

SECTION **DLN**  
DRIVELINE

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DLN

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**TRANSFER: TX15B**

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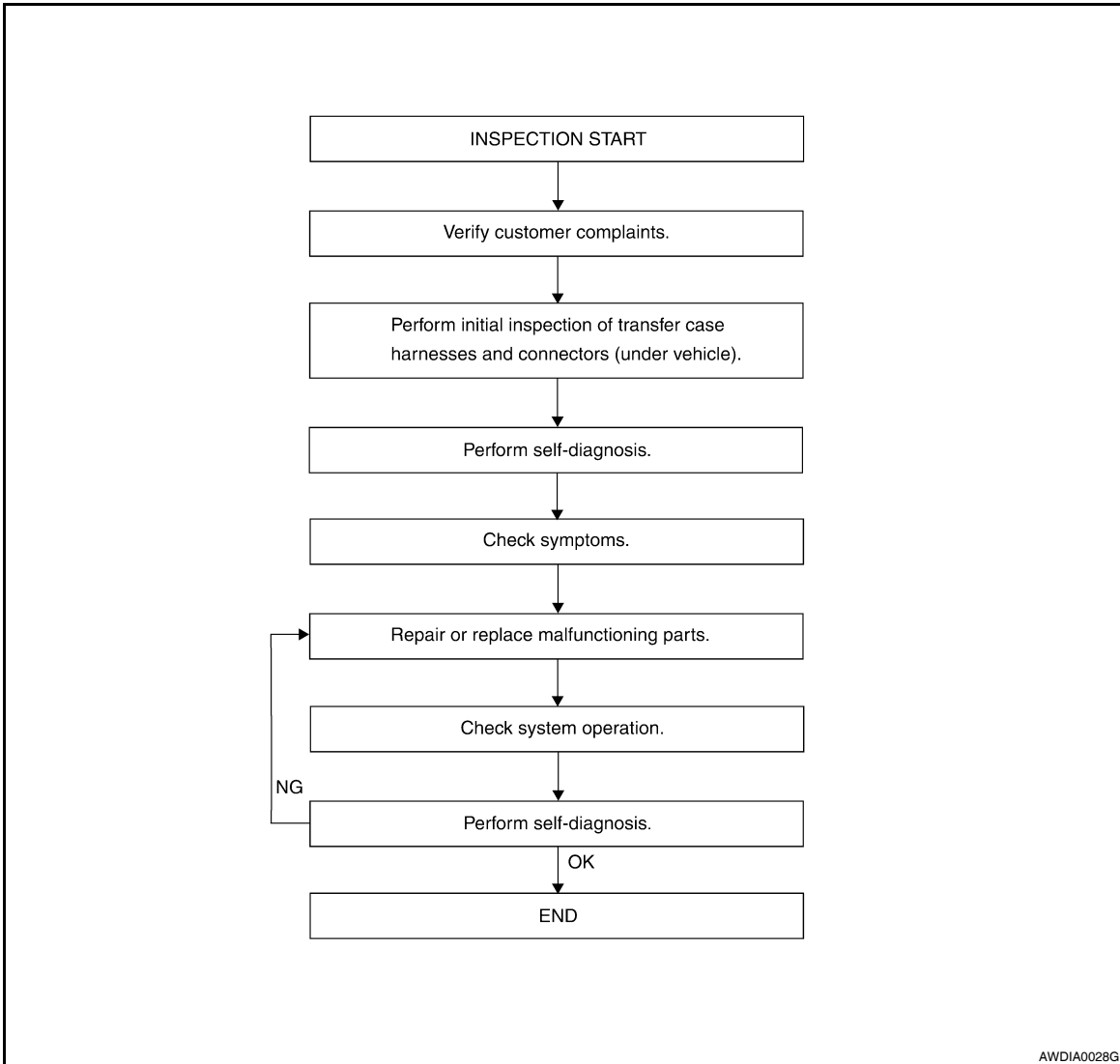
**BASIC INSPECTION**

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000003789438

WORK FLOW



DETAILED FLOW

**1. CUSTOMER INFORMATION**

Interview the customer to obtain detailed information about the symptom.

>> GO TO 2

**2. INITIAL INSPECTION**

Perform an initial inspection of all accessible transfer case harnesses and connectors under the vehicle.

>> GO TO 3

**3. SELF-DIAGNOSIS**

Perform self-diagnosis. Refer to [DLN-16, "CONSULT-III Function \(ALL MODE AWD/4WD\)"](#).

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# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

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>> GO TO 4

## 4.SYMPTOM

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Check for symptoms. Refer to [DLN-69. "Symptom Table"](#).

>> GO TO 5

## 5.MALFUNCTIONING PARTS

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Repair or replace the applicable parts.

>> GO TO 6

## 6.SYSTEM OPERATION

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Check system operation.

>> GO TO 7

## 7.SELF-DIAGNOSIS

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Perform self-diagnosis.

Are any DTC's displayed?

YES >> GO TO 5

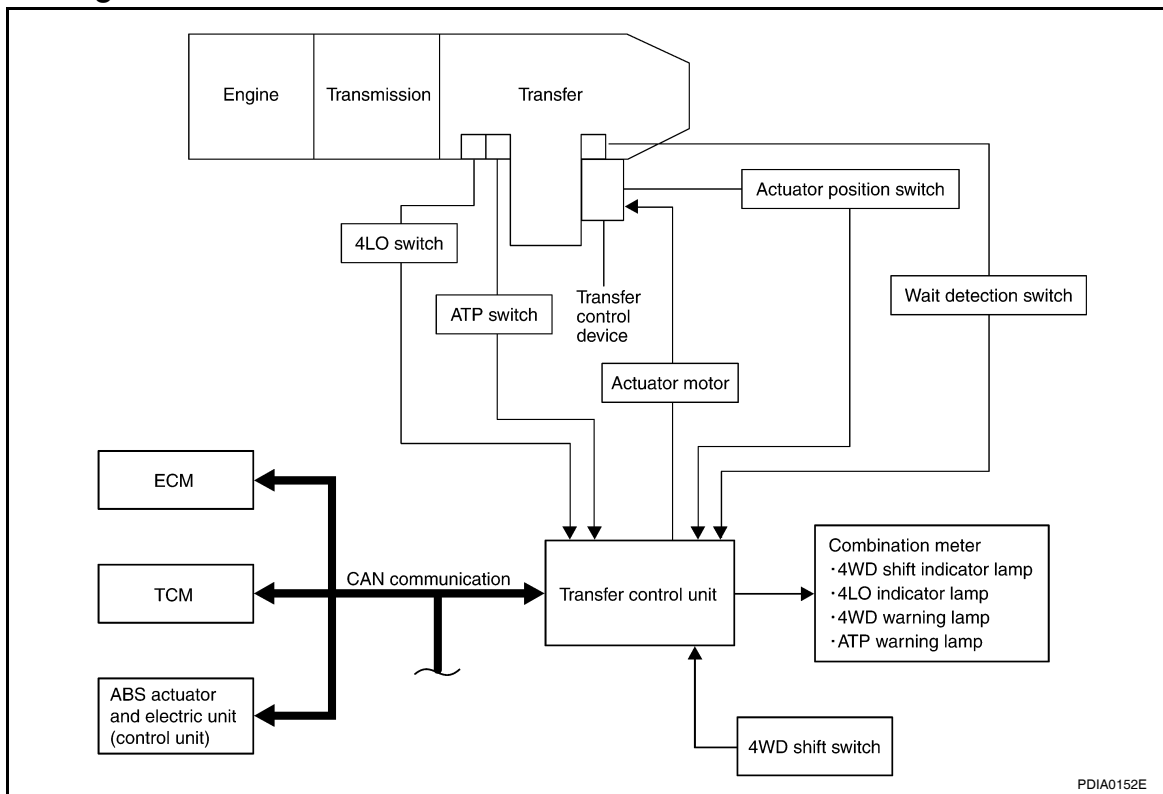
NO >> Inspection End



## FUNCTION DIAGNOSIS

### 4WD SYSTEM

#### System Diagram



#### COMPONENT DESCRIPTION

Components	Function
Transfer control unit	Controls transfer control device and controls shifts between 2WD/4WD and 4H/4LO.
Transfer control device	Integrates actuator motor and actuator position switch.
Actuator motor	Moves shift rods when signaled by transfer control unit.
Actuator position switch	Detects actuator motor position.
Wait detection switch	Detects if transfer case is in 4WD.
4LO switch	Detects if transfer case is in 4LO.
ATP switch	Detects if transfer case is in neutral.
4WD shift switch	Allows driver to select from 2WD/4WD and 4H/4LO.
4WD warning lamp	<ul style="list-style-type: none"> <li>• Illuminates if malfunction is detected in 4WD system.</li> <li>• Flashes (1 flash / 2 seconds) if there is a large difference in diameter of front and rear tires.</li> </ul>
ATP warning lamp	Indicates that A/T parking mechanism does not operate when A/T selector lever is in P position because transfer case is in neutral.
4WD shift indicator lamp	Displays driving range selected by 4WD shift switch.
4LO indicator lamp	Displays 4LO range.
ABS actuator and electric unit (control unit)	Transmits the following signals via CAN communication to transfer control unit. <ul style="list-style-type: none"> <li>• Vehicle speed signal</li> <li>• Stop lamp switch signal (brake signal)</li> </ul>
TCM	Transmits the following signal via CAN communication to transfer control unit. <ul style="list-style-type: none"> <li>• Output shaft revolution signal</li> <li>• A/T position indicator signal (PNP switch signal)</li> </ul>
ECM	Transmits engine speed signal via CAN communication to transfer control unit.

## System Description

INFOID:000000003789440

### TRANSFER CONTROL DEVICE

Integrates actuator motor and actuator position switch.

#### Actuator Motor

Moves shift rods when signaled by transfer control unit.

#### Actuator Position Switch

Detects actuator motor position and then sends signal to transfer control unit.

### WAIT DETECTION SWITCH

Detects if transfer case is in 4WD by the 2-4 shift fork position.

#### NOTE:

If 4WD shift switch is switched to 4H or 4LO and the transfer case is not in 4WD completely, the wait detection system will operate.

### 4LO SWITCH

4LO switch detects if the transfer case is in 4LO by the position of the L-H shift fork.

### ATP SWITCH

ATP switch detects if transfer case is in neutral by the position of the L-H shift fork.

#### NOTE:

Transfer case may be in neutral when shifting between 4H-4LO.

### TRANSFER CONTROL UNIT

- Transfer control unit controls transfer control device and it directs shifts from 4H-4LO and 2WD-4WD.
- Self-diagnosis can be done.





### TRANSFER SHIFT HIGH AND LOW RELAYS

Transfer shift high and low relays apply power supply to transfer control device.

### TRANSFER SHUT OFF RELAYS

Transfer shut off relays 1 and 2 apply power supply to transfer control unit.

### 4WD SHIFT SWITCH AND INDICATOR LAMP

4WD shift switch	Indicator lamp		Operation of 4WD shift switch	Use condition
	4WD shift	4LO		
2WD		OFF	2WD ⇌ 4H switching can be done while driving. The indicator lamp will change when the driving mode is changed. Gear shifting between 2WD ⇌ 4H position must be performed at speeds below 100km/h (60 MPH).	For driving on dry, paved roads.
4H				For driving on rough, sandy or snow-covered roads.
4LO		Flashing	To shift between 4H ⇌ 4LO, stop the vehicle and select the A/T selector lever to the "N" position with the brake pedal depressed. Depress and turn the 4WD shift switch. The 4WD shift switch will not shift to the desired mode if the transmission is not in "N" or the vehicle is moving with the brake pedal depressed. The 4LO indicator lamp will be lit when the 4LO is engaged.	The 4LO indicator lamp flashes when shifting between 4LO ⇌ 4H.
		ON		For use when maximum power and traction is required at low speed (for example on steep grades or rocky, sandy, muddy roads.).

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#### 4WD Shift Switch

4WD shift switch is able to select from 2WD, 4H or 4LO.

#### 4WD Shift Indicator Lamp

- Displays driving conditions selected by the 4WD shift switch while engine is running. When the 4WD warning lamp is turned on, all 4WD shift indicator lamps will turn off.
- Turns ON when ignition switch is turned ON, for purpose of lamp check. Turns OFF approximately for 1 second after the engine starts if system is normal.

# 4WD SYSTEM

## < FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]

### 4LO Indicator Lamp

- Displays 4LO while engine is running. 4LO indicator lamp flashes if transfer gear does not shift completely into 4H⇔4LO. In this condition, the transfer case may be in neutral and the A/T parking mechanism may not operate.
- Turns ON when ignition switch is turned ON, for purpose of lamp check. Turns OFF approximately for 1 second after the engine starts if system is normal.

### 4WD WARNING LAMP

Turns on or flashes when there is a malfunction in 4WD system.

Also turns on when ignition switch is turned ON, for purpose of lamp check. Turns OFF approximately for 1 second after the engine starts if system is normal.

### 4WD Warning Lamp Indication

Condition	4WD warning lamp
System normal	OFF
Lamp check	Turns ON when ignition switch is turned ON. Turns OFF after engine start.
4WD system malfunction	ON
During self-diagnosis	Flashes malfunction mode.
Large difference in diameter of front/rear tires	Flashes slow (1 flash / 2 seconds) (Continues to flash until the ignition switch is turned OFF)

### ATP WARNING LAMP

When the A/T selector lever is in P position, the vehicle may move if the transfer case is in neutral. ATP warning lamp is turned on to indicate this condition to the driver.

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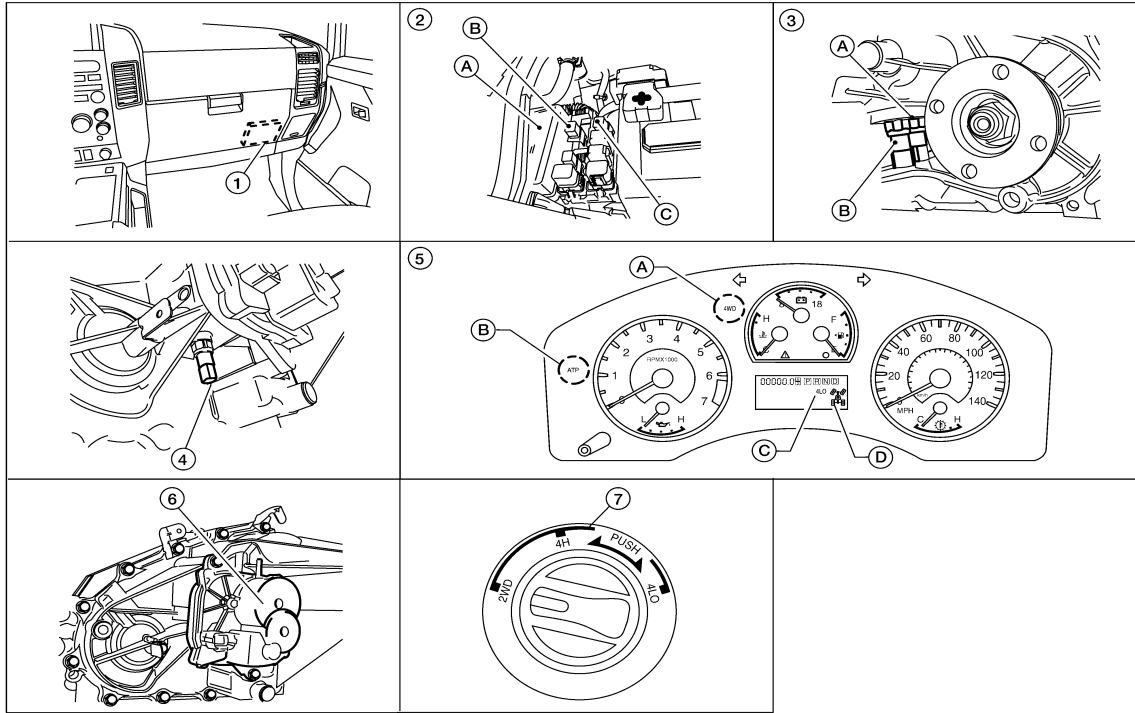
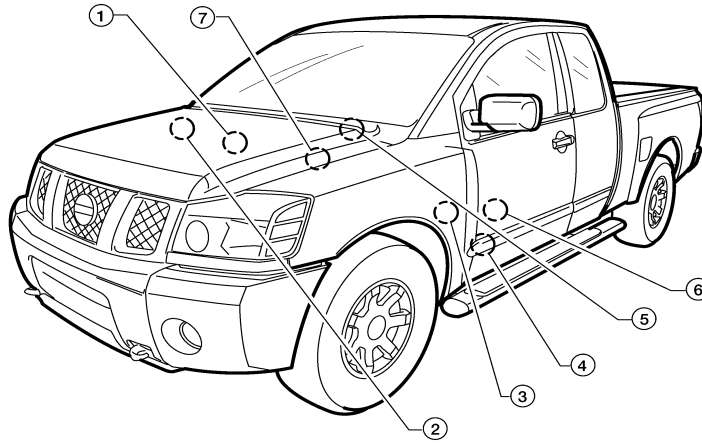
# 4WD SYSTEM

< FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]

## Component Parts Location

INFOID:000000003789441



AWDIA0055ZZ

1. Transfer control unit E142, E143

2. A. IPDM E/R E121  
 B. Transfer shut off relay 1 E46  
 C. Transfer shut off relay 2 E47

3. A. ATP switch F55  
 B. 4LO switch F60  
 (View with front propeller shaft removed)

# 4WD SYSTEM

< FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]

- |  |  |                                |
|--|--|--------------------------------|
| 4. Wait detection switch F59   | 5. Combination meter M24<br>A. 4WD warning lamp<br>B. ATP warning lamp<br>C. 4LO indicator lamp<br>D. 4WD shift indicator lamp | 6. Transfer control device F58 |
| 7. 4WD shift switch<br>M140 (with 2 control dial system or auto A/C)<br>M141 (with 3 control dial system without auto A/C) |  |                                |

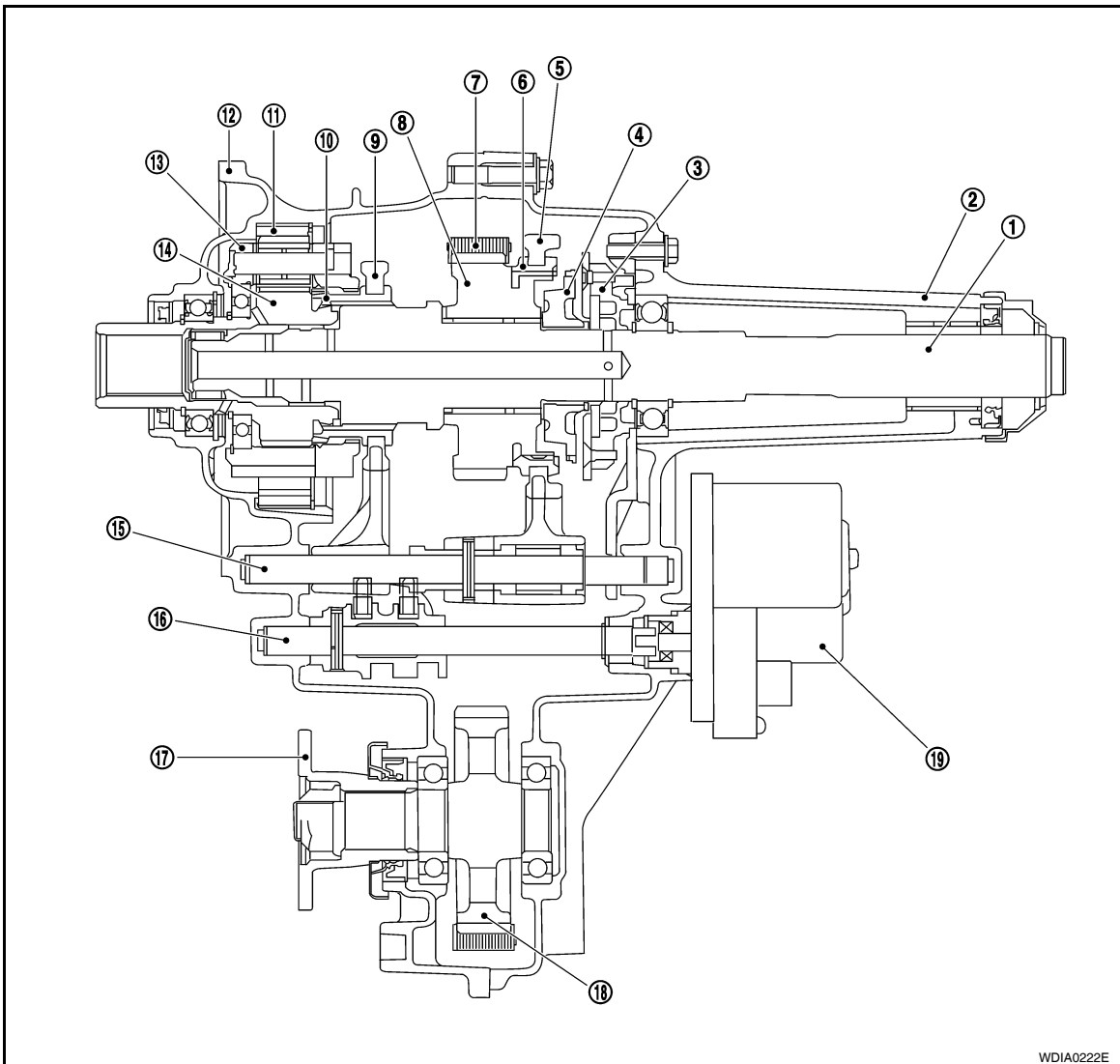
## CAN Communication

INFOID:000000003789442

Refer to [LAN-10, "Self-Diagnosis"](#).

## Cross-Sectional View

INFOID:000000003789443



- |                                |                       |                       |
|--------------------------------|-----------------------|-----------------------|
| 1. Mainshaft                   | 2. Rear case          | 3. Oil pump assembly  |
| 4. Clutch gear                 | 5. 2-4 shift fork     | 6. 2-4 sleeve         |
| 7. Drive chain                 | 8. Sprocket           | 9. L-H shift fork     |
| 10. L-H sleeve                 | 11. Internal gear     | 12. Front case        |
| 13. Planetary carrier assembly | 14. Sun gear assembly | 15. L-H shift rod     |
| 16. Control shift rod          | 17. Companion flange  | 18. Front drive shaft |
| 19. Transfer control device    |                       |                       |

# 4WD SYSTEM

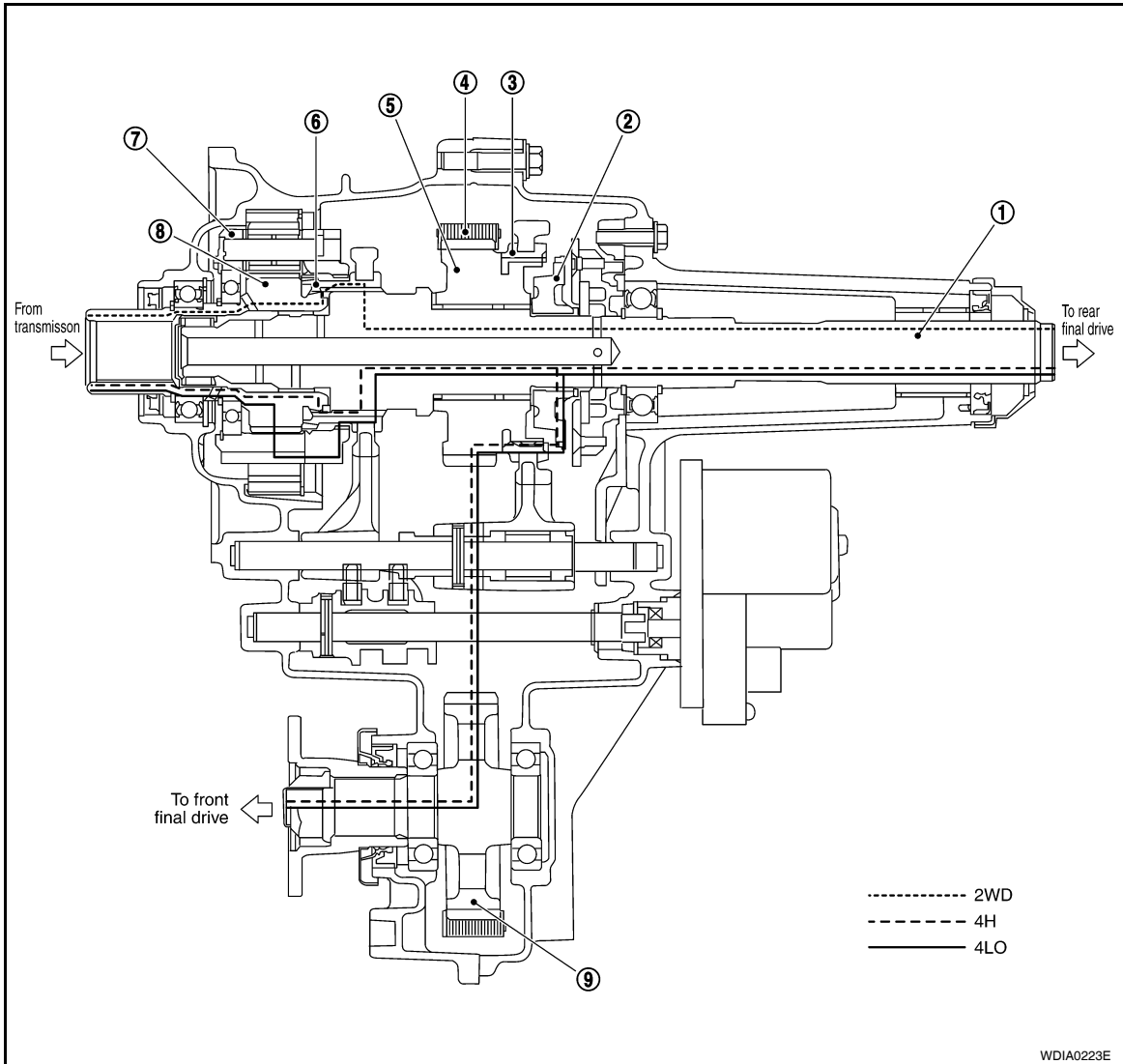
< FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]

## Power Transfer

INFOID:000000003789444

### POWER TRANSFER DIAGRAM



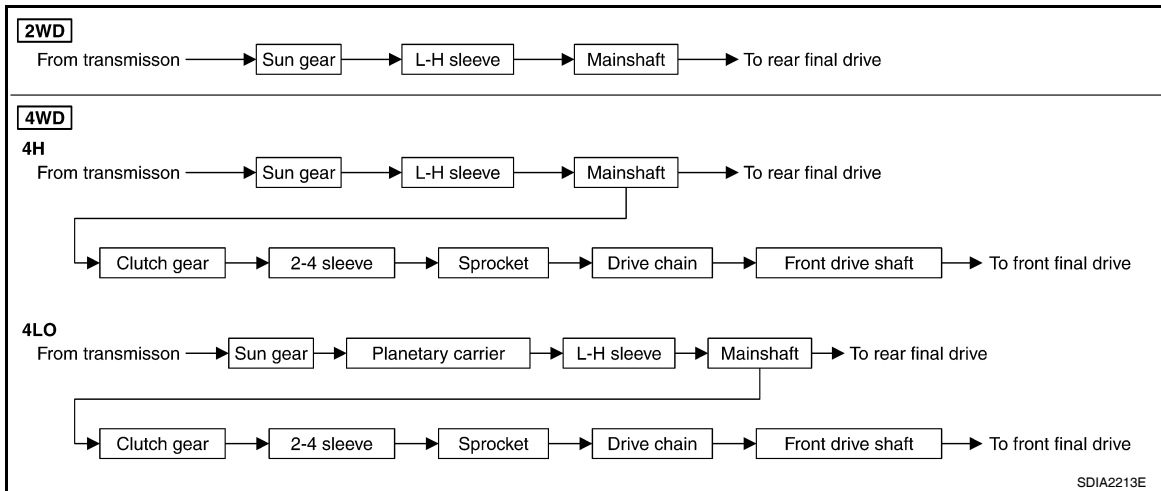
- |                               |                      |                      |
|-------------------------------|----------------------|----------------------|
| 1. Mainshaft                  | 2. Clutch gear       | 3. 2-4 sleeve        |
| 4. Drive chain                | 5. Sprocket          | 6. L-H sleeve        |
| 7. Planetary carrier assembly | 8. Sun gear assembly | 9. Front drive shaft |

### POWER TRANSFER FLOW

# 4WD SYSTEM

< FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]



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# DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

< FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]

## DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

### CONSULT-III Function (ALL MODE AWD/4WD)

INFOID:000000003789445

#### FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

ALL MODE AWD/4WD diagnostic mode	Description
SELF-DIAG RESULTS	Displays transfer control unit self-diagnosis results.
DATA MONITOR	Displays transfer control unit input/output data in real time.
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of CAN communication can be read.
ECU PART NUMBER	Transfer control unit part number can be read.

#### SELF-DIAG RESULT MODE

##### Operation Procedure

1. Connect CONSULT-III.
2. With engine at idle, touch SELF-DIAG RESULTS.  
Display shows malfunction experienced since the last erasing operation.

##### NOTE:

The details for TIME are as follows:

- 0: Error currently detected with transfer control unit.
- Except for 0: Error detected in the past and memorized with transfer control unit.  
Detects frequency of driving after DTC occurs (frequency of turning ignition switch ON/OFF).

##### How to Erase Self-diagnostic Results

1. Perform applicable inspection of malfunctioning item and then repair or replace.
2. Start engine and select SELF-DIAG RESULTS mode for ALL MODE AWD/4WD with CONSULT-III.
3. Touch ERASE on CONSULT-III screen to erase DTC memory.

##### **CAUTION:**

**If memory cannot be erased, perform applicable diagnosis.**

#### ⊗ SELF-DIAGNOSTIC PROCEDURE (WITHOUT CONSULT-III)

##### Description

If the engine starts when there is a malfunction with the 4WD system, the 4WD warning lamp turns ON or flickers in the combination meter. When the system functions properly, the warning lamp turns ON when the ignition switch is turned to ON, and it turns OFF after engine starts. To locate the cause of a problem, start the self-diagnosis function. The 4WD warning lamp in the combination meter will indicate the problem area by flickering according to the self-diagnostic results. Refer to [DLN-66. "DTC Index"](#).

##### Diagnostic Procedure

1. Warm up engine.
2. Turn ignition switch ON and OFF at least twice, and then turn ignition switch OFF.
3. Move A/T selector lever to P position.
4. Turn 4WD shift switch to 2WD position.
5. Turn ignition switch ON. (Do not start engine.)
6. 4WD warning lamp ON.  
If 4WD warning lamp does not turn ON, refer to [DLN-70. "Diagnosis Procedure"](#).
7. Move A/T selector lever to R position.
8. Turn 4WD shift switch to 2WD, 4H and 2WD in order.
9. Move A/T selector lever to P position.
10. Turn 4WD shift switch to 4H, 2WD and 4H in order.
11. Move A/T selector lever to N position.
12. Turn 4WD shift switch to 2WD position.
13. Move A/T selector lever to P position.



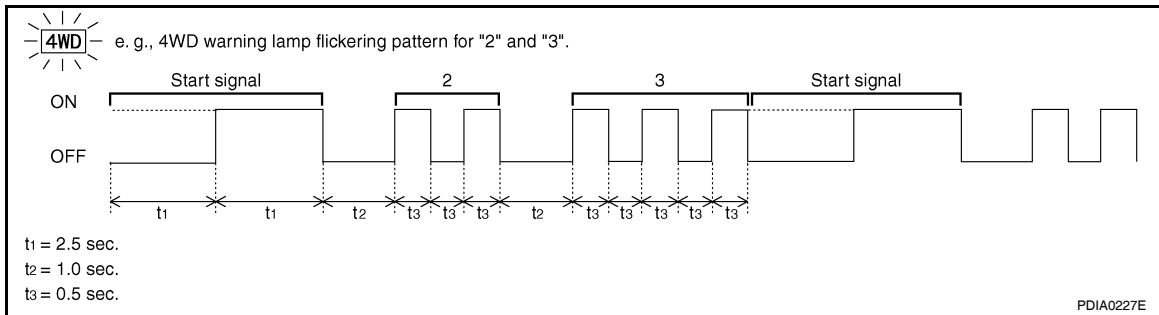
# DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

< FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]

## 14. Read the flickering of 4WD warning lamp.

Self-diagnosis example



## DATA MONITOR MODE

Operation Procedure

1. Connect CONSULT-III.
2. Touch DATA MONITOR.
3. Select from SELECT MONITOR ITEM, screen of data monitor mode is displayed.

**NOTE:**

**When malfunction is detected, CONSULT-III performs REAL-TIME DIAGNOSIS.**

**Also, any malfunction detected while in this mode will be displayed at real time.**

Display Item List

×: Standard    -: Not applicable

Monitored item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
VHCL/S SEN·FR [km/h] or [mph]	×	-	×	Wheel speed calculated by ABS actuator and electric unit (control unit). Signal input with CAN communication line.
VHCL/S SEN·RR [km/h] or [mph]	×	-	×	Wheel speed calculated by TCM. Signal input with CAN communication line.
ENGINE SPEED [rpm]	×	-	×	Engine speed is displayed. Signal input with CAN communication line.
BATTERY VOLT [V]	×	-	×	Power supply voltage for transfer control unit.
2WD SWITCH [ON/OFF]	×	-	×	4WD shift switch signal status is displayed. (4L means 4LO of 4WD shift switch.)
4H SWITCH [ON/OFF]	×	-	×	
4L SWITCH [ON/OFF]	×	-	×	
4L POSI SW [ON/OFF]	×	-	×	4LO switch signal status is displayed.
ATP SWITCH [ON/OFF]	×	-	×	ATP switch signal status is displayed.
WAIT DETCT SW [ON/OFF]	×	-	×	Wait detection switch signal status is displayed.
4WD MODE [2H/4H/4L]	-	×	×	Control status of 4WD recognized by transfer control unit. (2WD, 4H or 4LO)
VHCL/S COMP [km/h] or [mph]	-	×	×	Vehicle speed recognized by transfer control unit.
SHIFT ACT 1 [ON/OFF]	-	×	×	Output condition to actuator motor (clockwise)
SHIFT AC MON 1 [ON/OFF]	-	-	×	Check signal for transfer control unit signal output
SHIFT ACT 2 [ON/OFF]	-	×	×	Output condition to actuator motor (counterclockwise)

# DIAGNOSIS SYSTEM (TRANSFER CONTROL UNIT)

< FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]

Monitored item (Unit)	Monitor item selection			Remarks
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	
SHIFT AC MON 2 [ON/OFF]	-	-	×	Check signal for transfer control unit signal output
SFT ACT/R MON [ON/OFF]	-	-	×	Operating condition of actuator motor relay (integrated in transfer control unit)
SHIFT POS SW 1 [ON/OFF]	×	-	×	Condition of actuator position switch 1
SHIFT POS SW 2 [ON/OFF]	×	-	×	Condition of actuator position switch 2
SHIFT POS SW 3 [ON/OFF]	×	-	×	Condition of actuator position switch 3
SHIFT POS SW 4 [ON/OFF]	×	-	×	Condition of actuator position switch 4
4WD FAIL LAMP [ON/OFF]	-	×	×	Control status of 4WD warning lamp is displayed.
2WD IND [ON/OFF]	-	-	×	Control status of 4WD shift indicator lamp (rear) is displayed.
4H IND [ON/OFF]	-	-	×	Control status of 4WD shift indicator lamp (front and center) is displayed.
4L IND [ON/OFF]	-	-	×	Control status of 4LO indicator lamp is displayed.

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< FUNCTION DIAGNOSIS >

[TRANSFER: TX15B]

## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

### NVH Troubleshooting Chart

INFOID:000000003789446

Use the chart below to help you find the cause of the symptom. The numbers indicate the order of the inspection. If necessary, repair or replace these parts.

Reference page		<a href="#">DLN-89</a>			<a href="#">DLN-108</a>			<a href="#">DLN-105</a>	<a href="#">DLN-108</a>	<a href="#">DLN-99</a>
SUSPECTED PARTS (Possible cause)		TRANSFER FLUID (Level low)	TRANSFER FLUID (Wrong)	TRANSFER FLUID (Level too high)	LIQUID GASKET (Damaged)	O-RING (Worn or damaged)	OIL SEAL (Worn or damaged)	SHIFT FORK (Worn or damaged)	GEAR (Worn or damaged)	BEARING (Worn or damaged)
Symptom	Noise	1	2						3	3
	Transfer fluid leakage		3	1	2	2	2			
	Hard to shift or will not shift		1	1				2		

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# P1801, P1811 POWER SUPPLY CIRCUIT FOR TRANSFER CONTROL UNIT

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## COMPONENT DIAGNOSIS

### P1801, P1811 POWER SUPPLY CIRCUIT FOR TRANSFER CONTROL UNIT

#### Description

INFOID:000000003789447

The transfer control unit controls the transfer control device which controls shifts between 4H and 4LO and between 2WD and 4WD. When the vehicle battery is removed, the power supply to the transfer control unit is interrupted, and self-diagnosis memory function is suspended. DTC's P1801, P1811 or flash code 8 may also set when the power supply voltage for the transfer control unit is abnormally low while driving.

#### DTC Logic

INFOID:000000003789448

#### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1801]	*INITIAL START*	Due to removal of battery which cuts off power supply to transfer control unit, self-diagnosis memory function is suspended.	<a href="#">DLN-20, "Diagnosis Procedure"</a>
[P1811]	BATTERY VOLTAGE	Power supply voltage for transfer control unit is abnormally low while driving.	

#### DTC CONFIRMATION PROCEDURE

##### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Are DTC's P1801, P1811 or flash code 8 detected?

YES >> Perform diagnosis procedure. Refer to [DLN-20, "Diagnosis Procedure"](#).

NO >> Inspection End.

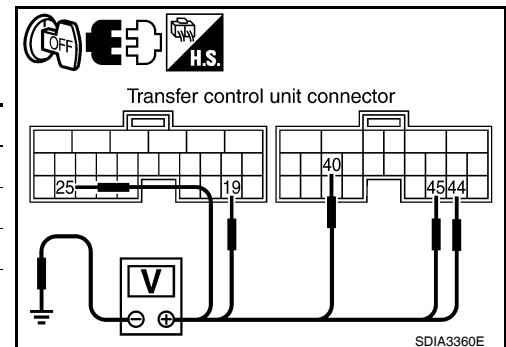
#### Diagnosis Procedure

INFOID:000000003789449

##### 1. CHECK POWER SUPPLY

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal	Voltage (Approx.)
E142	19 - Ground	Battery voltage
	25 - Ground	0V
E143	40 - Ground	Battery voltage
	44 - Ground	0V
	45 - Ground	



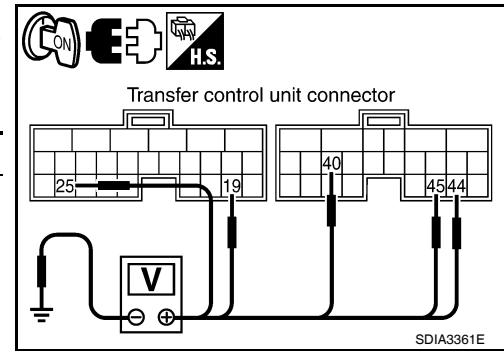
# P1801, P1811 POWER SUPPLY CIRCUIT FOR TRANSFER CONTROL UNIT

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

4. Turn ignition switch ON. (Do not start engine.)
5. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal	Voltage (Approx.)
E142	19 - Ground	Battery voltage
	25 - Ground	
E143	40 - Ground	
	44 - Ground	
	45 - Ground	



**OK or NG**

- OK >> GO TO 2.
- NG >> Check the following. If any items are damaged, repair or replace damaged parts.
- 10A fuses [No. 26 located in the fuse and fusible link box or 59 located in the fuse and relay box]
  - 20A fuse [No. 53, located in the IPDM E/R]
  - Harness for short or open between battery and transfer control unit harness connector E142 terminal 19.
  - Harness for short or open between battery and transfer shut off relay 2 harness connector E47 terminal 1 and 5.
  - Harness for short or open between battery and transfer shut off relay 1 harness connector E46 terminal 5.
  - Harness for short or open between ignition switch and transfer control unit harness connector E142 terminal 25.
  - Harness for short or open between ignition switch and transfer shut off relay 1 harness connector E46 terminal 2.
  - Harness for short or open between transfer shut off relay 2 harness connector E47 terminal 3 and transfer control unit harness connector E143 terminals 44, 45.
  - Harness for short or open between transfer shut off relay 1 harness connector E46 terminal 3 and transfer control unit harness connector E143 terminals 44, 45.
  - Harness for short or open between transfer shut off relay 2 harness connector E47 terminal 2 and transfer control unit harness connector E143 terminal 40.
  - Harness for open between transfer shut off relay 1 harness connector E46 terminal 1 and ground.
  - Battery and ignition switch.
  - Transfer shut off relay 1, 2. Refer to COMPONENT INSPECTION .

## 2.CHECK GROUND CIRCUIT

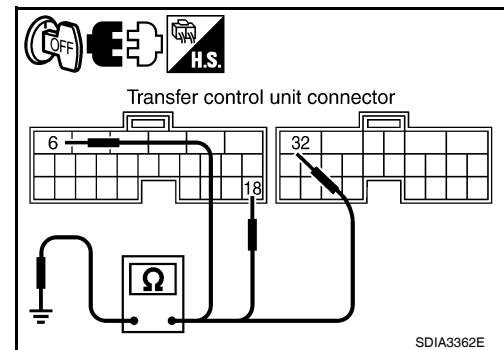
1. Turn ignition switch OFF.
2. Disconnect transfer control unit harness connector.
3. Check continuity between transfer control unit harness connector E142 terminals 6 and 18, and E143 terminal 32 and ground.

**Continuity should exist.**

Also check harness for short to power.

**OK or NG**

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



## 3.CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

**OK or NG**

- OK >> GO TO 4.
- NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

# P1801, P1811 POWER SUPPLY CIRCUIT FOR TRANSFER CONTROL UNIT

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## 4. CHECK DTC

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

OK or NG

OK >> Inspection End.

NG >> Replace transfer control unit. Refer to [DLN-90, "Removal and Installation"](#).

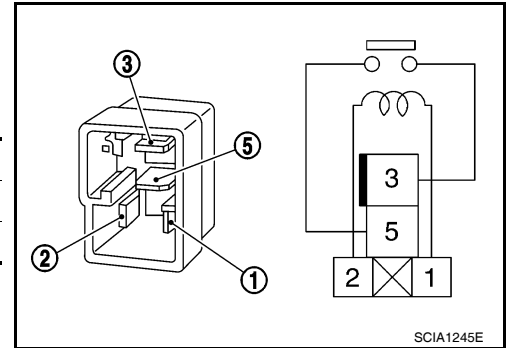
## Component Inspection

INFOID:000000003789450

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Remove transfer shut off relay 1 and transfer shut off relay 2. Refer to [DLN-12, "Component Parts Location"](#).
3. Apply 12V direct current between transfer shut off relay terminals 1 and 2.
4. Check continuity between relay terminals 3 and 5.

Condition	Continuity
12V direct current supply between terminals 1 and 2	Yes
OFF	No

5. If inspection results are not normal, replace the transfer shut off relay 1 or 2.



# P1802 – P1804, P1809 TRANSFER CONTROL UNIT

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1802 – P1804, P1809 TRANSFER CONTROL UNIT

### Description

INFOID:000000003789451

The transfer control unit controls the transfer control device which controls shifts between 4H and 4LO and between 2WD and 4WD. DTC P1802 - P1804 or P1809 may set when any of the following occur:

- Malfunction is detected in the memory (RAM) system of transfer control unit.
- Malfunction is detected in the memory (ROM) system of transfer control unit.
- Malfunction is detected in the memory (EEPROM) system of transfer control unit.
- AD converter system of transfer control unit is malfunctioning.

Flash code 5 may set when the following occurs:

- AD converter system of transfer control unit is malfunctioning.

### DTC Logic

INFOID:000000003789452

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1802]	CONTROL UNIT 1	Malfunction is detected in the memory (RAM) system of transfer control unit.	<a href="#">DLN-23, "Diagnosis Procedure"</a>
[P1803]	CONTROL UNIT 2	Malfunction is detected in the memory (ROM) system of transfer control unit.	
[P1804]	CONTROL UNIT 3	Malfunction is detected in the memory (EEPROM) system of transfer control unit.	
[P1809]	CONTROL UNIT 4	AD converter system of transfer control unit is malfunctioning.	

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Are DTC's P1802 - P1804, P1809 or flash code 5 detected?

- YES >> Perform diagnosis procedure. Refer to [DLN-23, "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789453

#### 1. INSPECTION START

Do you have CONSULT-III?

YES or NO

- YES >> GO TO 2.  
NO >> GO TO 3.

#### 2. PERFORM SELF-DIAGNOSIS (WITH CONSULT-III)

1. Turn ignition switch ON.
2. Select SELF-DIAG RESULTS mode for ALL MODE AWD/4WD with CONSULT-III.
3. Touch ERASE.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Perform the self-diagnosis again.

Is the CONTROL UNIT 1 [P1802], CONTROL UNIT 2 [P1803], CONTROL UNIT 3 [P1804] or CONTROL UNIT 4 [P1809] displayed?

- YES >> Replace transfer control unit. Refer to [DLN-90, "Removal and Installation"](#).  
NO >> Inspection End.

#### 3. PERFORM SELF-DIAGNOSIS (WITHOUT CONSULT-III)

1. Perform the self-diagnosis and then erase self-diagnostic results.

## P1802 – P1804, P1809 TRANSFER CONTROL UNIT

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

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2. Perform the self-diagnosis again.

Do the self-diagnostic results indicate AD converter?

YES >> Replace transfer control unit. Refer to [DLN-90, "Removal and Installation"](#).

NO >> Inspection End.



# P1807 VEHICLE SPEED SENSOR (A/T)

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1807 VEHICLE SPEED SENSOR (A/T)

### Description

INFOID:000000003789454

The transmission control module (TCM) transmits the output shaft revolution signal via CAN communication to Transfer control unit. DTC P1807 or flash code 2 will set when a malfunction is detected in the output shaft revolution signal or an improper signal is input while driving.

### DTC Logic

INFOID:000000003789455

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1807]	VHCL SPEED SEN-AT	<ul style="list-style-type: none"><li>Malfunction is detected in output shaft revolution signal that is output from TCM through CAN communication.</li><li>Improper signal is input while driving.</li></ul>	<a href="#">DLN-25. "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1807 or flash code 2 detected?

- YES >> Perform diagnosis procedure. Refer to [DLN-25. "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789456

#### 1. CHECK DTC WITH TCM

Perform self-diagnosis with TCM. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnosis?

- YES >> Check the malfunctioning system.  
NO >> GO TO 2.

#### 2. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54. "Reference Value"](#).

Are the inspection results normal?

- YES >> GO TO 3.  
NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.

#### 3. CHECK DTC

Drive vehicle and then perform Self-diagnosis.

Is DTC P1807 displayed?

- YES >> Perform self-diagnosis with TCM again.  
NO >> Inspection End.

# P1808 VEHICLE SPEED SENSOR (ABS)

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1808 VEHICLE SPEED SENSOR (ABS)

### Description

INFOID:000000003789457

The ABS actuator and electric unit (control unit) transmits a vehicle speed signal via CAN communication to the transfer control unit. DTC P1808 or flash code 3 sets when a malfunction is detected in the vehicle speed signal that is output from the ABS actuator and electric unit (control unit) or an improper signal is input while driving.

### DTC Logic

INFOID:000000003789458

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1808]	VHCL SPEED SEN-ABS	<ul style="list-style-type: none"><li>Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.</li><li>Improper signal is input while driving.</li></ul>	<a href="#">DLN-26, "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1808 or flash code 3 displayed?

- YES >> Perform diagnosis procedure. Refer to [DLN-26, "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789459

#### 1. CHECK DTC WITH ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Perform self-diagnosis with ABS actuator and electric unit (control unit). Refer to [BRC-78, "CONSULT-III Function \(ABS\)"](#) (with ABL/ABS) or [BRC-164, "CONSULT-III Function \(ABS\)"](#) (with VDC/TCS/ABS).

Is any malfunction detected by self-diagnosis?

- YES >> Check the malfunctioning system.  
NO >> GO TO 2.

#### 2. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

Are the inspection results normal?

- YES >> GO TO 3.  
NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.

#### 3. CHECK DTC

Drive vehicle and then perform Self-diagnosis.

Is DTC P1808 displayed?

- YES >> Perform self-diagnosis with ABS actuator and electric unit (control unit).  
NO >> Inspection End.

# P1810 4 LO SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1810 4 LO SWITCH

### Description

INFOID:000000003789460

The 4LO switch detects that the transfer case is in 4LO range. DTC P1810 or flash code 6 will set when an improper signal from the 4LO switch is input due to an open or short circuit.

### DTC Logic

INFOID:000000003789461

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1810]	4L POSI SW TF	Improper signal from 4LO switch is input due to open or short circuit.	<a href="#">DLN-27. "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1810 or flash code 6 displayed?

- YES >> Perform diagnosis procedure. Refer to [DLN-27. "Diagnosis Procedure"](#).  
 NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789462

#### 1. CHECK 4LO POSITION SWITCH SIGNAL

##### With CONSULT-III

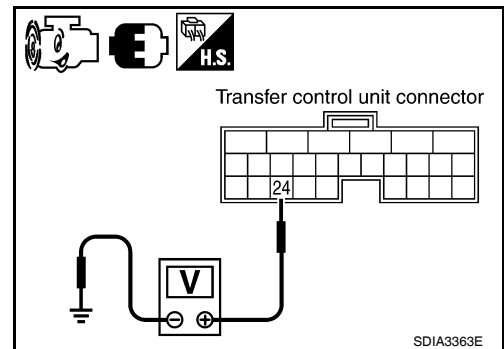
1. Start engine.
2. Select DATA MONITOR mode for ALL MODE AWD/4WD with CONSULT-III.
3. Read out the value of 4L POSI SW.

Condition	Display value
<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	4WD shift switch: 4LO ON
Except the above	OFF

##### Without CONSULT-III

1. Start engine.
2. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
E142	24 - Ground	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	4WD shift switch: 4LO 0V
		Except the above	Battery voltage



#### OK or NG

- OK >> GO TO 5.  
 NG >> GO TO 2.

#### 2. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND 4LO SWITCH

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)

# P1810 4 LO SWITCH

## < COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

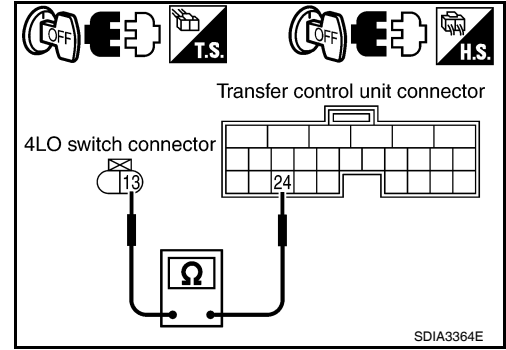
- Disconnect transfer control unit harness connector and the 4LO switch harness connector.
- Check continuity between transfer control unit harness connector E142 terminal 24 and 4LO switch harness connector F60 terminal 13.

**Continuity should exist.**

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

### OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace damaged parts.



## 3. CHECK GROUND CIRCUIT

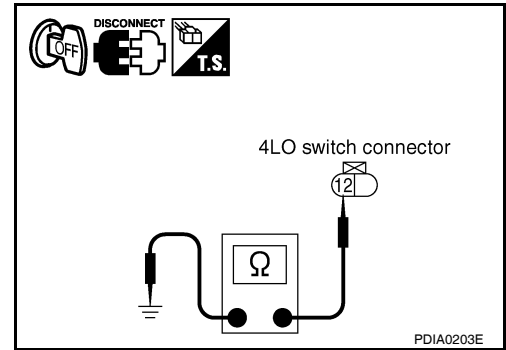
- Turn ignition switch OFF. (Stay for at least 5 seconds.)
- Disconnect 4LO switch harness connector.
- Check continuity between 4LO switch harness connector F60 terminal 12 and ground.

**Continuity should exist.**

Also check harness for short to power.

### OK or NG

- OK >> GO TO 4.
- NG >> Repair open circuit or short to power in harness or connectors.



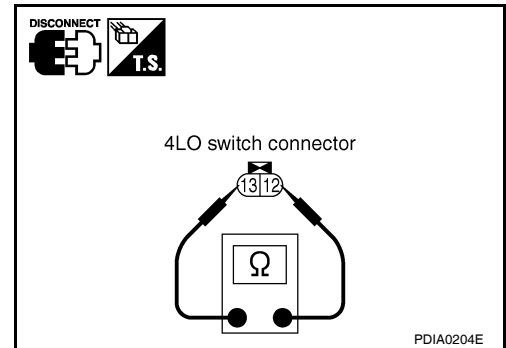
## 4. CHECK 4LO SWITCH

- Turn ignition switch OFF. (Stay for at least 5 seconds.)
- Disconnect 4LO switch harness connector.
- Remove 4LO switch. Refer to [DLN-12. "Component Parts Location"](#).
- Push and release 4LO switch and check continuity between 4LO switch terminals 12 and 13.

Terminal	Condition	Continuity
12 - 13	Push 4LO switch	Yes
	Release 4LO switch	No

### OK or NG

- OK >> GO TO 5.
- NG >> Replace 4LO switch.



## 5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54. "Reference Value"](#).

### OK or NG

- OK >> GO TO 6.
- NG >> Check transfer 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 a vehicle for a while.

### OK or NG

- OK >> Inspection End.
- NG >> Replace transfer control unit. Refer to [DLN-90. "Removal and Installation"](#).

# P1810 4 LO SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

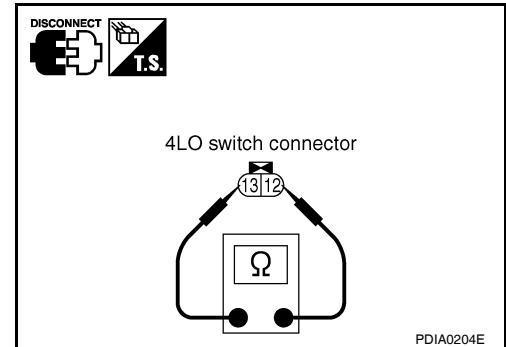
## Component Inspection

INFOID:000000003789463

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect 4LO switch harness connector.
3. Remove 4LO switch. Refer to [DLN-12, "Component Parts Location"](#).
4. Push and release 4LO switch and check continuity between 4LO switch terminals 12 and 13.

Terminal	Condition	Continuity
12 - 13	Push 4LO switch	Yes
	Release 4LO switch	No

5. If the inspection results are not normal replace the 4LO switch.



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# P1813 4WD SHIFT SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1813 4WD SHIFT SWITCH

### Description

INFOID:000000003789464

The 4WD shift switch allows the driver to select 2WD or 4WD and 4H or 4LO. DTC P1813 or flash code 9 will set if more than two switch inputs are simultaneously detected by the transfer control unit due to a short circuit in the 4WD shift switch.

### DTC Logic

INFOID:000000003789465

#### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1813]	4WD MODE SW	More than two switch inputs are simultaneously detected due to short circuit of 4WD shift switch.	<a href="#">DLN-30. "Diagnosis Procedure (With 3 Control Dial System Without Auto A/C)"</a> or, <a href="#">DLN-32. "Diagnosis Procedure (With 2 Control Dial System or Auto A/C)"</a>

#### DTC CONFIRMATION PROCEDURE

##### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1813 or flash code 9 displayed?

- YES >> Perform diagnosis procedure. Refer to [DLN-30. "Diagnosis Procedure \(With 3 Control Dial System Without Auto A/C\)"](#) or [DLN-32. "Diagnosis Procedure \(With 2 Control Dial System or Auto A/C\)"](#).
- NO >> Inspection End.

#### Diagnosis Procedure (With 3 Control Dial System Without Auto A/C)

INFOID:000000003789466

##### 1. CHECK 4WD SHIFT SWITCH SIGNAL

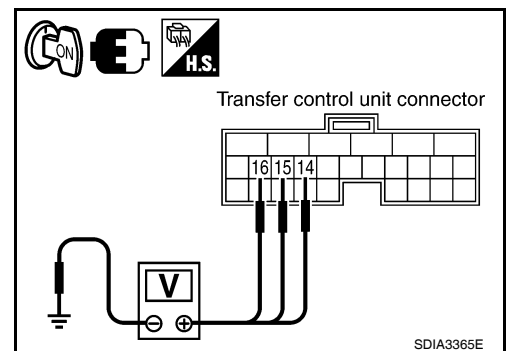
###### Ⓟ With CONSULT-III

1. Turn ignition switch ON.
2. Select DATA MONITOR mode for ALL MODE AWD/4WD with CONSULT-III.
3. Read out ON/OFF switching action of the 2WD SWITCH, 4H SWITCH, 4L SWITCH with operating 4WD shift switch.

###### ⊗ Without CONSULT-III

1. Turn ignition switch ON.
2. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal	Condition	Voltage (Approx.)
E142	14 - Ground	4WD shift switch: 2WD	Battery voltage
		4WD shift switch: 4H and 4LO	0V
	15 - Ground	4WD shift switch: 4H	Battery voltage
		4WD shift switch: 2WD and 4LO	0V
	16 - Ground	4WD shift switch: 4LO	Battery voltage
		4WD shift switch: 2WD and 4H	0V



#### OK or NG

- OK >> GO TO 5.

# P1813 4WD SHIFT SWITCH

< COMPONENT DIAGNOSIS >

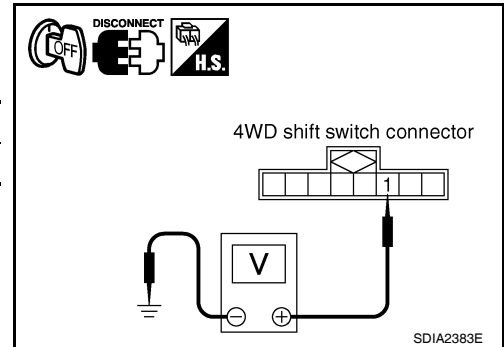
[TRANSFER: TX15B]

NG >> GO TO 2.

## 2. CHECK 4WD SHIFT SWITCH POWER SUPPLY CIRCUIT

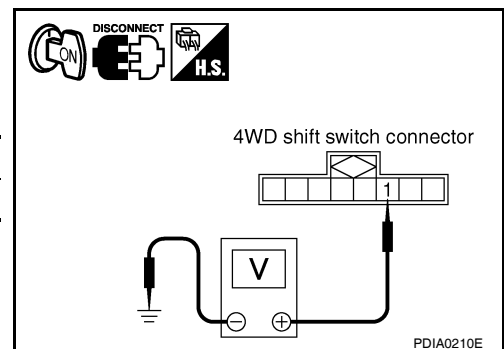
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect 4WD shift switch harness connector.
3. Check voltage between 4WD shift switch harness connector terminal 1 and ground.

Connector	Terminal	Voltage (Approx.)
M141	1 - Ground	0V



4. Turn ignition switch ON. (Do not start engine.)
5. Check voltage between 4WD shift switch harness connector terminal 1 and ground.

Connector	Terminal	Voltage (Approx.)
M141	1 - Ground	Battery voltage



**OK or NG**

OK >> GO TO 3.

NG >> 1. Check harness for short or open between 4WD shift switch harness connector terminal 1 and transfer shut off relay 2 harness connector E47 terminal 3 and 10A fuse (No. 26 located in the fuse and fusible link box). If any items are damaged, repair or replace damaged parts.

2. Perform trouble diagnosis for power supply circuit. Refer to [DLN-20, "Diagnosis Procedure"](#).

## 3. CHECK HARNESS BETWEEN 4WD SHIFT SWITCH AND TRANSFER CONTROL UNIT

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector and the 4WD shift switch harness connector.
3. Check continuity between the following terminals.
  - Transfer control unit harness connector E142 terminal 14 and 4WD shift switch harness connector M141 terminal 3.
  - Transfer control unit harness connector E142 terminal 15 and 4WD shift switch harness connector M141 terminal 5.
  - Transfer control unit harness connector E142 terminal 16 and 4WD shift switch harness connector M141 terminal 6.

**Continuity should exist.**

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

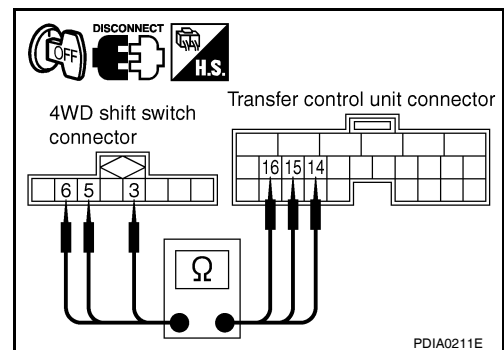
**OK or NG**

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

## 4. CHECK 4WD SHIFT SWITCH

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Remove 4WD shift switch harness connector.



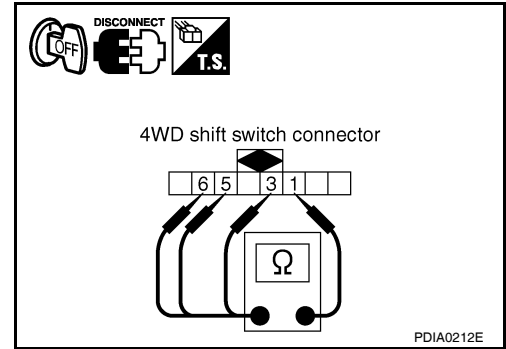
# P1813 4WD SHIFT SWITCH

## < COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

3. Operate 4WD shift switch and check continuity between 4WD shift switch terminals.

Terminal	Condition	Continuity
1 - 3	4WD shift switch: 2WD	Yes
	4WD shift switch: 4H and 4LO	No
1 - 5	4WD shift switch: 4H	Yes
	4WD shift switch: 2WD and 4LO	No
1 - 6	4WD shift switch: 4LO	Yes
	4WD shift switch: 2WD and 4H	No



### OK or NG

- OK >> GO TO 5.  
 NG >> Replace 4WD shift switch.

## 5.CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

### OK or NG

- OK >> GO TO 6.  
 NG >> Check transfer 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 a vehicle for a while.

### OK or NG

- OK >> Inspection End.  
 NG >> Replace transfer control unit. Refer to [DLN-90, "Removal and Installation"](#).

## Diagnosis Procedure (With 2 Control Dial System or Auto A/C)

INFOID:000000003789467

## 1.CHECK 4WD SHIFT SWITCH SIGNAL

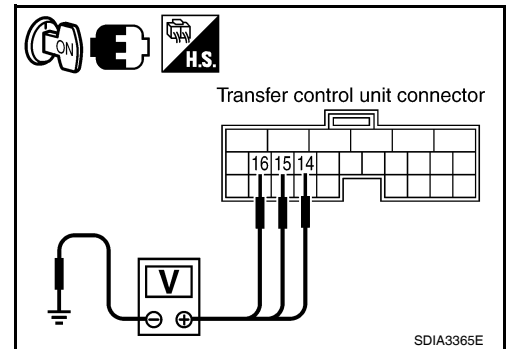
### Ⓟ With CONSULT-III

- Turn ignition switch ON.
- Select DATA MONITOR mode for ALL MODE AWD/4WD with CONSULT-III.
- Read out ON/OFF switching action of the 2WD SWITCH, 4H SWITCH, 4L SWITCH with operating 4WD shift switch.

### ⓧ Without CONSULT-III

- Turn ignition switch ON.
- Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal	Condition	Voltage (Approx.)
E142	14 - Ground	4WD shift switch: 2WD	Battery voltage
		4WD shift switch: 4H and 4LO	0V
	15 - Ground	4WD shift switch: 4H	Battery voltage
		4WD shift switch: 2WD and 4LO	0V
	16 - Ground	4WD shift switch: 4LO	Battery voltage
		4WD shift switch: 2WD and 4H	0V



### OK or NG

- OK >> GO TO 5.



# P1813 4WD SHIFT SWITCH

< COMPONENT DIAGNOSIS >

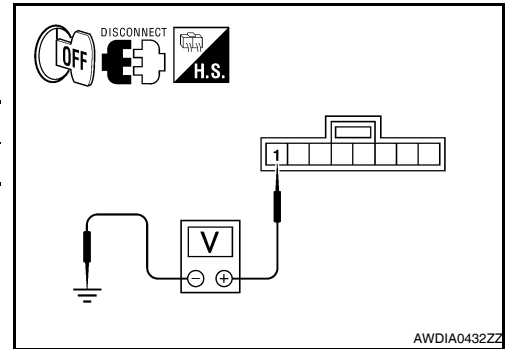
[TRANSFER: TX15B]

NG >> GO TO 2.

## 2. CHECK 4WD SHIFT SWITCH POWER SUPPLY CIRCUIT

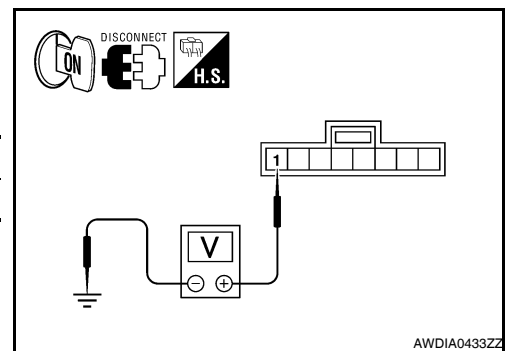
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect 4WD shift switch harness connector.
3. Check voltage between 4WD shift switch harness connector terminal 1 and ground.

Connector	Terminal	Voltage (Approx.)
M140	1 - Ground	0V



4. Turn ignition switch ON. (Do not start engine.)
5. Check voltage between 4WD shift switch harness connector terminal 1 and ground.

Connector	Terminal	Voltage (Approx.)
M140	1 - Ground	Battery voltage



OK or NG

OK >> GO TO 3.

NG >> 1. Check harness for short or open between 4WD shift switch harness connector terminal 1 and transfer shut off relay 2 harness connector E47 terminal 3 and 10A fuse (No. 26 located in the fuse and fusible link box). If any items are damaged, repair or replace damaged parts.

2. Perform trouble diagnosis for power supply circuit. Refer to [DLN-20, "Diagnosis Procedure"](#).

## 3. CHECK HARNESS BETWEEN 4WD SHIFT SWITCH AND TRANSFER CONTROL UNIT

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector and the 4WD shift switch harness connector.
3. Check continuity between the following terminals.
  - Transfer control unit harness connector E142 (B) terminal 14 and 4WD shift switch harness connector M140 (A) terminal 3.
  - Transfer control unit harness connector E142 (B) terminal 15 and 4WD shift switch harness connector M140 (A) terminal 5.
  - Transfer control unit harness connector E142 (B) terminal 16 and 4WD shift switch harness connector M140 (A) terminal 6.

**Continuity should exist.**

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

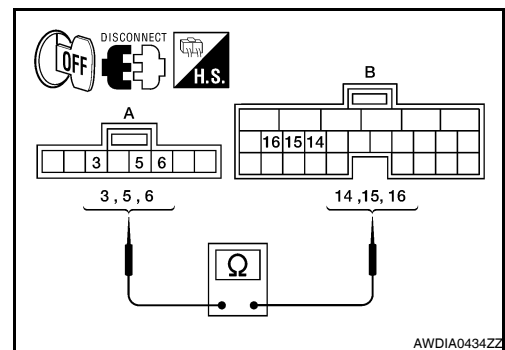
OK or NG

OK >> GO TO 4.

NG >> Repair or replace damaged parts.

## 4. CHECK 4WD SHIFT SWITCH

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Remove 4WD shift switch.



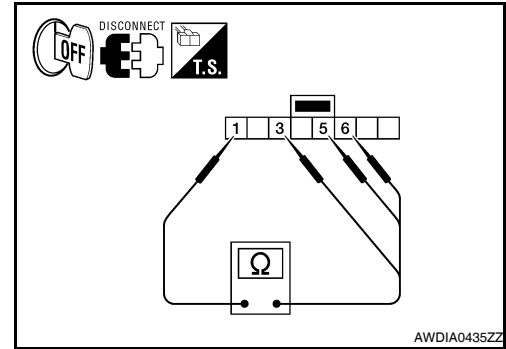
# P1813 4WD SHIFT SWITCH

## < COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

- Operate 4WD shift switch and check continuity between 4WD shift switch terminals.

Terminal	Condition	Continuity
1 - 3	4WD shift switch: 2WD	Yes
	4WD shift switch: 4H and 4LO	No
1 - 5	4WD shift switch: 4H	Yes
	4WD shift switch: 2WD and 4LO	No
1 - 6	4WD shift switch: 4LO	Yes
	4WD shift switch: 2WD and 4H	No



### OK or NG

- OK >> GO TO 5.
- NG >> Replace 4WD shift switch.

## 5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

### OK or NG

- OK >> GO TO 6.
- NG >> Check transfer 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 a vehicle for a while.

### OK or NG

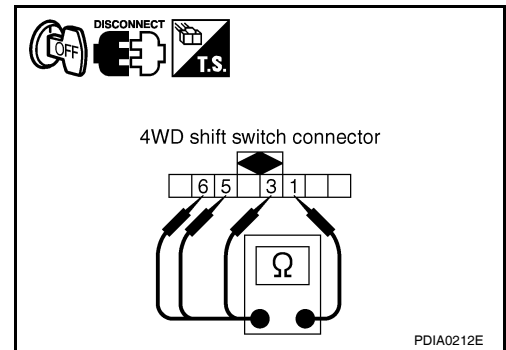
- OK >> Inspection End.
- NG >> Replace transfer control unit. Refer to [DLN-90, "Removal and Installation"](#).

## Component Inspection (With 3 Control Dial System Without Auto A/C)

INFOID:000000003789468

- Turn ignition switch OFF. (Stay for at least 5 seconds.)
- Remove 4WD shift switch harness connector.
- Operate 4WD shift switch and check continuity between 4WD shift switch terminals.

Terminal	Condition	Continuity
1 - 3	4WD shift switch: 2WD	Yes
	4WD shift switch: 4H and 4LO	No
1 - 5	4WD shift switch: 4H	Yes
	4WD shift switch: 2WD and 4LO	No
1 - 6	4WD shift switch: 4LO	Yes
	4WD shift switch: 2WD and 4H	No



- If the inspection results are abnormal replace the 4WD shift switch.

## Component Inspection (With 2 Control Dial System or Auto A/C)

INFOID:000000003789469

- Turn ignition switch OFF. (Stay for at least 5 seconds.)
- Remove 4WD shift switch harness connector.

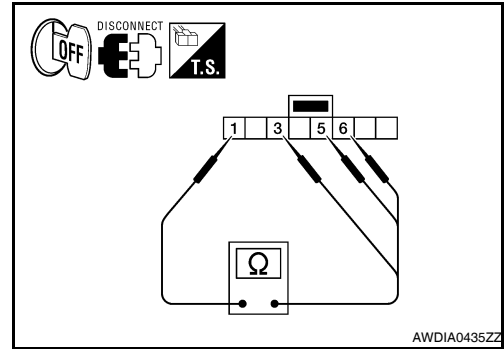
# P1813 4WD SHIFT SWITCH

## < COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

- Operate 4WD shift switch and check continuity between 4WD shift switch terminals.

Terminal	Condition	Continuity
1 - 3	4WD shift switch: 2WD	Yes
	4WD shift switch: 4H and 4LO	No
1 - 5	4WD shift switch: 4H	Yes
	4WD shift switch: 2WD and 4LO	No
1 - 6	4WD shift switch: 4LO	Yes
	4WD shift switch: 2WD and 4H	No



- If the inspection results are abnormal replace the 4WD shift switch.

