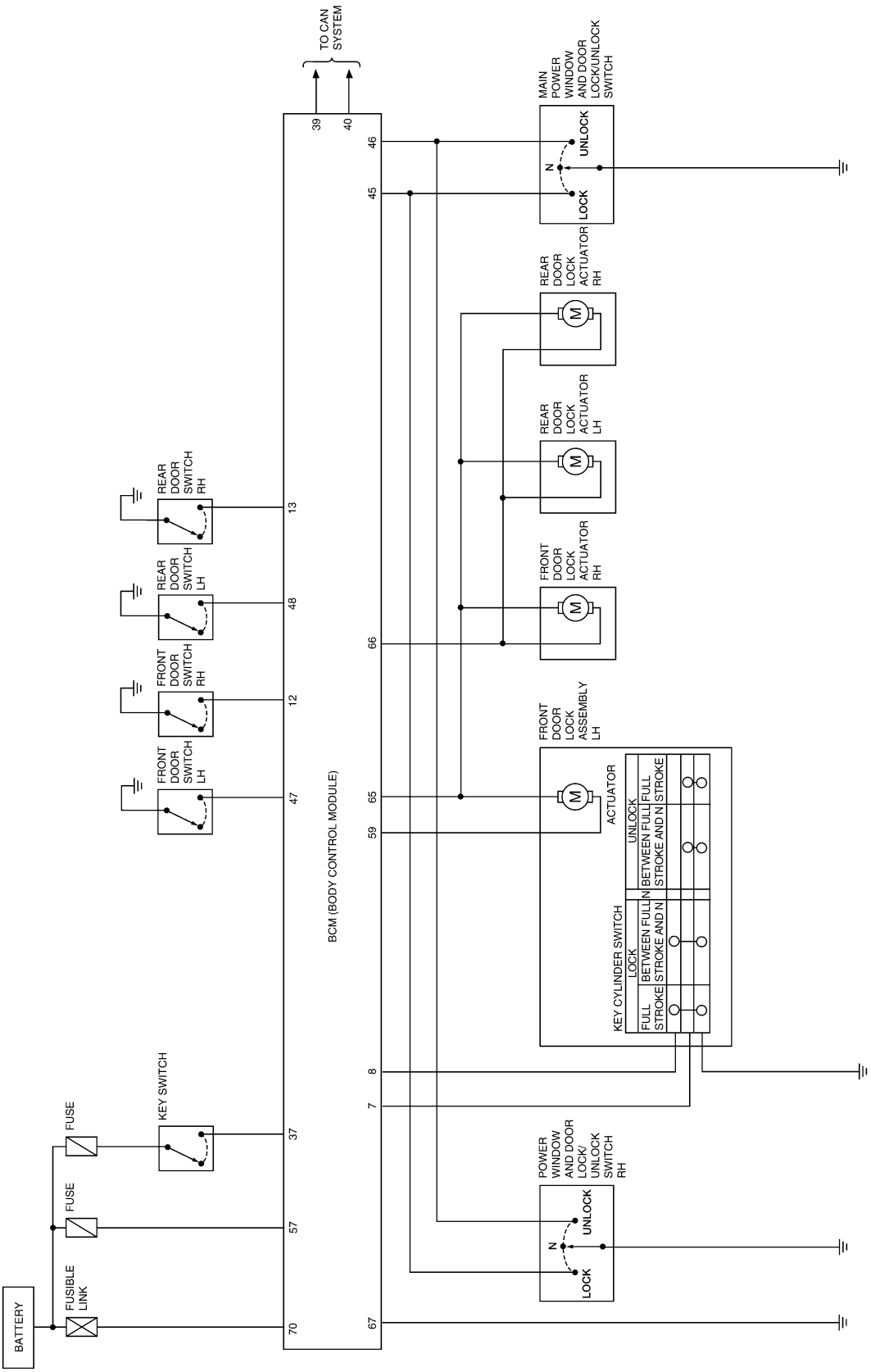
OK or NG

OK >> Replace satellite radio tuner (factory installed). Refer to AV-61, "SATELLITE RADIO TUNER" .
NG >> Replace audio unit. Refer to AV-59, "AUDIO UNIT" .

Terminal	Wire color	Item	Signal input/ output	Measuring condition		Reference value or waveform (Approx.)
				Ignition switch	Operation or condition	
15	W	Tire pressure warning check connector	Input	OFF	—	5V
18	BR	Remote keyless entry receiver (Ground)	Output	OFF	—	0V
19	V	Remote keyless entry receiver (power supply)	Output	OFF	Ignition switch OFF	 LIIA1893E
20	G	Remote keyless entry receiver signal (Signal)	Input	OFF	Stand-by (keyfob buttons released)	 LIIA1894E
					When remote keyless entry receiver receives signal from keyfob (keyfob buttons pressed)	 LIIA1895E
21	GR	NATS antenna amp.	Input	OFF → ON	Ignition switch (OFF → ON)	Just after turning ignition switch ON: Pointer of tester should move.
23	G	Security indicator lamp	Output	OFF	Goes OFF → illuminates (Every 2.4 seconds)	Battery voltage → 0V
25	BR	NATS antenna amp.	Input	OFF → ON	Ignition switch (OFF → ON)	Just after turning ignition switch ON: Pointer of tester should move.
27	W	Compressor ON signal	Input	ON	A/C switch OFF	5V
					A/C switch ON	0V
28	R	Front blower monitor	Input	ON	Front blower motor OFF	Battery voltage
					Front blower motor ON	0V
29	G	Hazard switch	Input	OFF	ON	0V
					OFF	5V
31	GR	Cargo lamp switch	Input	OFF	ON	0V
					OFF	Battery voltage
32	O	Combination switch output 5	Output	ON	Lighting, turn, wiper OFF Wiper dial position 4	 SKIA5291E

Schematic (Crew Cab)

EIS005WU



WIWA1648E

Door Switch Check (King Cab)

EIS005WZ

1. CHECK DOOR SWITCHES INPUT SIGNAL

With CONSULT-II

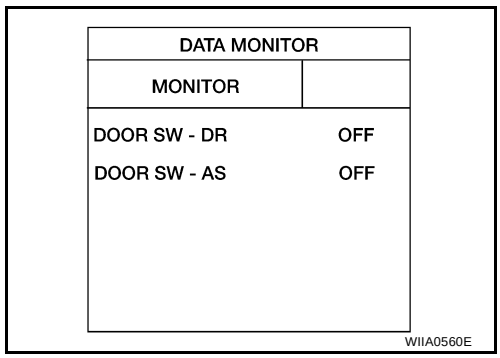
Check door switches ("DOOR SW-DR", "DOOR SW-AS") in DATA MONITOR mode with CONSULT–II. Refer to BL-59, "Data Monitor" .

- When any doors are open:

  DOOR SW-DR :ON
  DOOR SW-AS :ON

- When any doors are closed:

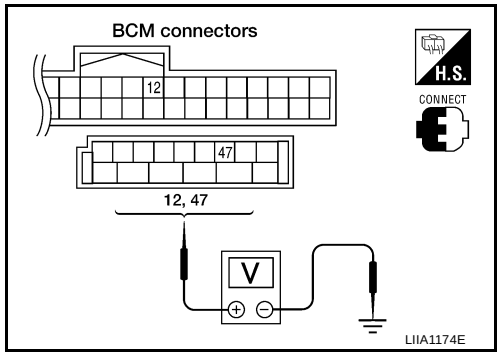
  DOOR SW-DR :OFF
  DOOR SW-AS :OFF



Without CONSULT-II

Check voltage between BCM connector M18 or M19 terminals 12, 47 and ground.

Connector	Item	Terminals (+)	Terminals (–)	Condition	Voltage (V) (Approx.)
M19	Door switches LH	47	Ground	Open ↓ Closed	0 ↓ Battery voltage
M18	Door switches RH	12			



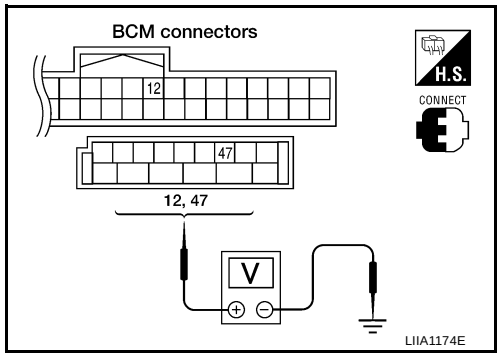
OK or NG

OK >> Door switch circuit is OK.
NG >> GO TO 2.

2. CHECK BCM OUTPUT VOLTAGE

1. Turn ignition switch OFF.
2. Disconnect door switches.
3. Check voltage between BCM connector M18, M19 terminals 12, 47 and ground.

   12 - Ground : Battery voltage
   47 - Ground : Battery voltage



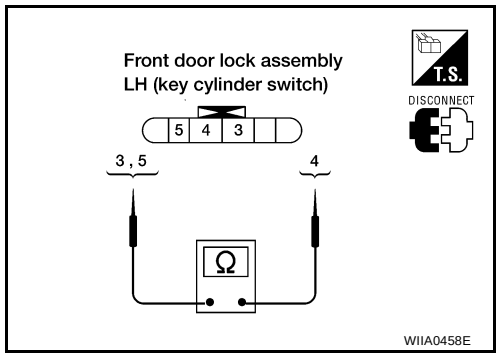
OK or NG

OK >> GO TO 3.
NG >> Replace BCM. Refer to BCS-25, "Removal and Installation" .

2. CHECK FRONT DOOR LOCK ASSEMBLY LH (KEY CYLINDER SWITCH)

1. Turn ignition switch OFF.
2. Disconnect front door lock assembly LH (key cylinder switch).
3. Check continuity between front door lock assembly LH (key cylinder switch) terminals 3, 4 and 5.

Terminals	Condition	Continuity
4 – 5	Key is turned to LOCK.	Yes
	Key is in N position or turned to UNLOCK	No
3 – 4	Key is turned to UNLOCK.	Yes
	Key is in N position or turned to LOCK	No



OK or NG

OK >> GO TO 3.
NG >> Replace front door lock assembly LH (key cylinder switch). Refer to BL-111, "Removal and Installation" .

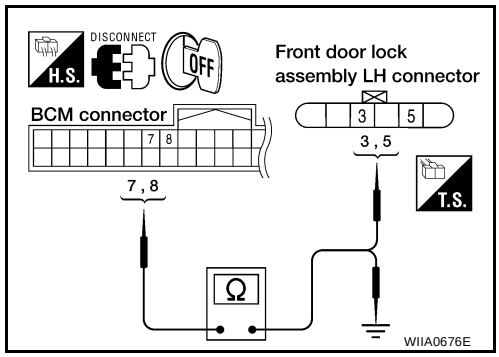
3. CHECK FRONT DOOR LOCK ASSEMBLY LH HARNESS

1. Disconnect BCM.
2. Check continuity between BCM connector M18 terminals 7, 8 and front door lock assembly LH connector D14 terminals 3, 5.

7 - 3 : Continuity should exist.
8 - 5 : Continuity should exist.

3. Check continuity between BCM connector M18 terminals 7, 8 and ground.

7 - Ground : Continuity should not exist.
8 - Ground : Continuity should not exist.



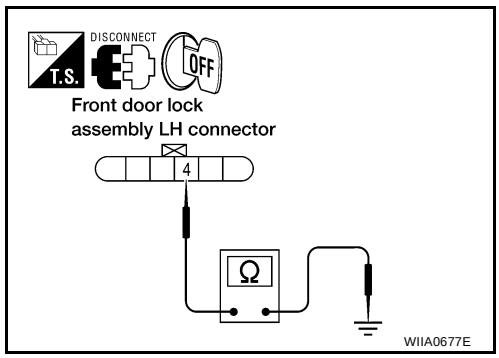
OK or NG

OK >> GO TO 4.
NG >> Repair or replace harness

4. CHECK FRONT DOOR LOCK ASSEMBLY LH GROUND

Check continuity between front door lock assembly LH connector D14 terminal 4 and ground.

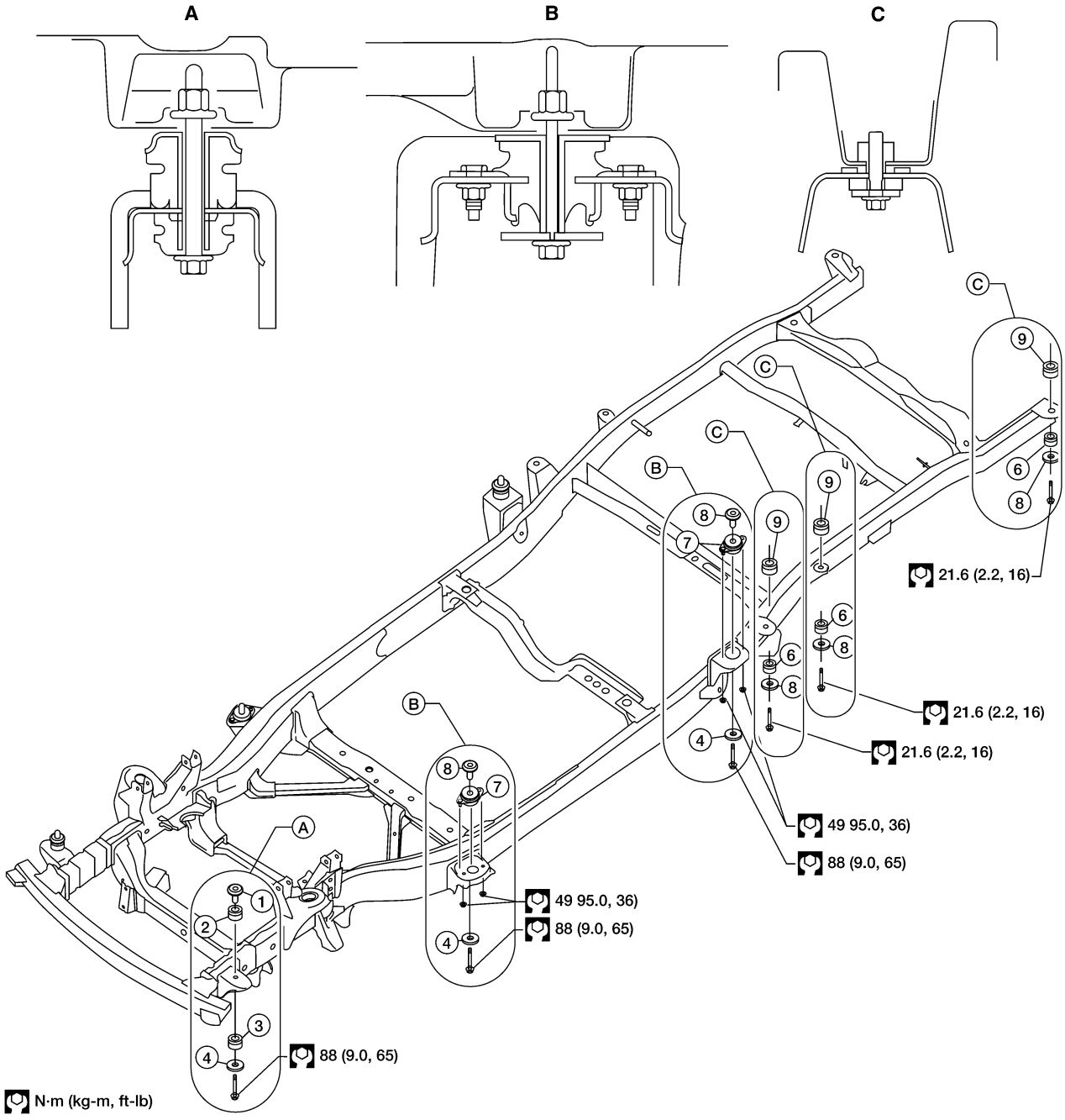
4 - Ground : Continuity should exist.



OK or NG

OK >> GO TO 5.
NG >> Repair or replace harness

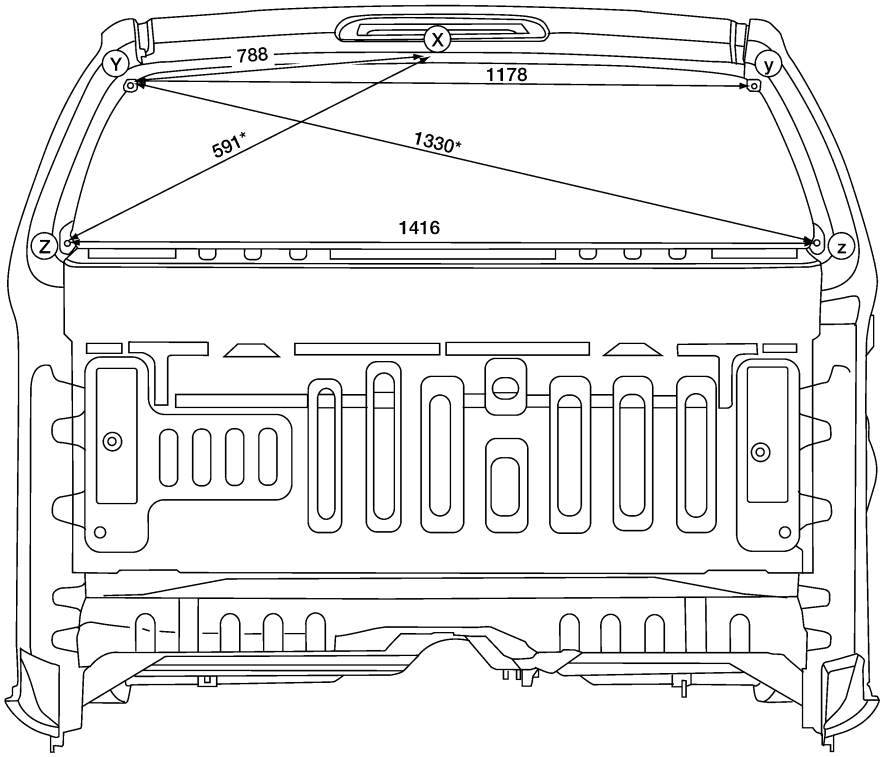
King Cab



1. Gold washer
2. Upper bushing
3. Lower bushing
4. Black washer
5. Washer
6. Upper bushing without paint mark
7. Body mount insulator
8. Body washer
9. Shim

REAR BODY
Measurement

Figures marked with a (*) indicate symmetrically identical dimensions on both right and left sides of the vehicle.

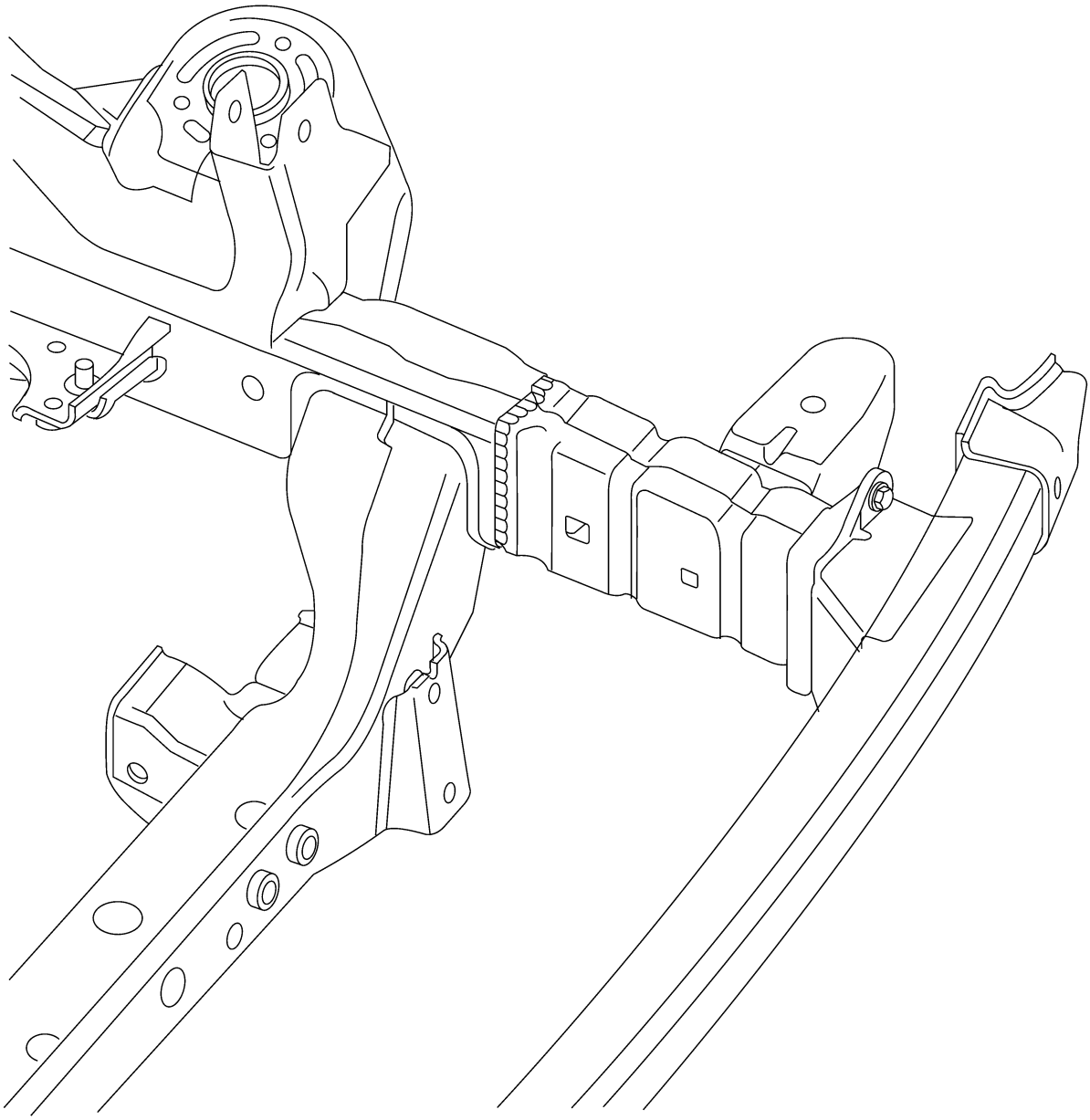


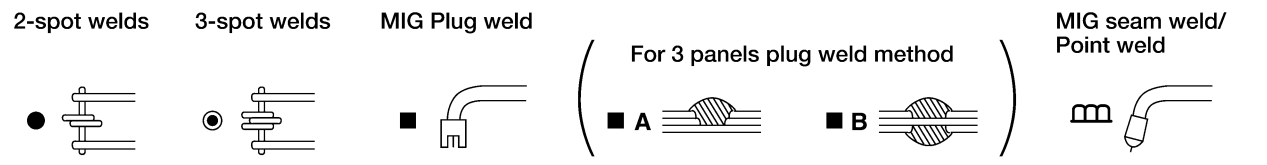
Unit: mm

LIIA2093E

Be sure to replace the entire crush horn when the crush horn has damage at the back of the body mounting bracket.

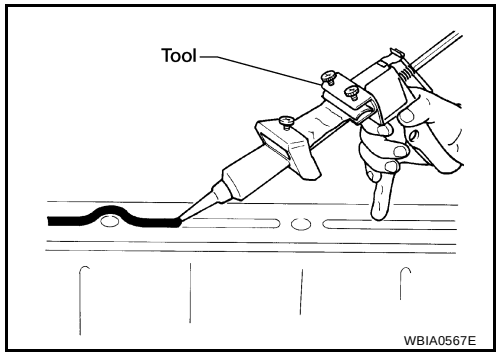
Service Joint





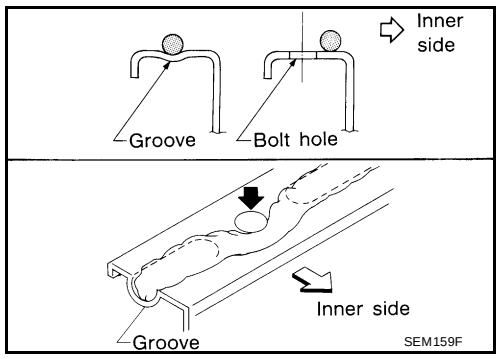
LIIA2148E

Tool number : WS39930000 (—)



Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .

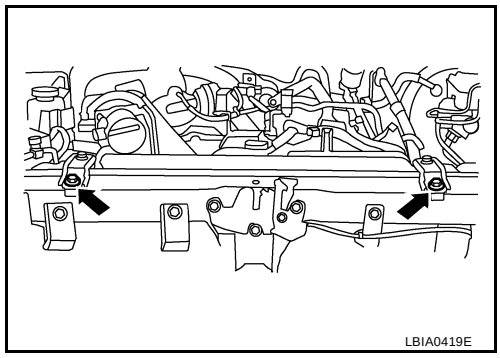
4. Apply liquid gasket without breaks to the specified location with the specified dimensions.
   - If there is a groove for the liquid gasket application, apply liquid gasket to the groove.
   - As for the bolt holes, normally apply liquid gasket inside the holes. Occasionally, it should be applied outside the holes. Make sure to read the text of service manual.
   - Within five minutes of liquid gasket application, install the mating component.
   - If liquid gasket protrudes, wipe it off immediately.
   - Do not retighten nuts or bolts after the installation.
   - After 30 minutes or more have passed from the installation, fill engine oil and engine coolant.



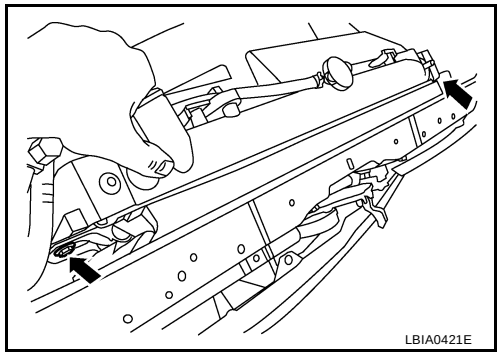
CAUTION:

If there are specific instructions in this manual, observe them.

7. Disconnect A/T fluid cooler hoses.
   - Install blind plug to avoid leakage of A/T fluid.
8. Remove the upper mount bracket bolts.



9. Remove the two A/C condenser bolts.

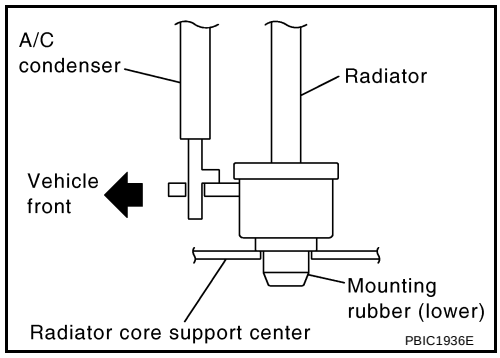


10. Remove radiator as follows:

CAUTION:
Do not damage or scratch A/C condenser and radiator core when removing.

a. With lifting and pulling radiator in a rear direction, disassemble lower mount from radiator core support center.

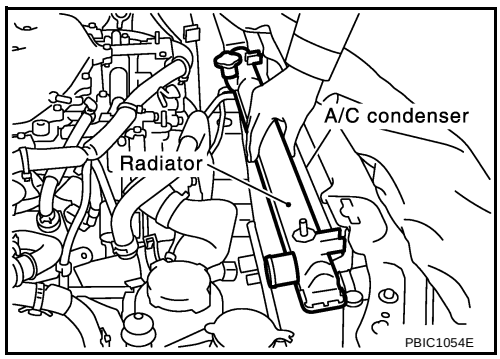
CAUTION:
Because A/C condenser is onto the front-lower portion of radiator, moving to rear direction should be at minimum.



b. Lift A/C condenser up and remove radiator after disengaging the fitting as front-bottom surface.

CAUTION:
Lifting A/C condenser should be minimum to prevent a load to A/C piping.

c. After removing radiator, put A/C condenser on radiator core support center to prevent a load to A/C piping, and temporarily fix it with rope or similar means.



COMPASS AND THERMOMETER

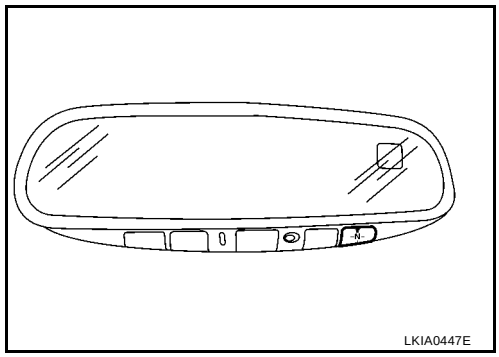
PFP:24835

System Description

EKS00BT0

This unit displays the following items:

- Earth magnetism and heading direction of vehicle.
- Outside air temperature.
- Caution for frozen road surfaces.



OUTSIDE TEMPERATURE DISPLAY

Push the mode (N) switch when the ignition switch is in the ON position. The outside temperature will be displayed in "°F". To change the indication from "°F" to "°C", push and hold the mode (N) switch for about 3 seconds until the display begins to flash. Press the mode (N) switch again to toggle between "°F" and "°C".

DIRECTION DISPLAY

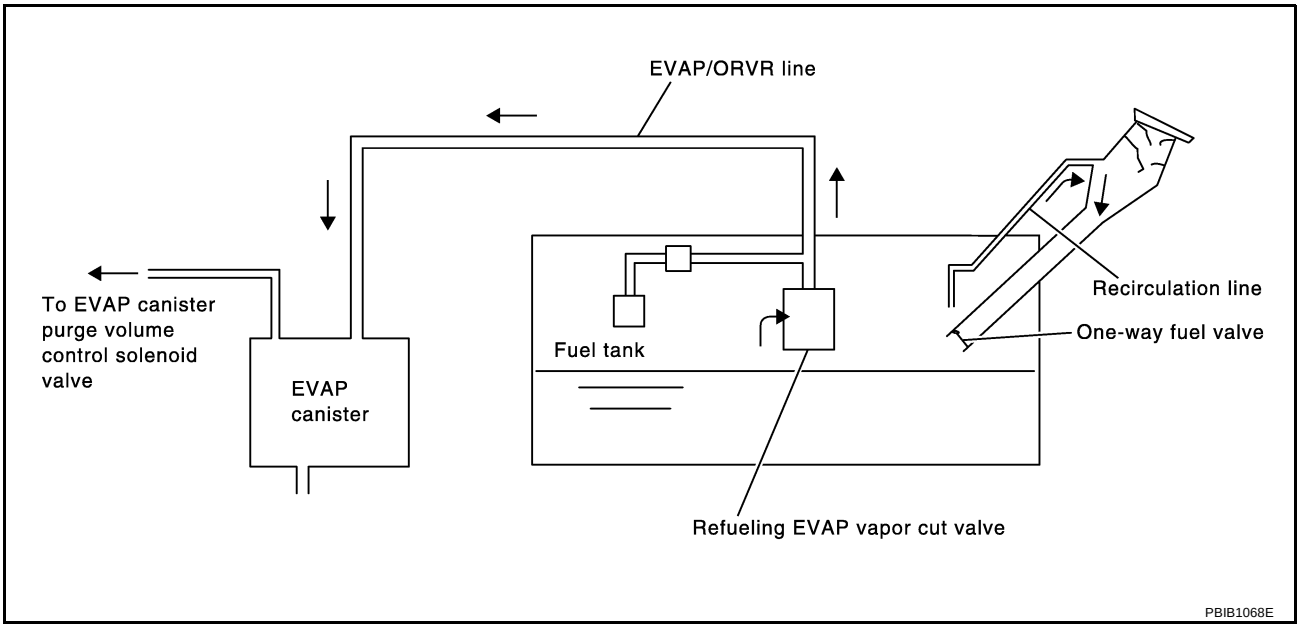
Push the mode (N) switch when the ignition switch is in the ON position. The direction will be displayed.

