For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.
For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.
If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.
   NOTE:
   Supply power using jumper cables if battery is discharged.
2. Use the Intelligent Key or mechanical key to turn the ignition switch to the ACC position. At this time, the steering lock will be released.
3. Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
4. Perform the necessary repair operation.
5. When the repair work is completed, return the ignition switch to the LOCK position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
6. Perform a self-diagnosis check of all control units using CONSULT.

Precautions For Xenon Headlamp Service

INFOID:0000000006226142

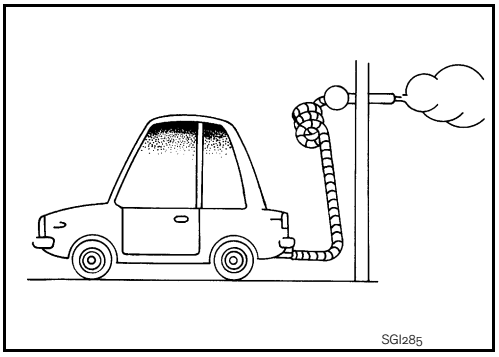
WARNING:
Comply with the following warnings to prevent any serious accident.
- **Disconnect the battery cable (negative terminal) or the power supply fuse before installing, removing, or touching the xenon headlamp (bulb included). The xenon headlamp contains high-voltage generated parts.**
- **Never work with wet hands.**
- **Check the xenon headlamp ON-OFF status after assembling it to the vehicle. Never turn the xenon headlamp ON in other conditions. Connect the power supply to the vehicle-side connector. (Turning it ON outside the lamp case may cause fire or visual impairments.)**
- **Never touch the bulb glass immediately after turning it OFF. It is extremely hot.**

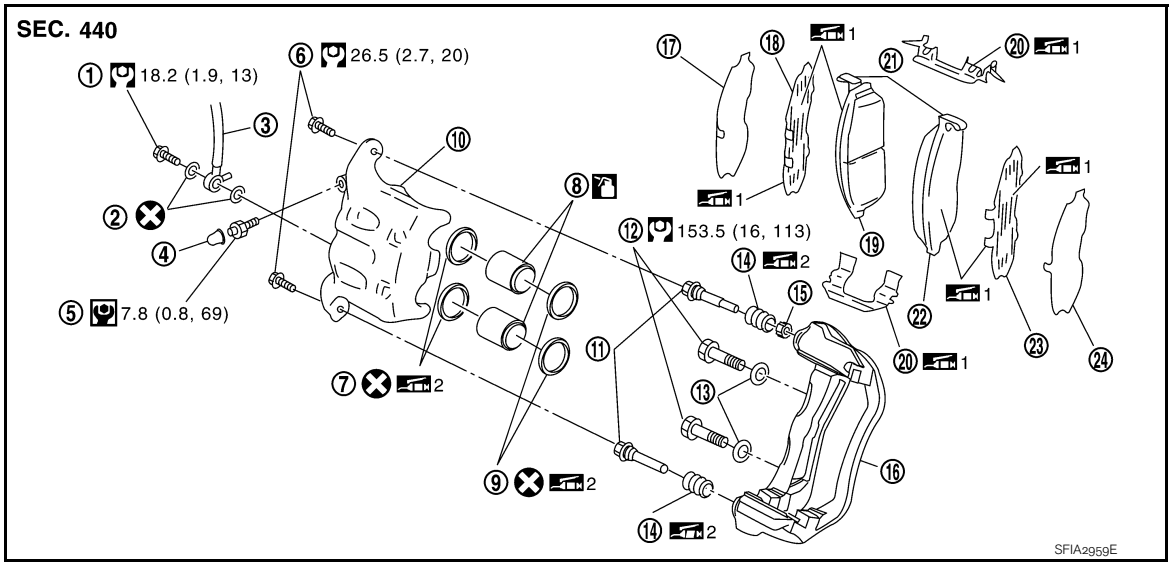
CAUTION:
Comply with the following cautions to prevent any error and malfunction.
- **Install the xenon bulb securely. (Insufficient bulb socket installation may melt the bulb, the connector, the housing, etc. by high-voltage leakage or corona discharge.)**
- **Never perform HID circuit inspection with a tester.**
- **Never touch the xenon bulb glass with hands. Never put oil and grease on it.**
- **Dispose of the used xenon bulb after packing it in thick vinyl without breaking it.**
- **Never wipe out dirt and contamination with organic solvent (thinner, gasoline, etc.).**

General Precaution

INFOID:0000000005418015

- Do not operate the engine for an extended period of time without proper exhaust ventilation.
  Keep the work area well ventilated and free of any inflammable materials. Special care should be taken when handling any inflammable or poisonous materials, such as gasoline, refrigerant gas, etc. When working in a pit or other enclosed area, be sure to properly ventilate the area before working with hazardous materials.
  Do not smoke while working on the vehicle.


SGI285



1. Union bolt
2. Copper washer
3. Brake hose
4. Cap
5. Bleed valve
6. Sliding pin bolt
7. Piston seal
8. Piston
9. Piston boot
10. Cylinder body
11. Sliding pin
12. Torque member mounting bolt
13. Washer
14. Sliding pin boot
15. Bushing
16. Torque member
17. Inner shim cover
18. Inner shim
19. Inner pad
20. Pad retainer
21. Pad wear sensor
22. Outer pad
23. Outer shim
24. Outer shim cover

1: PBC (Poly Butyl Cuprysil) grease or silicone-based grease
2: Rubber grease
: Brake fluid

Refer to GI section for additional symbol definitions.

SYMBOLS

SYMBOL	DESCRIPTION		SYMBOL	DESCRIPTION
	Tightening torque The tightening torque specifications of bolts and nuts may be presented as either a range or a standard tightening torque.	: N•m (kg-m, ft-lb)		Always replace after every disassembly.
		: N•m (kg-m, in-lb)	Ⓟ	Apply petroleum jelly.
	Should be lubricated with grease. Unless otherwise indicated, use recommended multi-purpose grease.		Ⓜ	Apply molybdenum added petroleum jelly.
	Should be lubricated with oil.		ATF	Apply ATF.
	Sealing point		★	Select with proper thickness.
Ⓛ	Sealing point with locking sealant.		☆	Adjustment is required.
	Checking point			

SAIA0749E

How to Follow Trouble Diagnosis

INFOID:0000000005418030

DESCRIPTION

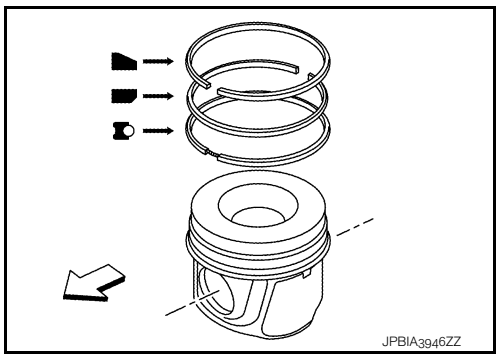
NOTICE:

Trouble diagnoses indicate work procedures required to diagnose problems effectively. Observe the following instructions before diagnosing.