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# P1814 WAIT DETECTION SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1814 WAIT DETECTION SWITCH

### Description

INFOID:000000003789470

The wait detection switch detects if the transfer case is in 4WD. DTC P1814 or flash code 10 will set if an improper signal from the wait detection switch is input due to open or short circuit.

### DTC Logic

INFOID:000000003789471

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1814]	4WD DETECT SWITCH	Improper signal from wait detection switch is input due to open or short circuit.	<a href="#">DLN-36. "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

#### Is DTC P1814 or flash code 10 detected?

- YES >> Perform diagnosis procedure. Refer to [DLN-36. "Diagnosis Procedure"](#).  
 NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789472

#### 1. CHECK WAIT DETECTION SWITCH SIGNAL

##### Ⓜ With CONSULT-III

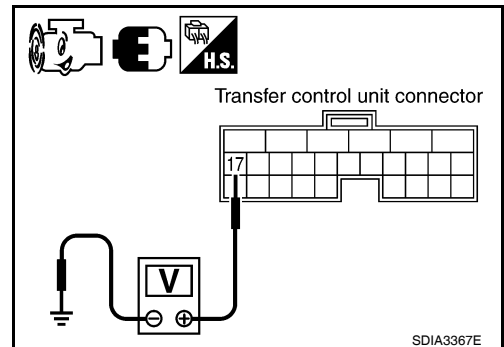
1. Start engine.
2. Select DATA MONITOR mode for ALL MODE AWD/4WD with CONSULT-III.
3. Read out the value of WAIT DETCT SW.

Condition		Display value
<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	4WD shift switch: 4H and 4LO	ON
	4WD shift switch: 2WD	OFF

##### ⓧ Without CONSULT-III

1. Start engine.
2. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
E142	17 - Ground	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul> 4WD shift switch : 4H and 4LO	0V
		4WD shift switch: 2WD	Battery voltage



#### OK or NG

- OK >> GO TO 5.  
 NG >> GO TO 2.

#### 2. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND WAIT DETECTION SWITCH

# P1814 WAIT DETECTION SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

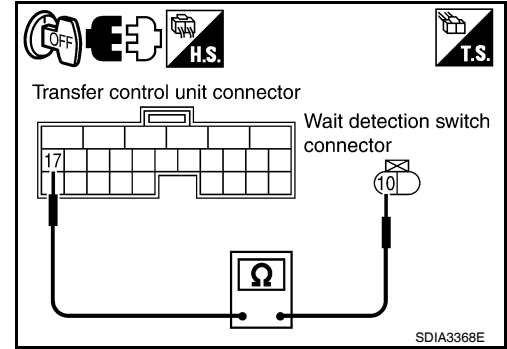
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector and the wait detection switch harness connector.
3. Check continuity between transfer control unit harness connector E142 terminal 17 and wait detection switch harness connector F59 terminal 10.

**Continuity should exist.**

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

OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace damaged parts.



## 3.CHECK GROUND CIRCUIT

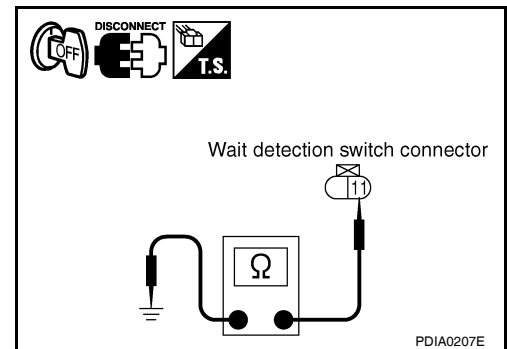
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect wait detection switch harness connector.
3. Check continuity between wait detection switch harness connector F59 terminal 11 and ground.

**Continuity should exist.**

Also check harness for short to power.

OK or NG

- OK >> GO TO 4.
- NG >> Repair open circuit or short to power in harness or connectors.



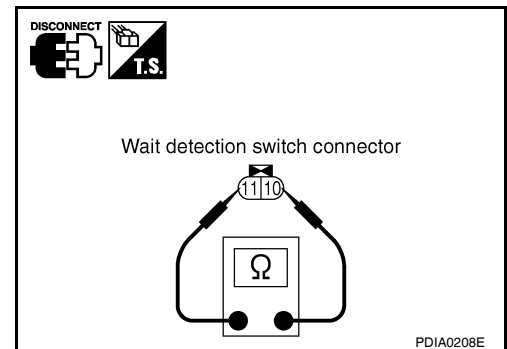
## 4.CHECK WAIT DETECTION SWITCH

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect wait detection switch harness connector.
3. Remove wait detection switch. Refer to [DLN-12, "Component Parts Location"](#).
4. Push and release wait detection switch and check continuity between wait detection switch terminals 10 and 11.

Terminal	Condition	Continuity
10 - 11	Push wait detection switch	Yes
	Release wait detection switch	No

OK or NG

- OK >> GO TO 5.
- NG >> Replace wait detection switch.



## 5.CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

OK or NG

- OK >> GO TO 6.
- NG >> Check transfer 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 a vehicle for a while.

OK or NG

- OK >> Inspection End.
- NG >> Replace transfer control unit. Refer to [DLN-90, "Removal and Installation"](#).

# P1814 WAIT DETECTION SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

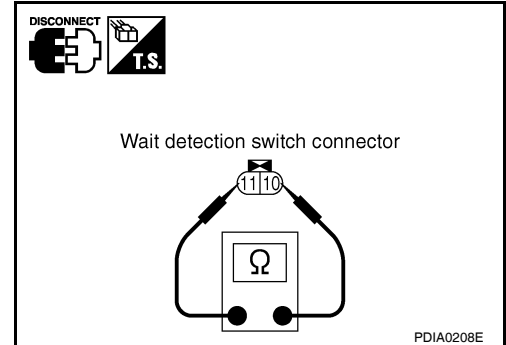
## Component Inspection

INFOID:000000003789473

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect wait detection switch harness connector.
3. Remove wait detection switch. Refer to [DLN-12, "Component Parts Location"](#).
4. Push and release wait detection switch and check continuity between wait detection switch terminals 10 and 11.

Terminal	Condition	Continuity
10 - 11	Push wait detection switch	Yes
	Release wait detection switch	No

5. If the inspection results are abnormal replace the wait detection switch.



# P1816 PNP SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1816 PNP SWITCH

### Description

INFOID:000000003789474

The A/T PNP switch transmits the A/T position indicator signal (PNP switch signal) via CAN communication to the transfer control unit. DTC P1816 or flash code 14 will set when the A/T PNP switch signal is malfunctioning or there is a communication error.

### DTC Logic

INFOID:000000003789475

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1816]	PNP SW/CIRC	When A/T PNP switch signal is malfunction or communication error between the vehicles.	<a href="#">DLN-39. "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1816 or flash code 14 displayed?

- YES >> Perform diagnosis procedure. Refer to [DLN-39. "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789476

#### 1. CHECK DTC WITH TCM

Perform self-diagnosis with TCM. Refer to [TM-35. "CONSULT-III Function \(TRANSMISSION\)"](#).

Is any malfunction detected by self-diagnosis?

- YES >> Check the malfunctioning system.  
NO >> GO TO 2.

#### 2. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54. "Reference Value"](#).

Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.

#### 3. CHECK DTC

Drive the vehicle and then perform self-diagnosis.

Is DTC P1816 displayed?

- YES >> Perform self-diagnosis with TCM again.  
NO >> Inspection End.

# P1817 ACTUATOR MOTOR

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1817 ACTUATOR MOTOR

### Description

INFOID:000000003789477

The actuator motor receives signals from the transfer control unit and controls shift rods which shift the transfer case. DTC P1817 or flash code 11 will set when any of the following occur:

- Motor does not operate properly due to open or short circuit in actuator motor.
- Malfunction is detected in the actuator motor. (When 4WD shift switch is operated and actuator motor does not operate)
- Malfunction is detected in transfer shift high relay or transfer shift low relay.

### DTC Logic

INFOID:000000003789478

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1817]	SHIFT ACTUATOR	<ul style="list-style-type: none"><li>• Motor does not operate properly due to open or short circuit in actuator motor.</li><li>• Malfunction is detected in the actuator motor. (When 4WD shift switch is operated and actuator motor is not operated)</li><li>• Malfunction is detected in transfer shift high relay or transfer shift low relay.</li></ul>	<a href="#">DLN-40. "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1817 or flash code 11 detected?

YES >> Perform diagnosis procedure. Refer to [DLN-40. "Diagnosis Procedure"](#).

NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789479

#### 1. CHECK ACTUATOR MOTOR SIGNAL

Ⓜ With CONSULT-III

1. Start engine.
2. Select DATA MONITOR mode for ALL MODE AWD/4WD with CONSULT-III.
3. Read out the value of SHIFT ACT1, SHIFT AC MON1, SHIFT ACT2, SHIFT AC MON2.



# P1817 ACTUATOR MOTOR

< COMPONENT DIAGNOSIS >

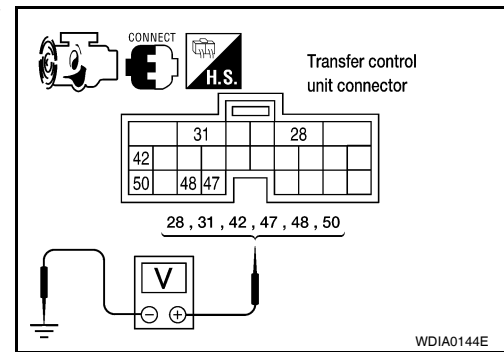
[TRANSFER: TX15B]

Monitored item	Condition	Display value
SHIFT ACT1	4WD shift switch: 2WD to 4H or 4H to 4LO or 2WD to 4LO	ON
	Except the above	OFF
SHIFT AC MON1	4WD shift switch: 2WD to 4H or 4H to 4LO or 2WD to 4LO	ON
	Except the above	OFF
SHIFT ACT2	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD	ON
	Except the above	OFF
SHIFT AC MON2	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD	ON
	Except the above	OFF

**⊗ Without CONSULT-III**

1. Start engine.
2. Depress brake pedal and stop vehicle.
3. Set A/T selector lever to N position.
4. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
E143	28 - Ground	When 4WD shift switch is operated (While actuator motor is operating.)	Battery voltage → 0V
		When 4WD shift switch is not operated	0V
	31 - Ground	Always	0V
E143	42 - Ground	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	4WD shift switch: 2WD to 4H or 4H to 4LO or 2WD to 4LO 0V Except the above Battery voltage
		E143	47 - Ground
<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD Battery voltage → 0V Except the above 0V		
50 - Ground	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD 0V Except the above Battery voltage		



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# P1817 ACTUATOR MOTOR

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

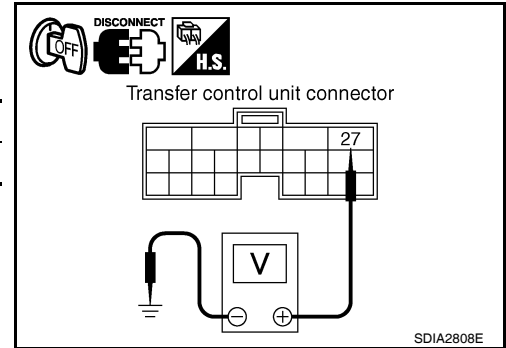
OK or NG

- OK >> GO TO 9.
- NG >> GO TO 2.

## 2. CHECK ACTUATOR MOTOR POWER SUPPLY CIRCUIT

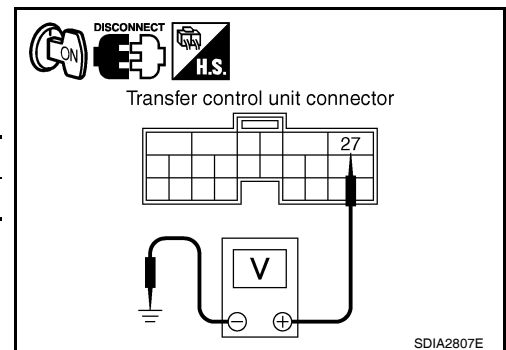
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminal 27 and ground.

Connector	Terminal	Voltage (Approx.)
E143	27 - Ground	0V



4. Turn ignition switch ON.
5. Check voltage between transfer control unit harness connector terminal 27 and ground.

Connector	Terminal	Voltage (Approx.)
E143	27 - Ground	Battery voltage



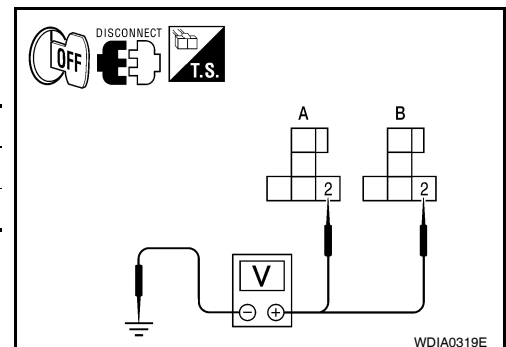
OK or NG

- OK >> GO TO 3.
- NG >> 1. Check harness for short or open between transfer control unit harness connector E143 terminal 27 and transfer shut off relay 2 harness connector E47 terminal 3 and 10A fuse (No. 26, located in the fuse and fusible link box). If any items are damaged, repair or replace damaged parts.
- 2. Perform trouble diagnosis for power supply circuit. Refer to [DLN-20, "Diagnosis Procedure"](#).

## 3. CHECK TRANSFER SHIFT RELAY POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Remove transfer shift high relay and transfer shift low relay. Refer to [DLN-12, "Component Parts Location"](#).
3. Check voltage between transfer shift high/low relay harness connector terminals and ground.

Connector	Terminal	Voltage (Approx.)
A: E156	2 - Ground	0V
B: E157	2 - Ground	0V



# P1817 ACTUATOR MOTOR

## < COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

4. Turn ignition switch ON. (Do not start engine.)
5. Check voltage between transfer shift high/low relay harness connector terminals and ground.

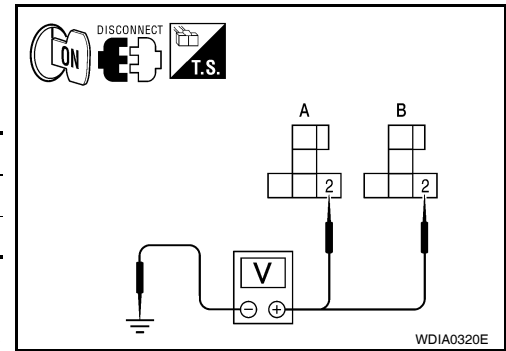
Connector	Terminal	Voltage (Approx.)
A: E156	2 - Ground	Battery voltage
B: E157	2 - Ground	Battery voltage

### OK or NG

OK >> GO TO 4.

NG >> Check the following. If any items are damaged, repair or replace damaged parts.

- Harness for short or open between transfer control unit harness connector terminal 27 and transfer shift high relay harness connector E156 terminal 2.
- Harness for short or open between transfer control unit harness connector terminal 27 and transfer shift low relay harness connector terminal E157 terminal 2.



## 4. CHECK TRANSFER SHIFT RELAY

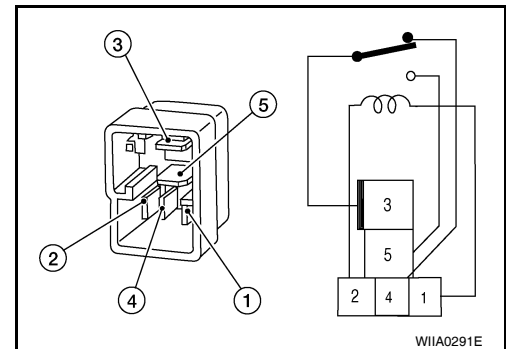
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Remove transfer shift high relay and transfer shift low relay.
3. Apply 12V direct current between transfer shift high relay and transfer shift low relay terminals 1 and 2.
4. Check continuity between relay terminals 3 and 4, 3 and 5.

Terminal	Condition	Continuity
3 - 4	12V direct current supply between terminals 1 and 2	No
	OFF	Yes
3 - 5	12V direct current supply between terminals 1 and 2	Yes
	OFF	No

### OK or NG

OK >> GO TO 5.

NG >> Replace the transfer relay.



## 5. CHECK (1) HARNESS BETWEEN TRANSFER CONTROL UNIT AND TRANSFER SHIFT RELAY

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector.
3. Remove transfer shift high relay and transfer shift low relay.
4. Check continuity between the following terminals.
  - Transfer control unit harness connector E143 (A) terminal 42 and transfer shift high relay harness connector E156 (B) terminal 1.
  - Transfer control unit harness connector E143 (A) terminal 50 and transfer shift low relay harness connector E157 (C) terminal 1.

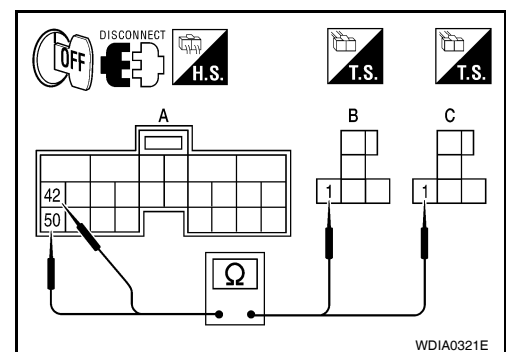
**Continuity should exist.**

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

### OK or NG

OK >> GO TO 6.

NG >> Repair or replace damaged parts.



## 6. CHECK (2) HARNESS BETWEEN TRANSFER CONTROL UNIT AND TRANSFER SHIFT RELAY

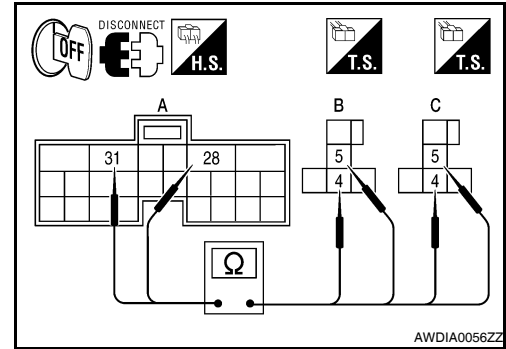
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector.
3. Remove transfer shift high relay and transfer shift low relay.

# P1817 ACTUATOR MOTOR

## < COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

4. Check continuity between the following terminals.
  - Transfer control unit harness connector E143 (A) terminal 28 and transfer shift high relay harness connector E156 (B) terminal 5.
  - Transfer control unit harness connector E143 (A) terminal 28 and transfer shift low relay harness connector E157 (C) terminal 5.
  - Transfer control unit harness connector E143 (A) terminal 31 and transfer shift high relay harness connector E156 (B) terminal 4.
  - Transfer control unit harness connector E143 (A) terminal 31 and transfer shift low relay harness connector E157 (C) terminal 4.



**Continuity should exist.**

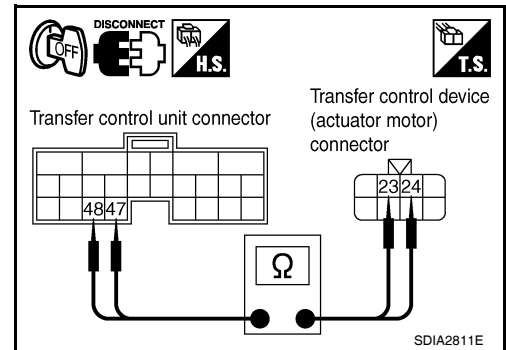
Also check harness for short to ground and short to power.

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.

## 7. CHECK ACTUATOR MOTOR OPERATION CIRCUIT

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector and the transfer control device harness connector.
3. Check continuity between the following terminals.
  - Transfer control unit harness connector E143 terminal 48 and transfer control device (actuator motor) harness connector F58 terminal 23.
  - Transfer control unit harness connector E143 terminal 47 and transfer control device (actuator motor) harness connector F58 terminal 24.



- Transfer control device (actuator motor) harness connector F58 (A) terminal 24 and transfer shift high relay harness connector E156 (B) terminal 3.
- Transfer control device (actuator motor) harness connector F58 (A) terminal 23 and transfer shift low relay harness connector E157 (C) terminal 3.

**Continuity should exist.**

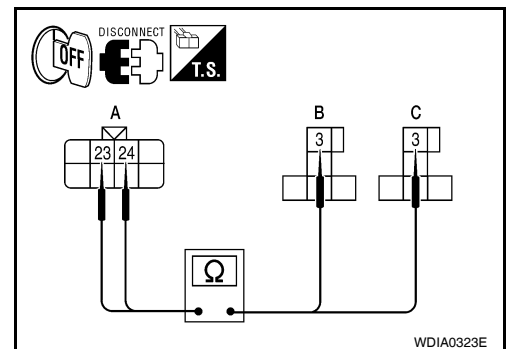
Also check harness for short to ground and short to power.

OK or NG

- OK >> GO TO 8.
- NG >> Repair or replace damaged parts.

## 8. CHECK ACTUATOR MOTOR

1. Remove transfer control device. Refer to [DLN-95, "Removal and Installation"](#).



# P1817 ACTUATOR MOTOR

[TRANSFER: TX15B]

## < COMPONENT DIAGNOSIS >

- Check operation by applying battery voltage to transfer control device (actuator motor) terminals 23 and 24.

**CAUTION:**

**Be careful not to overheat the harness.**

Terminal	Actuator motor
24 (Battery voltage) - 23 (Ground)	Clockwise rotate
23 (Battery voltage) - 24 (Ground)	Counterclockwise rotate

### Does actuator motor rotate?

- YES >> GO TO 9.
- NO >> Replace transfer control device.

## 9. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

### OK or NG

- OK >> GO TO 10.
- NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

## 10. CHECK DTC

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

### OK or NG

- OK >> Inspection End.
- NG >> Replace transfer control unit. Refer to [DLN-90, "Removal and Installation"](#).

## Component Inspection

INFOID:000000003789480

### ACTUATOR MOTOR

- Remove transfer control device. Refer to [DLN-95, "Removal and Installation"](#).
- Check operation by applying battery voltage to transfer control device (actuator motor) terminals 23 and 24.

**CAUTION:**

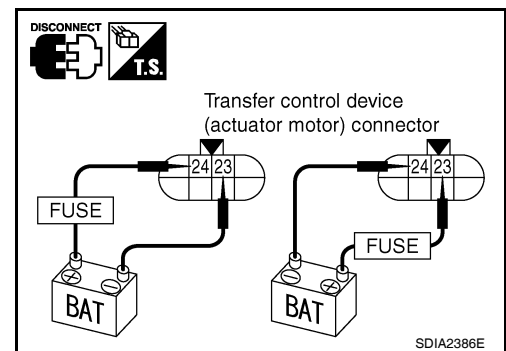
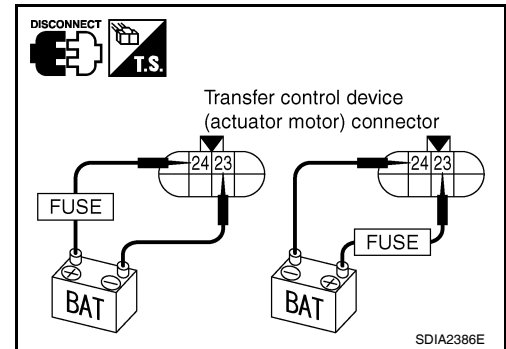
**Be careful not to overheat the harness.**

Terminal	Actuator motor
24 (Battery voltage) - 23 (Ground)	Clockwise rotate
23 (Battery voltage) - 24 (Ground)	Counterclockwise rotate

- If the inspection results are abnormal replace the transfer control device.

### TRANSFER RELAY

- Turn ignition switch "OFF". (Stay for at least 5 seconds.)
- Remove transfer shift high relay and transfer shift low relay. Refer to [DLN-12, "Component Parts Location"](#)
- Apply 12V direct current between transfer relay terminals 1 and 2.



# P1817 ACTUATOR MOTOR

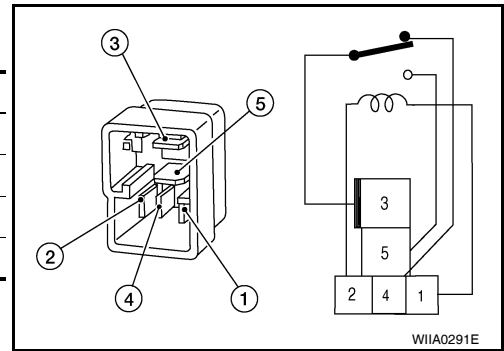
## < COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

4. Check continuity between relay terminals 3 and 4, and 3 and 5.

Terminal	Condition	Continuity
3 - 4	12V direct current supply between terminals 1 and 2	No
	OFF	Yes
3 - 5	12V direct current supply between terminals 1 and 2	Yes
	OFF	No

5. If NG, replace transfer shift high or low relay.



# P1818 ACTUATOR POSITION SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1818 ACTUATOR POSITION SWITCH

### Description

INFOID:000000003789481

The actuator position switch detects the current actuator motor range. DTC P1818 or flash code 12 will set if either of the following occur:

- Improper signal from actuator position switch is input due to open or short circuit.
- Malfunction is detected in actuator position switch.

### DTC Logic

INFOID:000000003789482

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1818]	SHIFT ACT POSI SW	<ul style="list-style-type: none"> <li>• Improper signal from actuator position switch is input due to open or short circuit.</li> <li>• Malfunction is detected in actuator position switch.</li> </ul>	<a href="#">DLN-47, "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1818 or flash code 12 detected?

- YES >> Perform diagnosis procedure. Refer to [DLN-47, "Diagnosis Procedure"](#).  
 NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789483

#### 1. CHECK ACTUATOR POSITION SWITCH SIGNAL

##### With CONSULT-III

1. Start engine.
2. Depress brake pedal and stop vehicle.
3. Set A/T selector lever to N position.
4. Select DATA MONITOR mode for ALL MODE AWD/4WD with CONSULT-III.
5. Read out the value of SHIFT POS SW1, SHIFT POS SW2, SHIFT POS SW3, SHIFT POS SW4.

Monitored item	Condition	Display value
SHIFT POS SW1	4WD shift switch: 2WD and 4LO	ON
	4WD shift switch: 4H	OFF
SHIFT POS SW2	4WD shift switch: 4LO	ON
	4WD shift switch: 2WD and 4H	OFF
SHIFT POS SW3	4WD shift switch: 2WD and 4H	ON
	4WD shift switch: 4LO	OFF
SHIFT POS SW4	4WD shift switch: 4H and 4LO	ON
	4WD shift switch: 2WD	OFF

##### Without CONSULT-III

1. Start engine.
2. Depress brake pedal and stop vehicle.
3. Set A/T selector lever to N position.

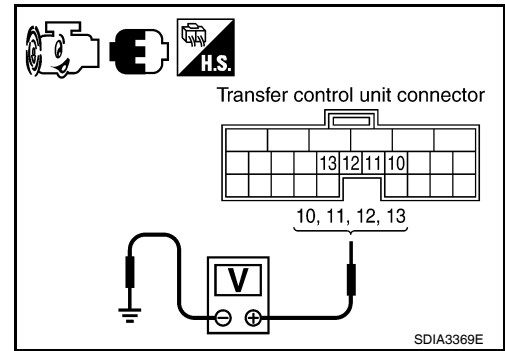
# P1818 ACTUATOR POSITION SWITCH

[TRANSFER: TX15B]

## < COMPONENT DIAGNOSIS >

4. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
E142	10 - Ground	4WD shift switch: 2WD and 4LO	0V
		4WD shift switch: 4H	Battery voltage
	11 - Ground	4WD shift switch: 4LO	0V
		4WD shift switch: 2WD and 4H	Battery voltage
	12 - Ground	4WD shift switch: 2WD and 4H	0V
		4WD shift switch: 4LO	Battery voltage
13 - Ground	4WD shift switch: 4H and 4LO	0V	
	4WD shift switch: 2WD	Battery voltage	

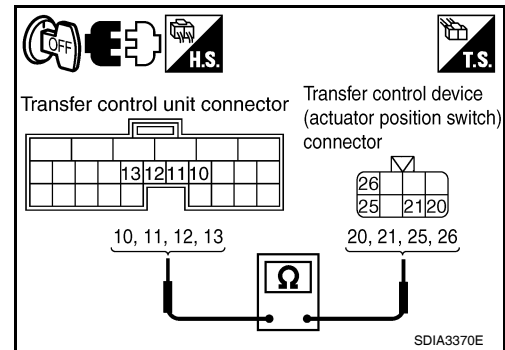


### OK or NG

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

## 2. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND ACTUATOR POSITION SWITCH

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector and the transfer control device harness connector.
3. Check continuity between the following terminals.
  - Transfer control unit harness connector E142 terminal 10 and transfer control device (actuator position switch) harness connector F58 terminal 26.
  - Transfer control unit harness connector E142 terminal 11 and transfer control device (actuator position switch) harness connector F58 terminal 20.
  - Transfer control unit harness connector E142 terminal 12 and transfer control device (actuator position switch) harness connector F58 terminal 21.
  - Transfer control unit harness connector E142 terminal 13 and transfer control device (actuator position switch) harness connector F58 terminal 25.



**Continuity should exist.**

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

### OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace damaged parts.

## 3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)



# P1818 ACTUATOR POSITION SWITCH

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

2. Check continuity between transfer control device (actuator position switch) harness connector F58 terminal 22 and ground.

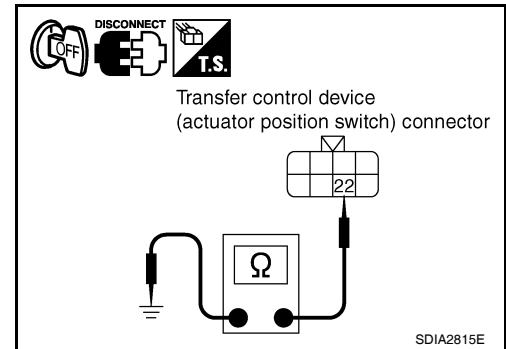
**Continuity should exist.**

Also check harness for short to power.

OK or NG

OK >> GO TO 4.

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



## 4.CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

OK or NG

OK >> GO TO 5.

NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

## 5.CHECK DTC

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

OK or NG

OK >> Inspection End.

NG >> Replace transfer control device. Refer to [DLN-95, "Removal and Installation"](#).

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# P1819 TRANSFER CONTROL DEVICE

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1819 TRANSFER CONTROL DEVICE

### Description

INFOID:000000003789484

The transfer control device integrates the actuator motor and actuator position switch. DTC P1819 of flash code 13 will set if either of the following conditions exist:

- Malfunction occurs in transfer control device drive circuit.
- Malfunction is detected in transfer shut off relay 1 and transfer shut off relay 2.

### DTC Logic

INFOID:000000003789485

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1819]	SHIFT ACT CIR	<ul style="list-style-type: none"> <li>• Malfunction is detected in transfer shut off relay 1 and transfer shut off relay 2.</li> <li>• Malfunction occurs in transfer control device drive circuit.</li> </ul>	<a href="#">DLN-50, "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1819 or flash code 13 detected?

- YES >> Perform diagnosis procedure. Refer to [DLN-50, "Diagnosis Procedure"](#).  
 NO >> Inspection End.

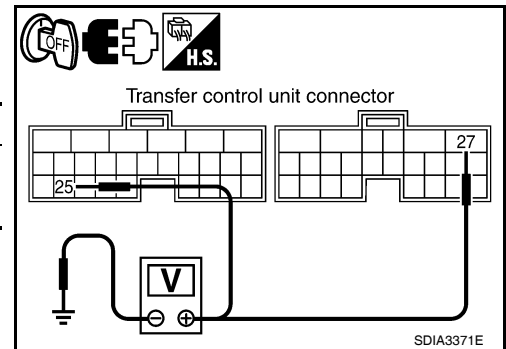
### Diagnosis Procedure

INFOID:000000003789486

#### 1. CHECK POWER SUPPLY

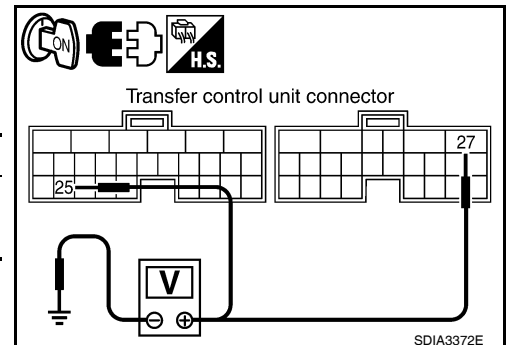
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal	Voltage (Approx.)
E142	25 - Ground	0V
E143	27 - Ground	



4. Turn ignition switch ON. (Do not start engine.)
5. Check voltage between transfer control unit harness connector terminals and ground.

Connector	Terminal	Voltage (Approx.)
E142	25 - Ground	Battery voltage
E143	27 - Ground	



OK or NG

- OK >> GO TO 2.  
 NG >> Check the following. If any items are damaged, repair or replace damaged parts.
- 10A fuse (No. 59, located in the fuse and relay block).

# P1819 TRANSFER CONTROL DEVICE

## < COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

- Harness for short or open between battery and transfer shut off relay 1 harness connector E46 terminal 5.
- Harness for short or open between transfer control unit harness connector E143 terminal 27 and transfer shut off relay 1 harness connector E46 terminal 3.
- Harness for short or open between ignition switch and transfer shut off relay 1 harness connector E46 terminal 2.
- Harness for short or open between transfer shut off relay 1 harness connector E46 terminal 1 and ground.
- Harness for short or open between ignition switch and transfer control unit harness connector E142 terminal 25.
- Battery and ignition switch.
- Transfer shut off relay 1. Refer to [DLN-22, "Component Inspection"](#).

## 2. CHECK GROUND CIRCUIT

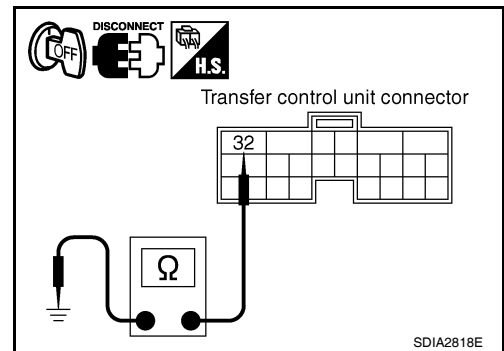
1. Turn ignition switch OFF (stay for at least 5 seconds).
2. Disconnect transfer control unit harness connector.
3. Check continuity between transfer control unit harness connector E143 terminal 32 and ground.

**Continuity should exist.**

Also check harness for short to power.

### OK or NG

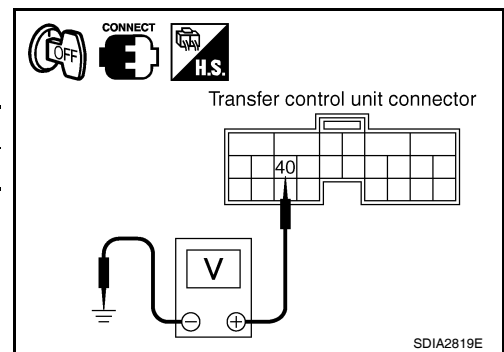
- OK >> GO TO 3.
- NG >> Repair open circuit or short to power in harness or connectors.



## 3. CHECK POWER SUPPLY SIGNAL

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Connect transfer control unit harness connector.
3. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal	Voltage (Approx.)
E143	40 - Ground	Battery voltage

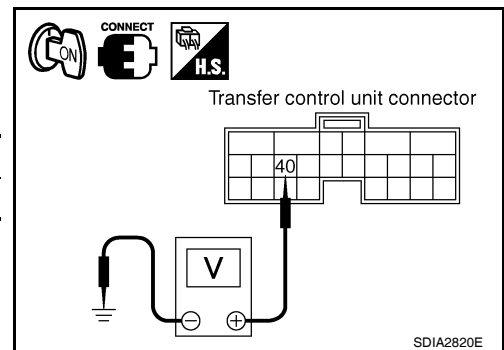


4. Turn ignition switch ON. (Do not start engine.)
5. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal	Voltage (Approx.)
E143	40 - Ground	0V

### OK or NG

- OK >> GO TO 4.
- NG >> Check the following. If any items are damaged, repair or replace damaged parts.
  - Harness for short or open between battery and transfer shut off relay 2 harness connector E47 terminal 1.
  - Harness for short or open between transfer shut off relay 2 harness connector E47 terminal 2 and transfer control unit harness connector E143 terminal 40.
  - Transfer shut off relay 2.



# P1819 TRANSFER CONTROL DEVICE

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

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## 4. CHECK TRANSFER CONTROL UNIT

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Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

### OK or NG

- OK-1 >> With CONSULT-III: GO TO 5.
- OK-2 >> Without CONSULT-III: GO TO 6.
- NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.

---

## 5. PERFORM SELF-DIAGNOSIS (WITH CONSULT-III)

---

### With CONSULT-III

1. Turn ignition switch ON. (Do not start engine.)
2. Select SELF-DIAG RESULTS mode for ALL MODE AWD/4WD with CONSULT-III.
3. Touch ERASE.
4. Turn ignition switch OFF and wait at least 10 seconds.
5. Perform the self-diagnosis again.

Is the SHIFT ACT CIR [P1819] displayed?

- YES >> Replace transfer control unit. Refer to [DLN-90, "Removal and Installation"](#).
- NO >> Inspection End.

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## 6. PERFORM SELF-DIAGNOSIS (WITHOUT CONSULT-III)

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### Without CONSULT-III

1. Perform the self-diagnosis and then erase self-diagnostic results. Refer to [DLN-16, "CONSULT-III Function \(ALL MODE AWD/4WD\)"](#).
2. Perform the self-diagnosis again.

Do the self-diagnostic results indicate transfer control device?

- YES >> Replace transfer control unit.
- NO >> Inspection End.

# P1820 ENGINE SPEED SIGNAL

< COMPONENT DIAGNOSIS >

[TRANSFER: TX15B]

## P1820 ENGINE SPEED SIGNAL

### Description

INFOID:000000003789487

The ECM transmits the engine speed signal via CAN communication to the transfer control unit. DTC P1820 or flash code 7 will set when either of the following occur:

- Malfunction is detected in engine speed signal that is output from the ECM.
- Improper signal is input while driving.

### DTC Logic

INFOID:000000003789488

### DTC DETECTION LOGIC

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1820]	ENGINE SPEED SIG	<ul style="list-style-type: none"><li>• Malfunction is detected in engine speed signal that is output from ECM through CAN communication.</li><li>• Improper signal is input while driving.</li></ul>	<a href="#">DLN-53, "Diagnosis Procedure"</a>

### DTC CONFIRMATION PROCEDURE

#### 1. DTC CONFIRMATION PROCEDURE

1. Turn ignition switch ON.
2. Perform self-diagnosis.

Is DTC P1820 or flash code 7 detected?

- YES >> Perform diagnosis procedure. Refer to [DLN-53, "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000003789489

#### 1. CHECK DTC WITH ECM

Perform self-diagnosis with ECM. Refer to [EC-67, "CONSULT-III Function \(ENGINE\)"](#).

Is any malfunction detected by self-diagnosis?

- YES >> Check the malfunctioning system.  
NO >> GO TO 2.

#### 2. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

Are the inspection results normal?

- YES >> GO TO 3.  
NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.

#### 3. CHECK DTC

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

Is DTC P1820 displayed?

- YES >> Perform self-diagnosis with ECM again.  
NO >> Inspection End.

# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

## ECU DIAGNOSIS

### TRANSFER CONTROL UNIT

#### Reference Value

INFOID:000000003789490

#### VALUE ON THE DIAGNOSIS TOOL

CONSULT-III data monitor item

Monitored item [Unit]	Content	Condition	Display value	
VHCL/S SEN·FR [km/h] or [mph]	Wheel speed (Front wheel)	Vehicle stopped	0 km/h (0 mph)	
		Vehicle running <b>CAUTION:</b> Check air pressure of tire under standard condition.	Approximately equal to the indication on speedometer (Inside of ±10%)	
VHCL/S SEN·RR [km/h] or [mph]	Wheel speed (Rear wheel)	Vehicle stopped	0 km/h (0 mph)	
		Vehicle running <b>CAUTION:</b> Check air pressure of tire under standard condition.	Approximately equal to the indication on speedometer (Inside of ±10%)	
ENGINE SPEED [rpm]	Engine speed	Engine stopped (Engine speed: Less than 400 rpm)	0 rpm	
		Engine running (Engine speed: 400 rpm or more)	Approximately equal to the indication on tachometer	
BATTERY VOLT [V]	Power supply voltage for transfer control unit	Ignition switch: ON	Battery voltage	
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	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	4WD shift switch: 4LO ON	
		Except the above	OFF	
ATP SWITCH [ON/OFF]	Condition of ATP switch	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	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	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	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

# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

Monitored item [Unit]	Content	Condition	Display value
VHCL/S COMP [km/h] or [mph]	Vehicle speed	Vehicle stopped	0 km/h (0 mph)
		Vehicle running <b>CAUTION:</b> Check air pressure of tire under standard condition.	Approximately equal to the indication on speedometer (Inside of ±10%)
SHIFT ACT 1 [ON/OFF]	Output condition to actuator motor (clockwise)	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul> 4WD shift switch : 2WD to 4H or 4H to 4LO or 2WD to 4LO	ON
		Except the above	OFF
SHIFT AC MON1 [ON/OFF]	Check signal for transfer control unit signal output	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul> 4WD shift switch : 2WD to 4H or 4H to 4LO or 2WD to 4LO	ON
		Except the above	OFF
SHIFT ACT 2 [ON/OFF]	Output condition to actuator motor (counterclockwise)	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul> 4WD shift switch : 4LO to 4H or 4H to 2WD or 4LO to 2WD	ON
		Except the above	OFF
SHIFT AC MON2 [ON/OFF]	Check signal for transfer control unit signal output	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul> 4WD shift switch : 4LO to 4H or 4H to 2WD or 4LO to 2WD	ON
		Except the above	OFF
SHIFT ACT/R MON [ON/OFF]	Operating condition of actuator motor relay (integrated in transfer control unit)	When 4WD shift switch is operated	ON
		When 4WD shift switch is not operated	OFF
SHIFT POS SW1 [ON/OFF]	Condition of actuator position switch 1	4WD shift switch: 2WD and 4LO	ON
SHIFT POS SW2 [ON/OFF]	Condition of actuator position switch 2	4WD shift switch: 4H	OFF
		4WD shift switch: 4LO	ON
SHIFT POS SW3 [ON/OFF]	Condition of actuator position switch 3	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul> 4WD shift switch: 2WD and 4H	OFF
		4WD shift switch: 2WD and 4H	ON
SHIFT POS SW4 [ON/OFF]	Condition of actuator position switch 4	4WD shift switch: 4LO	OFF
		4WD shift switch: 4H and 4LO	ON
4WD FAIL LAMP [ON/OFF]	4WD warning lamp condition	4WD warning lamp: ON	ON
		4WD warning lamp: OFF	OFF
2WD IND [ON/OFF]	Rear indicator of 4WD shift indicator lamp condition	Rear indicator of 4WD shift indicator lamp: ON	ON
		Rear indicator of 4WD shift indicator lamp: OFF	OFF
4H IND [ON/OFF]	Front and center indicator of 4WD shift indicator lamp condition	Front and center indicator of 4WD shift indicator lamp : ON	ON
		Front and center indicator of 4WD shift indicator lamp : OFF	OFF
4L IND [ON/OFF]	4LO indicator lamp condition	4LO indicator lamp: ON	ON
		4LO indicator lamp: OFF	OFF

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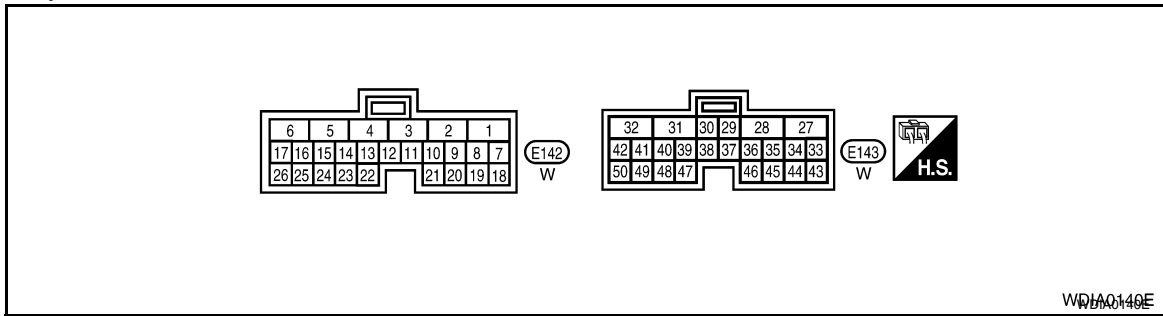
PHYSICAL VALUES

# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

## Terminal Layout



Terminal	Wire color	Item	Condition	Data (Approx.)
1	L	CAN-H	-	-
2	P	CAN-L	-	-
3	L	K-LINE (CONSULT-III signal)	-	-
6	B	Ground	Always	0V
10	LG/B	Actuator position switch 1	4WD shift switch: 2WD and 4LO	0V
11	W/L	Actuator position switch 2	4WD shift switch: 4H	Battery voltage
			4WD shift switch: 4LO	0V
12	B/R	Actuator position switch 3	4WD shift switch: 2WD and 4H	Battery voltage
			4WD shift switch: 2WD and 4H	0V
13	BR/W	Actuator position switch 4	4WD shift switch: 4LO	Battery voltage
			4WD shift switch: 4H and 4LO	0V
14	G/W	4WD shift switch (2WD)	4WD shift switch: 2WD	Battery voltage
			4WD shift switch: 4H and 4LO	0V
15	O	4WD shift switch (4H)	4WD shift switch: 4H	Battery voltage
			4WD shift switch: 2WD and 4LO	0V
16	R	4WD shift switch (4LO)	4WD shift switch: 4LO	Battery voltage
			4WD shift switch: 2WD and 4H	0V
17	G/Y	Wait detection switch	4WD shift switch: 4H and 4LO	0V
			4WD shift switch: 2WD	Battery voltage
18	B	Ground	Always	0V
19	W	Power supply (Memory back-up)	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	Battery voltage
23	R/B	ATP switch	4WD shift switch : 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	0V
			Except the above	Battery voltage
24	V	4LO switch	4WD shift switch: 4LO	0V
			Except the above	Battery voltage



# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

Terminal	Wire color	Item	Condition	Data (Approx.)
25	L/W	Ignition switch monitor	Ignition switch: ON	Battery voltage
			Ignition switch: OFF	0V
27	Y/R	Actuator motor power supply	Ignition switch: ON	Battery voltage
			Ignition switch: OFF (5 seconds after ignition switch is turned OFF)	0V
28	Y/W	Actuator motor (+)	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> </ul> When 4WD shift switch is operated (while actuator motor is operating)	Battery voltage → 0V
31	G/R	Actuator motor (-)	<ul style="list-style-type: none"> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul> When 4WD shift switch is not operated	0V
			Always	0V
32	B	Ground	Always	0V
35	B/W	4WD shift indicator lamp (Rear indicator)	Rear indicator of 4WD shift indicator lamp : ON	0V
			Rear indicator of 4WD shift indicator lamp : OFF	Battery voltage
36	L	4WD shift indicator lamp (Front and center indicator)	Engine running Front and center indicator of 4WD shift indicator lamp: ON	0V
			Engine running Front and center indicator of 4WD shift indicator lamp: OFF	Battery voltage
37	W/G	4LO indicator lamp	4LO indicator lamp: ON	0V
			4LO indicator lamp: OFF	Battery voltage
38	W/B	4WD warning lamp	4WD warning lamp: ON	0V
			4WD warning lamp: OFF	Battery voltage
39	L/B	ATP warning lamp	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever P position</li> <li>• Brake pedal depressed</li> </ul> 4WD shift switch: 4H to 4LO or 4LO to 4H (While actuator motor is operating.)	Battery voltage
			Except the above	0V
40	Y	Transfer shut off relay	Ignition switch: ON	0V
			Ignition switch: OFF (5 seconds after ignition switch is turned OFF)	Battery voltage
42	BR	Transfer shift high relay	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul> 4WD shift switch: 2WD to 4H or 4H to 4LO or 2WD to 4LO	0V
			Except the above	Battery voltage
44	Y/R	Power supply	Ignition switch: ON	Battery voltage
			Ignition switch: OFF (5 seconds after ignition switch is turned OFF)	0V
45	Y/R	Power supply	Ignition switch: ON	Battery voltage
			Ignition switch: OFF (5 seconds after ignition switch is turned OFF)	0V

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# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

Terminal	Wire color	Item	Condition	Data (Approx.)
47	Y/L	Transfer shift high relay monitor	4WD shift switch: 2WD to 4H or 4H to 4LO or 2WD to 4LO (while actuator motor is operating)	Battery voltage → 0V
			Except the above	0V
48	G/B	Transfer shift low relay monitor	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD (while actuator motor is operating)	Battery voltage → 0V
			Except the above	0V
50	R	Transfer shift low relay	4WD shift switch: 4LO to 4H or 4H to 2WD or 4LO to 2WD	0V
			Except the above	Battery voltage

**CAUTION:**

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

**NOTE:**

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

# TRANSFER CONTROL UNIT

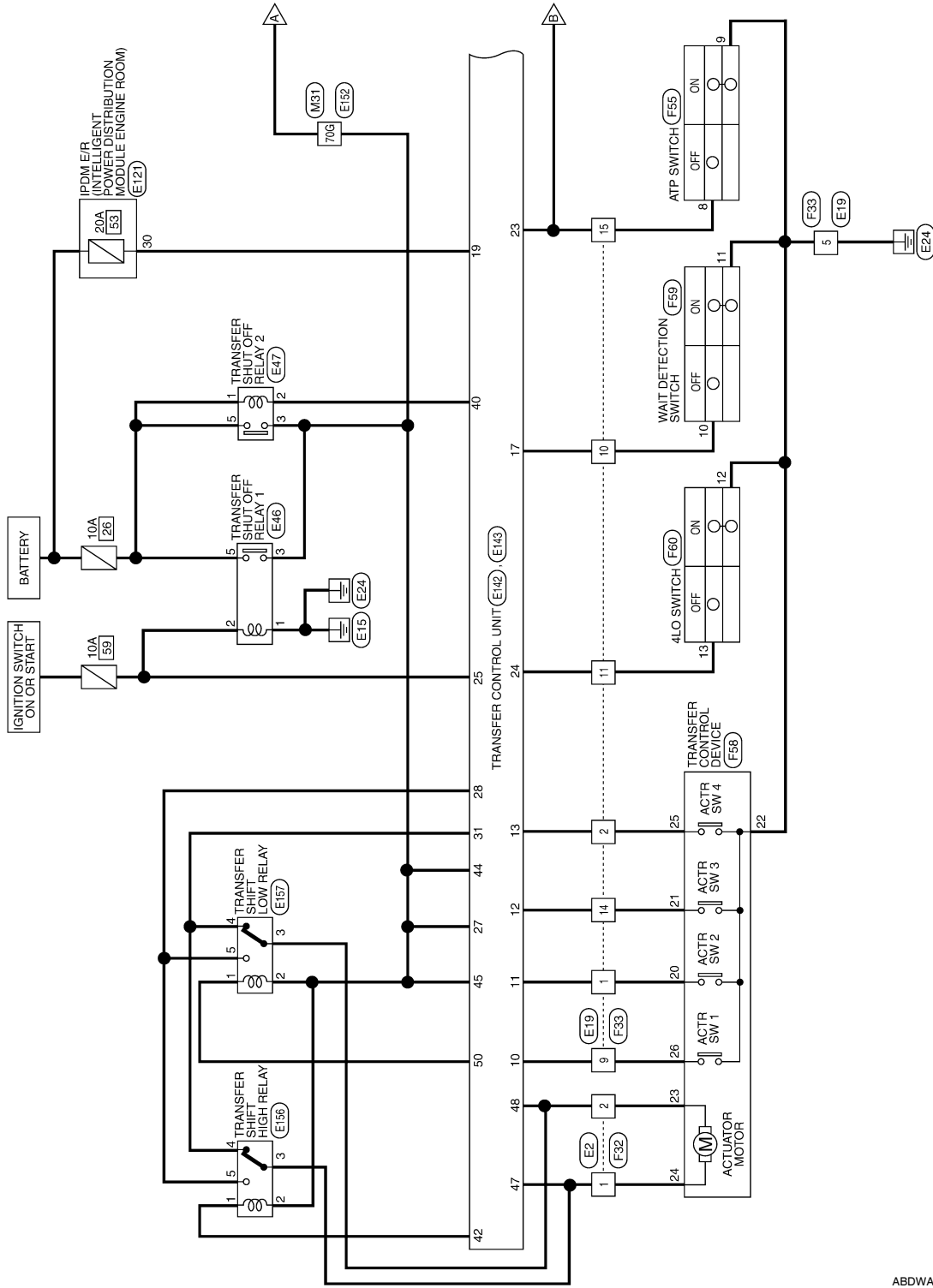
< ECU DIAGNOSIS >

[TRANSFER: TX15B]

INFOID:000000003789491

## Wiring Diagram

PART TIME 4WD SYSTEM



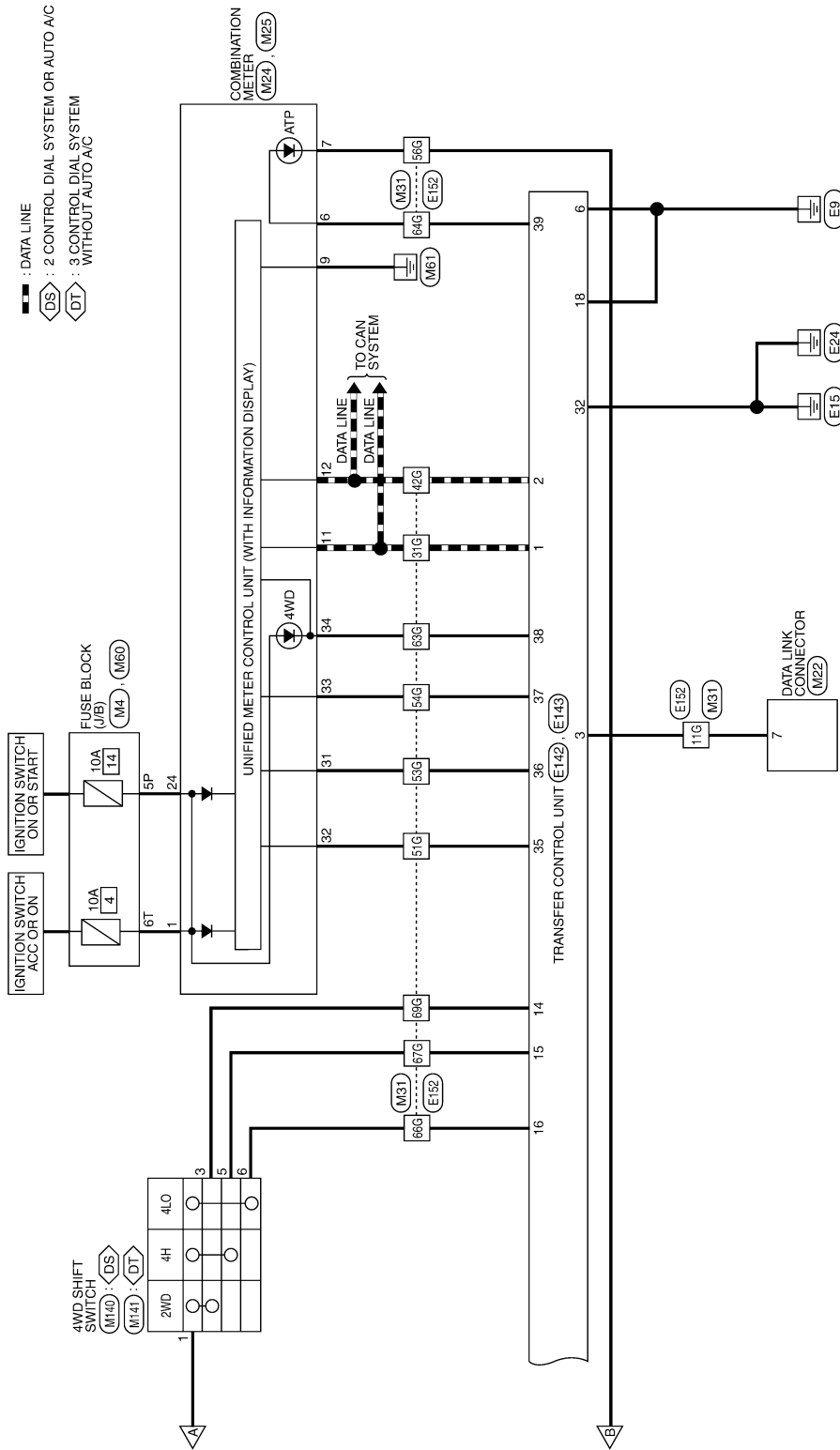
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[TRANSFER: TX15B]



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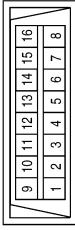
PART TIME 4WD SYSTEM CONNECTORS

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



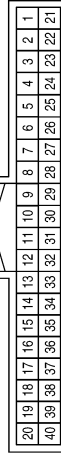
Terminal No.	5P	O/L	Signal Name	-
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Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE



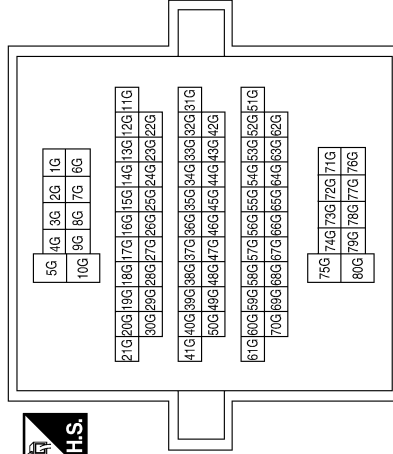
Terminal No.	7	G/W	Signal Name	-
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Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	O	ACCESSORY
6	L/B	ATP+
7	R/B	ATP-
9	B	GND
11	L	CAN-H
12	P	CAN-L
24	O/L	RUN/START
31	L	TF_LOCK
32	B/W	TF_2WD
33	W/G	TF_4LO
34	W/B	TF_4WD

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
11G	G/W	-
31G	L	-
42G	P	-
51G	B/W	-
53G	L	-
54G	W/G	-
56G	R/B	-
63G	W/B	-
64G	L/B	-
66G	R	-
67G	O	-
69G	G/W	-
70G	Y/R	-

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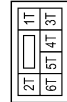
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< ECU DIAGNOSIS >

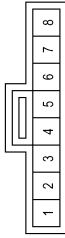
[TRANSFER: TX15B]

Connector No.	M60
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



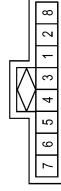
Terminal No.	Color of Wire	Signal Name
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Connector No.	M140
Connector Name	4WD SHIFT SWITCH (2 CONTROL DIAL SYSTEM OR AUTO A/C)
Connector Color	GRAY



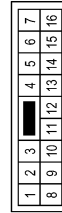
Terminal No.	Color of Wire	Signal Name
1	Y/R	-
3	G/W	-
5	O	-
6	R	-

Connector No.	M141
Connector Name	4WD SHIFT SWITCH (3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
Connector Color	WHITE



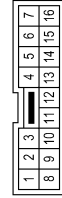
Terminal No.	Color of Wire	Signal Name
1	Y/R	-
3	G/W	-
5	O	-
6	R	-

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y/L	-
2	G/B	-

Connector No.	E19
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	W/L	-
2	BR/W	-
5	B	-
9	LG/B	-
10	G/Y	-
11	V	-
14	BR	-
15	R/B	-

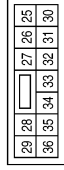
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# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

Connector No.	E121
Connector Name	IPDME/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
30	W	ECM_BAT

Connector No.	E47
Connector Name	TRANSFER SHUT OFF RELAY 2
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	G	-
2	Y	-
3	Y/R	-
5	G	-

Connector No.	E46
Connector Name	TRANSFER SHUT OFF RELAY 1
Connector Color	BLUE

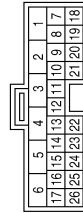


Terminal No.	Color of Wire	Signal Name
1	B	-
2	LW	-
3	Y/R	-
5	G	-

Terminal No.	Color of Wire	Signal Name
23	R/B	ATP_SW
24	V	4LD_SW
25	L/W	IGN_SW
26	-	-

Terminal No.	Color of Wire	Signal Name
8	-	-
9	-	-
10	LG/B	ACTR_SW1
11	W/L	ACTR_SW2
12	B/R	ACTR_SW3
13	BR/W	ACTR_SW4
14	G/W	2WD_SW
15	O	LOCK_SW
16	R	4L_SW
17	G/Y	4WD_SW
18	B	GND
19	W	MEMORY_B/U
20	-	-
21	-	-
22	-	-

Connector No.	E142
Connector Name	TRANSFER CONTROL UNIT
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	P	CAN-L
3	L	SSS_OUT(TX)
4	-	-
5	-	-
6	B	GND
7	-	-

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# TRANSFER CONTROL UNIT

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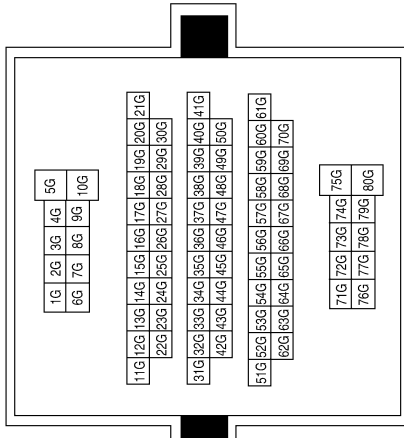
[TRANSFER: TX15B]

Connector No.	E143
Connector Name	TRANSFER CONTROL UNIT
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
27	Y/R	VIGN
28	Y/W	RLY CONT1
29	-	-
30	-	-
31	G/R	RLY CONT2
32	B	GND
33	-	-
34	-	-
35	B/W	2WD IND
36	L	LOCK IND
37	W/G	4LD IND
38	W/B	4WD FAIL
39	L/B	ATP IND
40	Y	SSOF
41	-	-
42	BR	MOTOR RLY 1
43	-	-
44	Y/R	VIGN
45	Y/R	VIGN
46	-	-
47	Y/L	MOTOR MON 1
48	G/B	MOTOR MON 2
49	-	-
50	R	MOTOR RLY 2

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
11G	G/W	-
31G	L	-
42G	P	-
51G	B/W	-
53G	L	-
54G	W/G	-
56G	R/B	-
63G	W/B	-
64G	L/B	-
66G	R	-
67G	O	-
69G	G/W	-
70G	Y/R	-

Connector No.	E156
Connector Name	TRANSFER SHIFT HIGH RELAY
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BR	-
2	SB	-(WITH 2 CONTROL DIAL SYSTEM OR AUTO A/C)
2	Y/R	-(3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
3	Y/L	-
4	G/R	-
5	Y/W	-

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# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

Connector No.	E157
Connector Name	TRANSFER SHIFT HIGH RELAY
Connector Color	BLACK



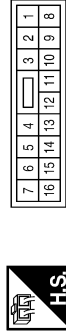
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	SB	-(WITH 2 CONTROL DIAL SYSTEM OR AUTO A/C)
2	YR	-(3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
3	Y/L	-
4	G/R	-
5	Y/W	-

Connector No.	F55
Connector Name	ATP SWITCH
Connector Color	BLACK



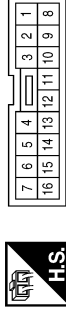
Terminal No.	Color of Wire	Signal Name
8	R/B	-
9	B	-

Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y/L	-
2	G/B	-

Connector No.	F33
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	W/L	-
2	BR/W	-
5	B	-
9	LG/B	-
10	G/Y	-
11	V	-
14	BR	-
15	R/B	-

Connector No.	F58
Connector Name	TRANSFER CONTROL DEVICE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
20	W/L	-
21	BR	-
22	B	-
23	G/B	-
24	Y/L	-
25	BR/W	-
26	LG/B	-

Connector No.	F59
Connector Name	WAIT DETECTION SWITCH
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
10	G/Y	-
11	B	-

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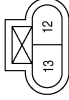
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# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

Connector No.	F60
Connector Name	4LO SWITCH
Connector Color	GRAY



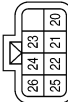
Terminal No.	Color of Wire	Signal Name
12	B	-
13	V	-

Connector No.	F59
Connector Name	WAIT DETECTION SWITCH
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
10	G/Y	-
11	B	-

Connector No.	F58
Connector Name	TRANSFER CONTROL DEVICE
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
20	W/L	-
21	BR	-
22	B	-
23	G/B	-
24	Y/L	-
25	BR/W	-
26	LG/B	-

DTC Index

DTC CHART

ABDIA0028GB

INFOID:000000003789492

# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

DTC	CONSULT-III	Diagnostic item is detected when...	Reference
[P1801]	*INITIAL START*	Due to removal of battery which cuts off power supply to transfer control unit, self-diagnosis memory function is suspended.	<a href="#">DLN-20</a>
[P1802]	CONTROL UNIT (1,2,3)	Malfunction is detected in the memory (RAM) system of transfer control unit.	<a href="#">DLN-23</a>
[P1803]		Malfunction is detected in the memory (ROM) system of transfer control unit.	
[P1804]		Malfunction is detected in the memory (EEPROM) system of transfer control unit.	
[P1807]	VHCL SPEED SEN-AT	<ul style="list-style-type: none"> <li>Malfunction is detected in output shaft revolution signal that is output from TCM through CAN communication.</li> <li>Improper signal is input while driving.</li> </ul>	<a href="#">DLN-25</a>
[P1808]	VHCL SPEED SEN-ABS	<ul style="list-style-type: none"> <li>Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.</li> <li>Improper signal is input while driving.</li> </ul>	<a href="#">DLN-26</a>
[P1809]	CONTROL UNIT 4	AD converter system of transfer control unit is malfunctioning.	<a href="#">DLN-23</a>
[P1810]	4L POSI SW TF	Improper signal from 4LO switch is input due to open or short circuit.	<a href="#">DLN-27</a>
[P1811]	BATTERY VOLTAGE	Power supply voltage for transfer control unit is abnormally low while driving.	<a href="#">DLN-20</a>
[P1813]	4WD MODE SW	More than two switch inputs are simultaneously detected due to short circuit of 4WD shift switch.	<a href="#">DLN-30</a>
[P1814]	4WD DETECT SWITCH	Improper signal from wait detection switch is input due to open or short circuit.	<a href="#">DLN-36</a>
[P1816]	PNP SW/CIRC	When A/T PNP switch signal is malfunction or communication error between the vehicles.	<a href="#">DLN-39</a>
[P1817]	SHIFT ACTUATOR	<ul style="list-style-type: none"> <li>Motor does not operate properly due to open or short circuit in actuator motor.</li> <li>Malfunction is detected in the actuator motor. (When 4WD shift switch is operated and actuator motor is not operated)</li> <li>Malfunction is detected in transfer shift high relay or transfer shift low relay.</li> </ul>	<a href="#">DLN-40</a>
[P1818]	SHIFT ACT POSI SW	<ul style="list-style-type: none"> <li>Improper signal from actuator position switch is input due to open or short circuit.</li> <li>Malfunction is detected in actuator position switch.</li> </ul>	<a href="#">DLN-47</a>
[P1819]	SHIFT ACT CIR	<ul style="list-style-type: none"> <li>Malfunction is detected in transfer shut off relay 1 and transfer shut off relay 2.</li> <li>Malfunction occurs in transfer control device drive circuit.</li> </ul>	<a href="#">DLN-50</a>
[P1820]	ENGINE SPEED SIG	<ul style="list-style-type: none"> <li>Malfunction is detected in engine speed signal that is output from ECM through CAN communication.</li> <li>Improper signal is input while driving.</li> </ul>	<a href="#">DLN-53</a>

**NOTE:**

If SHIFT ACT POSI SW [P1818] or SHIFT ACT CIR [P1819] is displayed, first erase self-diagnostic results. (SHIFT ACT POSI SW [P1818] or SHIFT ACT CIR [P1819] may be displayed after installing transfer control unit or transfer assembly.)

## FLASH CODE CHART

Flashing pattern	Item	Diagnostic item is detected when...	Reference
2	Output shaft revolution signal (from TCM)	<ul style="list-style-type: none"> <li>Malfunction is detected in output shaft revolution signal that is output from TCM through CAN communication.</li> <li>Improper signal is input while driving.</li> </ul>	<a href="#">DLN-25</a>
3	Vehicle speed signal (from ABS)	<ul style="list-style-type: none"> <li>Malfunction is detected in vehicle speed signal that is output from ABS actuator and electric unit (control unit) through CAN communication.</li> <li>Improper signal is input while driving.</li> </ul>	<a href="#">DLN-26</a>
4	CAN communication	Malfunction has been detected from CAN communication.	<a href="#">DLN-13</a>
5	AD converter	AD converter system of transfer control unit is malfunctioning.	<a href="#">DLN-23</a>
6	4LO switch	Improper signal from 4LO switch is input due to open or short circuit.	<a href="#">DLN-27</a>

# TRANSFER CONTROL UNIT

< ECU DIAGNOSIS >

[TRANSFER: TX15B]

Flashing pattern	Item	Diagnostic item is detected when...	Reference
7	Engine speed signal	<ul style="list-style-type: none"> <li>Malfunction is detected in engine speed signal that is output from ECM through CAN communication.</li> <li>Improper signal is input while driving.</li> </ul>	<a href="#">DLN-53</a>
8	Power supply	Power supply voltage for transfer control unit is abnormally low while driving.	<a href="#">DLN-20</a>
9	4WD shift switch	More than two switch inputs are simultaneously detected due to short circuit of 4WD shift switch.	<a href="#">DLN-30</a>
10	Wait detection switch	Improper signal from wait detection switch is input due to open or short circuit.	<a href="#">DLN-36</a>
11	Actuator motor	<ul style="list-style-type: none"> <li>Motor does not operate properly due to open or short circuit in actuator motor.</li> <li>Malfunction is detected in the actuator motor. (When 4WD shift switch is operated and actuator motor is not operated.)</li> <li>Malfunction is detected in transfer shift high relay or transfer shift low relay.</li> </ul>	<a href="#">DLN-40</a>
12	Actuator position switch	<ul style="list-style-type: none"> <li>Improper signal from actuator position switch is input due to open or short circuit.</li> <li>Malfunction is detected in the actuator position switch.</li> </ul>	<a href="#">DLN-47</a>
13	Transfer control device	<ul style="list-style-type: none"> <li>Malfunction is detected in transfer shut off relay 1 and transfer shut off 2.</li> <li>Malfunction occurs in transfer control device drive circuit.</li> </ul>	<a href="#">DLN-50</a>
14	PNP switch signal	When A/T PNP switch signal is malfunction or communication error between the vehicles.	<a href="#">DLN-39</a>
Repeats flickering every 0.25 sec.	Data erase display	<ul style="list-style-type: none"> <li>Power supply failure of memory back-up.</li> <li>Battery is disconnected for a long time.</li> <li>Battery performance is poor.</li> </ul>	<a href="#">DLN-20</a>
Repeats flickering every 2 to 5 sec.	—	Circuits that the self-diagnosis covers have no malfunction.	—
No flickering	PNP switch or 4WD shift switch	PNP switch or 4WD shift switch circuit is shorted or open.	<a href="#">DLN-39</a> or <a href="#">DLN-30</a>

**NOTE:**

If actuator position switch or transfer control device is displayed, first erase self-diagnostic results. (They may be displayed after installing transfer control unit or transfer assembly.)