ON BOARD REFUELING VAPOR RECOVERY (ORVR)

PFP:00032

System Description

UBS00L2T



From the beginning of refueling, the air and vapor inside the fuel tank go through refueling EVAP vapor cut valve and EVAP/ORVR line to the EVAP canister. The vapor is absorbed by the EVAP canister and the air is released to the atmosphere.
When the refueling has reached the full level of the fuel tank, the refueling EVAP vapor cut valve is closed and refueling is stopped because of auto shut-off. The vapor which was absorbed by the EVAP canister is purged during driving.

WARNING:

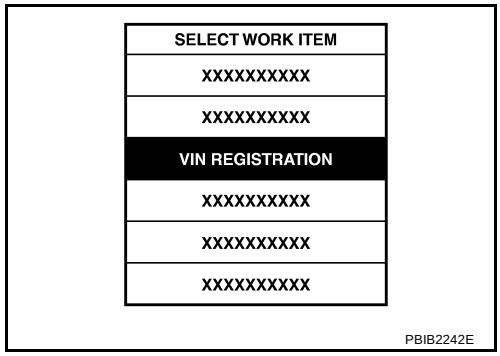
When conducting inspections below, be sure to observe the following:

- **Put a “CAUTION: FLAMMABLE” sign in workshop.**
- **Do not smoke while servicing fuel system. Keep open flames and sparks away from work area.**
- **Be sure to furnish the workshop with a CO_2 fire extinguisher.**

CAUTION:

- **Before removing fuel line parts, carry out the following procedures:**
  - **Put drained fuel in an explosion-proof container and put lid on securely.**
  - **Release fuel pressure from fuel line. Refer to EC-85, "FUEL PRESSURE RELEASE" .**
  - **Disconnect battery ground cable.**
- **Always replace O-ring when the fuel gauge retainer is removed.**
- **Do not kink or twist hose and tube when they are installed.**
- **Do not tighten hose and clamps excessively to avoid damaging hoses.**
- **After installation, run engine and check for fuel leaks at connection.**
- **Do not attempt to top off the fuel tank after the fuel pump nozzle shuts off automatically. Continued refueling may cause fuel overflow, resulting in fuel spray and possibly a fire.**

3. Select “VIN REGISTRATION” in “WORK SUPPORT” mode.
4. Follow the instruction of CONSULT-II display.



Accelerator Pedal Released Position Learning

UBS00S4N

DESCRIPTION

Accelerator Pedal Released Position Learning is an operation to learn the fully released position of the accelerator pedal by monitoring the accelerator pedal position sensor output signal. It must be performed each time harness connector of accelerator pedal position sensor or ECM is disconnected.

OPERATION PROCEDURE

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON and wait at least 2 seconds.
3. Turn ignition switch OFF and wait at least 10 seconds.
4. Turn ignition switch ON and wait at least 2 seconds.
5. Turn ignition switch OFF and wait at least 10 seconds.

Throttle Valve Closed Position Learning

UBS00S4O

DESCRIPTION

Throttle Valve Closed Position Learning is an operation to learn the fully closed position of the throttle valve by monitoring the throttle position sensor output signal. It must be performed each time harness connector of electric throttle control actuator or ECM is disconnected.

OPERATION PROCEDURE

1. Make sure that accelerator pedal is fully released.
2. Turn ignition switch ON.
3. Turn ignition switch OFF and wait at least 10 seconds.
   Make sure that throttle valve moves during above 10 seconds by confirming the operating sound.

Idle Air Volume Learning

UBS00S4P

DESCRIPTION

Idle Air Volume Learning is an operation to learn the idle air volume that keeps each engine within the specific range. It must be performed under any of the following conditions:

- Each time electric throttle control actuator or ECM is replaced.
- Idle speed or ignition timing is out of specification.

PREPARATION

Before performing Idle Air Volume Learning, make sure that all of the following conditions are satisfied.
Learning will be cancelled if any of the following conditions are missed for even a moment.

- Battery voltage: More than 12.9V (At idle)
- Engine coolant temperature: 70 - 95°C (158 - 203°F)
- Park/neutral position (PNP) switch: ON
- Electric load switch: OFF
  (Air conditioner, headlamp)
  On vehicles equipped with daytime light systems, if the parking brake is applied before the engine is started the headlamp will not be illuminated.
- Steering wheel: Neutral (Straight-ahead position)
- Vehicle speed: Stopped
- Transmission: Warmed-up

Freeze frame data item*	Description
ABSOL TH-P/S [%]	● The throttle valve opening at the moment a malfunction is detected is displayed.
B/FUEL SCHDL [msec]	● The base fuel schedule at the moment a malfunction is detected is displayed.
INT/A TEMP SE [°C] or [°F]	● The intake air temperature at the moment a malfunction is detected is displayed.

*: The items are the same as those of 1st trip freeze frame data.

DATA MONITOR MODE

Monitored Item

×: Applicable

Monitored item [Unit]	ECM INPUT SIGNALS	MAIN SIGNALS	Description	Remarks
ENG SPEED [rpm]	×	×	● Indicates the engine speed computed from the signals of the crankshaft position sensor (POS) and camshaft position sensor (PHASE).	● Accuracy becomes poor if engine speed drops below the idle rpm. ● If the signal is interrupted while the engine is running, an abnormal value may be indicated.
MAS A/F SE-B1 [V]	×	×	● The signal voltage of the mass air flow sensor is displayed.	● When the engine is stopped, a certain value is indicated.
B/FUEL SCHDL [msec]		×	● "Base fuel schedule" indicates the fuel injection pulse width programmed into ECM, prior to any learned on board correction.	
A/F ALPHA-B1 [%]		×	● The mean value of the air-fuel ratio feedback correction factor per cycle is indicated.	● When the engine is stopped, a certain value is indicated. ● This data also includes the data for the air-fuel ratio learning control.
COOLAN TEMP/S [°C] or [°F]	×	×	● The engine coolant temperature (determined by the signal voltage of the engine coolant temperature sensor) is displayed.	● When the engine coolant temperature sensor is open or short-circulated, ECM enters fail-safe mode. The engine coolant temperature determined by the ECM is displayed.
A/F SEN1 (B1) [V]	×	×	● The A/F signal computed from the input signal of the A/F sensor 1 is displayed.	
HO2S2 (B1) [V]	×		● The signal voltage of the heated oxygen sensor 2 is displayed.	
HO2S2 MNTR (B1) [RICH/LEAN]	×		● Display of heated oxygen sensor 2 signal: RICH: Means the amount of oxygen after three way catalyst is relatively small. LEAN: Means the amount of oxygen after three way catalyst is relatively large.	● When the engine is stopped, a certain value is indicated.
VHCL SPEED SE [km/h] or [mph]	×	×	● The vehicle speed computed from the vehicle speed signal sent from combination meter is displayed.	
BATTERY VOLT [V]	×	×	● The power supply voltage of ECM is displayed.	
ACCEL SEN 1 [V]	×	×	● The accelerator pedal position sensor signal voltage is displayed.	● ACCEL SEN 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
ACCEL SEN 2 [V]	×			
THRTL SEN 1 [V]	×	×	● The throttle position sensor signal voltage is displayed.	● THRTL SEN 2 signal is converted by ECM internally. Thus, it differs from ECM terminal voltage signal.
THRTL SEN 2 [V]	×			

DTC P0011 IVT CONTROL

PFP:23796

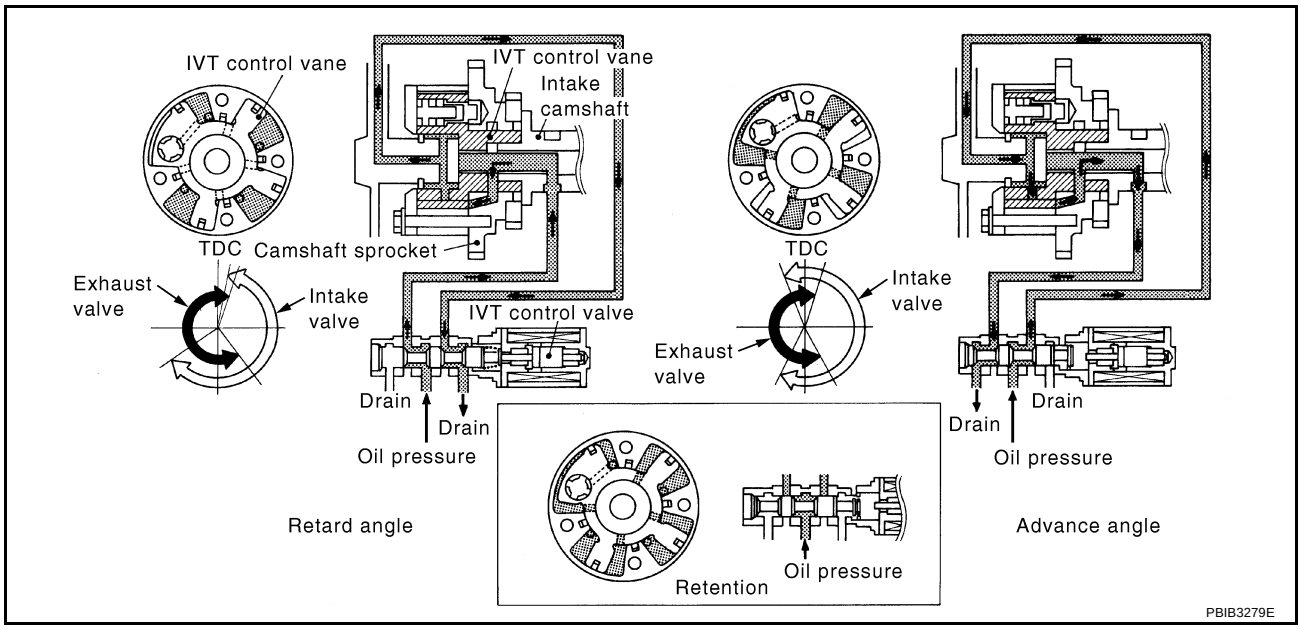
Description

UBS00L43

SYSTEM DESCRIPTION

Sensor	Input signal to ECM	ECM function	Actuator
Crankshaft position sensor (POS)	Engine speed Piston position	Intake valve timing control	Intake valve timing control solenoid valve
Camshaft position sensor (PHASE)			
Engine coolant temperature sensor	Engine coolant temperature		
Wheel sensor	Vehicle speed*		

*: This signal is sent to ECM through CAN communication line.



This mechanism hydraulically controls cam phases continuously with the fixed operating angle of the intake valve.

The ECM receives signals such as crankshaft position, camshaft position, engine speed, and engine coolant temperature. Then, the ECM sends ON/OFF pulse duty signals to the intake valve timing control solenoid valve depending on driving status. This makes it possible to control the shut/open timing of the intake valve to increase engine torque in low/mid speed range and output in high-speed range.

CONSULT-II Reference Value in Data Monitor Mode

UBS00L44

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
INT/V TIM (B1)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	–5° - 5°CA
		2,000 rpm	Approx. 0° - 20°CA
INT/V SOL (B1)	● Engine: After warming up ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Idle	0% - 2%
		2,000 rpm	Approx. 0% - 60%

4. CHECK INTAKE AIR TEMPERATURE SENSOR

Refer to EC-200, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace mass air flow sensor (with intake air temperature sensor).

5. CHECK INTERMITTENT INCIDENT

Refer to EC-147, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

>> **INSPECTION END**

Component Inspection

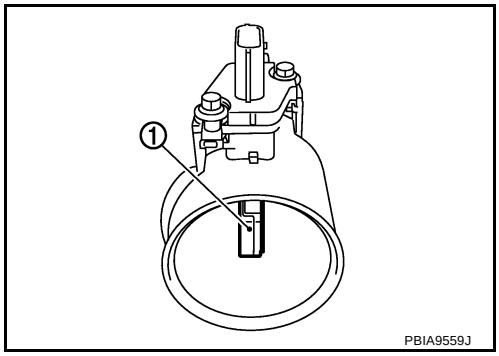
UBS00L54

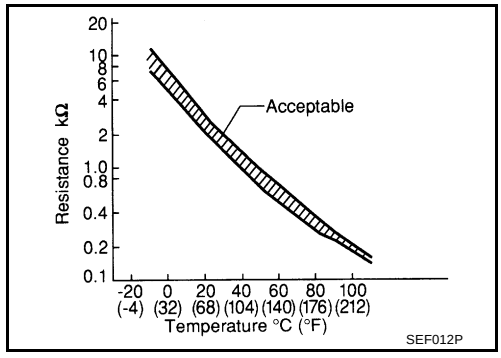
INTAKE AIR TEMPERATURE SENSOR

1. Check resistance between mass air flow sensor (1) terminals 5 and 6 under the following conditions.

Intake air temperature °C (°F)	Resistance kΩ
25 (77)	1.800 - 2.200

2. If NG, replace mass air flow sensor (with intake air temperature sensor).





Removal and Installation

UBS00L55

MASS AIR FLOW SENSOR

Refer to EM-16, "AIR CLEANER AND AIR DUCT" .

4. CHECK A/F SENSOR 1 INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between the following terminals. Refer to Wiring Diagram.

A/F sensor 1 terminal	ECM terminal
1	16
2	75
5	35
6	56

Continuity should exist.

4. Check harness continuity between ECM terminals 16, 35, 56, 75 or A/F sensor 1 terminals 1, 2, 5, 6 and ground. Refer to Wiring Diagram.

Continuity should not exist.

5. Also check harness for short to power.

OK or NG

OK >> GO TO 5.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

5. CHECK INTERMITTENT INCIDENT

Perform EC-147, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

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

6. REPLACE AIR FUEL RATIO (A/F) SENSOR 1

Replace air fuel ratio (A/F) sensor 1.

CAUTION:

- **Discard any air fuel ratio (A/F) sensor which has been dropped from a height of more than 0.5 m (19.7 in) onto a hard surface such as a concrete floor; use a new one.**
- **Before installing new air fuel ratio (A/F) sensor, clean exhaust system threads using Heated Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

>> **INSPECTION END**

Removal and Installation

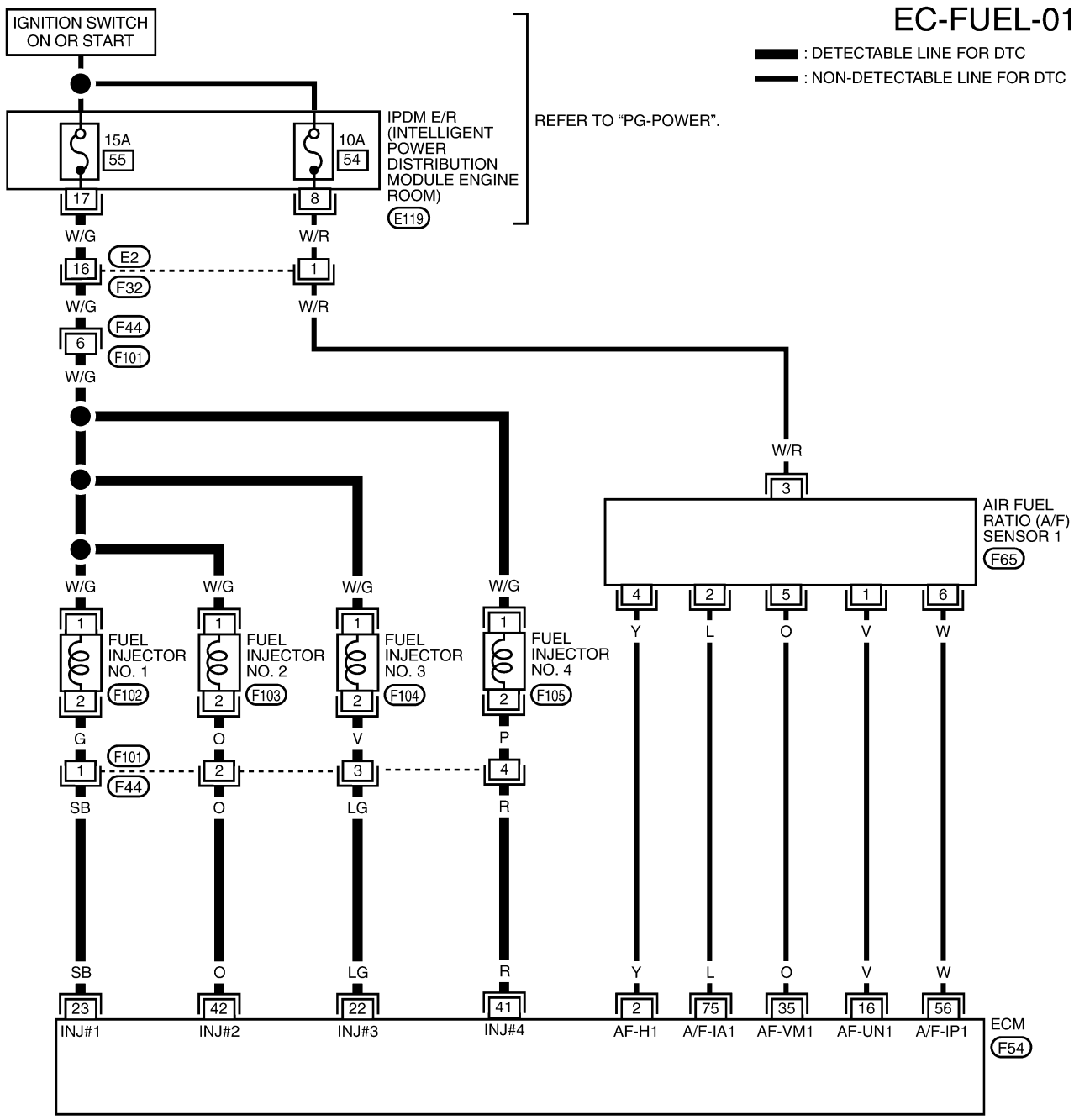
UBS00LDE

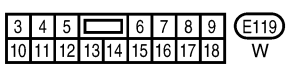
AIR FUEL RATIO SENSOR 1

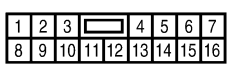
Refer to EM-21, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

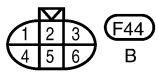
Wiring Diagram

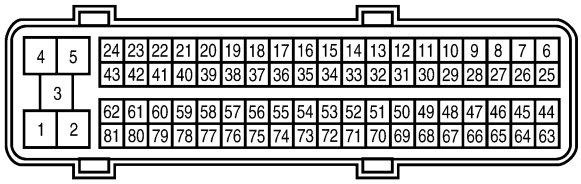
UBS00L6L

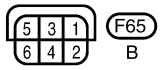


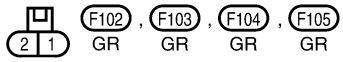










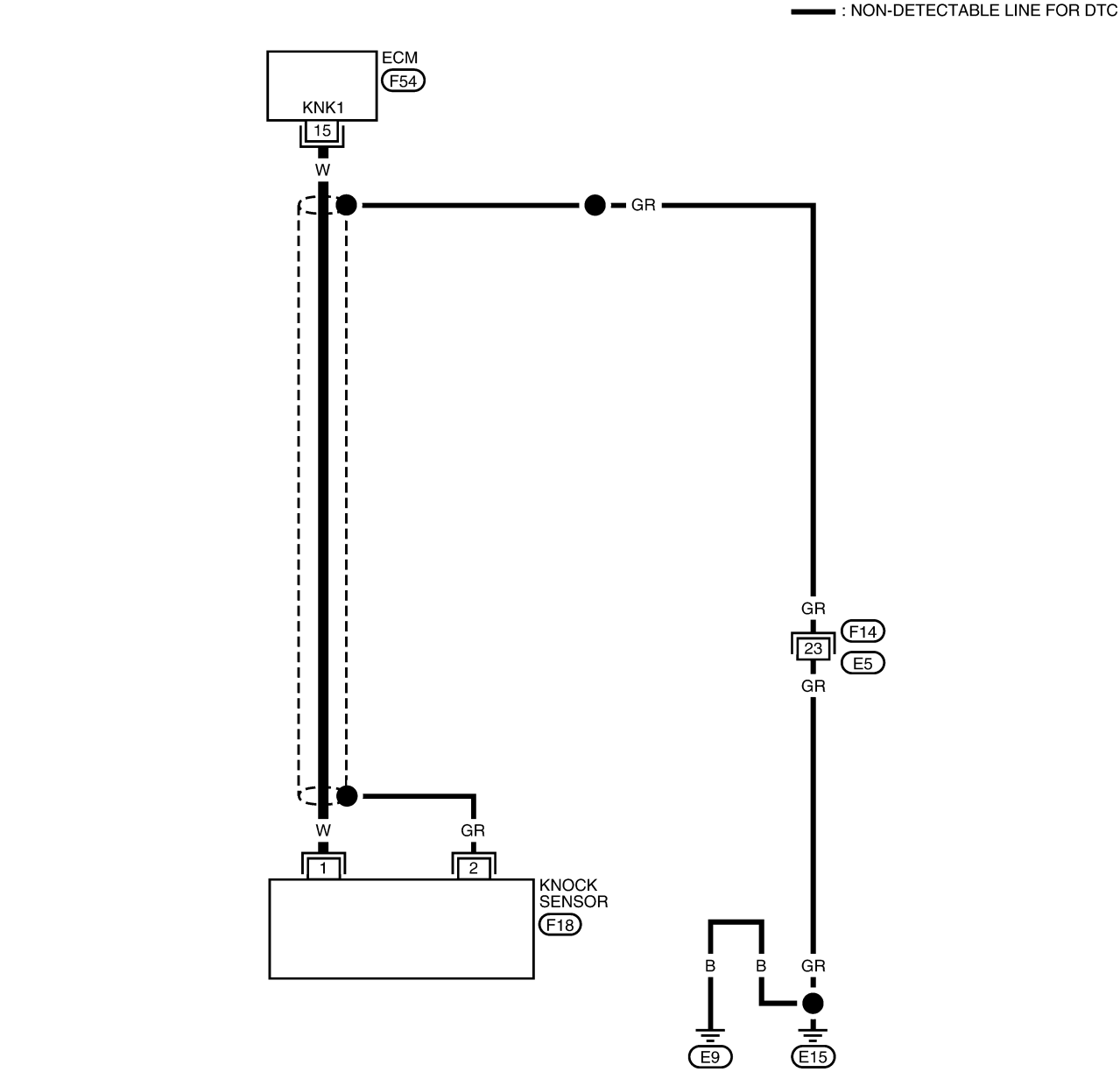


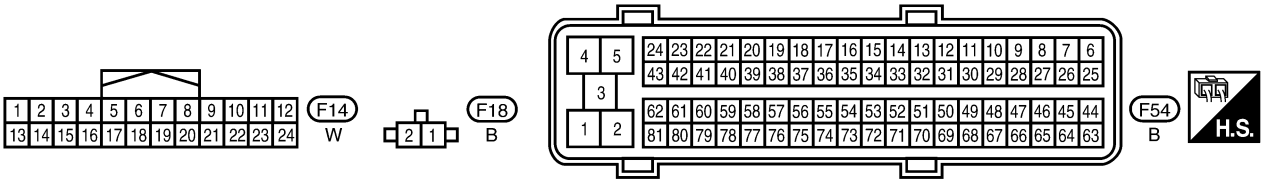
BBWA2839E

Wiring Diagram

UBS00L7J

EC-KS-01

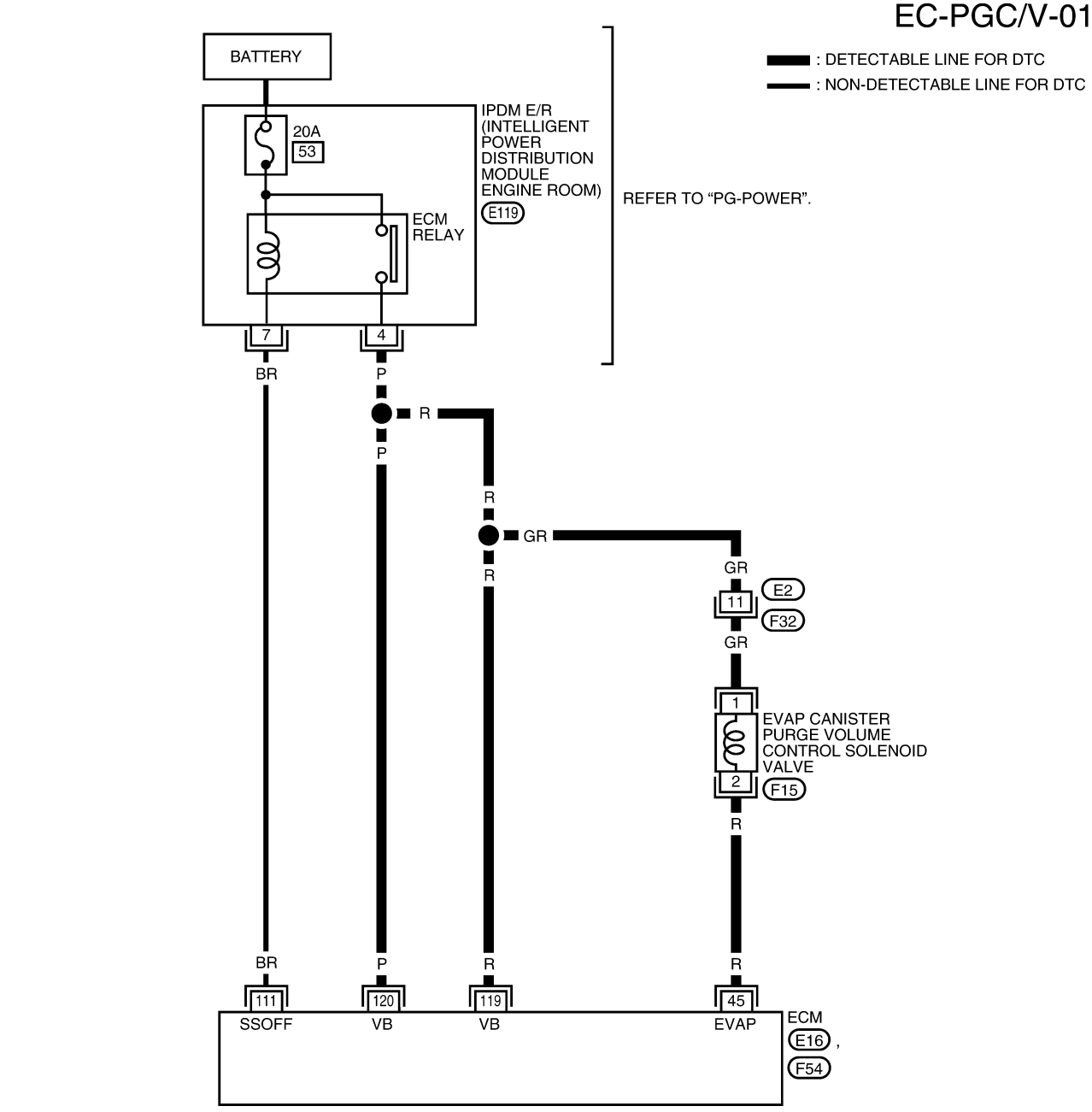


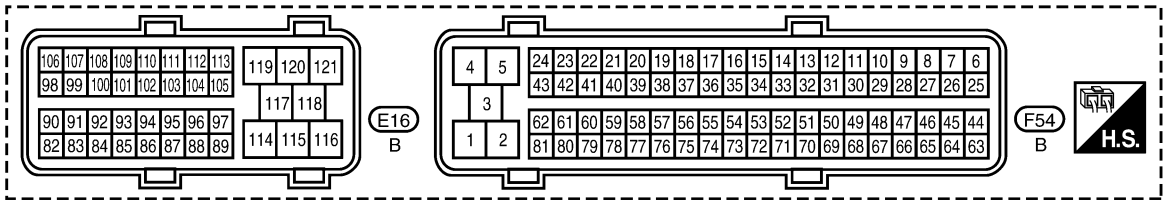


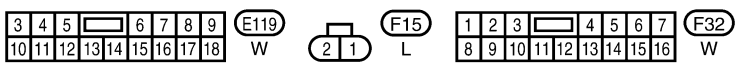
BBWA2411E

Wiring Diagram

UBS00LEJ





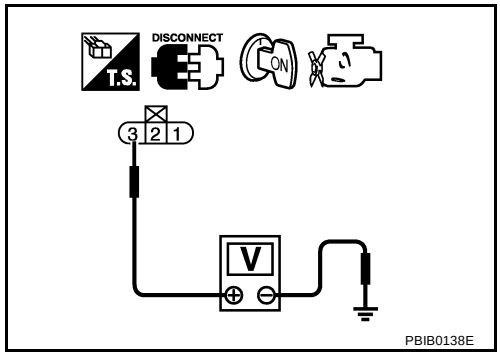


BBWA2412E

3. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch ON.
2. Check voltage between EVAP control system pressure sensor terminal 3 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors C1, E41
- Harness connectors E5, F14
- Harness for open or short between EVAP control system pressure sensor and ECM

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

5. CHECK EVAP CONTROL SYSTEM PRESSURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between EVAP control system pressure sensor terminal 1 and ECM terminal 67.
   Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors C1, E41
- Harness connectors E5, F14
- Harness for open or short between EVAP control system pressure sensor and ECM

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

4. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-II

1. Turn ignition switch ON.
2. Select “SELF DIAG RESULTS” mode with CONSULT-II.
3. Touch “ERASE”.
4. **Perform DTC Confirmation Procedure.**
   See EC-431, "DTC Confirmation Procedure" .
5. Is the 1st trip DTC P0603 displayed again?

With GST

1. Turn ignition switch ON.
2. Select Service $04 with GST.
3. **Perform “DTC Confirmation Procedure”.**
   See EC-431, "DTC Confirmation Procedure" .
4. Is the 1st trip DTC P0603 displayed again?