1. **Before performing trouble diagnoses, read the “Preliminary Check”, the “Symptom Chart” or the “Work Flow”.**
2. **After repairs, re-check that the problem has been completely eliminated.**

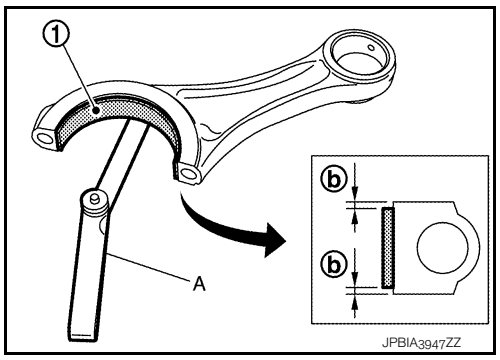
- Position each ring with the gap as shown in the figure referring to the piston front mark.

⇦ : Engine front



8. Install connecting rod bearing (upper) and connecting rod bearing (lower) to connecting rod and connecting rod cap.
   - When installing connecting rod bearings, apply new engine oil to the bearing surface (inside). Never apply new engine oil to the back surface, but thoroughly clean the back surface.
   - Adjust the position of the connecting rod bearing (1) using a fleer gauge [1.4 mm (0.055 in)] (A).
     NOTE:
     Locate the bearing for the connecting rod cap side.

b : 1.4 mm (0.055 in)

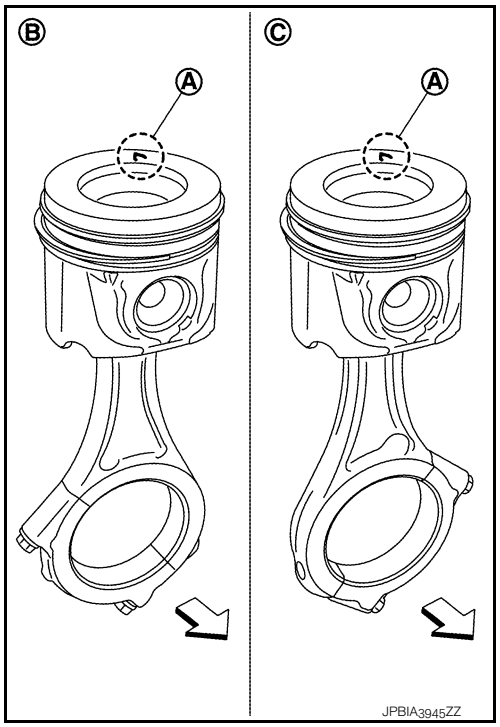


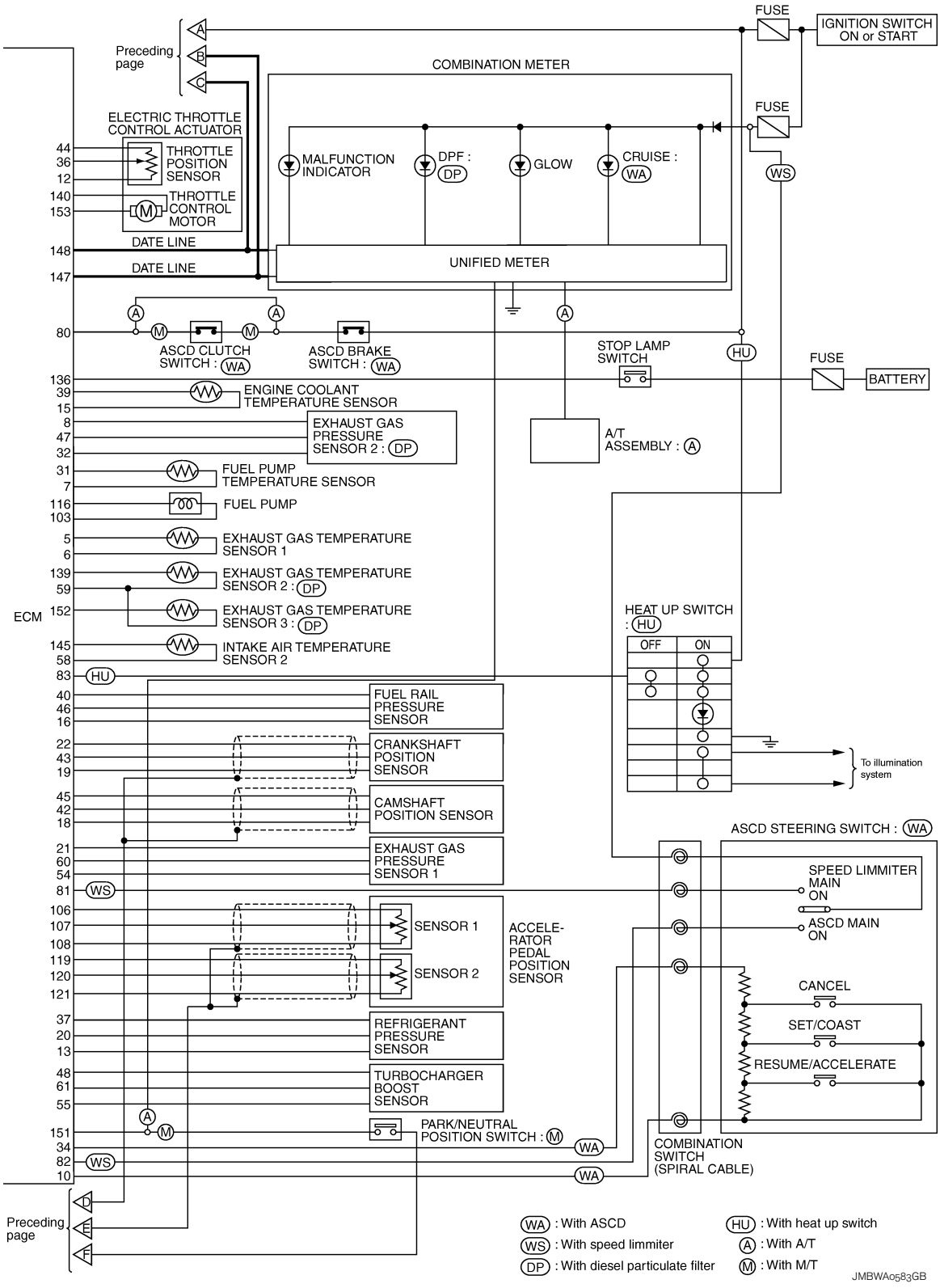
9. Install piston and connecting rod assembly to crankshaft with the following procedure:
   - Install removed parts in the same locations as before.

a. Position crankshaft pin corresponding to connecting rod to be installed onto the bottom dead center.
   - Apply new engine oil sufficiently to the cylinder bore, piston and crankshaft pin.

b. Install piston with the mark engraved (A) on the piston head facing the rear of the engine as shown in the figure.