# 4WD SYSTEM SYMPTOMS

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## SYMPTOM DIAGNOSIS

### 4WD SYSTEM SYMPTOMS

#### Symptom Table

INFOID:000000003789493

Symptom	Condition	Reference page
4WD warning lamp does not turn ON (lamp check)	Ignition switch: ON	<a href="#">DLN-70</a>
4WD shift indicator lamp and 4LO indicator lamp do not turn ON (lamp check)		<a href="#">DLN-71</a>
4WD shift indicator lamp or 4LO indicator lamp does not change	Engine running	<a href="#">DLN-73</a>
ATP warning lamp does not turn ON		<a href="#">DLN-75</a>
4WD shift indicator lamp keeps flashing	While driving	<a href="#">DLN-77</a>
4WD warning lamp flashes slowly (1 time/2 seconds)		<a href="#">DLN-78</a>
ATP switch is malfunctioning	Engine running	<a href="#">DLN-79</a>

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# 4WD WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## 4WD WARNING LAMP DOES NOT TURN ON

### Description

INFOID:000000003789494

4WD warning lamp does not turn ON when turning ignition switch to ON.

### Diagnosis Procedure

INFOID:000000003789495

#### 1. CHECK TRANSFER CONTROL UNIT POWER SUPPLY AND GROUND

Check transfer control unit power supply and ground circuits. Refer to [DLN-20, "Diagnosis Procedure"](#).

##### OK or NG

- OK >> GO TO 2.
- NG >> Repair as necessary.

#### 2. CHECK COMBINATION METER POWER SUPPLY AND GROUND

Check combination meter power supply and ground circuits. Refer to [MWI-33, "COMBINATION METER : Diagnosis Procedure"](#).

##### OK or NG

- OK >> GO TO 3.
- NG >> Repair as necessary.

#### 3. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND COMBINATION METER

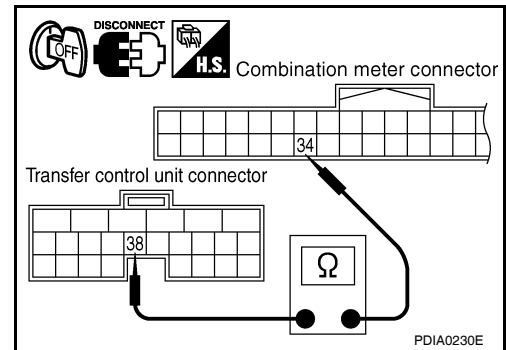
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Check continuity between transfer control unit harness connector E143 terminal 38 and combination meter harness connector M24 terminal 34.

**Continuity should exist.**

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

##### OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.



#### 4. CHECK COMBINATION METER

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Check the combination meter. Refer to [MWI-28, "CONSULT-III Function \(METER/M&A\)"](#).

##### OK or NG

- OK >> GO TO 5.
- NG >> Replace the combination meter. Refer to [MWI-103, "Removal and Installation"](#).

#### 5. SYMPTOM CHECK

Check again.

##### OK or NG

- OK >> Inspection End.
- NG >> GO TO 6.

#### 6. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

##### OK or NG

- OK >> Inspection End.
- NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

# 4WD SHIFT INDICATOR LAMP AND 4LO INDICATOR LAMP DO NOT TURN ON

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## 4WD SHIFT INDICATOR LAMP AND 4LO INDICATOR LAMP DO NOT TURN ON

### Description

INFOID:000000003789496

4WD shift indicator lamp and 4LO indicator lamp do not turn ON for approx. 1 second when turning ignition switch to ON.

### Diagnosis Procedure

INFOID:000000003789497

#### 1. CHECK TRANSFER CONTROL UNIT POWER SUPPLY AND GROUND

Check transfer control unit power supply and ground circuits. Refer to [DLN-20. "Diagnosis Procedure"](#).

##### OK or NG

- OK >> GO TO 2.
- NG >> Repair as necessary.

#### 2. CHECK COMBINATION METER POWER SUPPLY AND GROUND

Check combination meter power supply and ground circuits. Refer to [MWI-33. "COMBINATION METER : Diagnosis Procedure"](#).

##### OK or NG

- OK >> GO TO 3.
- NG >> Repair as necessary.

#### 3. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND COMBINATION METER

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Check continuity between the following terminals.
  - Transfer control unit harness connector E143 terminal 35 and combination meter harness connector M24 terminal 32.
  - Transfer control unit harness connector E143 terminal 36 and combination meter harness connector M24 terminal 31.
  - Transfer control unit harness connector E143 terminal 37 and combination meter harness connector M24 terminal 33.

**Continuity should exist.**

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

##### OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.

#### 4. CHECK COMBINATION METER

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Check the combination meter. Refer to [MWI-28. "CONSULT-III Function \(METER/M&A\)"](#).

##### OK or NG

- OK >> GO TO 5.
- NG >> Replace the combination meter. Refer to [MWI-103. "Removal and Installation"](#).

#### 5. SYMPTOM CHECK

Check again.

##### OK or NG

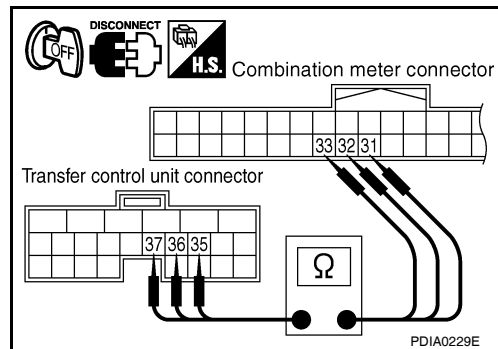
- OK >> Inspection End.
- NG >> GO TO 6.

#### 6. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54. "Reference Value"](#).

##### OK or NG

- OK >> Inspection End.



## 4WD SHIFT INDICATOR LAMP AND 4LO INDICATOR LAMP DO NOT TURN ON

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

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NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.



# 4WD SHIFT INDICATOR LAMP OR 4LO INDICATOR LAMP DO NOT CHANGE

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## 4WD SHIFT INDICATOR LAMP OR 4LO INDICATOR LAMP DO NOT CHANGE

### Description

INFOID:000000003789498

4WD shift indicator lamp or 4LO indicator lamp do not change when switching the 4WD shift switch.

### Diagnosis Procedure

INFOID:000000003789499

#### 1.CONFIRM THE SYMPTOM

Confirm 4WD shift indicator lamp and 4LO indicator lamp when ignition switch is turned to ON.

Do 4WD shift indicator lamp and 4LO indicator lamp turn on?

YES >> GO TO 2.

NO >> Refer to [DLN-71, "Diagnosis Procedure"](#).

#### 2.CHECK SYSTEM FOR 4WD SHIFT SWITCH

Perform trouble diagnosis for 4WD shift switch system. Refer to [DLN-30, "Diagnosis Procedure \(With 3 Control Dial System Without Auto A/C\)"](#).

Are the inspection results normal?

YES >> GO TO 3.

NO >> Repair or replace damaged parts.

#### 3.CHECK SYSTEM FOR WAIT DETECTION SWITCH

Perform trouble diagnosis for wait detection switch system. Refer to [DLN-36, "Diagnosis Procedure"](#).

Are the inspection results normal?

YES >> GO TO 4.

NO >> Repair or replace damaged parts.

#### 4.CHECK SYSTEM FOR 4LO SWITCH

Perform trouble diagnosis for 4LO switch system. Refer to [DLN-27, "Diagnosis Procedure"](#).

Are the inspection results normal?

YES >> GO TO 5.

NO >> Repair or replace damaged parts.

#### 5.CHECK SYSTEM FOR ATP SWITCH

Perform trouble diagnosis for ATP switch system. Refer to [DLN-79, "Diagnosis Procedure"](#).

Are the inspection results normal?

YES >> GO TO 6.

NO >> Repair or replace damaged parts.

#### 6.SYMPTOM CHECK

Check again.

Does the symptom still occur?

YES >> GO TO 7.

NO >> Inspection End

#### 7.CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

Are the inspection results normal?

YES >> GO TO 8.

NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.

#### 8.CHECK TRANSFER INNER PARTS

1. Disassemble transfer assembly. Refer to [DLN-108, "Disassembly and Assembly"](#).

2. Check transfer inner parts.

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## 4WD SHIFT INDICATOR LAMP OR 4LO INDICATOR LAMP DO NOT CHANGE

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

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Are the inspection results normal?

YES >> Inspection End.

NO >> Repair or replace damaged parts.

# ATP WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## ATP WARNING LAMP DOES NOT TURN ON

### Description

INFOID:000000003789500

ATP warning lamp does not turn ON when the transfer case is switched in or out of 4LO with the A/T selector lever in N position.

### Diagnosis Procedure

INFOID:000000003789501

#### 1. CHECK SYSTEM FOR CAN COMMUNICATION LINE

Perform self-diagnosis. Refer to [DLN-16, "CONSULT-III Function \(ALL MODE AWD/4WD\)"](#).

Do the self-diagnostic results indicate CAN communication?

- YES >> Perform trouble diagnosis for CAN communication line. Refer to [DLN-13, "CAN Communication"](#).
- NO >> GO TO 2.

#### 2. CHECK SYSTEM FOR 4WD SHIFT SWITCH

Perform trouble diagnosis for 4WD shift switch system. Refer to [DLN-30, "Diagnosis Procedure \(With 3 Control Dial System Without Auto A/C\)"](#).

OK or NG

- OK >> GO TO 3.
- NG >> Repair or replace damaged parts.

#### 3. CHECK SYSTEM FOR PNP SWITCH SIGNAL

Perform trouble diagnosis for PNP switch signal system. Refer to [DLN-39, "Diagnosis Procedure"](#).

OK or NG

- OK >> GO TO 4.
- NG >> Repair or replace damaged parts.

#### 4. CHECK SYSTEM FOR ATP SWITCH

Perform trouble diagnosis for ATP switch system. Refer to [DLN-79, "Diagnosis Procedure"](#).

OK or NG

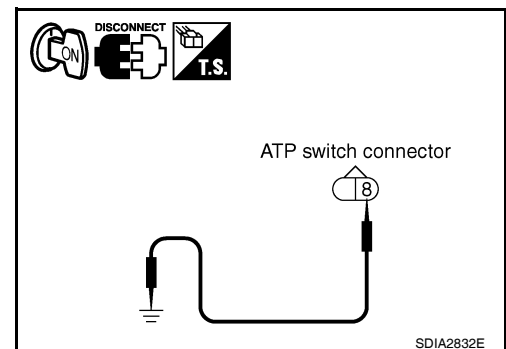
- OK >> GO TO 5.
- NG >> Repair or replace damaged parts.

#### 5. CHECK ATP WARNING LAMP CIRCUIT

1. Disconnect ATP switch harness connector.
2. Turn ignition switch ON. (Do not start engine.)
3. Ground the following terminal using suitable wiring.
  - ATP switch harness connector F55 terminal 8 and ground.
4. Turn ignition switch OFF. (Stay for at least 5 seconds.)

Does ATP warning lamp turn on?

- OK >> GO TO 9.
- NG >> GO TO 6.



#### 6. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND COMBINATION METER

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector and combination meter harness connector.

# ATP WARNING LAMP DOES NOT TURN ON

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

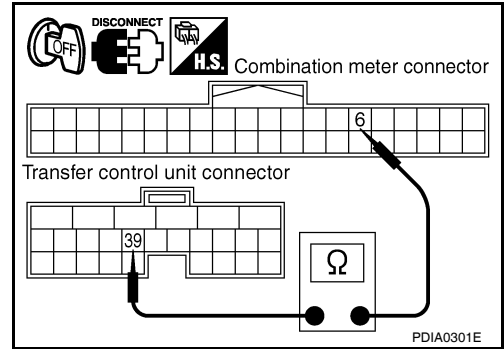
3. Check continuity between transfer control unit harness connector E143 terminal 39 and combination meter harness connector M24 terminal 6.

**Continuity should exist.**

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

OK or NG

- OK >> GO TO 7.
- NG >> Repair or replace damaged parts.



## 7. CHECK HARNESS BETWEEN COMBINATION METER AND ATP SWITCH

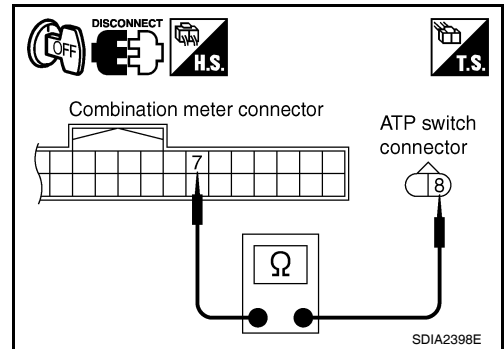
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect ATP switch harness connector.
3. Check continuity between combination meter harness connector M24 terminal 7 and ATP switch harness connector F55 terminal 8.

**Continuity should exist.**

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

OK or NG

- OK >> GO TO 8.
- NG >> Repair or replace damaged parts.



## 8. CHECK COMBINATION METER

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Check the combination meter. Refer to [MWI-28, "CONSULT-III Function \(METER/M&A\)"](#).

OK or NG

- OK >> GO TO 9.
- NG >> Replace the combination meter. Refer to [MWI-103, "Removal and Installation"](#).

## 9. SYMPTOM CHECK

Check again.

OK or NG

- OK >> Inspection End.
- NG >> GO TO 10.

## 10. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

OK or NG

- OK >> GO TO 11.
- NG >> Check transfer control unit pin terminals for damage or loose connection with harness connector. If any items are damaged, repair or replace damaged parts.

## 11. CHECK TRANSFER INNER PARTS

1. Disassemble transfer assembly. Refer to [DLN-108, "Disassembly and Assembly"](#).
2. Check transfer inner parts.

OK or NG

- OK >> Inspection End.
- NG >> Repair or replace damaged parts.

# 4WD SHIFT INDICATOR LAMP KEEPS FLASHING

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## 4WD SHIFT INDICATOR LAMP KEEPS FLASHING

### Description

INFOID:000000003789502

The 4WD shift indicator lamp keeps flashing.

### Diagnosis Procedure

INFOID:000000003789503

#### 1.CONFIRM THE SYMPTOM

1. Set 4WD shift switch to 2WD.
2. Drive the vehicle straight forward and backward keeping speed under 20 km/h (12 MPH).

Does 4WD shift indicator lamp keep flashing?

- YES >> GO TO 2.  
NO >> Inspection End.

#### 2.CHECK SYSTEM FOR WAIT DETECTION SWITCH

Perform trouble diagnosis for wait detection switch system. Refer to [DLN-36, "Diagnosis Procedure"](#).

Are the inspection results normal?

- YES >> GO TO 3.  
NO >> Repair or replace damaged parts.

#### 3.CHECK SYSTEM FOR 4LO SWITCH

Perform trouble diagnosis for 4LO switch. Refer to [DLN-27, "Diagnosis Procedure"](#).

Are the inspection results normal?

- YES >> GO TO 4.  
NO >> Repair or replace damaged parts.

#### 4.SYMPTOM CHECK

Check again.

Does the symptom still occur?

- YES >> GO TO 5.  
NO >> Inspection End.

#### 5.CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

Are the inspection results normal?

- YES >> GO TO 6.  
NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.

#### 6.CHECK TRANSFER INNER PARTS

1. Disassemble transfer assembly. Refer to [DLN-108, "Disassembly and Assembly"](#).
2. Check transfer inner parts.

Are the inspection results normal?

- YES >> Inspection End.  
NO >> Repair or replace damaged parts.

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# 4WD WARNING LAMP FLASHES SLOWLY

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## 4WD WARNING LAMP FLASHES SLOWLY

### Description

INFOID:000000003789504

The 4WD warning lamp flashes slowly while driving (1 time / 2 seconds). The lamp continues to flash until the ignition switch is turned OFF.

### Diagnosis Procedure

INFOID:000000003789505

#### 1.CHECK TIRES

Check the following. Refer to [WT-51, "Tire"](#).

- Tire size
- Tire wear
- Tire pressure

Are the inspection results normal?

YES >> GO TO 2.

NO >> Repair or replace damaged parts.

#### 2.SYMPTOM CHECK

Check again.

Does the symptom still occur?

YES >> GO TO 3.

NO >> Inspection End.

#### 3.CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

Are the inspection results normal?

YES >> Inspection End.

NO >> Check transfer control unit pin terminals for damage or loose connection with harness connector.  
If any items are damaged, repair or replace damaged parts.

# ATP SWITCH

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## ATP SWITCH

### Description

INFOID:000000003789506

The ATP indicator does not come on when the transfer is in neutral and the A/T lever is in neutral or, the ATP indicator stays on when the transfer case is not in neutral.

### Diagnosis Procedure

INFOID:000000003789507

#### DIAGNOSTIC PROCEDURE

#### 1. CHECK ATP SWITCH SIGNAL

##### With CONSULT-III

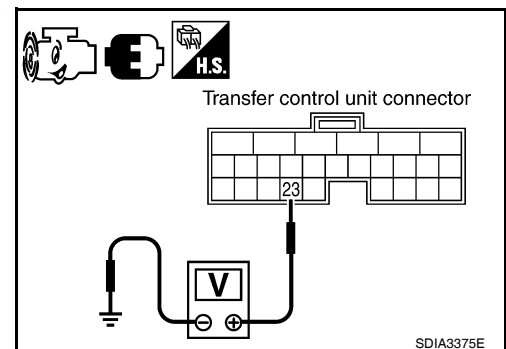
1. Start engine.
2. Select DATA MONITOR mode for ALL MODE AWD/4WD with CONSULT-III.
3. Read out the value of ATP SWITCH.

Condition	Display value
<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	4WD shift switch: 4H to 4LO or 4LO to 4H (While actuator motor is operating.)
Except the above	ON
Except the above	OFF

##### Without CONSULT-III

1. Start engine.
2. Check voltage between transfer control unit harness connector terminal and ground.

Connector	Terminal	Condition	Voltage (Approx.)
E142	23 - Ground	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• A/T selector lever N position</li> <li>• Brake pedal depressed</li> </ul>	4WD shift switch: 4H to 4LO or 4LO to 4H (While actuator motor is operating.)
		Except the above	0V
		Except the above	Battery voltage



#### OK or NG

- OK >> GO TO 5.  
 NG >> GO TO 2.

#### 2. CHECK HARNESS BETWEEN TRANSFER CONTROL UNIT AND ATP SWITCH

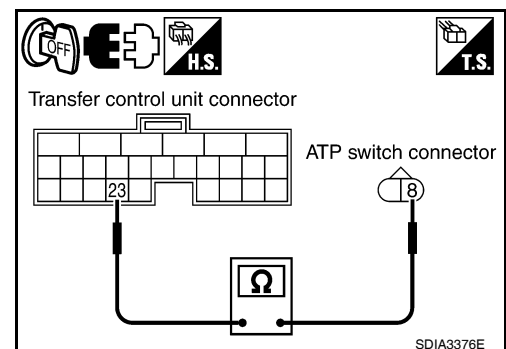
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect transfer control unit harness connector and the ATP switch harness connector.
3. Check continuity between transfer control unit harness connector E142 terminal 23 and ATP switch harness connector F55 terminal 8.

**Continuity should exist.**

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

#### OK or NG

- OK >> GO TO 3.  
 NG >> Repair or replace damaged parts.



# ATP SWITCH

< SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

## 3. CHECK GROUND CIRCUIT

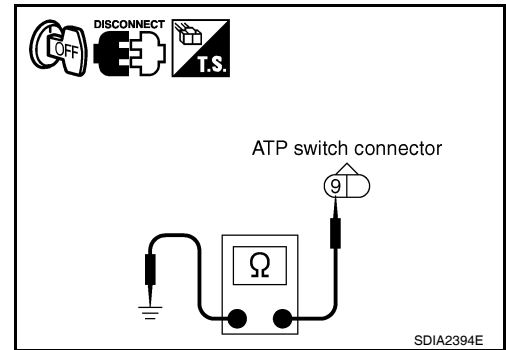
1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect ATP switch harness connector.
3. Check continuity between ATP switch harness connector F55 terminal 9 and ground.

**Continuity should exist.**

Also check harness for short to power.

OK or NG

- OK >> GO TO 4.  
NG >> Repair open circuit or short to power in harness or connectors.



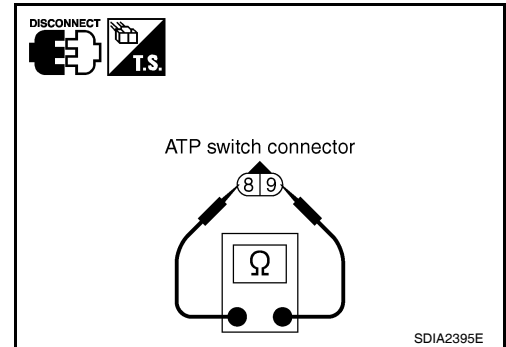
## 4. CHECK ATP SWITCH

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Remove ATP switch. Refer to [DLN-12, "Component Parts Location"](#).
3. Push and release ATP switch and check continuity between ATP switch terminals 8 and 9.

Terminal	Condition	Continuity
8 - 9	Push ATP switch	Yes
	Release ATP switch	No

OK or NG

- OK >> GO TO 5.  
NG >> Replace ATP switch.



## 5. CHECK TRANSFER CONTROL UNIT

Check transfer control unit input/output signal. Refer to [DLN-54, "Reference Value"](#).

OK or NG

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

## 6. CHECK ATP WARNING LAMP

1. Turn ignition switch ON. (Do not start engine.)
2. A/T selector lever N position and engage the parking brake.
3. Switch 4WD shift switch from 4H to 4LO or 4LO to 4H.

Does ATP warning lamp ON, while actuator motor is operating?

- YES >> Inspection End.  
NO >> Refer to [DLN-75, "Diagnosis Procedure"](#).

## Component Inspection

INFOID:000000003789508

1. Turn ignition switch OFF. (Stay for at least 5 seconds.)
2. Disconnect ATP switch harness connector.
3. Remove ATP switch. Refer to [DLN-12, "Component Parts Location"](#).



# ATP SWITCH

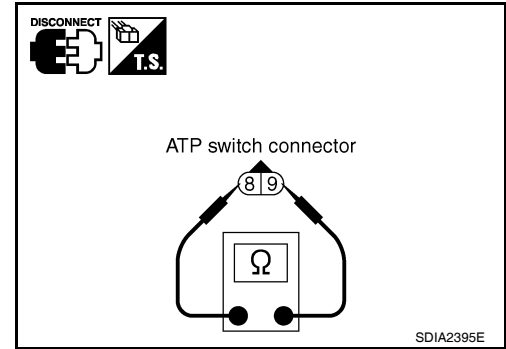
## < SYMPTOM DIAGNOSIS >

[TRANSFER: TX15B]

4. Push and release ATP switch and check continuity between ATP switch terminals 8 and 9.

Terminal	Condition	Continuity
8 - 9	Push ATP switch	Yes
	Release ATP switch	No

5. If the inspection results are abnormal replace the ATP switch.



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PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000003789509

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 SR 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 SR 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.





Precaution for Transfer Assembly and Transfer Control Unit Replacement

INFOID:000000003789510

When replacing transfer assembly or transfer control unit, check the 4WD shift indicator pattern and adjustment of the position between transfer assembly and transfer control unit if necessary.

CHECK 4WD SHIFT INDICATOR PATTERN

1. Set 4WD shift switch to 2WD, 4H, 4LO, 4H and 2WD in order. Stay at each switch position for at least 2 seconds.
2. Confirm 4WD shift indicator lamp and 4LO indicator lamp are changed properly as follows.

4WD shift switch	Indicator lamp		Operation of 4WD shift switch
	4WD shift	4LO	
2WD		OFF	2WD ⇄ 4H switching can be done while driving. The indicator lamp will change when the driving mode is changed. Gear shifting between 2WD ⇄ 4H position must be performed at speeds below 100km/h (60 MPH).
4H			
4LO		Flashing	To shift between 4H ⇄ 4LO, stop the vehicle and select the A/T selector lever to the "N" position with the brake pedal depressed. Depress and turn the 4WD shift switch. The 4WD shift switch will not shift to the desired mode if the transmission is not in "N" or the vehicle is moving with the brake pedal depressed. The 4LO indicator lamp will be lit when the 4LO is engaged.
		ON	

WDIA0137E

- If inspection results are normal, the position between transfer assembly and transfer control unit is correct.
- If inspection results are abnormal, the position is different between transfer assembly and transfer control unit.

Adjust the position between transfer assembly and transfer control unit. Refer to pattern table below.

# PRECAUTIONS

< PRECAUTION >

[TRANSFER: TX15B]

Transfer position adjustment pattern	
4WD shift switch condition	Refer procedure
4WD shift switch is under 2WD condition when engine is being stopped.	METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT 2WD
4WD shift switch is under 4H or 4LO condition when engine is being stopped.	METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT 4H OR 4LO

**NOTE:**

Method of adjustment can be chosen voluntarily, according to location of 4WD shift switch.

## METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT 2WD

### Select Adjustment Pattern

1. Start engine. Run engine for at least 10 seconds.
2. Check 4WD shift indicator lamp and 4LO indicator lamp.

Indicator lamp condition	Refer procedure
When 4WD shift indicator lamp or 4LO indicator lamp is flashing.	Pattern A
Except for above.	Pattern B

### Pattern A

1. Stop vehicle and move A/T selector lever to N position with brake pedal depressed. Stay in N for at least 2 seconds.
2. Turn 4WD shift switch to 4LO position. Stay in 4LO for at least 2 seconds.
3. Turn ignition switch OFF.
4. Start engine.
5. Erase self-diagnosis. Refer to [DLN-16, "CONSULT-III Function \(ALL MODE AWD/4WD\)"](#).
6. Check 4WD shift indicator lamp and 4LO indicator lamp again. Refer to CHECK 4WD SHIFT INDICATOR PATTERN.  
If 4WD shift indicator lamp and 4LO indicator lamp do not indicate proper pattern, install new transfer control unit and retry the above check.

### Pattern B

1. Stop vehicle and move A/T selector lever to N position with brake pedal depressed. Stay in N for at least 2 seconds.
2. Turn ignition switch OFF.
3. Start engine.
4. Erase self-diagnosis. Refer to [DLN-16, "CONSULT-III Function \(ALL MODE AWD/4WD\)"](#).
5. Check 4WD shift indicator lamp and 4LO indicator lamp again. Refer to CHECK 4WD SHIFT INDICATOR PATTERN.  
If 4WD shift indicator lamp and 4LO indicator lamp do not indicate proper pattern, install new transfer control unit and retry the above check.

## METHOD FOR ADJUSTMENT WITH 4WD SHIFT SWITCH AT 4H OR 4LO

1. Start engine. Run the engine for at least 10 seconds.
2. Stop vehicle and move A/T selector lever to N position with brake pedal depressed. Stay in N for at least 2 seconds.)
3. Turn 4WD shift switch to 2WD position. Stay in 2WD for at least 2 seconds.
4. Turn ignition switch OFF.
5. Start engine.
6. Erase self-diagnosis. Refer to [DLN-16, "CONSULT-III Function \(ALL MODE AWD/4WD\)"](#).
7. Check 4WD shift indicator lamp and 4LO indicator lamp again. Refer to CHECK 4WD SHIFT INDICATOR PATTERN.  
If 4WD shift indicator lamp and 4LO indicator lamp do not indicate proper pattern, install new transfer control unit and retry the above check.

# PRECAUTIONS

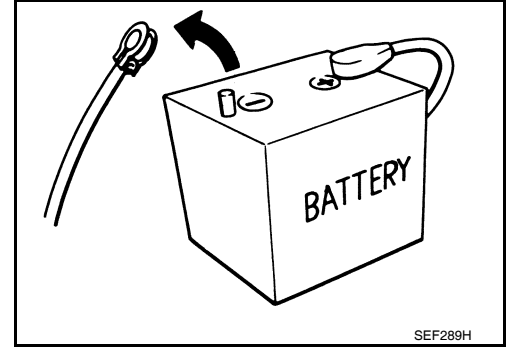
< PRECAUTION >

[TRANSFER: TX15B]

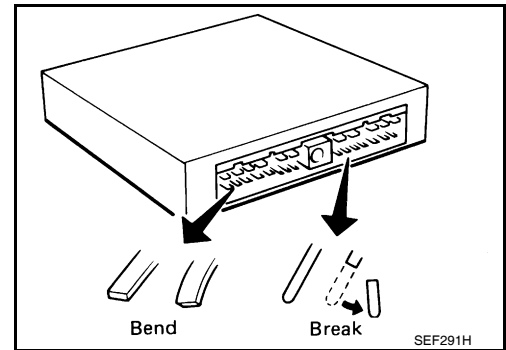
INFOID:000000003789511

## Precaution

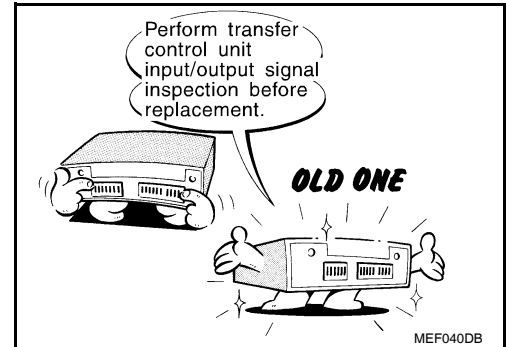
- Before connecting or disconnecting the transfer control unit harness connector, turn ignition switch OFF and disconnect the battery cables. Battery voltage is applied to transfer control unit even if ignition switch is turned OFF.



- When connecting or disconnecting pin connectors into or from transfer control unit, take care not to damage pin terminals (bend or break).  
When connecting pin connectors make sure that there are not any bends or breaks on transfer control unit pin terminals.



- Before replacing transfer control unit, perform transfer control unit input/output signal inspection and make sure transfer control unit functions properly. Refer to [DLN-54, "Reference Value"](#).



## Service Notice

INFOID:000000003789512

- After overhaul refill the transfer with new transfer fluid.
- Check the fluid level or replace the fluid only with the vehicle parked on level ground.
- During removal or installation, keep inside of transfer clear of dust or dirt.
- Disassembly should be done in a clean work area.
- Before proceeding with disassembly, thoroughly clean the transfer. It is important to prevent the internal parts from becoming contaminated by dirt or other foreign matter.
- Check for the correct installation status prior to removal or disassembly. If matchmarks are required, be certain they do not interfere with the function of the parts when applied.
- All parts should be carefully cleaned with a general purpose, non-flammable solvent before inspection or reassembly.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with a new ones if necessary.
- Gaskets, seals and O-rings should replaced any time the transfer is disassembled.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, use it.
- Observe the specified torque when assembling.
- Clean and flush the parts sufficiently and blow-dry them.
- Be careful not to damage sliding surfaces and mating surfaces.

# PRECAUTIONS

< PRECAUTION >

[TRANSFER: TX15B]

- Use lint-free cloth or towels for wiping parts clean. Common shop rags can leave fibers that could interfere with the operation of the transfer.

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# PREPARATION

< PREPARATION >

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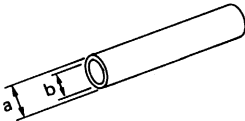
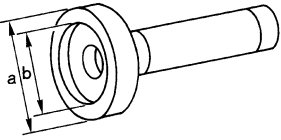
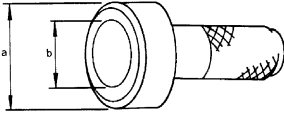
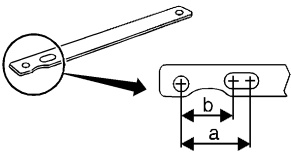
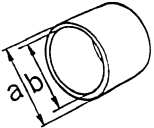
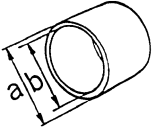
## PREPARATION

### PREPARATION

#### Special Service Tool

INFOID:000000003789513

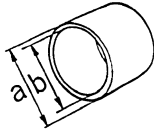
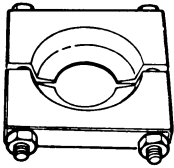
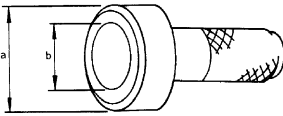
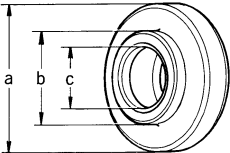
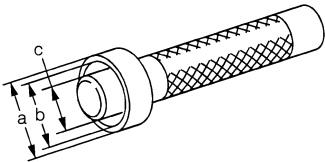
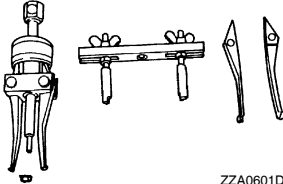
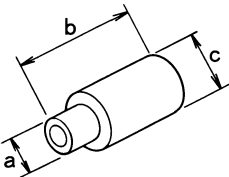
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV32102700 ( — ) Drift	<ul style="list-style-type: none"> <li>Installing mainshaft rear bearing</li> </ul> <b>a: 48 mm (1.89 in) dia.</b> <b>b: 41 mm (1.61 in) dia.</b>
 <p style="text-align: center;">ZZA0534D</p>	
KV38100200 ( — ) Drift	<ul style="list-style-type: none"> <li>Removing sun gear assembly and planetary carrier assembly</li> <li>Removing input bearing</li> <li>Installing sun gear assembly and planetary carrier assembly</li> </ul> <b>a: 65 mm (2.56 in) dia.</b> <b>b: 49 mm (1.93 in) dia.</b>
 <p style="text-align: center;">ZZA1143D</p>	
KV38100500 ( — ) Drift	<ul style="list-style-type: none"> <li>Installing front oil seal</li> <li>Installing rear oil seal</li> <li>Installing rear bearing</li> <li>Installing front bearing</li> </ul> <b>a: 80 mm (3.15 in) dia.</b> <b>b: 60 mm (2.36 in) dia.</b>
 <p style="text-align: center;">ZZA0811D</p>	
KV40104000 ( — ) Flange wrench	<ul style="list-style-type: none"> <li>Removing self-lock nut</li> <li>Installing self-lock nut</li> </ul> <b>a: 85 mm (3.35 in)</b> <b>b: 65 mm (2.56 in)</b>
 <p style="text-align: center;">NT659</p>	
KV40104830 ( — ) Drift	<ul style="list-style-type: none"> <li>Installing input oil seal</li> </ul> <b>a: 70 mm (2.76 in) dia.</b> <b>b: 63.5 mm (2.50 in) dia.</b>
 <p style="text-align: center;">ZZA1003D</p>	
KV40105310 ( — ) Drift	<ul style="list-style-type: none"> <li>Installing dust cover</li> </ul> <b>a: 89 mm (3.50 in) dia.</b> <b>b: 80.7 mm (3.17 in) dia.</b>
 <p style="text-align: center;">ZZA1003D</p>	

# PREPARATION

< PREPARATION >

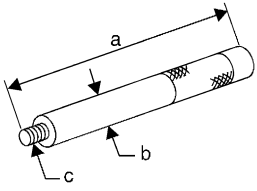
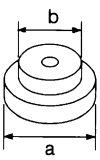
[TRANSFER: TX15B]

Tool number (Kent-Moore No.) Tool name	Description	
ST27863000 ( — ) Drift	 <p style="text-align: center;">ZZA1003D</p> <ul style="list-style-type: none"> <li>Installing carrier bearing</li> <li><b>a: 75 mm (2.95 in) dia.</b></li> <li><b>b: 62 mm (2.44 in) dia.</b></li> </ul>	A B C
ST30021000 (J-22912-01) Puller	 <p style="text-align: center;">ZZA0537D</p> <ul style="list-style-type: none"> <li>Removing carrier bearing</li> <li>Removing front bearing</li> <li>Removing rear bearing</li> </ul>	<div style="background-color: black; color: white; padding: 2px;">DLN</div> E F
ST30720000 (J-25405) Drift	 <p style="text-align: center;">ZZA0811D</p> <ul style="list-style-type: none"> <li>Installing input bearing</li> <li>Installing input oil seal</li> <li>Installing carrier bearing</li> <li><b>a: 77 mm (3.03 in) dia.</b></li> <li><b>b: 55 mm (2.17 in) dia.</b></li> </ul>	G H
ST30901000 (J-26010-01) Drift	 <p style="text-align: center;">ZZA0978D</p> <ul style="list-style-type: none"> <li>Installing rear bearing</li> <li>Installing front bearing</li> <li><b>a: 79 mm (3.11 in) dia.</b></li> <li><b>b: 45 mm (1.77 in) dia.</b></li> <li><b>c: 35.2 mm (1.38 in) dia.</b></li> </ul>	I J
ST33220000 ( — ) Drift	 <p style="text-align: center;">ZZA1046D</p> <ul style="list-style-type: none"> <li>Installing needle bearing</li> <li><b>a: 37 mm (1.46 in) dia.</b></li> <li><b>b: 31 mm (1.22 in) dia.</b></li> <li><b>c: 22 mm (0.87 in) dia.</b></li> </ul>	K L M
ST33290001 (J-34286) Puller	 <p style="text-align: center;">ZZA0601D</p> <ul style="list-style-type: none"> <li>Removing front oil seal</li> <li>Removing rear oil seal</li> <li>Removing metal bushing</li> </ul>	N O
ST33710000 ( — ) Drift	 <p style="text-align: center;">ZZA1057D</p> <ul style="list-style-type: none"> <li>Removing needle bearing</li> <li>Removing metal bushing</li> <li>Removing rear bearing</li> <li><b>a: 24 mm (0.94 in) dia.</b></li> <li><b>b: 89 mm (3.5 in)</b></li> <li><b>c: 30 mm (1.18 in) dia.</b></li> </ul>	P

# PREPARATION

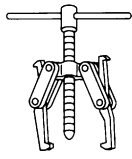
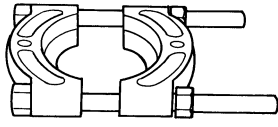
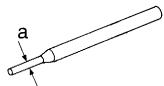
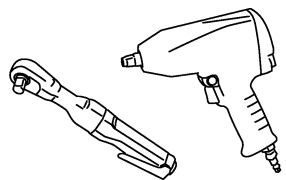
< PREPARATION >

[TRANSFER: TX15B]

Tool number (Kent-Moore No.) Tool name	Description
ST35325000 ( — ) Drift bar	<ul style="list-style-type: none"> <li>• Removing metal bushing</li> <li><b>a: 215 mm (8.46 in)</b></li> <li><b>b: 25 mm (0.98 in) dia.</b></li> <li><b>c: M12 × 1.5P</b></li> </ul>
 <p style="text-align: right; margin-top: 5px;">NT663</p>	
ST35300000 ( — ) Drift	<ul style="list-style-type: none"> <li>• Removing carrier bearing</li> <li>• Installing metal bushing</li> <li>• Removing front bearing</li> <li><b>a: 59 mm (2.32 in) dia.</b></li> <li><b>b: 45 mm (1.77 in) dia.</b></li> </ul>
 <p style="text-align: right; margin-top: 5px;">NT073</p>	

## Commercial Service Tool

INFOID:000000003789514

Tool name	Description
Puller	<ul style="list-style-type: none"> <li>• Removing companion flange</li> <li>• Removing mainshaft rear bearing</li> </ul>
 <p style="text-align: right; margin-top: 5px;">NT077</p>	
Puller	<ul style="list-style-type: none"> <li>• Removing mainshaft rear bearing</li> </ul>
 <p style="text-align: right; margin-top: 5px;">ZZB0823D</p>	
Pin punch	<ul style="list-style-type: none"> <li>• Removing retaining pin</li> <li><b>a: 6 mm (0.24 in) dia.</b></li> </ul>
 <p style="text-align: right; margin-top: 5px;">NT410</p>	
Power tool	<ul style="list-style-type: none"> <li>• Loosening bolts and nuts</li> </ul>
 <p style="text-align: right; margin-top: 5px;">PBIC0190E</p>	



ON-VEHICLE MAINTENANCE

TRANSFER FLUID

Replacement

INFOID:000000003789515

**CAUTION:**

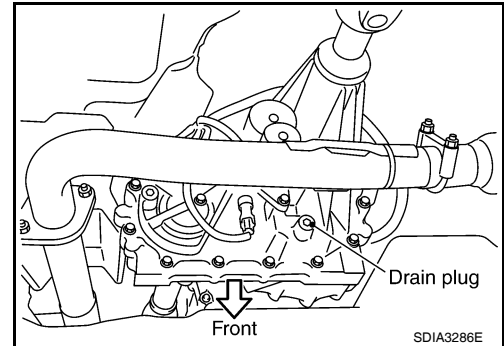
If using the vehicle for towing, the transfer fluid must be replaced as specified. Refer to [MA-6, "Introduction of Periodic Maintenance"](#).

DRAINING

1. Stop engine.
2. Remove the drain plug and gasket and drain the fluid.
3. Install the drain plug with a new gasket to the transfer. Tighten to the specified torque. Refer to [TM-240, "Component"](#).

**CAUTION:**

Do not reuse gasket.



FILLING

1. Remove the filler plug and gasket.
2. Fill the transfer with new fluid until the fluid level reaches the specified limit near the filler plug hole.

Fluid grade and capacity : Refer to [MA-10, "Fluids and Lubricants"](#).

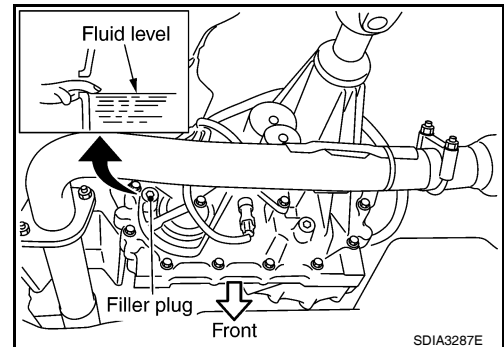
**CAUTION:**

Carefully fill fluid. (Fill up for approx. 3 minutes.)

3. Leave the vehicle for 3 minutes, and check fluid level again.
4. Install the filler plug with a new gasket to the transfer. Tighten to the specified torque. Refer to [TM-240, "Component"](#).

**CAUTION:**

Do not reuse gasket.



Inspection

INFOID:000000003789516

**CAUTION:**

If using the vehicle for towing, the transfer fluid must be replaced as specified. Refer to [MA-6, "Introduction of Periodic Maintenance"](#).

FLUID LEAKAGE AND FLUID LEVEL

1. Make sure that fluid is not leaking from the transfer assembly or around it.
2. Check fluid level from the filler plug hole as shown.

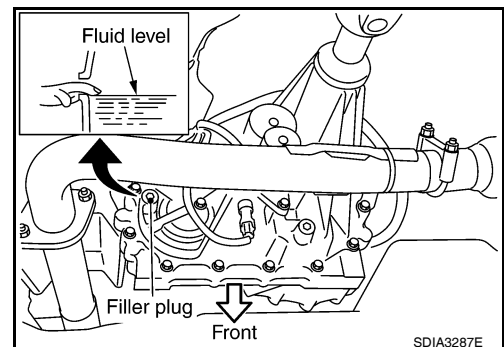
**CAUTION:**

Do not start engine while checking fluid level.

3. Install the filler plug with a new gasket to the transfer. Tighten to the specified torque. Refer to [DLN-89, "Inspection"](#).

**CAUTION:**

Do not reuse gasket.



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## ON-VEHICLE REPAIR

### TRANSFER CONTROL UNIT

#### Removal and Installation

INFOID:000000003789517

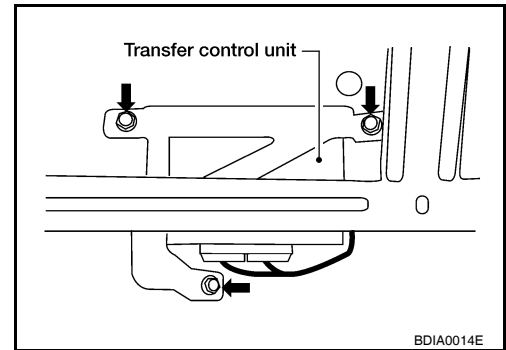
#### REMOVAL

1. Switch 4WD shift switch to 2WD and set transfer assembly to 2WD.

**CAUTION:**

**When removing transfer control unit, transfer state must be at 2WD.**

2. Turn the ignition switch OFF and disconnect negative battery terminal.
3. Remove the lower instrument panel RH. Refer to [IP-15. "Removal and Installation"](#).
4. Disconnect the two transfer control unit connectors.
5. Remove the transfer control unit bolts.
6. Remove the transfer control unit.



#### INSTALLATION

Installation is in the reverse order of removal.

- When installing the transfer control unit, tighten bolts to the specified torque.

**Transfer control unit bolts : 5.1 N·m (0.52 kg-m, 45 in-lb)**

- After the installation, check 4WD shift indicator pattern. If NG, adjust position between transfer assembly and transfer control unit. Refer to [DLN-82. "Precaution for Transfer Assembly and Transfer Control Unit Replacement"](#).

## FRONT OIL SEAL

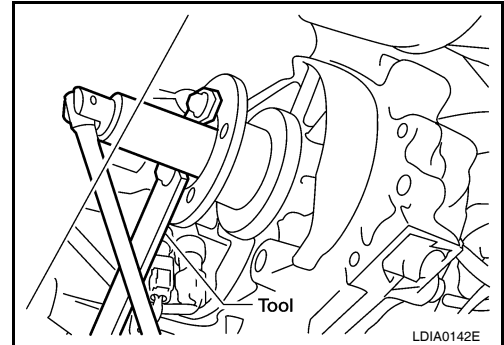
### Removal and Installation

INFOID:000000003789518

#### REMOVAL

1. Partially drain the transfer fluid. Refer to [DLN-89, "Replacement"](#).
2. Remove the front propeller shaft. Refer to [DLN-128, "Removal and Installation"](#).
3. Remove the companion flange self-lock nut using Tool.

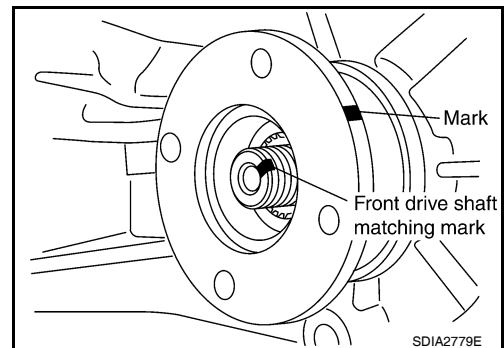
**Tool number** : KV40104000 ( — )



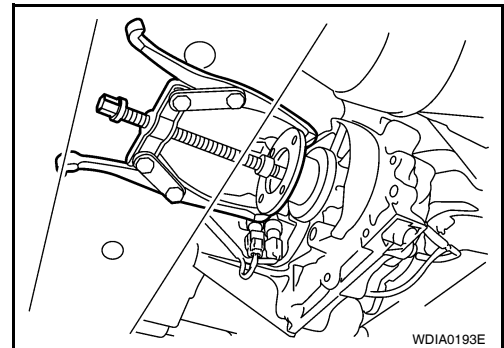
4. Put a matching mark on top of the front drive shaft in line with the mark on the companion flange.

**CAUTION:**

Use paint to make the matching mark on the front drive shaft. Do not damage the front drive shaft.



5. Remove the companion flange using suitable tool.

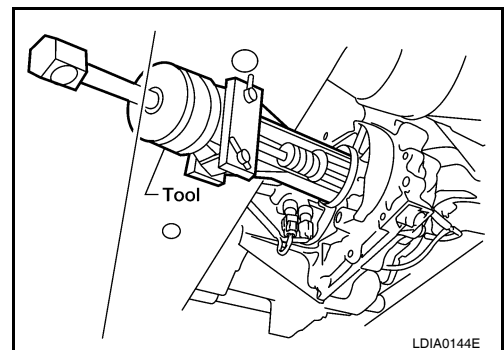


6. Remove the front oil seal from the front case using Tool.

**Tool number** : ST33290001 (J-34286)

**CAUTION:**

Do not damage front case.



#### INSTALLATION

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# FRONT OIL SEAL

< ON-VEHICLE REPAIR >

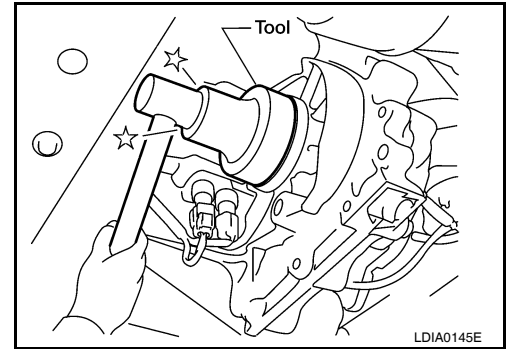
[TRANSFER: TX15B]

1. Install the new front oil seal until it is flush with the end face of the front case using Tool.

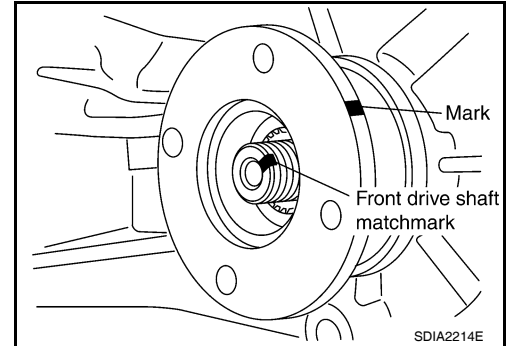
**Tool number** : KV38100500 ( — )

**CAUTION:**

- Do not reuse oil seal.
- Apply petroleum jelly to oil seal.



2. Align the matching mark of the front drive shaft with the matching mark of the companion flange, then install the companion flange.



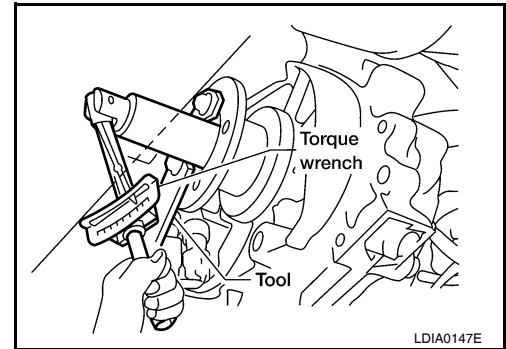
3. Install the new self-lock nut and tighten to the specified torque using Tool. Refer to [DLN-108, "Disassembly and Assembly"](#).

**Tool number** : KV40104000 ( — )

**CAUTION:**

**Do not reuse self-lock nut.**

4. Install the front propeller shaft. Refer to [DLN-128, "Removal and Installation"](#).
5. Refill the transfer with fluid and check for fluid leakage and fluid level. Refer to [DLN-89, "Inspection"](#).



# REAR OIL SEAL

< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

## REAR OIL SEAL

### Removal and Installation

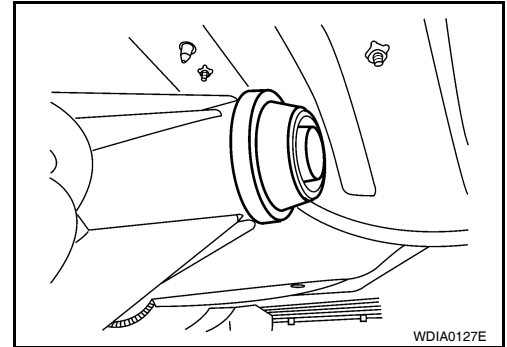
INFOID:000000003789519

#### REMOVAL

1. Partially drain the transfer fluid. Refer to [DLN-89, "Replacement"](#).
2. Remove the rear propeller shaft. Refer to [DLN-136, "Removal and Installation"](#).
3. Remove the dust cover from the rear case.

**CAUTION:**

Do not damage the rear case.

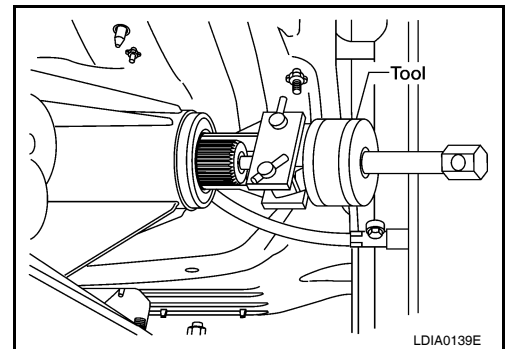


4. Remove the rear oil seal from the rear case using Tool.

**CAUTION:**

Do not damage the rear case.

**Tool number** : ST33290001 (J-34286)



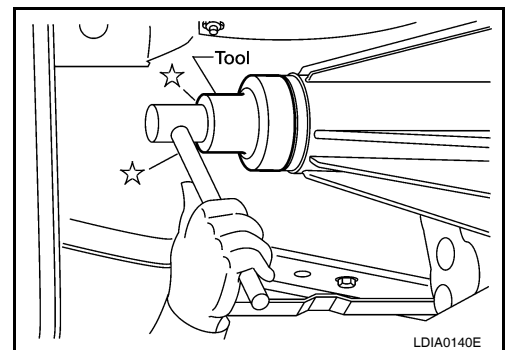
#### INSTALLATION

1. Install the new rear oil seal until it is flush with the end face of the rear case using Tool.

**Tool number** : KV38100500 ( — )

**CAUTION:**

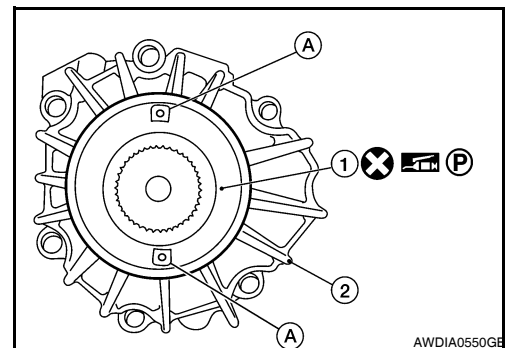
- Do not reuse oil seal.
- Apply petroleum jelly to oil seal.



2. Apply petroleum jelly to the circumference of the new dust cover (1). Position the new dust cover as shown.

**CAUTION:**

- Do not reuse dust cover.
- Position the identification mark at the position shown.
- Rear case assembly (2)
- Protrusions (A)



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## REAR OIL SEAL

< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

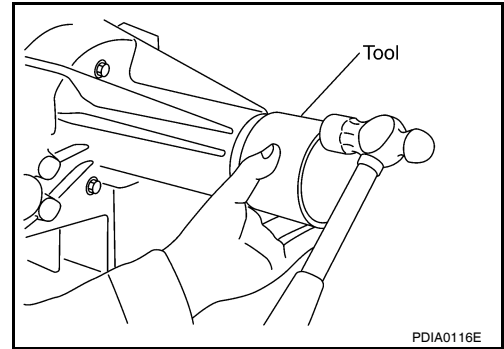
3. Install the new dust cover to the rear case using Tool.

**Tool number** : KV40105310 ( — )

**CAUTION:**

- Do not reuse dust cover.
- Apply petroleum jelly to dust cover.

4. Install the rear propeller shaft. Refer to [DLN-136, "Removal and Installation"](#).
5. Refill the transfer with fluid and check for fluid leakage and fluid level. Refer to [DLN-89, "Inspection"](#).



# TRANSFER CONTROL DEVICE

< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

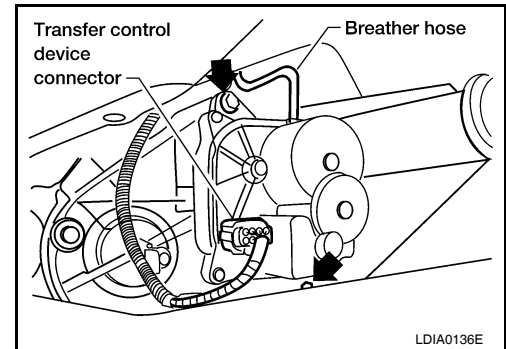
## TRANSFER CONTROL DEVICE

### Removal and Installation

INFOID:000000003789520

#### REMOVAL

1. Switch the 4WD shift switch to 2WD and set the transfer assembly to 2WD.
2. Disconnect the transfer control device connector.
3. Remove the breather hose from the transfer control device.
4. Remove the bolts and detach the transfer control device.

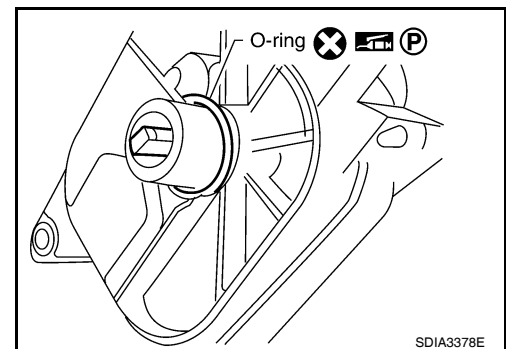


#### INSTALLATION

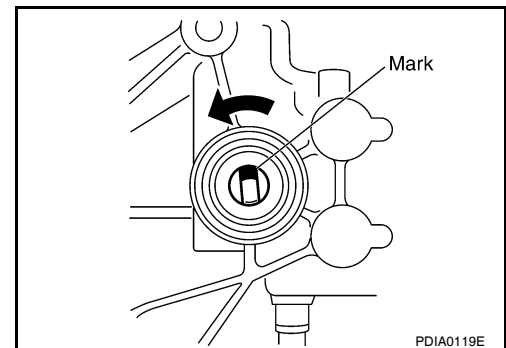
1. Install the new O-ring to the transfer control device.

**CAUTION:**

- Do not reuse O-ring.
- Apply petroleum jelly to O-ring.



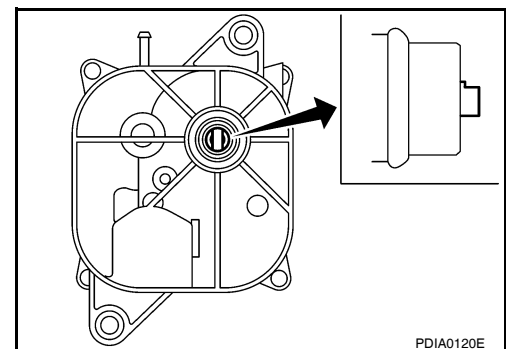
2. Install the transfer control device.
- a. Turn the control shift rod fully counterclockwise using a flat-bladed screwdriver, and then put a mark on the control shift rod.



- b. Align the transfer control device shaft cutout with the mark on the control shift rod, and install.

**NOTE:**

Turn the transfer control device when the transfer control device connection does not match.



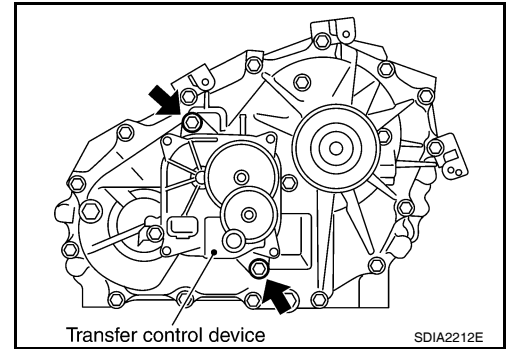
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## TRANSFER CONTROL DEVICE

< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

- c. Tighten the bolts to the specified torque. Refer to [DLN-108, "Dis-assembly and Assembly"](#).
3. Install the breather hose to the transfer control device.
4. Connect the transfer control device connector.
5. After the installation, check the 4WD shift indicator pattern. If NG, adjust the position between the transfer assembly and transfer control unit. Refer to [DLN-82, "Precaution for Transfer Assembly and Transfer Control Unit Replacement"](#).





# AIR BREATHER HOSE

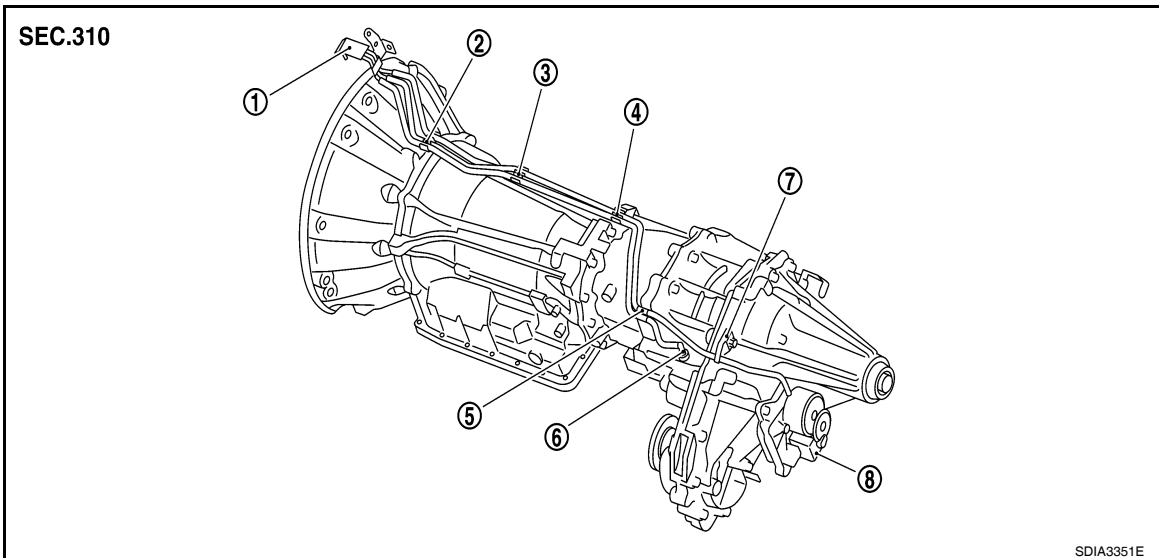
< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

## AIR BREATHER HOSE

### Removal and Installation

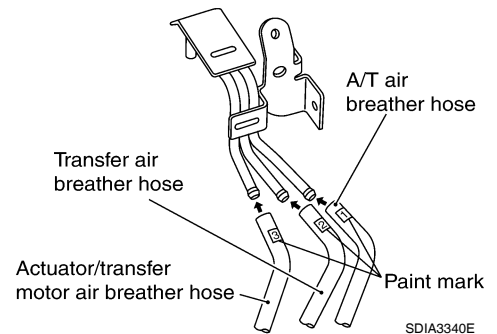
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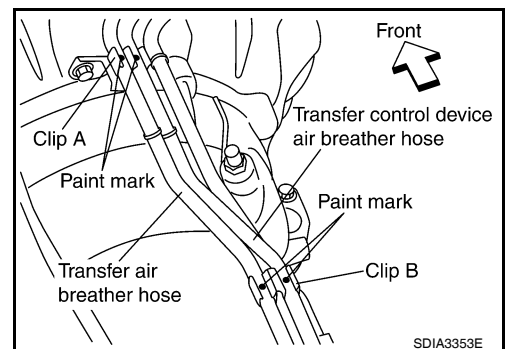
- |                            |                            |                             |
|----------------------------|----------------------------|-----------------------------|
| 1. Breather tube           | 2. Clip A                  | 3. Clip B                   |
| 4. Clip C                  | 5. Clip D                  | 6. Breather tube (transfer) |
| 7. Air breather hose clamp | 8. Transfer control device |                             |

#### CAUTION:

- Make sure there are no pinched or restricted areas on each air breather hose caused by folding or bending when installing it.
- Install each air breather hose into the breather tube (metal connector) until the hose end reaches the end of the curved section. Set each air breather hose with paint mark facing upward.



- Install transfer control device air breather hose and transfer air breather hose on clip A and clip B with the paint mark facing upward.



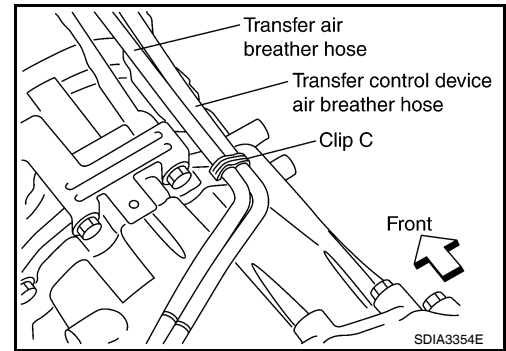
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# AIR BREATHER HOSE

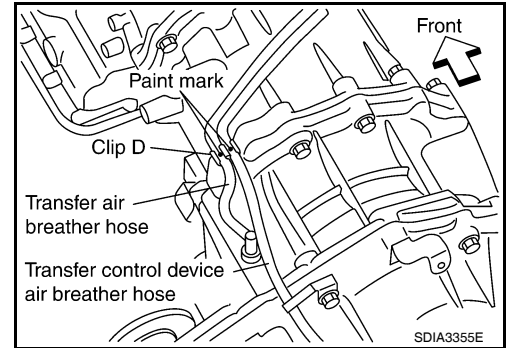
< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

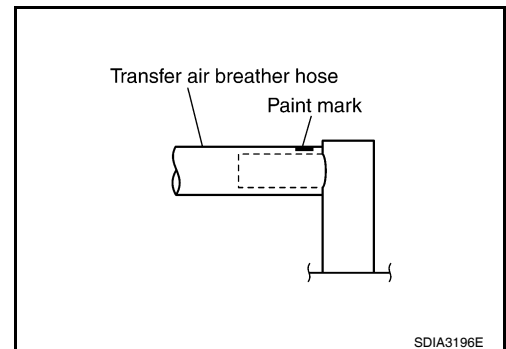
- Install clip C on transfer control device air breather hose and transfer air breather hose with the paint mark matched.



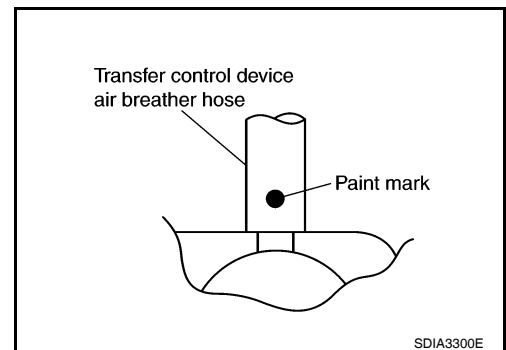
- Install transfer control device air breather hose and transfer air breather hose on clip D with the paint mark facing upward.



- Install transfer air breather hose into the breather tube (transfer, metal connector) until the hose end reaches the base of the tube. Set transfer air breather hose with paint mark facing upward.



- Install transfer control device air breather hose into transfer control device (case connector) until the hose end reaches the base of the tube. Set transfer control device air breather hose with paint mark facing forward.



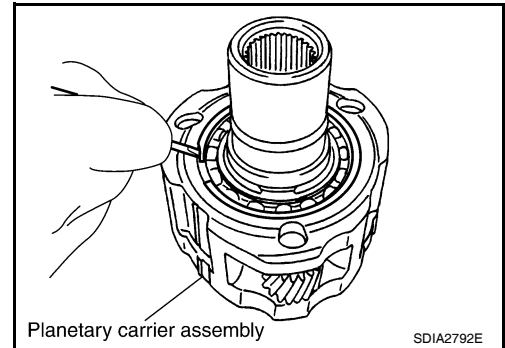
## PLANETARY CARRIER

### Disassembly and Assembly

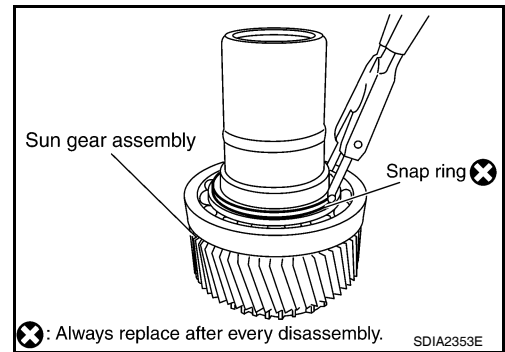
INFOID:000000003789522

#### DISASSEMBLY

1. Remove the snap ring.
2. Remove the sun gear assembly from the planetary carrier assembly using suitable tool.

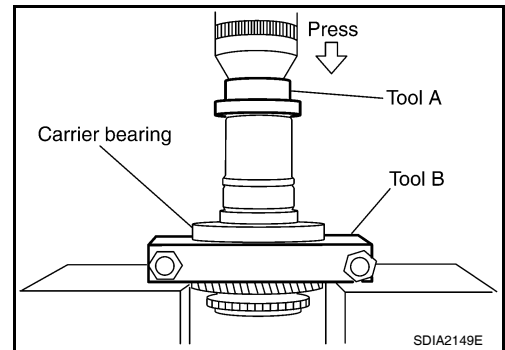


3. Remove the snap ring from the sun gear assembly using suitable tool.



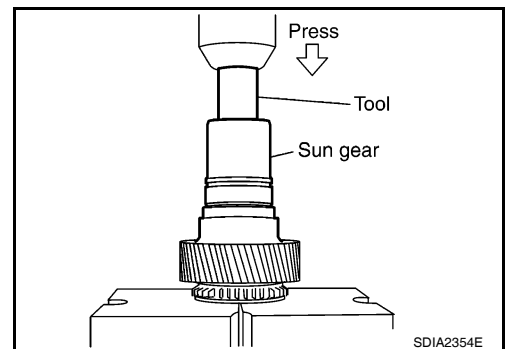
4. Remove the carrier bearing from the sun gear using Tools.

**Tool number**      **A: ST35300000 ( — )**  
                                  **B: ST30021000 (J-22912-01)**



5. Remove the needle bearing from the sun gear using Tool.

**Tool number**      **: ST33710000 ( — )**



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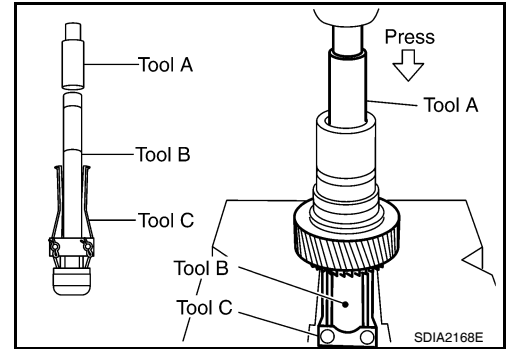
# PLANETARY CARRIER

< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

6. Remove the metal bushing from the sun gear using Tools.

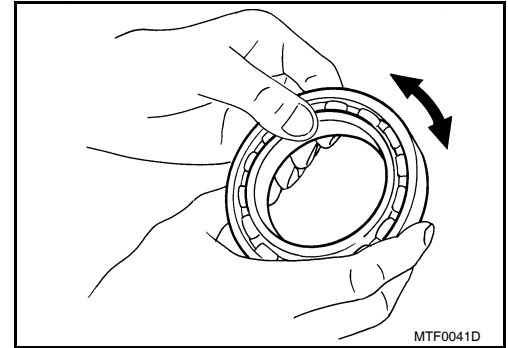
- Tool number**
- A: ST33710000 ( — )**
  - B: ST35325000 ( — )**
  - C: ST33290001 (J-34286)**



## INSPECTION AFTER DISASSEMBLY

### Bearing

Check the bearing for damage and rough rotation. If necessary, replace the bearing with a new one.

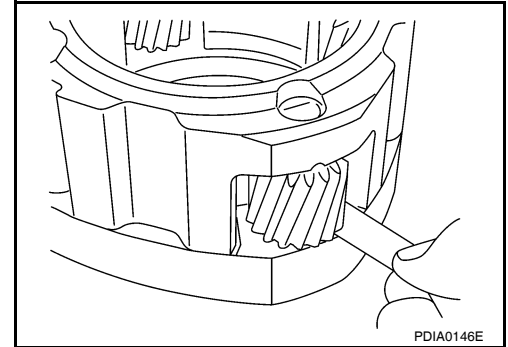


### Planetary Carrier

- Measure the end play of each pinion gear. If it is out of specification, replace the planetary carrier assembly with new one.