Yes or No

Yes >> GO TO 5.
No >> **INSPECTION END**

5. REPLACE ECM

1. Replace ECM.
2. Perform initialization of NVIS (NATS) system and registration of all NVIS (NATS) ignition key IDs. Refer to BL-121, "ECM Re-communicating Function" .
3. Perform EC-82, "VIN Registration" .
4. Perform EC-83, "Accelerator Pedal Released Position Learning" .
5. Perform EC-83, "Throttle Valve Closed Position Learning" .
6. Perform EC-83, "Idle Air Volume Learning" .

>> **INSPECTION END**

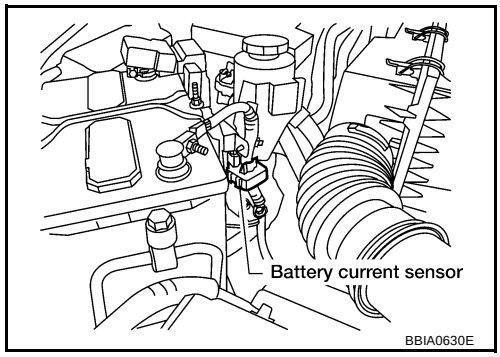
DTC P1553 BATTERY CURRENT SENSOR

PFP:294G0

Component Description

UBS00M16

The power generation voltage variable control enables fuel consumption to be decreased by reducing the engine load which is caused by the power generation of the generator. The battery current sensor is installed to the battery cable at the negative terminal. The sensor measures the charging/discharging current of the battery. Based on the sensor signal, ECM judges whether or not the power generation voltage variable control is performed. When performing the power generation voltage variable control, ECM calculates the target power generation voltage based on the sensor signal. And ECM sends the calculated value as the power generation command value to IPDM E/R. For the details of the power generation voltage variable control, refer to SC section.



CAUTION:

Do not connect the electrical component or the ground wire directly to the battery terminal. The connection causes the malfunction of the power generation voltage variable control, and then the battery discharge may occur.

CONSULT-II Reference Value in Data Monitor Mode

UBS00M17

Specification data are reference values.

MONITOR ITEM	CONDITION	SPECIFICATION
BAT CUR SEN	● Engine speed: Idle ● Battery: Fully charged* ● Shift lever: P or N (A/T), Neutral (M/T) ● Air conditioner switch: OFF ● No load	Approx. 2,600 - 3,500mV

*: Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to SC-5, "SPECIFIC GRAVITY CHECK" .

On Board Diagnosis Logic

UBS00M18

The MIL will not light up for this diagnosis.

NOTE:

If DTC P1553 is displayed with DTC P0643, first perform the trouble diagnosis for DTC P0643. Refer to EC-438, "DTC P0643 SENSOR POWER SUPPLY" .

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1553 1553	Battery current sensor performance	The signal voltage transmitted from the sensor to ECM is higher than the amount of the maximum power generation.	● Harness or connectors (The sensor circuit is open or shorted.) ● Battery current sensor

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)
101	LG	Stop lamp switch	**[Ignition switch: ON]** ● Brake pedal: Fully released	Approximately 0V
			[Ignition switch: ON] ● Brake pedal: Slightly depressed	BATTERY VOLTAGE (11 - 14V)

Diagnostic Procedure

UBS00LFW

1. CHECK STOP LAMP SWITCH CIRCUIT

1. Turn ignition switch OFF.
2. Check the stop lamp when depressing and releasing the brake pedal.

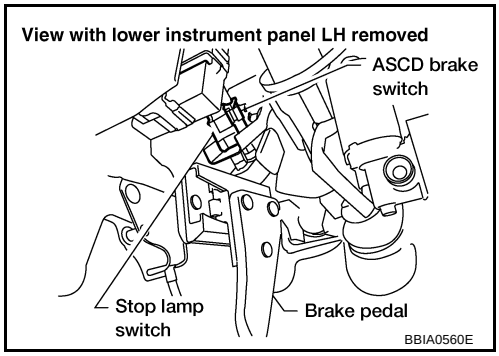
Brake pedal	Stop lamp
Fully released	Not illuminated
Slightly depressed	Illuminated

OK or NG

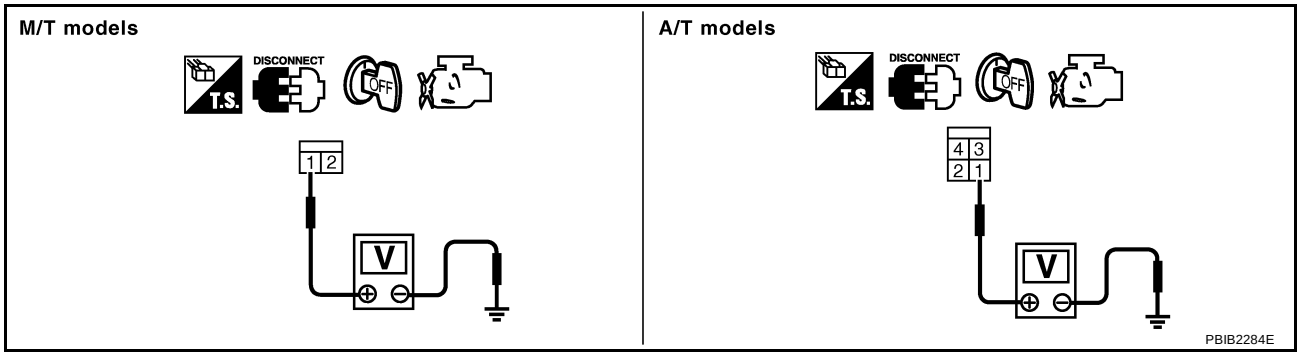
OK >> GO TO 4.
NG >> GO TO 2.

2. CHECK STOP LAMP SWITCH POWER SUPPLY CIRCUIT

1. Disconnect stop lamp switch harness connector.



2. Check voltage between stop lamp switch terminal 1 and ground with CONSULT-II or tester.



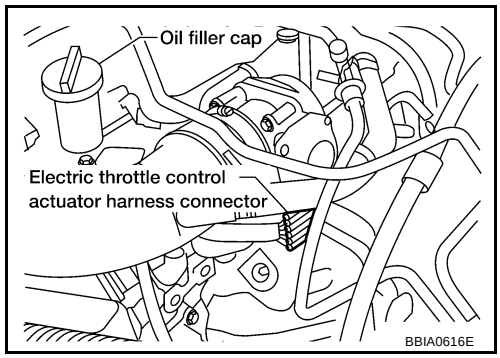
Voltage: Battery voltage

OK or NG

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

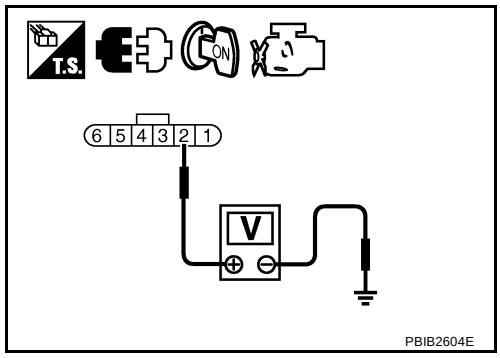
2. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-I

1. Disconnect electric throttle control actuator harness connector.
2. Turn ignition switch ON.



3. Check voltage between electric throttle control actuator terminal 2 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

OK >> GO TO 7.
NG >> GO TO 3.

3. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-II

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between electric throttle control actuator terminal 2 and ECM terminal 47. Refer to Wiring Diagram.

Continuity should exist.

OK or NG

OK >> GO TO 4.
NG >> Repair open circuit.

4. CHECK THROTTLE POSITION SENSOR POWER SUPPLY CIRCUIT-III

Check harness for short to power and short to ground, between the following terminals.

ECM terminal	Sensor terminal	Reference Wiring Diagram
47	Electric throttle control actuator terminal 2	EC-549
91	APP sensor terminal 1	EC-542

OK or NG

OK >> GO TO 5.
NG >> Repair short to ground or short to power in harness or connectors.

5. CHECK APP SENSOR

Refer to EC-546, "Component Inspection" .

OK or NG

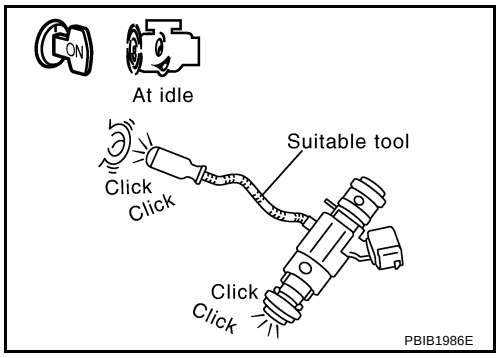
OK >> GO TO 11.
NG >> GO TO 6.

3. CHECK FUNCTION OF FUEL INJECTOR

Without CONSULT-II

1. Start engine.
2. Listen to each fuel injector operating sound.

Clicking noise should exist.

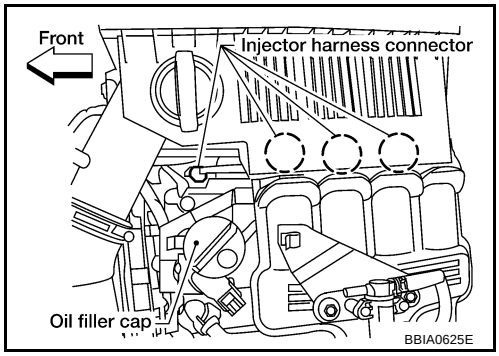


OK or NG

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

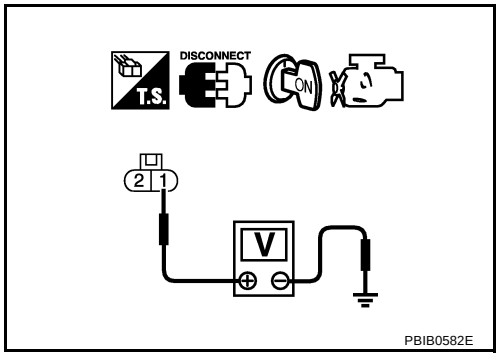
4. CHECK FUEL INJECTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect fuel injector harness connector.



3. Turn ignition switch ON.
4. Check voltage between fuel injector terminal 1 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

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

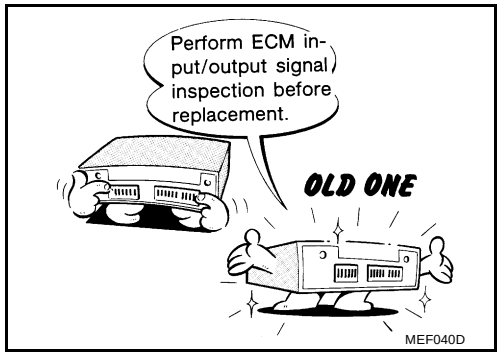
5. DETECT MALFUNCTIONING PART

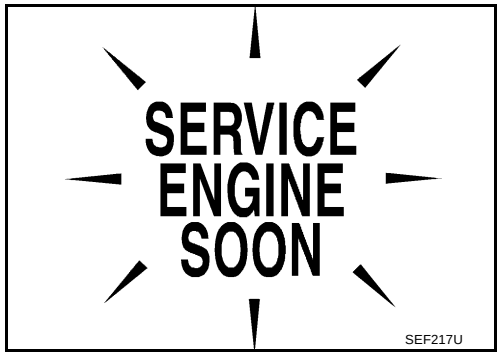
Check the following.

- Harness connectors E2, F32
- Harness connectors F44, F101
- IPDM E/R harness connector E119
- 15A fuse
- Harness for open or short between fuel injector and fuse

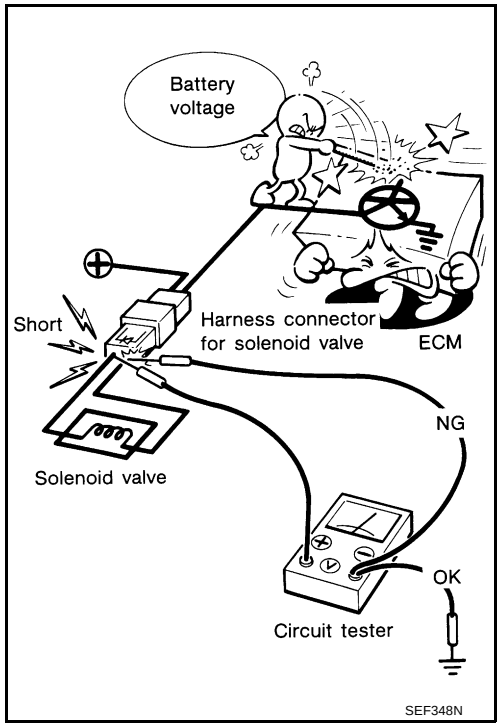
>> Repair harness or connectors.

- **Before replacing ECM, perform “ECM Terminals and Reference Value” inspection and make sure ECM functions properly. Refer to EC-716, "ECM Terminals and Reference Value" .**
- **Handle mass air flow sensor carefully to avoid damage.**
- **Do not clean mass air flow sensor with any type of detergent.**
- **Do not disassemble electric throttle control actuator.**
- **Even a slight leak in the air intake system can cause serious incidents.**
- **Do not shock or jar the camshaft position sensor (PHASE), crankshaft position sensor (POS).**
- **After performing each TROUBLE DIAGNOSIS, perform DTC Confirmation Procedure or Overall Function Check.**
  The DTC should not be displayed in the DTC Confirmation Procedure if the repair is completed. The Overall Function Check should be a good result if the repair is completed.





- **When measuring ECM signals with a circuit tester, never allow the two tester probes to contact.**
  Accidental contact of probes will cause a short circuit and damage the ECM power transistor.
- **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.**



- The time required for each diagnosis varies with road surface conditions, weather, altitude, individual driving habits, etc.
  Zone A refers to the range where the time, required for the diagnosis under normal conditions*, is the shortest.
  Zone B refers to the range where the diagnosis can still be performed if the diagnosis is not completed within zone A.

*: Normal conditions refer to the following:

- Sea level
- Flat road
- Ambient air temperature: 20 - 30°C (68 - 86°F)
- Diagnosis is performed as quickly as possible under normal conditions.
  Under different conditions [For example: ambient air temperature other than 20 - 30°C (68 - 86°F)], diagnosis may also be performed.

Pattern 1:

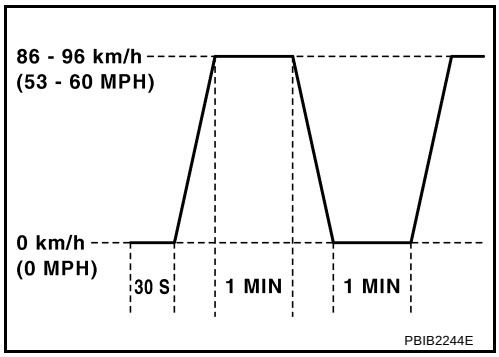
- **The engine is started at the engine coolant temperature of −10 to 35°C (14 to 95°F) (where the voltage between the ECM terminal 73 and ground is 3.0 - 4.3V).**
- **The engine must be operated at idle speed until the engine coolant temperature is greater than 70°C (158°F) (where the voltage between the ECM terminal 73 and ground is lower than 1.4V).**
- **The engine is started at the fuel tank temperature of warmer than 0°C (32°F) (where the voltage between the ECM terminal 107 and ground is less than 4.1V).**

Pattern 2:

- When steady-state driving is performed again even after it is interrupted, each diagnosis can be conducted. In this case, the time required for diagnosis may be extended.

Pattern 3:

- Operate vehicle following the driving pattern shown in the figure.
- replace the accelerator pedal during decelerating vehicle speed from 90km/h (56MPH) to 0km/h (0MPH).



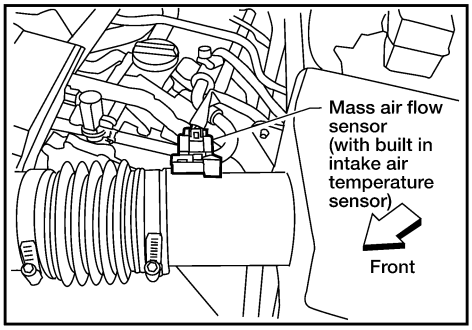
Pattern 4:

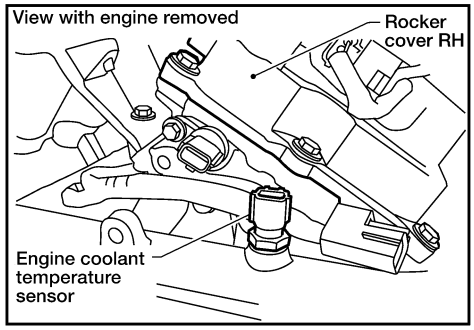
- The accelerator pedal must be held very steady during steady-state driving.
- If the accelerator pedal is moved, the test must be conducted all over again.

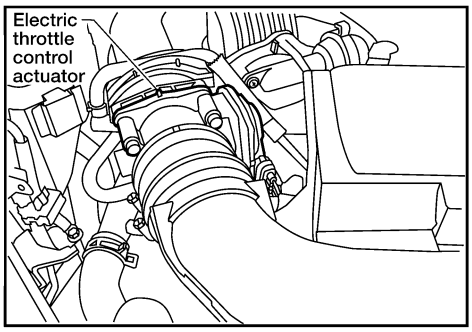
*1: Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH), then release the accelerator pedal and keep it released for more than 10 seconds. Depress the accelerator pedal until vehicle speed is 90 km/h (56 MPH) again.
*2: Checking the vehicle speed with GST is advised.

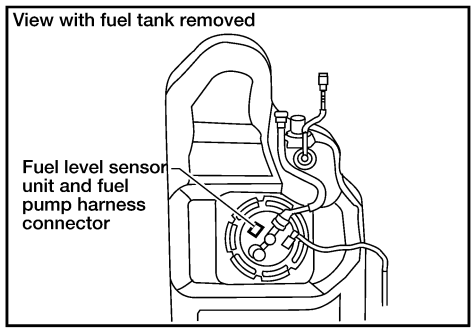
Suggested Transmission Gear Position for A/T Models
Set the selector lever in the D position with the overdrive switch turned ON.
Suggested Upshift Speeds for M/T Models
Shown below are suggested vehicle speeds for shifting into a higher gear. These suggestions relate to fuel economy and vehicle performance. Actual upshift speeds will vary according to road conditions, the weather and individual driving habits.

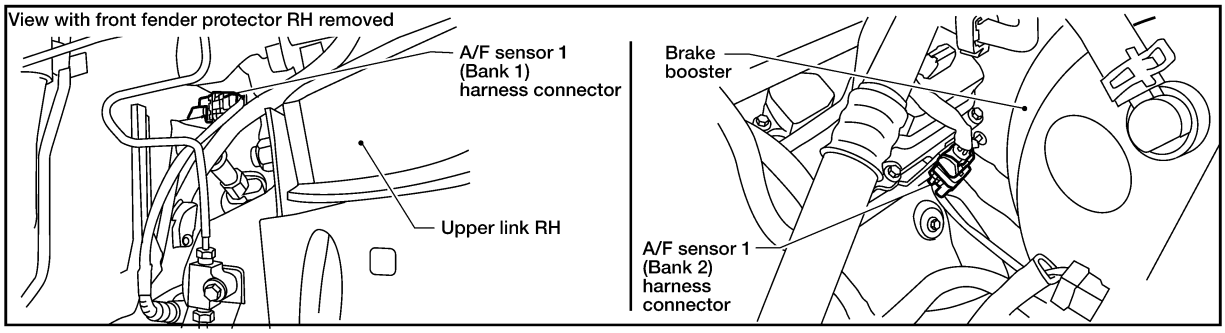
	For normal acceleration in low altitude areas [less than 1,219 m (4,000 ft)]:		For quick acceleration in low altitude areas and high altitude areas [over 1,219 m (4,000 ft)]:
Gear change	ACCEL shift point km/h (MPH)	CRUISE shift point km/h (MPH)	km/h (MPH)
1st to 2nd	21 (13)	17 (11)	24 (15)
2nd to 3rd	38 (24)	27 (17)	40 (25)
3rd to 4th	53 (33)	40 (25)	64 (40)
4th to 5th	69 (43)	51 (32)	72 (45)
6th	77 (48)	72 (45)	80 (50)

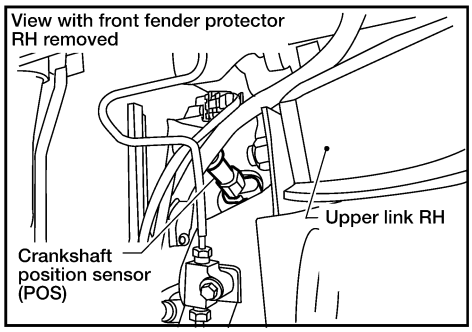

Mass air flow sensor (with built in intake air temperature sensor)
Front

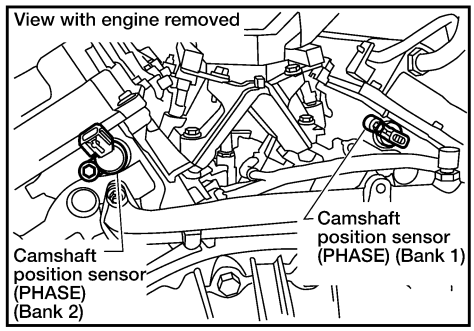

View with engine removed
Rocker cover RH
Engine coolant temperature sensor


Electric throttle control actuator

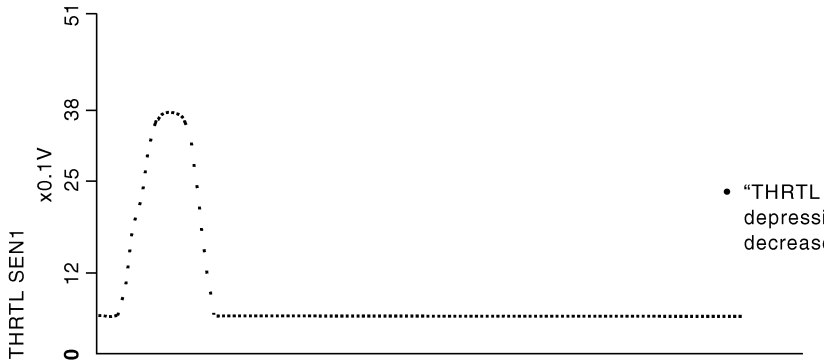

View with fuel tank removed
Fuel level sensor unit and fuel pump harness connector


View with front fender protector RH removed
A/F sensor 1 (Bank 1) harness connector
Upper link RH
Brake booster
A/F sensor 1 (Bank 2) harness connector

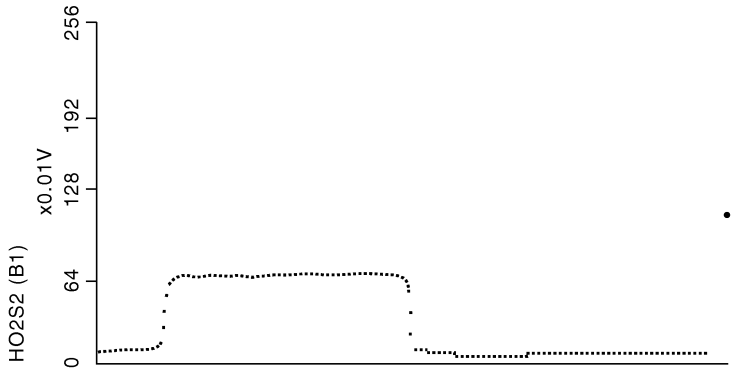

View with front fender protector RH removed
Upper link RH
Crankshaft position sensor (POS)


View with engine removed
Camshaft position sensor (PHASE) (Bank 1)
Camshaft position sensor (PHASE) (Bank 2)

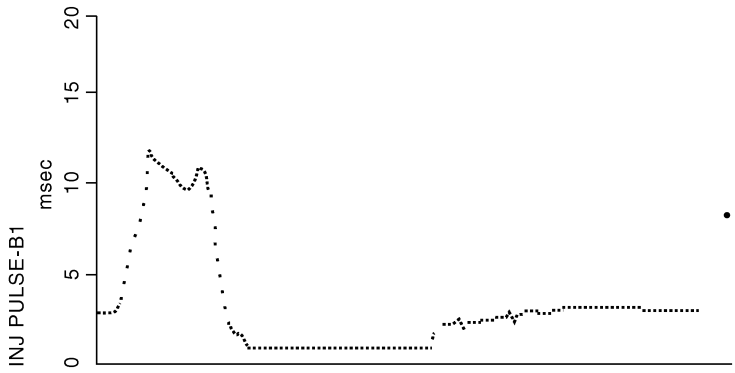
BBIA0596E



- "THRTL SEN1" should increase while depressing the accelerator pedal and should decrease while releasing it.



- "HO2S2 (B1)" may increase immediately after depressing the accelerator pedal and may decrease after releasing the pedal.



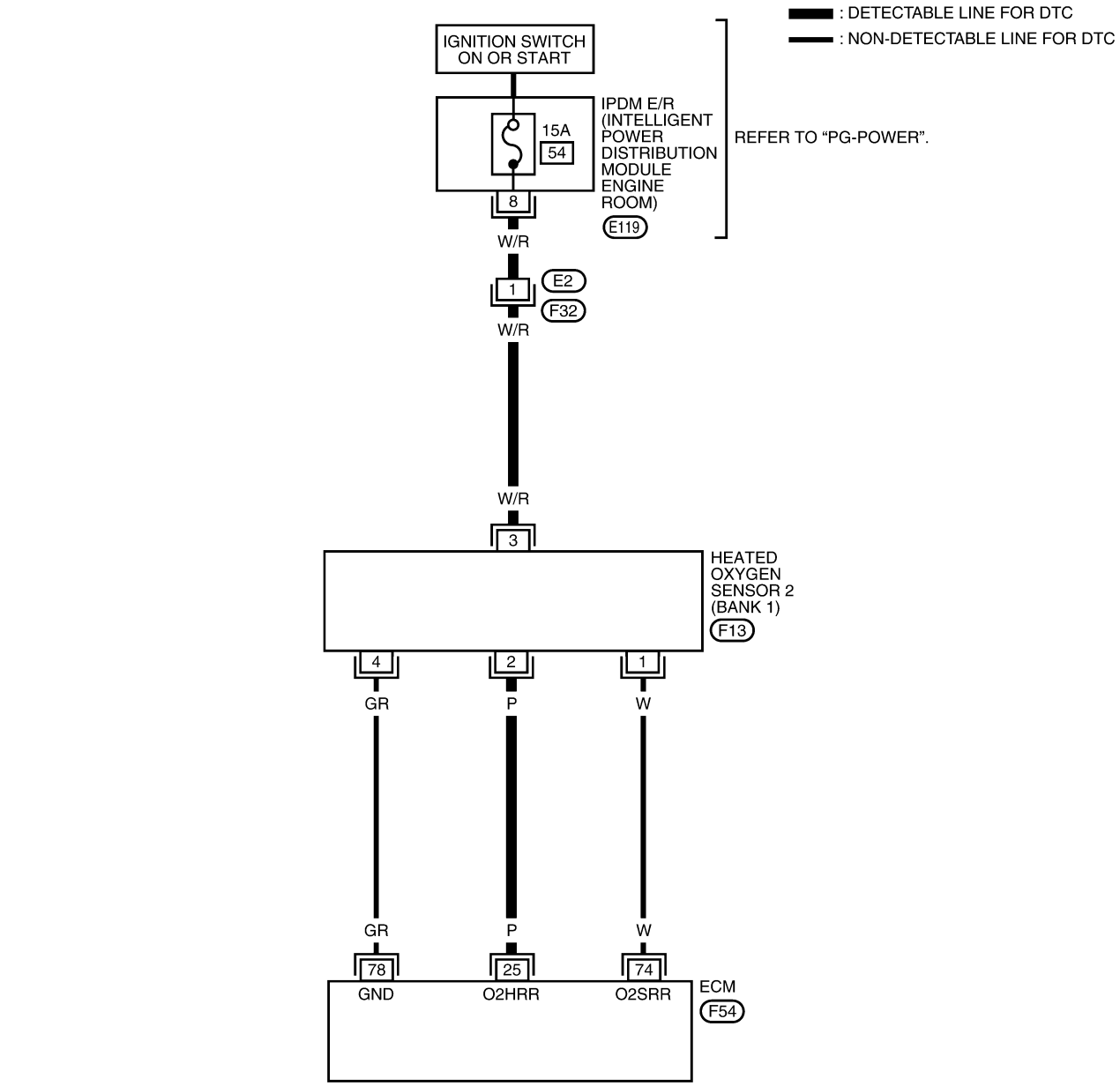
- "INJ PULSE-B1" should increase when depressing the accelerator pedal and should decrease when the pedal is released.

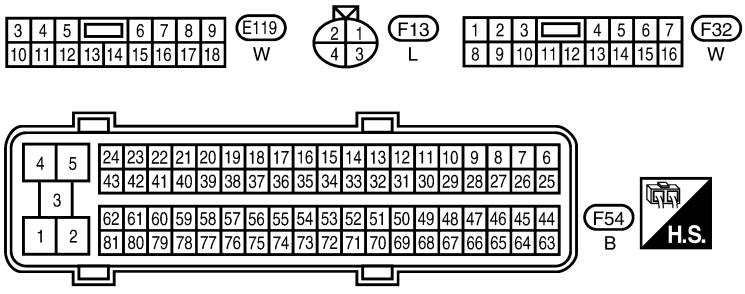
PBIB2099E

Wiring Diagram
BANK 1

UBS00LLT

EC-O2H2B1-01





BBWA2845E

3. CHECK ECT SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect ECM harness connector.
3. Check harness continuity between ECT sensor terminal 2 and ECM terminal 67. Refer to Wiring Diagram.

Continuity should exist.

4. Also check harness for short to ground and short to power.

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 ENGINE COOLANT TEMPERATURE SENSOR

Refer to EC-824, "Component Inspection" .

OK or NG

OK >> GO TO 5.
NG >> Replace engine coolant temperature sensor.