B : Bank 1
C : Bank 2
⇦ : Engine front




FUSE
IGNITION SWITCH ON or START
Preceding page
COMBINATION METER
ELECTRIC THROTTLE CONTROL ACTUATOR
THROTTLE POSITION SENSOR
THROTTLE CONTROL MOTOR
MALFUNCTION INDICATOR
DPF : DP
GLOW
CRUISE : WA
DATE LINE
UNIFIED METER
ASCD CLUTCH SWITCH : WA
ASCD BRAKE SWITCH : WA
STOP LAMP SWITCH
FUSE
BATTERY
ENGINE COOLANT TEMPERATURE SENSOR
EXHAUST GAS PRESSURE SENSOR 2 : DP
A/T ASSEMBLY : A
FUEL PUMP TEMPERATURE SENSOR
FUEL PUMP
EXHAUST GAS TEMPERATURE SENSOR 1
EXHAUST GAS TEMPERATURE SENSOR 2 : DP
EXHAUST GAS TEMPERATURE SENSOR 3 : DP
INTAKE AIR TEMPERATURE SENSOR 2
ECM
HEAT UP SWITCH : HU
OFF
ON
To illumination system
FUEL RAIL PRESSURE SENSOR
CRANKSHAFT POSITION SENSOR
CAMSHAFT POSITION SENSOR
EXHAUST GAS PRESSURE SENSOR 1
SENSOR 1
SENSOR 2
ACCELERATOR PEDAL POSITION SENSOR
REFRIGERANT PRESSURE SENSOR
TURBOCHARGER BOOST SENSOR
PARK/NEUTRAL POSITION SWITCH : M
ASCD STEERING SWITCH : WA
SPEED LIMMITER MAIN ON
ASCD MAIN ON
CANCEL
SET/COAST
RESUME/ACCELERATE
COMBINATION SWITCH (SPIRAL CABLE)
Preceding page
WA : With ASCD
WS : With speed limmiter
DP : With diesel particulate filter
HU : With heat up switch
A : With A/T
M : With M/T
JMBWA0583GB

BASIC INSPECTION

Work Procedure

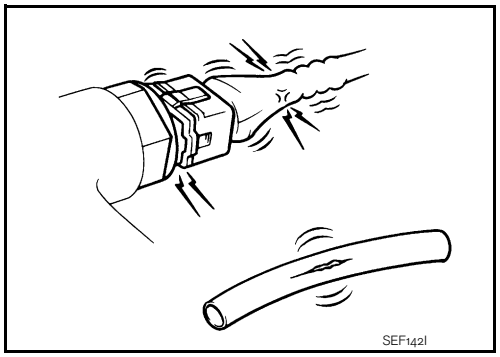
INFOID:0000000006219304

1.INSPECTION START

1. Check service records for any recent repairs that may indicate a related incident.
2. Check the current need for scheduled maintenance, especially for fuel filter and air cleaner filter. Refer to FL-18, "Removal and Installation" or EM-159, "Removal and Installation".
3. Open engine hood and check the following:

- Harness connectors for improper connections
- Vacuum hoses for splits, kinks, or improper connections
- Wiring for improper connections, pinches, or cuts

4. Start engine and warm it up to the normal operating temperature.



>> GO TO 2.

2.CHECK IDLE SPEED

Check idle speed.
For procedure, refer to EC-769, "Inspection".
For specification, refer to EC-774, "Idle Speed".

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 3.

3.CHECK FOR INTAKE AIR LEAK

1. Stop engine.
2. Listen for an intake air leak after the mass air flow sensor.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace. Refer to EM-162, "Exploded View".

4.BLEED AIR FROM FUEL SYSTEM

Use priming pump to bleed air from fuel system. Refer to FL-19, "Air Bleeding".

>> GO TO 5.

5.CHECK IDLE SPEED AGAIN

Check idle speed.
For procedure, refer to EC-769, "Inspection".
For specification, refer to EC-774, "Idle Speed".

Is the inspection result normal?

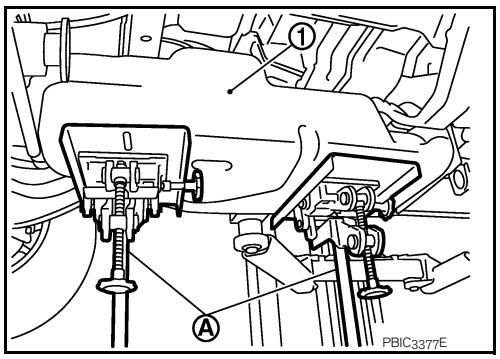
YES >> INSPECTION END
NO >> GO TO 6.

6.DRAIN WATER FROM FUEL FILTER

1. Stop engine.
2. Drain water from fuel filter. Refer to FL-21, "Draining Water from Fuel Filter".

>> GO TO 7.

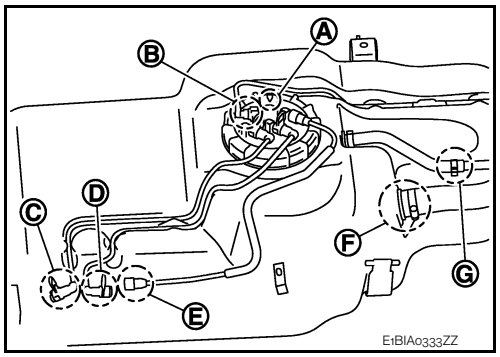
7. Using a transmission jack (A), support the bottom of fuel tank (1).
CAUTION:
Support the position that fuel tank bands never engage.



8. Remove fuel tank bands, and lower the transmission jack carefully until harness connector (A), EVAP tube (B), fuel filler hose (F) and vent hose (G) can be disconnected.