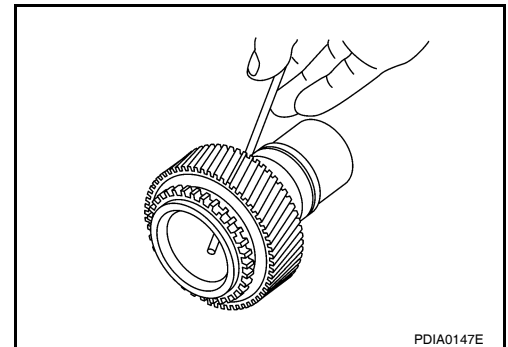
**Pinion gear end play : 0.1 - 0.7 mm (0.004 - 0.028 in)**

- Check the working face of each gear and bearing for damage, burrs, partial wear, dents and other abnormality. If any is found, replace the planetary carrier assembly with a new one.



### Sun Gear

- Check if the oil passage of the sun gear assembly is clogged. For this, try to pass a 3.6 mm (0.142 in) dia. wire through the oil passage as shown.
- Check the sliding and contact surface of each gear and bearing for damage, burrs, partial wear, dents and other abnormality. If any is found, replace the sun gear assembly with a new one.



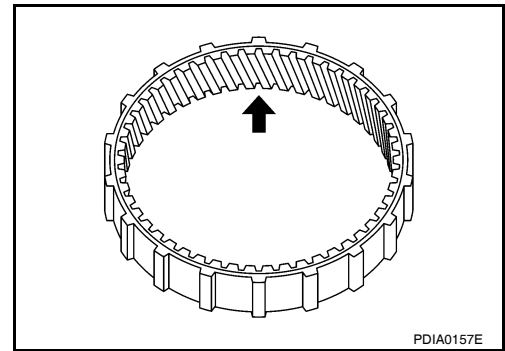
### Internal Gear

# PLANETARY CARRIER

< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

Check the internal gear teeth for damage, partial wear, dents or other abnormality. If any is found, replace the internal gear with a new one.



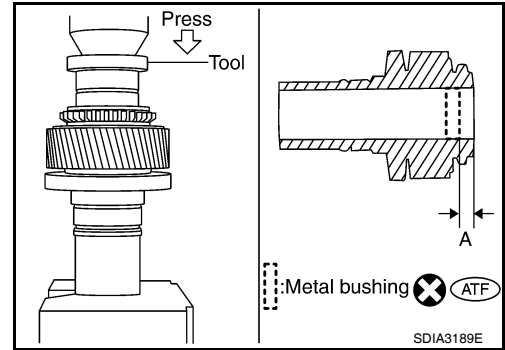
## ASSEMBLY

1. Apply ATF to the new metal bushing, then install the new metal bushing until it becomes "Dimension A" using Tool.

**Tool number** : ST35300000 ( — )

**Dimension A** : 7.7 - 8.3mm (0.303 - 0.327in)

**CAUTION:**  
Do not reuse metal bushing.

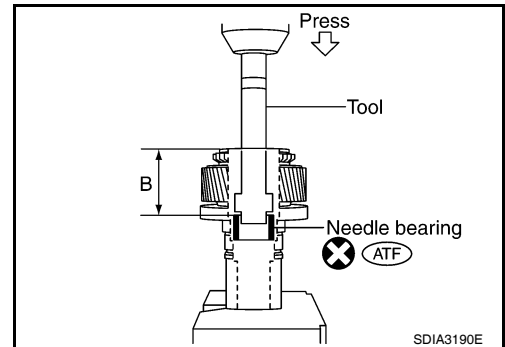


2. Apply ATF to the new needle bearing, then install the new needle bearing until it becomes "Dimension B" using Tool.

**Tool number** : ST33220000 ( — )

**Dimension B** : 62.5 - 63.1mm (2.461 - 2.484in)

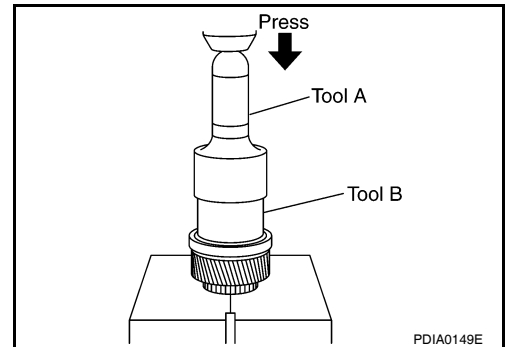
**CAUTION:**  
Do not reuse needle bearing.



3. Install the carrier bearing to the sun gear using Tools.

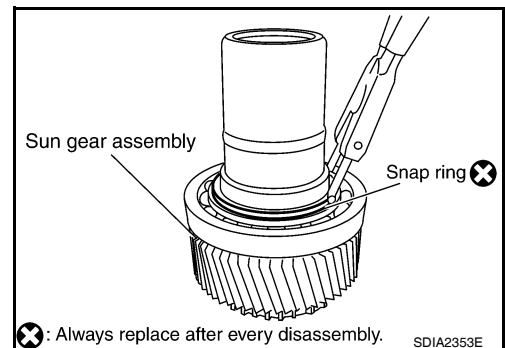
**Tool number** **A:** ST30720000 (J-25405)

**B:** ST27863000 ( — )



4. Install the new snap ring to the sun gear assembly using suitable tool.

**CAUTION:**  
Do not reuse snap ring.



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## PLANETARY CARRIER

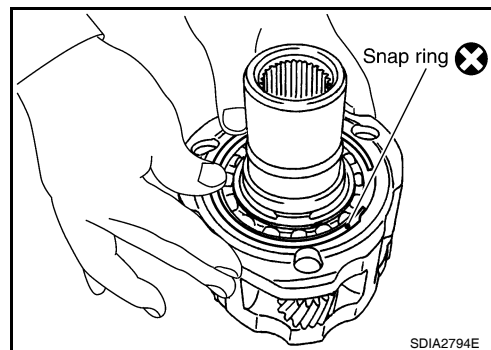
< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

5. Install the sun gear assembly to the planetary carrier assembly.
6. Install the new snap ring to the planetary carrier assembly.

**CAUTION:**

**Do not reuse snap ring.**



SDIA2794E

# FRONT DRIVE SHAFT

< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

## FRONT DRIVE SHAFT

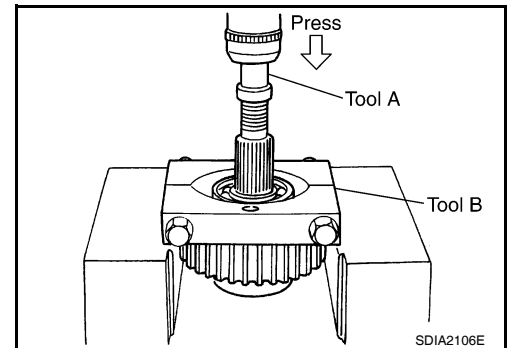
### Disassembly and Assembly

INFOID:000000003789523

#### DISASSEMBLY

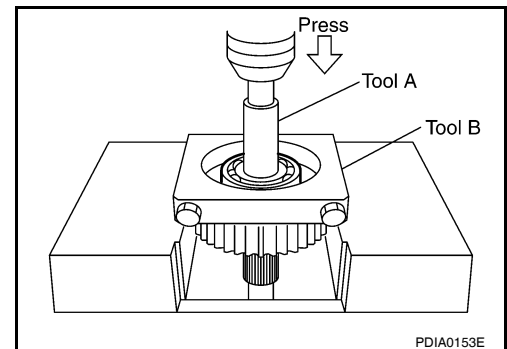
1. Remove the front bearing using Tools.

**Tool number**      **A: ST35300000 ( — )**  
                             **B: ST30021000 (J-22912-01)**



2. Remove the rear bearing using Tools.

**Tool number**      **A: ST33710000 ( — )**  
                             **B: ST30021000 (J-22912-01)**

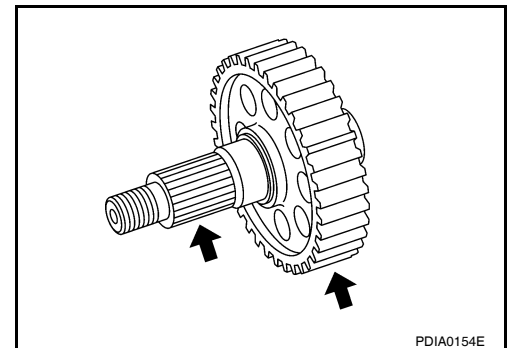


#### INSPECTION AFTER DISASSEMBLY

##### Front Drive Shaft

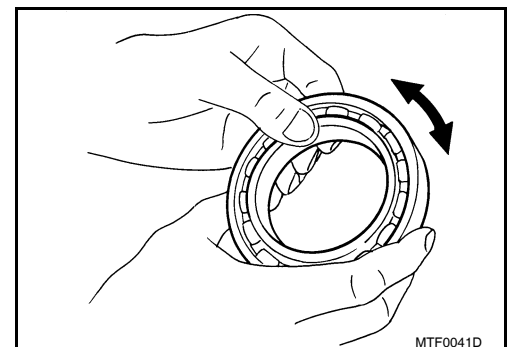
Check the items below. If necessary, replace them with new ones.

- Damage, peeling, dent, uneven wear and bending of the shaft.
- Excessive wear, damage and peeling of the gear.



##### Bearing

Check the bearing for damage and rough rotation. If necessary, replace the bearing with a new one.



#### ASSEMBLY

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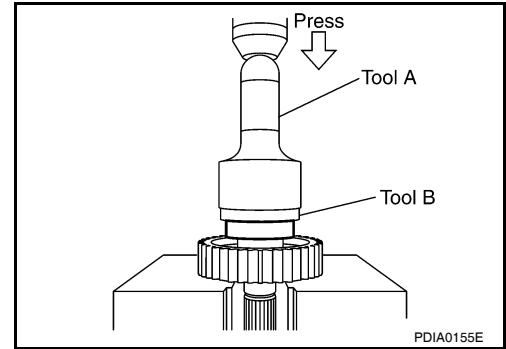
# FRONT DRIVE SHAFT

< ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

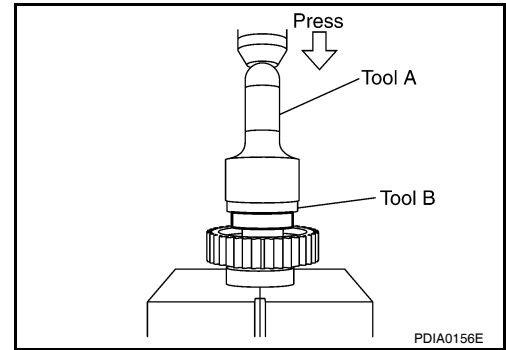
1. Install the rear bearing using Tools.

**Tool number**      **A: KV38100500 ( — )**  
                             **B: ST30901000 (J-26010-01)**



2. Install the front bearing using Tools.

**Tool number**      **A: KV38100500 ( — )**  
                             **B: ST30901000 (J-26010-01)**





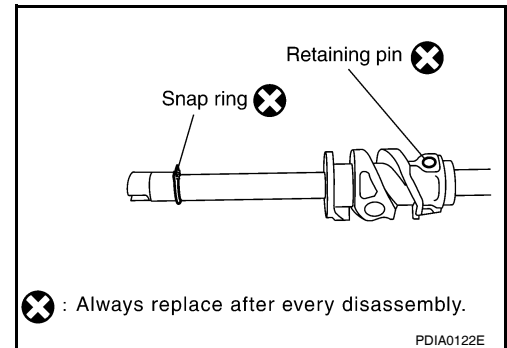
## SHIFT CONTROL

### Disassembly and Assembly

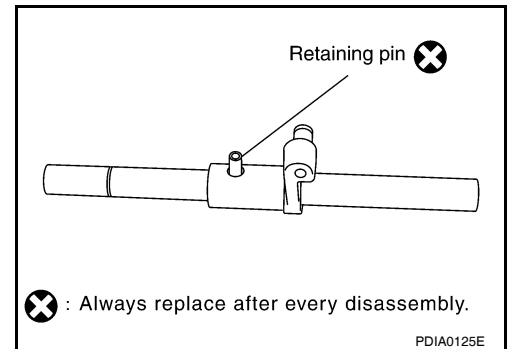
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#### DISASSEMBLY

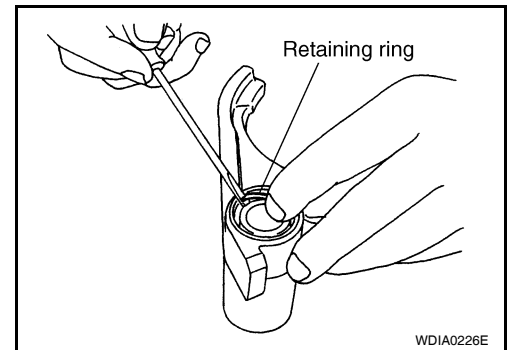
1. Remove the snap ring.
2. Remove the retaining pin.
3. Remove the drum cam from the control shift rod.



4. Remove the retaining pin from the L-H shift rod.
5. Remove the 2-4 shift bracket.



6. Remove the retaining ring from the 2-4 shift fork using suitable tool.
7. Remove the fork guide collar and 2-4 shift fork spring from the 2-4 shift fork.



#### INSPECTION AFTER DISASSEMBLY

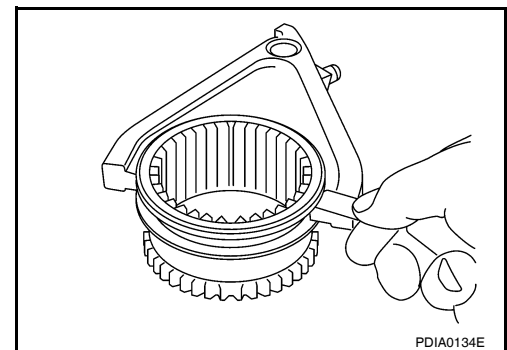
##### Shift Fork

- Measure the clearance between the shift fork and sleeve. If it is out of specification, replace it with a new one.

##### Standard value

2-4 : Less than 0.46 mm (0.018 in)

L-H : Less than 0.46 mm (0.018 in)



##### Shift Rod and Fork Components

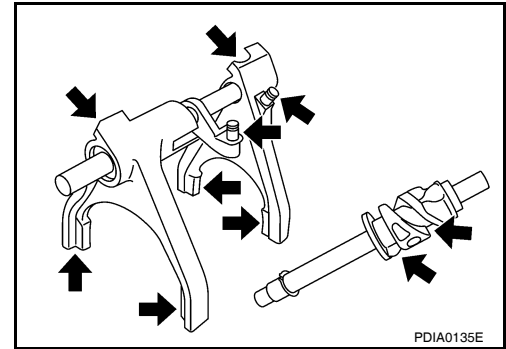
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# SHIFT CONTROL

## < ON-VEHICLE REPAIR >

[TRANSFER: TX15B]

- Check the working face of the shift rod and fork for wear, partial wear, abrasion, bending and other abnormality. If any is found, replace with a new one.



## ASSEMBLY

1. Install clevis pin and shift collar to L-H shift fork after assembling them.

**CAUTION:**

**Use caution when installing L-H shift fork, clevis pin or shift collar.**

2. Install clevis pin and shift collar to 2-4 shift bracket after assembling them.

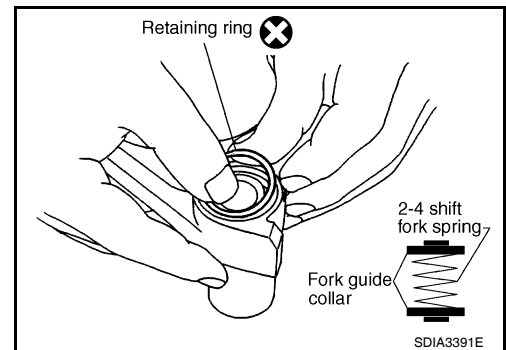
**CAUTION:**

**Use caution when installing 2-4 shift bracket.**

3. Install guide fork collar and 2-4 shift fork spring to the 2-4 shift fork, and then secure it with the new retaining ring.

**CAUTION:**

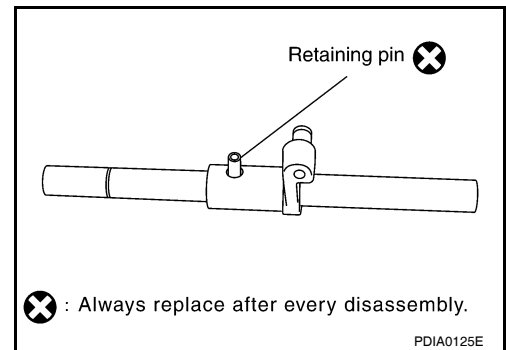
- Do not reuse retaining ring.
- Be careful with orientation.



4. Install the 2-4shift bracket to the L-H shift rod.
5. Install the new retaining pin evenly to the L-H shift rod.

**CAUTION:**

**Do not reuse retaining pin.**



6. Install the drum cam to the control shift rod, and then secure it with the new retaining pin.

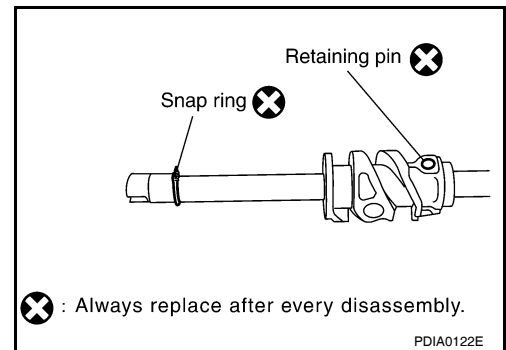
**CAUTION:**

**Do not reuse retaining pin.**

7. Install the new snap ring to the control shift rod.

**CAUTION:**

**Do not reuse snap ring.**



# REMOVAL AND INSTALLATION

## TRANSFER ASSEMBLY

### Removal and Installation

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#### REMOVAL

1. Switch 4WD shift switch to 2WD and set transfer assembly to 2WD.
2. Remove the undercovers using power tool.
3. Drain the transfer fluid. Refer to [DLN-89, "Replacement"](#).
4. Remove the center exhaust tube and main muffler. Refer to [EX-6, "Removal and Installation"](#).
5. Remove the front and rear propeller shafts. Refer to [DLN-128, "Removal and Installation"](#) (front), [DLN-136, "Removal and Installation"](#) (rear).

**CAUTION:**

**Do not damage spline, sleeve yoke and rear oil seal when removing rear propeller shaft.**

**NOTE:**

Insert a plug into the rear oil seal after removing the rear propeller shaft.

6. Remove the A/T nuts from the A/T crossmember. Refer to [TM-236, "Removal and Installation \(4WD\)"](#).
7. Position two suitable jacks under the A/T and transfer assembly.
8. Remove the A/T crossmember. Refer to [TM-236, "Removal and Installation \(4WD\)"](#).

**WARNING:**

**Support A/T and transfer assembly using two suitable jacks while removing A/T crossmember.**

9. Disconnect the electrical connectors from the following:
  - ATP switch
  - 4LO switch
  - Wait detection switch
  - Transfer control device
10. Disconnect each air breather hose from the following. Refer to [TM-220, "Removal and Installation"](#).
  - Transfer control device
  - Breather tube (transfer)
11. Remove the transfer to A/T and A/T to transfer bolts.
12. Remove the transfer assembly.

**WARNING:**

**support transfer assembly with suitable jack while removing it.**

**CAUTION:**

**Do not damage rear oil seal (A/T).**

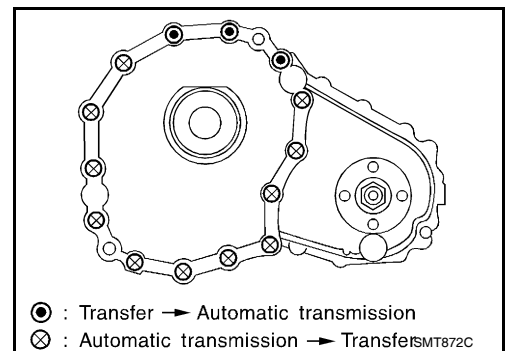
#### INSTALLATION

Installation is in the reverse order of removal.

- Tighten the bolts to specification.

**Tightening torque : 36 N·m (3.7kg·m, 27 ft-lb)**

- Fill the transfer with new fluid and check for fluid leakage and fluid level. Refer to [DLN-89, "Inspection"](#).
- Start the engine for one minute. Then stop the engine and recheck the transfer fluid. Refer to [DLN-89, "Inspection"](#).
- After the installation, check the 4WD shift indicator pattern. If NG, adjust the position between the transfer assembly and transfer control unit. Refer to [DLN-82, "Precaution for Transfer Assembly and Transfer Control Unit Replacement"](#).



# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]

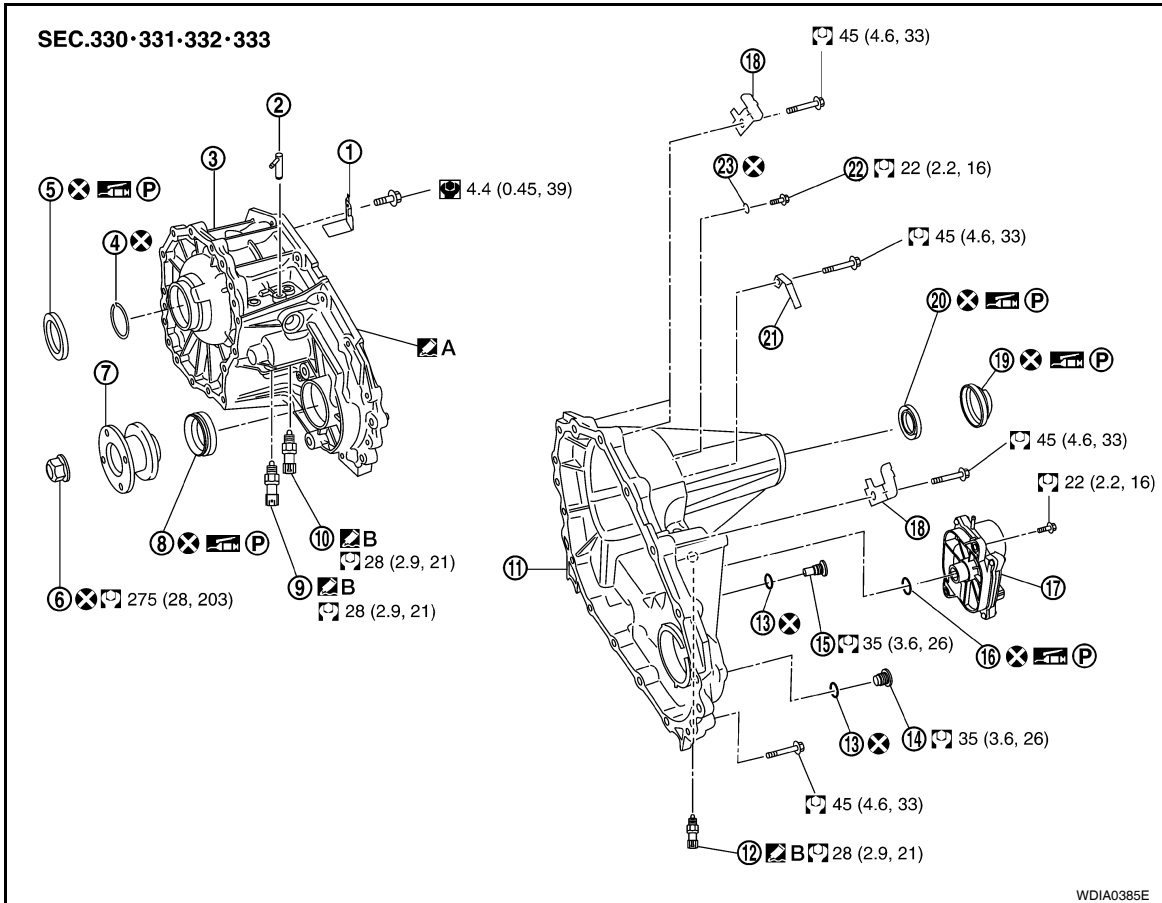
## DISASSEMBLY AND ASSEMBLY

### TRANSFER ASSEMBLY

#### Disassembly and Assembly

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#### COMPONENTS

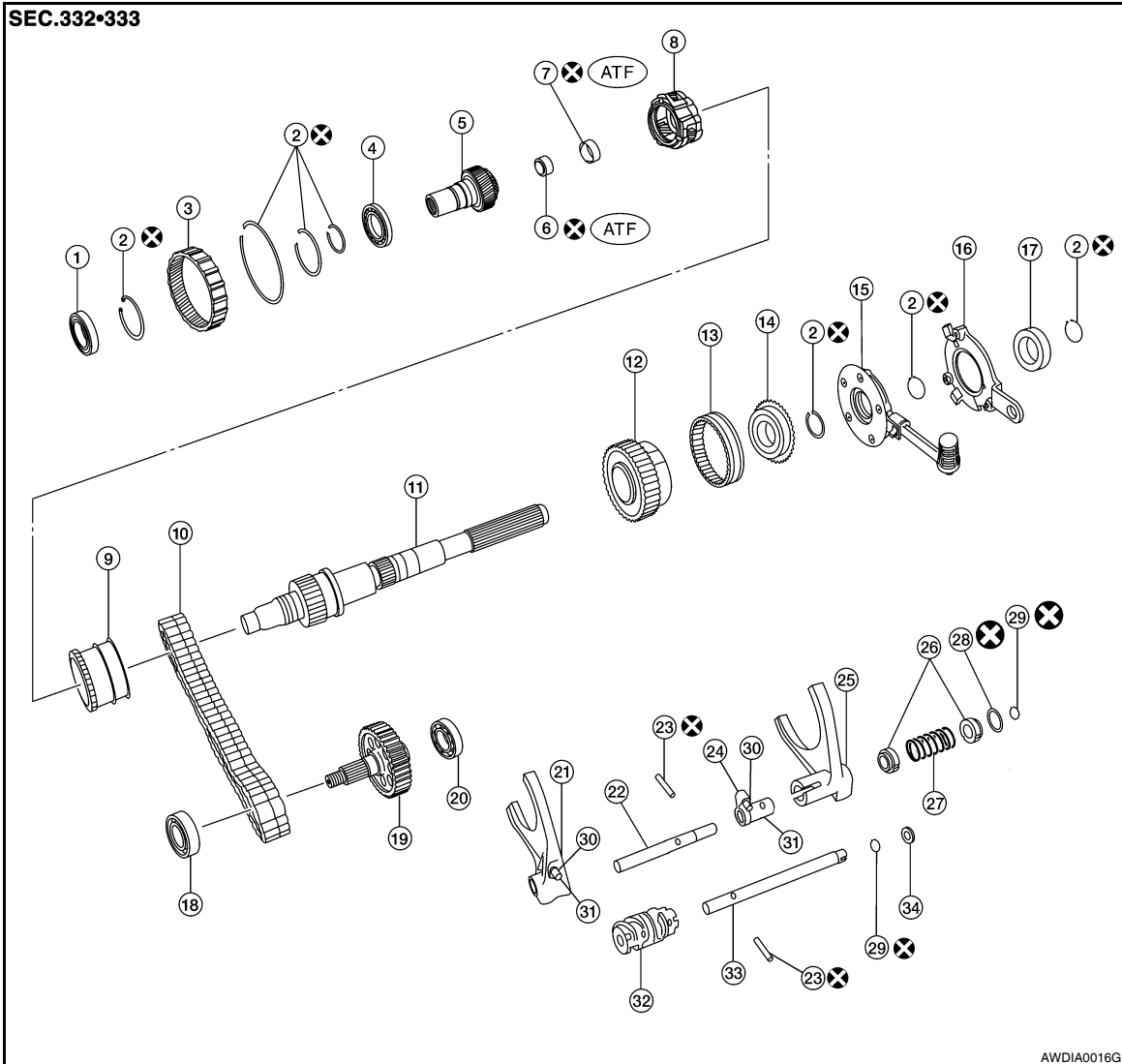


- |  |                             |   |
|--|-----------------------------|---|
| 1. Baffle plate                              | 2. Breather tube            | 3. Front case   |
| 4. Snap ring                                 | 5. Input oil seal           | 6. Self-lock nut  |
| 7. Companion flange                          | 8. Front oil seal           | 9. 4LO switch (gray with green paint)                   |
| 10. ATP switch (black)                       | 11. Rear case               | 12. Wait detection switch (gray)                        |
| 13. Gasket                                   | 14. Filler plug             | 15. Drain plug  |
| 16. O-ring                                   | 17. Transfer control device | 18. Harness bracket                                     |
| 19. Dust cover                               | 20. Rear oil seal           | 21. Air breather hose clamp                             |
| 22. Retainer bolt                            | 23. Gasket                  | A. Apply Genuine Anaerobic Liquid Gasket or equivalent. |
| B. Apply Genuine Silicone RTV or equivalent. | P. Apply petroleum jelly    |   |

# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]



- |                       |                               |                           |
|-----------------------|-------------------------------|---------------------------|
| 1. Input bearing      | 2. Snap ring                  | 3. Internal gear          |
| 4. Carrier bearing    | 5. Sun gear                   | 6. Needle bearing         |
| 7. Metal bushing      | 8. Planetary carrier assembly | 9. L-H sleeve             |
| 10. Drive chain       | 11. Mainshaft                 | 12. Sprocket              |
| 13. 2-4 sleeve        | 14. Clutch gear               | 15. Oil pump assembly     |
| 16. Retainer          | 17. Mainshaft rear bearing    | 18. Front bearing         |
| 19. Front drive shaft | 20. Rear bearing              | 21. L-H shift fork        |
| 22. L-H shift rod     | 23. Retaining pin             | 24. 2-4 shift bracket     |
| 25. 2-4 shift fork    | 26. Fork guide collar         | 27. 2-4 shift fork spring |
| 28. Retaining ring    | 29. Snap ring                 | 30. Shift collar          |
| 31. Clevis pin        | 32. Drum cam                  | 33. Control shift rod     |
| 34. Spacer            |                               |                           |

## DISASSEMBLY

1. Remove the drain plug and filler plug.

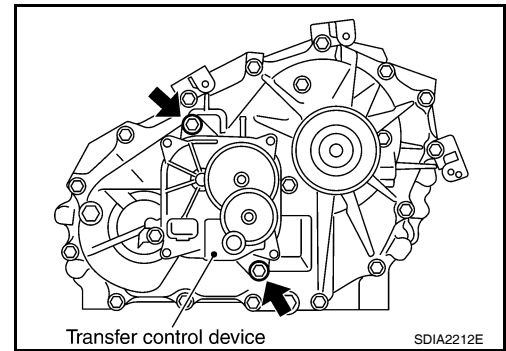
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# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

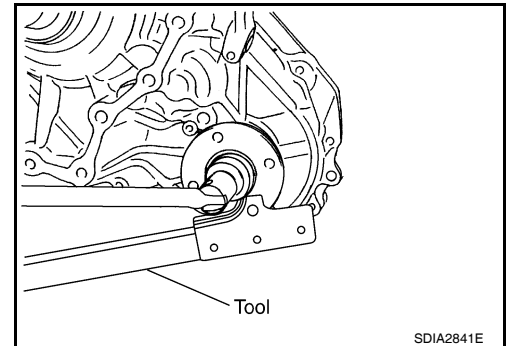
[TRANSFER: TX15B]

2. Remove the transfer control device from the rear case.
3. Remove the O-ring from the transfer control device.



4. Remove the self-lock nut from the companion flange using Tool.

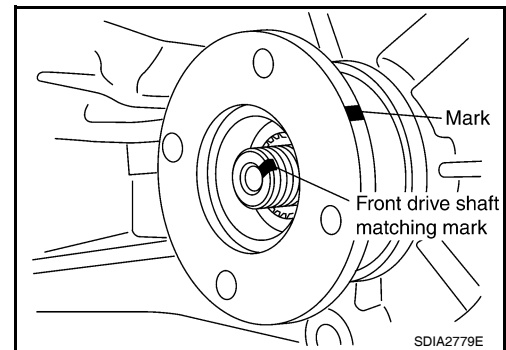
**Tool number** : KV40104000 ( — )



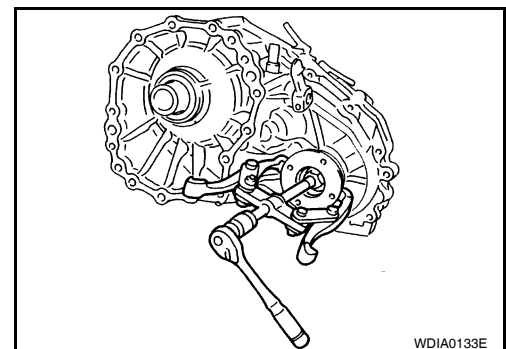
5. Put a matching mark on top of the front drive shaft in line with the mark on the companion flange.

**CAUTION:**

**Use paint to make the matching mark on the front drive shaft. Do not damage the front drive shaft.**



6. Remove the companion flange using suitable tool.

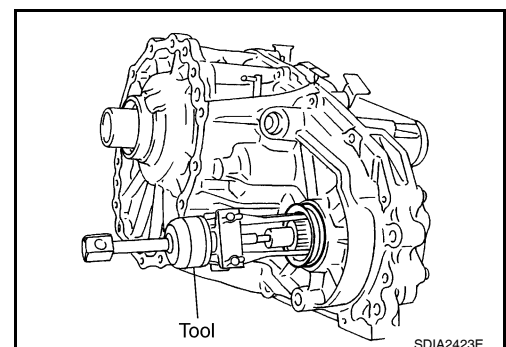


7. Remove the front oil seal from the front case using Tool.

**Tool number** : ST33290001 (J-34286)

**CAUTION:**

**Do not damage front case or front drive shaft.**

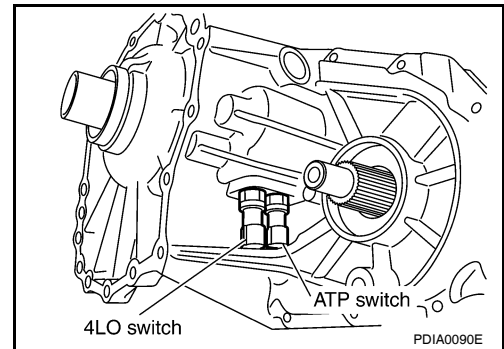


# TRANSFER ASSEMBLY

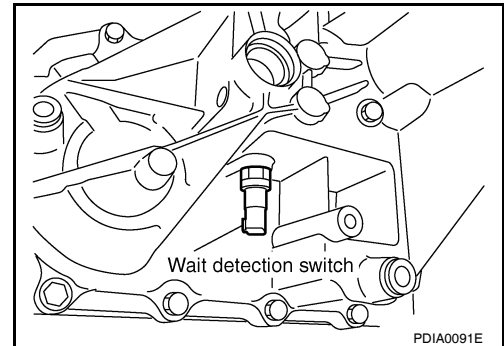
< DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]

8. Remove the 4LO switch [gray (with green paint)] and ATP switch (black) from the front case.



9. Remove the wait detection switch (gray) from the rear case.



10. Remove the dust cover from the rear case using suitable tool.

**CAUTION:**

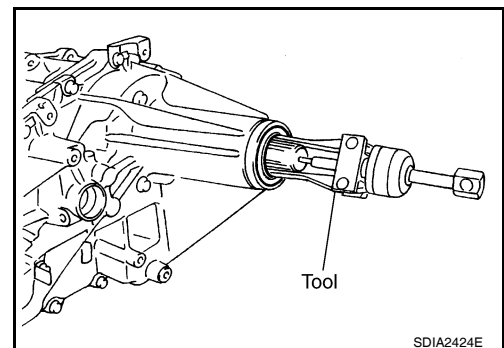
**Do not damage rear case.**

11. Remove the rear oil seal from the rear case using Tool.

**Tool number : ST33290001 (J-34286)**

**CAUTION:**

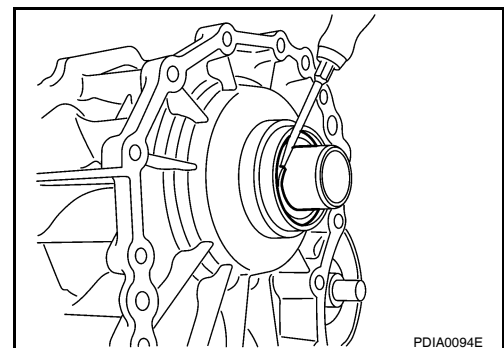
**Do not damage rear case or mainshaft.**



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

**CAUTION:**

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



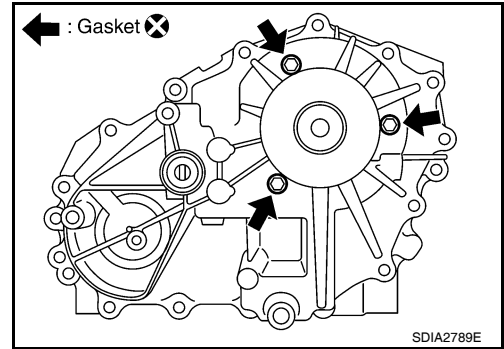
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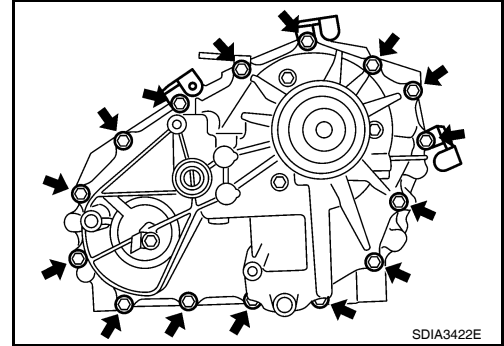
< DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]

13. Remove the retainer bolts and gaskets.



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



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

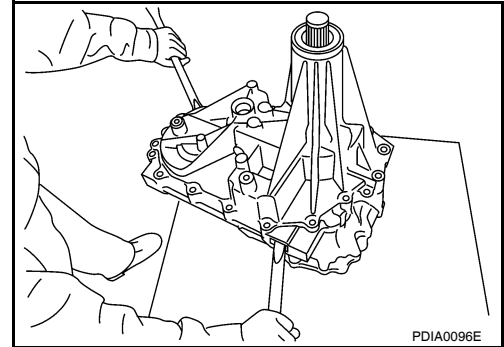
**CAUTION:**

**Do not damage the mating surface.**

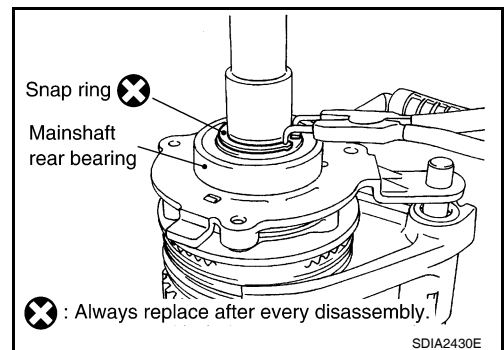
16. Remove the spacer from the control shift rod.

**CAUTION:**

**Do not drop spacer.**

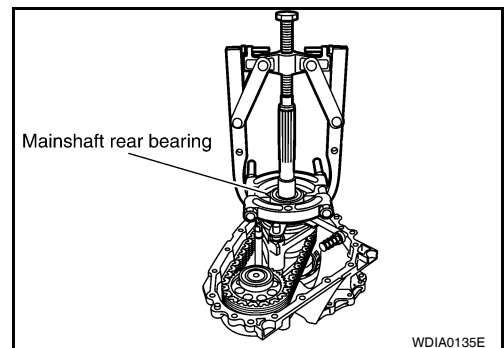


17. Remove the snap ring from the mainshaft using suitable tool.



18. Remove the mainshaft rear bearing from the mainshaft using suitable tool.

19. Remove the retainer from the mainshaft.



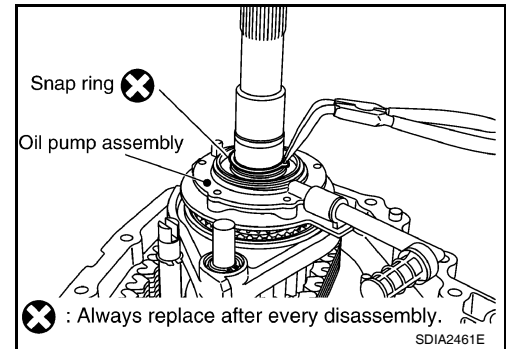


# TRANSFER ASSEMBLY

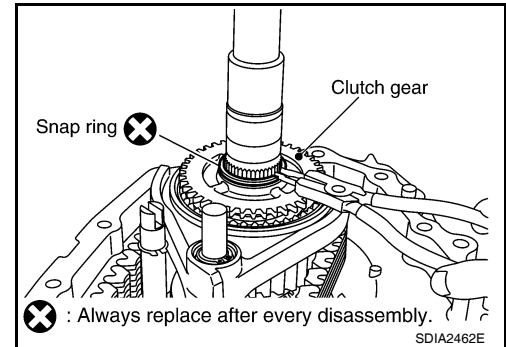
< DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]

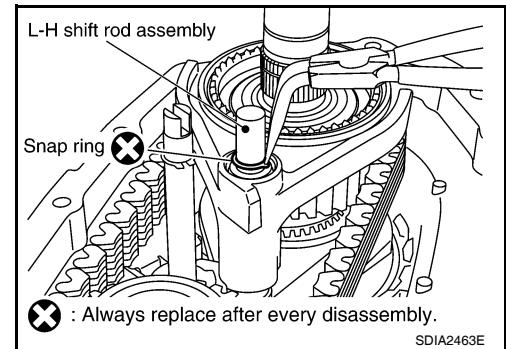
- 20. Remove the snap ring from the mainshaft using suitable tool.
- 21. Remove the oil pump assembly from the mainshaft.



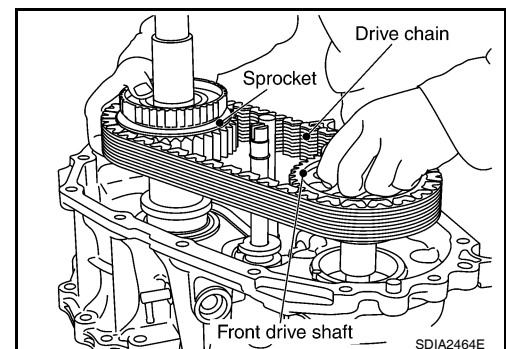
- 22. Remove the snap ring from the mainshaft using suitable tool.
- 23. Remove the clutch gear from the mainshaft.



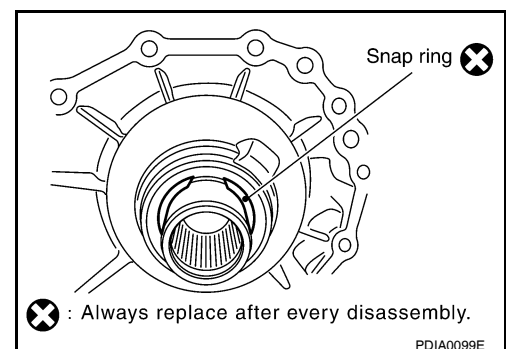
- 24. Remove the snap ring from the L-H shift rod assembly using suitable tool.
- 25. Remove the 2-4 sleeve and 2-4 shift fork assembly from the mainshaft.



- 26. Remove the drive chain together with the sprocket and front drive shaft from the front case.
- 27. Remove the mainshaft from the sun gear assembly.
- 28. Remove the L-H shift rod assembly and control shift rod assembly from the front case.
- 29. Remove the L-H sleeve together with the L-H shift fork from the planetary carrier assembly.



- 30. Remove the snap ring from the sun gear.  
**CAUTION:**  
Do not damage sun gear or input bearing.



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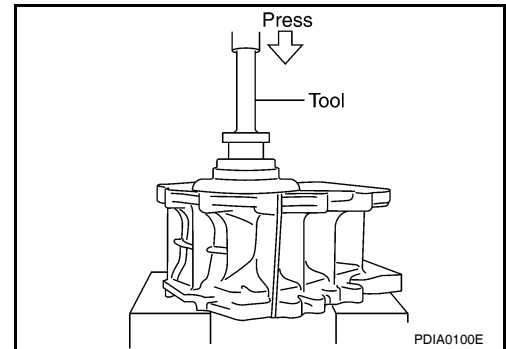
# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

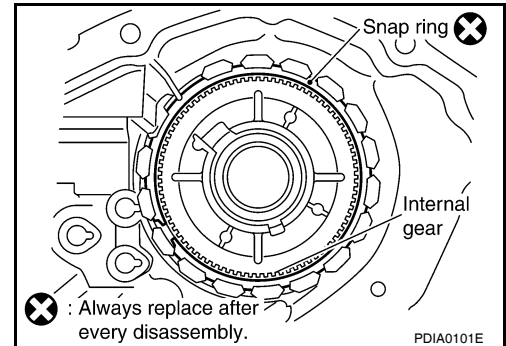
[TRANSFER: TX15B]

31. Press the sun gear assembly and planetary carrier assembly from the front case using Tool.

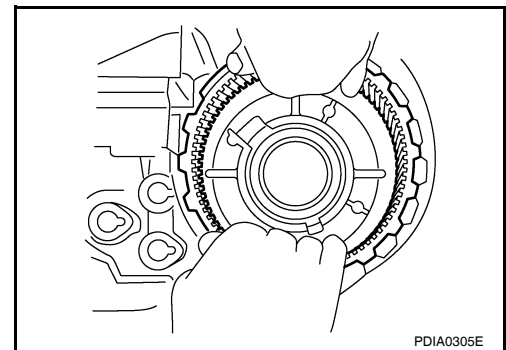
**Tool number** : KV38100200 ( — )



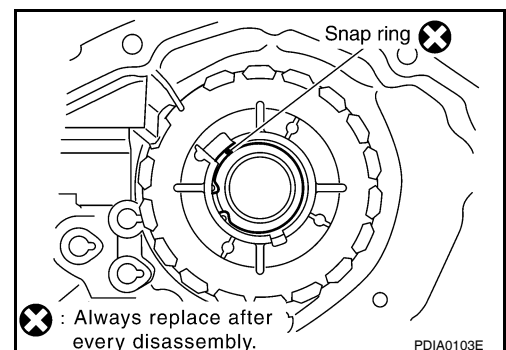
32. Remove the snap ring from the front case.



33. Remove the internal gear from the front case.

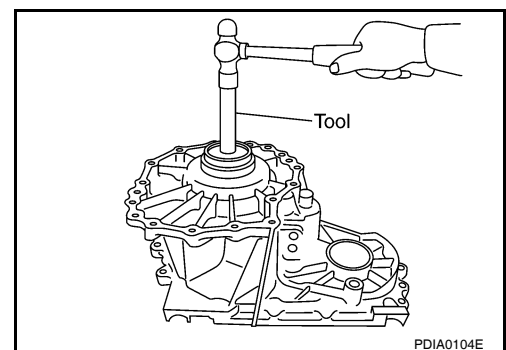


34. Remove the snap ring from the front case.



35. Remove the input bearing from the front case using Tool.

**Tool number** : KV38100200 ( — )

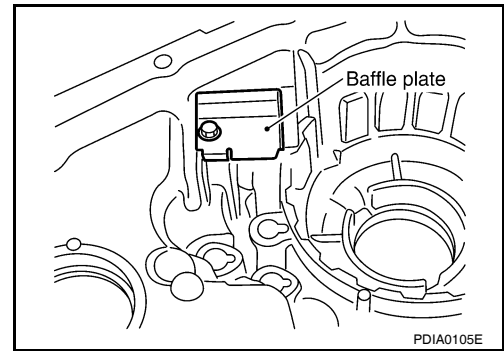


# TRANSFER ASSEMBLY

## < DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]

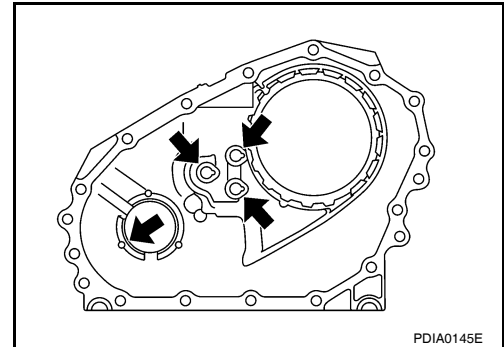
36. Remove the baffle plate from the front case.
37. Remove the breather tube from the front case.



## INSPECTION AFTER DISASSEMBLY

### Case

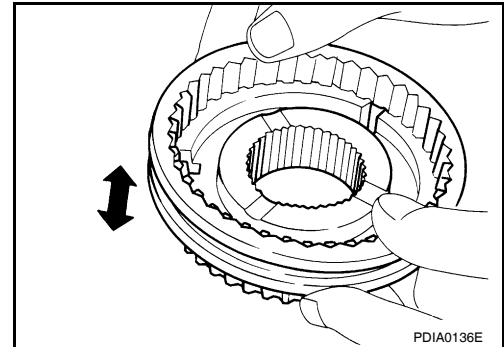
Check the contact surfaces of the shift rod and bearing for wear and damage. If any is found, replace with a new one.



### Sleeve

Check the items below. If necessary, replace them with new ones.

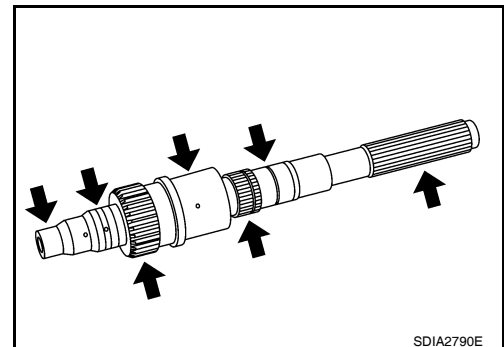
- Damage and excessive wear of the contact surfaces of the sprocket, mainshaft and sleeve.
- Sleeve must move smoothly.



### Gear, Shaft and Drive Chain

Check the items below. If necessary, replace them with new ones.

- Damage, peeling, uneven wear and bending of the shaft.
- Excessive wear, damage and peeling of the gear.



### Bearing

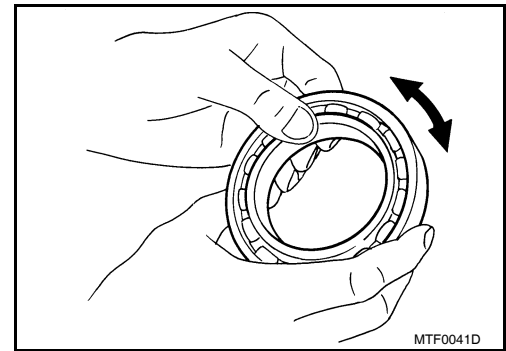
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# TRANSFER ASSEMBLY

## < DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]

Check the bearing for damage and rough rotation. If necessary, replace it with a new one.

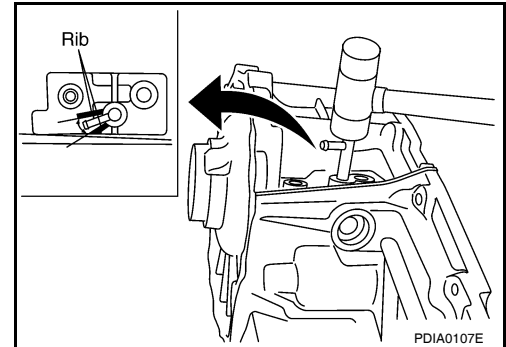


## ASSEMBLY

1. Install the breather tube.

**CAUTION:**

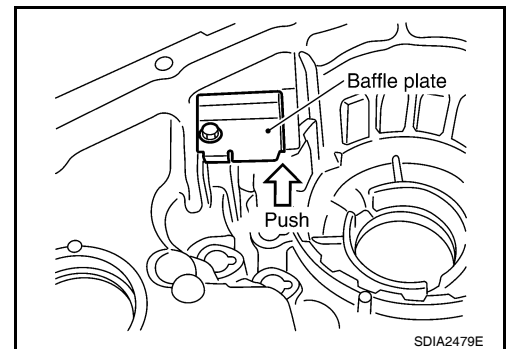
**Install breather tube in the direction shown.**



2. Install the baffle plate to the front case. Tighten the bolt to the specified torque. Refer to [DLN-108, "Disassembly and Assembly"](#).

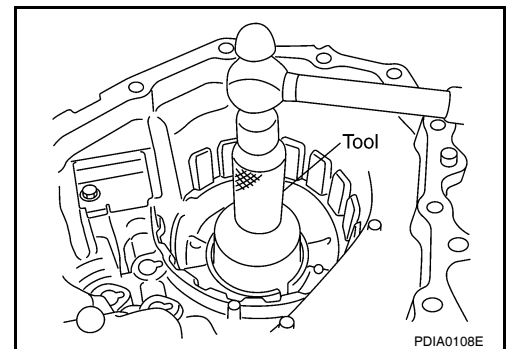
**CAUTION:**

**Install baffle plate by pushing it in the direction shown while tightening the bolt.**



3. Install the input bearing to the front case using Tool.

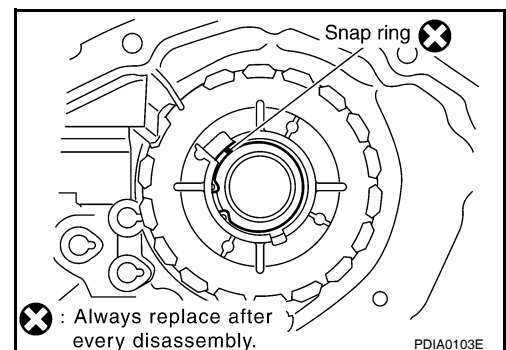
**Tool number : ST30720000 (J-25405)**



4. Install the new snap ring to the front case.

**CAUTION:**

**Do not reuse snap ring.**

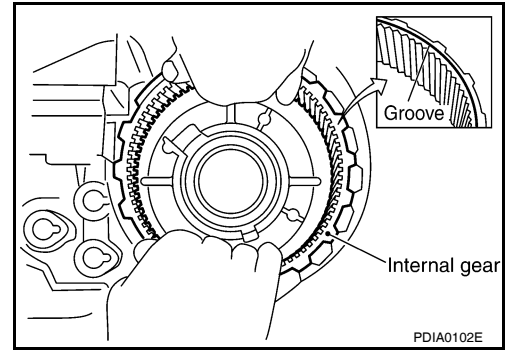


# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]

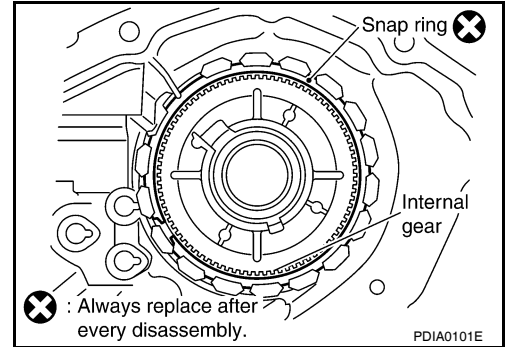
5. Install the internal gear with the groove facing up into the front case.



6. Install the new snap ring to the front case.

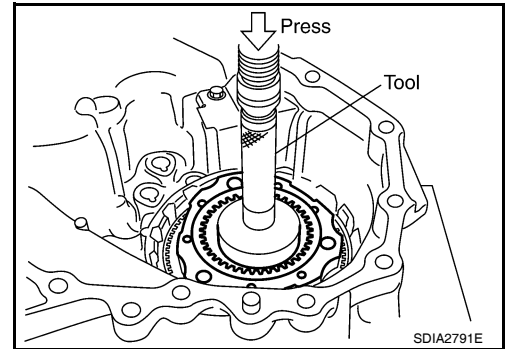
**CAUTION:**

**Do not reuse snap ring.**



7. Install the planetary carrier assembly and sun gear assembly to the front case using Tool.

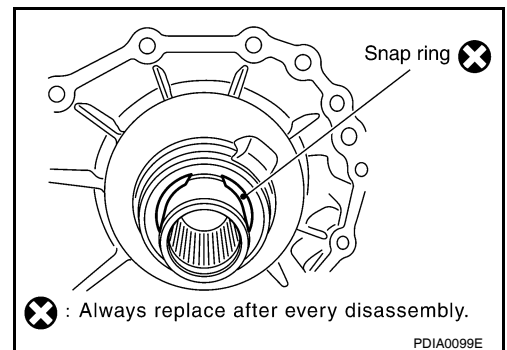
**Tool number** : KV38100200 ( — )



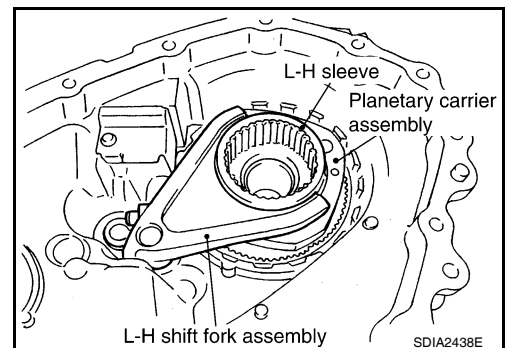
8. Install the new snap ring to the sun gear.

**CAUTION:**

- Do not reuse snap ring.
- Do not damage sun gear.



9. Set the L-H sleeve together with the L-H shift fork assembly onto the planetary carrier assembly.



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# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

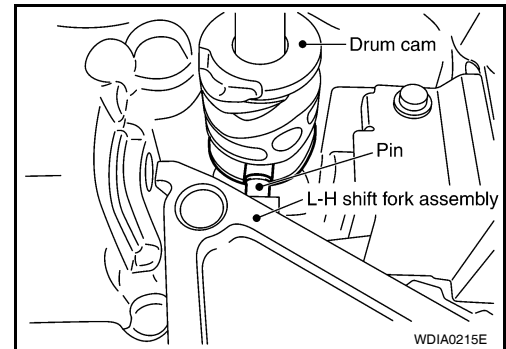
[TRANSFER: TX15B]

10. Install the control shift rod assembly to the front case.

**CAUTION:**

**Set pin of L-H shift fork assembly into the groove of drum cam.**

11. Turn the control shift rod assembly fully counterclockwise.

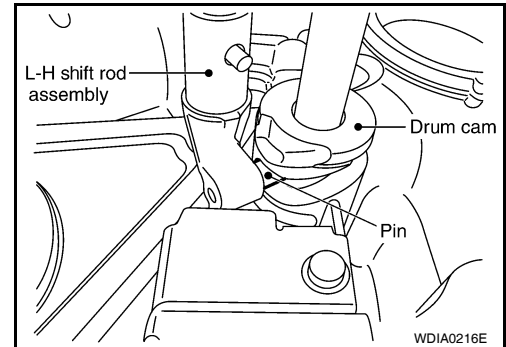


12. Install the L-H shift rod assembly through the L-H shift fork assembly opening to the front case.

**CAUTION:**

**Set pin of L-H shift rod assembly into the groove of drum cam.**

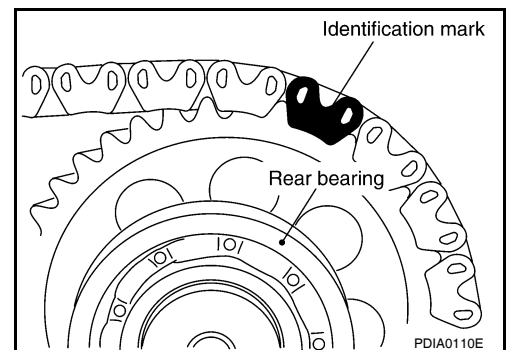
13. Install the mainshaft to the sun gear assembly.



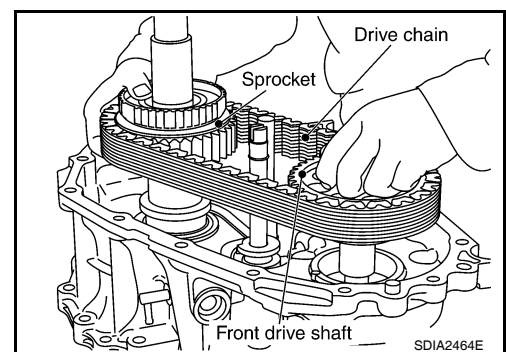
14. Install the drive chain to the front drive shaft and sprocket.

**CAUTION:**

**Install with the Identification mark of drive chain on the side of the rear bearing of front drive shaft.**



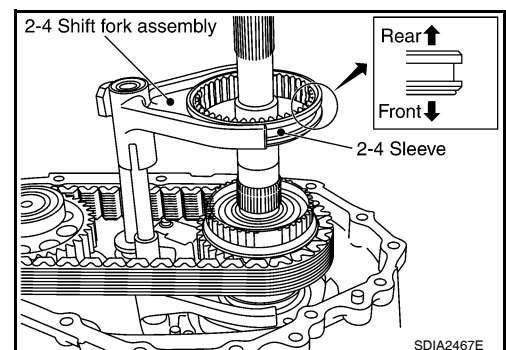
15. Install the drive chain together with the front drive shaft and sprocket to the front case.



16. Install the 2-4 sleeve and 2-4 shift fork assembly to the mainshaft.

**CAUTION:**

- Install with proper orientation of 2-4 sleeve.
- Install 2-4 shift fork with engaging the grooves of 2-4 shift fork in the retaining pin of 2-4 shift bracket.



# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

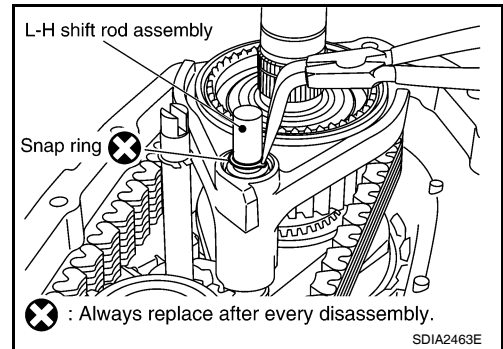
[TRANSFER: TX15B]

17. Install the new snap ring to the L-H shift rod assembly using suitable tool.

**CAUTION:**

**Do not reuse snap ring.**

18. Install the clutch gear to the mainshaft.

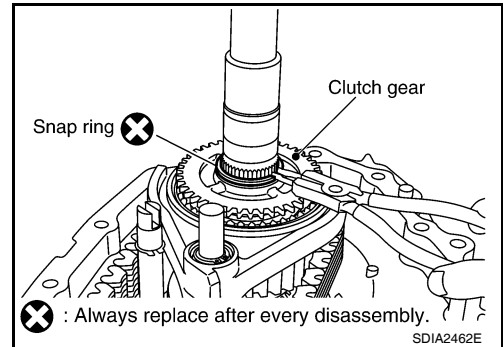


19. Install the new snap ring to the mainshaft using suitable tool.

**CAUTION:**

**Do not reuse snap ring.**

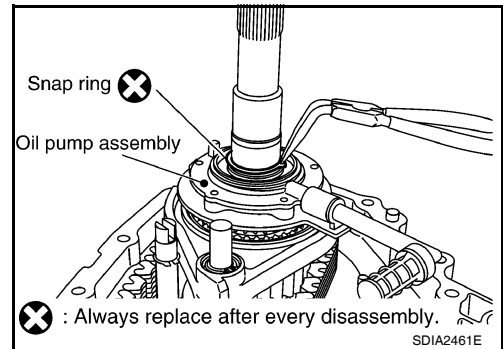
20. Install the oil pump assembly to the mainshaft.



21. Install the new snap ring to the mainshaft using suitable tool.

**CAUTION:**

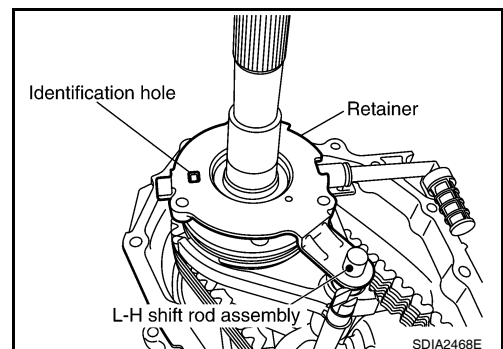
**Do not reuse snap ring.**



22. Install the retainer to the mainshaft.

**CAUTION:**

**Set the projection of oil pump assembly to the identification hole, and then align locating hole of retainer to the L-H shift rod assembly.**

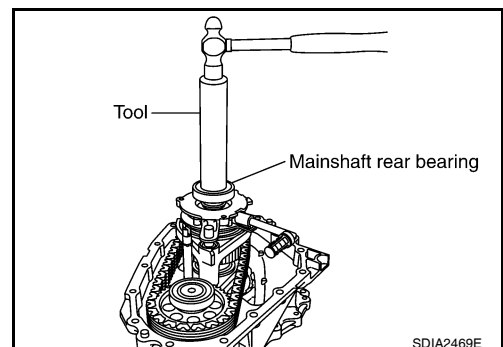


23. Install the mainshaft rear bearing to the mainshaft using Tool.

**Tool number** : KV32102700 ( — )

**CAUTION:**

**Do not push too hard in order to avoid snap rings becoming dislodged from mainshaft.**



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# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

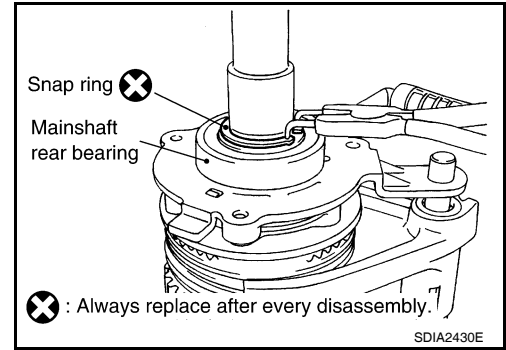
[TRANSFER: TX15B]

24. Install the new snap ring to the mainshaft using suitable tool.

**CAUTION:**

**Do not reuse snap ring.**

25. Install the spacer to the control shift rod.



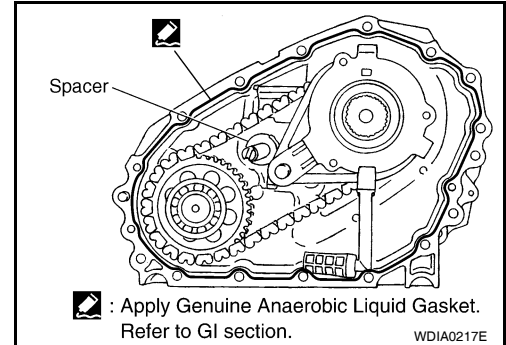
26. Apply liquid gasket to the mating surface of the front case.

- Use **Genuine Anaerobic Liquid Gasket** or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

**CAUTION:**

**Remove old sealant adhering to mating surfaces. Also remove any moisture, oil, or foreign material adhering to application and mating surfaces.**

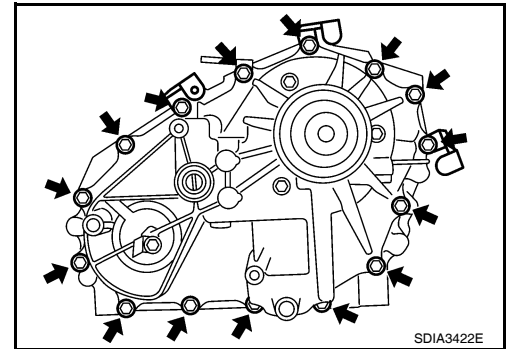
27. Install the rear case to the front case.



28. Tighten the bolts to the specified torque. Refer to [DLN-108, "Disassembly and Assembly"](#).

**CAUTION:**

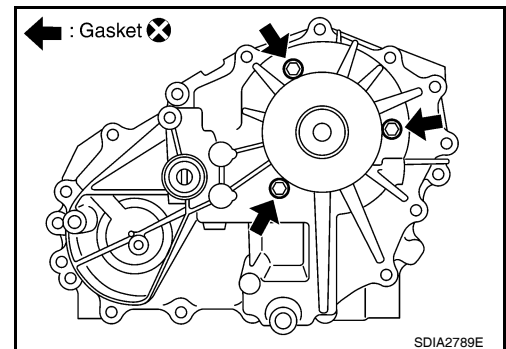
**Be sure to install the harness brackets and air breather hose clamp.**



29. Install the retainer bolts with new gaskets. Tighten the bolts to the specified torque. Refer to [DLN-108, "Disassembly and Assembly"](#).

**CAUTION:**

- **Do not reuse gasket.**
- **Tighten them to the specified torque again.**



30. Apply petroleum jelly to the circumference of the new oil seal, and install it to the front case using Tools.

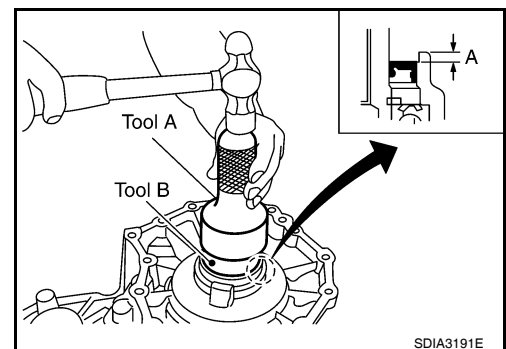
**Tool number**            **A: ST30720000 (J-25405)**

**B: KV40104830 ( — )**

**Dimension A**            **: 4.0 - 4.6 mm (0.157 - 0.181 in)**

**CAUTION:**

- **Do not reuse oil seal.**
- **Apply petroleum jelly to oil seal.**





# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

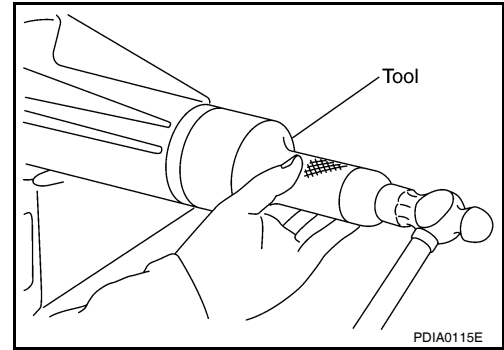
[TRANSFER: TX15B]

31. Install the new rear oil seal until it is flush with the end face of the rear case using Tool.

**Tool number** : KV38100500 ( — )

**CAUTION:**

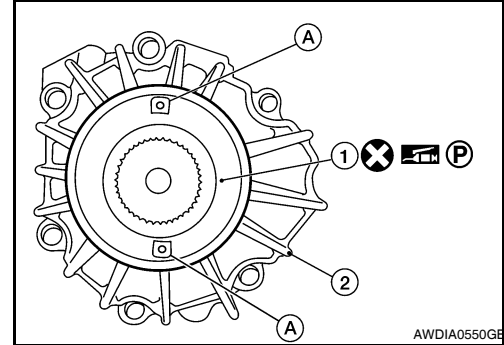
- Do not reuse oil seal.
- Apply petroleum jelly to oil seal.



32. Apply petroleum jelly to the circumference of the new dust cover (1). Position the new dust cover as shown.

**CAUTION:**

- Do not reuse dust cover.
- Position the identification mark at the position shown.
- Rear case assembly (2)
- Protrusions (A)

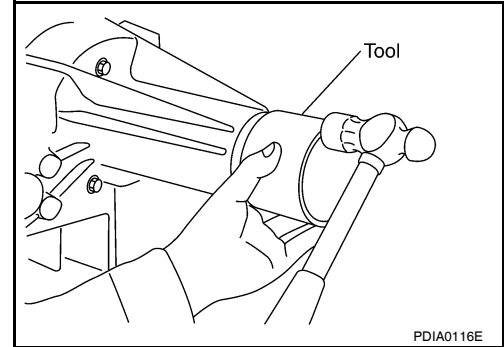


33. Install the new dust cover to the rear case using Tool.

**Tool number** : KV40105310 ( — )

**CAUTION:**

- Do not reuse dust cover.
- Apply petroleum jelly to dust cover.

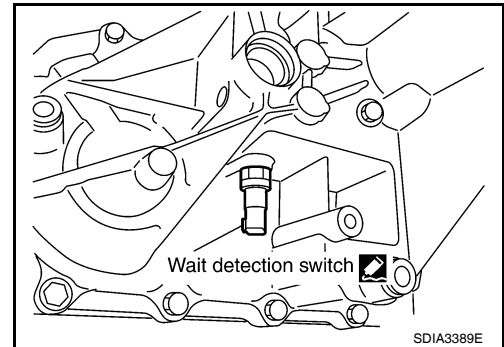


34. Apply sealant to the threads of the wait detection switch (gray). Then install it to the rear case and tighten to the specified torque. Refer to [DLN-108, "Disassembly and Assembly"](#).

- Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

**CAUTION:**

Remove old sealant and oil adhering to threads.



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# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

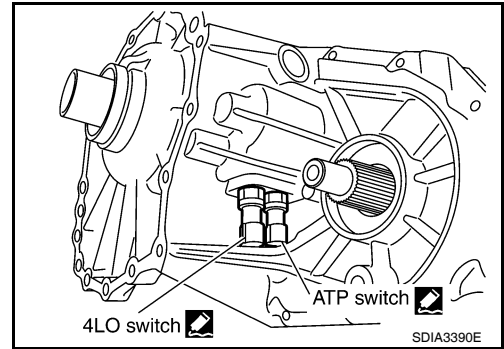
[TRANSFER: TX15B]

35. Apply sealant to the threads of the 4LO switch (gray with green paint) and ATP switch (black). Then install them to the front case and tighten to the specified torque. Refer to [DLN-108, "Disassembly and Assembly"](#).

• Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

**CAUTION:**

Remove old sealant and oil adhering to threads.

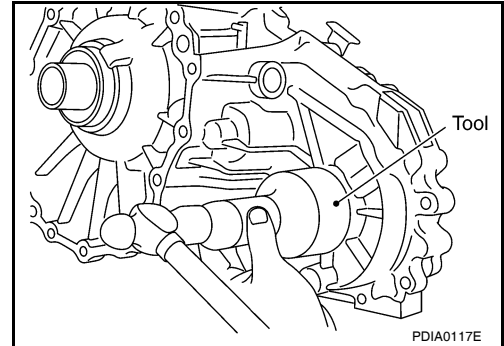


36. Install the new front oil seal until it is flush with the end face of the front case using Tool.

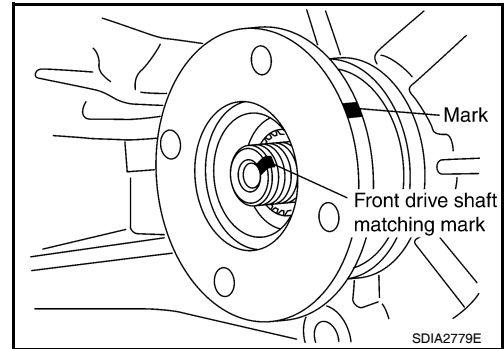
**Tool number** : KV38100500 ( — )

**CAUTION:**

- Do not reuse oil seal.
- Apply petroleum jelly to oil seal.



37. Align the matching mark on the front drive shaft with the mark on the companion flange, then install the companion flange.

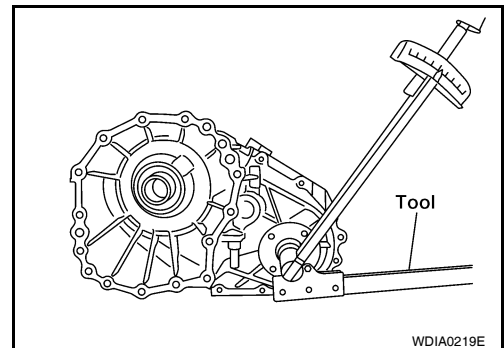


38. Install the new companion flange self-lock nut. Tighten to the specified torque using Tool. Refer to [DLN-108, "Disassembly and Assembly"](#).

**Tool number** : KV40104000 ( — )

**CAUTION:**

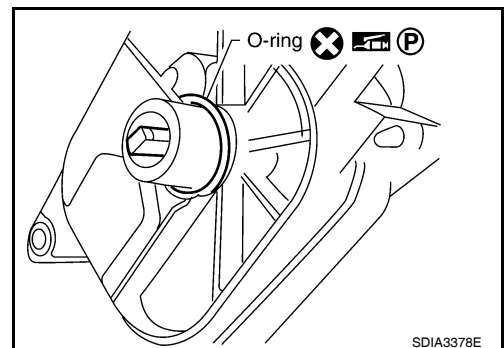
Do not reuse self-lock nut.



39. Install the new O-ring to the transfer control device.

**CAUTION:**

- Do not reuse O-ring.
- Apply petroleum jelly to O-ring.



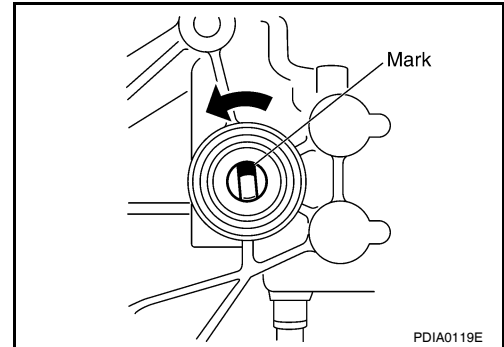
# TRANSFER ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[TRANSFER: TX15B]

40. Install the transfer control device to the rear case.

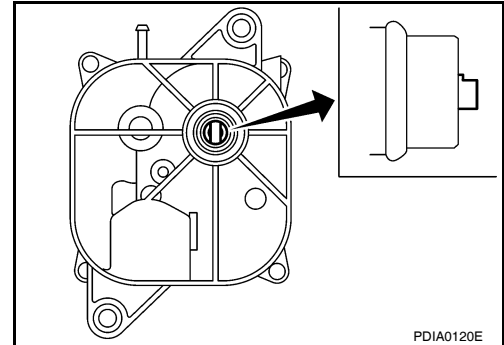
- a. Turn the control shift rod fully counterclockwise using a flat-bladed screwdriver, and then put a mark on the control shift rod.



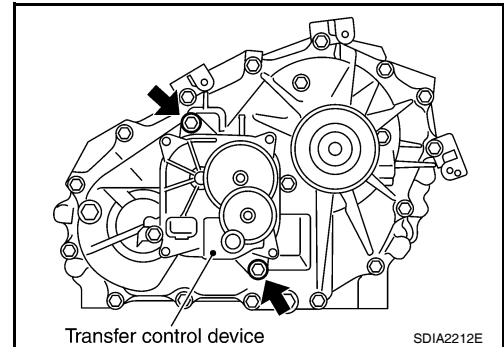
- b. Align the transfer control device shaft cutout with the mark on the control shift rod, and install it.

**NOTE:**

Turn the transfer control device when the transfer control device connection does not match.



- c. Tighten the bolts to the specified torque. Refer to [DLN-107, "Removal and Installation"](#).



41. Install the drain plug and filler plug with new gaskets to the rear case. Tighten to the specified torque. Refer to [DLN-107, "Removal and Installation"](#).

**CAUTION:**

Do not reuse gaskets.

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# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[TRANSFER: TX15B]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### General Specification

INFOID:000000003789527

Applied model		4WD	
		VK56DE	
		A/T	
Transfer model		TX15B	
Fluid capacity (Approx.)		$\ell$ (US qt, Imp qt)	2.0 (2-1/8, 1-3/4)
Gear ratio	High		1.000
	Low		2.625
Number of teeth	Planetary gear	Sun gear	56
		Internal gear	91
	Front drive sprocket		38
	Front drive shaft		38

#### Inspection and Adjustment

INFOID:000000003789528

##### PINION GEAR END PLAY

Unit: mm (in)

Item	Standard
Pinion gear end play	0.1 - 0.7 (0.004 - 0.028)

##### CLEARANCE BETWEEN SHIFT FORK AND SLEEVE

Unit: mm (in)

Item	Standard
2-4 shift fork to 2-4 sleeve	Less than 0.46 (0.018)
L-H shift fork to L-H sleeve	Less than 0.46 (0.018)

# PREPARATION

< PREPARATION >

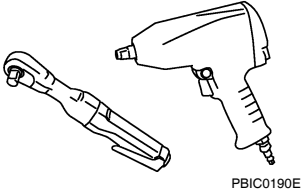
[PROPELLER SHAFT: 2F1310]

## PREPARATION

### PREPARATION

#### Commercial Service Tool

INFOID:000000003789529

Tool name	Description
<p data-bbox="151 411 263 441">Power tool</p>  <p data-bbox="862 632 933 646">PBIC0190E</p>	<p data-bbox="1008 411 1260 441">Loosening bolts and nuts</p>

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# NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

< FUNCTION DIAGNOSIS >

[PROPELLER SHAFT: 2F1310]

## FUNCTION DIAGNOSIS

### NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

#### NVH Troubleshooting Chart

INFOID:000000003789530

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		<a href="#">DLN-128, "Removal and Installation"</a>	<a href="#">DLN-128, "Removal and Installation"</a>	<a href="#">DLN-127, "On-Vehicle Service"</a>		<a href="#">FAX-4, "NVH Troubleshooting Chart"</a>	<a href="#">FSU-4, "NVH Troubleshooting Chart"</a>	<a href="#">WT-42, "NVH Troubleshooting Chart"</a>	<a href="#">WT-42, "NVH Troubleshooting Chart"</a>		<a href="#">BR-5, "NVH Troubleshooting Chart"</a>	<a href="#">ST-5, "NVH Troubleshooting Chart"</a>
Possible cause and suspected parts		Uneven rotation torque	Rotation imbalance	Excessive run out	Differential	Axle	Suspension	Tires	Road wheel	Drive shaft	Brakes	Steering
Symptom	Noise	x	x	x	x	x	x	x	x	x	x	x
	Shake					x	x	x	x	x	x	x
	Vibration	x	x	x		x	x	x		x		x

x: Applicable

ON-VEHICLE REPAIR

PROPELLER SHAFT

On-Vehicle Service

INFOID:000000003789531

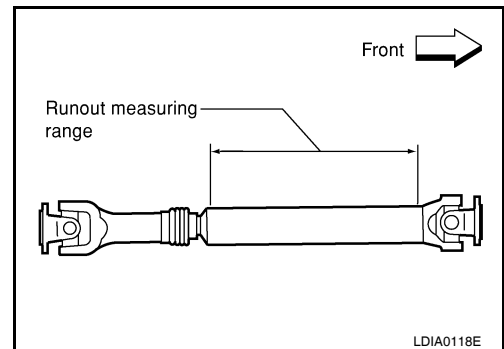
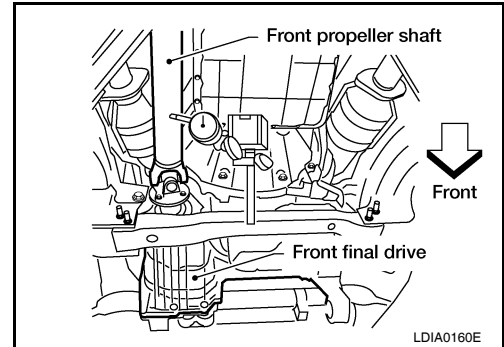
APPEARANCE AND NOISE INSPECTION

- Check the propeller shaft tube surface for dents or cracks. If damaged, replace the propeller shaft assembly.
- Check the bearings for noise and damage. Repair or replace the bearings as necessary.

PROPELLER SHAFT VIBRATION

If a vibration is present at high speed, inspect the propeller shaft runout first.

1. Measure the runout of the propeller shaft tube at several points by rotating the final drive companion flange with your hands. Refer to [DLN-132, "General Specification"](#).
2. If the runout exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180° and 270° and reconnect the propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly. Refer to [DLN-132, "General Specification"](#).
4. After installation, check for vibration by driving the vehicle.



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# PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[PROPELLER SHAFT: 2F1310]

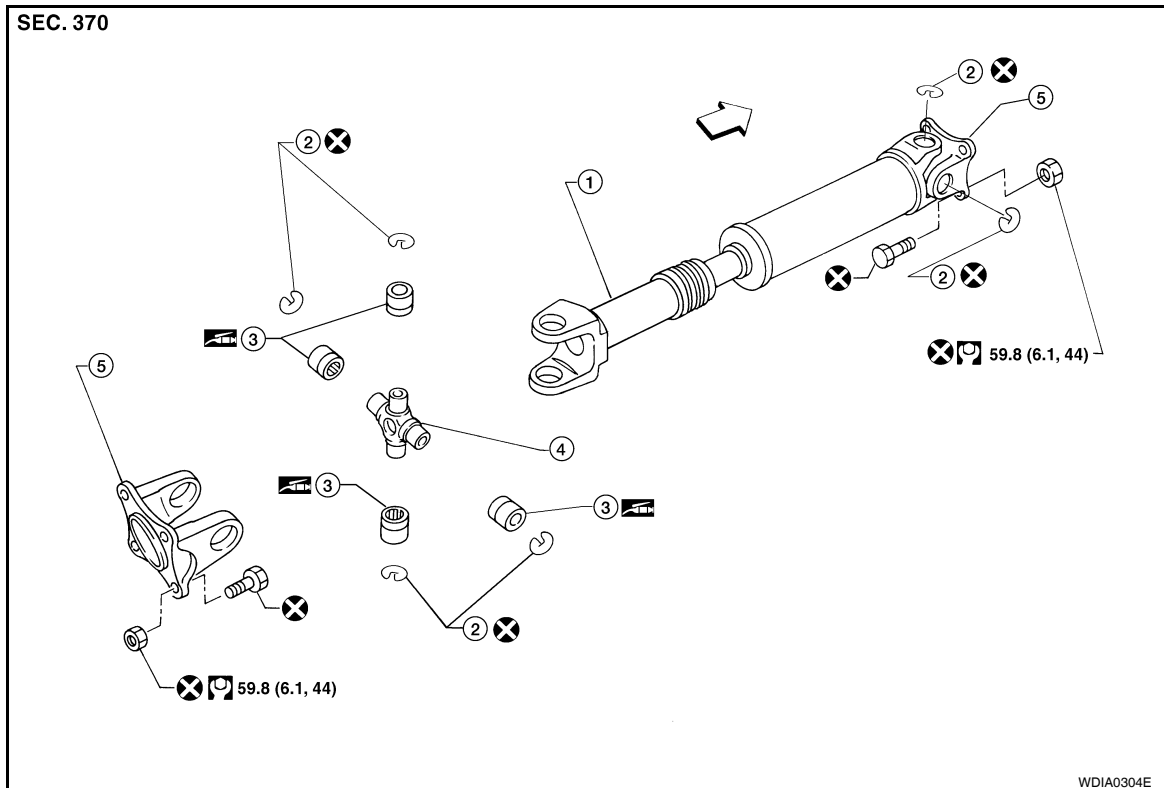
## REMOVAL AND INSTALLATION

### PROPELLER SHAFT

#### Removal and Installation

INFOID:000000003789532

#### COMPONENTS



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

#### REMOVAL

1. Put matching marks on the front propeller shaft flange yoke and the front final drive companion flange as shown.

**CAUTION:**

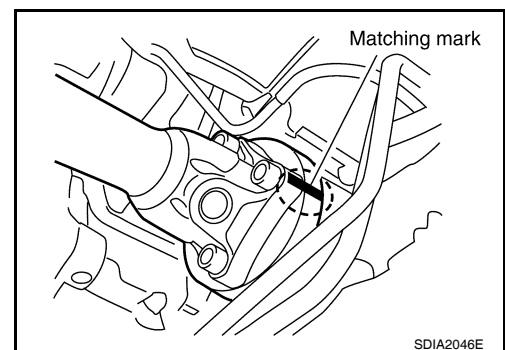
**For matching marks, use paint. Never damage the flange yoke and companion flange of the front final drive.**

2. 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.**

3. Remove the bolts and then remove the front propeller shaft from the front final drive and transfer.



#### INSPECTION

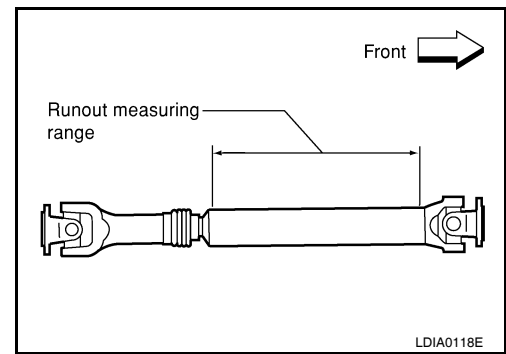


# PROPELLER SHAFT

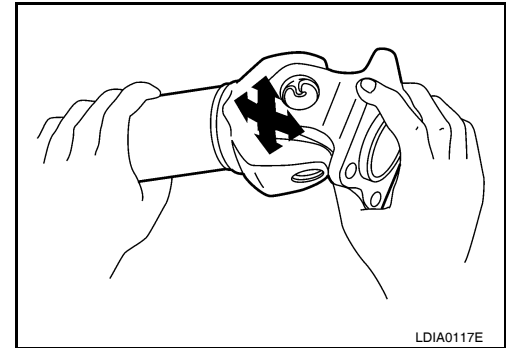
## < REMOVAL AND INSTALLATION >

[PROPELLER SHAFT: 2F1310]

- Inspect the propeller shaft runout. If runout exceeds the limit, replace the propeller shaft assembly. Refer to [DLN-132, "General Specification"](#).



- While holding the flange yoke on one side, check axial play of the joint as shown. If the journal axial play exceeds the specification, repair or replace the journal parts. Refer to [DLN-132, "General Specification"](#).
- Check the propeller shaft tube surface for dents or cracks. If damage is detected, replace the propeller shaft assembly.



## INSTALLATION

Installation is in the reverse order of removal.

- After installation, check for vibration by driving the vehicle. Refer to [DLN-126, "NVH Troubleshooting Chart"](#).

### **CAUTION:**

**Do not reuse the bolts and nuts. Always install new ones.**

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## DISASSEMBLY AND ASSEMBLY

### PROPELLER SHAFT

#### Disassembly and Assembly

INFOID:000000003789533

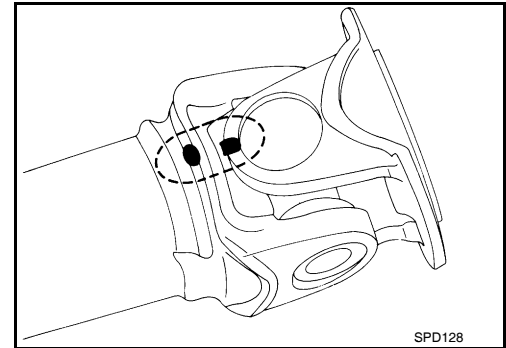
#### DISASSEMBLY

##### Journal

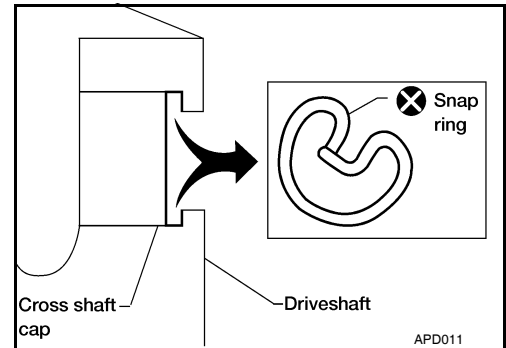
1. Put matching marks on the front propeller shaft and flange yoke as shown.

**CAUTION:**

For matching marks, use paint. Never damage the front propeller shaft or flange yoke.



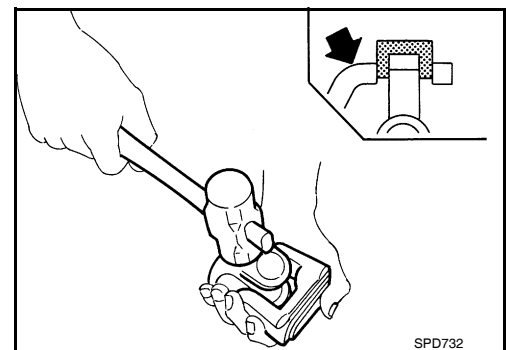
2. Remove the snap rings.



3. Push out and remove the journal bearings by lightly tapping the flange yoke with a hammer, taking care not to damage the journal or flange yoke hole.

**NOTE:**

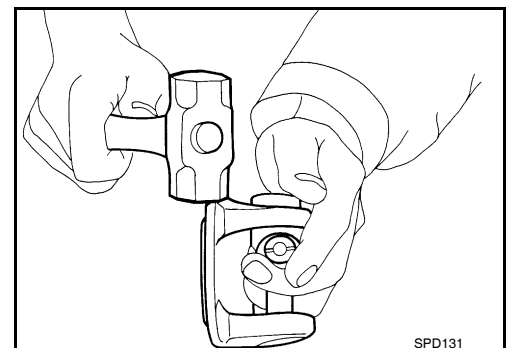
Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.



4. Push out and remove the remaining journal bearings at the opposite side by lightly tapping the flange yoke with a hammer, taking care not to damage the journal or flange yoke hole.

**NOTE:**

Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.



#### ASSEMBLY

# PROPELLER SHAFT

< DISASSEMBLY AND ASSEMBLY >

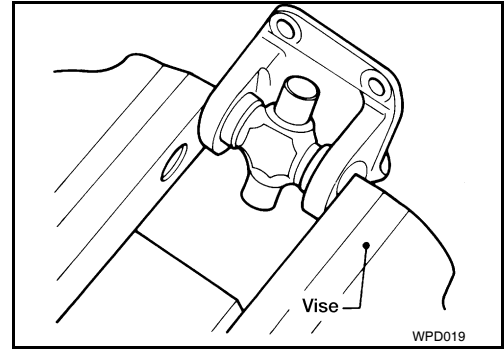
[PROPELLER SHAFT: 2F1310]

## Journal

1. Assemble the journal bearings. Apply multipurpose grease on the bearing inner surface.

**NOTE:**

During assembly, use caution so that the needle bearings do not fall down.



2. Select new snap rings that will provide the specified play in an axial direction of the journal, and install them. Refer to [DLN-132](#).

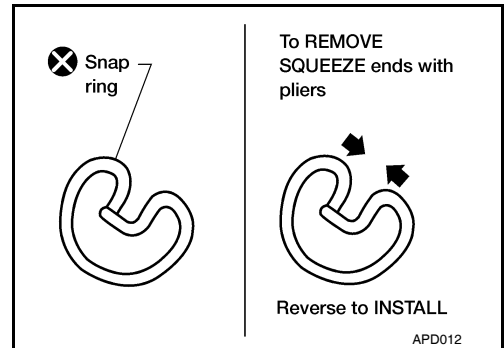
**"Snap Ring".**

**CAUTION:**

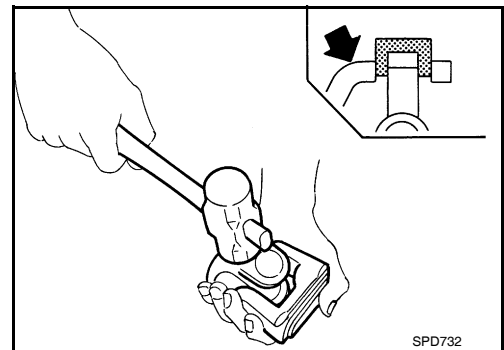
**Do not reuse snap rings**

**NOTE:**

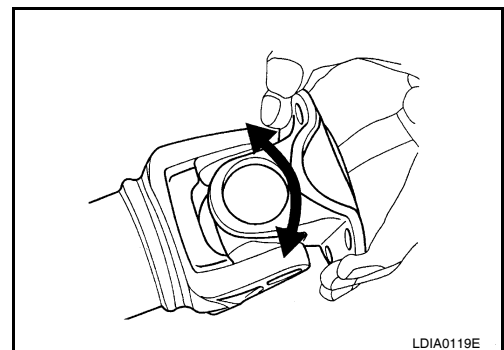
Select snap rings with a difference in thickness at both sides within 0.02 mm (0.0008 in).



3. Adjust the thrust clearance between the bearing and snap ring to zero by tapping the yoke.



4. Make sure that the journal moves smoothly and is below the joint flex effort specification. Refer to [DLN-132](#). "[General Specification](#)".



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# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[PROPELLER SHAFT: 2F1310]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### General Specification

INFOID:000000003789534

Unit: mm (in)

Applied model	4WD
	VK56DE
	A/T
Propeller shaft model	2F1310
Number of joints	2
Coupling method with front final drive	Flange type
Coupling method with transfer	Flange type
Shaft length (Spider to spider)	696 mm (27.40 in)
Shaft outer diameter	63.5 mm (2.50 in)

#### Propeller Shaft Runout

Unit: mm (in)

Item	Limit
Propeller shaft runout	0.60 mm (0.024 in)

#### Propeller Shaft Joint Flex Effort

Unit: N·m (kg·m, in)

Item	Limit
Propeller shaft joint flex effort	2.26 N·m (0.23 kg·m, 20 in·lb) or less

#### Journal Axial Play

Unit: mm (in)

Item	Limit
Journal axial play	0.02 mm (0.0008 in) or less

#### Snap Ring

INFOID:000000003789535

Model 2F1310 (4WD)

Unit: mm (in)

Thickness	Color	Part Number*
1.99 (0.0783)	White	37146-C9400
2.02 (0.0795)	Yellow	37147-C9400
2.05 (0.0807)	Red	37148-C9400
2.08 (0.0819)	Green	37149-C9400
2.11 (0.0831)	Blue	37150-C9400
2.14 (0.0843)	Light brown	37151-C9400
2.17 (0.0854)	Black	37152-C9400
2.20 (0.0866)	No paint	37153-C9400

\*Always check with the Parts Department for the latest parts information.

# PREPARATION

< PREPARATION >

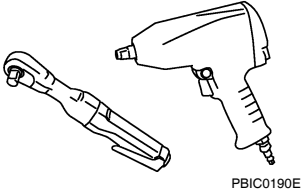
[PROPELLER SHAFT: 2S1410]

## PREPARATION

### PREPARATION

Commercial Service Tool

INFOID:000000003789543

Tool name	Description
<p data-bbox="151 411 264 441">Power tool</p>  <p data-bbox="862 632 933 646">PBIC0190E</p>	<p data-bbox="1008 411 1260 441">Loosening bolts and nuts</p>

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# NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

< FUNCTION DIAGNOSIS >

[PROPELLER SHAFT: 2S1410]

## FUNCTION DIAGNOSIS

### NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

#### NVH Troubleshooting Chart

INFOID:000000003789544

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Symptom	Possible cause and suspected parts											
	Uneven rotation torque	Rotation imbalance	Excessive run out	Differential	Axle	Suspension	Tires	Road wheel	Drive shaft	Brakes	Steering	
Noise	x	x	x	x	x	x	x	x	x	x	x	x
Shake					x	x	x	x	x	x		x
Vibration	x	x	x		x	x	x		x			x

x: Applicable

ON-VEHICLE REPAIR

PROPELLER SHAFT

On-Vehicle Service

INFOID:000000003789545

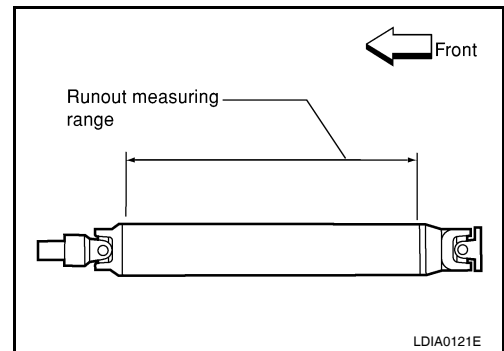
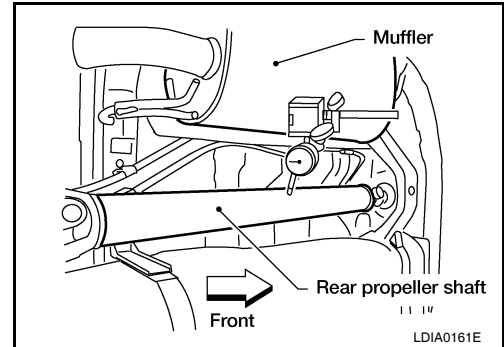
APPEARANCE AND NOISE INSPECTION

- Check the propeller shaft tube surface for dents or cracks. If damaged, replace the propeller shaft assembly.
- Check the bearings for noise and damage. Repair or replace the bearings as necessary.

PROPELLER SHAFT VIBRATION

If a vibration is present at high speed, inspect the propeller shaft runout first.

1. Measure the runout of the propeller shaft tube at several points by rotating the final drive companion flange with your hands. Refer to [DLN-140, "General Specification"](#).
2. If the runout exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180° and 270° and reconnect the propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly. Refer to [DLN-140, "General Specification"](#).
4. After installation, check for vibration by driving vehicle.



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# PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[PROPELLER SHAFT: 2S1410]

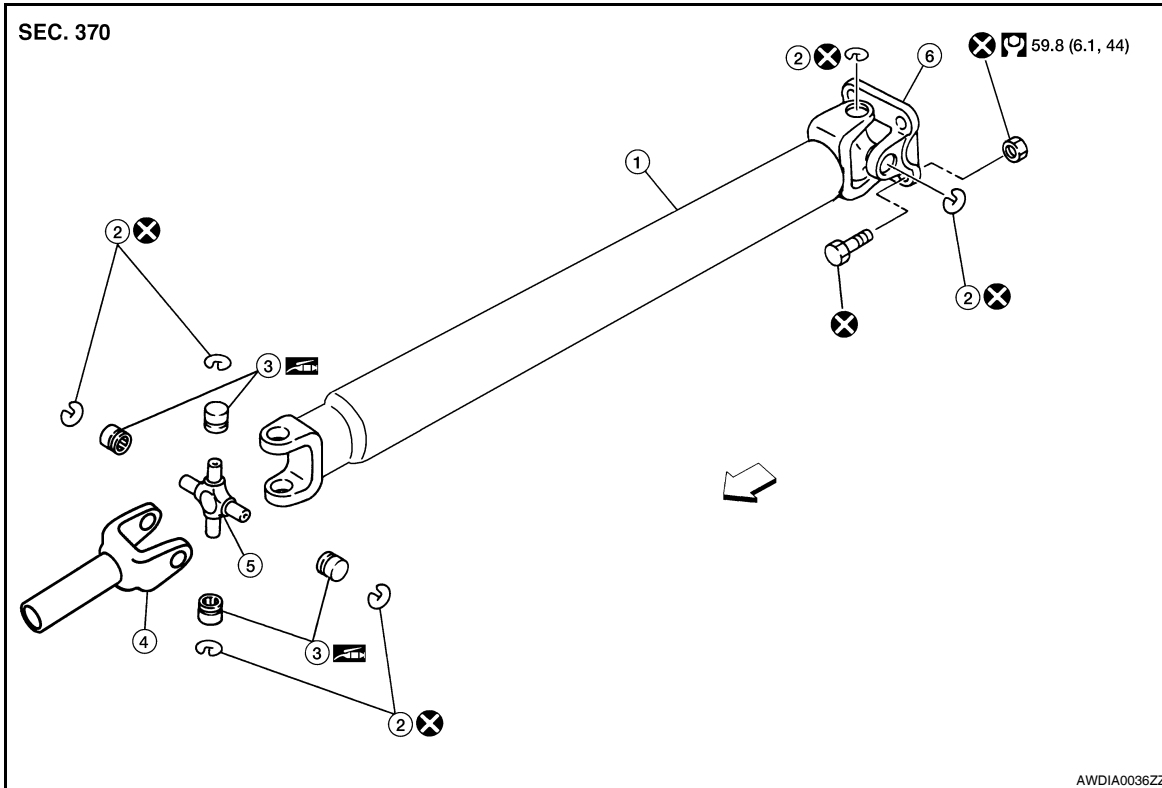
## REMOVAL AND INSTALLATION

### PROPELLER SHAFT

#### Removal and Installation

INFOID:000000003789546

#### COMPONENTS



- |                         |              |                    |
|-------------------------|--------------|--------------------|
| 1. Propeller shaft tube | 2. Snap ring | 3. Journal bearing |
| 4. Sleeve yoke          | 5. Journal   | 6. Flange yoke     |
- ← Front

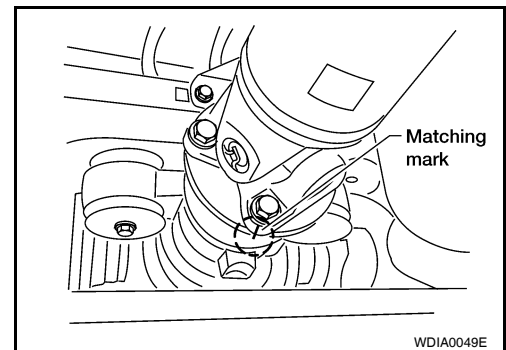
#### REMOVAL

1. Move the A/T select lever to the N position and release the parking brake.
2. Put matching marks on the rear propeller shaft flange yoke and the rear final drive companion flange as shown.

**CAUTION:**

**For matching marks, use paint. Never damage the rear propeller shaft flange yoke or the companion flange.**

3. Remove the bolts, then remove the propeller shaft from the rear final drive and transfer case.



#### INSPECTION

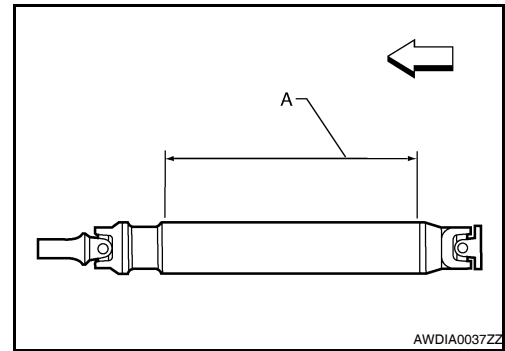


# PROPELLER SHAFT

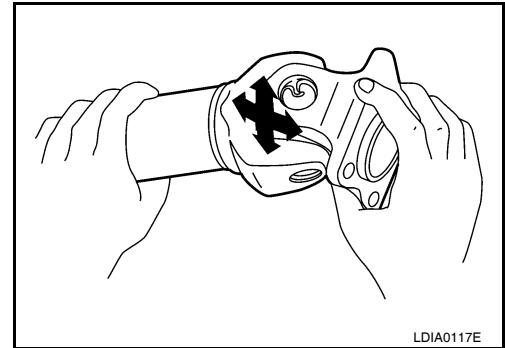
## < REMOVAL AND INSTALLATION >

[PROPELLER SHAFT: 2S1410]

- Inspect the propeller shaft runout. If runout exceeds the limit, replace the propeller shaft assembly. Refer to [DLN-140, "General Specification"](#).
- ⇐ Front



- While holding the flange yoke on one side, check axial play of the joint as shown. If the journal axial play exceeds the specification, repair or replace the journal parts. Refer to [DLN-140, "General Specification"](#).
- Check the propeller shaft tube for dents or cracks. If damage is detected, replace the propeller shaft assembly.



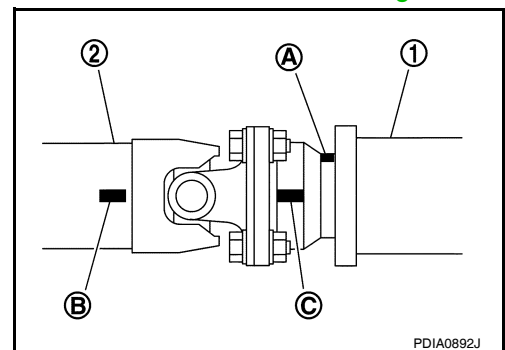
## INSTALLATION

Installation is in the reverse order of removal.

- After installation, check for vibration by driving the vehicle. Refer to [DLN-134, "NVH Troubleshooting Chart"](#).
- If propeller shaft assembly or final drive assembly has been replaced, connect them as follows:
  - Face companion flange mark (A) of the final drive (1) upward. With the mark (A) faced upward, couple the propeller shaft and the final drive so that the matching mark (B) of the propeller shaft (2) can be positioned as close as possible with the matching mark (C) of the final drive companion flange.
  - Tighten propeller shaft and final drive bolts and nuts to specifications. Refer to [DLN-136, "Removal and Installation"](#).

### CAUTION:

**Do not reuse the bolts and nuts. Always install new ones.**



DISASSEMBLY AND ASSEMBLY

PROPELLER SHAFT

Disassembly and Assembly

INFOID:000000003789547

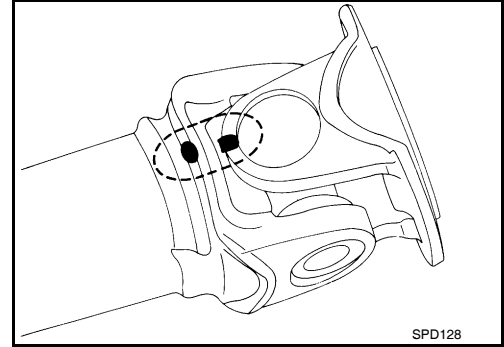
DISASSEMBLY

Journal

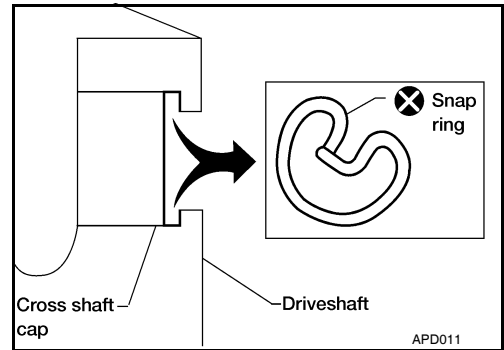
1. Put matching marks on the rear propeller shaft and flange yoke as shown.

**CAUTION:**

For matching marks use paint. Never damage the rear propeller shaft or flange yoke.



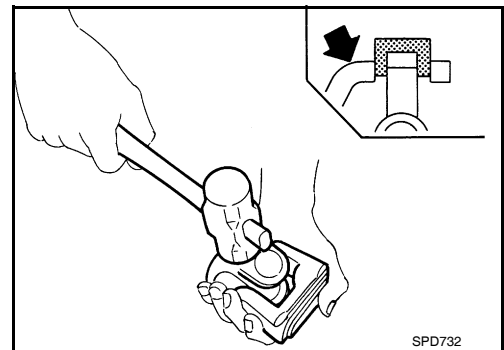
2. Remove the snap rings.



3. Push out and remove the journal bearings by lightly tapping the flange yoke with a hammer, taking care not to damage the journal or flange yoke hole.

**NOTE:**

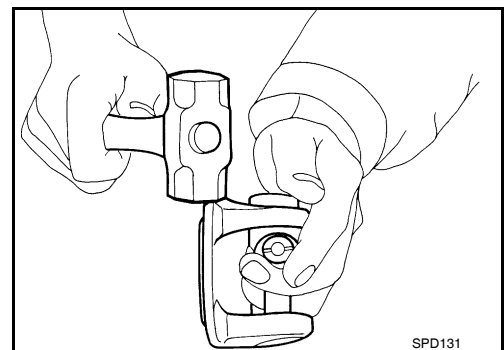
Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.



4. Push out and remove the remaining journal bearings at the opposite side by lightly tapping the flange yoke with a hammer, taking care not to damage the journal or flange yoke hole.

**NOTE:**

Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.



ASSEMBLY

# PROPELLER SHAFT

< DISASSEMBLY AND ASSEMBLY >

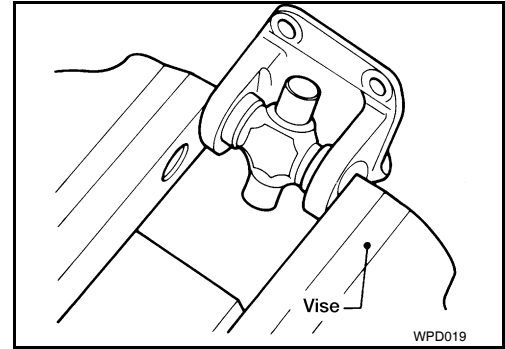
[PROPELLER SHAFT: 2S1410]

## Journal

1. Assemble the journal bearings. Apply multipurpose grease on the bearing inner surface.

**NOTE:**

During assembly, use caution so that the needle bearings do not fall down.



2. Select new snap rings that will provide the specified play in an axial direction of the journal, and install them. Refer to [DLN-140](#).

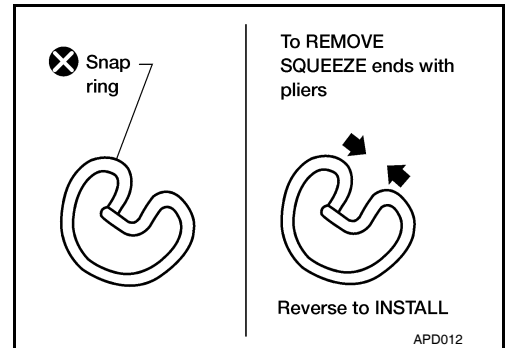
**"Snap Ring".**

**CAUTION:**

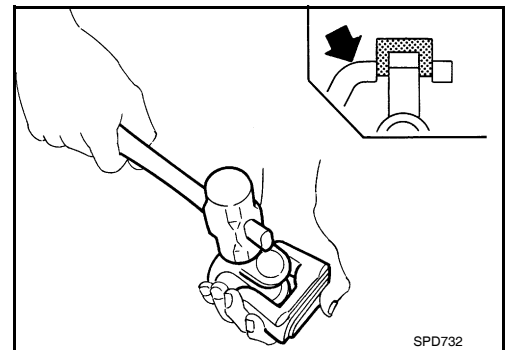
**Do not reuse snap rings**

**NOTE:**

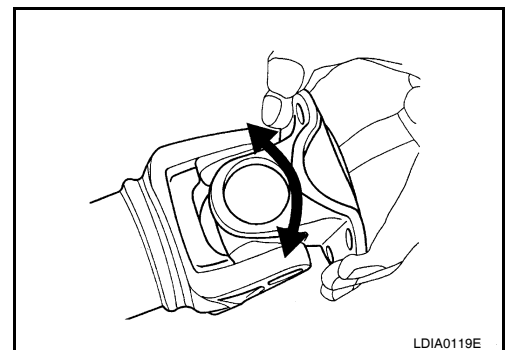
Select snap rings with a difference in thickness at both sides within 0.02 mm (0.0008 in).



3. Adjust the thrust clearance between the bearing and snap ring to zero by tapping the yoke.



4. Make sure that the journal moves smoothly and is below the propeller joint flex effort specification. Refer to [DLN-140](#). "[General Specification](#)".



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# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[PROPELLER SHAFT: 2S1410]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### General Specification

INFOID:000000003789548

Applied model	4WD
	VK56DE
	A/T
	Short wheel base
Propeller shaft model	2S1410
Number of joints	2
Coupling method with rear final drive	Flange type
Coupling method with Transfer	Sleeve type
Shaft length (Spider to spider)	1616.2 mm (63.63 in)
Shaft outer diameter	127.6 mm (5.02 in)

#### Propeller Shaft Runout

Unit: mm (in)

Item	Limit
Propeller shaft runout	1.02 (0.0402) or less

#### Propeller Shaft Joint Flex Effort

Unit: N·m (kg-m, in-lb)

Item	Limit
Propeller shaft joint flex effort	2.26 (0.23, 20) or less

#### Journal Axial Play

Unit: mm (in)

Item	Limit
Journal axial play	0.02 (0.0008) or less

#### Snap Ring

INFOID:000000003789549

Unit: mm (in)

Thickness	Color	Part Number*
1.99 (0.0783)	White	37146-C9400
2.02 (0.0795)	Yellow	37147-C9400
2.05 (0.0807)	Red	37148-C9400
2.08 (0.0819)	Green	37149-C9400
2.11 (0.0831)	Blue	37150-C9400
2.14 (0.0843)	Light brown	37151-C9400
2.17 (0.0854)	Black	37152-C9400
2.20 (0.0866)	No paint	37153-C9400

\*Always check with the Parts Department for the latest parts information.

Unit: mm (in)

Thickness	Color	Part Number*
1.600 - 1.638 (0.0630 - 0.0645)	Black	37146-EA500
1.549 - 1.588 (0.0610 - 0.0625)	Black	37147-EA500

# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[PROPELLER SHAFT: 2S1410]

Thickness	Color	Part Number*
1.524 - 1.562 (0.0600 - 0.0615)	Black	37148-EA500
1.499 - 1.537 (0.0590 - 0.0605)	Black	37149-EA500

\*Always check with the Parts Department for the latest parts information.

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# PREPARATION

< PREPARATION >

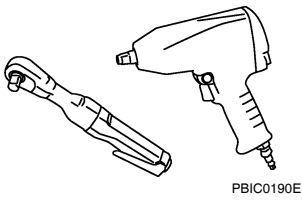
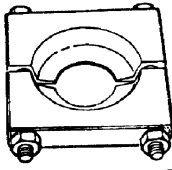
[PROPELLER SHAFT: 3S1410]

## PREPARATION

### PREPARATION

Commercial Service Tool

INFOID:000000003789557

Tool name	Description
<p>Power tool</p>  <p>PBIC0190E</p>	<p>Loosening bolts and nuts</p>
<p>205-D002 Bearing splitter</p>  <p>ZZA0700D</p>	<p>Removing center support bearing</p>

# NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

< FUNCTION DIAGNOSIS >

[PROPELLER SHAFT: 3S1410]

## FUNCTION DIAGNOSIS

### NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

#### NVH Troubleshooting Chart

INFOID:000000003789558

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Symptom		Possible cause and suspected parts										
		Uneven rotation torque	Rotation imbalance	Excessive run out	Differential	Axle	Suspension	Tires	Road wheel	Drive shaft	Brakes	Steering
Noise	Noise	x	x	x	x	x	x	x	x	x	x	x
	Shake					x	x	x	x	x	x	x
	Vibration	x	x	x		x	x	x		x		x

x: Applicable

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## ON-VEHICLE REPAIR

### REAR PROPELLER SHAFT

#### On-Vehicle Service

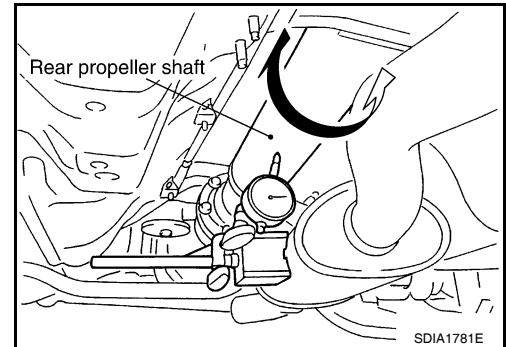
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#### PROPELLER SHAFT VIBRATION

**NOTE:**

If vibration is present at high speed, check propeller shaft runout first, then check mounting between propeller shaft and companion flange.

1. Measure the runout of the propeller shaft tube at several points by rotating the final drive companion flange with your hands. Refer to [DLN-152, "General Specification"](#).
2. If the runout still exceeds specifications, disconnect the propeller shaft at the final drive companion flange; then rotate the companion flange 90°, 180°, 270° and reconnect propeller shaft.
3. Check the runout again. If the runout still exceeds specifications, replace the propeller shaft assembly.
4. After installation, check for vibration by driving vehicle.



#### INSPECTION

Inspect the propeller shaft tube for dents or cracks. If damaged, replace the propeller shaft assembly.



# REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[PROPELLER SHAFT: 3S1410]

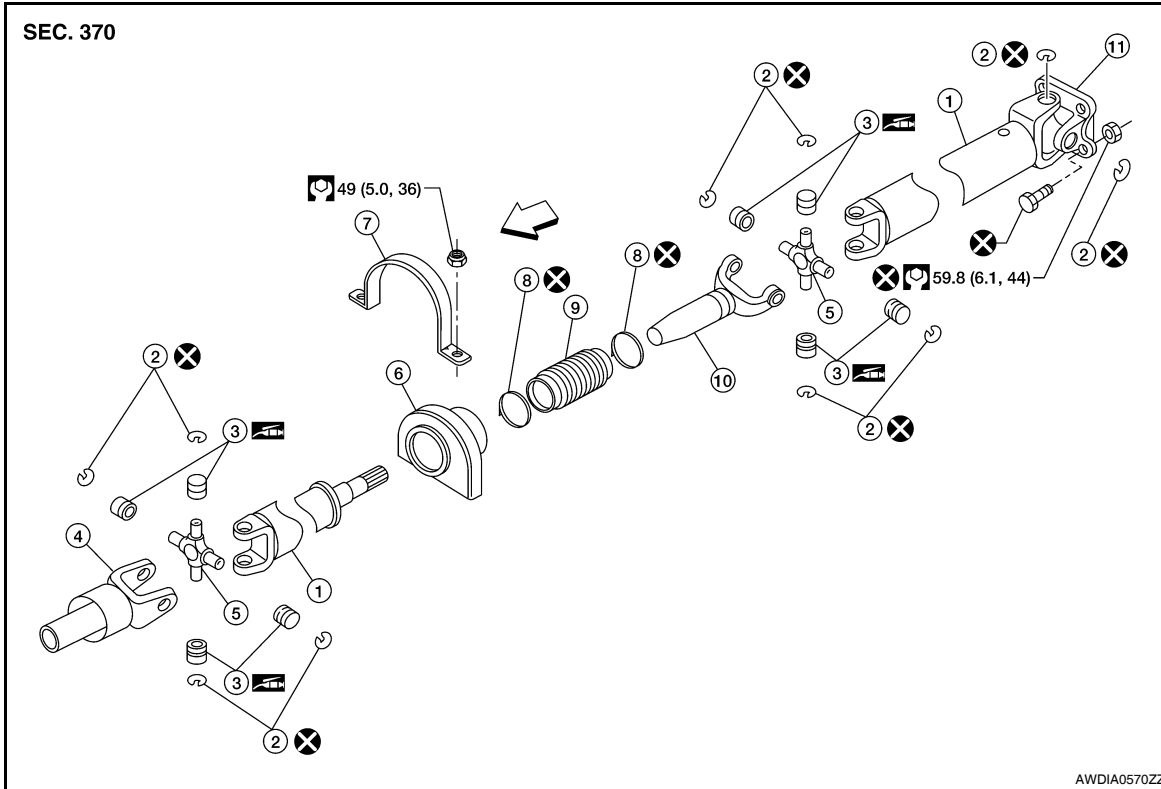
## REMOVAL AND INSTALLATION

### REAR PROPELLER SHAFT

#### Removal and Installation

INFOID:000000003789560

2WD Models (short wheel base)



- |                                   |                 |                           |
|-----------------------------------|-----------------|---------------------------|
| 1. Propeller shaft tube           | 2. Snap ring    | 3. Journal bearing        |
| 4. Sleeve yoke                    | 5. Journal      | 6. Center support bearing |
| 7. Center support bearing bracket | 8. Clamp        | 9. Boot                   |
| 10. Slip yoke                     | 11. Flange yoke | ⇒ : Front                 |

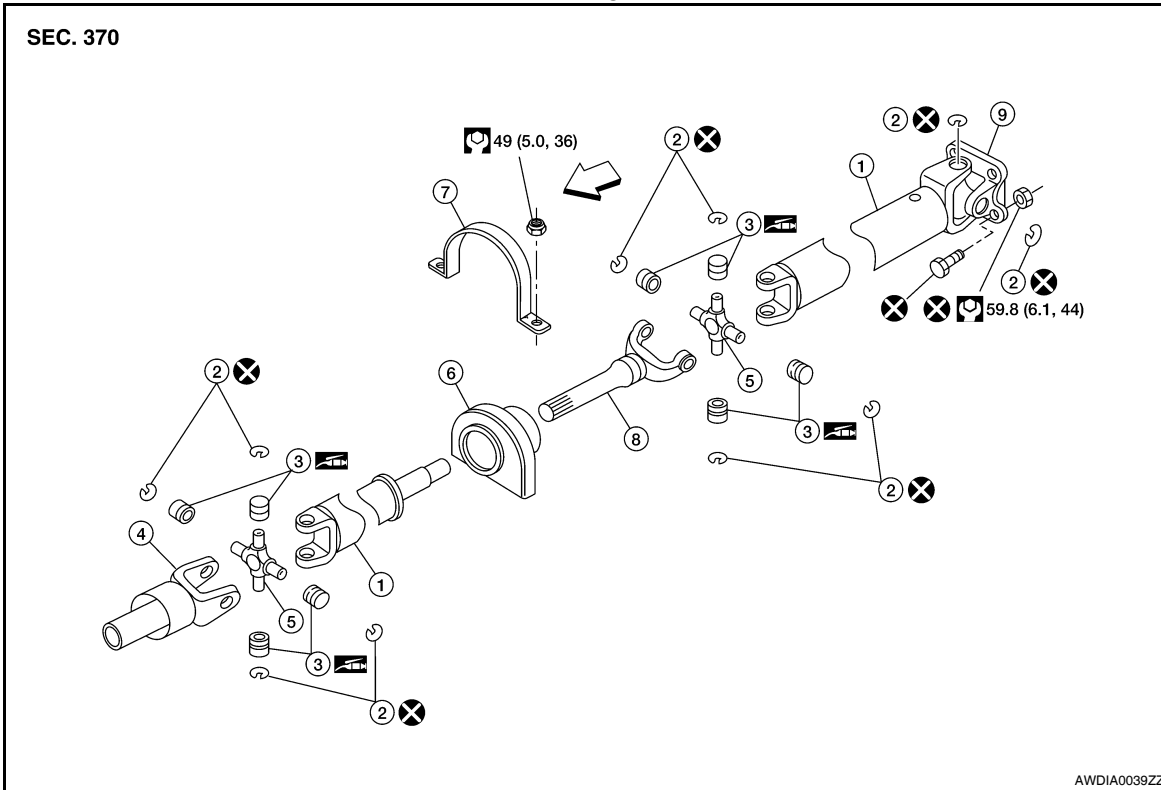
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# REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

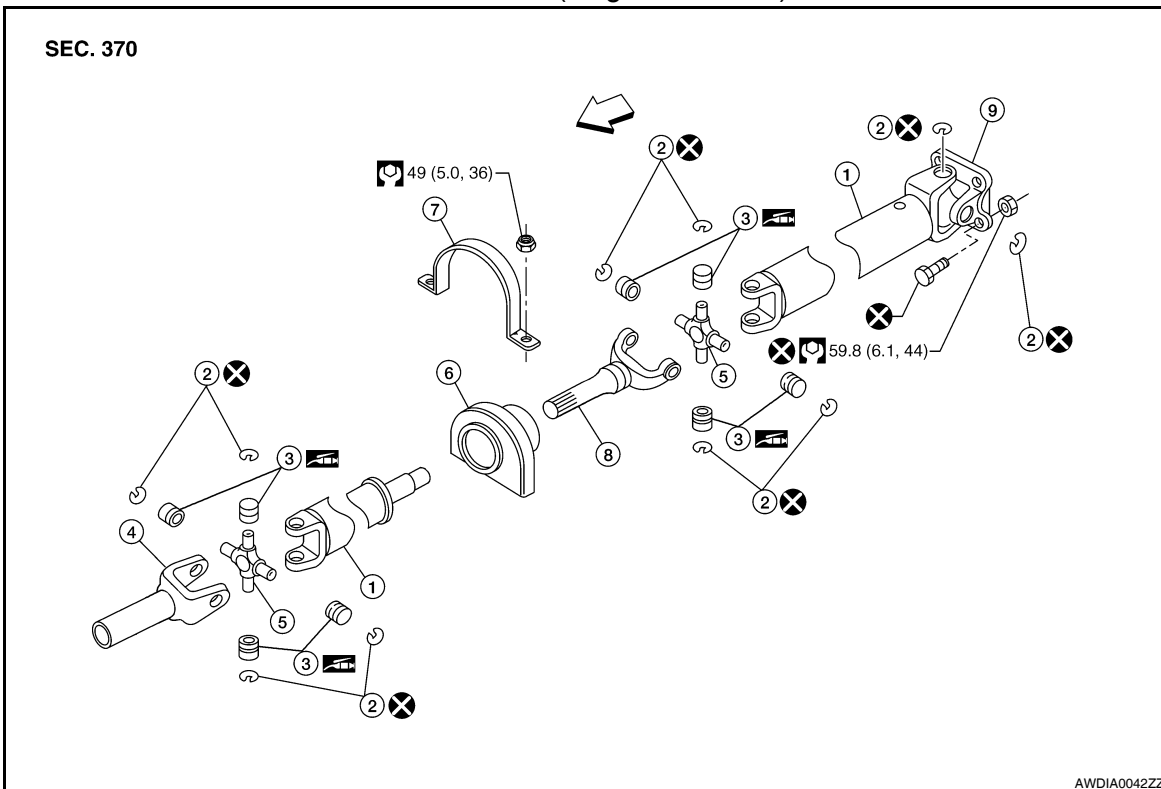
[PROPELLER SHAFT: 3S1410]

2WD Models (long wheel base)



- |                                   |              |                           |
|-----------------------------------|--------------|---------------------------|
| 1. Propeller shaft tube           | 2. Snap ring | 3. Journal bearing        |
| 4. Sleeve yoke                    | 5. Journal   | 6. Center support bearing |
| 7. Center support bearing bracket | 8. Slip yoke | 9. Flange yoke            |
- ⇨ : Front

4WD Models (long wheel base)



# REAR PROPELLER SHAFT

## < REMOVAL AND INSTALLATION >

[PROPELLER SHAFT: 3S1410]

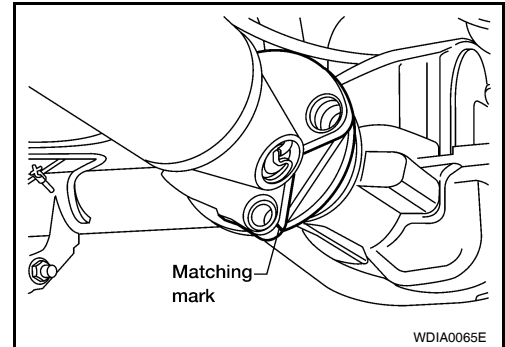
- |                                   |              |                           |
|-----------------------------------|--------------|---------------------------|
| 1. Propeller shaft tube           | 2. Snap ring | 3. Journal bearing        |
| 4. Sleeve yoke                    | 5. Journal   | 6. Center support bearing |
| 7. Center support bearing bracket | 8. Slip yoke | 9. Flange yoke            |
- ⇨ : Front

### REMOVAL

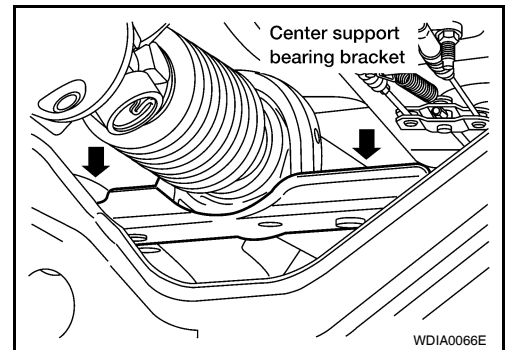
1. Move the A/T select lever to the N position and release the parking brake.
2. Put matching marks on the rear propeller shaft flange yoke and the companion flange of the rear final drive as shown.

**CAUTION:**

**For matching marks, use paint. Never damage the rear propeller shaft flange yoke or the companion flange.**

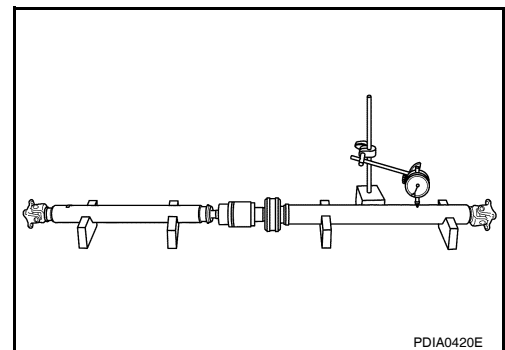


3. Remove the center support bearing bracket nuts, and remove the propeller shaft from the rear final drive.



### INSPECTION AFTER REMOVAL

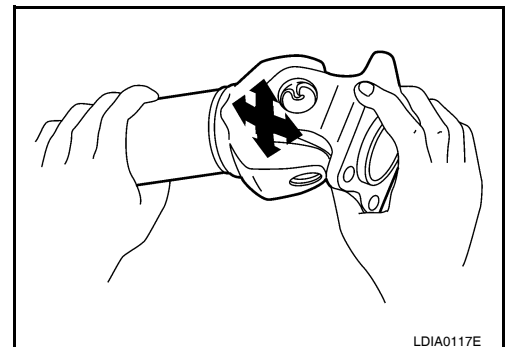
- Inspect the propeller shaft runout. If runout exceeds the limit, replace the propeller shaft assembly. Refer to [DLN-152. "General Specification"](#).



- While holding the flange yoke on one side, check axial play of the journal as shown. If the journal axial play exceeds the specification, replace the propeller shaft assembly.

**Journal axial play : 0.02 mm (0.0008 in) or less**

- Check the propeller shaft tube for bend and damage. If damage is detected, replace the propeller shaft assembly.



### INSTALLATION

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## REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

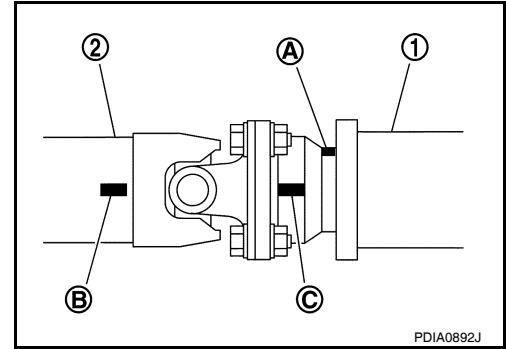
[PROPELLER SHAFT: 3S1410]

Installation is in the reverse order of removal.

- After installation, check for vibration by driving the vehicle. Refer to [DLN-143, "NVH Troubleshooting Chart"](#).
- If propeller shaft assembly of final drive assembly has been replaced, connect them as follows:
  - Face companion flange mark (A) of the final drive (1) upward. With the mark (A) faced upward, couple the propeller shaft and the final drive so that the matching mark (B) of the propeller shaft (2) can be positioned as close as possible with the matching mark (C) of the final drive companion flange.
  - Tighten propeller shaft and final drive bolts and nuts of the to specification. Refer to [DLN-145, "Removal and Installation"](#).

**CAUTION:**

**Do not reuse the bolts and nuts. Always install new ones.**



# REAR PROPELLER SHAFT

< DISASSEMBLY AND ASSEMBLY >

[PROPELLER SHAFT: 3S1410]

## DISASSEMBLY AND ASSEMBLY

### REAR PROPELLER SHAFT

#### Disassembly and Assembly

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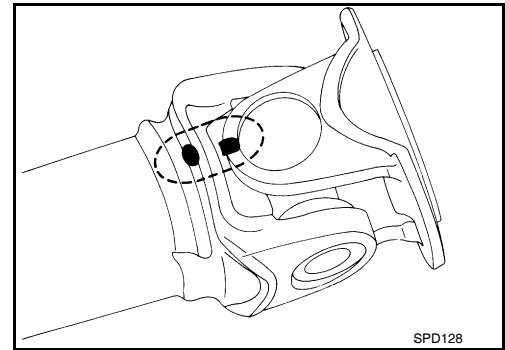
#### DISASSEMBLY

##### Journal

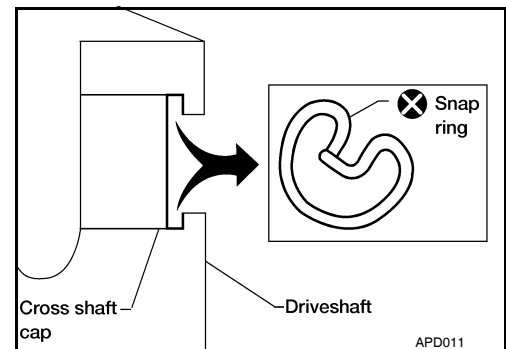
1. Remove the propeller shaft assembly from the vehicle. Refer to [DLN-145. "Removal and Installation"](#).
2. Put matching marks on the rear propeller shaft tube and flange yoke as shown.

**CAUTION:**

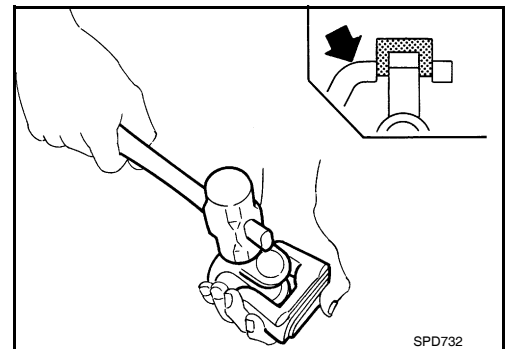
For matching marks use paint. Never damage the rear propeller shaft or flange yoke.



3. Remove the snap rings.



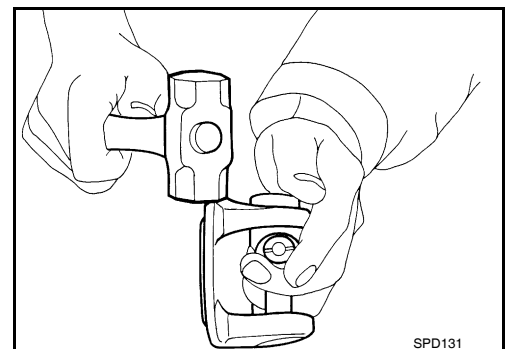
4. Push out and remove the journal bearing by lightly tapping the yoke with a hammer, taking care not to damage the journal or yoke hole.



5. Remove the bearing at the opposite side of above operation.

**NOTE:**

Put marks on the disassembled parts so that they can be reinstalled in their original positions from which they were removed.



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# REAR PROPELLER SHAFT

< DISASSEMBLY AND ASSEMBLY >

[PROPELLER SHAFT: 3S1410]

## Center Support Bearing

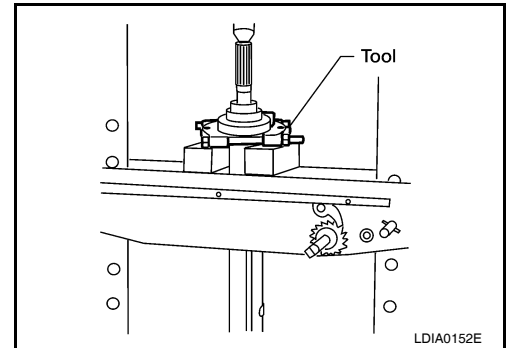
1. Remove the propeller shaft assembly from the vehicle. Refer to [DLN-145, "Removal and Installation"](#).
2. Put matching marks on the propeller shaft tube and the slip yoke.

**CAUTION:**

**For matching marks, use paint. Never damage the propeller shaft tube or slip yoke.**

3. Remove and discard the clamp near the center support bearing, then slide the slip yoke off of propeller shaft tube.
4. Press the center support bearing off the propeller shaft tube using Tool and suitable hydraulic press.

**Tool number : 205-D002**



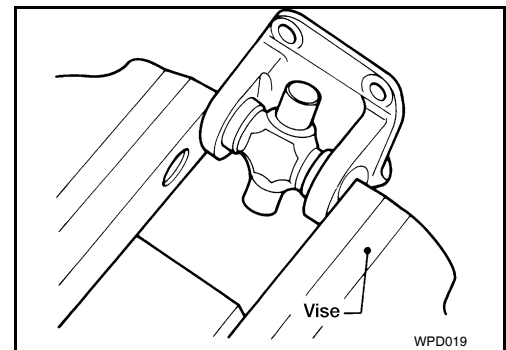
## ASSEMBLY

### Journal

1. Assemble the journal bearings. Apply multipurpose grease on the bearing inner surface.

**NOTE:**

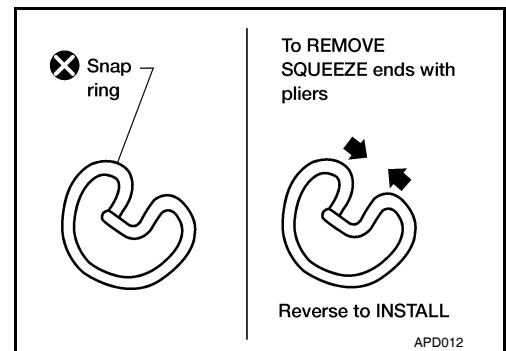
During assembly, use caution so that the needle bearings do not fall down.



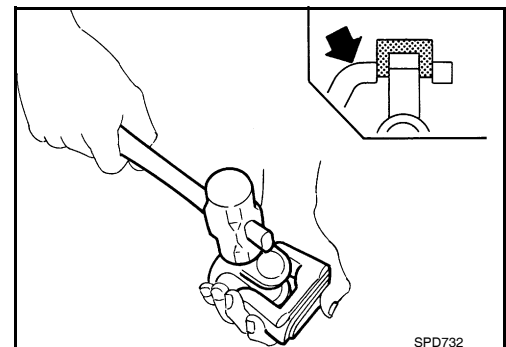
2. Select snap rings that will provide the specified play in an axial direction of the journal, and install them. Refer to [DLN-153, "Snap Ring"](#).

**NOTE:**

Select snap rings with a difference in thickness at both sides within 0.02 mm (0.0008 in).



3. Adjust the thrust clearance between the bearing and snap ring to zero by tapping the yoke.

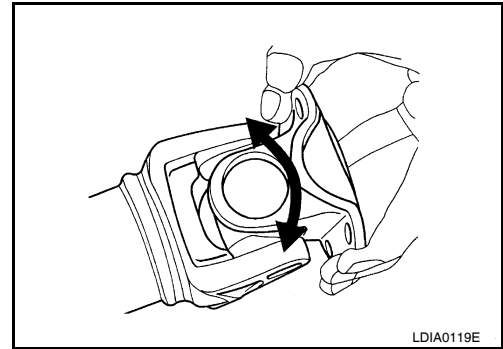


# REAR PROPELLER SHAFT

< DISASSEMBLY AND ASSEMBLY >

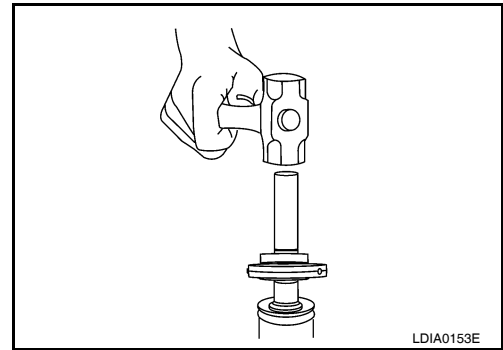
[PROPELLER SHAFT: 3S1410]

4. Make sure that the journal moves smoothly and is below the joint flex effort specification. Refer to [DLN-152, "General Specification"](#).

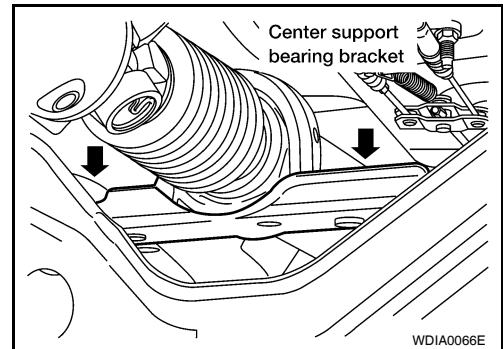


## Center Support Bearing

1. Apply a thin coat of multi-purpose grease to both the propeller shaft tube and the inside surface of the center support bearing.
2. Install the center support bearing on the propeller shaft tube using a suitable pipe pressing on the inner race.



3. Install a new clamp over the boot on the slip yoke.
4. Align the matching marks and install the slip yoke on the propeller shaft tube.
5. Clean the surfaces and position the boot over the propeller shaft tube and tighten the clamp.
6. Install the center support bearing bracket, then install the rear propeller shaft assembly in the vehicle. Refer to [DLN-145, "Removal and Installation"](#).