5. CHECK INTERMITTENT INCIDENT

Refer to EC-757, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

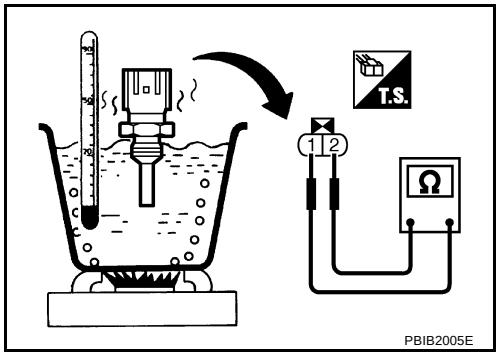
>> **INSPECTION END**

Component Inspection

UBS00LMQ

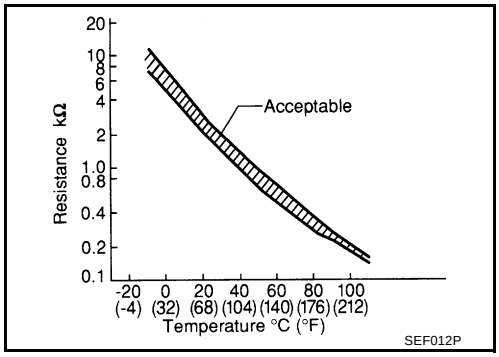
ENGINE COOLANT TEMPERATURE SENSOR

1. Check resistance between engine coolant temperature sensor terminals 1 and 2 as shown in the figure.



<Reference data>

Engine coolant temperature °C (°F)	Resistance kΩ
20 (68)	2.1 - 2.9
50 (122)	0.68 - 1.00
90 (194)	0.236 - 0.260



2. If NG, replace engine coolant temperature sensor.

Removal and Installation

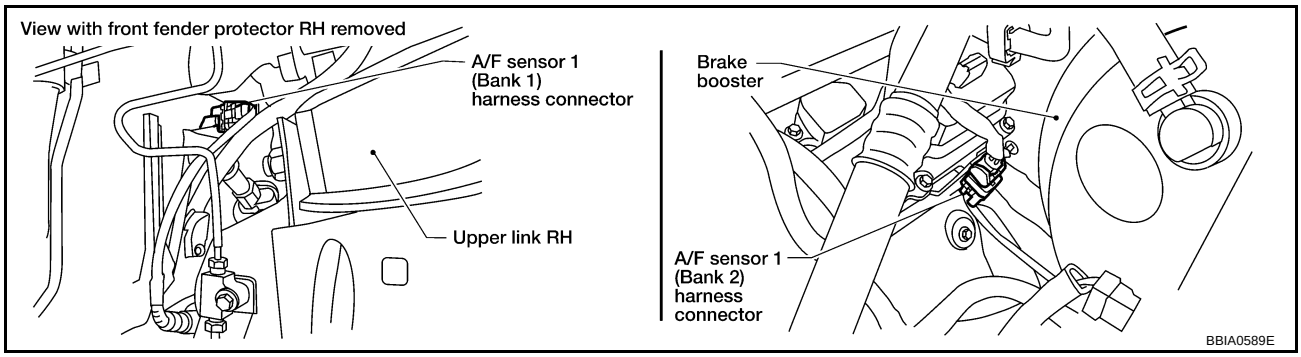
UBS00LMR

ENGINE COOLANT TEMPERATURE SENSOR

Refer to CO-52, "WATER INLET AND THERMOSTAT ASSEMBLY" .

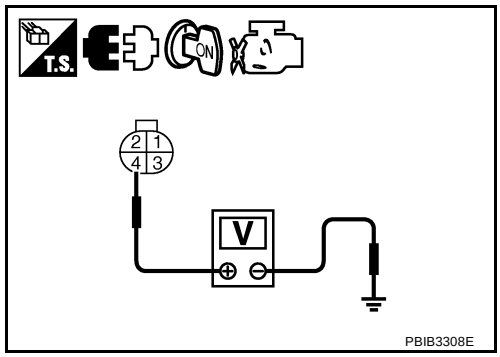
2. CHECK AIR FUEL RATIO (A/F) SENSOR 1 POWER SUPPLY CIRCUIT

1. Disconnect air fuel ratio (A/F) sensor 1 harness connector.



2. Turn ignition switch ON.
3. Check voltage between air fuel ratio (A/F) sensor 1 terminal 4 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

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

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E2, F32
- IPDM E/R connector E119
- 15A fuse
- Harness for open or short between air fuel ratio (A/F) sensor 1 and fuse

>> Repair or replace harness or connectors.

- **Before installing new oxygen sensor, clean exhaust system threads using Oxygen Sensor Thread Cleaner tool J-43897-18 or J-43897-12 and approved anti-seize lubricant.**

Removal and Installation

UBS00LNO

HEATED OXYGEN SENSOR 2

Refer to EM-133, "EXHAUST MANIFOLD AND THREE WAY CATALYST" .

Diagnostic Procedure

UBS00LOA

1. CHECK COMBINATION METER FUNCTION

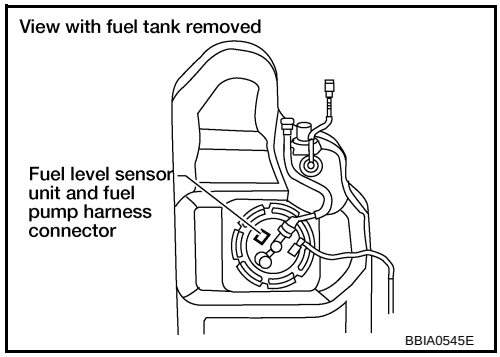
Refer to DI-5, "COMBINATION METERS" .

OK or NG

OK >> GO TO 2.
NG >> Go to DI-22, "Fuel Level Sensor Unit Inspection" .

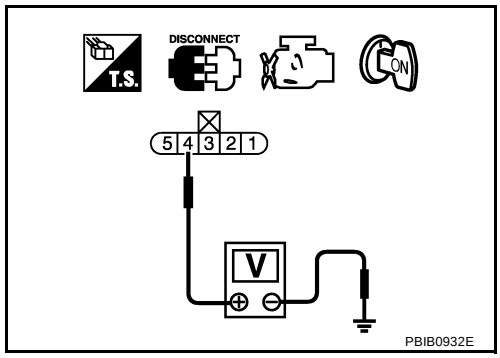
2. CHECK FUEL TANK TEMPERATURE SENSOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect “fuel level sensor unit and fuel pump” harness connector.
3. Turn ignition switch ON.



4. Check voltage between “fuel level sensor unit and fuel pump” terminal 4 and ground with CONSULT-II or tester.

Voltage: Approximately 5V



OK or NG

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

3. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E41, C1
- Harness for open or short between ECM and “fuel level sensor unit and fuel pump”

>> Repair harness or connector.

4. CHECK FUEL TANK TEMPERATURE SENSOR GROUND CIRCUIT FOR OPEN AND SHORT

1. Turn ignition switch OFF.
2. Disconnect combination meter harness connector.
3. Check harness continuity between “fuel level sensor unit and fuel pump” terminal 2 and combination meter terminal 9. Refer to Wiring Diagram.

Continuity should exist.

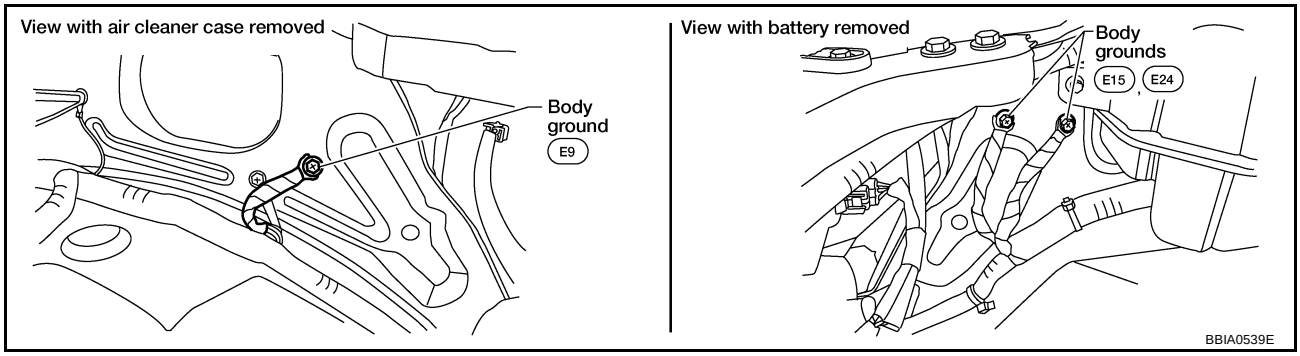
4. Also check harness for short to ground and short to power.

OK or NG

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

2. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body. Refer to EC-765, "Ground Inspection" .

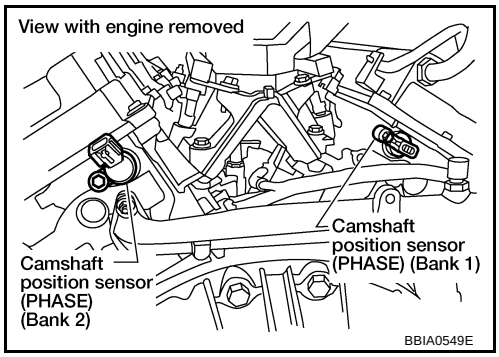


OK or NG

OK >> GO TO 3.
NG >> Repair or replace ground connections.

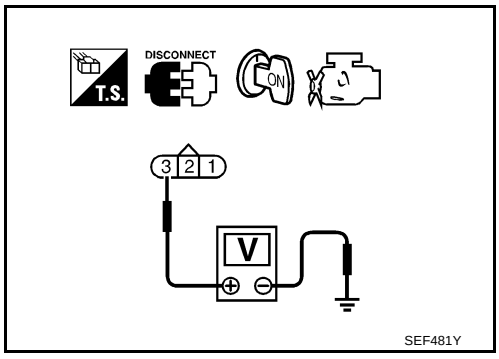
3. CHECK CAMSHAFT POSITION (CMP) SENSOR (PHASE) POWER SUPPLY CIRCUIT

1. Disconnect camshaft position (CMP) sensor (PHASE) harness connector.
2. Turn ignition switch ON.



3. Check voltage between CMP sensor (PHASE) terminal 3 and ground with CONSULT-II or tester.

Voltage: Battery voltage



OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E2, F32
- Harness for open or short between camshaft position sensor (PHASE) and ECM
- Harness for open or short between camshaft position sensor (PHASE) and IPDM E/R

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

DTC Confirmation Procedure

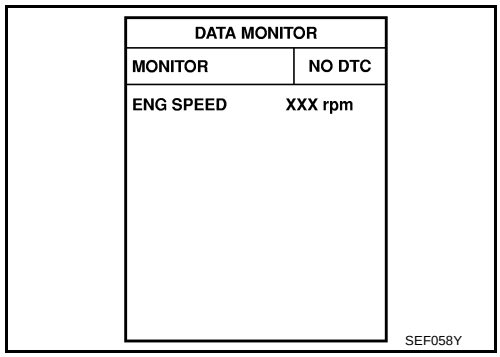
UBS00LQ5

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 battery voltage is more than 11V at idle.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Select “DATA MONITOR” mode with CONSULT-II.
3. Start engine and wait at least 8 seconds.
4. If 1st trip DTC is detected, go to EC-1021, "Diagnostic Procedure" .



WITH GST

Follow the procedure “WITH CONSULT-II” above.

Diagnostic Procedure

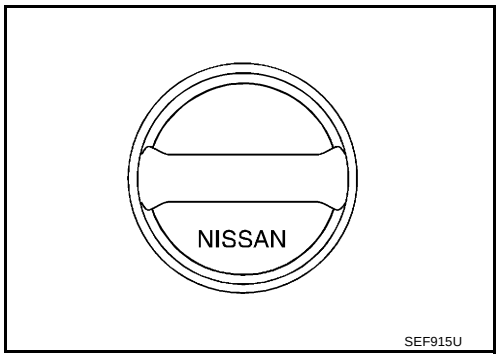
UBS00LQZ

1. CHECK FUEL FILLER CAP DESIGN

1. Turn ignition switch OFF.
2. Check for genuine NISSAN fuel filler cap design.

OK or NG

OK >> GO TO 2.
NG >> Replace with genuine NISSAN fuel filler cap.



2. CHECK FUEL FILLER CAP INSTALLATION

Check that the cap is tightened properly by rotating the cap clockwise.

OK or NG

OK >> GO TO 3.
NG >> 1. Open fuel filler cap, then clean cap and fuel filler neck threads using air blower.
2. Retighten until ratcheting sound is heard.

3. CHECK FUEL FILLER CAP FUNCTION

Check for air releasing sound while opening the fuel filler cap.

OK or NG

OK >> GO TO 5.
NG >> GO TO 4.

4. CHECK FUEL TANK VACUUM RELIEF VALVE

Refer to EC-645, "FUEL TANK VACUUM RELIEF VALVE (BUILT INTO FUEL FILLER CAP)" .

OK or NG

OK >> GO TO 5.
NG >> Replace fuel filler cap with a genuine one.

5. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-II

1. Disconnect ECM harness connector.
2. Check harness continuity between ECM terminal 102 and combination meter terminal 7. Refer to Wiring Diagram.

Continuity should exist.

3. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 7.
NG >> GO TO 6.

6. DETECT MALFUNCTIONING PART

Check the following.

- Harness connectors E152, M31
- Harness for open or short between ECM and combination meter

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

7. CHECK PNP SWITCH INPUT SIGNAL CIRCUIT FOR OPEN AND SHORT-III

1. Check harness continuity between A/T assembly terminal 9 and TCM terminal 8. Refer to AT-101, "DTC P0615 START SIGNAL CIRCUIT" .

Continuity should exist.

2. Also check harness for short to ground and short to power.

OK or NG

OK >> GO TO 8.
NG >> Repair open circuit or short to ground or short to power in harness or connectors.

8. CHECK INTERMITTENT INCIDENT

Refer to EC-757, "TROUBLE DIAGNOSIS FOR INTERMITTENT INCIDENT" .

OK or NG

OK >> GO TO 9.
NG >> Repair or replace.

9. REPLACE COMBINATION METER

Refer to DI-5, "COMBINATION METERS" .

>> **INSPECTION END**

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 ECMs transistor. Use a ground other than ECM terminals, such as the ground.

TERMINAL NO.	WIRE COLOR	ITEM	CONDITION	DATA (DC Voltage)
49	P	Sensor power supply (Refrigerant pressure sensor/Battery current sensor)	**[Ignition switch: ON]**	Approximately 5V
67	B	Sensor ground	**[Engine is running]** ● **Warm-up condition** ● Idle speed	Approximately 0V
71	R	Battery current sensor	**[Engine is running]** ● Battery: Fully charged* ● Idle speed	Approximately 2.6 - 3.5 V

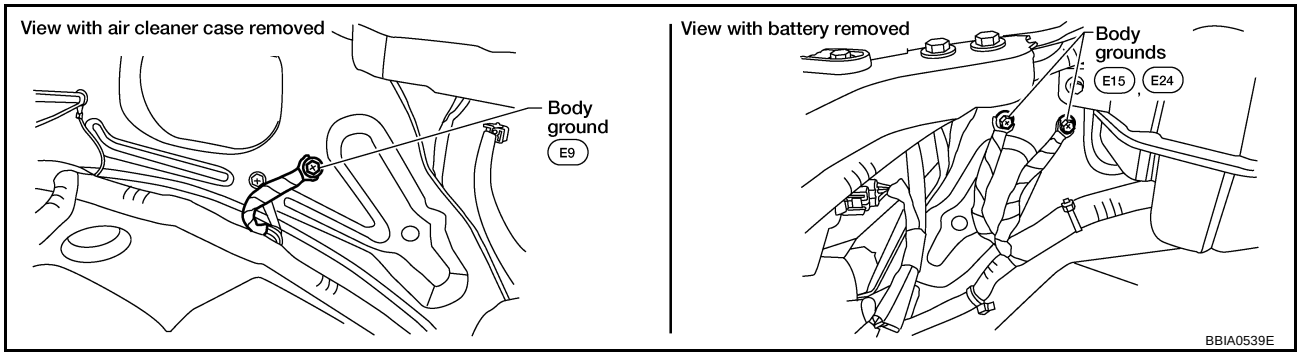
*: Before measuring the terminal voltage, confirm that the battery is fully charged. Refer to SC-5, "SPECIFIC GRAVITY CHECK" .

Diagnostic Procedure

UBS00LX2

1. CHECK GROUND CONNECTIONS

1. Turn ignition switch OFF.
2. Loosen and retighten three ground screws on the body.
   Refer to EC-765, "Ground Inspection" .



OK or NG

OK >> GO TO 2.
NG >> Repair or replace ground connections.

DTC P1805 BRAKE SWITCH

PFP:25320

Description

UBS00LY8

Brake switch signal is applied to the ECM through the stop lamp switch when the brake pedal is depressed. This signal is used mainly to decrease the engine speed when the vehicle is driving.

CONSULT-II Reference Value in Data Monitor Mode

UBS00LY9

Specification data are reference values.

MONITOR ITEM	CONDITION		SPECIFICATION
BRAKE SW	● Ignition switch: ON	Brake pedal: Fully released	OFF
		Brake pedal: Slightly depressed	ON

On Board Diagnosis Logic

UBS00LYA

The MIL will not light up for this diagnosis.

DTC No.	Trouble diagnosis name	DTC detecting condition	Possible cause
P1805 1805	Brake switch	A brake switch signal is not sent to ECM for extremely long time while the vehicle is driving.	● Harness or connectors (Stop lamp switch circuit is open or shorted.) ● Stop lamp switch

FAIL-SAFE MODE

When the malfunction is detected, the ECM enters fail-safe mode.

Engine operating condition in fail-safe mode	
ECM controls the electric throttle control actuator by regulating the throttle opening to a small range. Therefore, acceleration will be poor.	
Vehicle condition	Driving condition
When engine is idling	Normal
When accelerating	Poor acceleration

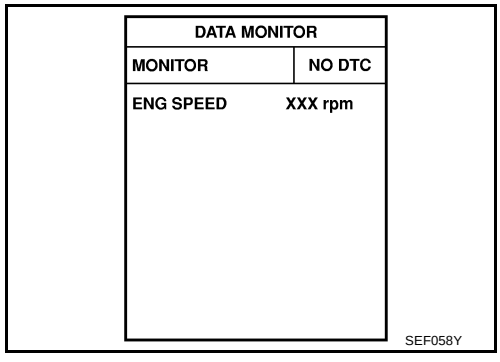
DTC Confirmation Procedure

UBS00LYB

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.

WITH CONSULT-II

1. Turn ignition switch ON.
2. Fully depress the brake pedal for at least 5 seconds.
3. Erase the DTC with CONSULT-II.
4. Select “DATA MONITOR” mode with CONSULT-II.
5. If 1st trip DTC is detected, go to EC-1177, "Diagnostic Procedure" .



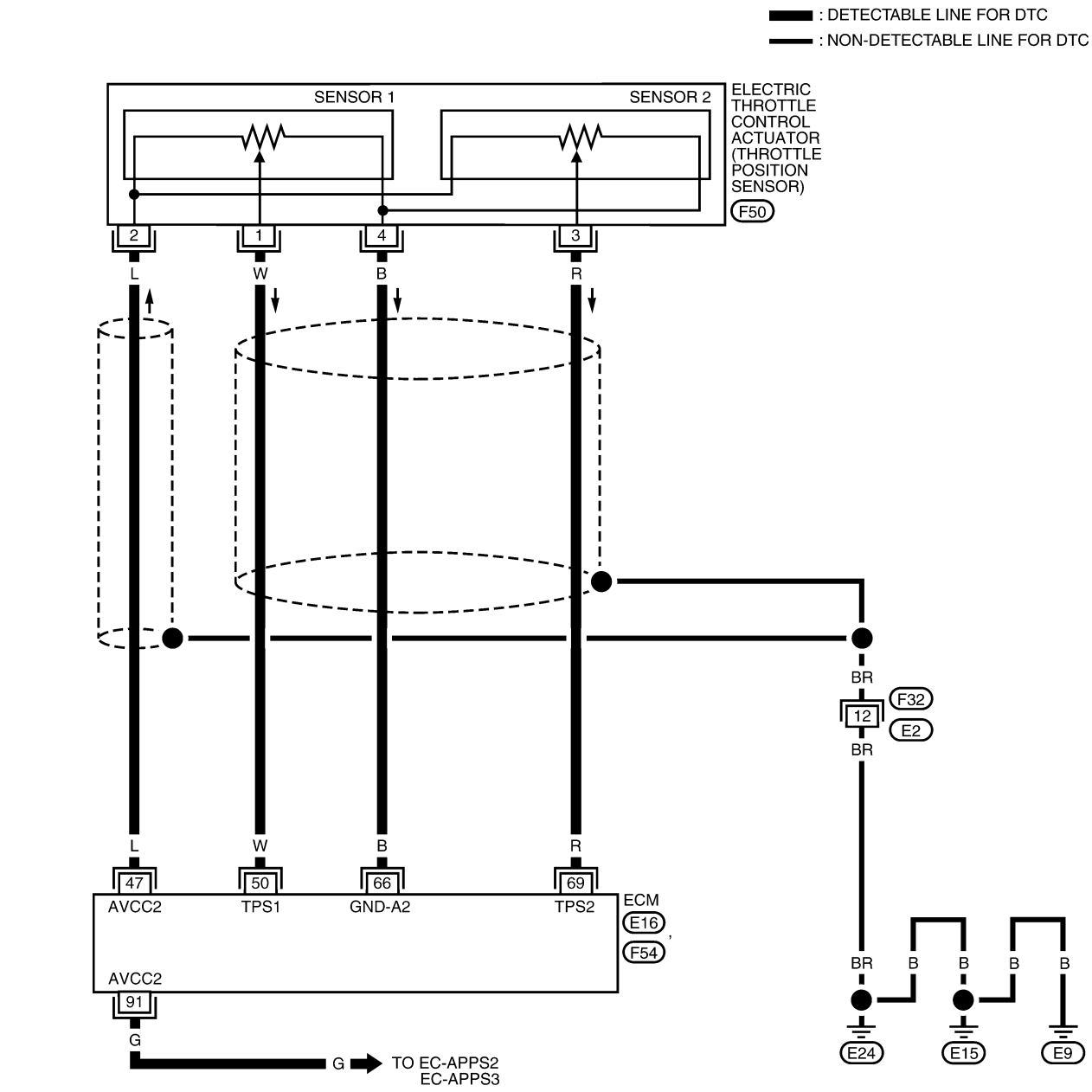
WITH GST

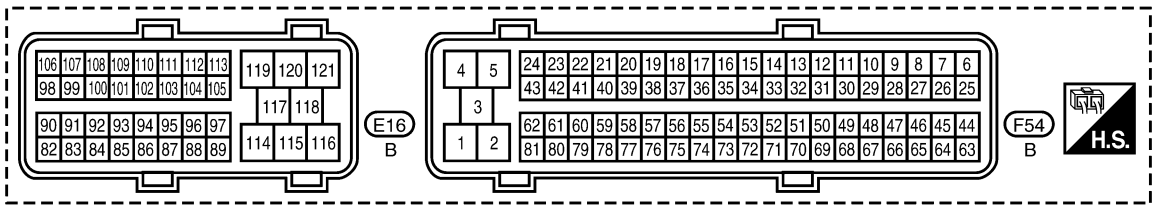
Follow the procedure “WITH CONSULT-II” above.

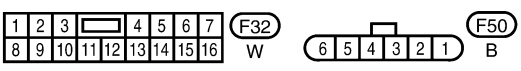
Wiring Diagram

UBS00LYZ

EC-TPS3-01



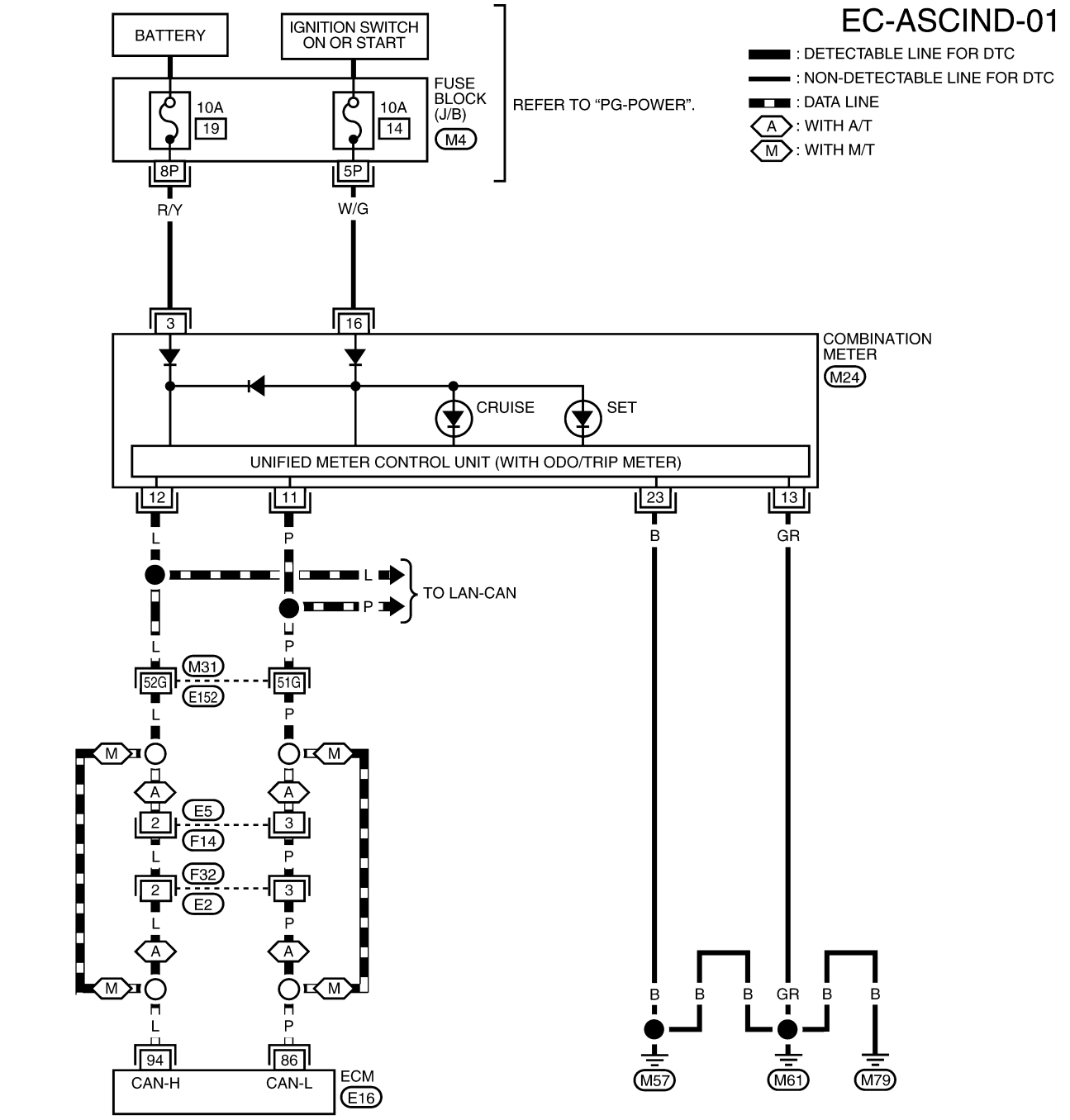


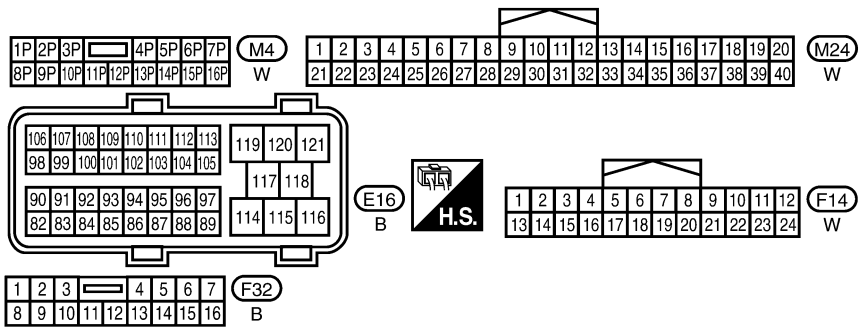


BBWA1746E

Wiring Diagram

UBS00M0C





REFER TO THE FOLLOWING.
M31 - SUPER MULTIPLE JUNCTION (SMJ)

BBWA2404E

Diagnostic Procedure

UBS00LZJ

1. CHECK OVERALL FUNCTION

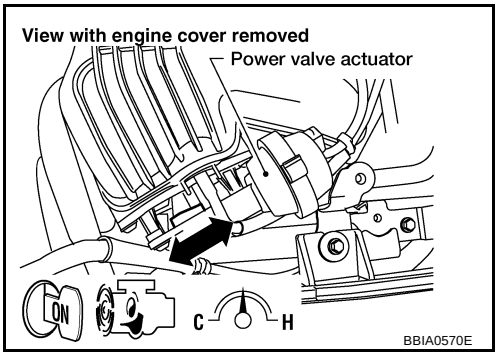
With CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Perform “VIAS SOL VALVE” in “ACTIVE TEST” mode with CONSULT-II.

ACTIVE TEST	
VIAS SOL VALVE	OFF
MONITOR	
ENG SPEED	XXX rpm

PBIB0844E

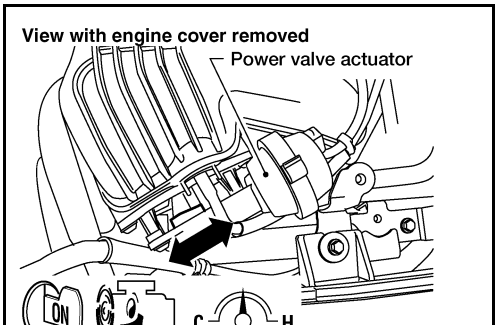
3. Turn VIAS control solenoid valve “ON” and “OFF”, and make sure that power valve actuator rod moves.



BBIA0570E

Without CONSULT-II

1. Start engine and warm it up to normal operating temperature.
2. Rev engine up to between 2,200 and 3,300 rpm and make sure that power valve actuator rod moves.



BBIA0570E

OK or NG

OK >> **INSPECTION END**
NG (With CONSULT-II) >>GO TO 2.
NG (Without CONSULT-II) >>GO TO 3.

A. Double-faced adhesive tape B. King cab side guard moulding C. Crew cab side guard moulding

REMOVAL

CAUTION:

Never apply tack-paper adhesive remover to body panel surface finished with lacquer-based paints.

- Original side guard molding is affixed to body panel with double-faced adhesive tape.

1. Heat molding to between 30° and 40°C (86° to 104°F) with a heat gun.
2. Raise end of molding and cut away tape to remove molding. Remove all traces of tape.

INSTALLATION

- On vehicles coated with Hard Clear Coat, use double-faced 3M adhesive tape Product No. 4210 or equivalent, after priming with 3M primer Product No. N200, C-100 or equivalent.
- The repair parts are also affixed with double-faced adhesive tape.
- To re-use existing molding, clean all traces of double sided tape from the molding and apply new double-faced tape to the molding.