C : Fuel feed tube
D : Fuel return tube
E : Exhaust fuel injector fuel feed tube

9. Disconnect harness connector, EVAP tube, fuel filler hose and vent hose.



10. Supporting with hands, lower transmission jack carefully, and remove fuel tank.
CAUTION:
- **Pay attention not to fall fuel tank.**
- **Check that all connection points have been disconnected.**
- **Confirm there is no interference with vehicle.**

11. Remove fuel filler tubes, fuel filler hoses and vent hoses if necessary.

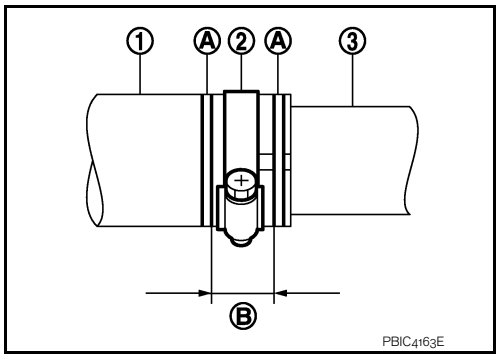
INSTALLATION

Note the following, and install in the reverse order of removal.
- Surely clamp fuel hoses and insert hose to the length below.

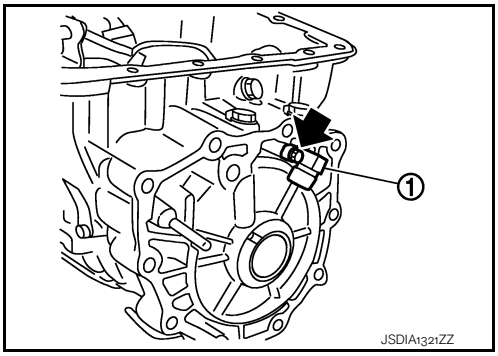
Fuel filler hose	**: 35 mm (1.38 in)**
The other hose	**: 25 mm (0.98 in)**

- Be sure hose clamp is not positioned on swelled area of fuel tube.
- Position fuel filler hose clamp (2) between paint marking (B).

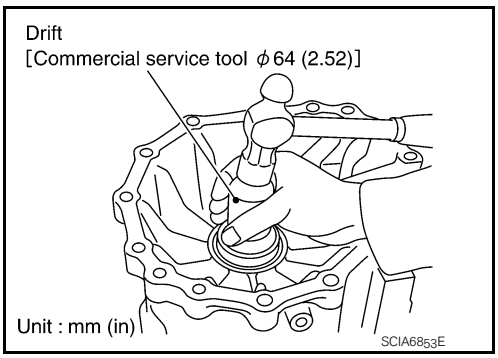
1 : Fuel filler hose
3 : Fuel filler tube
A : paint marking



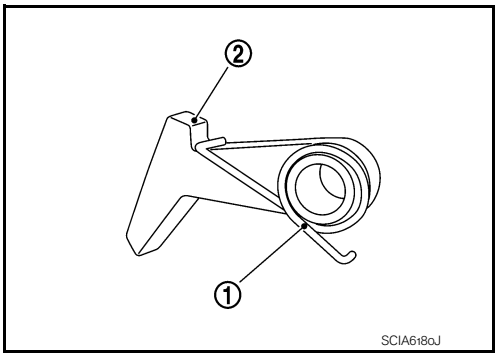
24. Install output speed sensor (1) to transmission case and tighten bolt (⬅) to specified torque. Refer to AT-215, "Component".
CAUTION:
- **Do not subject sensor to impact by dropping or hitting it.**
- **Do not disassemble sensor.**
- **Do not allow metal filings or any foreign material to get on the sensor's front edge magnetic area.**
- **Do not place sensor in an area affected by magnetism.**



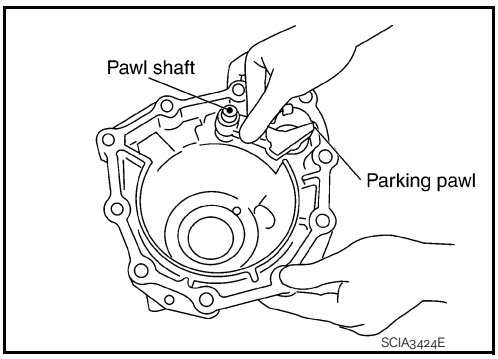
25. As shown in the figure, drive to rear oil seal into adapter case until it is flush using a drift [commercial service tool: 64 mm (2.52 in) dia.].



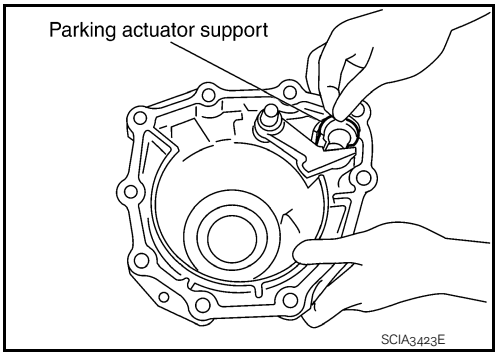
26. Install return spring (1) to parking pawl (2).