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# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[PROPELLER SHAFT: 3S1410]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### General Specification

INFOID:000000003789562

#### 2WD Model

Applied model		VK56DE	
Body		SWB	LWB
Propeller shaft model		3S1410	
Number of joints		3	
Coupling method with rear final drive		Flange type	Flange type
Coupling method with transmission		Sleeve type	Sleeve type
Shaft length	1 st (Spider to spider)	829.4 mm (32.65in)	1194.7 mm (47.04 in)
	2 nd (Spider to spider)	1205.6 mm (47.46 in)	1377.6 mm (54.24 in)
Shaft outer diameter	1 st	88.9 mm (3.50 in)	
	2 nd	88.9 mm (3.50 in)	101.6 mm (4.00in)

#### Propeller Shaft Runout

Unit: mm (in)

Item	Limit
Propeller shaft runout limit	0.60 mm (0.024 in) or less

#### Journal Axial Play

Unit: mm (in)

Item	Limit
Journal axial play	0.02 mm (0.0008 in) or less

#### Propeller shaft Joint Flex Effort

Unit: N·m (kg·m, in·lb)

Item	Limit
Propeller shaft joint flex effort	2.26 N·m (0.23 kg·m, 20 in·lb) or less

#### 4WD Model

Applied model		4WD
		VK56DE
		A/T
Propeller shaft model		LWB
		3S1410
Number of joints		3
Coupling method with rear final drive		Flange type
Coupling method with transfer		Sleeve type
Shaft length	1 st (Spider to spider)	738.7 mm (29.08 in)
	2 nd (Spider to spider)	1377.6 mm (54.24 in)
Shaft outer diameter	1 st	88.9 mm (3.50 in)
	2 nd	101.6 mm (4.00 in)

#### Propeller Shaft Runout

Unit: mm (in)

Item	Limit
Propeller shaft runout limit	0.60 mm (0.024 in) or less



# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[PROPELLER SHAFT: 3S1410]

## Journal Axial Play

Unit: mm (in)

Item	Limit
Journal axial play	0.02 mm (0.0008 in) or less

## Propeller shaft Joint Flex Effort

Unit: N·m (kg-m, in-lb)

Item	Limit
Propeller shaft joint flex effort	2.26 N·m (0.23 kg-m, 20 in-lb) or less

## Snap Ring

INFOID:000000003789563

Unit: mm (in)

Thickness	Color	Part Number*
1.99 (0.0783)	White	37146-C9400
2.02 (0.0795)	Yellow	37147-C9400
2.05 (0.0807)	Red	37148-C9400
2.08 (0.0819)	Green	37149-C9400
2.11 (0.0831)	Blue	37150-C9400
2.14 (0.0843)	Light brown	37151-C9400
2.17 (0.0854)	Black	37152-C9400
2.20 (0.0866)	No paint	37153-C9400

\*Always check with the Parts Department for the latest parts information.

Unit: mm (in)

Thickness	Color	Part Number*
1.600 - 1.638 (0.0630 - 0.0645)	Black	37146-7S000
1.549 - 1.588 (0.0610 - 0.0625)	Black	37147-7S000
1.524 - 1.562 (0.0600 - 0.0615)	Black	37148-7S000
1.499 - 1.537 (0.0590 - 0.0605)	Black	37149-7S000

\*Always check with the Parts Department for the latest parts information.

## PRECAUTION

### PRECAUTIONS

#### Precaution for Servicing Front Final Drive

INFOID:000000003789564

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.

# PREPARATION

< PREPARATION >

[FRONT FINAL DRIVE: M205]

## PREPARATION

### PREPARATION

#### Special Service Tool

INFOID:000000004193580

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV10111100 (J-37228) Seal cutter	Removing carrier cover
ST35271000 ( — ) Drift	Installing drive pinion front bearing outer race. <b>a: 72 mm (2.83 in) dia.</b> <b>b: 36 mm (1.42 in) dia.</b>
KV38100500 (J-25273) Drift	Installing front oil seal. <b>a: 80 mm (3.15 in) dia.</b> <b>b: 60 mm (2.36 in) dia.</b>
ST30021000 ( — ) Puller	<ul style="list-style-type: none"> <li>• Removing side bearing inner race.</li> <li>• Removing drive pinion rear bearing inner race.</li> </ul>
KV38100300 (J-25523) Drift	Installing side bearing inner race. <b>a: 54 mm (2.13 in) dia.</b> <b>b: 46 mm (1.81 in) dia.</b> <b>c: 32 mm (1.26 in) dia.</b>
ST30901000 ( — ) Drift	Installing drive pinion rear bearing outer race. <b>A: 79 mm (3.11 in) dia.</b> <b>B: 45 mm (1.77 in) dia.</b> <b>C: 35.2 mm (1.39 in) dia.</b>

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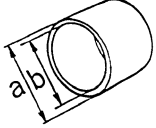
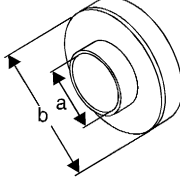
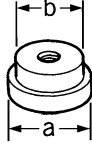
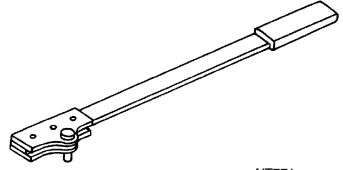
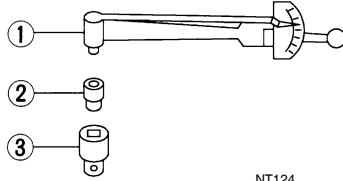
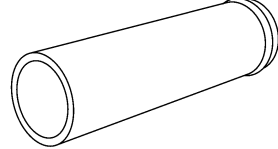
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# PREPARATION

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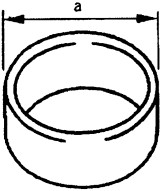
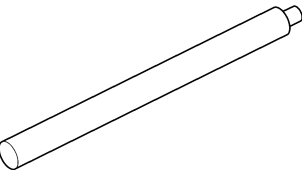
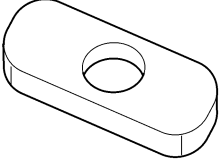
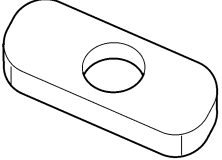
[FRONT FINAL DRIVE: M205]

Tool number (Kent-Moore No.) Tool name	Description
KV40104810 ( — ) Drift	Installing drive pinion front bearing outer race. <b>a: 68 mm (2.68 in) dia.</b> <b>b: 55 mm (2.17 in) dia.</b>
 <p style="text-align: center; font-size: small;">ZZA1003D</p>	Installing front oil seal. <b>a: 90 mm (3.54 in) dia.</b> <b>b: 55.3 mm (2.18 in) dia.</b>
KV38102200 ( — ) Drift	Installing front oil seal. <b>a: 90 mm (3.54 in) dia.</b> <b>b: 55.3 mm (2.18 in) dia.</b>
 <p style="text-align: center; font-size: small;">NT660</p>	Removing and installing side bearing inner race. <b>a: 43 mm (1.69 in) dia.</b> <b>b: 33.5 mm (1.32 in) dia.</b>
ST33081000 ( — ) Adapter	Removing and installing side bearing inner race. <b>a: 43 mm (1.69 in) dia.</b> <b>b: 33.5 mm (1.32 in) dia.</b>
 <p style="text-align: center; font-size: small;">ZZA1000D</p>	Removing and installing drive pinion nut.
KV38108300 (J-44195) Companion flange wrench	Removing and installing drive pinion nut.
 <p style="text-align: center; font-size: small;">NT771</p>	Inspecting drive pinion bearing preload and total preload
ST3127S000 (J-25765-A) Preload gauge 1. GG91030000 (J-25765) Torque wrench 2. HT62940000 ( — ) Socket adapter (1/2") 3. HT62900000 ( — ) Socket adapter (3/8")	 <p style="text-align: center; font-size: small;">NT124</p>
— (C-4040) Installer	Installing drive pinion rear bearing inner race.
 <p style="text-align: center; font-size: small;">SDIA2607E</p>	Installing drive pinion rear bearing inner race.

# PREPARATION

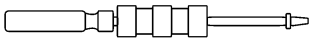
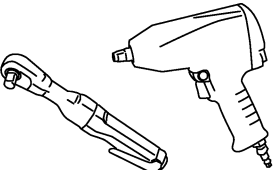
< PREPARATION >

[FRONT FINAL DRIVE: M205]

Tool number (Kent-Moore No.) Tool name		Description	
KV40105230 ( — ) Drift	 ZZA0898D	Installing drive pinion rear bearing outer race. <b>a: 92 mm (3.62 in) dia.</b> <b>b: 85.5 mm (3.37 in) dia.</b>	A B C
— (C-4171) Handle	 LDIA0134E	<ul style="list-style-type: none"> <li>• Removing drive pinion front bearing outer race</li> <li>• Removing drive pinion rear bearing outer race</li> </ul>	DLN E F
— (D-103) Remover	 LDIA0135E	Removing drive pinion front bearing outer race	G H
— (C-4307) Remover	 LDIA0135E	Removing drive pinion rear bearing outer race	I J K

## Commercial Service Tool

INFOID:000000004193581

(Kent-Moore No.) Tool name		Description	
(SP8P) Slide hammer	 LDIA0133E	<ul style="list-style-type: none"> <li>• Removing front oil seal</li> <li>• Removing side oil seal</li> </ul>	L M N O
Power tool	 PBIC0190E	Loosening bolts and nuts	P

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[FRONT FINAL DRIVE: M205]

## SYMPTOM DIAGNOSIS

### NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

#### NVH Troubleshooting Chart

INFOID:000000004193582

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Symptom	Noise		Reference page
		Gear tooth rough	<a href="#">DLN-166, "Disassembly and Assembly"</a>
		Gear contact improper	<a href="#">DLN-166, "Disassembly and Assembly"</a>
		Tooth surfaces worn	<a href="#">DLN-166, "Disassembly and Assembly"</a>
		Incorrect backlash	<a href="#">DLN-166, "Disassembly and Assembly"</a>
		Companion flange excessive runout	<a href="#">DLN-166, "Disassembly and Assembly"</a>
		Gear oil improper	<a href="#">DLN-159, "Checking Differential Gear Oil"</a>
		PROPELLER SHAFT	<a href="#">DLN-126, "NVH Troubleshooting Chart"</a>
		FRONT AXLE	<a href="#">FAX-4, "NVH Troubleshooting Chart"</a>
		FRONT SUSPENSION	<a href="#">FSU-4, "NVH Troubleshooting Chart"</a>
		TIRES	<a href="#">WT-42, "NVH Troubleshooting Chart"</a>
		ROAD WHEEL	<a href="#">WT-42, "NVH Troubleshooting Chart"</a>
		DRIVE SHAFT	<a href="#">FSU-4, "NVH Troubleshooting Chart"</a>
		BRAKES	<a href="#">BR-5, "NVH Troubleshooting Chart"</a>
		STEERING	<a href="#">ST-5, "NVH Troubleshooting Chart"</a>

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## ON-VEHICLE MAINTENANCE

### DIFFERENTIAL GEAR OIL

#### Changing Differential Gear Oil

INFOID:000000004193583

#### DRAINING

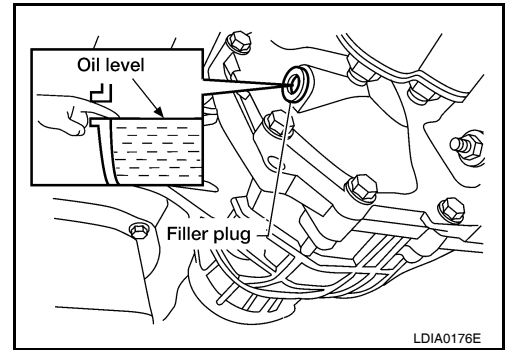
1. Stop the engine.
2. Remove the drain plug from the front final drive assembly to drain the differential gear oil.
3. Install the drain plug with sealant applied on the threads to the front final drive assembly. Tighten to the specified torque. Refer to [DLN-166, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

#### FILLING

1. Remove the filler plug from the front final drive assembly.
2. Fill the front final drive assembly with new differential gear oil until the level reaches the specified level near the filler plug hole.

**Differential gear oil grade and capacity** : Refer to [MA-10, "Fluids and Lubricants"](#).

3. Install the filler plug with sealant applied on the threads to the front final drive assembly. Tighten to the specified torque. Refer to [DLN-166, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).



#### Checking Differential Gear Oil

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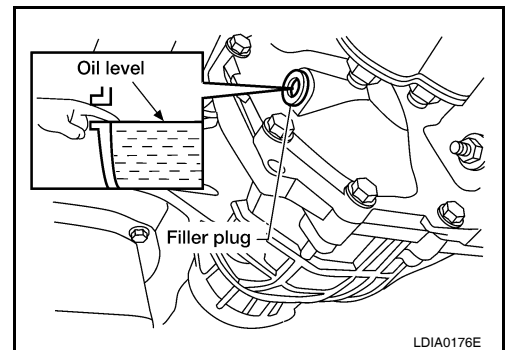
#### DIFFERENTIAL GEAR OIL LEAKAGE AND LEVEL

1. Make sure that differential gear oil is not leaking from the front final drive assembly or around it.
2. Check the differential gear oil level from the filler plug hole as shown.

**CAUTION:**

**Do not start engine while checking differential gear oil level.**

3. Install the filler plug with sealant applied on the threads to the front final drive assembly. Tighten to the specified torque. Refer to [DLN-166, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).



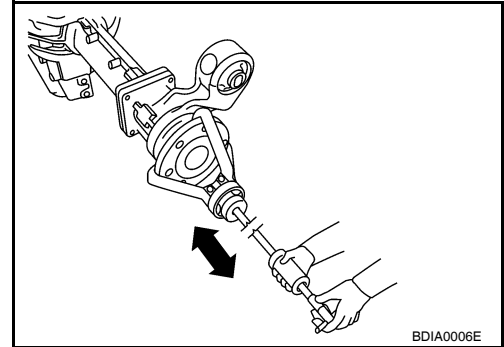
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**ON-VEHICLE REPAIR****SIDE OIL SEAL****Removal and Installation**

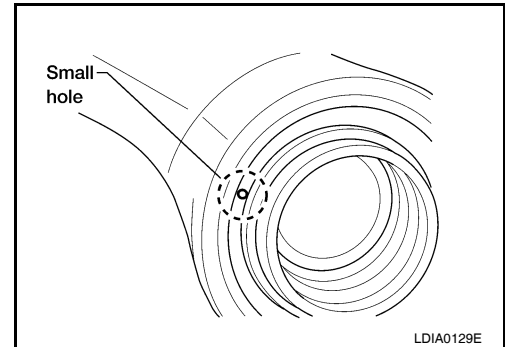
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**REMOVAL**

1. Remove the front final drive assembly. Refer to [DLN-164, "Removal and Installation"](#).
2. Remove the differential side shaft and differential side flange using suitable tool.

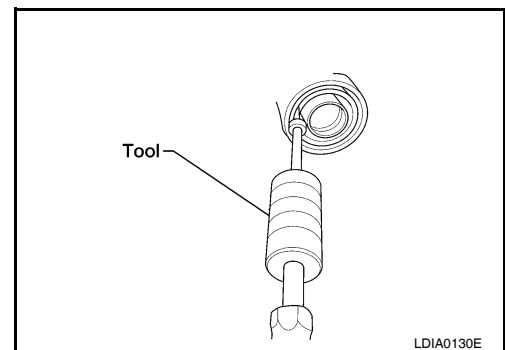


3. Place a small hole in the side oil seal case using suitable tool.



4. Remove the side oil seal using Tool as shown.

**Tool number : SP8P**

**INSTALLATION**

1. Apply multi-purpose grease to the lips of the new side oil seal. Then drive the new side oil seal in evenly to the gear carrier using suitable tool.

**CAUTION:**

- Do not reuse side oil seal.
- Do not incline the new side oil seal when installing.
- Apply multi-purpose grease to the lips of the new side oil seal.

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

**CAUTION:**

**Check the differential gear oil level after installation. Refer to [DLN-159](#).**



## FRONT OIL SEAL

### Removal and Installation

INFOID:000000004193586

#### REMOVAL

1. Remove the drive shafts from the front final drive assembly. Refer to [FAX-8, "Removal and Installation"](#).
2. Remove the front propeller shaft from the front final drive assembly. Refer to [DLN-128, "Removal and Installation"](#).
3. Measure the total preload torque. Refer to [DLN-182, "Inspection and Adjustment"](#).

**NOTE:**

Record the total preload torque measurement.

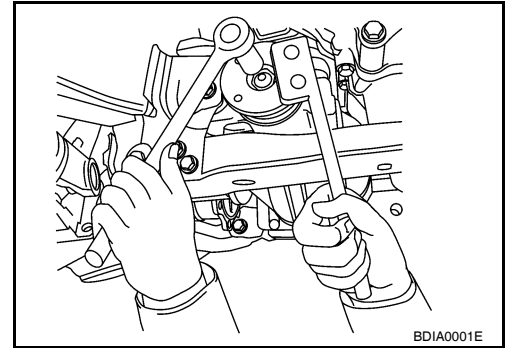
4. Remove the drive pinion lock nut using Tool.

**Tool number : KV38108300 (J-44195)**

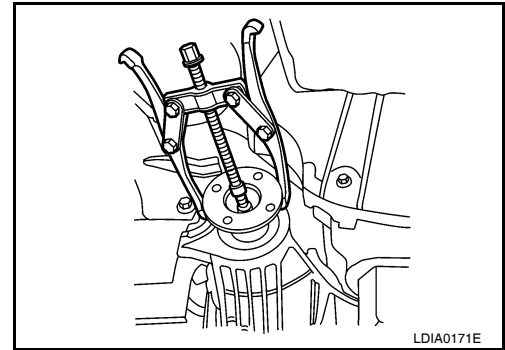
5. Put matching marks on the companion flange and drive pinion using paint.

**CAUTION:**

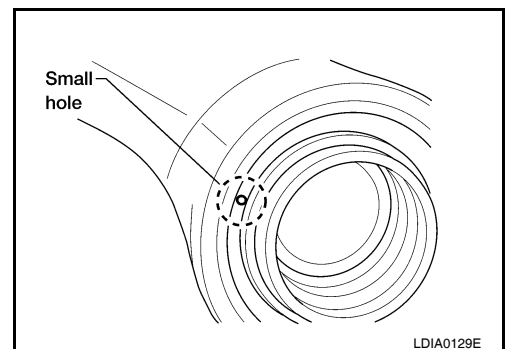
**Use paint to make the matching marks. Do not damage the companion flange or drive pinion.**



6. Remove companion flange using suitable tool.

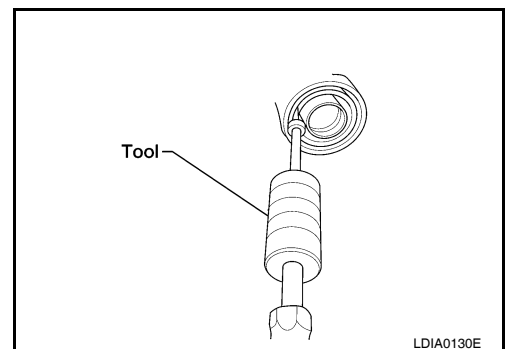


7. Place a small hole in the front oil seal case using suitable tool.



8. Remove the front oil seal using Tool as shown.

**Tool number : SP8P**



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# FRONT OIL SEAL

< ON-VEHICLE REPAIR >

[FRONT FINAL DRIVE: M205]

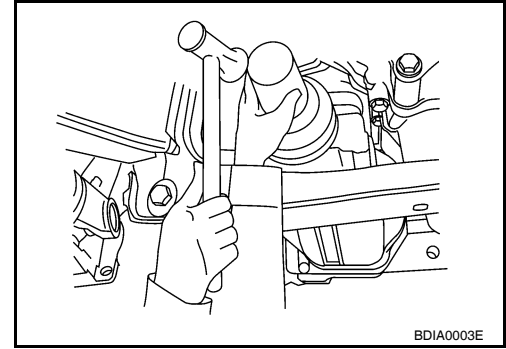
## INSTALLATION

1. Apply multi-purpose grease to the lips of the new front oil seal. Then drive the new front oil seal in evenly to the gear carrier using Tool.

**Tool number** : KV38100500 (J-25273)  
: KV38102200 ( — )

### CAUTION:

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.



2. Install the companion flange to the drive pinion while aligning the matching marks.
3. Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut. Then adjust the drive pinion lock nut tightening torque using Tool A, and check the total preload torque using Tool B.

**Tool number** A: KV38108300 (J-44195)  
B: ST3127S000 (J-25765-A)

**Total preload torque:** Refer to [DLN-182, "Inspection and Adjustment"](#).

- The total preload torque should be within the total preload torque specification. When not replacing the collapsible spacer, it should also be equal to the measurement taken during removal plus an additional 0.56 N·m (0.06 Kg-m, 5 in-lb).
- If the total preload torque is low, tighten the drive pinion lock nut in 6.8 N·m (0.69 Kg-m, 5ft-lb) increments until the total preload torque is met.

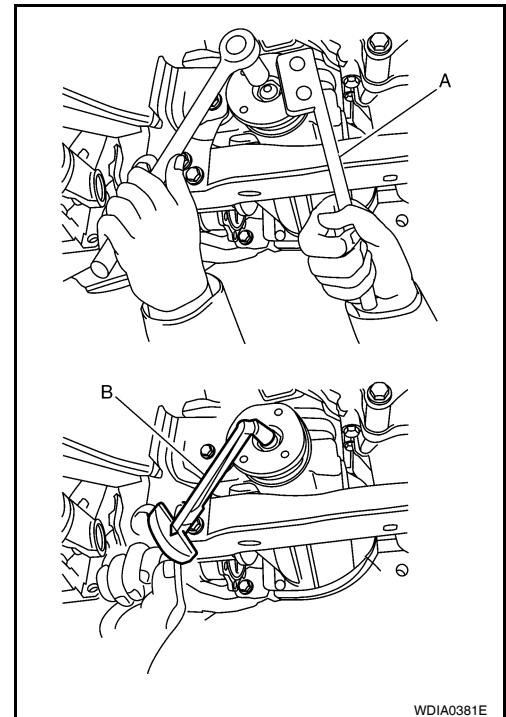
### CAUTION:

- Do not reuse drive pinion lock nut.
- Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut.
- Adjust the drive pinion lock nut tightening torque to the lower limit first. Do not exceed the drive pinion lock nut specified torque. Refer to [DLN-166, "Disassembly and Assembly"](#).
- Do not loosen drive pinion lock nut to adjust the total preload torque. If the drive pinion lock nut torque or the total preload torque exceeds the specifications, replace the collapsible spacer and tighten it again to adjust. Refer to [DLN-166, "Disassembly and Assembly"](#).
- After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.

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

### CAUTION:

Check the differential gear oil level after installation. Refer to [DLN-159, "Checking Differential Gear Oil"](#).



## CARRIER COVER

### Removal and Installation

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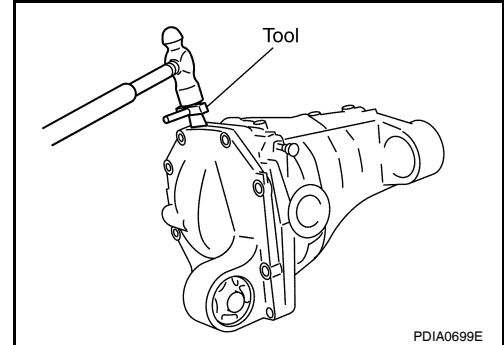
#### REMOVAL

1. Remove the front final drive assembly. Refer to [DLN-164, "Removal and Installation"](#).
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.



#### INSTALLATION

1. Apply 3 mm (0.12 in) bead of sealant to the mating surface of the carrier cover as shown.
  - Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

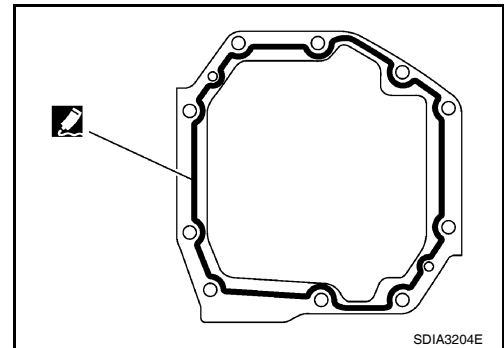
**CAUTION:**

**Remove any old sealant adhering to the mating surfaces. Also remove any moisture, oil, or foreign material adhering to the application and mating surfaces.**

2. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque. Refer to [DLN-166, "Disassembly and Assembly"](#).
3. Install the front final drive assembly. Refer to [DLN-164, "Removal and Installation"](#).

**CAUTION:**

**Fill the front final drive assembly with recommended differential gear oil. Refer to [DLN-159, "Checking Differential Gear Oil"](#).**



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# FRONT FINAL DRIVE

< REMOVAL AND INSTALLATION >

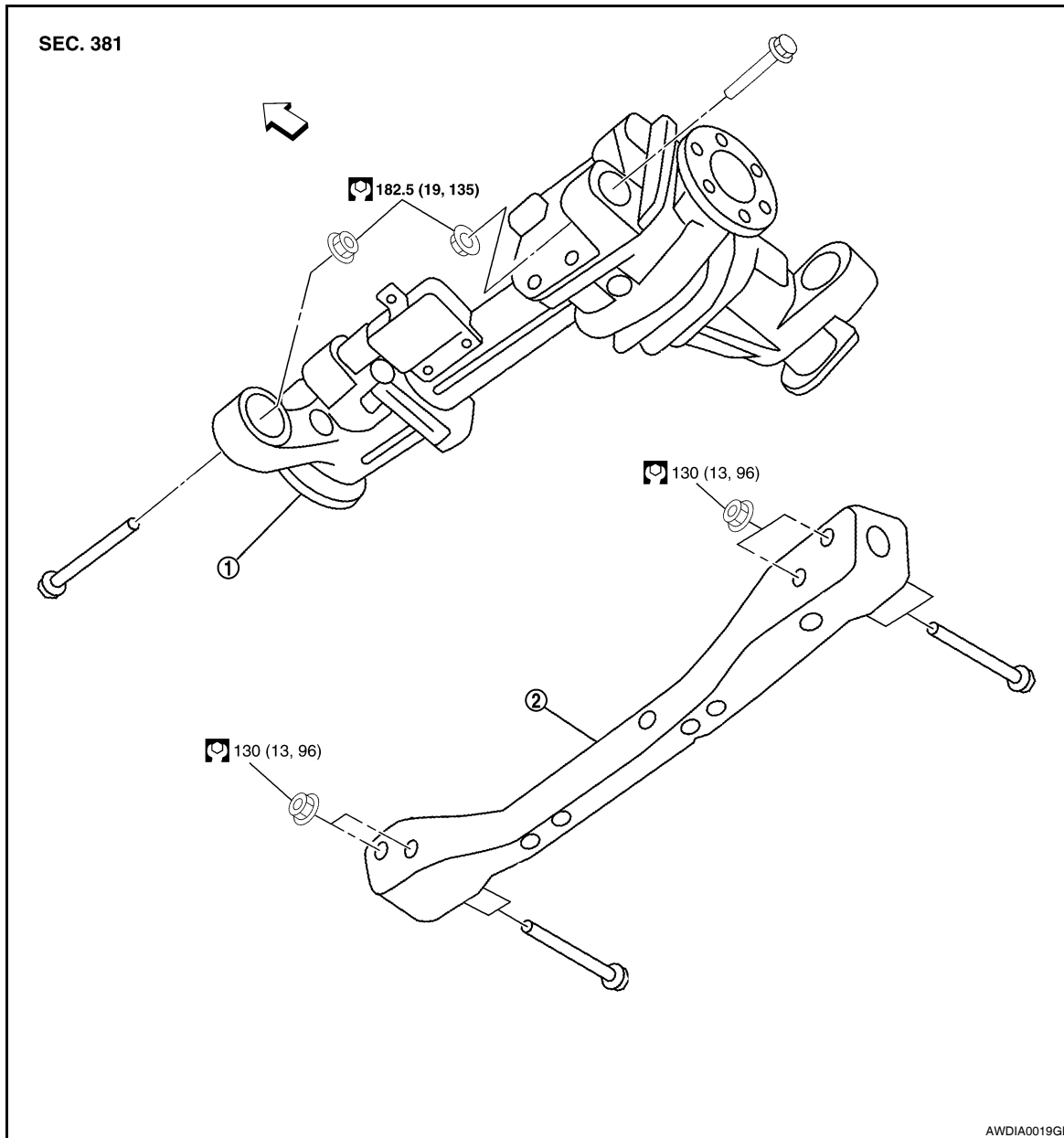
[FRONT FINAL DRIVE: M205]

## REMOVAL AND INSTALLATION

### FRONT FINAL DRIVE

#### Removal and Installation

INFOID:000000004193588



1. Front final drive assembly

2. Front cross member

← Front

#### REMOVAL

1. Drain the differential gear oil. Refer to [DLN-159, "Changing Differential Gear Oil"](#).
2. Remove the drive shafts from the front final drive assembly. Refer to [FAX-8, "Removal and Installation"](#).
3. Remove the front cross member.
4. Remove the front propeller shaft from the front final drive assembly. Refer to [DLN-128, "Removal and Installation"](#).
5. Disconnect the vent hose from the front final drive assembly.
6. Support the front final drive assembly using a suitable jack.

## FRONT FINAL DRIVE

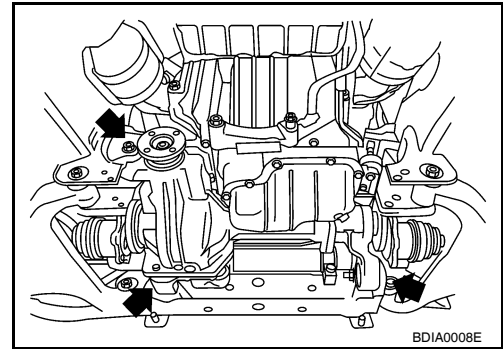
### < REMOVAL AND INSTALLATION >

[FRONT FINAL DRIVE: M205]

7. Remove the front final drive assembly bolts, then remove the front final drive assembly.

**CAUTION:**

Support the front final drive assembly while removing using a suitable jack.



### INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

- Make sure there are no pinched or restricted areas on the breather hose caused by folding or bending when installing it.
- Fill the front final drive assembly with differential gear oil after installation. Refer to [DLN-159](#), "[Checking Differential Gear Oil](#)".

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# FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

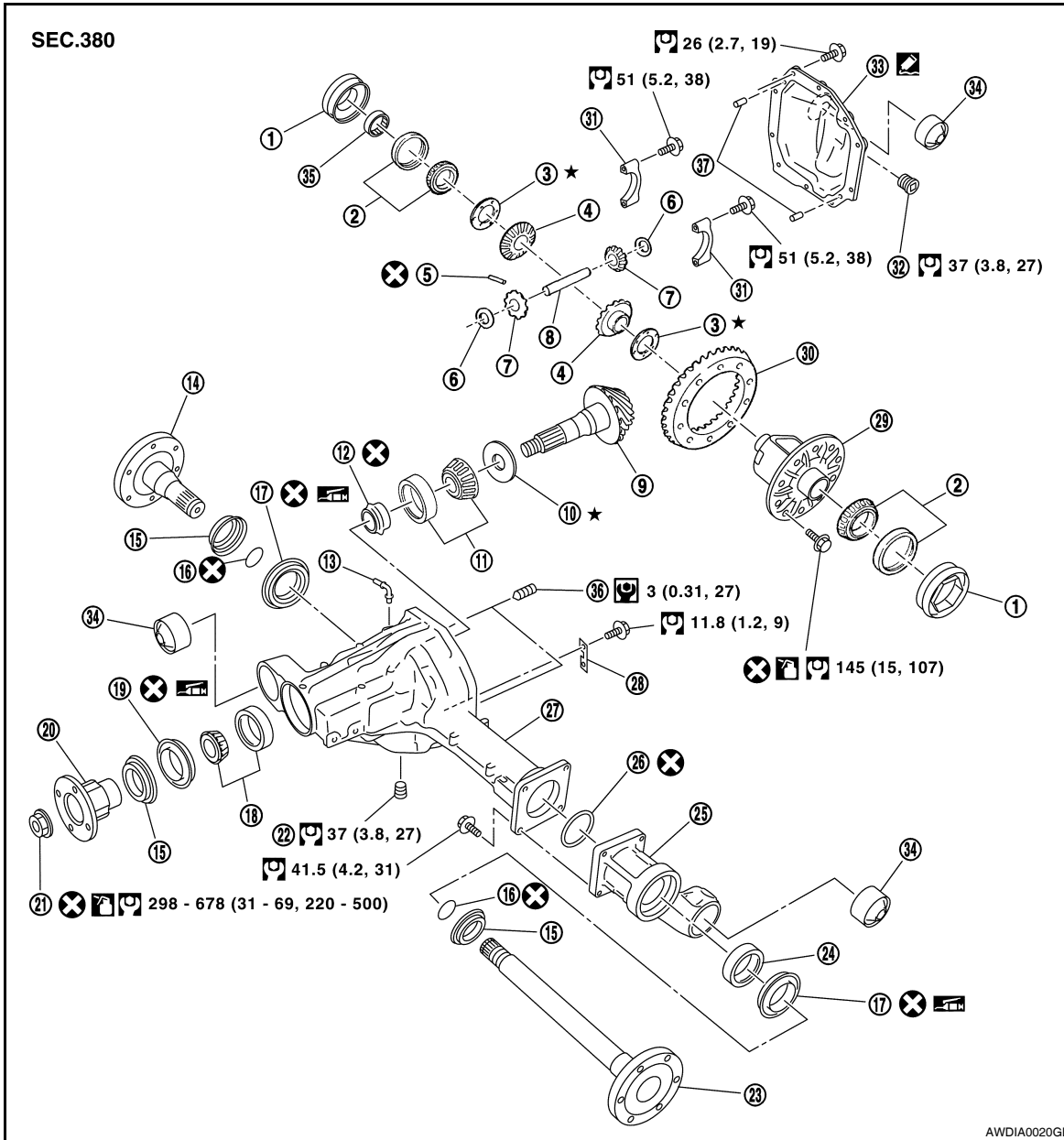
## DISASSEMBLY AND ASSEMBLY

### FRONT FINAL DRIVE

#### Disassembly and Assembly

INFOID:000000004193589

#### COMPONENTS



- |  |                               |                                     |
|--|-------------------------------|-------------------------------------|
| 1. Side bearing adjuster                 | 2. Side bearing               | 3. Side gear thrust washer          |
| 4. Side gear                             | 5. Lock pin                   | 6. Pinion mate thrust washer        |
| 7. Pinion mate gear                      | 8. Pinion mate shaft          | 9. Drive pinion                     |
| 10. Drive pinion height adjusting washer | 11. Drive pinion rear bearing | 12. Collapsible spacer              |
| 13. Breather tube                        | 14. Differential side flange  | 15. Dust shield                     |
| 16. Circular clip                        | 17. Side oil seal             | 18. Drive pinion front bearing      |
| 19. Front oil seal                       | 20. Companion flange          | 21. Drive pinion lock nut           |
| 22. Drain plug                           | 23. Differential side shaft   | 24. Differential side shaft bearing |
| 25. Extension tube                       | 26. O-ring                    | 27. Gear carrier                    |

# FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

- |                      |                       |                   |
|----------------------|-----------------------|-------------------|
| 28. Plate            | 29. Differential case | 30. Drive gear    |
| 31. Side bearing cap | 32. Filler plug       | 33. Carrier cover |
| 34. Bushing          | 35. Bearing           | 36. Screw         |
| 37. Dowel pin        |                       |                   |

## ASSEMBLY INSPECTION AND ADJUSTMENT

- Drain the differential gear oil before inspection and adjustment. Refer to [DLN-159, "Changing Differential Gear Oil"](#).
- Remove and install the carrier cover as necessary for inspection and adjustment. Refer to [DLN-163, "Removal and Installation"](#).

### Total Preload Torque

1. Install the differential side shaft and differential side flange if necessary.

**CAUTION:**

**The differential side shaft and differential side flange must be installed in order to measure total preload torque.**

2. Rotate the drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
3. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.
4. Measure total preload torque using Tool.

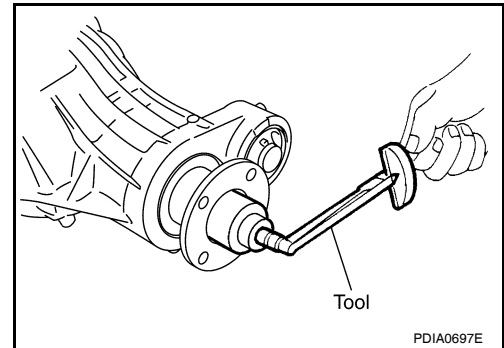
**Tool number** : ST3127S000 (J-25765-A)

**Total preload torque**

: Refer to [DLN-182, "Inspection and Adjustment"](#)

**NOTE:**

**Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque**



- If the measured value is out of the specification, check and adjust each part. Adjust the drive pinion bearing preload torque first, then adjust the side bearing preload torque.

**If the total preload torque is greater than specification**

**On drive pinion bearings:** Replace the collapsible spacer.

**On side bearings:** Loosen the side bearing adjuster by the same amount on each side.

**If the total preload torque is less than specification**

**On drive pinion bearings:** Tighten the drive pinion lock nut.

**On side bearings:** Tighten the side bearing adjuster by the same amount on each side.

### Drive Gear Runout

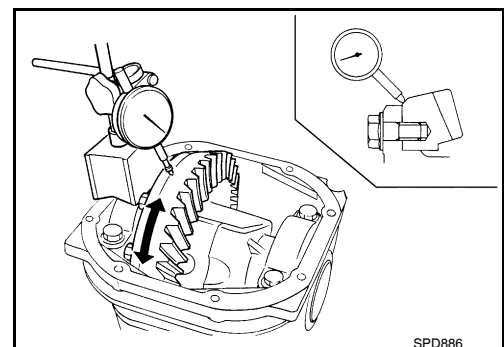
1. Fit a dial indicator to the drive gear back face.
2. Rotate the drive gear to measure runout.

**Runout limit:** 0.08 mm (0.0031 in) or less

- If the runout is outside of the limit, check the condition of the drive gear assembly. Foreign material may be caught between the drive gear and differential case, or the differential case or drive gear may be deformed.

**CAUTION:**

**Replace drive gear and drive pinion as a set.**



### Tooth Contact

# FRONT FINAL DRIVE

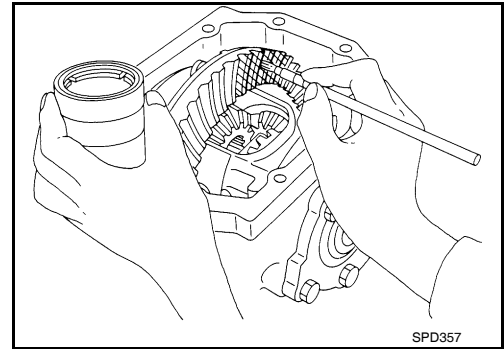
< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

1. Apply red lead to the drive gear.

**NOTE:**

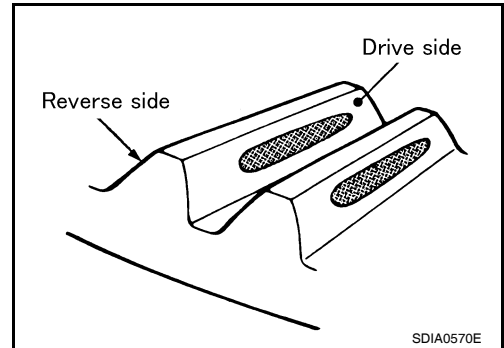
Apply red lead to both faces of three to four gears, at four locations evenly spaced on the drive gear.



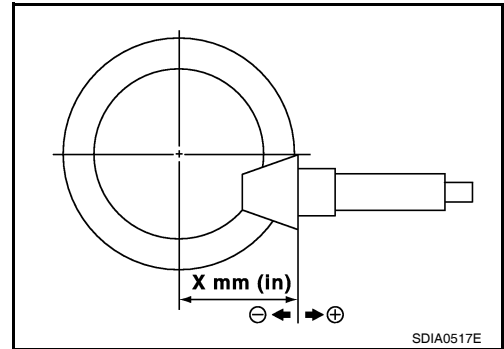
2. Rotate the drive gear back and forth several times. Then check for correct drive pinion to drive gear tooth contact as shown.

**CAUTION:**

**Check tooth contact on drive side and reverse side.**

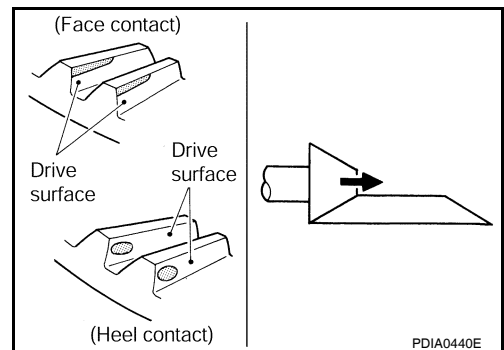


3. If the tooth contact is improperly adjusted, follow the procedure below to adjust the drive pinion height (dimension X).



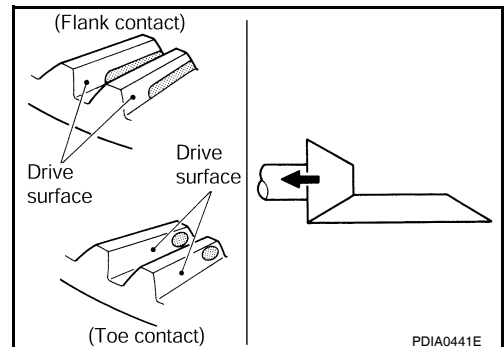
- If the tooth contact is near the face (face contact), or near the heel (heel contact), use a thicker drive pinion height adjusting washer to move drive pinion closer to the drive gear.

Refer to [DLN-182, "Inspection and Adjustment"](#).



- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), use a thinner drive pinion height adjusting washer to move the drive pinion farther from the drive gear.

Refer to [DLN-182, "Inspection and Adjustment"](#).





# FRONT FINAL DRIVE

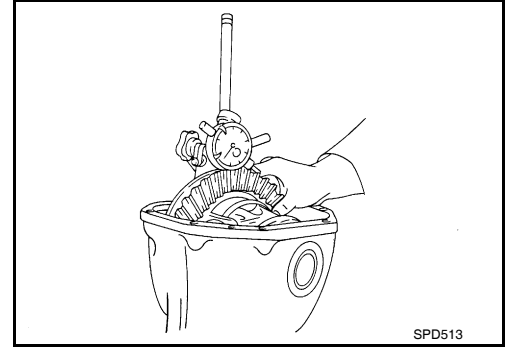
< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

## Backlash

1. Fit a dial indicator to the drive gear face to measure the backlash.

**Backlash:** 0.12 - 0.20 mm (0.0050 - 0.0078 in)



- If the backlash is outside of the specification, adjust each side bearing adjuster.

**If the backlash is greater than specification:**

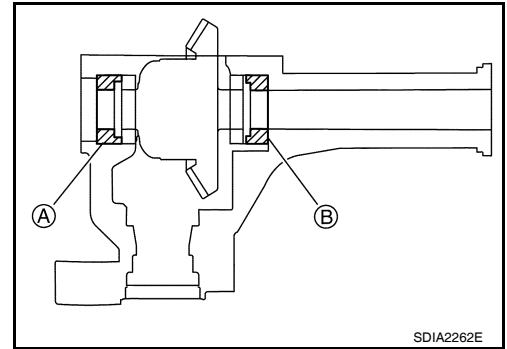
**Loosen side bearing adjuster A and tighten side bearing adjuster B by the same amount.**

**If the backlash is less than specification:**

**Loosen side bearing adjuster B and tighten side bearing adjuster A by the same amount.**

### CAUTION:

**Do not change the side bearing adjusters by different amounts as it will change the side bearing preload torque.**



## Companion Flange Runout

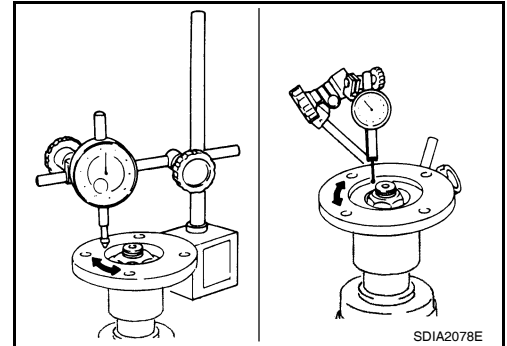
1. Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool.

### Runout limit

**Companion flange face: 0.10 mm (0.0039 in)**

**Companion flange inner side: 0.13 mm (0.0051 in)**

2. If the runout is outside the runout limit, follow the procedure below to adjust.
  - a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
  - b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
  - c. If the runout is still outside of the runout limit after repair of the assembly of drive pinion and drive pinion bearing or drive pinion bearing, replace the companion flange.



## DISASSEMBLY

### Differential Assembly

1. Drain the differential gear oil if necessary.

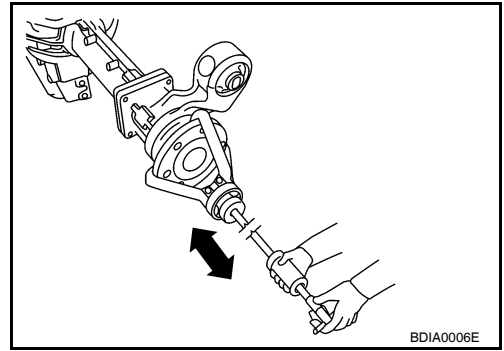
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# FRONT FINAL DRIVE

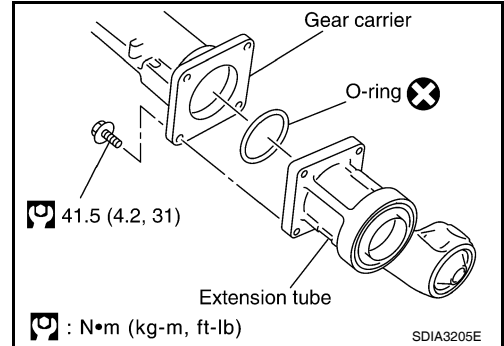
## < DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

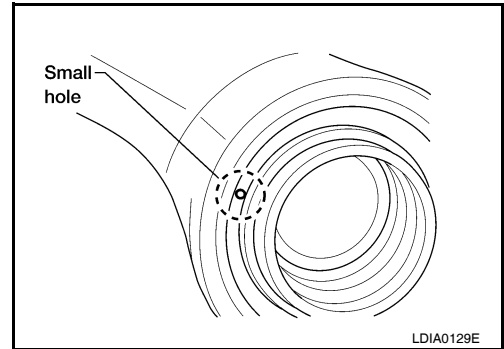
2. Remove the differential side shaft and differential side flange using suitable tool.



3. Remove the extension tube and O-ring from the gear carrier.

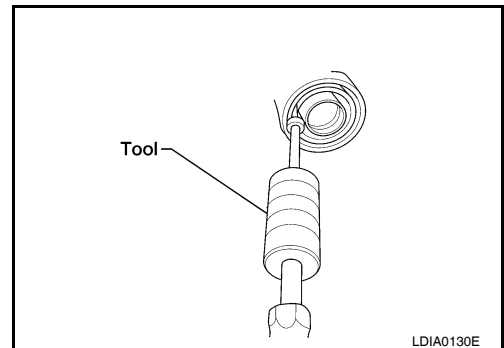


4. Place a small hole in the side oil seal case using suitable tool.



5. Remove the side oil seal using Tool as shown.

**Tool number : SP8P**

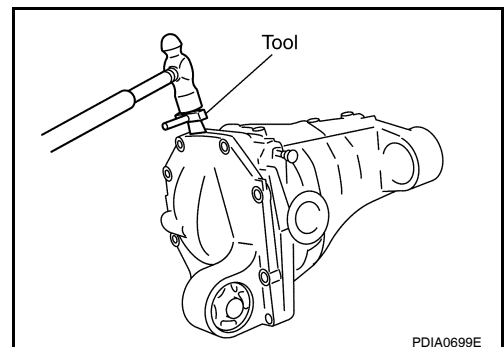


6. Remove the carrier cover bolts and separate the carrier cover from the gear carrier using Tool.

**Tool number : KV10111100 (J-37228)**

**CAUTION:**

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



# FRONT FINAL DRIVE

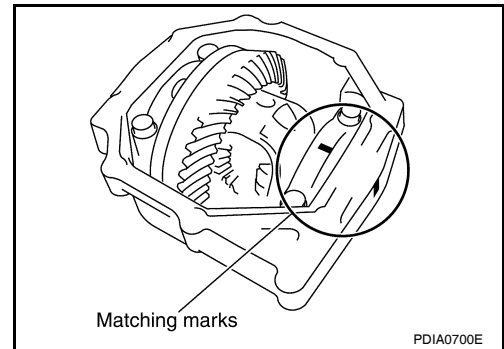
## < DISASSEMBLY AND ASSEMBLY >

## [FRONT FINAL DRIVE: M205]

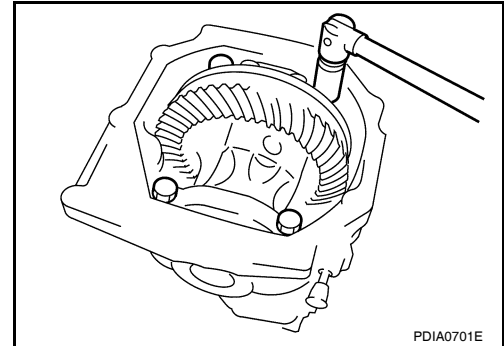
7. For proper reinstallation, paint matching marks on one side of the side bearing cap and gear carrier.

**CAUTION:**

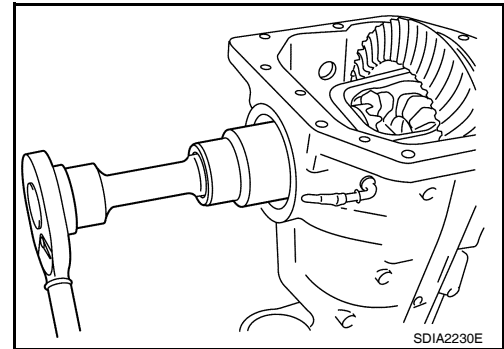
- For matching marks, use paint. Do not damage side bearing cap or gear carrier.
- Side bearing caps are line-board during manufacture. The matching marks are used to reinstall them in their original positions.



8. Remove the side bearing caps.



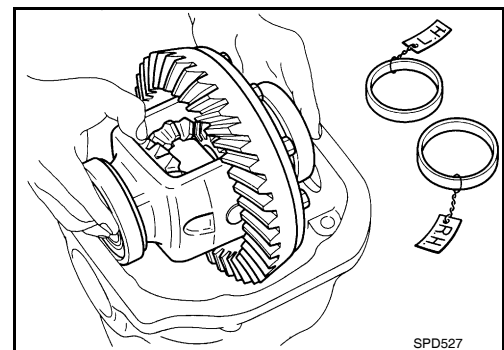
9. Remove the side bearing adjuster.



10. Lift the differential case assembly out of the gear carrier.

**CAUTION:**

Keep side bearing outer races together with side bearing inner races. Do not mix them up.

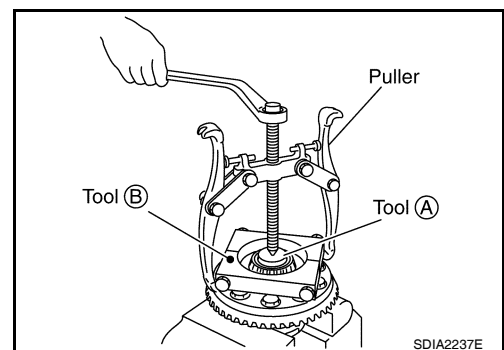


11. Remove side bearing inner race using Tools as shown.

Tool number    A: ST33081000 ( — )  
                      B: ST30021000 ( — )

**CAUTION:**

- Do not remove side bearing inner race unless it is being replaced.
- Place copper plates between the vise and the side bearing inner race and drive gear to prevent damage.
- Engage puller jaws in groove to prevent damage to bearing.



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# FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

- Keep side bearing outer races together with side bearing inner races. Do not mix them up.

12. For proper reinstallation, paint matching marks on the differential case and drive gear.

**CAUTION:**

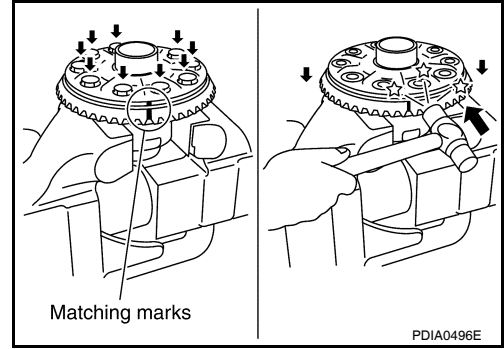
**Use paint for matching marks. Do not damage differential case or drive gear.**

13. Remove the drive gear bolts.

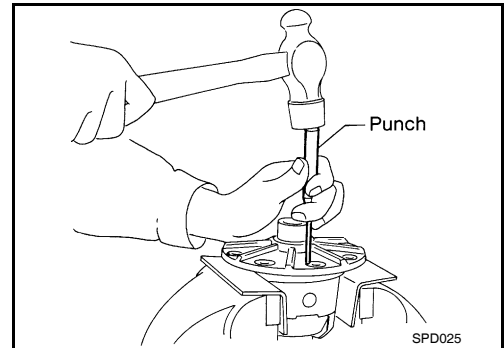
14. Tap the drive gear off the differential case using suitable tool.

**CAUTION:**

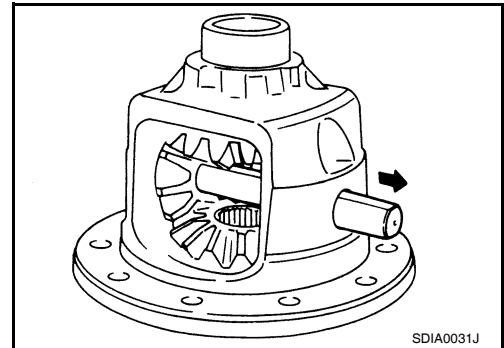
**Tap evenly all around to keep drive gear from bending.**



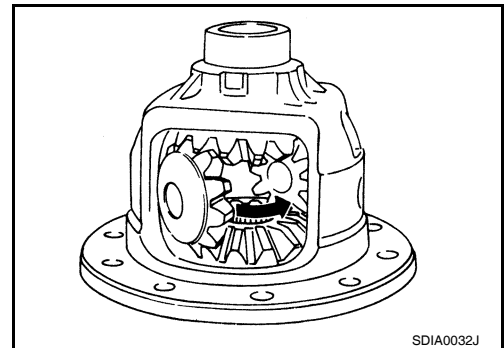
15. Remove the lock pin of the pinion mate shaft from the drive gear side using suitable tool.



16. Remove the pinion mate shaft.



17. Turn the pinion mate gear, then remove the pinion mate gear, pinion mate thrust washer, side gear and side gear thrust washer from the differential case.



Drive Pinion Assembly

1. Remove the differential assembly.

# FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

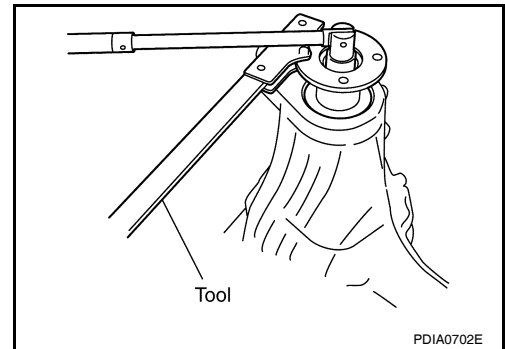
2. Remove the drive pinion lock nut using Tool.

**Tool number** : KV38108300 (J-44195)

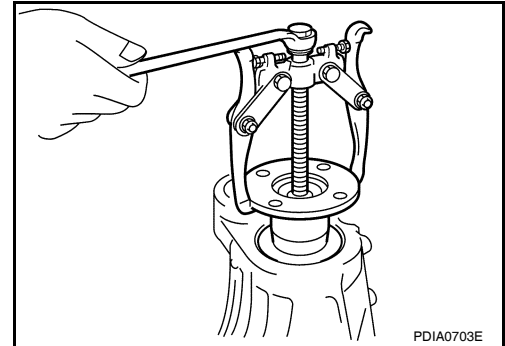
3. Put matching marks on the companion flange and drive pinion using paint.

**CAUTION:**

**Use paint to make the matching marks. Do not damage the companion flange or drive pinion.**



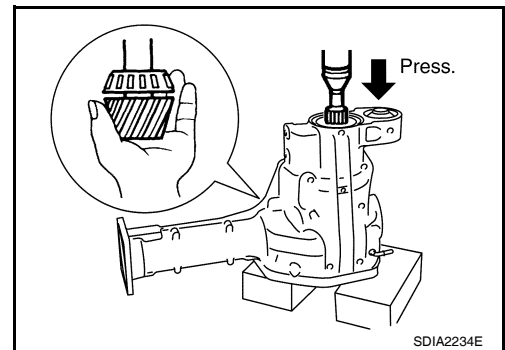
4. Remove the companion flange using suitable tool.



5. Press the drive pinion assembly (with rear inner bearing race and collapsible spacer) out of the gear carrier.

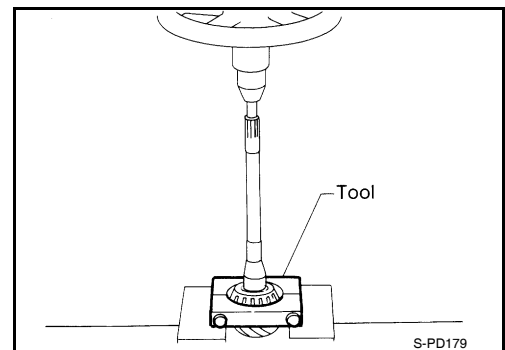
**CAUTION:**

**Do not drop drive pinion assembly.**

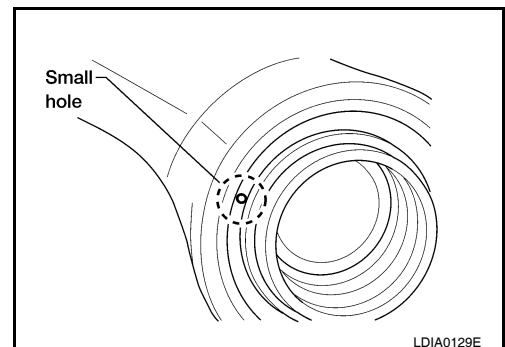


6. Remove the drive pinion rear bearing inner race and drive pinion height adjusting washer using Tool.

**Tool number** : ST30021000 ( — )



7. Place a small hole in the front oil seal case using suitable tool.



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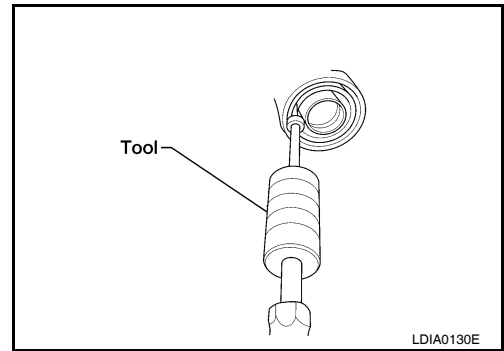
## FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

8. Remove the front oil seal using Tool as shown.

**Tool number** : SP8P



9. Remove the drive pinion front bearing inner race.

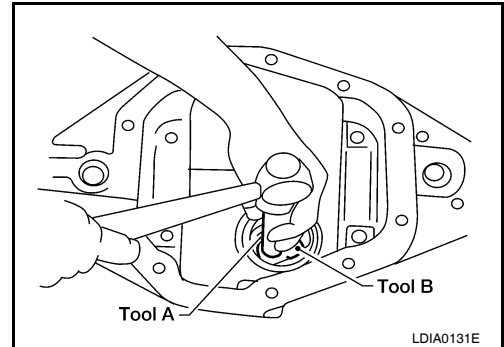
10. Remove the drive pinion front bearing outer race using Tool as shown. Locate the driver on the back edge of the drive pinion front bearing outer race, then drive the drive pinion front bearing outer race out.

**Tool number** A: C-4171

B: D-103

**CAUTION:**

**Do not damage gear carrier.**



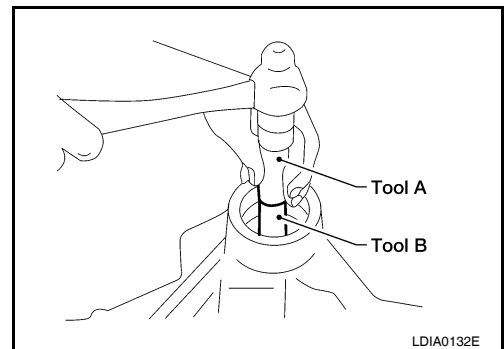
11. Remove the drive pinion rear bearing outer race using Tool as shown. Locate the driver on the back edge of the drive pinion rear bearing outer race, then drive the drive pinion rear bearing outer race out.

**Tool number** A: C-4171

B: C-4307

**CAUTION:**

**Do not damage gear carrier.**



### INSPECTION AFTER DISASSEMBLY

Clean the disassembled parts. Then inspect the parts for wear or damage. If wear or damage are found, follow the measures below.

#### Drive Pinion and Drive Gear

- If the drive pinion and drive gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair, or replace as necessary.
- If the drive pinion or drive gear are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive pinion and drive gear.
- Drive pinion and drive gear are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new drive pinion and drive gear set are being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.

#### Bearing

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set).
- Bearing must be replaced with a new one whenever disassembled.

#### Side Gear and Pinion Mate Gear

- If any cracks or damage are found on the surface of the teeth, replace with new one.
- If any worn or chipped marks are found on the side of the side gear and pinion mate gear which contact the thrust washer, replace with new one.
- Replace both side gear and pinion mate gear as a set when replacing side gear or pinion mate gear.

# FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

Side Gear Thrust Washer and Pinion Mate Thrust Washer

- If any chips (by friction), damage, or unusual wear are found, replace with new one.

Gear Carrier

- If any wear or cracks are found on the contact sides of gear carrier, replace with new one.

Companion Flange

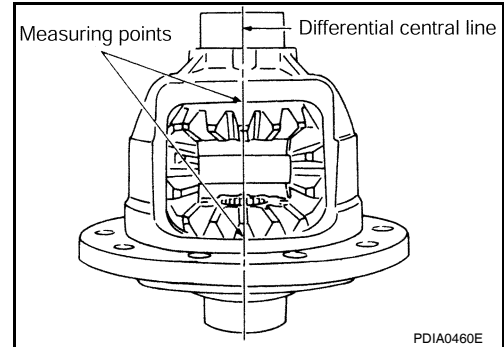
- If any chips (about 0.1mm, 0.004 in) or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one.

## ADJUSTING AND SELECTING WASHERS

Side Gear Back Clearance

- Assemble the differential parts if they are disassembled.

1. Place the differential case straight up so that the side gear to be measured is upward.



2. Using feeler gauges, measure the clearance between the side gear back and differential case at three different points, while rotating the side gear. Average the three readings to calculate the clearance. (Measure the clearance of the other side as well.)

**Side gear back clearance: 0.20 mm (0.0079 in) or less**

- If the side gear back clearance is outside of the specification, use a thicker or thinner side gear thrust washer to adjust. Refer to [DLN-182, "Inspection and Adjustment"](#).

**If the side gear back clearance is greater than specification:**

**Use a thicker side gear thrust washer.**

**If the side gear back clearance is less than specification:**

**Use a thinner side gear thrust washer.**

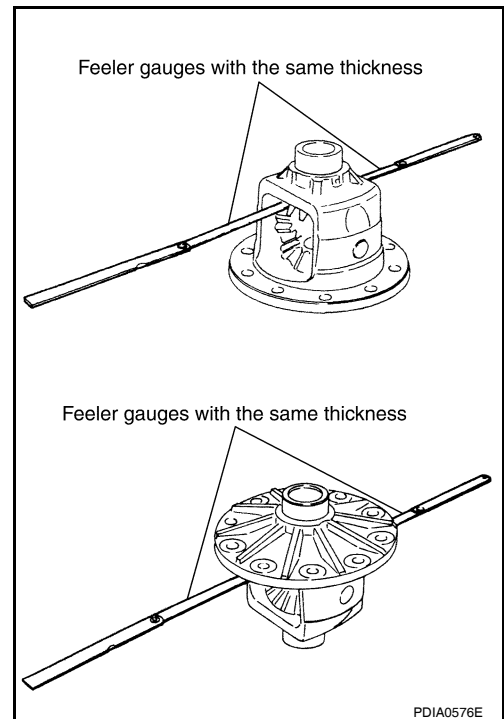
### CAUTION:

- Insert feeler gauges with the same thickness on both sides to prevent side gear from tilting.
- Each gear should rotate smoothly without excessive resistance during differential motion.
- Select a side gear thrust washer for right and left individually.

### NOTE:

Side gear back clearance is clearance between side gear and differential case for adjusting side gear backlash.

Drive Pinion Height



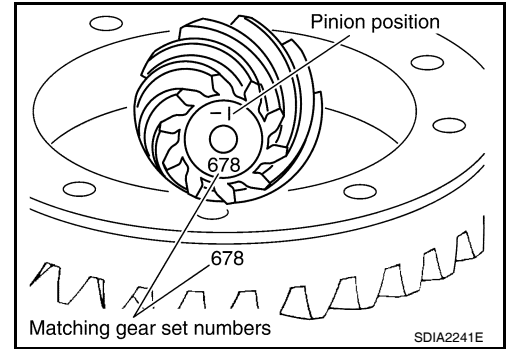
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# FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

- 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 centerline of the drive gear to the back face of the drive pinion for the M205 final drive assembly is 103.5 mm (4.0748 inches).  
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 the drive pinion rear bearing inner race and drive pinion.  
For example: If a drive pinion is etched m+8 (+3), it would require 0.08 mm (0.003 inch) 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 the drive pinion to 103.6 mm (4.0778 inches). If a drive pinion is etched m-8 (-3), it would require adding 0.08mm (0.003 inch) more to the drive pinion height adjusting washer than would be required if the drive pinion were etched "0". By adding 0.08 mm (0.003 inch), the mounting distance of the drive pinion was decreased to 103.4 mm (4.0718 inches) which is just what a m-8 (-3) etching indicated.
- To change the drive pinion height, 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)

## ASSEMBLY

Drive Pinion Assembly



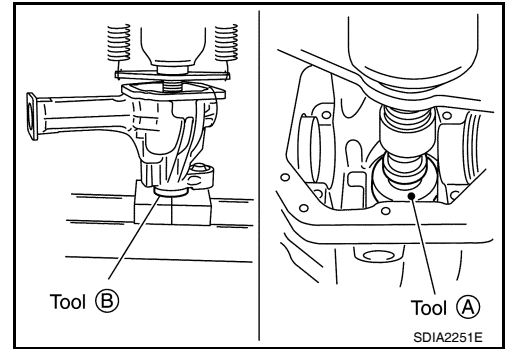
# FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

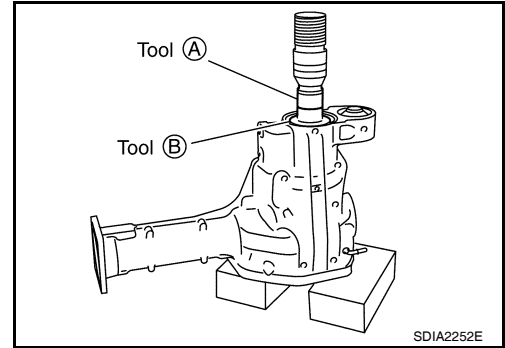
1. Install drive pinion rear bearing outer race using Tools.

**Tool number**    **A: ST30901000 ( — )**  
                          **B: KV40105230 ( — )**



2. Install drive pinion front bearing outer race using Tools.

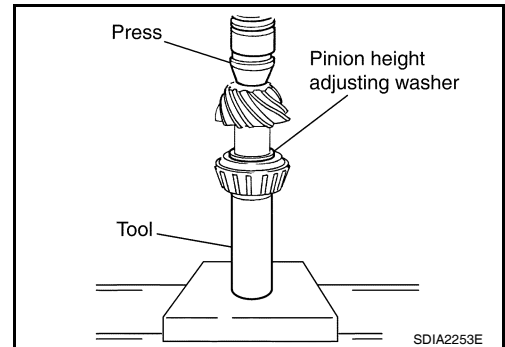
**Tool number**    **A: ST35271000 ( — )**  
                          **B: KV40104810 ( — )**



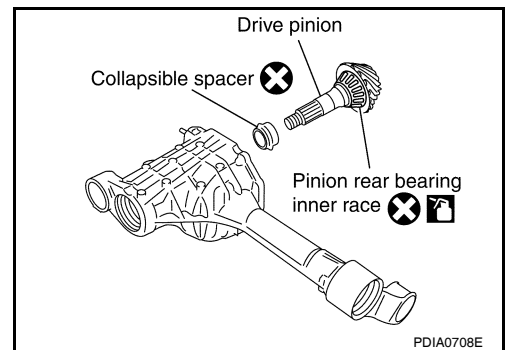
3. Select drive pinion height adjusting washer.
4. Install the selected drive pinion height adjusting washer to the drive pinion. Press the drive pinion rear bearing inner race to it using Tool.

**Tool number**    :    —    **(C-4040)**

**CAUTION:**  
**Do not reuse drive pinion rear bearing inner race.**



5. Install the collapsible spacer to the drive pinion.  
**CAUTION:**  
**Do not reuse collapsible spacer.**
6. Apply differential gear oil to the drive pinion rear bearing, and install the drive pinion assembly to the gear carrier.
7. Apply differential gear oil to the drive pinion front bearing, and install the drive pinion front bearing inner race to the drive pinion assembly.  
**CAUTION:**  
**Do not reuse drive pinion front bearing inner race.**

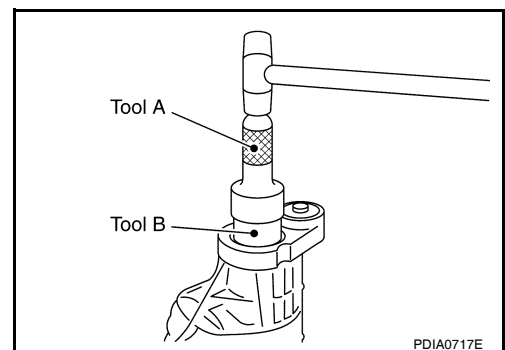


8. Apply multi-purpose grease to the lips of the new front oil seal. Then drive the new front oil seal in evenly using Tools.

**Tool number**    **A: KV38100500 (J-25273)**  
                          **B: KV38102200 ( — )**

**CAUTION:**

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.



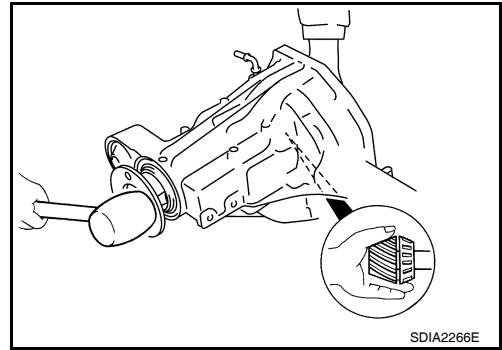
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## FRONT FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

9. Install the companion flange to the drive pinion while aligning the matching marks. Tap the companion flange until fully seated using suitable tool.