1. Clean the panel surface with isopropyl alcohol or equivalent to degrease the surface.
2. Heat the panel and molding tape surface to 30° to 40°C (86° to 104°F).
3. Remove the backing sheet from the tape surface.
   - Align the locating pin into the hole in the outer door.
   - Continue aligning the pins into their corresponding holes in the outer door during installation.
4. Press ends by hand and use a roller to apply 5 kg-f (11 lbs-f) to press molding to door surface.
   - Apply even pressure along molding to insure proper wet out.

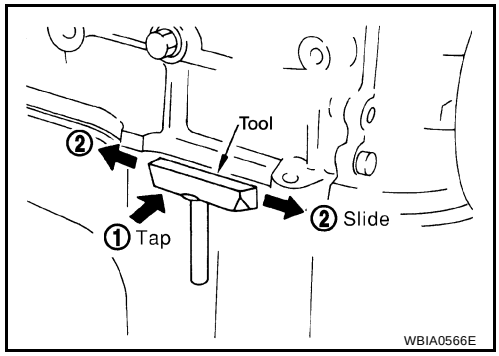
CAUTION:

To secure contact, do not wash vehicle for 24 hours after installation.

Tool number : KV10111100 (J-37228)

CAUTION:

- **Be careful not to damage the mating surfaces.**
- **Do not insert a screwdriver, this will damage the mating surfaces.**



INSTALLATION

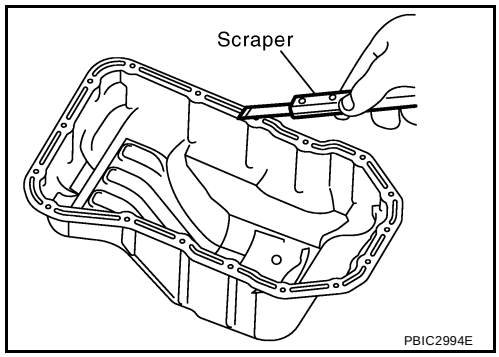
1. Install oil pan with the following procedure:

a. Use a scraper to remove old liquid gasket from mating surfaces.

- Also remove the old liquid gasket from mating surface of cylinder block.
- Remove old liquid gasket from the bolt holes and threads.

CAUTION:

Do not scratch or damage the mating surfaces when cleaning off old liquid gasket.



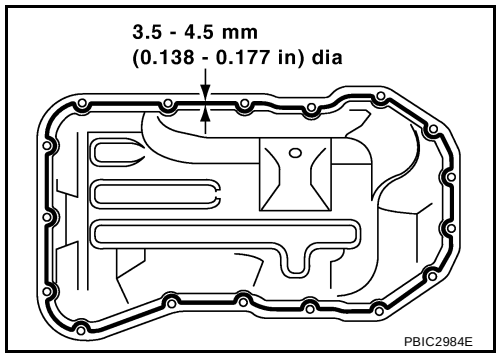
b. Apply a continuous bead of liquid gasket using Tool as shown.

Tool number : WS39930000 (—)

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .

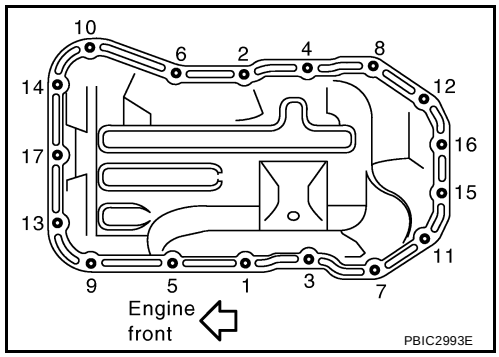
CAUTION:

Attaching should be done within 5 minutes after coating.



c. Tighten bolts in numerical order as shown.

- Install A/T fluid cooler tube bracket with bolts No.1 and 9 as shown (A/T models).



2. Install oil pan drain plug. Refer to MA-25, "Changing Engine Oil" .
3. Install in the reverse order of removal after this step.

NOTE:

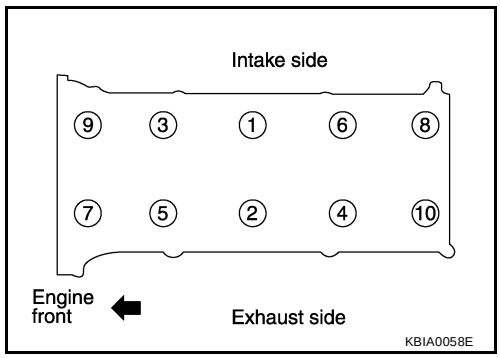
Pour engine oil at least 30 minutes after oil pan is installed.

INSPECTION AFTER INSTALLATION

1. Check the engine oil level, and adjust the level. Refer to LU-6, "ENGINE OIL LEVEL" .

INSTALLATION

1. Install new cylinder head gasket.
2. Install cylinder head follow the steps below to tighten cylinder head bolts in numerical order as shown.



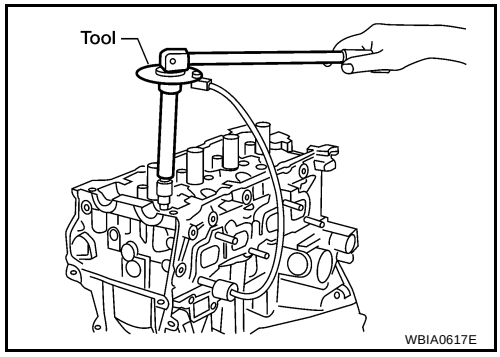
CAUTION:

If cylinder head bolts re-used, check their outer diameters before installation. Refer to EM-62, "Cylinder Head Bolts Outer Diameter" .

NOTE:

Apply new engine oil to threads and seating surfaces of mounting bolts.

Tool number : KV10112100 (BT8653-A)



Step a : 50 N·m (5.1 kg-m, 37 ft-lb)

Step b : 60° clockwise

Step c : Loosen to 0 N·m in the reverse order of tightening.

Step d : 39.2 N·m (4.0 kg-m, 29 ft-lb)

Step e : 75° clockwise

Step f : 75° clockwise

3. Installation of the remaining components is in reverse order of removal.

INSPECTION AFTER INSTALLATION

Inspection for Leaks

The following are procedures for checking fluid leaks, lubricates leak and exhaust gases leak.

- Before starting the engine, check oil fluid levels including engine coolant and engine oil. If less than required quantity, fill to the specified level. Refer to MA-11, "QR25DE" .
- Use procedures below to check for fuel leakage.
  - Turn ignition switch “ON” (with engine stopped). With fuel pressure applied to fuel piping, check for fuel leakage at connection points.
  - Start the engine. With the engine speed increased, check again for fuel leakage at connection points.
- Run the engine to check for unusual noise and vibration.

NOTE:

If hydraulic pressure inside timing chain tensioner drops after removal/installation, slack in the guide may generate a pounding noise during and just after the engine start. However, this is normal. Noise will stop after hydraulic pressure rises.

- Warm up the engine thoroughly to make sure there is no leakage of fuel, exhaust gases, or any oil/ fluids including engine oil and engine coolant.
- Bleed air from lines and hoses of applicable lines, such as in cooling system.
- After cooling down the engine, again check oil/fluid levels including engine oil and engine coolant. Refill to the specified level, if necessary.

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

Standard and Limit

EBS00NIF

GENERAL SPECIFICATIONS

Cylinder arrangement		In-line 4
Displacement cm^3 (cu in)		2,488 (151.82)
Bore and stroke mm (in)		89.0 x 100.0 (3.504 x 3.937)
Valve arrangement		DOHC
Firing order		1-3-4-2
Number of piston rings	Compression	2
	Oil	1
Compression ratio		9.5
Compression pressure kPa (kg/cm^2 , psi) / 250 rpm	Standard	1,304 (13.3, 189)
	Minimum	1,108 (11.3, 161)
	Differential limit between cylinders	100 (1.0, 14)

DRIVE BELT

Tension of drive belt	Auto adjustment by auto-tensioner

EXHAUST MANIFOLD AND THREE WAY CATALYST ASSEMBLY

Unit: mm (in)

Item	Limit
Surface distortion	0.3 (0.012)

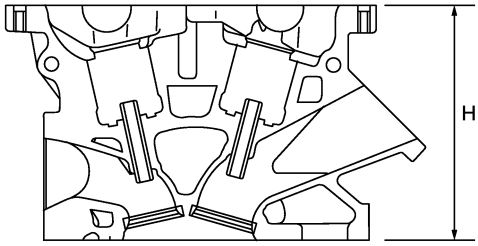
SPARK PLUG

Make	NGK
Standard type	PLZKAR6A–11
Gap (nominal)	1.1 mm (0.043 in)

CYLINDER HEAD

Unit: mm (in)

Items	Limit
Head surface distortion	0.1 (0.004)



Nominal cylinder head height:
H = 129.4 mm (5.09 in)

PBIC0283E

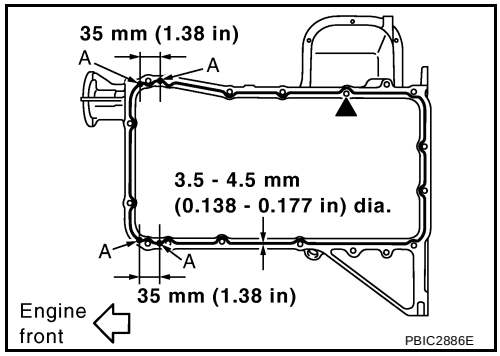
c. Apply a continuous bead of liquid gasket using Tool to the lower cylinder block mating surfaces of oil pan (upper) to a limited portion as shown.

Tool number : WS39930000 (—)

Use Genuine RTV Silicone Sealant or equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .

CAUTION:

- **For bolt holes with ▲ mark, apply liquid gasket outside the hole.**
- **Apply a bead of 4.5 to 5.5 mm (0.177 to 0.217 in) in diameter to area "A".**
- **Attaching should be done within 5 minutes after coating.**



d. Install oil pan (upper).

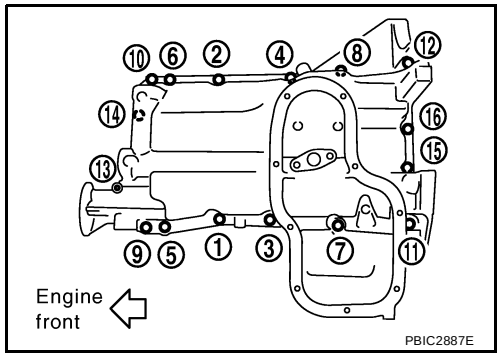
CAUTION:

Install avoiding misalignment of both oil pan gaskets and O-rings.

- Tighten bolts in numerical order as shown.
- There are two types of bolts. Refer to the following for locating bolts.

M8 × 100 mm (3.97 in) : 7, 11, 12, 13

M8 × 25 mm (0.98 in) : Except the above



e. Tighten transmission joint bolts. Refer to AT-242, "TRANSMISSION ASSEMBLY" .

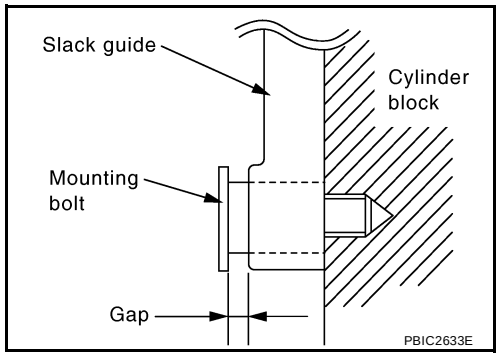
2. Install oil strainer to oil pan (upper).
3. Installation of the remaining components is in the reverse order of removal.

INSPECTION AFTER INSTALLATION

1. Check engine oil level and adjust engine oil. Refer to LU-18, "ENGINE OIL" .
2. Start engine, and check there is no leak of engine oil.
3. Stop engine and wait for 10 minutes.
4. Check engine oil level again. Refer to LU-18, "ENGINE OIL" .

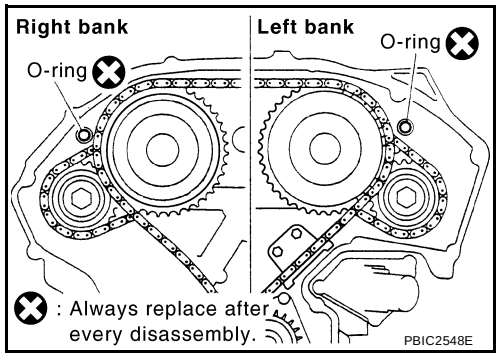
CAUTION:

Do not overtighten slack guide bolts. It is normal for a gap to exist under the bolt seats when bolts are tightened to specification.

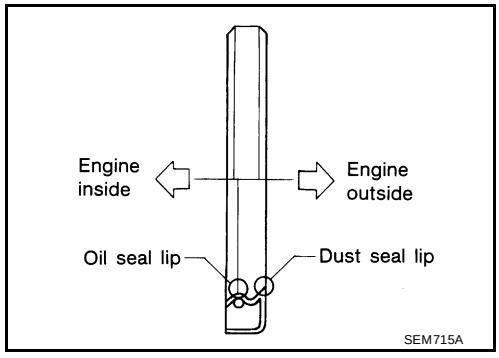


- When installing timing chain tensioner (primary), push in plunger and keep it pressed in with stopper pin.
- Remove any dirt and foreign materials completely from the back and the mounting surfaces of timing chain tensioner (primary).
- After installation, pull out stopper pin by pressing slack guide.

9. Make sure again that the mating marks on camshaft sprockets and timing chain have not slipped out of alignment.
10. Install new O-rings on rear timing chain case.

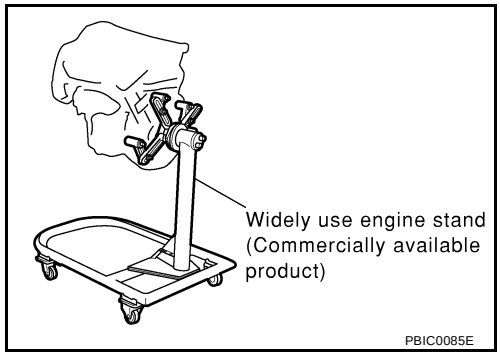


11. Install new front oil seal on front timing chain case.
    - Apply new engine oil to both oil seal lip and dust seal lip.
    - Install it so that each seal lip is oriented as shown.



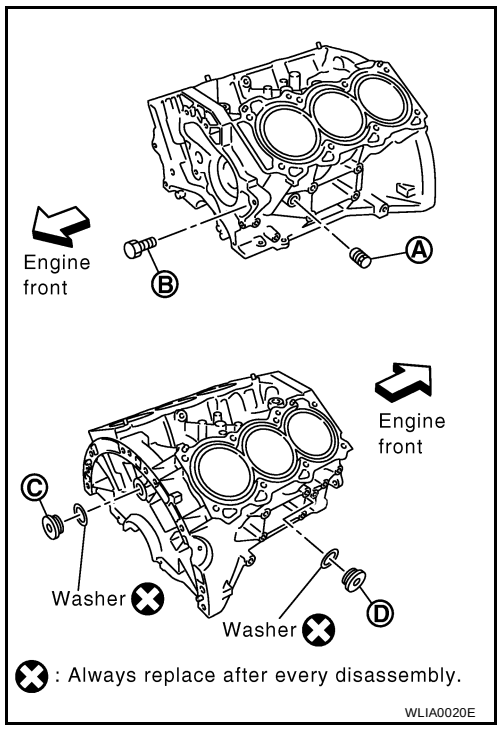
- A widely use engine stand can be used.

CAUTION:
Use engine stand that has a load capacity [approximately 220 kg (441 lb) or more] large enough for supporting the engine weight.



4. Drain engine oil. Refer to LU-20, "Changing Engine Oil" .
5. Drain engine coolant by removing water drain plugs from cylinder block left side at “A” and cylinder block front side at “B” as shown in the figure.

NOTE:
For Canada, “D” in the figure is not plug but block heater.

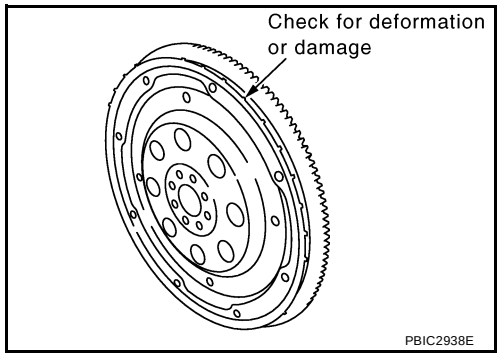


6. Remove drive plate (A/T models); using Tool.

Tool number : KV10117700 (J-44716)

- Loosen bolts in diagonal order.
- Use TORX socket for drive plate bolts.

CAUTION:
- **Do not disassemble drive plate (A/T models).**
- **Do not place drive plate (A/T models) with signal plate facing down.**
- **When handling signal plate, take care not to damage or scratch it.**
- **Handle signal plate in a manner that prevents it from becoming magnetized.**



7. Remove cylinder head. Refer to EM-203, "REMOVAL" .
8. Remove sub harness, and remove knock sensors.

PRECAUTIONS

PFP:00001

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

EBS00T2N

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. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted.
Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

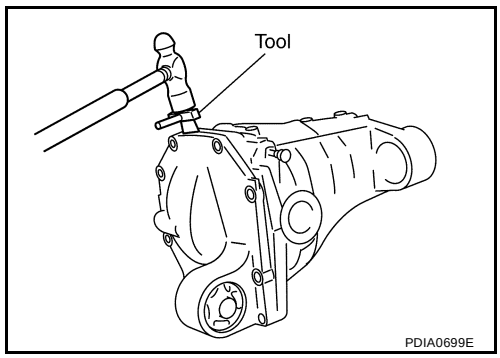
WARNING:

- **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.**

2. Remove the carrier cover bolts and separate the carrier cover from the gear carrier using Tool.

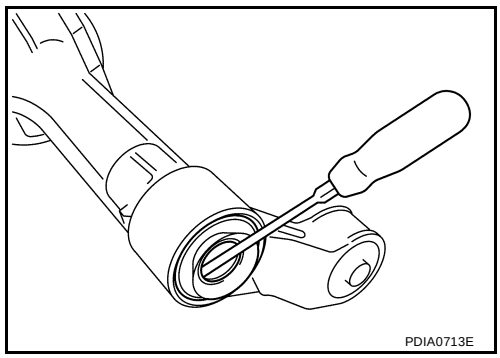
Tool number : KV10111100 (J-37228)

CAUTION:
- **Do not damage the mating surface.**
- **Do not insert flat-bladed screwdriver, this will damage the mating surface.**

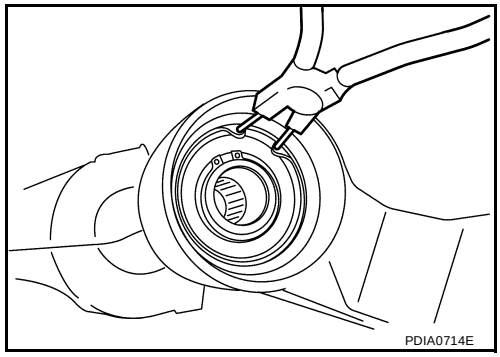


3. Remove side oil seal.

CAUTION:
Do not damage gear carrier.



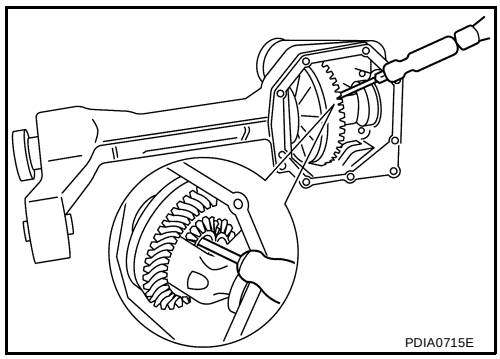
4. Remove snap ring (hole side) using suitable tool.



5. Remove differential side shaft assembly out of gear carrier using suitable tool.

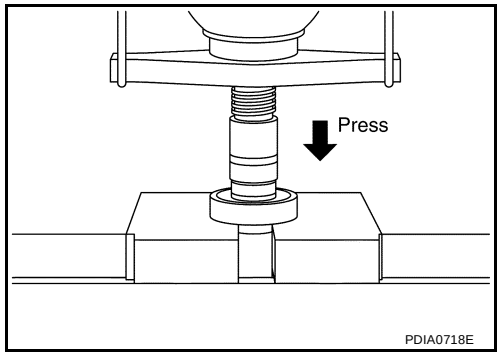
NOTE:
Tap on differential side shaft assembly from side gear side.

6. Remove snap ring (differential side shaft side).



7. Press differential side shaft out of differential side shaft bearing.

CAUTION:
Do not drop differential side shaft.



NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

EES001IU

Use the chart below to help you find the cause of the symptom. Repair or replace parts as necessary.

		Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	DRIVE SHAFT	DIFFERENTIAL	WHEEL HUB AND BEARING	TIRES	ROAD WHEEL	BRAKES	STEERING
Reference page		FSU-6	FSU-6	FSU-6	FSU-5	FSU-21	FSU-6	FSU-6	FSU-6	FAX-4, "NVH Troubleshooting Chart"	FFD-6, "NVH Troubleshooting Chart"	FAX-4, "NVH Troubleshooting Chart"	WT-4, "NVH Troubleshooting Chart"	WT-4, "NVH Troubleshooting Chart"	BR-5, "NVH Troubleshooting Chart"	PS-5, "NVH Troubleshooting Chart"
Symptom	Noise	×	×	×	×	×	×			×	×	×	×	×	×	×
	Shake	×	×	×	×		×			×		×	×	×	×	×
	Vibration	×	×	×	×	×				×		×	×			×
	Shimmy	×	×	×	×			×				×	×	×	×	×
	Shudder	×	×	×								×	×	×	×	×
	Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×		

x: Applicable

- The switch diagram is used in wiring diagrams.

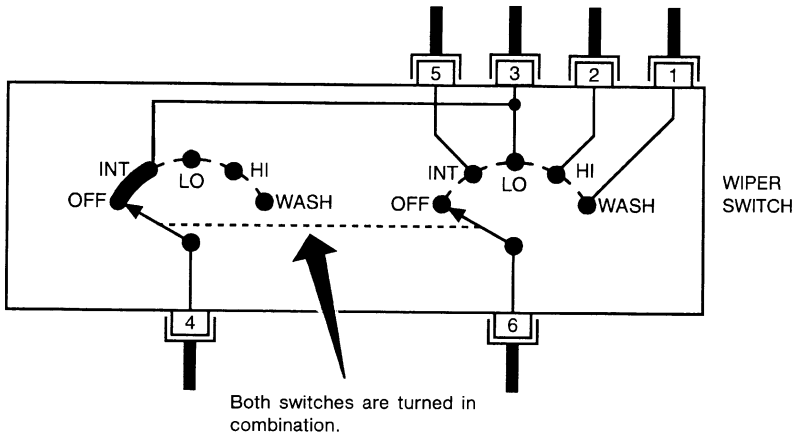
Example

(SWITCH CHART)

WIPER SWITCH

	OFF	INT	LO	HI	WASH
1					○
2				○	
3	○	○	○		
4	○	○			
5		○			
6		○	○	○	○

(SWITCH DIAGRAM)



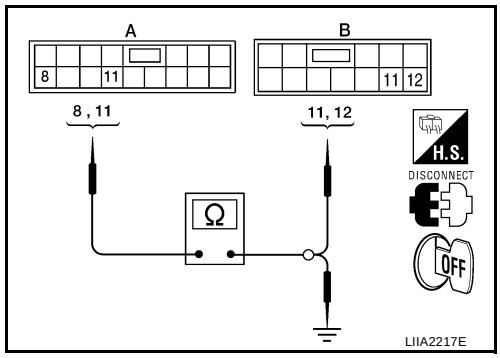
Continuity circuit of wiper switch

SWITCH POSITION	CONTINUITY CIRCUIT
OFF	3 - 4
INT	3 - 4, 5 - 6
LO	3 - 6
HI	2 - 6
WASH	1 - 6

SGI875

8. CHECK GROUND SUPPLY CIRCUIT

1. Disconnect main power window and door lock/unlock switch and power window and door lock/unlock switch RH.
2. Check continuity between main power window and door lock/unlock switch connector and power window and door lock/unlock switch RH connector.



Connector	Terminal	Connector	Terminal	Continuity
A		B		
Main power window and door lock/unlock switch: D7	8	Power window and door lock/unlock switch RH: D105	12	Yes
	11		11	Yes

3. Check continuity between main power window and door lock/unlock switch connector and ground.

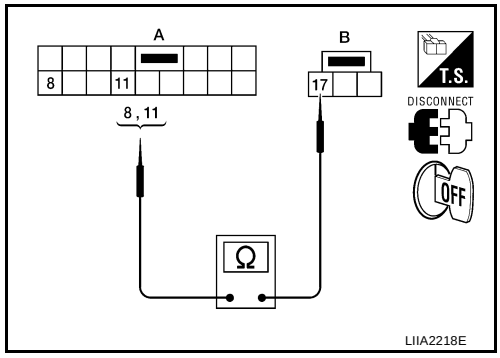
Connector	Terminal	Ground	Continuity
A			
Main power window and door lock/unlock switch: D7	8		No
	11		No

OK or NG

OK >> GO TO 9.
NG >> Repair or replace harness.

9. CHECK MAIN POWER WINDOW AND DOOR LOCK/UNLOCK SWITCH

Check continuity between main power window and door lock/unlock switch terminals.



	Terminals		Condition	Continuity
Main power window and door lock/unlock switch	17	8	Lock switch UNLOCK	Yes
			Lock switch LOCK	No
		11	Lock switch UNLOCK	Yes
			Lock switch LOCK	No

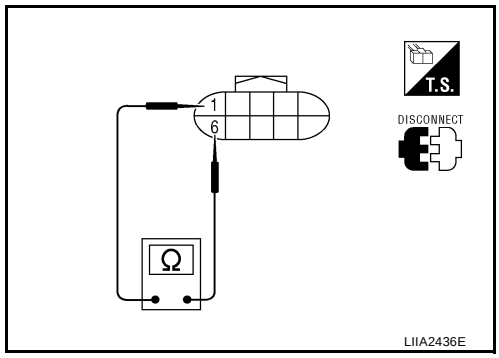
OK or NG

OK >> Repair or replace harness.
NG >> Replace main power window and door lock/unlock switch. Refer to EI-32, "FRONT DOOR" .

5. CHECK DOOR MIRROR DEFOGGER

Check continuity between each door mirror LH or RH terminals 1 and 6.

1 - 6 : Continuity should exist.



OK or NG

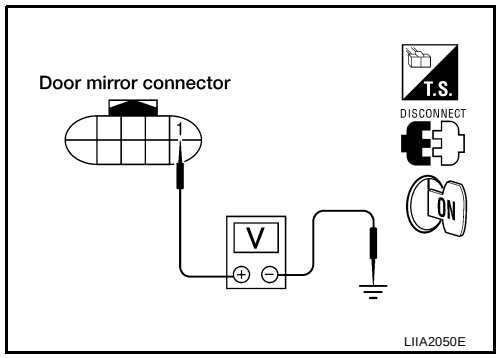
OK >> Check the condition of the harness and the connector.
NG >> Replace malfunctioning door mirror LH or RH. Refer to GW-91, "Door Mirror Assembly" .

Door Mirror LH Defogger Circuit Check (With Heated Mirrors)

EIS0054U

1. CHECK DOOR MIRROR DEFOGGER POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door mirror LH.
3. Turn ignition switch ON.
4. Check voltage between door mirror LH connector and ground.



Connector	Terminals		Condition	Voltage (V) (Approx.)
	(+)	(-)		
D4	1	Ground	Rear window defogger switch ON	Battery voltage
			Rear window defogger switch OFF	0

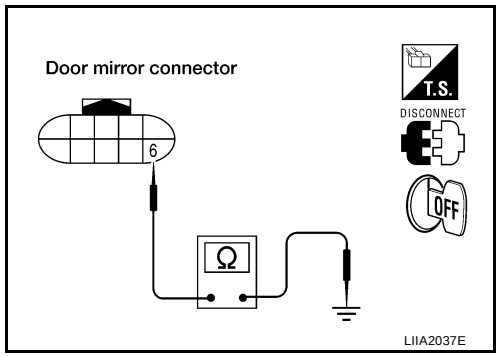
OK or NG

OK >> GO TO 2.
NG >> Repair or replace harness.

2. CHECK DOOR MIRROR DEFOGGER GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between door mirror LH connector D4 terminal 6 and ground.

6 - Ground : Continuity should exist.



OK or NG

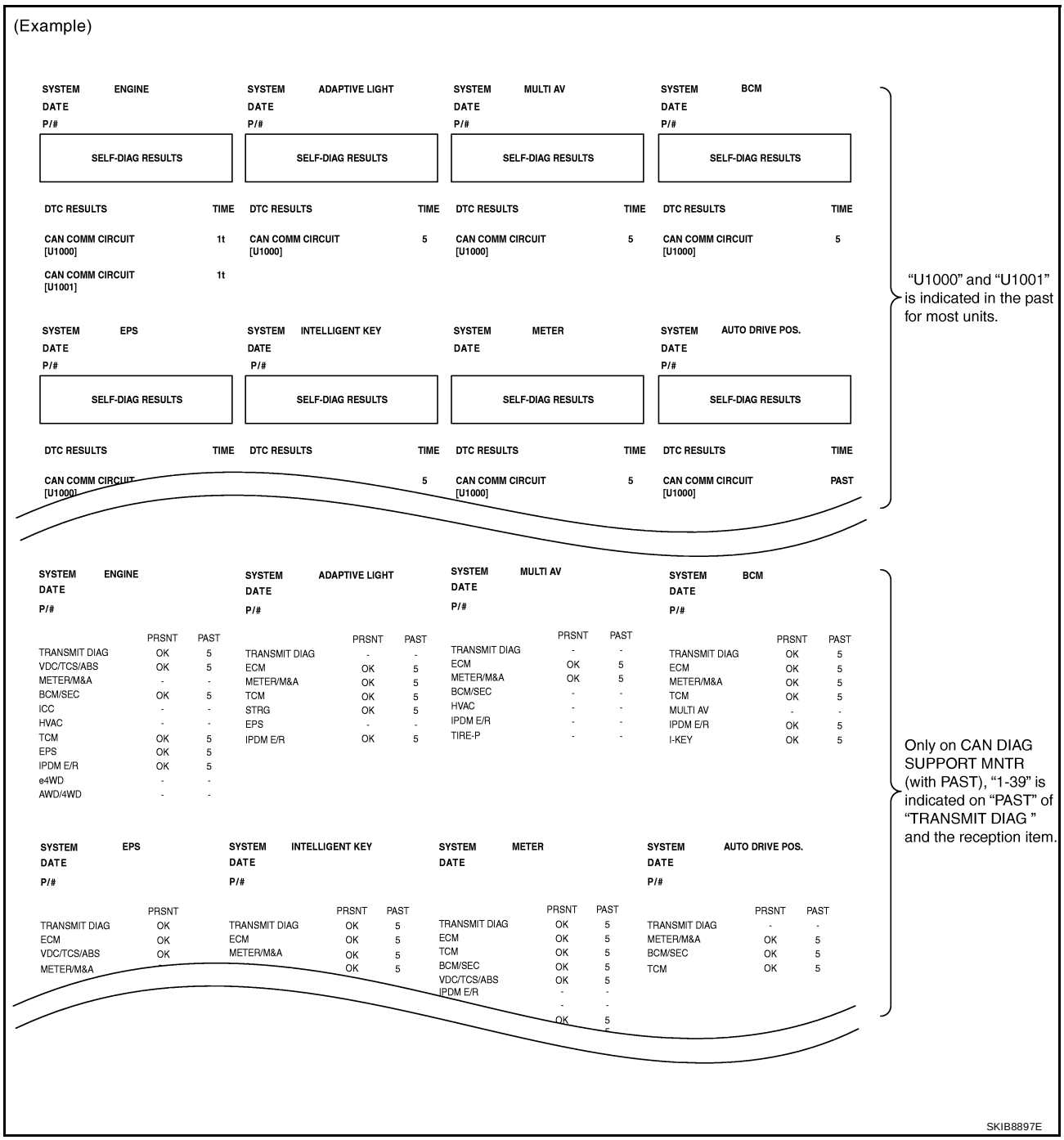
OK >> GO TO 3.
NG >> Repair or replace harness.