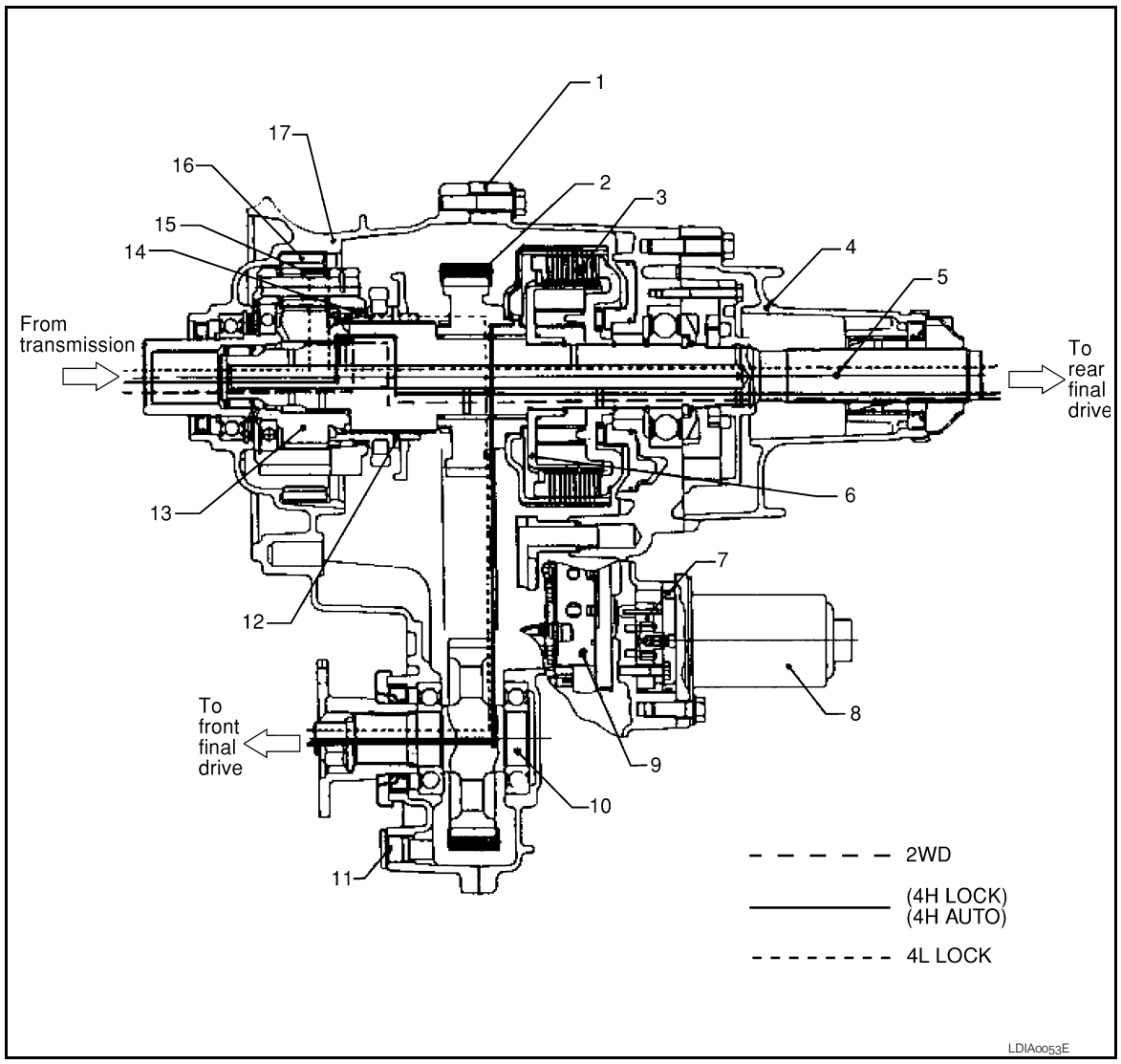


27. Install parking pawl (with return spring) and pawl shaft to adapter case.



28. Install parking actuator support to adapter case.

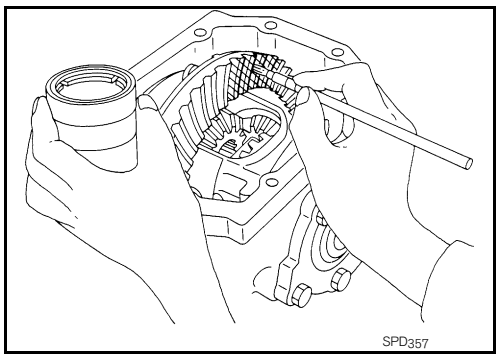




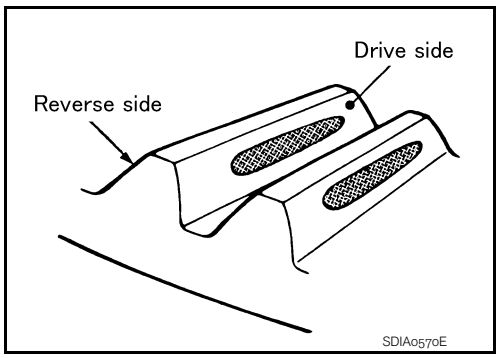
1. Center case
2. Chain
3. Multiple disc clutch
4. Rear case
5. Mainshaft
6. Clutch hub assembly
7. Sub oil pump
8. Transfer motor
9. Control valve
10. Front drive shaft
11. Drain plug
12. 2-4 sleeve
13. Sun gear assembly
14. L-H sleeve
15. Planetary carrier assembly
16. Internal gear
17. Front case

POWER TRANSFER FLOW

2. Apply red lead to the drive gear.
NOTE:
Apply red lead to both faces of 3 to 4 gears, at 4 locations evenly spaced on the drive gear.



3. Rotate the drive gear back and forth several times. Check the drive pinion gear to drive gear tooth contact.
CAUTION:
Check tooth contact on drive side and reverse side.