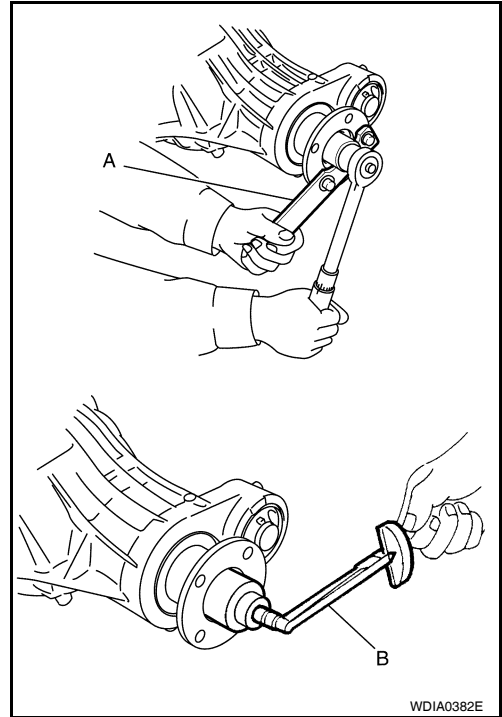
10. Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut. Then adjust the drive pinion lock nut tightening torque using Tool (A), and check the drive pinion bearing preload torque using Tool (B).

**Tool number**     **A: KV38108300 (J-44195)**  
                          **B: ST3127S000 (J-25765-A)**

**Drive pinion bearing preload torque:**  
**2.3 - 3.4 N·m (24 - 34 kg·cm, 21 - 30 in·lb)**

**CAUTION:**

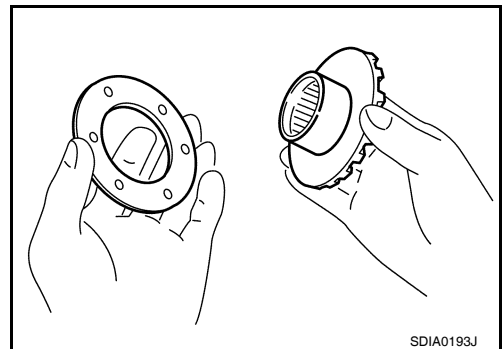
- Do not reuse drive pinion lock nut.
- Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut.
- Adjust the drive pinion lock nut tightening torque to the lower limit first. Do not exceed the drive pinion lock nut specified torque. Refer to [DLN-166, "Disassembly and Assembly"](#).
- If the drive pinion bearing preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque.
- After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.



11. Check companion flange runout.  
12. Install the differential case assembly.

### Differential Assembly

1. Install side gear thrust washers with the same thickness as the ones installed prior to disassembly, or reinstall the old ones on the side gears.

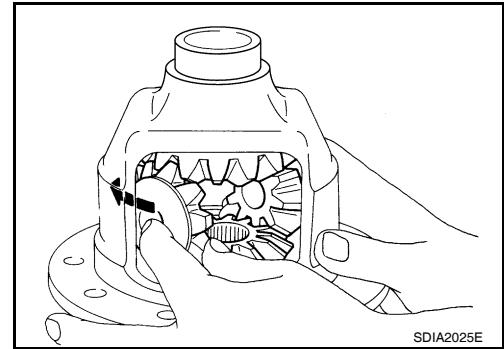


# FRONT FINAL DRIVE

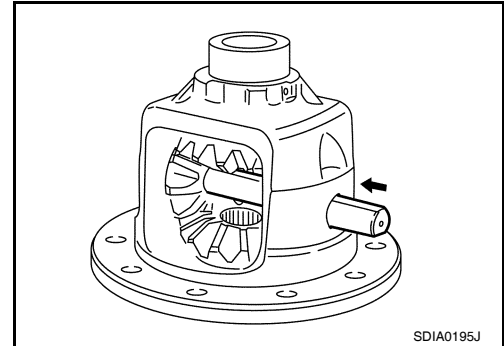
## < DISASSEMBLY AND ASSEMBLY >

## [FRONT FINAL DRIVE: M205]

2. Install the side gears and side gear thrust washers into the differential case.
3. Install the pinion mate thrust washers to the two pinion mate gears. Then install the pinion mate gears with the pinion mate thrust washers by aligning them in diagonally opposite positions and rotating them into the differential case.



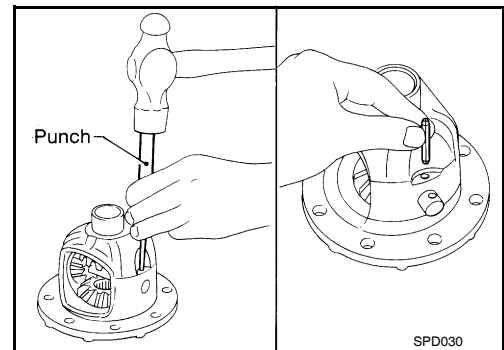
4. Install the pinion mate shaft and align the lock pin hole on the pinion mate shaft with the lock pin hole on the differential case.
5. Measure the side gear end play. If necessary, select the appropriate side gear thrust washers.



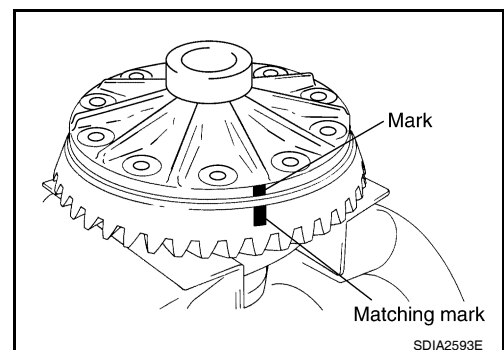
6. Drive a new lock pin into the pinion mate shaft until it is flush with the differential case using suitable tool.

**CAUTION:**

**Do not reuse lock pin.**



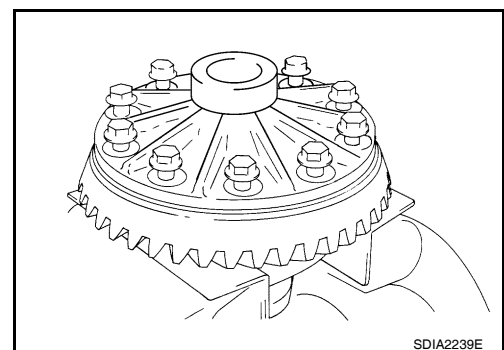
7. Align the matching mark of the differential case with the mark of the drive gear, then place the drive gear onto the differential case.



8. Install and tighten the new drive gear bolts to the specified torque. Refer to [DLN-166, "Disassembly and Assembly"](#).

**CAUTION:**

- Make sure the drive gear back and threaded holes are clean.
- Do not reuse drive gear bolts.
- Tighten new drive gear bolts in a crisscross pattern.



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# FRONT FINAL DRIVE

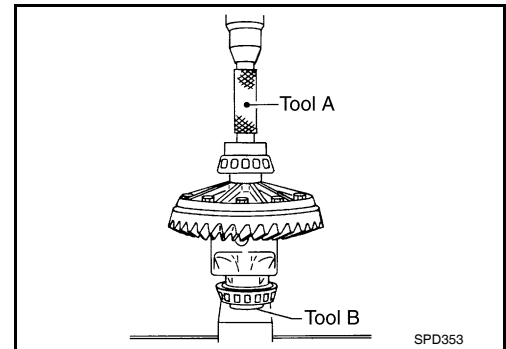
< DISASSEMBLY AND ASSEMBLY >

[FRONT FINAL DRIVE: M205]

9. Press the new side bearing inner races to the differential case using Tools.

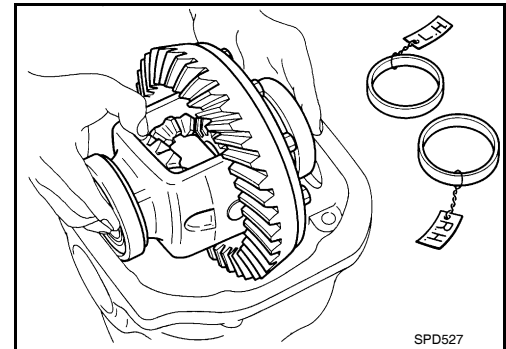
**Tool number**    **A: KV38100300 (J-25523)**  
                         **B: ST33081000 ( — )**

**CAUTION:**  
Do not reuse side bearing inner races.

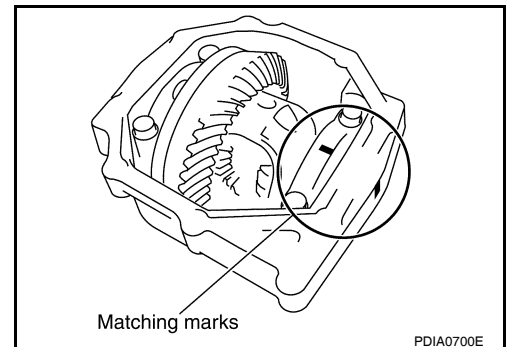


10. Install side bearing adjusters into gear carrier.  
11. Apply differential gear oil to the side bearings, and install the differential case assembly with the side bearing outer races into the gear carrier.

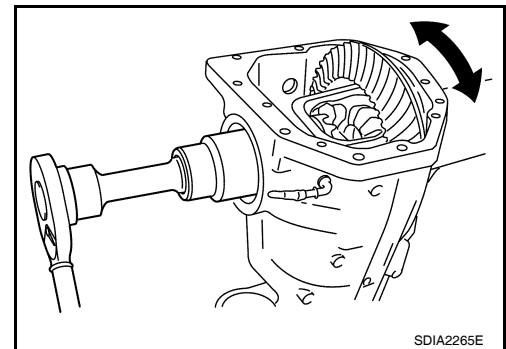
**CAUTION:**  
Do not reuse side bearing outer race when replacing side bearing inner race (replace as a set).



12. Install the side bearing caps with the matching marks aligned.  
**NOTE:**  
Do not tighten at this step. This allows further tightening of side bearing adjusters.



13. Tighten each side bearing adjuster alternately turning drive gear.



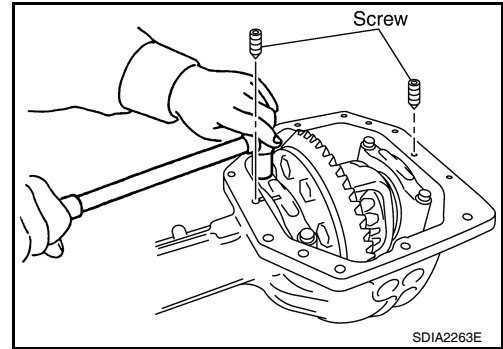
14. Check and adjust tooth contact, backlash, drive gear runout and total preload torque. Recheck above items.

# FRONT FINAL DRIVE

## < DISASSEMBLY AND ASSEMBLY >

## [FRONT FINAL DRIVE: M205]

- After adjusting tooth contact and backlash secure side bearing adjuster with screws and tighten side bearing cap bolt to the specified torque. Refer to [DLN-166, "Disassembly and Assembly"](#).



15. Apply multi-purpose grease to the lips of the new side oil seal. Then drive the new side oil seal in evenly to the gear carrier using suitable tool.

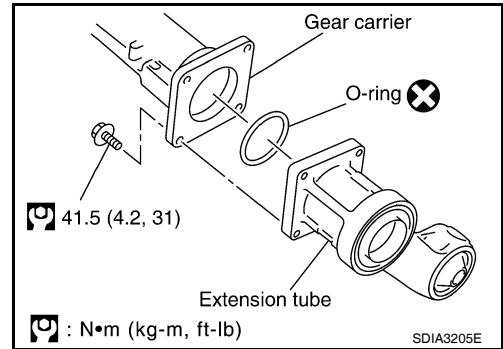
**CAUTION:**

- Do not reuse side oil seal.
- Do not incline the new side oil seal when installing.
- Apply multi-purpose grease to the lips of the new side oil seal.

16. Install the extension tube with a new O-ring.

**CAUTION:**

- Do not reuse O-ring.
- If the extension tube is being replaced, install a new axle shaft bearing.



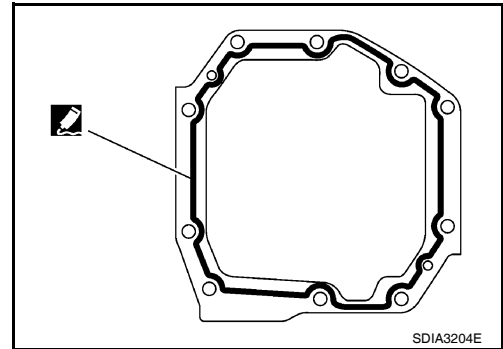
17. Apply 3 mm (0.12 in) bead of sealant to the mating surface of the carrier cover as shown.

- Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

**CAUTION:**

**Remove any old sealant adhering to the mating surfaces. Also remove any moisture, oil, or foreign material adhering to the application and mating surfaces.**

18. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque. Refer to [DLN-163, "Removal and Installation"](#).



19. Install side shaft and side flange.

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# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[FRONT FINAL DRIVE: M205]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### General Specification

INFOID:000000003789575

Applied model	4WD		
	VK56DE		
	A/T		
	LE, SE, XE	Off-Road Package	
Final drive model	M205		
Gear ratio	2.937	3.357*	3.357
Number of teeth (Drive gear/Drive pinion)	47/16	47/14	47/14
Differential gear oil capacity (Approx.)	1.6 ℓ (3 3/8 US pt, 2 7/8 Imp pt)		
Number of pinion gears	2		
Drive pinion adjustment spacer type	Collapsible		

\*\* Option

#### Inspection and Adjustment

INFOID:000000003789576

#### DRIVE GEAR RUNOUT

Unit: mm (in)

Item	Limit
Drive gear back face	0.08 (0.0031) or less

#### SIDE GEAR CLEARANCE

Unit: mm (in)

Item	Standard
Side gear back clearance (Clearance between side gear and differential case for adjusting side gear backlash)	0.20 (0.0079) or less (Each gear should rotate smoothly without excessive resistance during differential motion.)

#### PRELOAD TORQUE

(Gear ratio :2.937 type)

Unit: N·m (kg·m, in·lb)

Item	Standard
Drive pinion bearing preload torque	2.3 - 3.4 (0.24 - 0.34, 21 - 30)
Total preload torque (Total preload torque = drive pinion bearing preload torque + side bearing preload torque).	3.09 - 4.87 (0.32 - 0.49, 28 - 43)

#### PRELOAD TORQUE

(Gear ratio :3.357 type)

Unit: N·m (kg·m, in·lb)

Item	Standard
Drive pinion bearing preload torque	2.3 - 3.4 (0.24 - 0.34, 21 - 30)
Total preload torque (Total preload torque = drive pinion bearing preload torque + side bearing preload torque).	2.98 - 4.76 (0.31 - 0.48, 27 - 42)

#### BACKLASH

# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[FRONT FINAL DRIVE: M205]

Unit: mm (in)

Item	Standard
Drive gear to drive pinion backlash	0.12 - 0.20 (0.0050 - 0.0078)

## COMPANION FLANGE RUNOUT

Unit: mm (in)

Item	Limit
Companion flange face	0.10 (0.0039)
Companion flange inner side	0.13 (0.0051)

## SELECTIVE PARTS

### Drive Pinion Height Adjusting Washer

Unit: mm (in)

Thickness	Package part number*
1.22 (0.048)	38154 8S111
1.24 (0.049)	
1.27 (0.050)	
1.30 (0.051)	
1.32 (0.052)	
1.35 (0.053)	38154 8S112
1.37 (0.054)	
1.40 (0.055)	
1.42 (0.056)	
1.45 (0.057)	
1.47 (0.058)	38154 8S113
1.50 (0.059)	
1.52 (0.060)	
1.55 (0.061)	
1.57 (0.062)	
1.60 (0.063)	38154 8S114
1.63 (0.064)	
1.65 (0.065)	
1.68 (0.066)	
1.70 (0.067)	
1.73 (0.068)	38154 8S115
1.75 (0.069)	
1.78 (0.070)	
1.80 (0.071)	
1.83 (0.072)	

\*Always check with the Parts Department for the latest parts information.

### Side Gear Thrust Washer

Unit: mm (in)

Thickness	Package part number*
0.76 (0.030)	38424 8S111
0.79 (0.031)	
0.81 (0.032)	
0.84 (0.033)	
0.87 (0.034)	
0.89 (0.035)	38424 8S112
0.91 (0.036)	
0.94 (0.037)	
0.97 (0.038)	
0.99 (0.039)	

\*: Always check with the Parts Department for the latest parts information.

## PRECAUTION

### PRECAUTIONS

#### Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000004929078

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 SR 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 SR 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.

#### PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

**WARNING:**

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

#### Precaution for Servicing Rear Final Drive

INFOID:000000004929079

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.



# PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: M226 ]

## PREPARATION

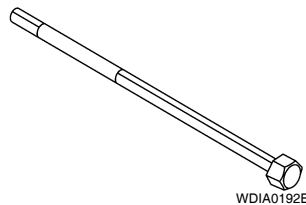
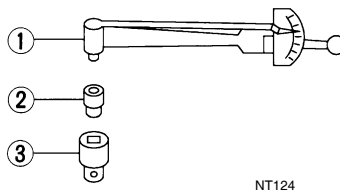
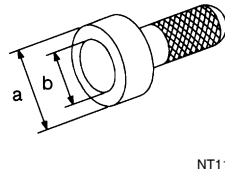
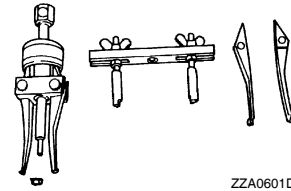
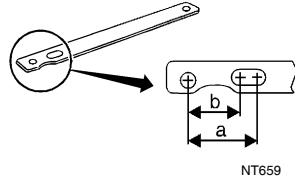
### PREPARATION

#### Special Service Tool

INFOID:000000004929080

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV40104000 ( — ) Flange wrench	Removing and installing drive pinion lock nut <b>a: 85 mm (3.35 in) dia.</b> <b>b: 65 mm (2.56 in) dia.</b>
ST33290001 (J-34286) Puller	Removing front oil seal
ST15310000 ( — ) Drift	Installing front oil seal <b>a: 96mm (3.77 in) dia.</b> <b>b: 84 mm (3.30 in) dia.</b>
ST3127S000 (J-25765-A) Preload gauge set <ol style="list-style-type: none"> <li>1. GG91030000 (J-25765) Torque wrench</li> <li>2. HT62940000 (1/2") ( — ) Socket adapter</li> <li>3. HT62900000 (3/8") ( — ) Socket adapter</li> </ol>	Inspecting drive pinion bearing preload torque and total preload torque
— (C-4164) Adjuster tool	Removing and installing side bearing adjuster

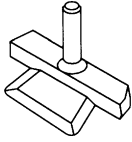
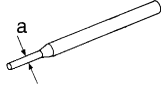


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# PREPARATION

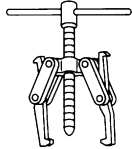
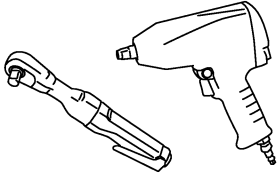
< PREPARATION >

[REAR FINAL DRIVE: M226 ]

Tool number (Kent-Moore No.) Tool name	Description
KV10111100 (J-37228) Seal cutter	Removing carrier cover
 <p style="margin-top: 5px;">S-NT046</p>	
ST23550000 ( — ) Pin punch	Removing and installing lock pin <b>a: 4.5 mm (0.177 in) dia.</b>
 <p style="margin-top: 5px;">NT410</p>	

## Commercial Service Tool

INFOID:000000004929081

Tool name	Description
Puller	Removing companion flange
 <p style="margin-top: 5px;">NT077</p>	
Power tool	Loosening bolts and nuts
 <p style="margin-top: 5px;">PBIC0190E</p>	

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< FUNCTION DIAGNOSIS >

[REAR FINAL DRIVE: M226 ]

## FUNCTION DIAGNOSIS

### NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

#### NVH Troubleshooting Chart

INFOID:000000004929082

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page	Possible cause and SUSPECTED PARTS	DLN-194. "Disassembly and Assembly"	DLN-194. "Disassembly and Assembly"	DLN-194. "Disassembly and Assembly"	DLN-194. "Disassembly and Assembly"	DLN-194. "Disassembly and Assembly"	MA-10. "Fluids and Lubricants"	DLN-134. "NVH Troubleshooting Chart"	RAX-4. "NVH Troubleshooting Chart"	RSU-4. "NVH Troubleshooting Chart"	WT-42. "NVH Troubleshooting Chart"	WT-42. "NVH Troubleshooting Chart"	RAX-4. "NVH Troubleshooting Chart"	BR-5. "NVH Troubleshooting Chart"	ST-5. "NVH Troubleshooting Chart"
	Gear tooth rough														
	Gear contact improper														
	Tooth surfaces worn														
	Backlash incorrect														
	Companion flange excessive runout														
	Gear oil improper														
	PROPELLER SHAFT														
	REAR AXLE														
	REAR SUSPENSION														
	TIRES														
	ROAD WHEEL														
	AXLE SHAFT														
	BRAKES														
	STEERING														
Symptom	Noise	x	x	x	x	x	x	x	x	x	x	x	x	x	x

x: Applicable

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# DESCRIPTION

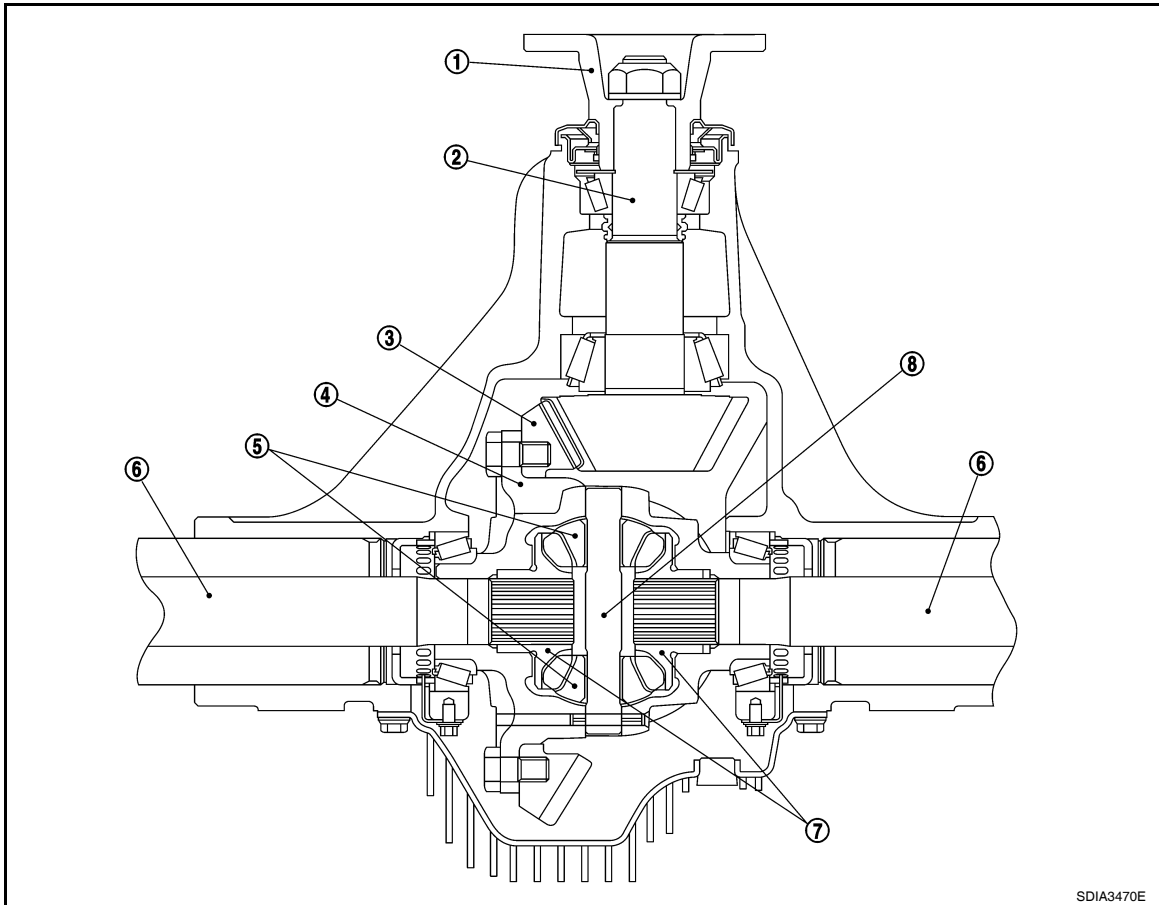
< FUNCTION DIAGNOSIS >

[REAR FINAL DRIVE: M226 ]

## DESCRIPTION

### Cross-Sectional View

INFOID:000000004929083



SDIA3470E

- |                      |                      |               |
|----------------------|----------------------|---------------|
| 1. Companion flange  | 2. Drive pinion      | 3. Drive gear |
| 4. Differential case | 5. Pinion mate gear  | 6. Axle shaft |
| 7. Side gear         | 8. Pinion mate shaft |               |

## ON-VEHICLE MAINTENANCE

### DIFFERENTIAL GEAR OIL

#### Checking Differential Gear Oil

INFOID:000000004929084

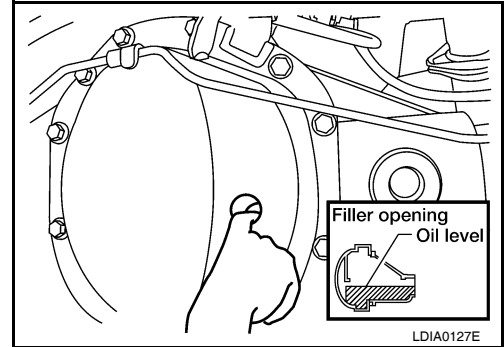
#### DIFFERENTIAL GEAR OIL LEAKAGE AND LEVEL

1. Make sure that differential gear oil is not leaking from the rear final drive assembly or around it.
2. Check the differential gear oil level from the filler plug hole as shown.

**CAUTION:**

**Do not start engine while checking differential gear oil level.**

3. Install the filler plug with sealant applied on the threads to the rear final drive assembly. Tighten to the specified torque. Refer to [DLN-194, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

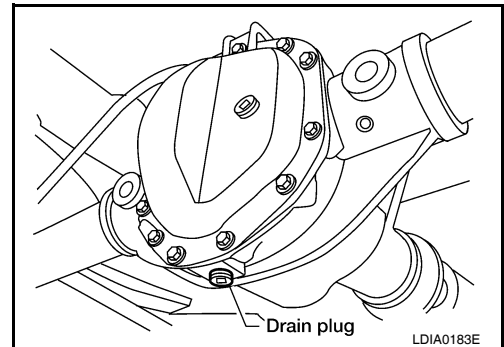


#### Changing Differential Gear Oil

INFOID:000000004929085

#### DRAINING

1. Stop engine.
2. Remove the drain plug from the rear final drive assembly to drain the differential gear oil.
3. Install the drain plug with sealant applied on the threads to the rear final drive assembly. Tighten to the specified torque. Refer to [DLN-194, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

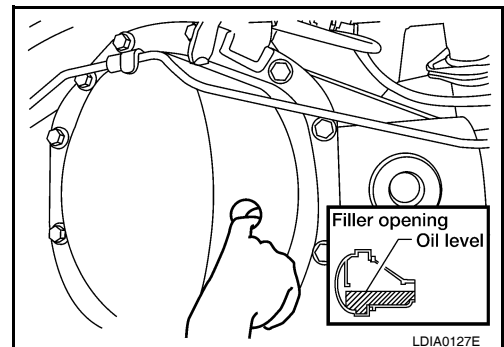


#### FILLING

1. Remove the filler plug from the rear final drive assembly.
2. Fill the rear final drive assembly with new differential gear oil until the level reaches the specified level near the filler plug hole.

**Differential gear oil grade and capacity** : Refer to [MA-10, "Fluids and Lubricants"](#).

3. Install the filler plug with sealant applied on the threads to the rear final drive assembly. Tighten to the specified torque. Refer to [DLN-194, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).



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## ON-VEHICLE REPAIR

### FRONT OIL SEAL

#### Removal and Installation

INFOID:000000004929086

#### REMOVAL

1. Remove rear propeller shaft. Refer to [DLN-136. "Removal and Installation"](#) (2S1410), [DLN-145. "Removal and Installation"](#) (3S1410).
2. Remove brake calipers and rotors. Refer to [BR-40. "Removal and Installation of Brake Caliper and Disc Rotor"](#).
3. Measure the total preload torque. Refer to [DLN-194. "Disassembly and Assembly"](#).

**NOTE:**

Record the total preload torque measurement.

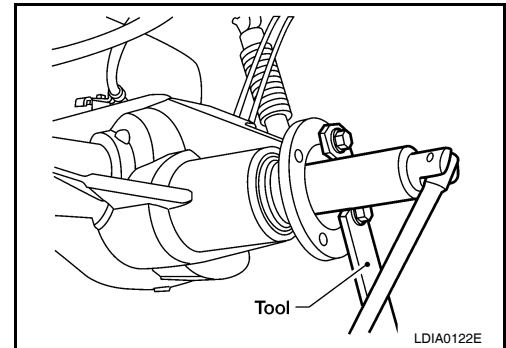
4. Remove the drive pinion nut using Tool.

Tool number : KV40104000 ( — )

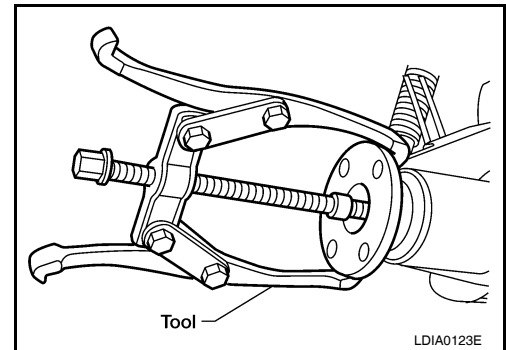
5. Put matching marks on the companion flange and drive pinion using paint.

**CAUTION:**

**Use paint to make the matching marks. Do not damage the companion flange or drive pinion.**

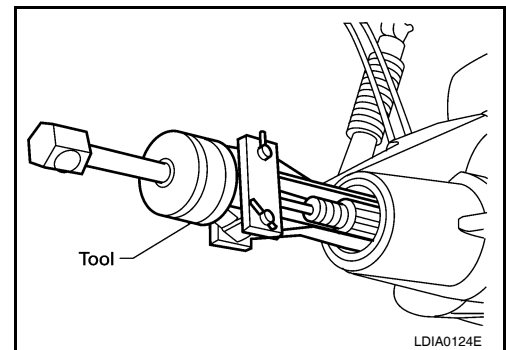


6. Remove the companion flange using suitable tool.



7. Remove oil seal/dust shield and discard.
8. Remove the front oil seal using Tool.

Tool number : ST33290001 (J-34286)



#### INSTALLATION



## CARRIER COVER

## Removal and Installation

INFOID:000000004929087

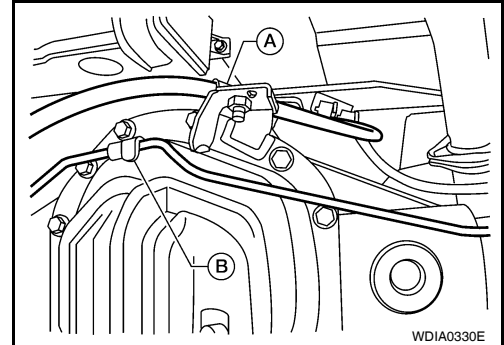
## REMOVAL

1. Drain the differential gear oil. Refer to [DLN-189, "Changing Differential Gear Oil"](#).
2. Disconnect the parking brake cable (A) and brake tube (B) from the carrier cover.
3. Remove the carrier cover bolts and separate the carrier cover from the gear carrier using Tool.

**Tool number** : KV10111100 (J-37228)

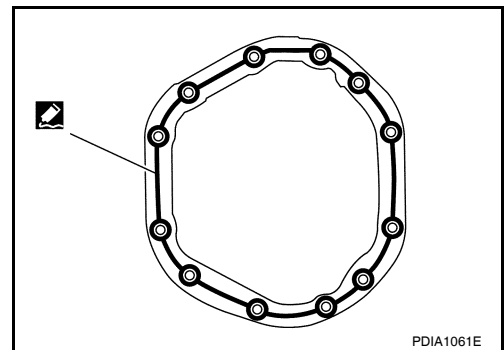
**CAUTION:**

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



## INSTALLATION

1. Apply a bead of sealant to the mating surface of the carrier cover as shown.
    - Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).
- CAUTION:**  
Remove any old sealant adhering to the mating surfaces. Also remove any moisture, oil, or foreign material adhering to the application and mating surfaces.
2. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque. Refer to [DLN-194, "Disassembly and Assembly"](#).
  3. Connect the parking brake cable and brake tube to the carrier cover.
  4. Fill the rear final drive assembly with recommended differential gear oil. Refer to [DLN-189, "Changing Differential Gear Oil"](#).





## REMOVAL AND INSTALLATION

### REAR FINAL DRIVE

#### Removal and Installation

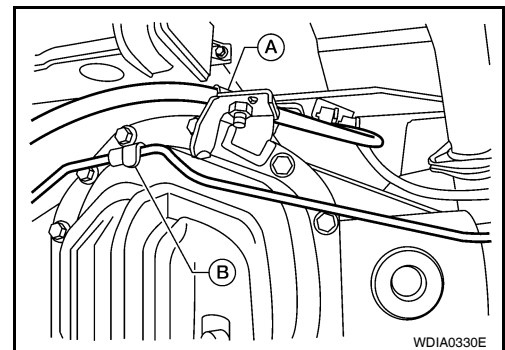
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#### REMOVAL

##### CAUTION:

- Do not damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from final drive/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.

1. Drain the differential gear oil. Refer to [DLN-189, "Changing Differential Gear Oil"](#).
2. Remove the rear propeller shaft. Refer to [DLN-136, "Removal and Installation"](#) (2S1410), [DLN-145, "Removal and Installation"](#) (3S1410).
3. Remove the axle shaft. Refer to [RAX-8, "Removal and Installation"](#).
4. Disconnect the following components from the rear final drive assembly.
  - Brake tube block connectors. Refer to [BR-24, "Removal and Installation of Rear Brake Piping and Brake Hose"](#).
  - ABS sensor wire harness. Refer to [BRC-141, "Removal and Installation"](#) (without VDC), [BRC-252, "Removal and Installation"](#) (with VDC).
  - Parking brake cable (A).
  - Brake tube (B).



5. Disconnect brake hose from brake tube at the mounting clip on top of rear final drive assembly. Then remove the metal clip to disconnect brake line from the mounting clip on top of the rear final drive assembly.
6. Support rear final drive assembly using a suitable jack.
7. Remove rear shock absorber lower bolts. Refer to [RSU-10, "Removal and Installation"](#).
8. Remove leaf spring U-bolt nuts. Refer to [RSU-8, "Removal and Installation"](#).
9. Remove rear final drive assembly.

##### CAUTION:

Secure rear final drive assembly to the jack while removing it.

#### INSTALLATION

Installation is in the reverse order of removal.

##### CAUTION:

- Fill the rear final drive assembly with differential gear oil after installation. Refer to [DLN-189, "Changing Differential Gear Oil"](#).
- Bleed the air from brake system. Refer to [BR-17, "Bleeding Brake System"](#).

# REAR FINAL DRIVE ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 ]

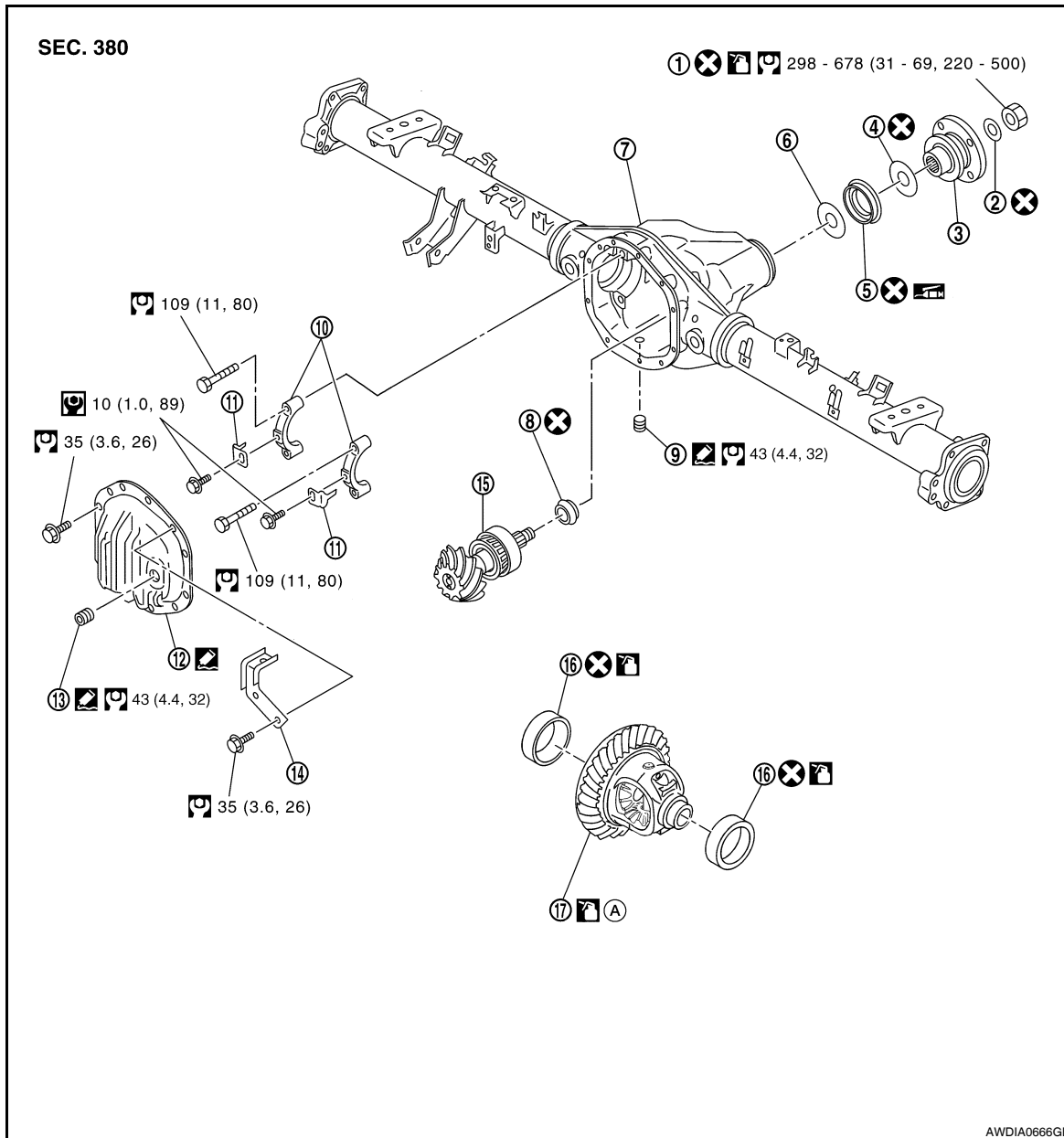
## DISASSEMBLY AND ASSEMBLY

### REAR FINAL DRIVE ASSEMBLY

#### Disassembly and Assembly

INFOID:000000004929089

#### COMPONENTS



- |  |  |   |
|--|--|---|
| 1. Drive pinion lock nut               | 2. Drive pinion lock nut washer                  | 3. Companion flange   |
| 4. Oil seal/dust shield                | 5. Front oil seal                                | 6. Drive pinion front bearing thrust washer (non-serviceable) |
| 7. Gear carrier (non-serviceable)      | 8. Collapsible spacer                            | 9. Drain plug (non-serviceable)                               |
| 10. Side bearing cap (non-serviceable) | 11. Adjuster lock plate (non-serviceable)        | 12. Carrier cover   |
| 13. Filler plug                        | 14. Bracket                                      | 15. Drive pinion assembly (non-serviceable)                   |
| 16. Side bearing outer race            | 17. Differential case assembly (non-serviceable) | A. Gear oil   |

#### ASSEMBLY INSPECTION AND ADJUSTMENT

# REAR FINAL DRIVE ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 ]

- Drain the differential gear oil before inspection and adjustment. Refer to [DLN-189. "Changing Differential Gear Oil"](#).
- Remove and install the carrier cover as necessary for inspection and adjustment. Refer to [DLN-192. "Removal and Installation"](#).

## Total Preload Torque

1. Rotate the drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
2. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.
3. Measure total preload torque using Tool. Refer to [DLN-203. "General Specification"](#).
  - If the measured value is out of the specification, check and adjust each part. Adjust the drive pinion bearing preload torque first, then adjust the side bearing preload torque.

**Tool number : ST3127S000 (J-25765-A)**

### NOTE:

**Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque**

**If the total preload torque is greater than specification**

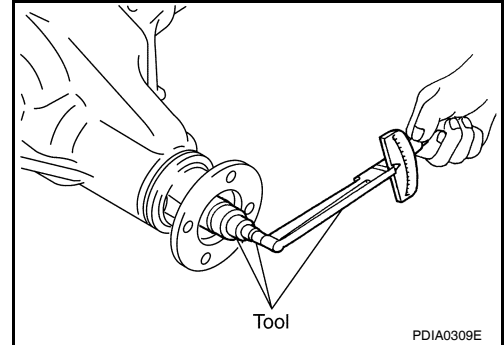
**On drive pinion bearings : Replace collapsible spacer.**

**On side bearings : Loosen side bearing adjuster.**

**If the total preload torque is less than specification**

**On drive pinion bearings : Tighten drive pinion lock nut.**

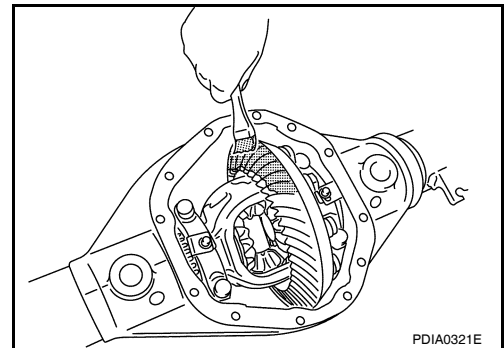
**On side bearings : Tighten side bearing adjuster.**



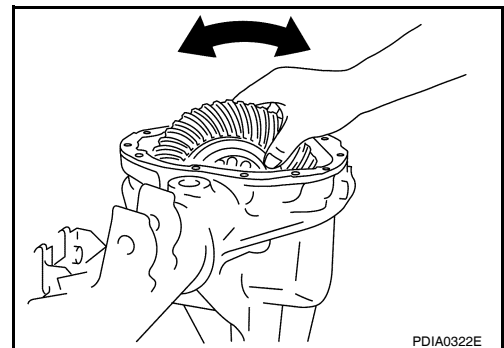
## Tooth Contact

Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion. Gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

1. Thoroughly clean drive gear and drive pinion teeth.
2. Apply red lead to the drive gear.
  - Apply red lead to both faces of three to four gears, at four locations evenly spaced on the drive gear.



3. Hold companion flange steady by hand and rotate drive gear in both directions.



# REAR FINAL DRIVE ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 ]

Usually the pattern will be correct if washers are correctly calculated and the backlash is correct. However, in rare cases, trial and error processes may be employed to obtain a correct pattern. The tooth pattern is the best indication of how well a differential has been set up.

Heel contact    Face contact    Toe contact    Flank contact

To correct, increase thickness of drive pinion height adjusting washer in order to bring drive pinion close to drive gear.

To correct, reduce thickness of drive pinion height adjusting washer in order to make drive pinion go away from drive gear.

Correct tooth contact

When adjustment is completed, be sure to wipe off completely the red lead and oil or their equivalent.

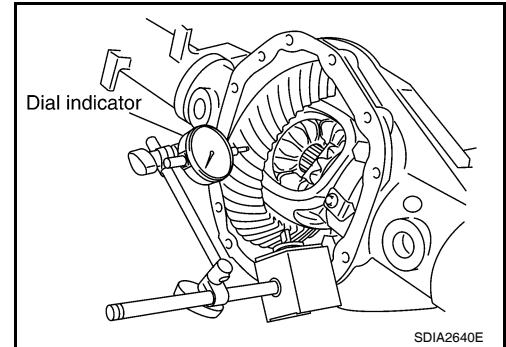
SDIA2591E

4. If outside the standard, replace the final drive assembly. Refer to [DLN-193. "Removal and Installation"](#).

## Backlash

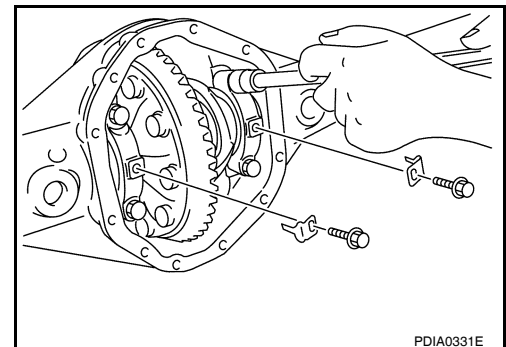
1. Fit a dial indicator to the drive gear face to measure the backlash.

**Backlash : 0.12 - 0.20 mm (0.0050 - 0.0078 in)**



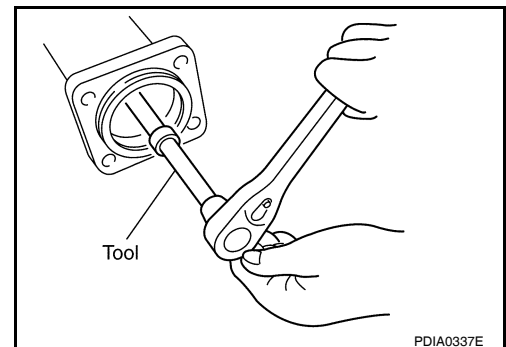
2. If the backlash is outside of the specification, adjust each side bearing side bearing adjuster.

- a. Remove adjuster lock plates.  
b. Loosen side bearing cap bolts.



- c. Tighten or loosen each side bearing adjuster using Tool.

**Tool number : — (C - 4164)**



# REAR FINAL DRIVE ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 ]

If the backlash is greater than specification:

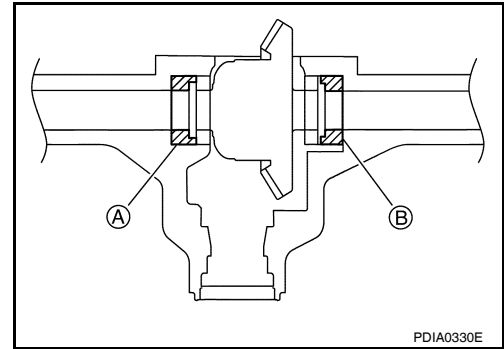
Loosen side bearing adjuster A and tighten side bearing adjuster B by the same amount.

If the backlash is less than specification:

Loosen side bearing adjuster B and tighten side bearing adjuster A by the same amount.

**CAUTION:**

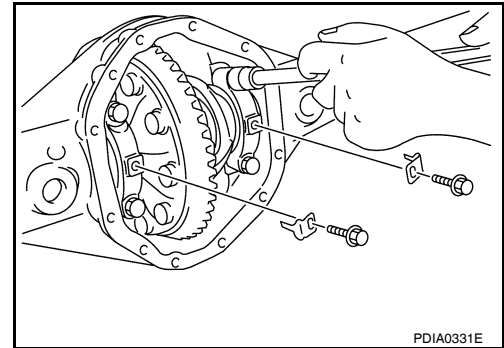
Do not change the side bearing side bearing adjusters by different amounts as it will change the side bearing preload torque.



- d. Tighten side bearing cap bolts to the specified torque.
- e. Install adjuster lock plate and tighten to the specified torque.

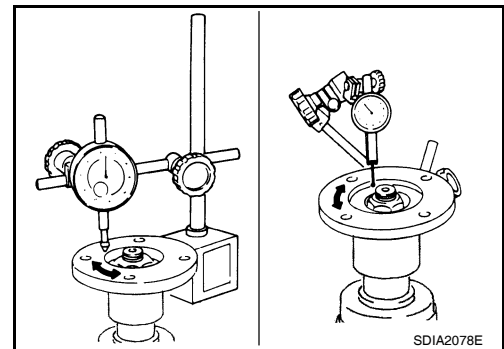
**CAUTION:**

Check tooth contact and total preload torque after adjusting side bearing adjuster. Refer to [DLN-203, "Inspection and Adjustment"](#).



## Companion Flange Runout

1. Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool. Refer to [DLN-203, "General Specification"](#).
2. If the runout is outside the runout limit, follow the procedure below to adjust.
  - a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
  - b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
  - c. If the runout is still outside of the runout limit after replacing the companion flange. Replace the rear final drive assembly. Refer to [DLN-193, "Removal and Installation"](#).



## DISASSEMBLY

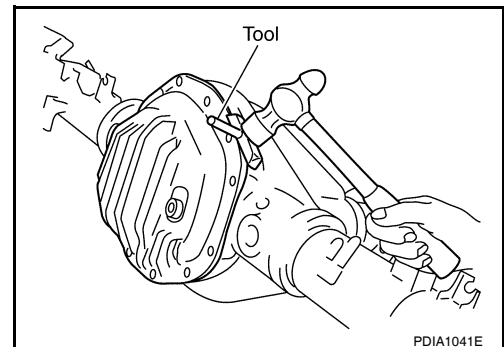
### Differential Assembly

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.



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# REAR FINAL DRIVE ASSEMBLY

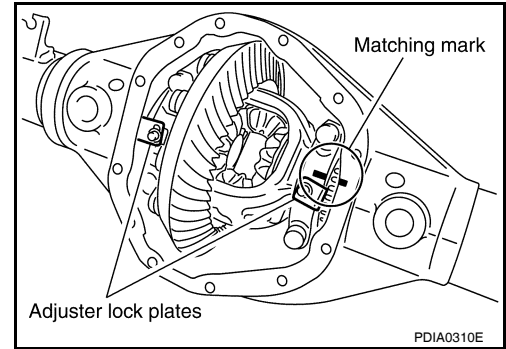
< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 ]

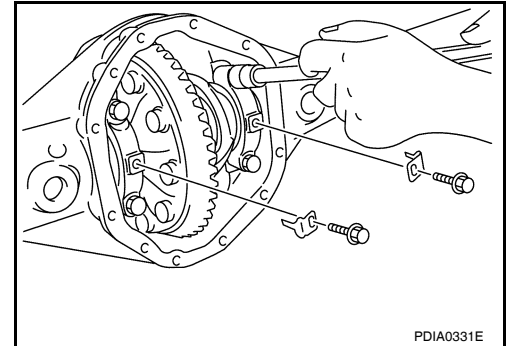
3. For proper reinstallation, paint matching mark on one side of side bearing cap.

**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.

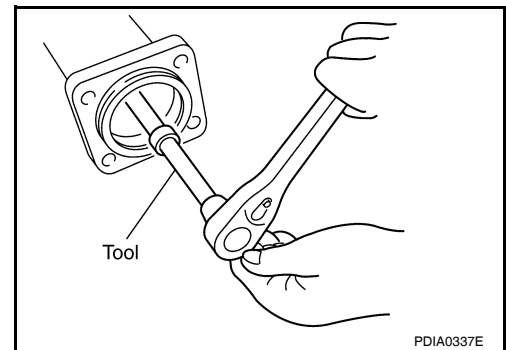


4. Remove adjuster lock plates.  
5. Remove side bearing caps.

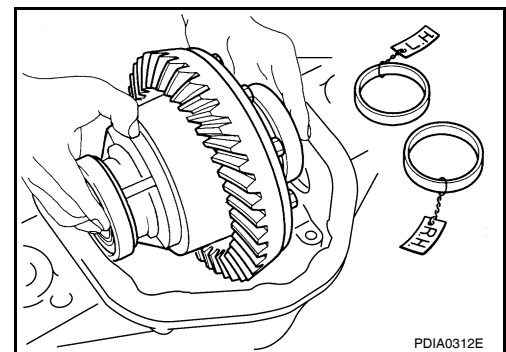


6. Loosen side bearing adjusters using Tool.

**Tool number** : — (C - 4164)



7. Remove the differential case assembly. Label side bearing outer races to keep them together with inner races. Do not mix them up.

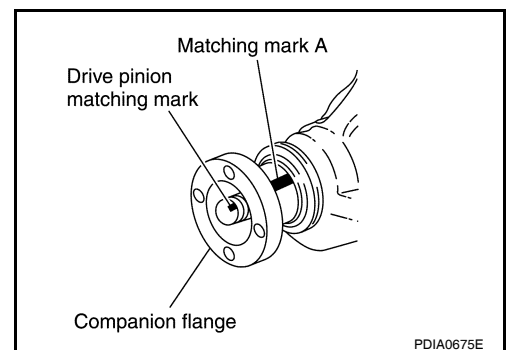


## Drive Pinion Assembly

1. Put matching marks on the companion flange at location (A) and drive pinion using paint as shown.

**CAUTION:**

Use paint to make the matching marks. Do not damage the companion flange or drive pinion.



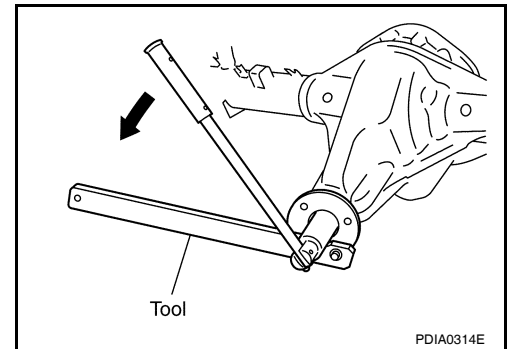
# REAR FINAL DRIVE ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

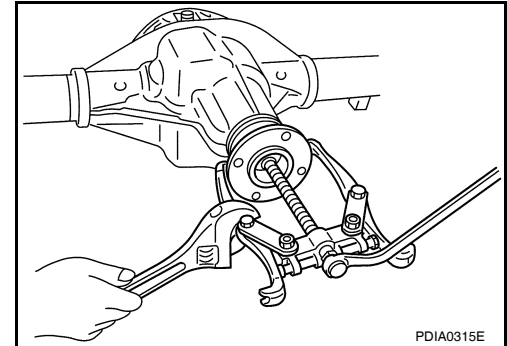
[REAR FINAL DRIVE: M226 ]

2. Remove drive pinion lock nut and washer using Tool.

**Tool number** : KV40104000 ( — )



3. Remove companion flange using a suitable tool.



4. Remove oil seal/dust shield and discard.

**CAUTION:**

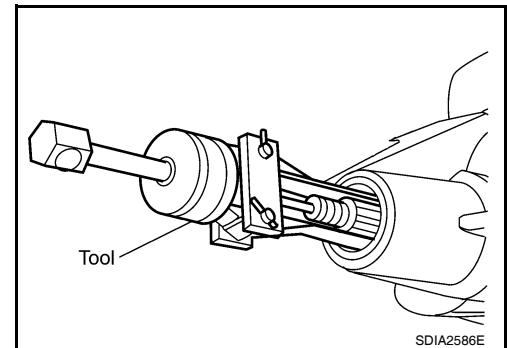
**Do not reuse the differential oil seal.**

5. Remove front oil seal using Tool.

**Tool number** : ST33290001 (J-34286)

**CAUTION:**

**Do not damage gear carrier.**

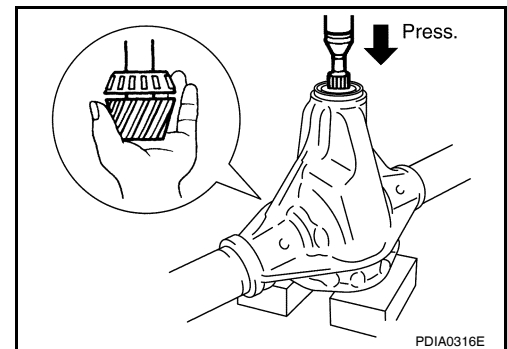


6. Remove drive pinion front bearing thrust washer.

7. Remove drive pinion assembly (with rear inner bearing race and collapsible spacer) out of gear carrier.

**CAUTION:**

**Do not drop drive pinion assembly.**



8. Remove collapsible spacer from drive pinion assembly and discard collapsible spacer.

**CAUTION:**

**Do not reuse the collapsible spacer.**

## INSPECTION AFTER DISASSEMBLY

Clean the disassembled parts. Then inspect the parts for wear or damage. If wear or damage are found, follow the measures below.

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# REAR FINAL DRIVE ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 ]

## Drive Pinion and Drive Gear

- If the gear teeth do not mesh or line-up correctly, replace with new rear final drive assembly. Refer to [DLN-193, "Removal and Installation"](#).
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new rear final drive assembly. Refer to [DLN-193, "Removal and Installation"](#).

## Bearings

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from the bearing, replace with new rear final drive assembly. Refer to [DLN-193, "Removal and Installation"](#).

## Differential Case Assembly

- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new rear final drive assembly. Refer to [DLN-193, "Removal and Installation"](#).
- If the movement is not smooth when pushing cam ring of differential case assembly by hand. Replace with new rear final drive assembly. Refer to [DLN-193, "Removal and Installation"](#).

## Companion Flange

- If any chips (about 0.1mm, 0.004 in) or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one. Refer to [DLN-190, "Removal and Installation"](#).

## ASSEMBLY

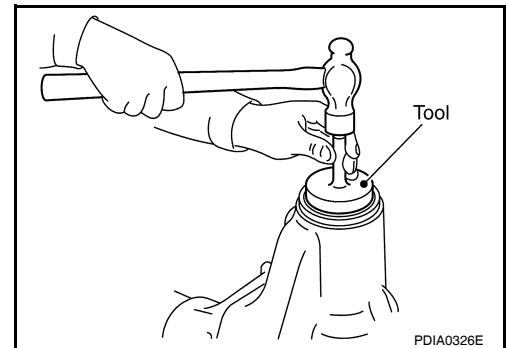
### Drive Pinion Assembly

1. Install drive pinion front bearing thrust washer.
2. Apply multi-purpose grease to new front oil seal lip. Install front oil seal into gear carrier using Tool.

**Tool number** : ST15310000 ( — )

#### **CAUTION:**

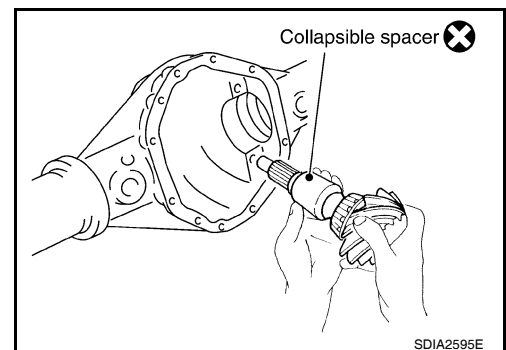
- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.



3. Install new collapsible spacer to drive pinion. And then install drive pinion assembly into gear carrier.

#### **CAUTION:**

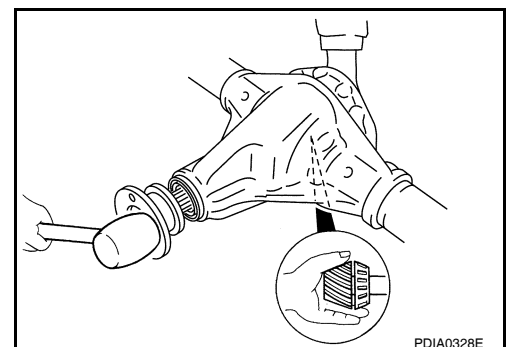
- Do not reuse collapsible spacer.
- Do not damage front oil seal.



4. Install a new oil seal/dust shield.
5. Install the companion flange onto the drive pinion while aligning the matching marks. Then tap the companion flange using suitable tool.

#### **CAUTION:**

**Do not damage companion flange or front oil seal.**





## REAR FINAL DRIVE ASSEMBLY

< DISASSEMBLY AND ASSEMBLY >

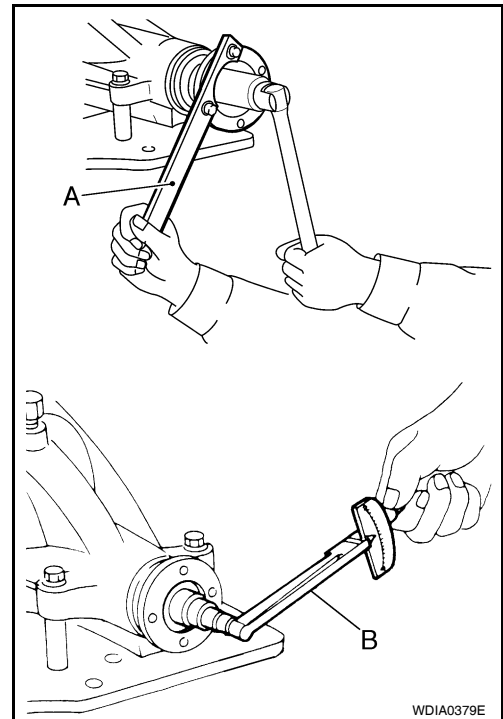
[REAR FINAL DRIVE: M226 ]

6. Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut and new drive pinion lock nut washer. Then adjust the drive pinion lock nut tightening torque using Tool A, and check the drive pinion bearing preload torque using Tool B. Refer to [DLN-203, "General Specification"](#).

Tool number    **A: KV40104000 ( — )**  
                      **B: ST3127S000 (J-25765-A)**

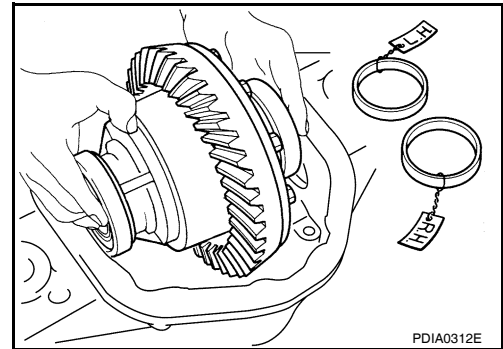
### CAUTION:

- Do not reuse drive pinion lock nut or drive pinion lock nut washer.
- Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut.
- Adjust the drive pinion lock nut tightening torque to the lower limit first. Do not exceed the drive pinion lock nut specified torque.
- If the drive pinion bearing preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque.
- After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.



### Differential Assembly

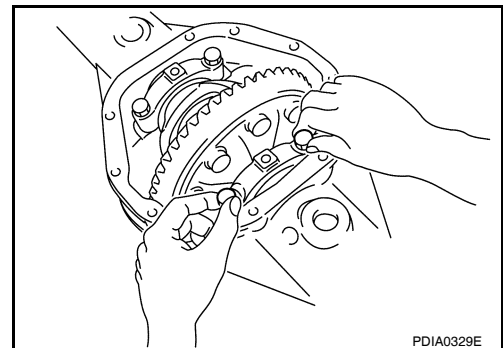
1. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into gear carrier.



2. Align paint matching mark on side bearing caps with that on gear carrier and install side bearing caps on gear carrier.

### CAUTION:

Do not tighten side bearing cap bolts at this point. This allows further tightening of side bearing adjusters.



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## REAR FINAL DRIVE ASSEMBLY

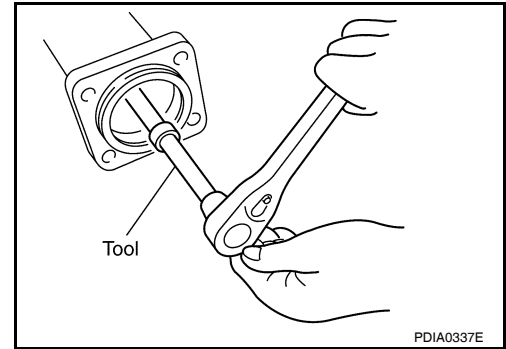
< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 ]

3. Tighten each side bearing adjusters using Tool.

**Tool number** : — (C - 4164)

- Adjusting backlash of drive gear and drive pinion. Refer to [DLN-203, "Inspection and Adjustment"](#).
- Check total preload. Refer to [DLN-203, "Inspection and Adjustment"](#).
- Check tooth contact. Refer to [DLN-203, "Inspection and Adjustment"](#).



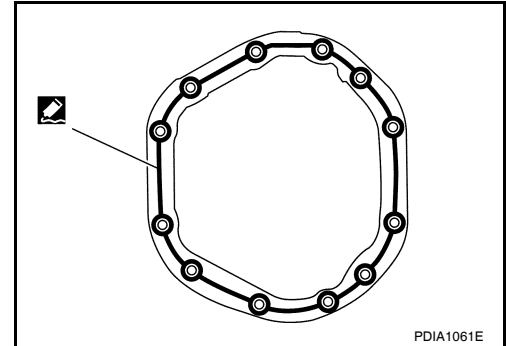
4. Apply a bead of sealant to the mating surface of the carrier cover as shown.

- Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

**CAUTION:**

**Remove any old sealant adhering to the mating surfaces. Also remove any moisture, oil, or foreign material adhering to the application and mating surfaces.**

5. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque.



# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: M226 ]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### General Specification

INFOID:000000004929090

Applied model	2WD, 4WD	
	VK56DE	
	A/T	
Vehicle grade	LE, SE, XE	Tow package
Final drive model	M226	
Gear ratio	2.937	3.357
Number of pinion gears	2	
Number of teeth (Drive gear / drive pinion)	47/16	47/14
Oil capacity (Approx.)	2.01 ℓ (4-1/4 US pt, 3-1/2 Imp pt)	
Drive pinion adjustment spacer type	Collapsible	

#### Inspection and Adjustment

INFOID:000000004929091

#### DIFFERENTIAL SIDE GEAR CLEARANCE

Unit: mm (in)

Item	Standard
Side gear back clearance (Clearance between side gear and differential case for adjusting side gear backlash)	0.305 (0.0120) or less. (Each gear should rotate smoothly without excessive resistance during differential motion.)

#### PRELOAD TORQUE

(Gear ratio 2.937 type)

Unit: N·m (kg·m, in·lb)

Item	Standard
Drive pinion bearing preload torque	1.7 - 3.1 (0.18 - 0.31, 15 - 27)
Total preload (Total preload torque = drive pinion bearing preload torque + Side bearing preload torque)	2.49 - 4.57 (0.26 - 0.46, 22 - 40)

#### PRELOAD TORQUE

(Gear ratio 3.357 type)

Unit: N·m (kg·m, in·lb)

Item	Standard
Drive pinion bearing preload torque	1.7 - 3.1 (0.18 - 0.31, 15 - 27)
Total preload (Total preload torque = drive pinion bearing preload torque + Side bearing preload torque)	2.38 - 4.46 (0.25 - 0.45, 21 - 39)

#### BACKLASH

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.12 - 0.20 (0.0050 - 0.0078)

#### COMPANION FLANGE RUNOUT

Unit: mm (in)

# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: M226 ]

Item	Limit
Companion flange face	0.13 (0.0051)
Companion flange inner side	

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[REAR FINAL DRIVE: M226 (ELD) ]

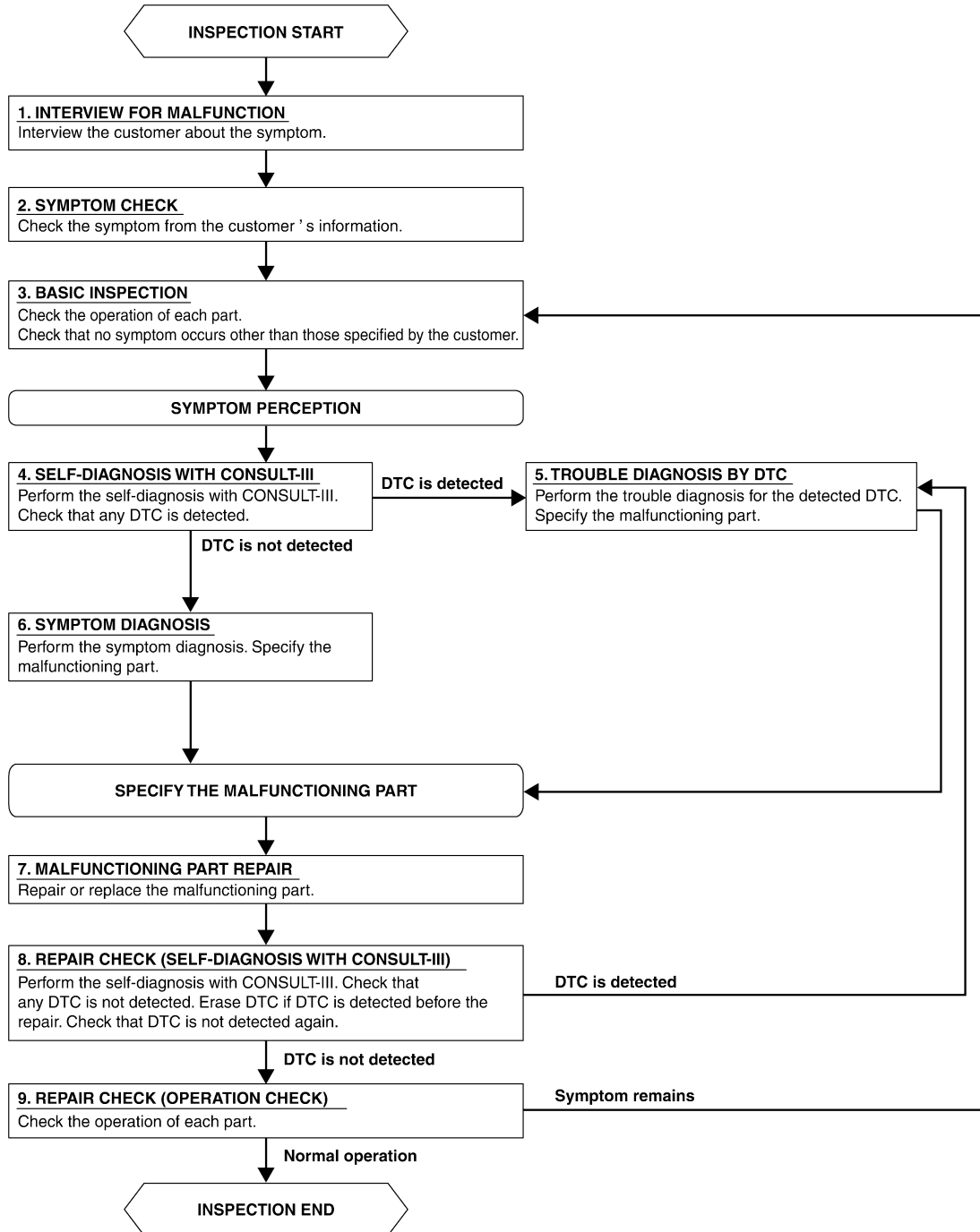
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000004929092

OVERALL SEQUENCE



DETAILED FLOW

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# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[REAR FINAL DRIVE: M226 (ELD) ]

---

## 1. INTERVIEW FOR MALFUNCTION

---

Interview the customer about the symptom.

>> GO TO 2

---

## 2. SYMPTOM CHECK

---

Verify the symptom from the customer's information.

>> GO TO 3

---

## 3. BASIC INSPECTION

---

Check the operation of each part. Check that no symptoms occur other than those specified by the customer.

>> GO TO 4

---

## 4. SELF-DIAGNOSIS WITH CONSULT-III

---

Perform the self diagnosis with CONSULT-III. Check that any DTC is detected.

Is any DTC detected?

YES >> GO TO 5

NO >> GO TO 6

---

## 5. TROUBLE DIAGNOSIS BY DTC

---

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 7

---

## 6. SYMPTOM DIAGNOSIS

---

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 7

---

## 7. MALFUNCTIONING PART REPAIR

---

Repair or replace the malfunctioning part.

>> GO TO 8

---

## 8. REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT-III)

---

Perform the self diagnosis with CONSULT-III. Verified that no DTCs are detected. Erase all DTCs detected prior to the repair. Verify that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5

NO >> GO TO 9

---

## 9. REPAIR CHECK (OPERATION CHECK)

---

Check the operation of each part.

Does it operate normally?

YES >> Inspection End.