Past Error — Short Circuit —

When the symptoms listed below exist, a short circuit of the CAN communication line is a possible cause.

Item (CONSULT-II)	Indication	Inspection procedure
SELF-DIAG RESULTS	"U1000" and "U1001" is indicated in the past for most units.	Refer to LAN-86, "Malfunction Area Chart" .
CAN DIAG SUPPORT MNTR	Only on CAN DIAG SUPPORT MNTR (with PAST), "1 - 39" is indicated on "PAST" of "TRANSMIT DIAG" and the reception item.	

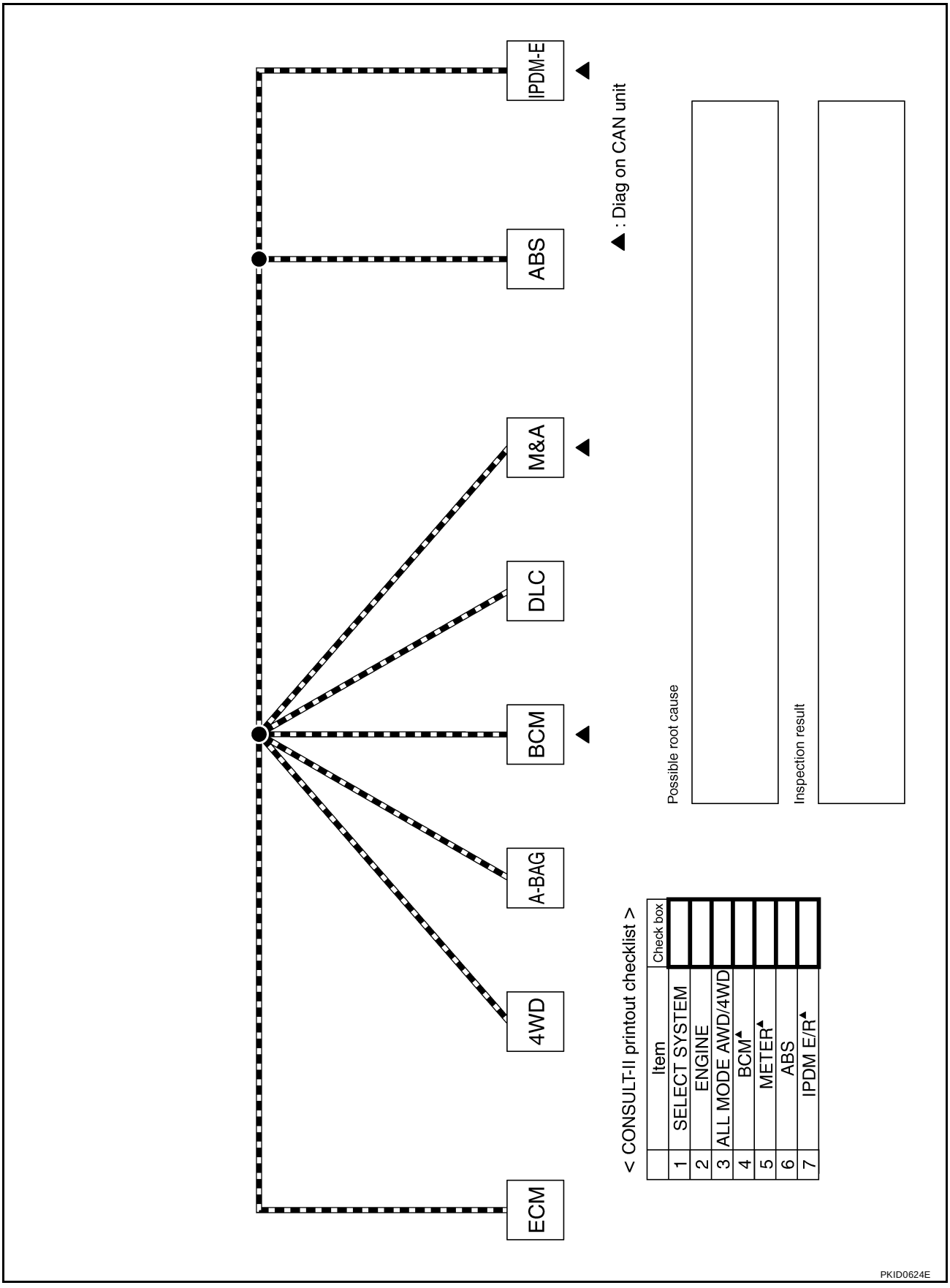
(Example)



CAN System (Type 9)

UKS006F8

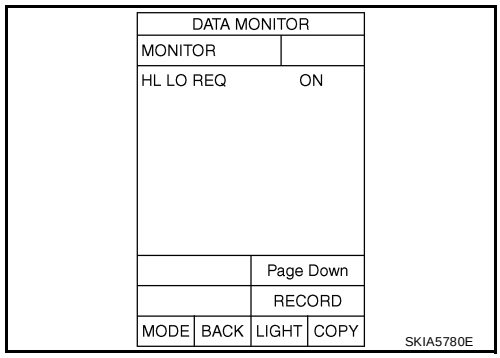
DIAGNOSIS SHEET



3. CHECK IPDM E/R

1. Select "IPDM E/R" on CONSULT-II, and select "DATA MONITOR" on "SELECT DIAG MODE" screen.
2. Make sure "HL LO REQ" turns ON when lighting switch is in 2ND position.

When lighting switch is in 2ND position : HL LO REQ ON



OK or NG

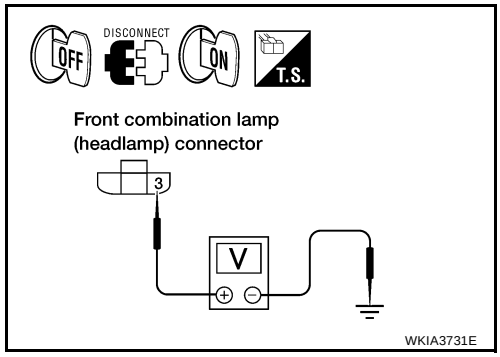
OK >> Replace IPDM E/R. Refer to PG-32, "Removal and Installation of IPDM E/R" .

NG >> Replace BCM. Refer to BCS-25, "Removal and Installation" .

4. CHECK HEADLAMP INPUT SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front combination lamp RH and LH (headlamp) connector.
3. Turn ignition switch ON.
4. Select "IPDM E/R" on CONSULT-II, and select "ACTIVE TEST" on "SELECT DIAG MODE" screen.
5. Select "EXTERNAL LAMPS" on "SELECT TEST ITEM" screen.
6. Touch "LO" on "ACTIVE TEST" screen.
7. When headlamp low beam is operating, check voltage between front combination lamp RH and LH (headlamp) harness connector and ground.

Front combination lamp (headlamp) (+)			(–)	Voltage
Connector		Terminal		
RH	E107	3	Ground	Battery voltage
LH	E11			



OK or NG

OK >> GO TO 6.

NG >> GO TO 5.

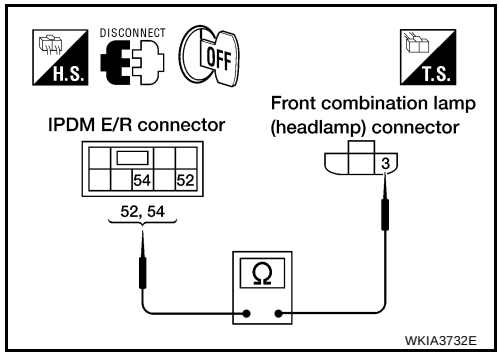
5. CHECK HEADLAMP CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between IPDM E/R harness connector E123 terminal 54 and front combination lamp RH (headlamp) harness connector E107 terminal 3.

54 - 3 : Continuity should exist.

4. Check continuity between IPDM E/R harness connector E123 terminal 52 and front combination lamp LH (headlamp) harness connector E11 terminal 3.

52 - 3 : Continuity should exist.



OK or NG

OK >> Replace IPDM E/R. Refer to PG-32, "Removal and Installation of IPDM E/R" .

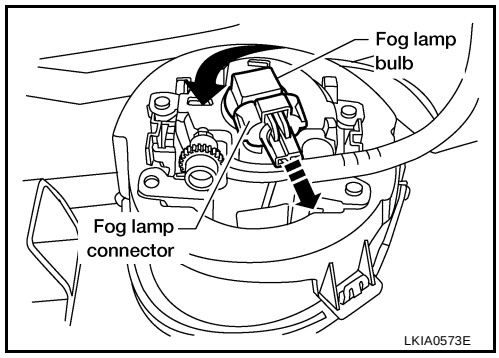
NG >> Repair harness or connector.

Bulb Replacement

EKS00BQC

REMOVAL

1. Position front fender protector aside. Refer to EI-22, "FENDER PROTECTOR" .
2. Disconnect fog lamp connector.
3. Turn the bulb counterclockwise to remove it.



CAUTION:

- **Do not touch the glass of bulb directly by hand. Keep grease and other oily substances away from it. Do not touch bulb by hand while it is lit or right after being turned off. Burning may result.**
- **Do not leave bulb out of fog lamp reflector for a long time because dust, moisture smoke, etc. may affect the performance of fog lamp. When replacing bulb, be sure to replace it with new one.**

INSTALLATION

Installation is in the reverse order of removal.

Removal and Installation

EKS00BQD

FOG LAMP

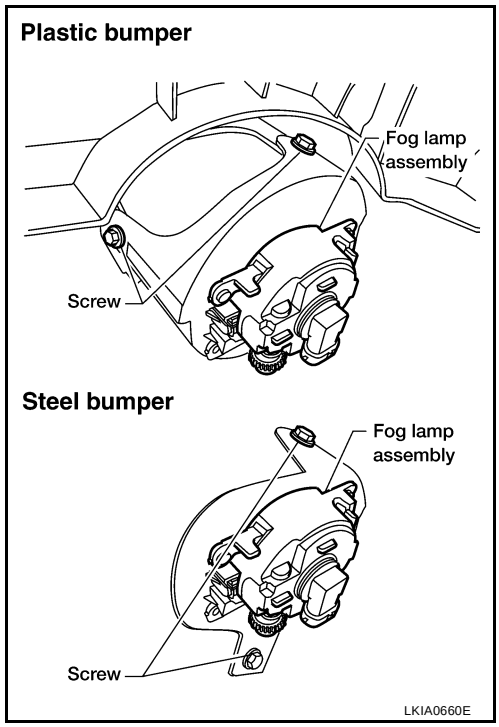
Removal

The fog lamp is a semi-sealed beam type which uses a replaceable halogen bulb.

CAUTION:

- **Do not leave fog lamp assembly without bulb for a long period of time. Dust, moisture, smoke, etc. entering the fog lamp body may affect the performance. Remove the bulb from the headlamp assembly just before replacement bulb is installed.**
- **Grasp only the plastic base when handling the bulb. Never touch the glass envelope. Touching the glass could significantly affect the bulb life and/or fog lamp performance.**

1. Position front fender protector aside. Refer to EI-23, "Removal and Installation of Front Fender Protector"
2. Disconnect fog lamp connector.
3. Remove fog lamp screws and pull fog lamp rearward out of front bumper.



Installation

Installation is in the reverse order of removal.

Parking, Side Marker, License Plate and Tail Lamps Do Not Turn OFF (After Approx. 10 Minutes)

EKS00CND

1. CHECK IPDM E/R

1. Turn ignition switch ON. Turn the combination switch (lighting switch) to the OFF position. Turn ignition switch OFF.
2. Verify that the front parking, front side marker, license plate, and tail lamps turn on and off after approximately 10 minutes.

OK or NG

OK >> Ignition relay malfunction. Refer to PG-19, "Function of Detecting Ignition Relay Malfunction" .
NG >> Inspection End.

Bulb Replacement

EKS00BRL

FRONT PARKING LAMP

Refer to LT-25, "FRONT TURN SIGNAL/PARKING LAMP" .

LICENSE PLATE LAMP

Removal

1. Turn bulb socket counterclockwise to unlock bulb socket.
2. Pull bulb to remove from bulb socket.

Installation

Installation is in the reverse order of removal.

TAIL LAMP

Refer toLT-98, "REMOVAL"

Removal and Installation

EKS00HM8

FRONT PARKING LAMP

Refer to LT-25, "Removal and Installation" .

LICENSE PLATE LAMP

Removal

1. Disconnect license plate lamp harness.
2. Depress tab to remove license plate lamp from rear bumper.

Installation

Installation is in the reverse order of removal.

TAIL LAMP

Refer to LT-98, "Removal and Installation" .

When the lighting switch is turned from OFF to 1ST or 2ND position (or if auto light system is activated) after illumination lamps are turned off by the battery saver control, the illumination lamps illuminate again.
Exterior lamp battery saver control mode can be changed by the function setting of CONSULT-II.

CAN Communication System Description

EKS00BS6

Refer to LAN-4, "CAN Communication System" .

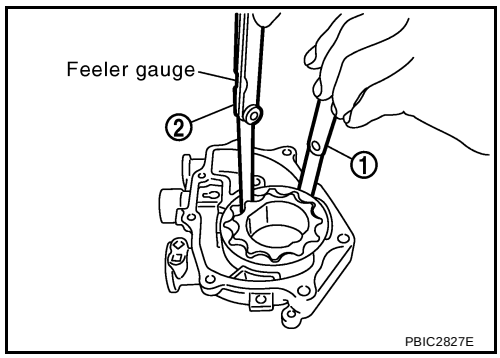
INSPECTION AFTER DISASSEMBLY

Oil Pump Clearance

- Measure the clearance with feeler gauge.
  - Clearance between oil pump outer rotor and oil pump body (position “1”)

    Standard : 0.120 - 0.195 mm (0.0047 - 0.0077 in)
  - Tip clearance between oil pump inner rotor and oil pump outer rotor (position “2”)

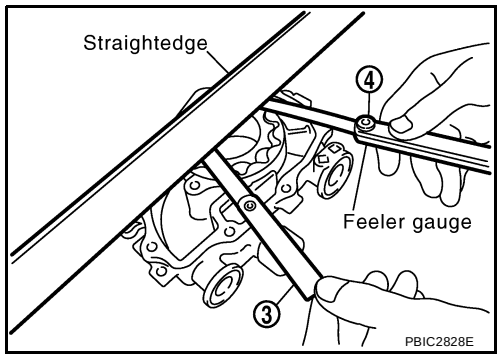
    Standard : 0.06 - 0.16 mm (0.0024 - 0.0063 in)



- Measure the clearance with feeler gauge and straightedge.
  - Side clearance between oil pump inner rotor and oil pump body (position “3”)

    Standard : 0.030 - 0.070 mm (0.0012 - 0.0028 in)
  - Side clearance between oil pump outer rotor and oil pump body (position “4”)

    Standard : 0.05 - 0.09 mm (0.0020 - 0.0035 in)



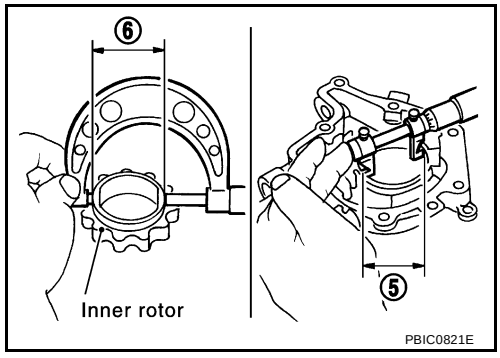
- Calculate the clearance between oil pump inner rotor and oil pump body as follows:

OIL PUMP BODY INNER DIAMETER

- Measure the inner diameter of oil pump body with inside micrometer. (position “5”)

OIL PUMP INNER ROTOR OUTER DIAMETER

- Measure the outer diameter of protruded portion of oil pump inner rotor with micrometer. (position “6”)



OIL PUMP INNER ROTOR TO OIL PUMP BODY CLEARANCE

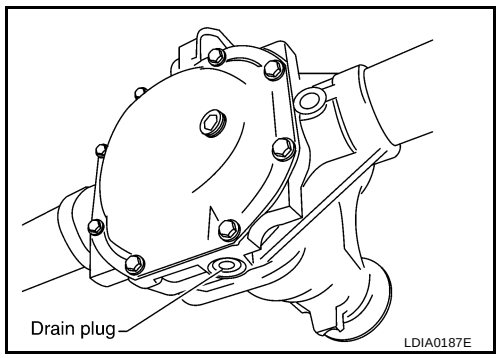
- (Clearance) = (Oil pump body inner diameter) – (Oil pump inner rotor outer diameter)

  Standard : 0.045 - 0.091 mm (0.0018 - 0.0036 in)

- If measured/calculated values are out of the standard, replace oil pump assembly.

2. Remove drain plug and drain gear oil.
3. Set a gasket on drain plug and install it to final drive assembly and tighten to the specified torque. Refer to RFD-15, "COMPONENTS" (C200), RFD-49, "COMPONENTS" (M226 without electronic locking differential), RFD-115, "COMPONENTS" (M226 with electronic locking differential).

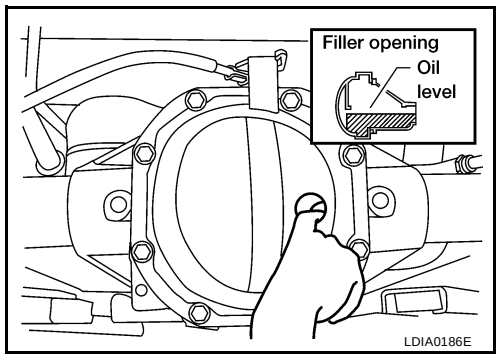
CAUTION:
Do not reuse gasket.



FILLING

1. Remove filler plug. Fill with new gear oil until oil level reaches the specified level near filler plug hole.

Oil grade and viscosity	**: Refer to MA-11, "Fluids and Lubricants" .**
Oil capacity	**: Refer to MA-11, "Fluids and Lubricants" .**



2. After refilling oil, check oil level. Apply sealant to filler plug. Install filler plug to final drive assembly and tighten to the specified torque. Refer to RFD-15, "COMPONENTS" (C200), RFD-49, "COMPONENTS" (M226 without electronic locking differential), RFD-115, "COMPONENTS" (M226 with electronic locking differential).

- **Use Genuine Silicone RTV or equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .**

Balancing Wheels

ELS001DW

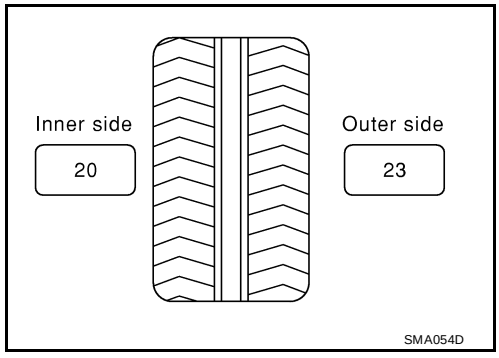
WHEEL BALANCE ADJUSTMENT

NOTE:
If a wheel balance machine has adhesion balance weight mode settings and drive-in weight mode setting, select and adjust a drive-in weight mode suitable for the wheels.

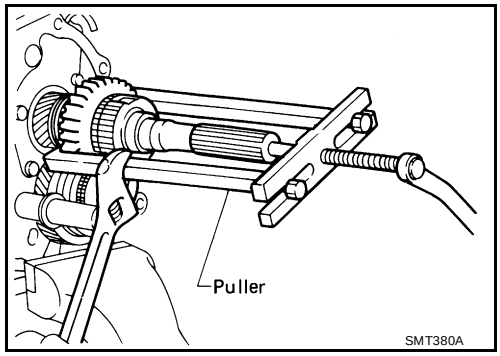
1. Set the wheel on the wheel balance machine using the center hole as a guide. Start the wheel balance machine.
2. When the inner and outer imbalance values are shown on the wheel balance machine indicator, multiply the outer imbalance value by 1.6 to determine the balance weight that should be used. Select the outer balance weight with a value closest to the calculated value and install it to the designated outer position of, or at the designated angle in relation to the road wheel.

CAUTION:
- **Do not install the inner balance weight before installing the outer balance weight.**
- **Before installing the balance weight, be sure to clean the mating surface of the wheel.**

Indicated imbalance value × 5/3 = balance weight to be installed
Calculation example:
23 g (0.81 oz) × 5/3 = 38.33 g (1.35 oz) = 40 g (1.41 oz) balance weight (closer to calculated balance weight value)
Note that balance weight value must be closer to the calculated balance weight value.
Example:
37.4 g = 35 g (1.23 oz)
37.5 g = 40 g (1.41 oz)

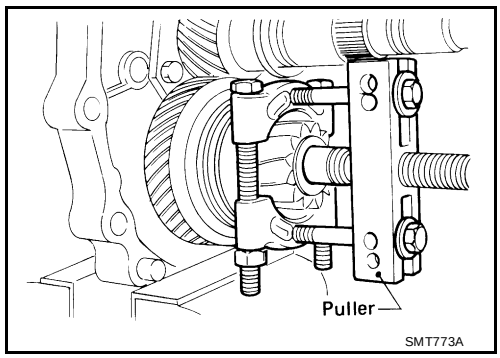


g. Remove reverse main gear together with mainshaft spacer and reverse synchronizer hub using suitable tool. Then remove reverse gear needle bearings.

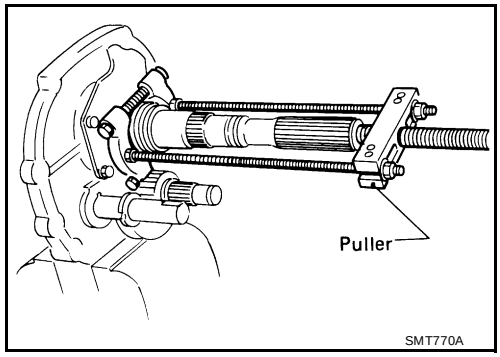


h. Remove reverse counter gear using suitable tool.

i. Remove OD coupling sleeve together with OD baulk ring, reverse baulk ring and spring inserts.



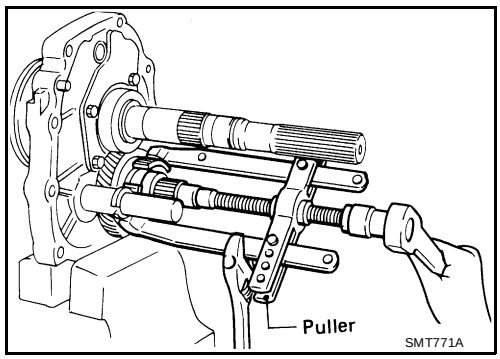
j. Remove reverse gear bushing using suitable tool.



k. Remove OD counter gear and reverse cone using suitable tool.

l. Remove OD gear needle bearing.

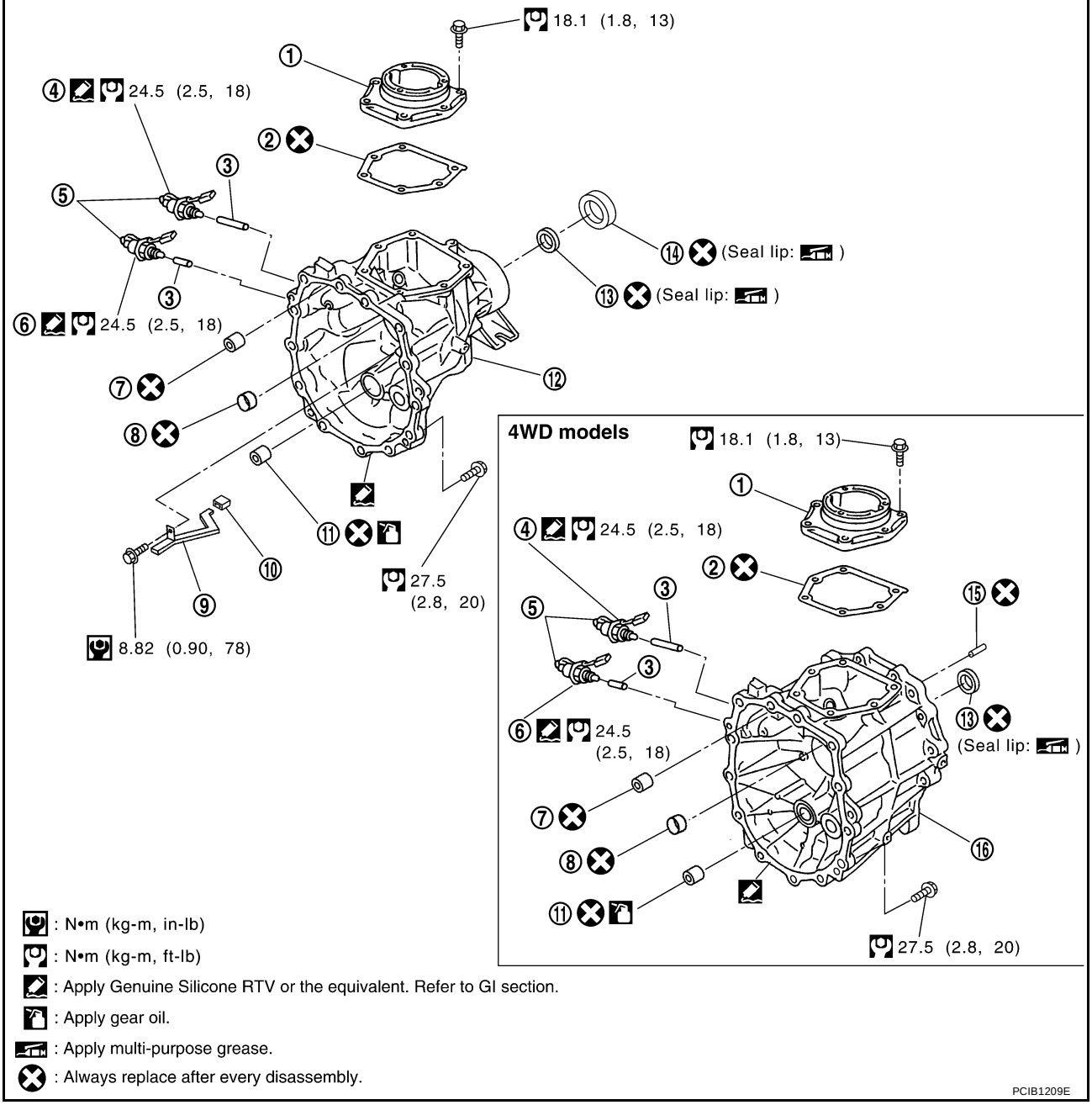
m. Remove reverse idler shaft.



3. Press out mainshaft, OD main gear, OD gear bushing and counter gear alternately using Tool.

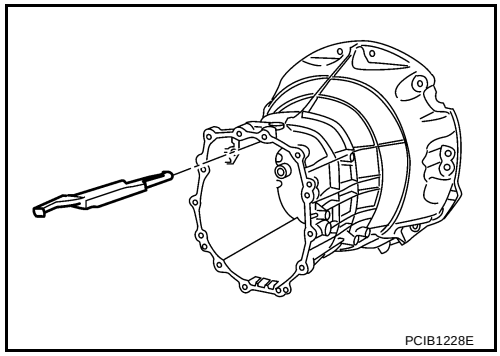
Tool number : ST33230000 (—)

SEC.321



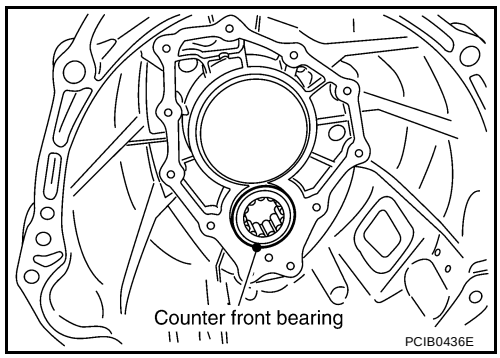
1. Control housing
2. Gasket
3. Plunger
4. Park/neutral position (PNP) switch
5. Clip
6. Back-up lamp switch
7. Sliding ball bearing
8. Bushing
9. Rear extension oil gutter
10. Cap
11. Counter end bearing
12. Rear extension
13. Rear oil seal
14. Dust seal
15. Dowel pin
16. OD gear case

3. Install oil gutter to transmission case.



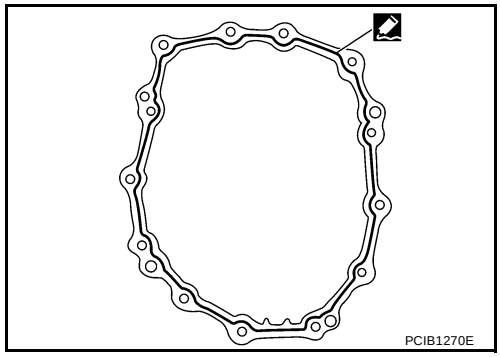
4. Install counter front bearing to transmission case.

CAUTION:
Apply multi-purpose grease to counter front bearing.