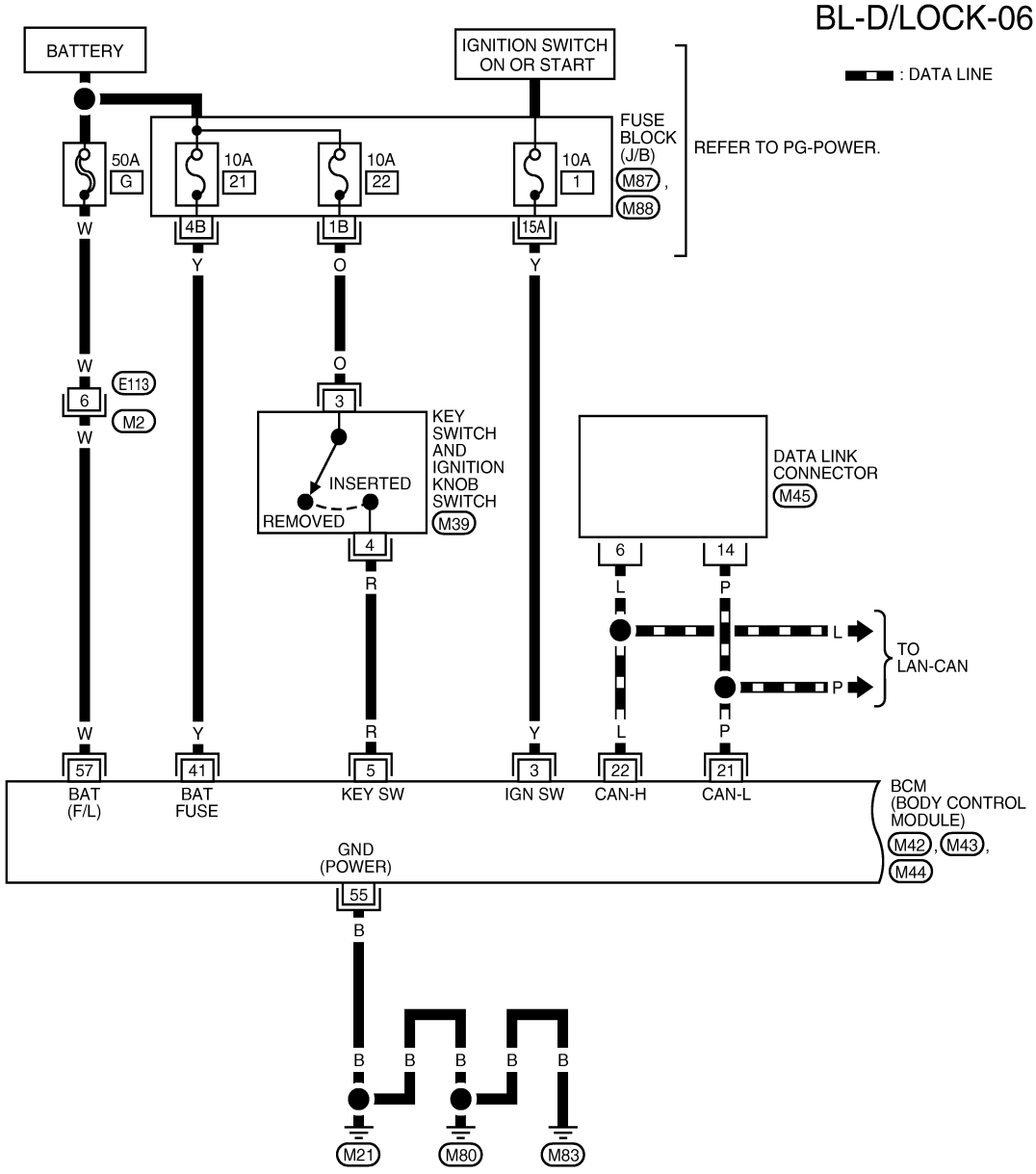
Tooth contact condition		Pinion height adjusting washer selection valve [mm (in)]		Adjustment (Yes/No)	Possible cause
Drive side	Back side				
Heel side Toe side	Toe side Heel side	Thicker ↑	+0.09 (+0.0035)	Yes	Occurrence of noise and scoring sound in all speed ranges.
			+0.06 (+0.0024)		Occurrence of noise when accelerating.
			+0.03 (+0.0012)	No	–
			0		
		Thinner ↓	-0.03 (-0.0012)		
			-0.06 (-0.0024)	Yes	Occurrence of noise at constant speed and decreasing speed.
			-0.09 (-0.0035)		Occurrence of noise and scoring sound in all speed ranges.

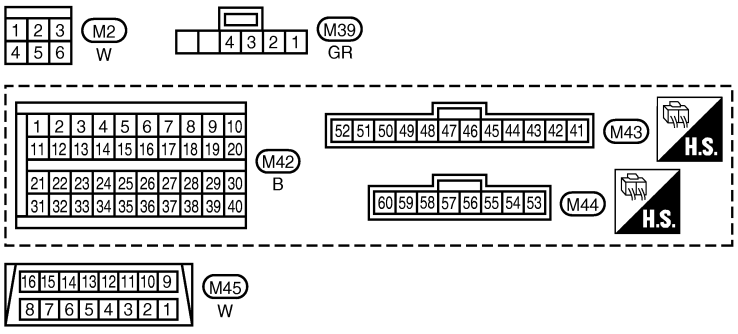
SDIA0207E

Wiring Diagram - D/LOCK -/With Intelligent Key System

INFOID:0000000005418888

BL-D/LOCK-06

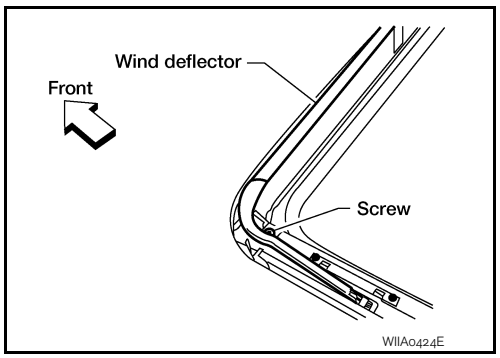




REFER TO THE FOLLOWING.
M87, M88 - FUSE BLOCK JUNCTION BOX (J/B)

JMIWA0182GB

2. Remove spring hinge screws and then remove hinge from the frame.
3. Remove the stopper from the sunroof assembly.
4. Turn the wind deflector from ditch of the sunroof unit assembly.

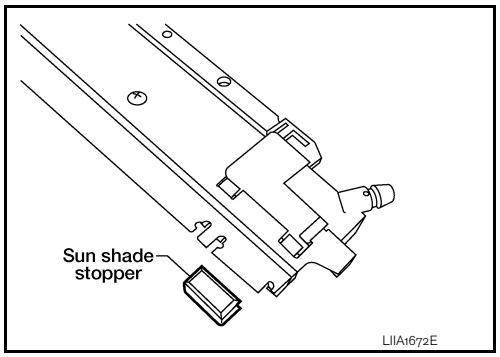


Installation
Install in the reverse order of removal.

SUNSHADE

Removal
NOTE:
Removing is possible even by the on vehicle.

1. Remove headlining.
2. Remove the sunshade stoppers (2 points) from the rear end of the sunroof frame assembly.
3. Remove the sunshade assembly from the rear end of the sunroof frame assembly.

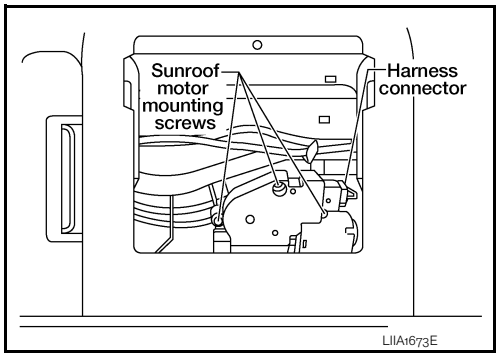


Installation
Install in the reverse order of removal.