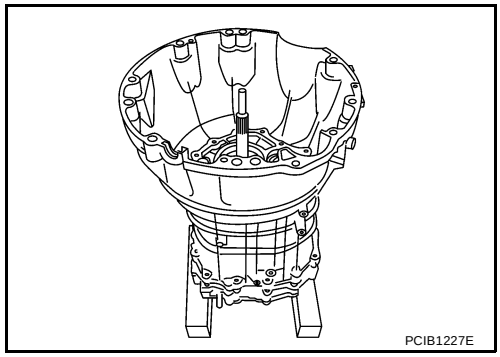


5. Apply recommended sealant to mating surface of transmission case as shown.
   - **Use Genuine Silicone RTV or the equivalent. Refer to GI-47, "Recommended Chemical Products and Sealants" .**

CAUTION:
Remove old sealant adhering to the mating surfaces. Also remove any moisture, oil, or foreign material adhering to both mating surfaces.

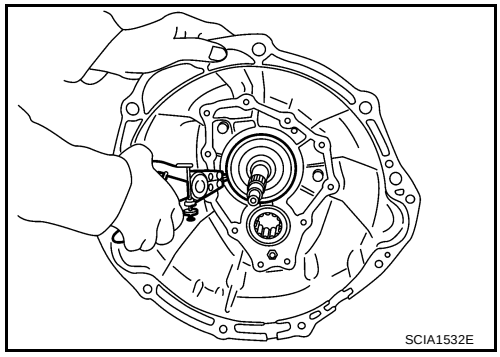


6. Install transmission case to adapter plate assembly.



7. Install snap ring to main drive gear bearing using suitable tool.

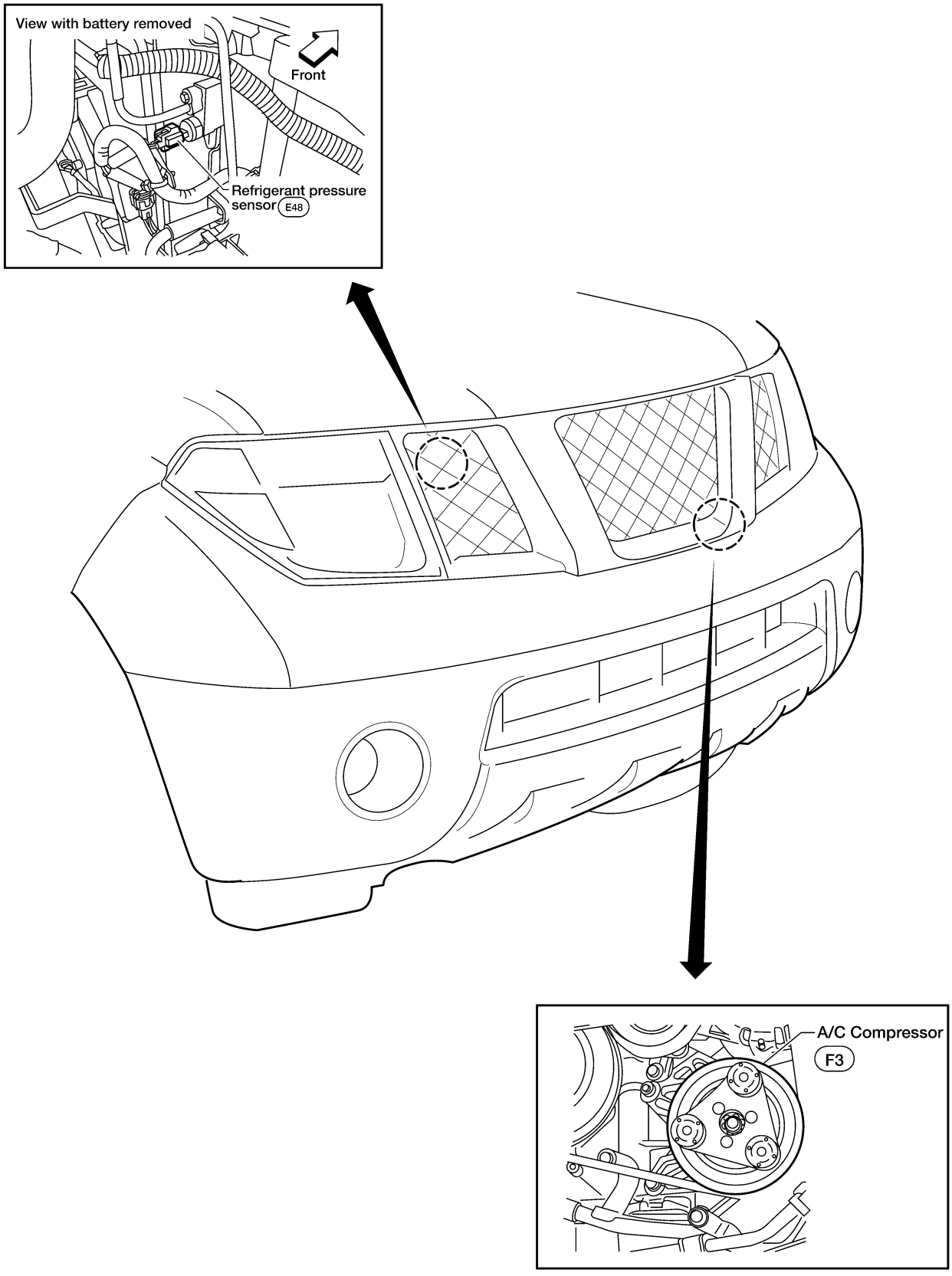
CAUTION:
Do not reuse snap ring.



Component Parts and Harness Connector Location

EJS003Q8

ENGINE COMPARTMENT



WJIA1489E

9. CHECK INTAKE SENSOR CIRCUITS

Check intake sensor. Refer to MTC-82, "Intake Sensor Circuit" .

OK or NG

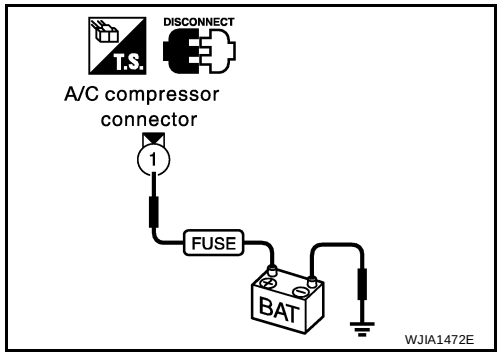
OK >> Replace BCM. Refer to BCS-25, "Removal and Installation" .
NG >> Replace intake sensor. Refer to MTC-85, "INTAKE SENSOR" .

10. CHECK MAGNET CLUTCH CIRCUIT

Check for operation sound when applying battery voltage to terminal.

OK or NG

OK >> GO TO 11.
NG >> Replace magnet clutch. Refer to MTC-104, "Removal and Installation for Compressor Clutch" .



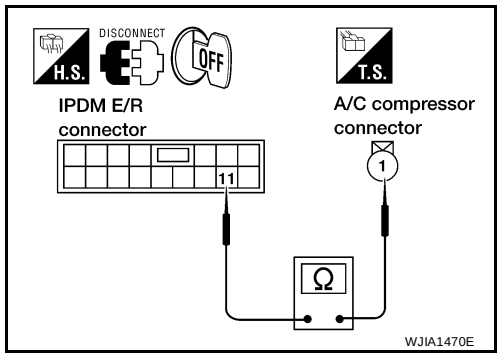
11. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND A/C COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and A/C compressor (magnet clutch) connector.
3. Check continuity between IPDM E/R harness connector E119 terminal 11 and A/C compressor harness connector F3 terminal 1.

11 – 1 : Continuity should exist.

OK or NG

OK >> Replace IPDM E/R. Refer to PG-32, "Removal and Installation of IPDM E/R" .
NG >> Repair harness or connector.



Refer to MTC-101, "Components" .

CAUTION:

- **Replace the O-ring of the low-pressure flexible A/C hose with a new one, then apply compressor oil to it for installation.**
- **After charging refrigerant, check for leaks.**

Removal and Installation for Low-pressure A/C Pipe

EJS003PG

REMOVAL

1. Discharge the refrigerant. Refer to MTC-99, "HFC-134a (R-134a) Service Procedure" .
2. Remove the low-pressure A/C pipe. Refer to MTC-101, "Components" .

   CAUTION:
   Cap or wrap the joint of the pipe with suitable material such as vinyl tape to avoid the entry of air.

INSTALLATION

Installation is in the reverse order of removal.
Refer to MTC-101, "Components" .

CAUTION:

- **Replace the O-ring of the low-pressure A/C pipe with a new one, then apply compressor oil to it for installation.**
- **After charging refrigerant, check for leaks.**

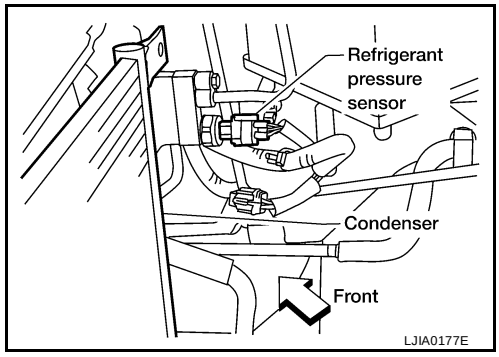
Removal and Installation for Refrigerant Pressure Sensor

EJS003PJ

REMOVAL

1. Discharge the refrigerant. Refer to MTC-99, "HFC-134a (R-134a) Service Procedure" .
2. Disconnect the refrigerant pressure sensor harness connector and remove the refrigerant pressure sensor from the condenser.

   CAUTION:
   Be careful not to damage the condenser fins.



INSTALLATION

Installation is in the reverse order of removal.
Refer to MTC-101, "Components" .

CAUTION:

- **Be careful not to damage the condenser fins.**
- **Replace the O-ring of the refrigerant pressure sensor with a new one, then apply compressor oil to it for installation.**
- **After charging refrigerant, check for leaks.**

Removal and Installation for Condenser

EJS003PK

REMOVAL

1. Discharge the refrigerant. Refer to MTC-99, "HFC-134a (R-134a) Service Procedure" .
2. Remove the radiator. Refer to CO-15, "RADIATOR" (QR), CO-42, "RADIATOR" (VQ).

   CAUTION:
   Be careful not to damage the core surface of the condenser and the radiator.
3. Disconnect the high-pressure flexible A/C hose and the high-pressure A/C pipe from the condenser.

   CAUTION:
   Cap or wrap the joint of the pipes with suitable material such as vinyl tape to avoid the entry of air.

DATA MONITOR

All Signals, Main Signals, Selection From Menu

Item name	CONSULT-II screen display	Display or unit	Monitor item selection			Description
			ALL SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
Motor fan request	MOTOR FAN REQ	1/2/3/4	X	X	X	Signal status input from ECM
Compressor request	AC COMP REQ	ON/OFF	X	X	X	Signal status input from BCM
Parking, license plate, and tail lamp request	TAIL & CLR REQ	ON/OFF	X	X	X	Signal status input from BCM
Headlamp low beam request	HL LO REQ	ON/OFF	X	X	X	Signal status input from BCM
Headlamp high beam request	HL HI REQ	ON/OFF	X	X	X	Signal status input from BCM
Front fog lamps request	FR FOG REQ	ON/OFF	X	X	X	Signal status input from BCM
Front wiper request	FR WIP REQ	STOP/1LO/LO/HI	X	X	X	Signal status input from BCM
Wiper auto stop	WIP AUTO STOP	ACT P/STOP P	X	X	X	Output status of IPDM E/R
Wiper protection	WIP PROT	OFF/LS/HS/ BLOCK	X	X	X	Control status of IPDM E/R
Starter request	ST RLY REQ	ON/OFF	X		X	Signal status input from BCM
Ignition relay status	IGN RLY	ON/OFF	X	X	X	Ignition relay status monitored with IPDM E/R
Rear defogger request	RR DEF REQ	ON/OFF	X	X	X	Signal status input from BCM
Hood switch	HOOD SW (*1)	OFF	X			Signal status input from IPDM E/R
Theft warning horn request	THFT HRN REQ	ON/OFF	X		X	Signal status input from BCM
Horn chirp	HORN CHIRP	ON/OFF	X		X	Output status of IPDM E/R
Daytime lights request	DTRL REQ	ON/OFF	X		X	Signal status input from BCM
Oil pressure switch	OIL P SW	OPEN/CLOSE	X		X	Signal status input from IPDM E/R

NOTE:

- Perform monitoring of IPDM E/R data with the ignition switch ON. When the ignition switch is in ACC position, display may not be correct.
- (*1) This item is displayed, but does not function.

CAN DIAG SUPPORT MNTR

Refer to LAN-4, "SYSTEM DESCRIPTION" .

ACTIVE TEST

Display Item List

Test name	CONSULT-II screen display	Description
Rear defogger output	REAR DEFOGGER	With a certain ON-OFF operation, the rear defogger relay can be operated.
Front wiper (HI, LO) output	FRONT WIPER	With a certain operation (OFF, HI ON, LO ON), the front wiper relay (Lo, Hi) can be operated.

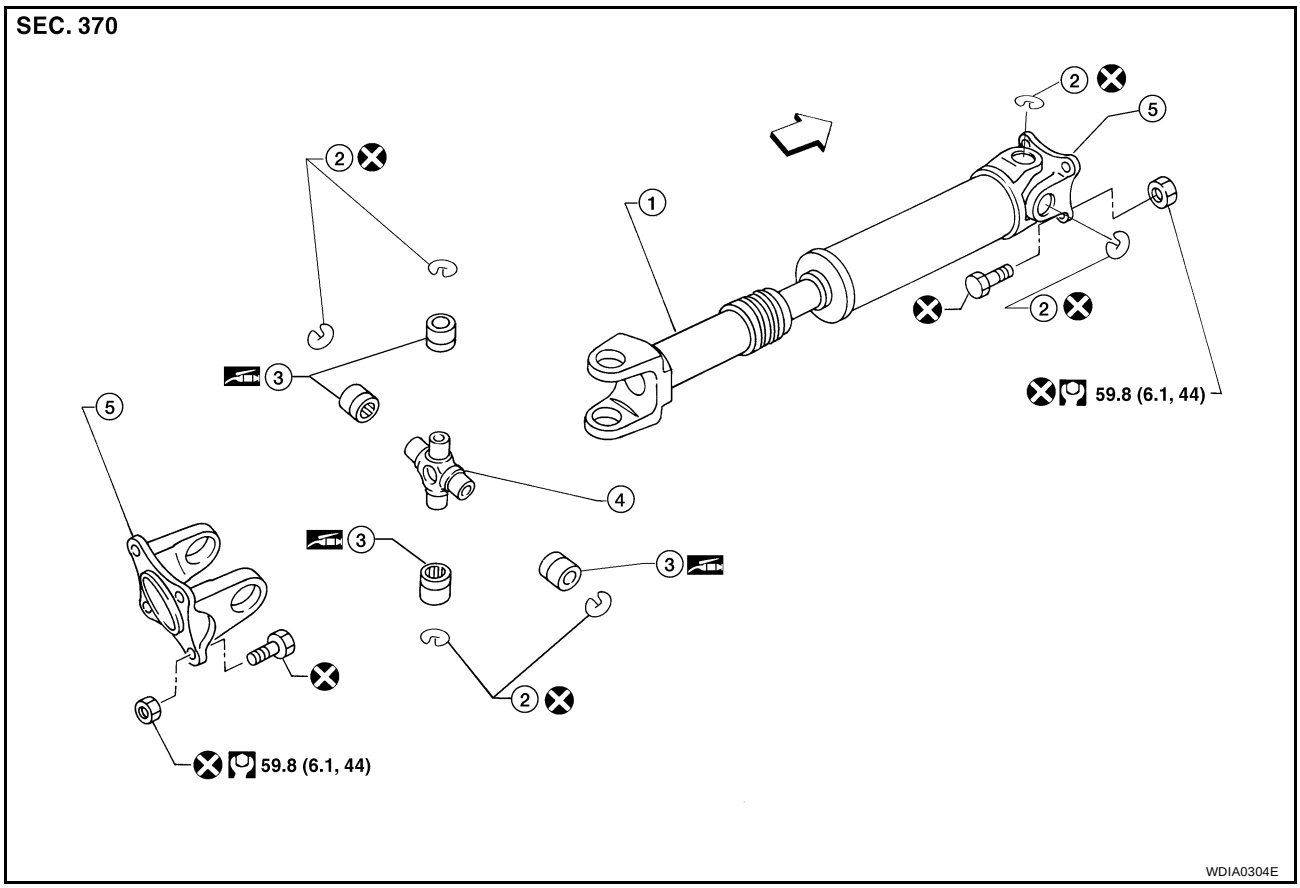
G2	C1	SMJ	: To E41	A4	C125	GR/6	: To C51
D3	C5	GR/5	: Fuel level sensor unit and fuel pump	B5	C126	B/7	: Trailer (7-pin)
C3	C6	B/2	: EVAP canister vent control valve	B5	C126	B/4	: Trailer (4-pin)
C3	C7	GR/3	: EVAP control system pressure sensor	A4	C150	B/2	: To C52
D4	C10	GR/2	: Rear wheel sensor RH	Tail lamp sub-harness			
C3	C11	GR/2	: Rear wheel sensor LH	A3	C200	GR/8	: To C15
B4	C14	GR/4	: To C115	A3	C201	BR/3	: Rear combination lamp LH (tail/stop)
B4	C15	GR/8	: To C200	C4	C202	BR/3	: Rear combination lamp RH (tail/stop)
B4	C51	GR/6	: To C125	A4	C203	GR/2	: License plate lamp LH
A4	C52	B/2	: To C150	B5	C204	GR/2	: License plate lamp RH
Differential lock sub-harness				A4	C205	GR/2	: Rear combination lamp LH (back-up)
B4	C115	GR/4	: To C14	C5	C206	GR/2	: Rear combination lamp RH (back-up)
D4	C116	GR/2	: Differential lock position switch	A3	C207	GR/2	: Rear combination lamp LH (turn signal)
D4	C117	B/2	: Differential lock solenoid	C4	C208	GR/2	: Rear combination lamp RH (turn signal)
Trailer sub-harness							

Removal and Installation

EDS0023C

COMPONENTS

Model 2F1310



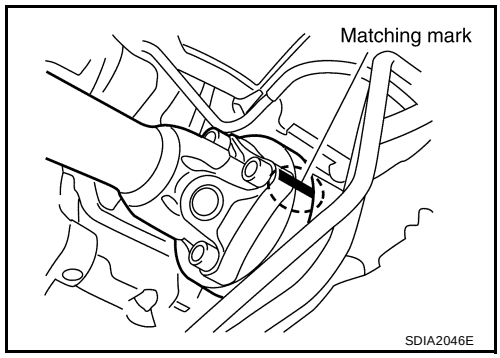
1. Propeller shaft tube
2. Snap ring
3. Journal bearing
4. Journal
5. Flange yoke
⇐: Front

REMOVAL

1. Remove the undercover using power tool.
2. Put matching marks on the front propeller shaft flange yoke and the front final drive companion flange as shown.

   CAUTION:
   For matching marks, use paint. Never damage the flange yoke and companion flange of the front final drive.
3. Put matching marks on the front propeller shaft flange yoke and the transfer companion flange.

   CAUTION:
   For matching marks, use paint. Never damage the flange yoke and companion flange of the front final drive.
4. Remove the bolts and then remove the front propeller shaft from the front final drive and transfer.



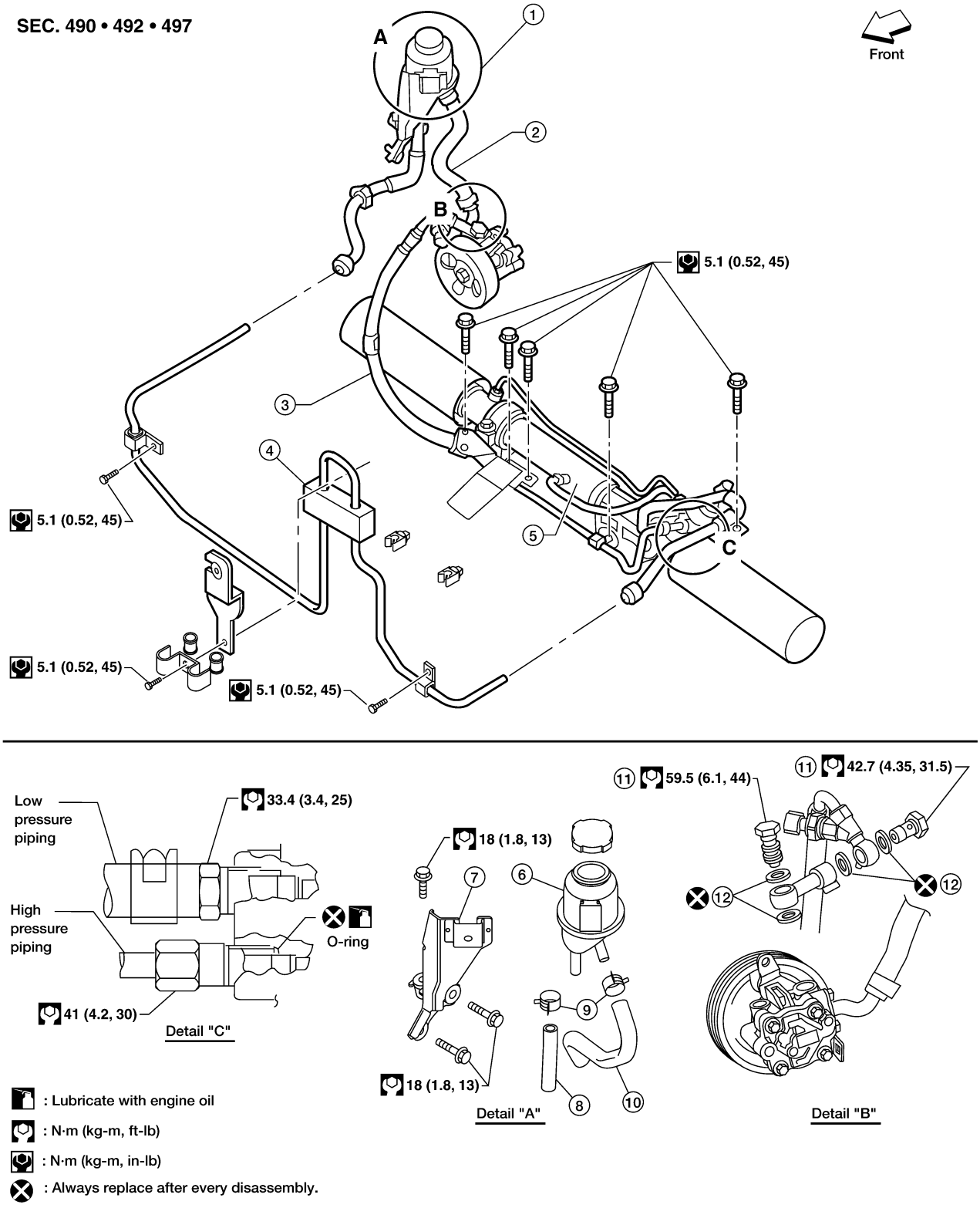
HYDRAULIC LINE

PFP:49721

Removal and Installation

EGS000VA

Refer to the following illustration for hydraulic line removal and installation.



1. Reservoir tank
2. Suction hose
3. High pressure hose
4. Oil cooler
5. Steering gear assembly
6. Reservoir tank

SQUEAK & RATTLE DIAGNOSTIC WORKSHEET - page 2

Briefly describe the location where the noise occurs:

_____

_____

II. WHEN DOES IT OCCUR? (please check the boxes that apply)

- ☐ Anytime
- ☐ 1st time in the morning
- ☐ Only when it is cold outside
- ☐ Only when it is hot outside
- ☐ After sitting out in the rain
- ☐ When it is raining or wet
- ☐ Dry or dusty conditions
- ☐ Other:

III. WHEN DRIVING:

- ☐ Through driveways
- ☐ Over rough roads
- ☐ Over speed bumps
- ☐ Only about ____ mph
- ☐ On acceleration
- ☐ Coming to a stop
- ☐ On turns: left, right or either (circle)
- ☐ With passengers or cargo
- ☐ Other: _____
- ☐ After driving _____ miles or _____ minutes

IV. WHAT TYPE OF NOISE

- ☐ Squeak (like tennis shoes on a clean floor)
- ☐ Creak (like walking on an old wooden floor)
- ☐ Rattle (like shaking a baby rattle)
- ☐ Knock (like a knock at the door)
- ☐ Tick (like a clock second hand)
- ☐ Thump (heavy muffled knock noise)
- ☐ Buzz (like a bumble bee)

TO BE COMPLETED BY DEALERSHIP PERSONNEL

Test Drive Notes:

_____

_____

_____

	YES	NO	Initials of person performing
Vehicle test driven with customer	☐	☐	_____
- Noise verified on test drive	☐	☐	_____
- Noise source located and repaired	☐	☐	_____
- Follow up test drive performed to confirm repair	☐	☐	_____

VIN: _____ Customer Name _____

W.O.# _____ Date: _____

This form must be attached to Work Order

LAIA0071E

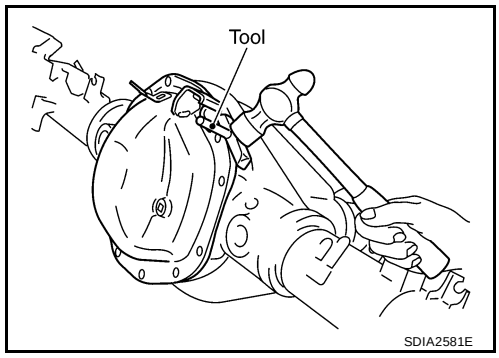
DISASSEMBLY

Differential Assembly

1. Remove carrier cover bolts.
2. Remove carrier cover using Tool.

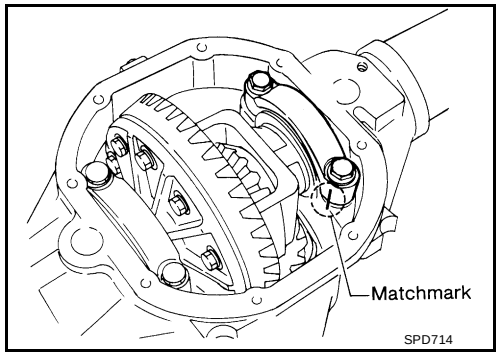
   Tool number : KV10111100 (J-37228)

   CAUTION:
   - **Do not damage the mating surface.**
   - **Do not insert flat-bladed screwdriver, this will damage the mating surface.**

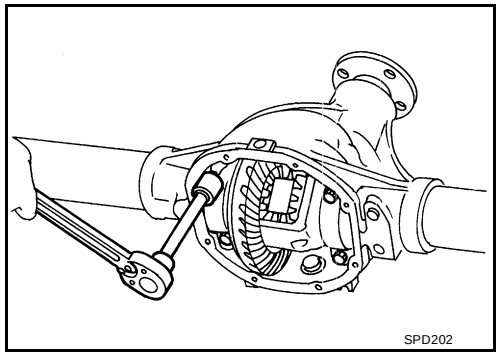


3. For proper reinstallation, paint matching marks on one side of side bearing cap.

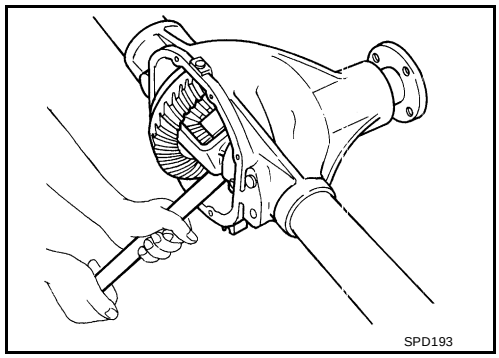
   CAUTION:
   - **Side bearing caps are line-board for initial assembly. The matching marks are used to reinstall them in their original positions.**
   - **For matching mark, use paint. Do not damage side bearing cap.**



4. Remove side bearing caps.

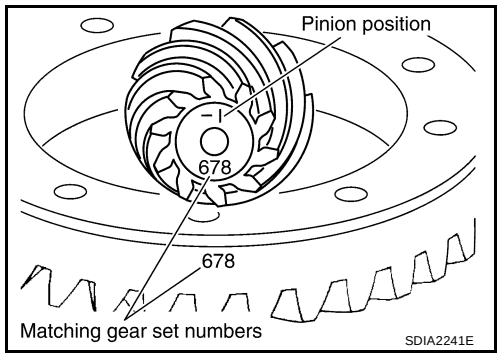


5. Remove differential case assembly using suitable tool.



Drive Pinion Height Adjusting Washer

- Drive gear and drive pinion are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new gear set is being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.



- The mounting distance from the center line of drive gear to the back face of drive pinion for the Model 226 final drive assembly is 109.5 mm (4.312 in).
  On the button end of each drive pinion, there is etched a plus (+) number, a minus (-) number, or a zero (0), which indicates the best running position for each particular gear set. This dimension is controlled by a selective drive pinion height adjusting washer between drive pinion inner bearing race and drive pinion.
  For example: If a drive pinion is etched m+8 (+3), it would require 0.08 mm (0.003 in) less drive pinion height adjusting washer than a drive pinion etched “0”. This means decreasing drive pinion height adjusting washer thickness; increases the mounting distance of drive pinion to 109.6 mm (4.315 in). If a drive pinion is etched m-8 (-3), it would require adding 0.08 mm (0.003 in) more to drive pinion height adjusting washer than would be required if drive pinion were etched “0”. By adding 0.08 mm (0.003 in), the mounting distance of drive pinion was decreased to 109.4 mm (4.309 in) which is just what m-8 (a-3) etching indicated.
- To change drive pinion adjustment, use different drive pinion height adjusting washers which come in different thickness.
- Use the following tables as a guide for selecting the correct drive pinion height adjusting washer thickness to add or subtract from the old drive pinion height adjusting washer.

OLD DRIVE PINION MARKING	NEW DRIVE PINION MARKING mm (in)								
	-10 (-4)	-8 (-3)	-5 (-2)	-3 (-1)	0 (0)	+3 (+1)	+5 (+2)	+8 (+3)	+10 (+4)
+10 (+4)	+0.20 (+0.008)	+0.18 (+0.007)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)
+8 (+3)	+0.18 (+0.007)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)
+5 (+2)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)
+3 (+1)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)
0 (0)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)
-3 (-1)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)
-5 (-2)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)
-8 (-3)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)	-0.18 (-0.007)
-10 (-4)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)	-0.18 (-0.007)	-0.20 (-0.008)

5. CHECK DIFFERENTIAL LOCK CONTROL UNIT

Check differential lock control unit input/output signal. Refer to RFD-85, "Differential Lock Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 6.
NG >> Check differential lock control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

6. CHECK DTC

Perform the self-diagnosis, after driving the vehicle for a while.

OK or NG

OK >> Inspection End.
NG >> Replace differential lock control unit. Refer to RFD-110, "DIFFERENTIAL LOCK CONTROL UNIT" .

Differential Lock Solenoid Relay

EDS0027T

DIAGNOSTIC PROCEDURE

1. CHECK DIFFERENTIAL LOCK SOLENOID SYSTEM

Perform self-diagnosis. Refer to RFD-88, "SELF-DIAG RESULTS MODE" .

Is “RELAY [P1844]” displayed?

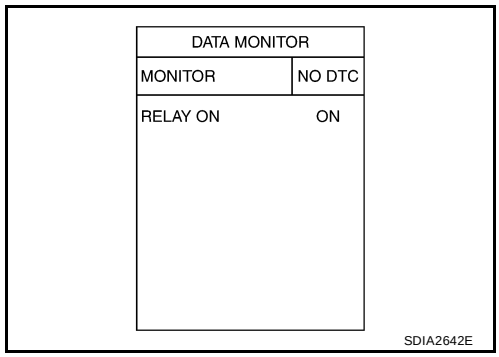
YES >> Perform trouble diagnosis for differential lock solenoid. Refer to RFD-99, "Differential Lock Solenoid" .
NO >> GO TO 2.

2. CHECK DIFFERENTIAL LOCK SOLENOID RELAY SIGNAL

With CONSULT-II

1. Start engine.
2. Select “DATA MONITOR” mode for “DIFF LOCK” with CONSULT-II.
3. Read out ON/OFF switching action of “RELAY ON”.

Monitor item	Condition		Display value
RELAY ON	● Vehicle stopped ● Engine running ● VDC OFF switch (if equipped): ON ● 4WD shift switch: 4LO	Differential lock mode switch: ON	ON
		Differential lock mode switch: OFF	OFF



OK or NG

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

3. CHECK DIFFERENTIAL LOCK CONTROL UNIT

Check differential lock control unit input/output signal. Refer to RFD-85, "Differential Lock Control Unit Input/Output Signal Reference Values" .

OK or NG

OK >> GO TO 4.
NG >> Check differential lock control unit pin terminals for damage or loose connection with harness connector. If any item is damaged, repair or replace damaged parts.

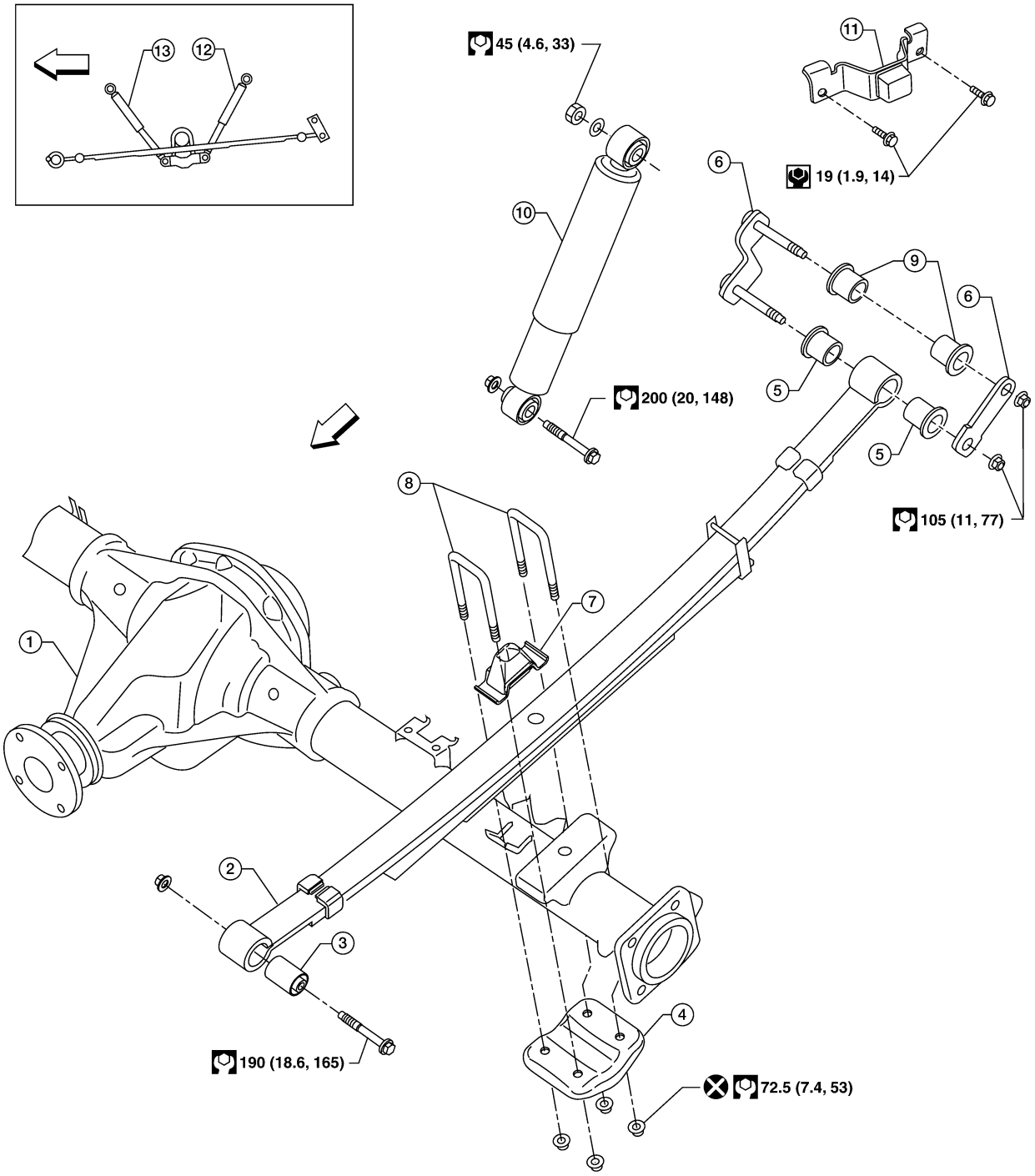
REAR SUSPENSION ASSEMBLY

PFP:55020

Components

EES001KU

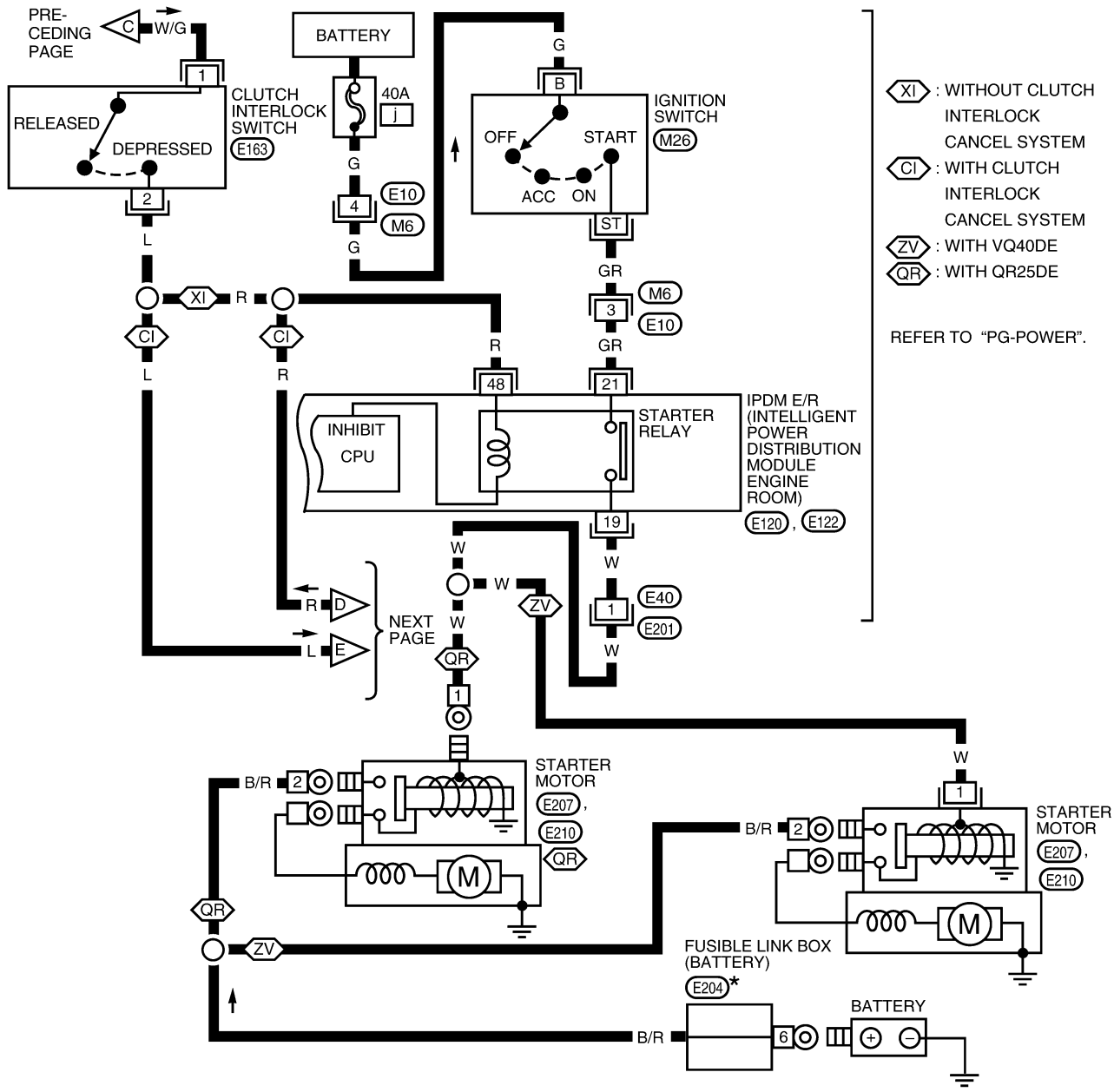
SEC. 431

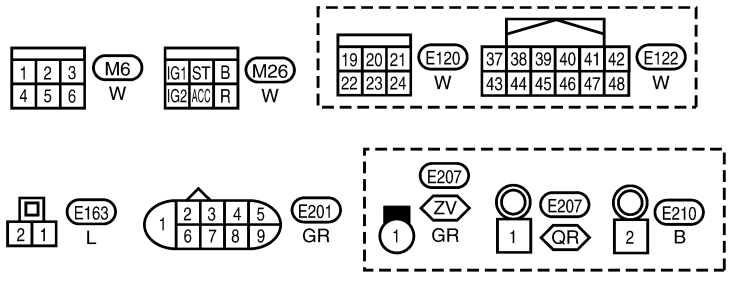


WEIA0203E

1. Rear final drive
2. Rear leaf spring
3. Rear spring bushing (front)
4. Rear spring pad
5. Rear spring bushing (rear)
6. Rear spring shackle
7. Bumper
8. Rear spring clip U-bolts
9. Rear spring shackle bushing

SC-START-04

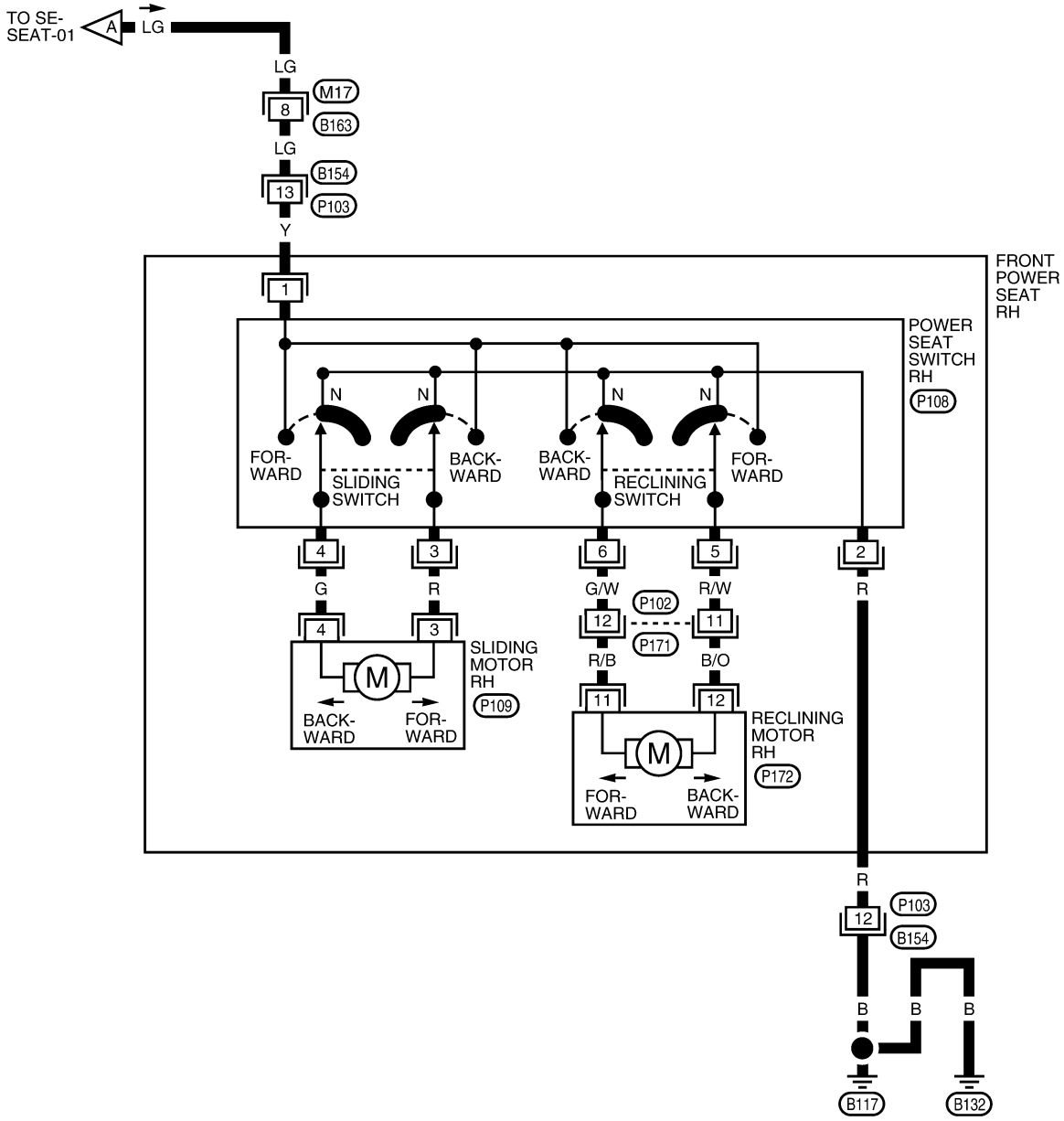


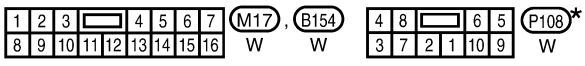


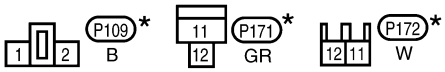
*: E204 IS AN INTEGRAL PART OF FUSIBLE LINK BOX (BATTERY) ASSEMBLY.

WKWA5409E

SE-SEAT-03

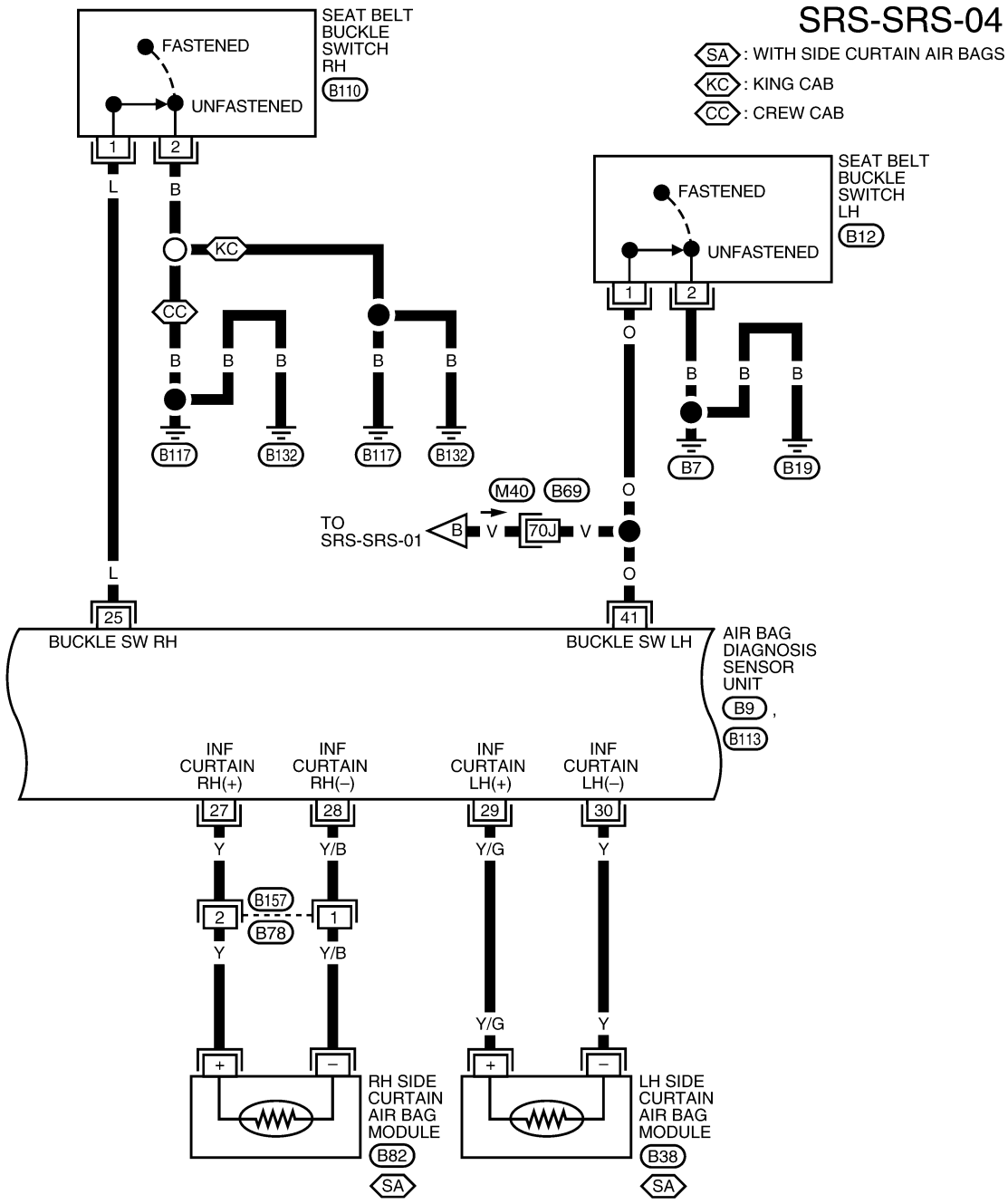


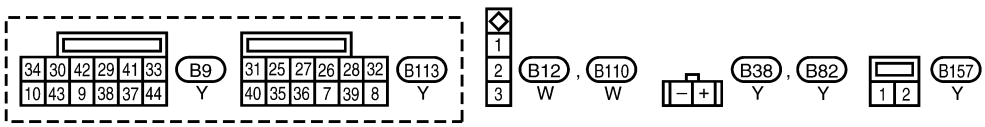




*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT" OF PG SECTION.

WIWA0930E


SRS-SRS-04
SA : WITH SIDE CURTAIN AIR BAGS
KC : KING CAB
CC : CREW CAB
SEAT BELT BUCKLE SWITCH RH
B110
FASTENED
UNFASTENED
SEAT BELT BUCKLE SWITCH LH
B12
B117
B132
B7
B19
M40
B69
70J
TO SRS-SRS-01
25
41
BUCKLE SW RH
BUCKLE SW LH
AIR BAG DIAGNOSIS SENSOR UNIT
B9
B113
INF CURTAIN RH(+)
INF CURTAIN RH(–)
INF CURTAIN LH(+)
INF CURTAIN LH(–)
27
28
29
30
B157
B78
RH SIDE CURTAIN AIR BAG MODULE
LH SIDE CURTAIN AIR BAG MODULE
B82
B38
SA


B9
B113
B12
B110
B38
B82
B157

WHWA0316E

SRS INSPECTION (FOR SIDE AND ROLLOVER COLLISION)

Part	SRS is activated	SRS is NOT activated
LH side curtain air bag module	If the LH side curtain air bag has deployed: REPLACE the LH side curtain air bag module. (Repair the center pillar inner, etc. before installing new one if damaged.)	If the LH side curtain air bag has NOT deployed: 1. Check for visible signs of damage (dents, tears, deformation) of the center pillar on the collision side. 2. If damaged—Remove the LH side curtain air bag module. 3. Check for visible signs of damaged (tears etc.) of the LH side curtain air bag module. 4. Check harness and connectors for damage, and terminals for deformities. 5. If no damage is found, reinstall the LH side curtain air bag module with new fasteners. 6. If damaged—REPLACE the LH side curtain air bag module with new fasteners.
RH side curtain air bag module	If the RH side curtain air bag has deployed: REPLACE the RH side curtain air bag module. (Repair the center pillar inner, etc. before installing new one if damaged.)	If the RH side curtain air bag has NOT deployed: 1. Check for visible signs of damage (dents, tears, deformation) of the center pillar on the collision side. 2. If damaged—Remove the RH side curtain air bag module. 3. Check for visible signs of damaged (tears etc.) of the RH side curtain air bag module. 4. Check harness and connectors for damage, and terminals for deformities. 5. If no damage is found, reinstall the RH side curtain air bag module with new fasteners. 6. If damaged—REPLACE the RH side curtain air bag module with new fasteners.
Front LH side air bag module	If the front LH side air bag has deployed: REPLACE front LH seatback assembly.	If the front LH side air bag has NOT deployed: 1. Check for visible signs of damage (dents, tears, deformation) of the seat back on the collision side. 2. Check harness and connectors for damage, and terminals for deformities. 3. If damaged—REPLACE the front LH seatback assembly.
Front RH side air bag module	If the front RH side air bag has deployed: REPLACE front RH seatback assembly.	If the front RH side air bag has NOT deployed: 1. Check for visible signs of damage (dents, tears, deformation) of the seat back on the collision side. 2. Check harness and connectors for damage, and terminals for deformities. 3. If damaged—REPLACE the front RH seatback assembly.
(LH or RH) side air bag (satellite) sensor	If any of the SRS components have deployed: REPLACE the side air bag (satellite) sensor on the collision side with new fasteners. (Repair the center pillar inner, etc. before installing new one if damaged.)	If none of the SRS components have been activated: 1. Remove the side air bag (satellite) sensor on the collision side. Check harness connectors for damage, terminals for deformities, and harness for binding. 2. Check for visible signs of damage (dents, cracks, deformation) of the side air bag (satellite) sensor. 3. Install the side air bag (satellite) sensor to check fit. 4. If no damage is found, reinstall the side sir bag (satellite) sensor with new fasteners. 5. If damaged—REPLACE the side air bag (satellite) sensor with new fasteners.
Diagnosis sensor unit	If any of the SRS components have deployed: REPLACE the diagnosis sensor unit with new fasteners.	If none of the SRS components have been activated: 1. Check case and bracket for dents, cracks or deformities. 2. Check connectors for damage, and terminals for deformities. 3. If no damage is found, reinstall the diagnosis sensor unit with new fasteners. 4. If damaged—REPLACE the diagnosis sensor unit with new fasteners.

Monitored item [Unit]	Content	Condition		Display value
2WD SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 2WD		ON
		4WD shift switch: 4H and 4LO		OFF
4H SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 4H		ON
		4WD shift switch: 2WD and 4LO		OFF
4L SWITCH [ON/OFF]	Input condition from 4WD shift switch	4WD shift switch: 4LO		ON
		4WD shift switch: 2WD and 4H		OFF
4L POSI SW [ON/OFF]	Condition of 4LO switch	● Vehicle stopped ● Engine running ● For A/T models, A/T selector lever “N” position with brake pedal depressed. ● For M/T models, M/T shift lever neutral position with clutch and brake pedal depressed.	4WD shift switch: 4LO	ON
			Except the above	OFF
ATP SWITCH [ON/OFF]	Condition of ATP switch	● Vehicle stopped ● Engine running ● A/T selector lever “N” position with brake pedal depressed.	4WD shift switch : 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	ON
			Except the above	OFF
WAIT DETCT SW [ON/OFF]	Condition of wait detection switch	● Vehicle stopped ● Engine running ● For A/T models, A/T selector lever “N” position with brake pedal depressed. ● For M/T models, M/T shift lever neutral position with clutch and brake pedal depressed.	4WD shift switch : 4H and 4LO	ON
			4WD shift switch: 2WD	OFF
4WD MODE [2H/4H/4L]	Control status of 4WD (Output condition of 4WD shift indicator lamp and 4LO indicator lamp)	4WD shift switch (Engine running)	2WD	2H
			4H	4H
			4LO	4L
VHCL/S COMP [km/h] or [mph]	Vehicle speed	Vehicle stopped		0 km/h (0 mph)
		Vehicle running **CAUTION:** **Check air pressure of tires under standard condition.**		Approximately equal to the indication on speedometer (Inside of ±10%)
SHIFT ACT 1 [ON/OFF]	Output condition to actuator motor (clockwise)	● Vehicle stopped ● Engine running ● For A/T models, A/T selector lever “N” position with brake pedal depressed. ● For M/T models, M/T shift lever neutral position with clutch and brake pedal depressed.	4WD shift switch : 2WD to 4H or 4H to 4LO or 2WD to 4LO	ON
			Except the above	OFF

Actuator Position Switch

EDS002PU

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

Data are reference value.

Monitored item [Unit]	Content	Condition		Display value
SHIFT POS SW1 [ON/OFF]	Condition of actuator position switch 1	● Vehicle stopped ● Engine running ● For A/T models, A/T selector lever “N” position with brake pedal depressed. ● For M/T models, M/T shift lever neutral position with clutch and brake pedal depressed.	4WD shift switch: 2WD and 4LO	ON
			4WD shift switch: 4H	OFF
SHIFT POS SW2 [ON/OFF]	Condition of actuator position switch 2		4WD shift switch: 4LO	ON
			4WD shift switch: 2WD and 4H	OFF
SHIFT POS SW3 [ON/OFF]	Condition of actuator position switch 3		4WD shift switch: 2WD and 4H	ON
			4WD shift switch: 4LO	OFF
SHIFT POS SW4 [ON/OFF]	Condition of actuator position switch 4		4WD shift switch: 4H and 4LO	ON
			4WD shift switch: 2WD	OFF

TRANSFER CONTROL UNIT TERMINALS AND REFERENCE VALUE

Data are reference value and are measured between each terminal and ground.

Terminal	Wire color	Item	Condition		Data (Approx.)
10	LG	Actuator position switch 1	● Vehicle stopped ● Engine running ● For A/T models, A/T selector lever “N” position with brake pedal depressed. ● For M/T models, M/T shift lever neutral position with clutch and brake pedal depressed.	4WD shift switch: 2WD and 4LO	0V
				4WD shift switch: 4H	Battery voltage
11	W	Actuator position switch 2		4WD shift switch: 4LO	0V
				4WD shift switch: 2WD and 4H	Battery voltage
12	BR	Actuator position switch 3		4WD shift switch: 2WD and 4H	0V
				4WD shift switch: 4LO	Battery voltage
13	L	Actuator position switch 4		4WD shift switch: 4H and 4LO	0V
				4WD shift switch: 2WD	Battery voltage

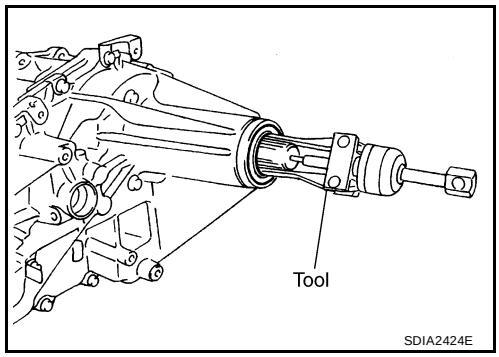
CAUTION:

When using a circuit tester to measure voltage for inspection, be sure not to extend forcibly any connector terminals.

12. Remove the rear oil seal from the rear case, using Tool.

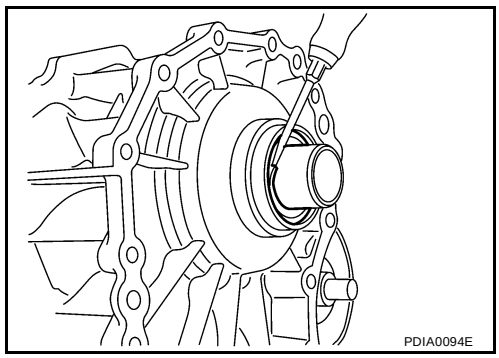
CAUTION:
Do not damage rear case or mainshaft.

Tool number : ST33290001 (J-34286)

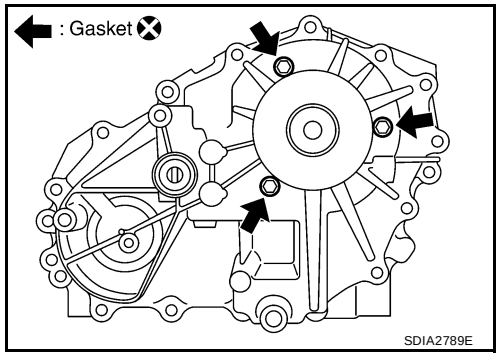


13. Remove the input oil seal from the front case, using suitable tool.

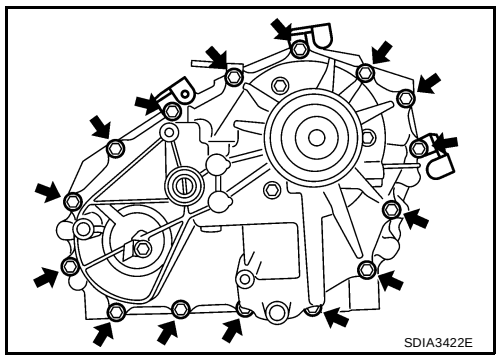
CAUTION:
Do not damage front case, sun gear or input bearing.



14. Remove the retainer bolts and gaskets.



15. Remove the rear case bolts, harness bracket and air breather hose clamp from the rear case.



16. Separate the front case from the rear case. Then remove the rear case by prying it up, using suitable tool.

CAUTION:
Do not damage the mating surface.

17. Remove the spacer from the control shift rod (A/T models only).

CAUTION:
Do not drop spacer.