SUNROOF MOTOR

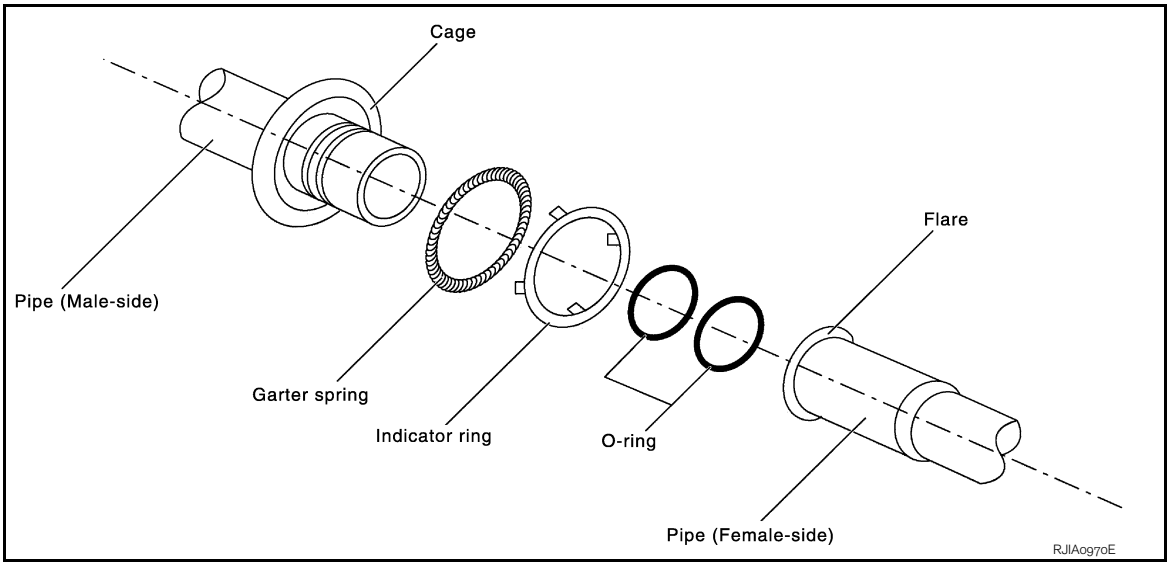
Removal
CAUTION:
- **When removing the sunroof motor, be sure that the sunroof is in the fully closed position.**
- **Never run the removed motor as a single unit.**

1. Position the sunroof assembly in the fully closed position.
2. Remove the front roof console assembly. Refer to EI-31, "Removal and Installation".
3. Disconnect the harness connector from the sunroof motor assembly.
4. Remove the mounting screws and the sunroof motor assembly.



Installation

COMPONENT PARTS

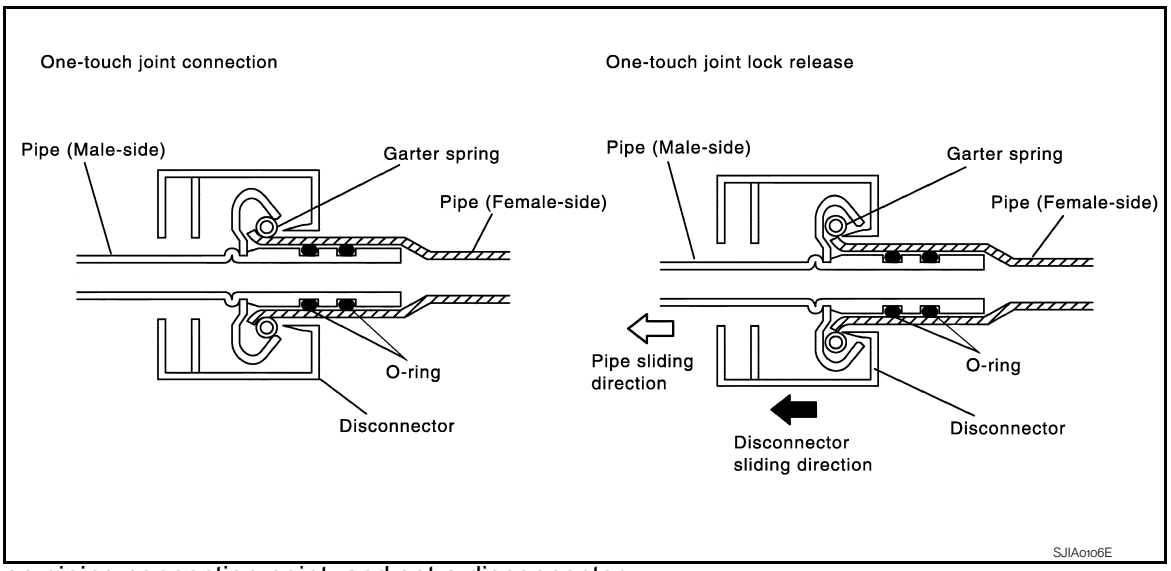


FUNCTIONS OF COMPONENT PARTS

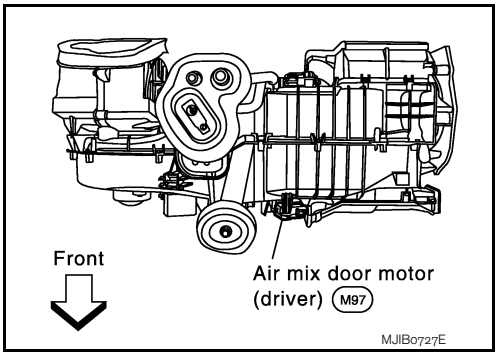
Pipe (Male side)	• Retains O-rings. • Retains garter spring in cage.
Garter spring	Anchors female side piping.
Indicator ring	When connection is made properly, this is ejected from male-side piping. (This part is no longer necessary after connection.)
O-ring	Seals connection point. (Not reusable)
Pipe (Female side)	• Seals connection by compressing O-rings. • Anchors piping connection using flare and garter spring.

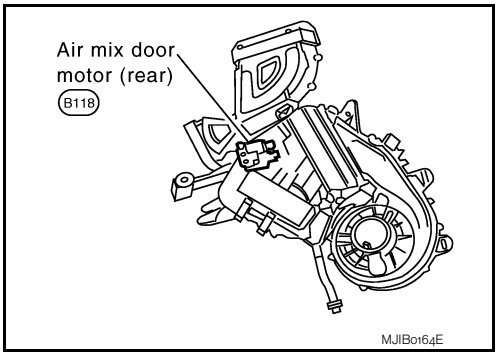
NOTE:
- Garter spring cannot be removed from cage of male-side piping.
- Indicator ring remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

REMOVAL



1. Clean piping connection point, and set a disconnector.
2. Slide disconnector in axial direction of piping, and stretch garter spring with tapered point of disconnector.
3. Slide disconnector farther so that inside diameter of garter spring becomes larger than outside diameter of female-side piping flare. Then male-side piping can be disconnected.





DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (DRIVER)

1.CHECK RESULT FROM FRONT AIR CONTROL SELF-DIAGNOSIS

Self-diagnosis code 12 is present. Refer to ATC-219, "A/C System Self-Diagnosis Function".

YES or NO

YES >> GO TO 2.
NO >> GO TO 4.

2.CHECK AIR MIX DOOR MOTOR (DRIVER) VOLTAGE

1. Turn ignition switch OFF.
2. Disconnect air mix door motor (driver) connector.
3. Turn ignition switch ON.
4. Check voltage between air mix door motor (driver) harness connector M97 terminals 5, 6 and ground.

(+)		(–)	Condition		Voltage (V) (Approx.)
Air mix door motor (driver)					
Connector	Terminal				
M97	5	Ground	Temperature dial	Turn counter-clockwise	Battery voltage
	6			Turn clockwise	

OK or NG

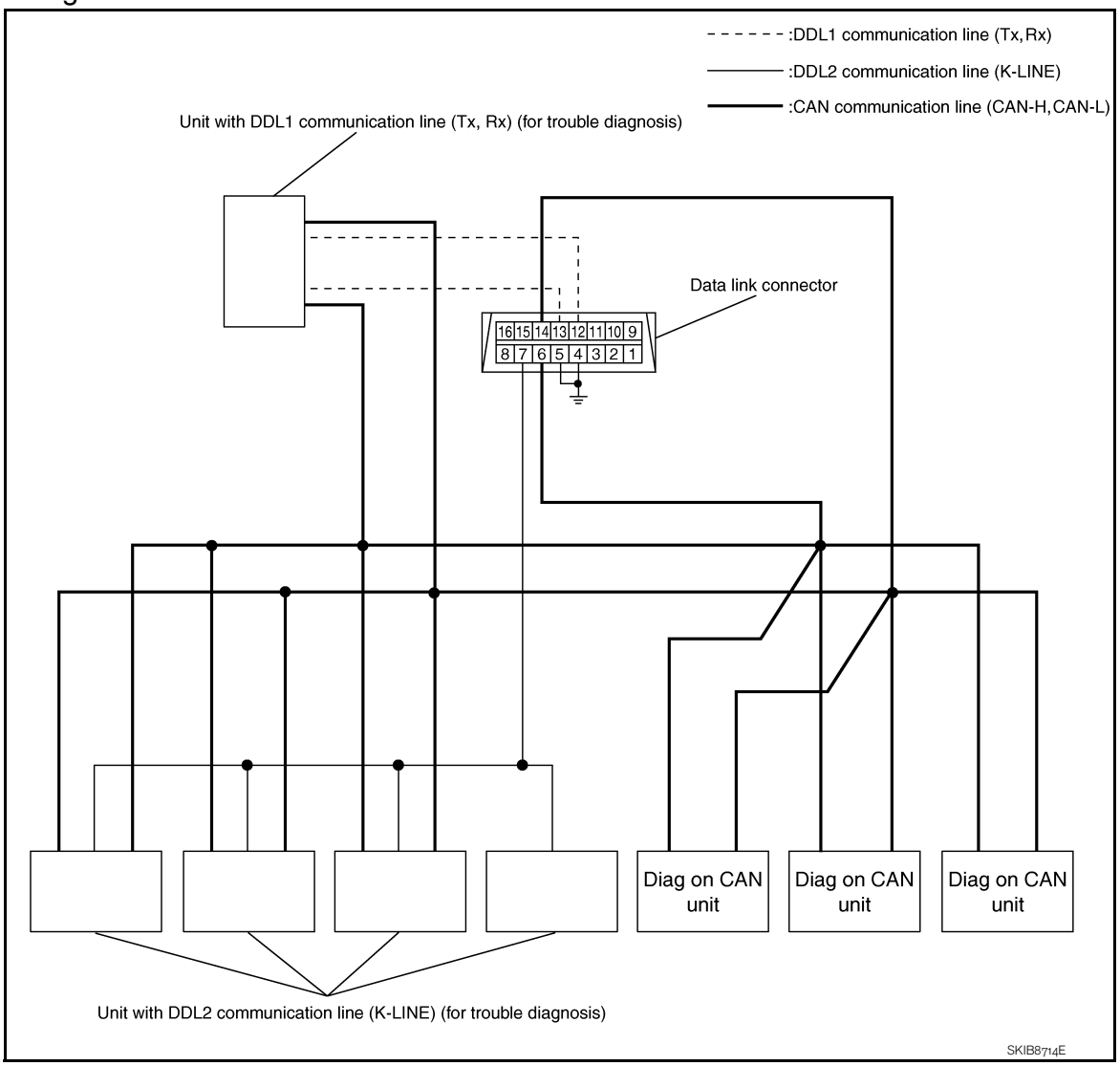
OK >> Replace air mix door motor (driver).
NG >> GO TO 3.

3.CHECK POWER SUPPLY CIRCUITS FOR AIR MIX DOOR MOTOR (DRIVER)

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between front air control harness connector M127 terminal 2 and 3 and air mix door motor (driver) harness connector M97 terminal 5 and 6.

2 - 6 : Continuity should exist.
3 - 5 : Continuity should exist.

System Diagram



Name	Harness	Description
DDL1	Tx Rx	It is used for trouble diagnosis. (CAN-H and CAN-L are used for controlling)
DDL2	K-LINE	It is used for trouble diagnosis. (CAN-H and CAN-L are used for controlling)
Diag on CAN	CAN-H CAN-L	It is used for trouble diagnosis and control.

DISK EJECT SIGNAL CIRCUIT

Description

INFOID:0000000006031837

The eject signal is output to AV control unit when the eject switch of multifunction switch is pressed.

Diagnosis Procedure

INFOID:0000000006031838

1.CHECK CONTINUITY DISK EJECT SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect multifunction switch connector and AV control unit connector.
3. Check continuity between multifunction switch harness connector and AV control unit harness connector.

Multifunction switch		AV control unit		Continuity
Connector	Terminal	Connector	Terminal	
M138	8	M147	29	Existed

4. Check continuity between multifunction switch harness connector and ground.

Multifunction switch		Ground	Continuity
Connector	Terminal		
M139	8		Not existed

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector.

2.CHECK AV CONTROL UNIT VOLTAGE

1. Connect multifunction switch connector and AV control unit connector.
2. Turn ignition switch ON.
3. Check voltage between AV control unit harness connector and ground.

(+)		(−)	Condition	Voltage (Approx.)
AV control unit				
Connector	Terminal			
M147	29	Ground	Pressing the eject switch	0 V
			Except for above	5.0 V

Is the inspection result normal?

YES >> Replace preset switch.
NO >> Replace AV control unit.