NO >> GO TO 3

# DIFFERENTIAL LOCK SYSTEM

< FUNCTION DIAGNOSIS >

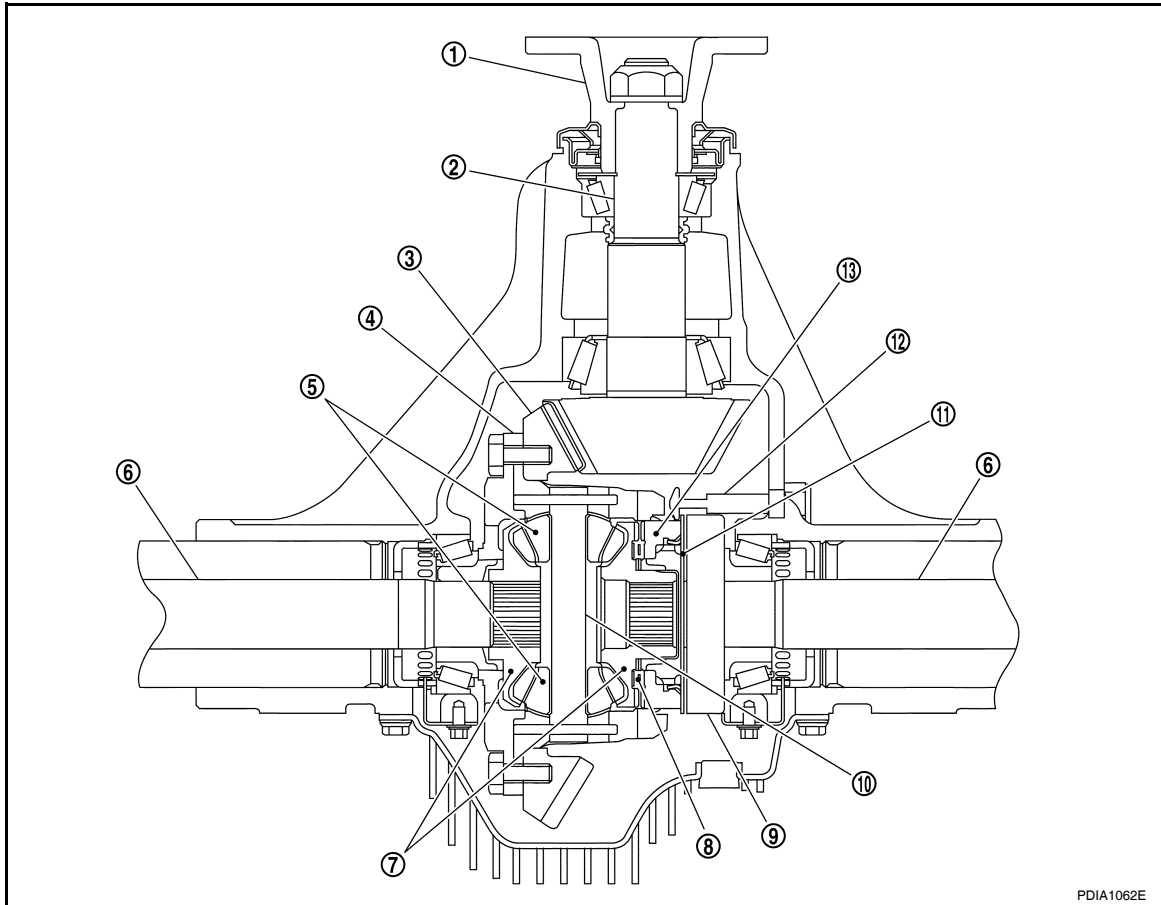
[REAR FINAL DRIVE: M226 (ELD) ]

## FUNCTION DIAGNOSIS

### DIFFERENTIAL LOCK SYSTEM

#### Cross-Sectional View

INFOID:000000004929093



- |                       |                     |                                       |
|-----------------------|---------------------|---------------------------------------|
| 1. Companion flange   | 2. Drive pinion     | 3. Drive gear                         |
| 4. Differential case  | 5. Pinion mate gear | 6. Axle shaft                         |
| 7. Side gear          | 8. Spring           | 9. Differential lock solenoid         |
| 10. Pinion mate shaft | 11. Pressure plate  | 12. Differential lock position switch |
| 13. Cam ring          |                     |                                       |

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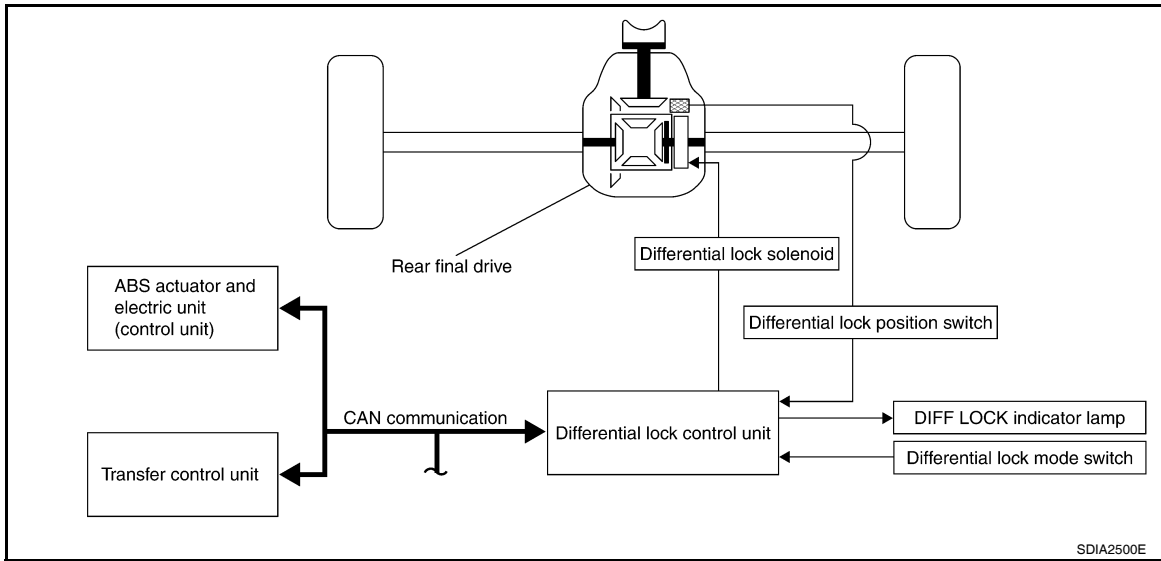
# DIFFERENTIAL LOCK SYSTEM

< FUNCTION DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## System Diagram

INFOID:000000004929094



## System Description

INFOID:000000004929095

The differential lock system consists of the following components

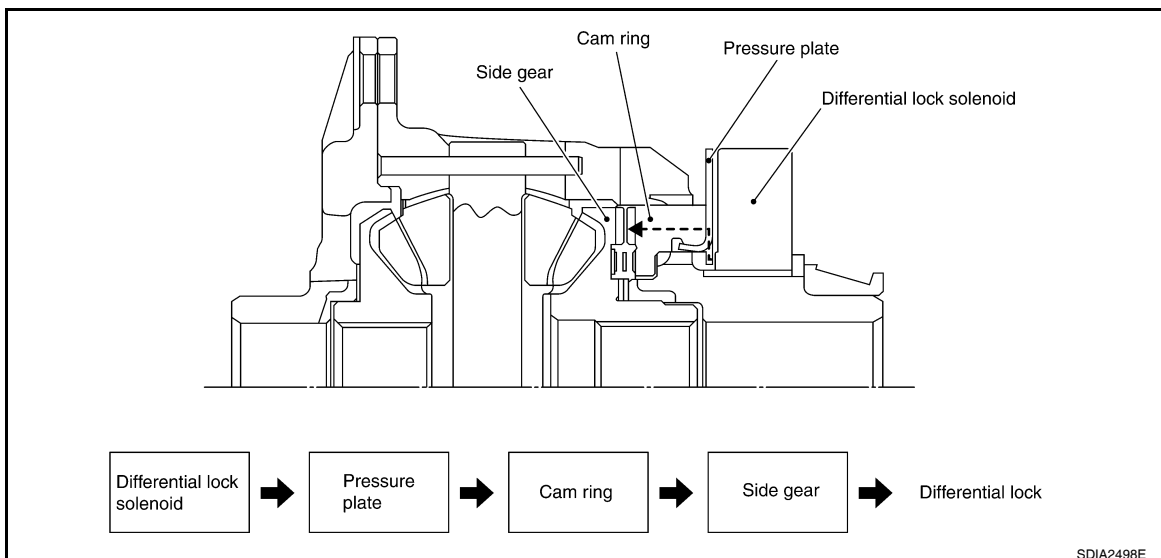
- Differential lock control unit
- Differential lock mode switch
- Differential lock position switch
- Differential lock solenoid
- ABS actuator and electric unit (control unit)
- Transfer control unit

## DIFFERENTIAL LOCK SYSTEM OPERATION

When the differential lock mode switch is in the LOCK position, a signal is sent to the differential lock control unit. The differential lock control unit monitors input from the ABS actuator and electric unit (vehicle speed and VDC operation) and the transfer control unit (4WD shift switch). If conditions are set, the differential lock control unit provides power and ground to the differential lock solenoid to lock the differential. The differential lock position switch provides feedback to the differential lock control unit as to whether the lock is engaged based on pressure plate position. The differential lock control unit provides ground to the DIFF LOCK indicator lamp to activate the lamp. Refer to the Owner's Manual for differential lock system operating instructions.

As a fail-safe function, the differential lock disengages when a malfunction is detected in the differential lock system. Self-diagnostics can be performed using CONSULT-III. Refer to [DLN-211, "CONSULT-III Function \(DIFF LOCK\)"](#).

## DIFFERENTIAL LOCK OPERATION





# DIFFERENTIAL LOCK SYSTEM

< FUNCTION DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

1. Differential lock solenoid operates pressure plate.
2. Pressure plate presses cam ring.
3. Engage cam ring and side gear, and the differential is locked.

## DIFFERENTIAL LOCK INDICATOR LAMP OPERATION

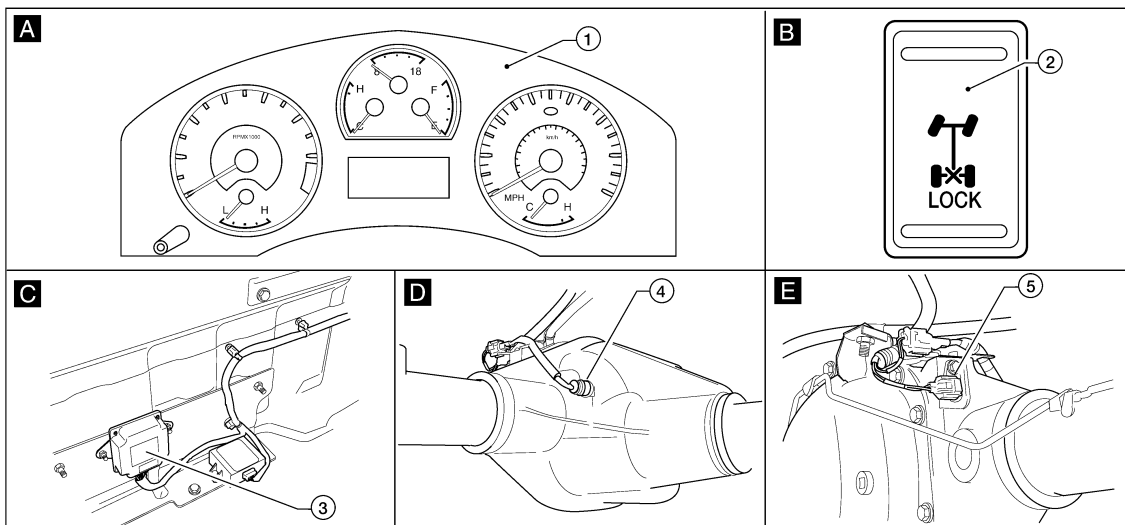
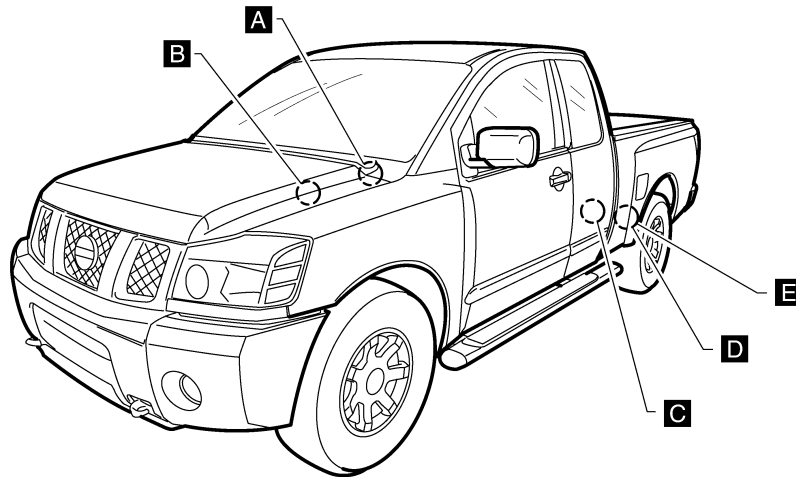
Condition	DIFF LOCK indicator lamp
Differential lock/unlock	ON/OFF
Differential lock standby condition	Flashing once every 2 seconds
Differential lock system malfunction	OFF (even if differential lock mode switch is in LOCK position)
Lamp check	Turns ON when ignition switch is turned ON. Turns OFF after engine start.

### NOTE:

The differential lock standby condition is the time where the differential lock mode switch is in the LOCK position and the differential is unlocked.

## Component Parts Location

INFOID:000000004929096



ALDIA0164ZZ

1. Combination meter M24 (DIFF LOCK indicator lamp)
2. Differential lock mode switch M72
3. Differential lock control unit B77 (view of rear cab)
4. Differential lock position switch C16
5. Differential lock solenoid C17

# DIFFERENTIAL LOCK SYSTEM

< FUNCTION DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## Component Description

INFOID:000000004929097

Component	Function
Differential lock control unit	<ul style="list-style-type: none"><li>• Controls differential lock solenoid to lock/unlock the differential.</li><li>• As a fail-safe function, the differential lock disengages when a malfunction is detected within the differential lock system.</li></ul>
Differential lock solenoid	Controls pressure plate operation when provided power and ground from the differential lock control unit.
Differential lock position switch	Detects differential lock/unlock condition based on the position of the pressure plate.
Differential lock mode switch	Allows driver input for differential LOCK/UNLOCK to the differential lock control unit.
DIFF LOCK indicator lamp	Illuminates to indicate the differential lock is locked or in standby condition.
ABS actuator and electric unit (control unit)	Transmits the following signals via CAN communication to the differential lock control unit. <ul style="list-style-type: none"><li>• Vehicle speed signal</li><li>• VDC operation signal</li></ul>
Transfer control unit	Transmits the 4WD shift switch signal via CAN communication to the differential lock control unit.

# DIAGNOSIS SYSTEM (DIFFERENTIAL LOCK CONTROL UNIT)

< FUNCTION DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## DIAGNOSIS SYSTEM (DIFFERENTIAL LOCK CONTROL UNIT)

### CONSULT-III Function (DIFF LOCK)

INFOID:000000004929098

CONSULT-III can display each diagnostic item using the following diagnostic test modes

DIFF LOCK Diagnostic test mode	Function
SELF-DIAGNOSTIC RESULTS	Displays differential lock control unit self-diagnostic results.
DATA MONITOR	Displays differential lock control unit input/output data in real time.
CAN DIAG SUPPORT MNTR	The results of transmit/receive diagnosis of CAN communication can be read.
ECU PART NUMBER	The part number of the differential lock control unit can be checked

### SELF-DIAGNOSTIC RESULTS

Display Item List

Refer to [DLN-240, "DTC Index"](#).

### DATA MONITOR

Display Item List

Monitor item [Unit]	Description
BATTERY VOLT [V]	Displays power supply voltage for the differential lock control unit.
4WD MODE [2H/4H/4Lo]	Displays 4WD shift switch position.
VHCL S/SEN-RL [km/h] or [mph]	Displays average of rear wheel speed sensors (left and right). Value is approximately equal to the indication of vehicle speed on the speedometer (inside $\pm 10\%$ ).
D-LOCK SW SIG [ON/OFF]	Displays differential lock mode switch position.
D-LOCK SIG [ON/OFF]	Displays control status of differential lock.
RELAY ON [ON/OFF]	Displays operating condition of differential lock solenoid relay (integrated in differential lock control unit).
RELAY MTR [ON/OFF]	Displays control status of differential lock solenoid relay (integrated in differential differential lock control unit).
SOL MTR [ON/OFF]	Displays control status of differential lock solenoid.
IND MTR [ON/OFF]	Displays control status of DIFF LOCK indicator lamp.
D-LOCK POS SW [ON/OFF]	Displays condition of differential lock position switch

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< FUNCTION DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

### NVH Troubleshooting Chart

INFOID:000000004929099

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Symptom	Noise	Possible cause and SUSPECTED PARTS	Reference page
	x	Gear tooth rough	<a href="#">DLN-259, "Disassembly and Assembly"</a>
	x	Gear contact improper	<a href="#">DLN-259, "Disassembly and Assembly"</a>
	x	Tooth surfaces worn	<a href="#">DLN-259, "Disassembly and Assembly"</a>
	x	Backlash incorrect	<a href="#">DLN-257, "Removal and Installation"</a>
	x	Companion flange excessive runout	<a href="#">DLN-259, "Disassembly and Assembly"</a>
	x	Gear oil improper	<a href="#">DLN-203, "General Specification"</a>
	x	PROPELLER SHAFT	<a href="#">DLN-134, "NVH Troubleshooting Chart"</a> <a href="#">DLN-143, "NVH Troubleshooting Chart"</a>
	x	REAR AXLE	<a href="#">RAX-4, "NVH Troubleshooting Chart"</a>
	x	REAR SUSPENSION	<a href="#">RSU-4, "NVH Troubleshooting Chart"</a>
	x	TIRES	<a href="#">WT-42, "NVH Troubleshooting Chart"</a>
	x	ROAD WHEEL	<a href="#">WT-42, "NVH Troubleshooting Chart"</a>
	x	AXLE SHAFT	<a href="#">RAX-4, "NVH Troubleshooting Chart"</a>
	x	BRAKES	<a href="#">BR-5, "NVH Troubleshooting Chart"</a>
	x	STEERING	<a href="#">ST-5, "NVH Troubleshooting Chart"</a>

x: Applicable

# U1000 CAN COMM CIRCUIT

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## COMPONENT DIAGNOSIS

### U1000 CAN COMM CIRCUIT

#### Description

INFOID:000000004929100

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN-H, CAN-L) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

CAN Communication Signal Chart. Refer to [LAN-59, "CAN Communication Signal Chart"](#).

#### DTC Logic

INFOID:000000004929101

#### DTC DETECTION LOGIC

DTC	Display contents of CONSULT-III	Diagnostic item is detected when ...	Probable malfunction location
U1000	CAN COMM CIRCUIT	When differential lock control unit is not transmitting or receiving CAN communication signal for 2 seconds or more.	CAN communication system

#### Diagnosis Procedure

INFOID:000000004929102

##### 1. PERFORM SELF DIAGNOSTIC

1. Turn ignition switch ON and wait for 2 seconds or more.
2. Check "Self Diagnostic Result" of differential lock control unit.

Is "CAN COMM CIRCUIT" displayed?

- YES >> Refer to [DLN-211, "CONSULT-III Function \(DIFF LOCK\)"](#).  
NO >> Refer to [GI-38, "Intermittent Incident"](#).

# P1833 INITIAL START

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1833 INITIAL START

### Description

INFOID:000000004929103

Self-diagnosis memory function was suspended due to low battery voltage at the differential lock control unit.

### DTC Logic

INFOID:000000004929104

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1833	INITIAL START [P1833]	Low battery voltage available to the differential lock control unit.	Check differential lock control unit power supply and ground circuit. Refer to <a href="#">DLN-214</a> . "Diagnosis Procedure"

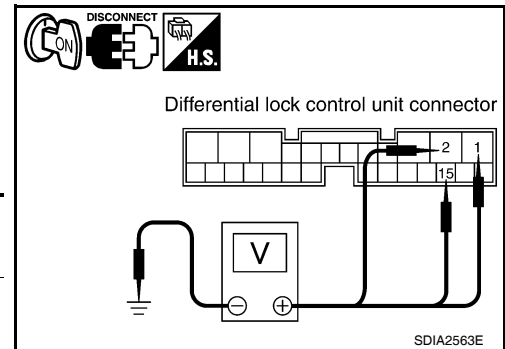
### Diagnosis Procedure

INFOID:000000004929105

#### 1. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect differential lock control unit connector.
3. Turn ignition switch ON.
4. Check voltage between differential lock control unit connector B77 terminals 1, 2, 15 and ground.

(+)		(-)	Voltage (Approx.)
Connector	Terminal		
B77	1	Ground	Battery voltage
	2		
	15		



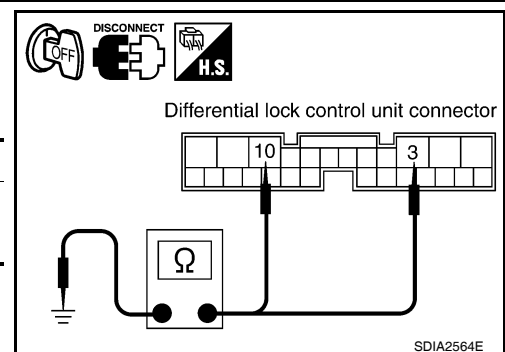
Is the inspection result normal?

- YES >> GO TO 2.  
 NO >> Check fuse. Repair harness or connectors.

#### 2. CHECK DIFFERENTIAL LOCK CONTROL UNIT GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between differential lock control unit connector B77 terminals 3, 10 and ground.

Connector	Terminal	—	Continuity
B77	3	Ground	Yes
	10		



Is the inspection result normal?

- YES >> Power and ground supply is normal.  
 NO >> Repair harness or connectors.

# P1834 CONTROL UNIT 1

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1834 CONTROL UNIT 1

### Description

INFOID:000000004929106

Replace the differential lock control unit if this DTC is displayed. Refer to [DLN-249. "Removal and Installation"](#).

### DTC Logic

INFOID:000000004929107

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1834	CONTROL UNIT 1 [P1834]	A malfunction is detected in the memory (RAM) of the differential lock control unit.	Replace differential lock control unit. Refer to <a href="#">DLN-249. "Removal and Installation"</a> .

A

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# P1835 CONTROL UNIT 2

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1835 CONTROL UNIT 2

### Description

INFOID:000000004929108

Replace the differential lock control unit if this DTC is displayed. Refer to [DLN-249, "Removal and Installation"](#).

### DTC Logic

INFOID:000000004929109

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1835	CONTROL UNIT 2 [P1835]	A malfunction is detected in the memory (ROM) of the differential lock control unit.	Replace differential lock control unit. Refer to <a href="#">DLN-249, "Removal and Installation"</a>



# P1836 CONTROL UNIT 3

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1836 CONTROL UNIT 3

### Description

INFOID:000000004929110

Replace the differential lock control unit if this DTC is displayed. Refer to [DLN-249. "Removal and Installation"](#).

### DTC Logic

INFOID:000000004929111

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1836	CONTROL UNIT 3 [P1836]	A malfunction is detected in the memory (EEPROM) of the differential lock control unit.	Replace differential lock control unit. Refer to <a href="#">DLN-249. "Removal and Installation"</a> .

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# P1837 CONTROL UNIT 4

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1837 CONTROL UNIT 4

### Description

INFOID:000000004929112

Replace the differential lock control unit if this DTC is displayed. Refer to [DLN-249, "Removal and Installation"](#).

### DTC Logic

INFOID:000000004929113

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1837	CONTROL UNIT 4 [P1837]	The AD converter system of the differential lock control unit is malfunctioning.	Replace differential lock control unit. Refer to <a href="#">DLN-249, "Removal and Installation"</a>

# P1838 ON SWITCH

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1838 ON SWITCH

### Description

INFOID:000000004929114

The differential lock mode switch sends differential lock ON/OFF signals to the differential lock control unit.

### DTC Logic

INFOID:000000004929115

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1838	ON SW [P1838]	Two switch inputs were simultaneously detected due to a short circuit in the differential lock mode switch.	Inspect the differential lock mode switch. Refer to <a href="#">DLN-219</a> , "Diagnosis Procedure"

A  
B  
C  
DLN

### Diagnosis Procedure

INFOID:000000004929116

#### 1. CHECK DIFFERENTIAL LOCK MODE SWITCH OPERATION

- Turn ignition switch ON.
- Using CONSULT-III, select "D-LOCK SW SIG" of DIFF LOCK data monitor items.
- While operating the differential lock mode switch, check that the display value changes between ON/OFF.

**Switch ON**  
**Switch OFF**

**Display item ON**  
**Display item OFF**

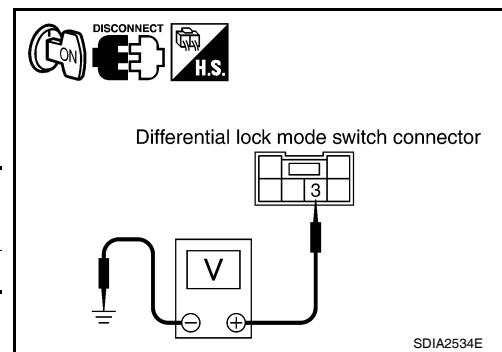
Is the inspection result normal?

- YES >> Differential lock mode switch is operating properly.  
NO >> GO TO 2.

#### 2. CHECK DIFFERENTIAL LOCK MODE SWITCH POWER SUPPLY CIRCUIT

- Disconnect differential lock mode switch connector.
- Turn ignition switch ON.
- Check voltage between differential lock mode switch connector M72 terminal 3 and ground.

(+)		(-)	Voltage (Approx.)
Connector	Terminal		
M72	3	Ground	Battery voltage



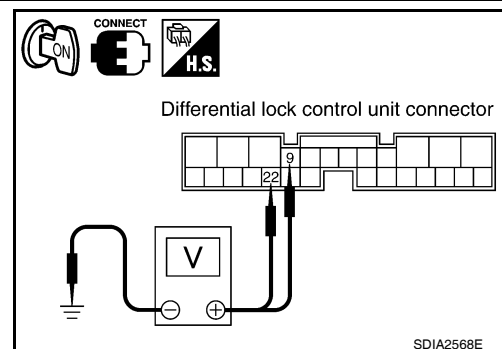
Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Repair harness or connector.

#### 3. CHECK DIFFERENTIAL LOCK MODE SWITCH SIGNAL

- Turn ignition switch OFF.
- Connect differential lock mode switch connector.
- Check voltage between differential lock control unit connector B77 terminals 9, 22 and ground.

(+)		(-)	Differential lock mode switch	Voltage (Approx.)
Connector	Terminal			
B77	9	Ground	ON	Battery voltage
			OFF	0V
	22		ON	0V
			OFF	Battery voltage



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# P1838 ON SWITCH

[REAR FINAL DRIVE: M226 (ELD) ]

## < COMPONENT DIAGNOSIS >

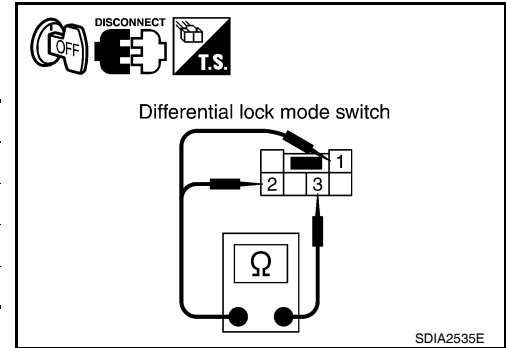
### Is the inspection result normal?

- YES >> Replace the differential lock control unit. Refer to [DLN-249, "Removal and Installation"](#).  
 NO >> GO TO 4.

## 4. CHECK DIFFERENTIAL LOCK MODE SWITCH

1. Turn ignition switch OFF.
2. Disconnect differential lock mode switch connector.
3. Operate differential lock mode switch and check continuity between differential lock mode switch terminals.

Terminals	Differential lock mode switch	Continuity
1 - 3	ON	No
	OFF	Yes
2 - 3	ON	Yes
	OFF	No



### Is the inspection result normal?

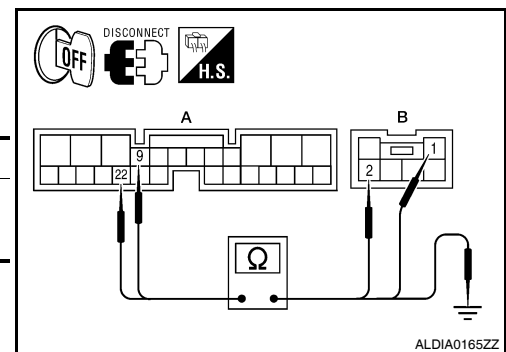
- YES >> GO TO 5.  
 NO >> Replace differential lock mode switch.

## 5. CHECK HARNESS BETWEEN DIFFERENTIAL LOCK CONTROL UNIT AND DIFFERENTIAL LOCK MODE SWITCH

1. Check continuity between differential lock control unit connector B77 (A) terminals 9, 22 and differential lock mode switch connector M72 (B) terminals 2, 1.

Connector	Terminal	Connector	Terminal	Continuity
B77 (A)	9	M72 (B)	2	Yes
	22		1	

2. Check continuity between differential lock control unit connector B77 (A) terminals 9, 22 and ground.



Connector	Terminal	Continuity
B77 (A)	9	No
	22	

### Is the inspection result normal?

- YES >> Replace the differential lock control unit. Refer to [DLN-249, "Removal and Installation"](#).  
 NO >> Repair harness or connector.

# P1839 POSITION SWITCH ON

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1839 POSITION SWITCH ON

### Description

INFOID:000000004929117

The differential lock position switch sends a signal to the differential lock control module when the differential lock is engaged. The differential lock control module monitors the left and right rear wheel speed sensor signals to determine wheel slippage. When the differential lock is engaged the left and right rear wheel speed sensor signals should match.

### DTC Logic

INFOID:000000004929118

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1839	POSI SW ON [P1839]	The differential lock position switch is ON indicating the differential is locked, but the differential lock control module detects a difference between left and right rear wheel speeds.	Inspect the differential lock position switch. Refer to <a href="#">DLN-221, "Diagnosis Procedure"</a> .

### Diagnosis Procedure

INFOID:000000004929119

#### 1. CHECK DIFFERENTIAL LOCK POSITION SWITCH SIGNAL

1. Start engine.
2. Select "D-LOCK POS SW SIG" of DIFF LOCK data monitor.
3. Activate the differential lock according to the directions listed in the table and monitor the display value.

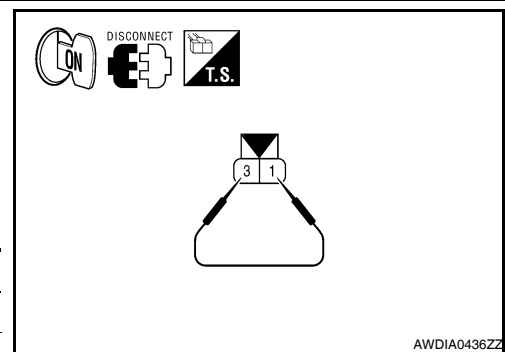
Monitor item	Condition	Display value
D-LOCK POS SW SIG	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> </ul>	Differential lock mode switch: ON (DIFF LOCK indicator lamp: ON)
	<ul style="list-style-type: none"> <li>• VDC OFF switch (if equipped): ON</li> <li>• 4WD shift switch: 4LO</li> </ul>	Differential lock mode switch: OFF (DIFF LOCK indicator lamp: OFF)

#### Is the inspection result normal?

- YES >> Differential lock position switch is operating normally.  
 NO >> GO TO 2.

#### 2. CHECK DIFFERENTIAL LOCK POSITION SWITCH

1. Disconnect differential lock position switch harness connector C16.
2. Turn ignition switch ON.
3. Select "D-LOCK POS SW SIG" of DIFF LOCK data monitor.
4. Monitor the display value while connecting and disconnecting a jumper wire between differential lock position switch terminals 1 and 3.



Monitor item	Condition	Display value
D-LOCK POS SW SIG	Jumper wire connected	ON
	Jumper wire disconnected	OFF

#### Is the inspection result normal?

- YES >> Check the mechanical operation of the differential lock. Replace the differential lock position switch. Refer to [DLN-250, "Removal and Installation"](#).  
 NO >> GO TO 3.

#### 3. CHECK DIFFERENTIAL LOCK POSITION SWITCH VOLTAGE

# P1839 POSITION SWITCH ON

[REAR FINAL DRIVE: M226 (ELD) ]

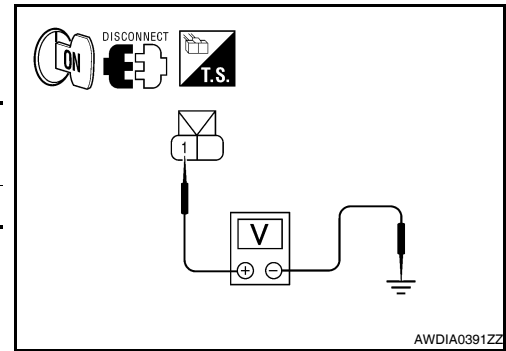
## < COMPONENT DIAGNOSIS >

Check voltage between differential lock position switch connector C16 terminal 1 and ground.

(+)		(-)	Voltage (Approx.)
Connector	Terminal		
C16	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 4.  
NO >> GO TO 5.



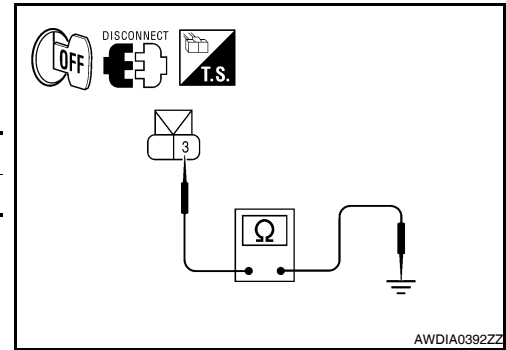
### 4. CHECK GROUND CIRCUIT

- Turn ignition switch OFF.
- Check continuity between differential lock position switch harness connector C16 terminal 3 and ground.

Connector	Terminal	—	Continuity
C16	3	Ground	Yes

Is the inspection result normal?

- YES >> Replace the differential lock control unit. Refer to [DLN-249. "Removal and Installation"](#).  
NO >> Repair harness or connector.



### 5. CHECK HARNESS BETWEEN DIFFERENTIAL LOCK CONTROL UNIT AND DIFFERENTIAL LOCK POSITION SWITCH

- Turn ignition switch OFF.
- Disconnect differential lock control unit harness connector B77.
- Check continuity between differential lock control unit harness connector B77 (A) terminal 20 and differential lock position switch harness connector C16 (B) terminal 1.

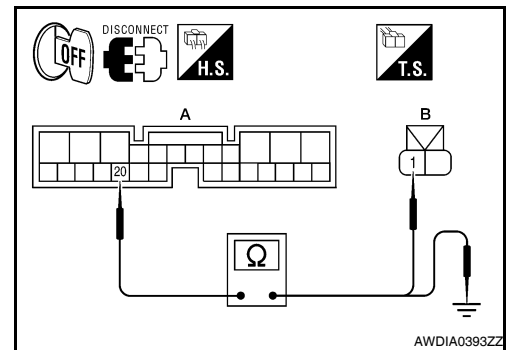
Connector	Terminal	Connector	Terminal	Continuity
B77 (A)	20	C16 (B)	1	Yes

- Check continuity between differential lock control unit harness connector B77 (A) terminal 20 and ground.

Connector	Terminal	Ground	No
B77 (A)	20		

Is the inspection result normal?

- YES >> Replace differential lock control unit. Refer to [DLN-249. "Removal and Installation"](#).  
NO >> Repair harness or connector.



# P1844 RELAY

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1844 RELAY

### Description

INFOID:000000004929120

The differential lock solenoid relay is an integral part of the differential lock control unit.

### DTC Logic

INFOID:000000004929121

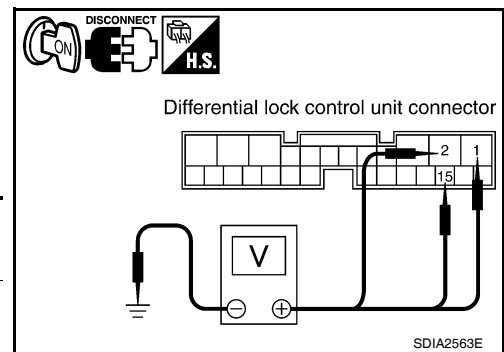
DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1844	RELAY [P1844]	The differential lock control unit relay monitor did not detect expected voltage at the relay.	Inspect differential lock control unit relay power and ground supply circuit. Refer to <a href="#">DLN-223, "Diagnosis Procedure"</a> .

### Diagnosis Procedure

INFOID:000000004929122

#### 1. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect differential lock control unit connector.
3. Turn ignition switch ON.
4. Check voltage between differential lock control unit connector B77 terminals 1, 2, 15 and ground.



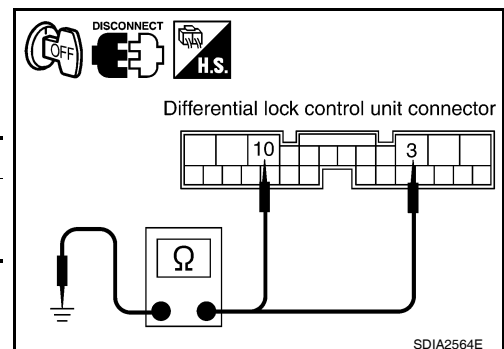
(+)		(-)	Voltage (Approx.)
Connector	Terminal		
B77	1	Ground	Battery voltage
	2		
	15		

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Check fuse. Repair harness or connectors.

#### 2. CHECK DIFFERENTIAL LOCK CONTROL UNIT GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between differential lock control unit connector B77 terminals 3, 10 and ground.



Connector	Terminal	—	Continuity
B77	3	Ground	Yes
	10		

Is the inspection result normal?

- YES >> Power and ground supply is normal.  
NO >> Repair harness or connectors.

# P1847 SOLENOID CIRCUIT

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1847 SOLENOID CIRCUIT

### Description

INFOID:000000004929123

Replace the differential lock control unit if this DTC is displayed. Refer to [DLN-249, "Removal and Installation"](#)

### DTC Logic

INFOID:000000004929124

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1847	SOL CIRCUIT [P1847]	A malfunction is detected in the differential lock control unit internal circuit.	Replace differential lock control unit. Refer to <a href="#">DLN-249, "Removal and Installation"</a>



# P1848 SOLENOID DISCONNECT

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1848 SOLENOID DISCONNECT

### Description

INFOID:000000004929125

When power and ground is supplied from the differential lock control unit, the differential lock solenoid will actuate to move the pressure plate against the cam ring to lock the differential. By reversing polarity at the differential lock control unit, the differential lock solenoid moves the pressure plate away from the cam ring to unlock the differential.

### DTC Logic

INFOID:000000004929126

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1848	SOL DISCONNECT [P1848]	An open was detected in the differential lock solenoid or circuit.	Inspect differential lock solenoid. Refer to <a href="#">DLN-225, "Diagnosis Procedure"</a> .

### Diagnosis Procedure

INFOID:000000004929127

#### 1. CHECK DIFFERENTIAL SOLENOID CONTROL

1. Start engine.
2. Using CONSULT-III, select "RELAY ON", "RELAY MTR", "SOL MTR" of DIFF LOCK data monitor.
3. Observe the display values while operating the differential lock system.

Monitor item	Condition	Differential lock mode switch	Display value
RELAY ON	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• VDC OFF switch (if equipped): ON</li> <li>• 4WD shift switch: 4LO</li> </ul>	ON	ON
		OFF	OFF
RELAY MTR		ON	ON
		OFF	OFF
SOL MTR		ON	ON
		OFF	OFF

#### Is the inspection result normal?

- YES >> Differential lock solenoid control system is operating normally.  
 NO >> GO TO 2.

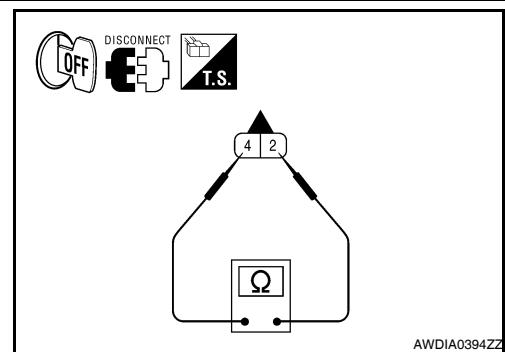
#### 2. CHECK DIFFERENTIAL LOCK SOLENOID RESISTANCE

1. Turn ignition switch OFF.
2. Disconnect differential lock solenoid connector.
3. Check resistance between differential lock solenoid terminals 2 and 4.

**2 - 4 : Approx. 3.4Ω**

#### Is the inspection result normal?

- YES >> GO TO 3.  
 NO >> Replace differential lock solenoid.



#### 3. CHECK DIFFERENTIAL LOCK SOLENOID OPERATION

# P1848 SOLENOID DISCONNECT

[REAR FINAL DRIVE: M226 (ELD) ]

## < COMPONENT DIAGNOSIS >

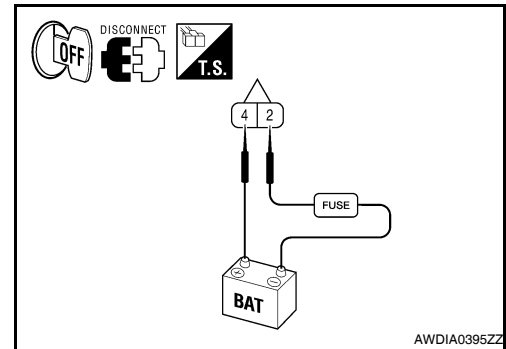
Check operation by applying power and ground to the differential lock solenoid terminals.

Component	(+)	(-)	Solenoid operation
	Terminal	Terminal	
Differential lock solenoid	2	4	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Check for a mechanical malfunction with the differential lock system. Replace differential lock solenoid.



## 4. CHECK DIFFERENTIAL LOCK SOLENOID CIRCUIT

1. Disconnect differential lock control unit connector.
2. Check continuity between differential lock control unit connector B77 (A) terminals 11, 12 and differential lock solenoid connector C17 (B) terminals 2, 4.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
B77	11	C17	2	Yes
	12		4	

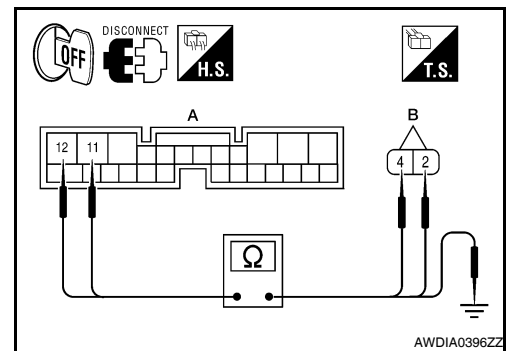
3. Check continuity between differential lock control unit connector B77 (A) terminals 11, 12 and ground.

A		—	Continuity
Connector	Terminal		
B77	11	Ground	No
	12		

Is the inspection result normal?

YES >> Replace the differential lock control unit. Refer to [DLN-249, "Removal and Installation"](#).

NO >> Repair harness or connector.



# P1849 SOLENOID SHORT

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1849 SOLENOID SHORT

### Description

INFOID:000000004929128

When power and ground is supplied from the differential lock control unit, the differential lock solenoid will actuate to move the pressure plate against the cam ring to lock the differential. By reversing polarity at the differential lock control unit, the differential lock solenoid moves the pressure plate away from the cam ring to unlock the differential.

### DTC Logic

INFOID:000000004929129

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1849	SOL SHORT [P1849]	A short was detected in the differential lock solenoid internal circuit or in the harness.	Inspect the differential lock solenoid. Refer to <a href="#">DLN-227</a> . "Diagnosis Procedure".

### Diagnosis Procedure

INFOID:000000004929130

#### 1. CHECK DIFFERENTIAL SOLENOID CONTROL

1. Start engine.
2. Using CONSULT-III, select "RELAY ON", "RELAY MTR", "SOL MTR" of DIFF LOCK data monitor.
3. Observe the display values while operating the differential lock system.

Monitor item	Condition	Differential lock mode switch	Display value
RELAY ON	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• VDC OFF switch (if equipped): ON</li> <li>• 4WD shift switch: 4LO</li> </ul>	ON	ON
		OFF	OFF
RELAY MTR		ON	ON
		OFF	OFF
SOL MTR		ON	ON
		OFF	OFF

Is the inspection result normal?

- YES >> Differential lock solenoid control system is operating normally.  
 NO >> GO TO 2.

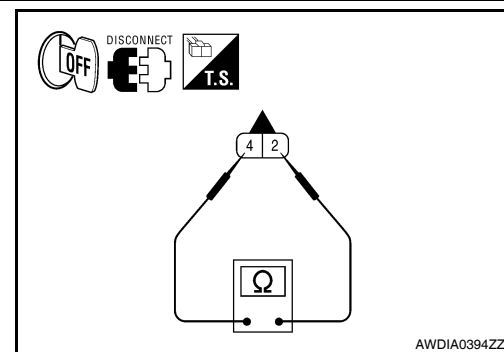
#### 2. CHECK DIFFERENTIAL LOCK SOLENOID RESISTANCE

1. Turn ignition switch OFF.
2. Disconnect differential lock solenoid connector.
3. Check resistance between differential lock solenoid terminals 2 and 4.

**2 - 4 : Approx. 3.4Ω**

Is the inspection result normal?

- YES >> GO TO 3.  
 NO >> Replace differential lock solenoid.



#### 3. CHECK DIFFERENTIAL LOCK SOLENOID OPERATION

# P1849 SOLENOID SHORT

[REAR FINAL DRIVE: M226 (ELD) ]

## < COMPONENT DIAGNOSIS >

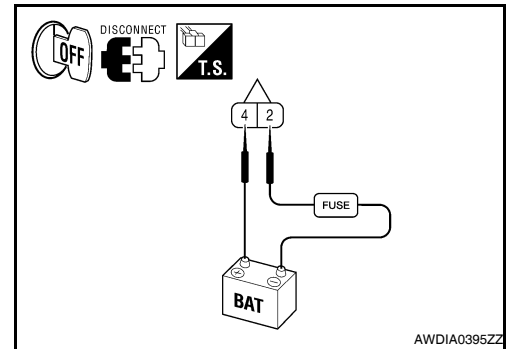
Check operation by applying power and ground to the differential lock solenoid terminals.

Component	(+)	(-)	Solenoid operation
	Terminal	Terminal	
Differential lock solenoid	2	4	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Check for a mechanical malfunction with the differential lock system. Replace differential lock solenoid.



## 4. CHECK DIFFERENTIAL LOCK SOLENOID CIRCUIT

1. Disconnect differential lock control unit connector.
2. Check continuity between differential lock control unit connector B77 (A) terminals 11, 12 and differential lock solenoid connector C17 (B) terminals 2, 4.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
B77	11	C17	2	Yes
	12		4	

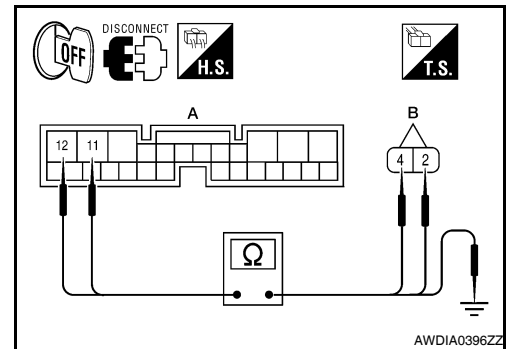
3. Check continuity between differential lock control unit connector B77 (A) terminals 11, 12 and ground.

A		—	Continuity
Connector	Terminal		
B77	11	Ground	No
	12		

Is the inspection result normal?

YES >> Replace the differential lock control unit. Refer to [DLN-249, "Removal and Installation"](#).

NO >> Repair harness or connector.



# P1850 SOLENOID CURRENT

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## P1850 SOLENOID CURRENT

### Description

INFOID:000000004929131

The differential lock control unit supplies power and ground to the differential lock solenoid via the differential lock solenoid relay (integral to the differential lock control unit).

### DTC Logic

INFOID:000000004929132

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
P1850	SOL CURRENT [P1850]	The differential lock relay does not switch to OFF or there is a short to power in the harness.	Inspect the differential lock solenoid. Refer to <a href="#">DLN-229</a> . "Diagnosis Procedure".

### Diagnosis Procedure

INFOID:000000004929133

#### 1. CHECK DIFFERENTIAL SOLENOID CONTROL

1. Start engine.
2. Using CONSULT-III, select "RELAY ON", "RELAY MTR", "SOL MTR" of DIFF LOCK data monitor.
3. Observe the display values while operating the differential lock system.

Monitor item	Condition	Differential lock mode switch	Display value
RELAY ON	<ul style="list-style-type: none"> <li>• Vehicle stopped</li> <li>• Engine running</li> <li>• VDC OFF switch (if equipped): ON</li> <li>• 4WD shift switch: 4LO</li> </ul>	ON	ON
		OFF	OFF
RELAY MTR		ON	ON
		OFF	OFF
SOL MTR		ON	ON
		OFF	OFF

Is the inspection result normal?

- YES >> Differential lock solenoid control system is operating normally.  
NO >> GO TO 2.

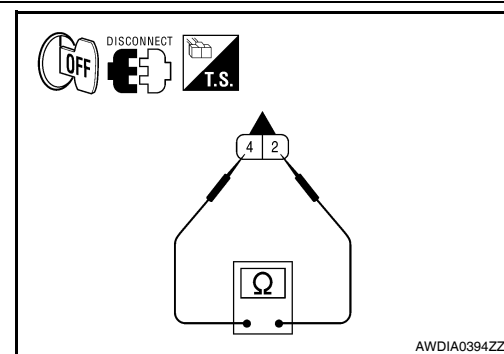
#### 2. CHECK DIFFERENTIAL LOCK SOLENOID RESISTANCE

1. Turn ignition switch OFF.
2. Disconnect differential lock solenoid connector.
3. Check resistance between differential lock solenoid terminals 2 and 4.

**2 - 4 : Approx. 3.4Ω**

Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Replace differential lock solenoid.



#### 3. CHECK DIFFERENTIAL LOCK SOLENOID OPERATION

# P1850 SOLENOID CURRENT

## < COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

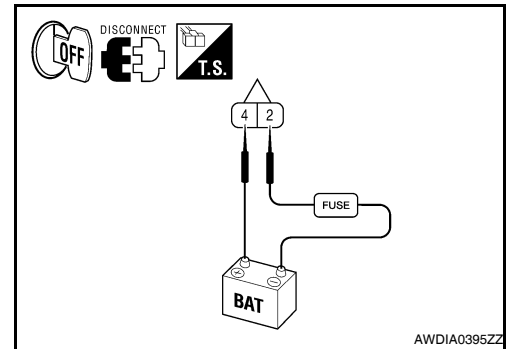
Check operation by applying power and ground to the differential lock solenoid terminals.

Component	(+)	(-)	Solenoid operation
	Terminal	Terminal	
Differential lock solenoid	2	4	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Check for a mechanical malfunction with the differential lock system. Replace differential lock solenoid.



## 4. CHECK DIFFERENTIAL LOCK SOLENOID CIRCUIT

1. Disconnect differential lock control unit connector.
2. Check continuity between differential lock control unit connector B77 (A) terminals 11, 12 and differential lock solenoid connector C17 (B) terminals 2, 4.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
B77	11	C17	2	Yes
	12		4	

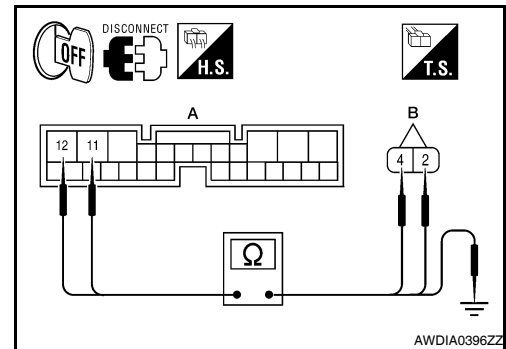
3. Check continuity between differential lock control unit connector B77 (A) terminals 11, 12 and ground.

A		—	Continuity
Connector	Terminal		
B77	11	Ground	No
	12		

Is the inspection result normal?

YES >> Replace the differential lock control unit. Refer to [DLN-249, "Removal and Installation"](#).

NO >> Repair harness or connector.



# C1203 ABS SYSTEM

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## C1203 ABS SYSTEM

### Description

INFOID:000000004929134

The differential lock control unit and the ABS actuator and electric unit (control unit) are in communication via the CAN communication network. Vehicle speed and wheel slippage information is used by the differential lock control unit to determine if conditions are met to actuate the differential lock solenoid.

### DTC Logic

INFOID:000000004929135

DTC	Display contents of CONSULT-III	DTC Detection Condition	Action to take
C1203	ABS SYSTEM [C1203]	A malfunction related to wheel speed sensors has been detected by the ABS actuator and electric unit (control unit).	Check for proper ABS operation. Refer to <a href="#">BRC-78. "CONSULT-III Function (ABS)"</a> (ABLS/ABS) or <a href="#">BRC-164. "CONSULT-III Function (ABS)"</a> (VDC/TCS/ABS).

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# LOCK INDICATOR LAMP

< COMPONENT DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## LOCK INDICATOR LAMP

### Description

INFOID:000000004929136

The DIFF LOCK indicator lamp has power available to it any time the ignition switch is in the ON or START position. The differential lock control unit supplies ground to activate the DIFF LOCK indicator lamp. The DIFF LOCK indicator lamp will go through a prove out at initial key ON. The DIFF LOCK will flash while the differential lock system is activating or while waiting for conditions to be met to activate. Once the differential lock has been engaged, the DIFF LOCK indicator lamp will remain ON. For more information about the DIFF LOCK indicator lamp, refer to the Owner's Manual.

### Diagnosis Procedure

INFOID:000000004929137

#### 1. CHECK DIFF LOCK INDICATOR LAMP OPERATION

1. Turn the ignition switch ON.
2. Observe the DIFF LOCK indicator lamp.

**Ignition switch ON**

**Indicator prove out**

Is the inspection result normal?

YES >> DIFF LOCK indicator lamp is operating normally.

NO, ALWAYS ON>> Perform self diagnostics on differential lock control unit. Refer to [DLN-211, "CONSULT-III Function \(DIFF LOCK\)"](#).

NO, ALWAYS OFF>>GO TO 2.

#### 2. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER AND GROUND SUPPLY

Check the differential lock control unit power and ground supply. Refer to [DLN-214, "Diagnosis Procedure"](#).

Is the inspection result normal?

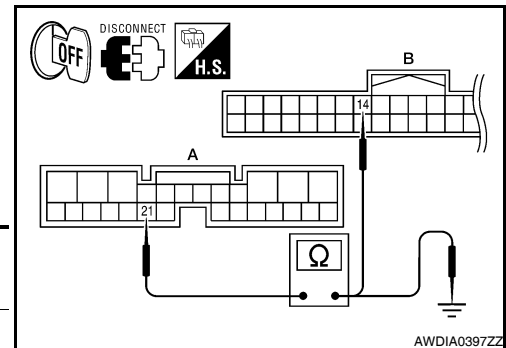
YES >> GO TO 3.

NO >> Repair or replace malfunctioning component.

#### 3. CHECK HARNESS BETWEEN DIFFERENTIAL LOCK CONTROL UNIT AND COMBINATION METER

1. Turn ignition switch OFF.
2. Disconnect differential lock control unit connector and combination meter connector.
3. Check continuity between differential lock control unit connector B77 (A) terminal 21 and combination meter connector M24 (B) terminal 14.

Differential lock control unit		Combination meter		Continuity
Connector	Terminal	Connector	Terminal	
B77	21	M24	14	Yes



4. Check continuity between differential lock control unit connector B77 (A) terminal 21 and ground.

Differential lock control unit		—	Continuity
Connector	Terminal		
B77	21	Ground	Yes

Is the inspection result normal?

YES >> Check DIFF LOCK indicator lamp bulb and power supply. Refer to [DLN-205, "Work Flow"](#).

NO >> Repair harness or connector.



# DIFFERENTIAL LOCK CONTROL UNIT

< ECU DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

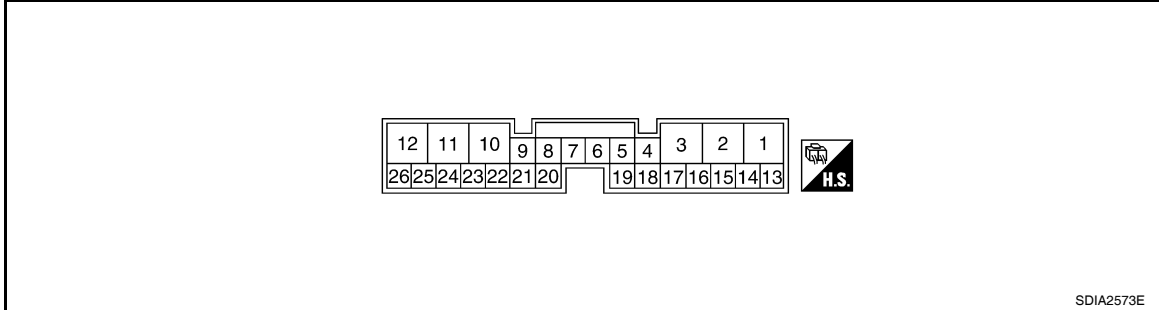
## ECU DIAGNOSIS

### DIFFERENTIAL LOCK CONTROL UNIT

Reference Value

INFOID:000000004929138

#### DIFFERENTIAL LOCK CONTROL UNIT TERMINAL CONNECTOR LAYOUT



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

Terminal No. (Wire color)		Description		Condition	Voltage (V) (Approx.)
+	-	Signal name	Input/Output		
1 (L)	Ground	Ign power supply	Input	Ignition ON or START	Battery voltage
2 (L)	Ground	Ign power supply	Input	Ignition ON or START	Battery voltage
3 (B)	Ground	Ground	Input	Ignition ON	Less than 0.2V
4 (P)	-	CAN-L	-		-
5 (L)	-	CAN-H	-		-
9 (G)	Ground	Differential lock mode switch (ON)	Input	Differential lock mode switch: ON	Battery voltage
				Differential lock mode switch: OFF	0V
10 (B)	Ground	Ground	Input	Ignition ON	Less than 0.2V
11 (V)	Ground	Differential lock solenoid (LO)	Output	Differential lock mode switch: ON	0V
				Differential lock mode switch: OFF	Battery voltage
12 (Y)	Ground	Differential lock solenoid (HIGH)	Output	Differential lock mode switch: ON	0V
				Differential lock mode switch: OFF	Battery voltage
13 (G/W)	-	K-LINE	-	-	-
15 (Y/R)	Ground	Battery power supply (Memory back-up)	Input	Ignition OFF	Battery voltage
20 (W/R)	Ground	Differential lock position switch	Input	Differential lock mode switch: ON (DIFF LOCK indicator lamp: ON)	0V
				Differential lock mode switch: OFF (DIFF LOCK indicator lamp: OFF)	Battery voltage
21 (L)	Ground	DIFF LOCK indicator lamp	Output	DIFF LOCK indicator lamp: ON	0V
				DIFF LOCK indicator lamp: OFF	Battery voltage
22 (O)	Ground	Differential lock mode switch (OFF)	Input	Differential lock mode switch: ON	0V
				Differential lock mode switch: OFF	Battery voltage

**CAUTION:**

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

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# DIFFERENTIAL LOCK CONTROL UNIT

[REAR FINAL DRIVE: M226 (ELD) ]

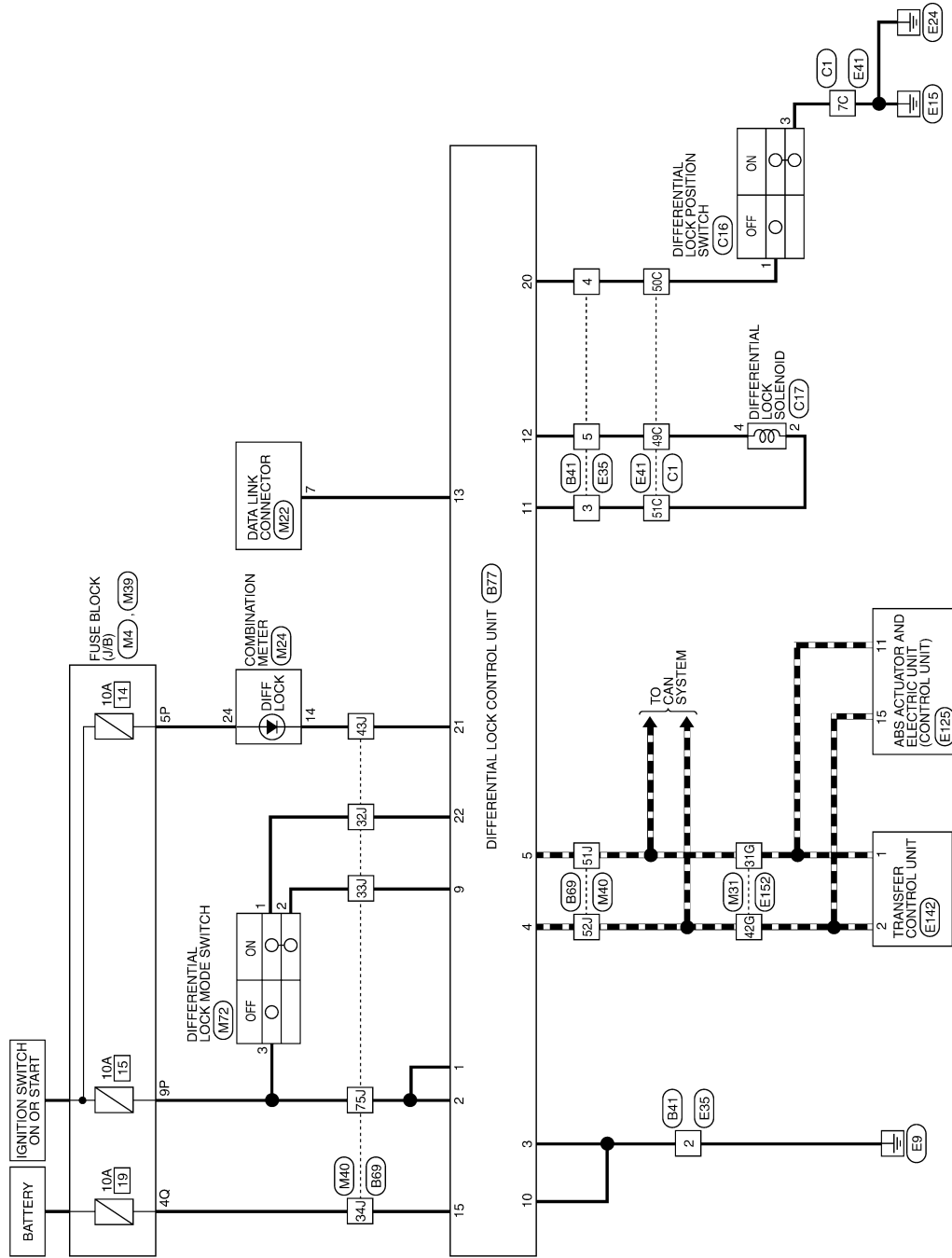
< ECU DIAGNOSIS >

## Wiring Diagram

INFOID:000000004929139

— : DATA LINE

### REAR FINAL DRIVE



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# DIFFERENTIAL LOCK CONTROL UNIT

[REAR FINAL DRIVE: M226 (ELD) ]

< ECU DIAGNOSIS >

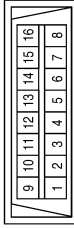
## REAR FINAL DRIVE CONNECTORS

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



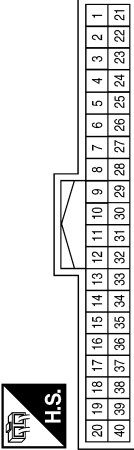
Terminal No.	Color of Wire	Signal Name
5P	O/L	-
9P	R/B	-

Connector No.	M22
Connector Name	DATA LINK CONNECTOR
Connector Color	WHITE



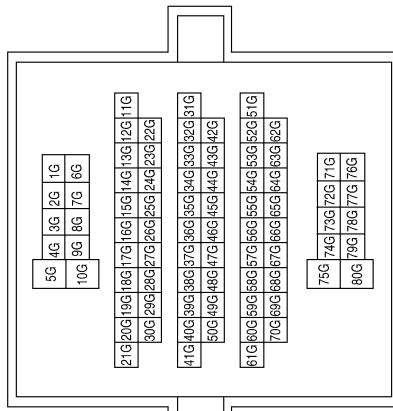
Terminal No.	Color of Wire	Signal Name
7	G/W	K - LINE

Connector No.	M24
Connector Name	COMBINATION METER
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
14	L	DIFF_LOCK
24	O/L	RUN_START

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
31G	L	-
42G	P	-

Connector No.	M39
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
4Q	Y/R	-

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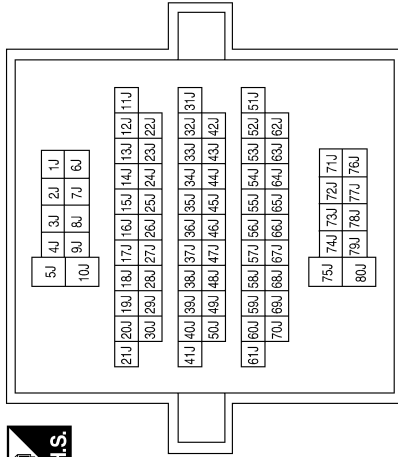
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# DIFFERENTIAL LOCK CONTROL UNIT

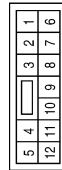
< ECU DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	E35
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	B	-
3	V	-
4	W/R	-
5	Y	-

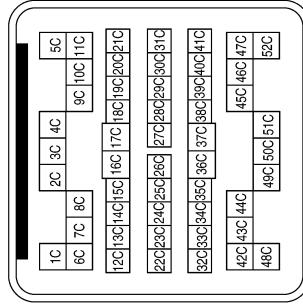
Terminal No.	Color of Wire	Signal Name
32J	O	-
33J	G	-
34J	Y/R	-
43J	L	-
51J	L	-
52J	P	-
75J	R/B	-

Connector No.	M72
Connector Name	DIFFERENTIAL LOCK MODE SWITCH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	O	-
2	G	-
3	R/B	-

Connector No.	E41
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
7C	B	-
49C	Y	-
50C	W/R	-
51C	V	-

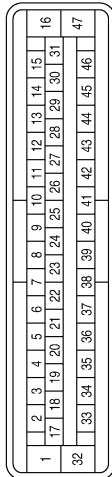
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# DIFFERENTIAL LOCK CONTROL UNIT

[REAR FINAL DRIVE: M226 (ELD) ]

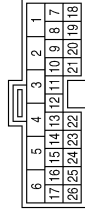
< ECU DIAGNOSIS >

Connector No.	E125
Connector Name	ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)
Connector Color	BLACK



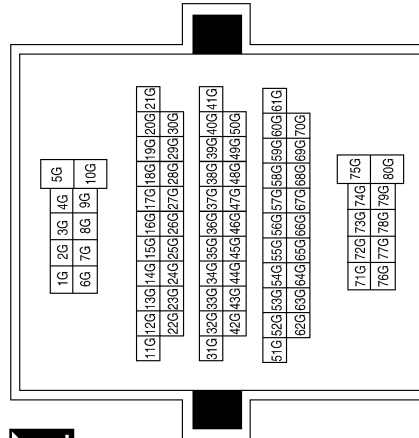
Terminal No.	Color of Wire	Signal Name
11	L	CAN-H
15	P	CAN-L

Connector No.	E142
Connector Name	TRANSFER CONTROL UNIT
Connector Color	WHITE



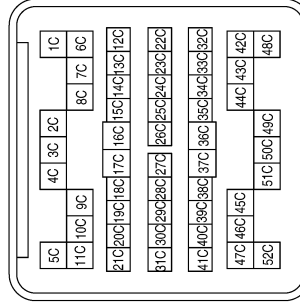
Terminal No.	Color of Wire	Signal Name
1	L	CAN-H
2	P	CAN-L

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
31G	L	-
42G	P	-

Connector No.	C1
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
7C	B	-
49C	Y	-
50C	W/R	-
51C	V	-

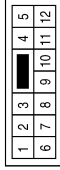
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# DIFFERENTIAL LOCK CONTROL UNIT

[REAR FINAL DRIVE: M226 (ELD) ]

< ECU DIAGNOSIS >

Connector No.	B41
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	B	-
3	V	-
4	W/R	-
5	Y	-

Connector No.	C17
Connector Name	DIFFERENTIAL LOCK SOLENOID
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
2	V	-
4	Y	-

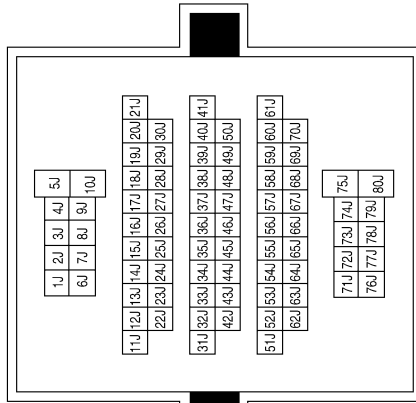
Connector No.	C16
Connector Name	DIFFERENTIAL LOCK POSITION SWITCH
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	W/R	-
3	B	-

Terminal No.	Color of Wire	Signal Name
32J	O	-
33J	G	-
34J	Y/R	-
43J	L	-
51J	L	-
52J	P	-
75J	R/B	-

Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE



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# DIFFERENTIAL LOCK CONTROL UNIT

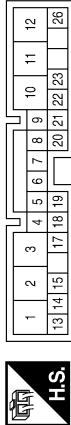
< ECU DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

Terminal No.	Color of Wire	Signal Name
19	-	-
20	W/R	POSITION_SW
21	L	IND
22	O	SW (OFF)
23	-	-
24	-	-
25	-	-
26	-	-

Terminal No.	Color of Wire	Signal Name
6	-	-
7	-	-
8	-	-
9	G	SW (ON)
10	B	GND_C
11	V	DRIVE (LO)
12	Y	DRIVE (HI)
13	G/W	K-LINE
14	-	-
15	Y/R	B
16	-	-
17	-	-
18	-	-

Connector No.	B77
Connector Name	DIFFERENTIAL LOCK CONTROL UNIT
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	VIGN (MAIN)
2	L	VIGN (MAIN)
3	B	GND_C
4	P	CAN-L
5	L	CAN-H

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# DIFFERENTIAL LOCK CONTROL UNIT

< ECU DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## DTC Index

INFOID:000000004929140

Items (CONSULT-III screen terms)	Diagnostic item is detected when...	Check item
INITIAL START [P1833]	Due to removal of battery which cuts off power supply to differential control unit, self-diagnosis memory function is suspended.	<a href="#">DLN-214. "Description"</a>
CONTROL UNIT 1 [P1834]	Malfunction is detected in the memory (RAM) system of differential lock control unit.	<a href="#">DLN-215. "Description"</a>
CONTROL UNIT 2 [P1835]	Malfunction is detected in the memory (ROM) system of differential lock control unit.	<a href="#">DLN-216. "Description"</a>
CONTROL UNIT 3 [P1836]	Malfunction is detected in the memory (EEPROM) system of differential lock control unit.	<a href="#">DLN-217. "Description"</a>
CONTROL UNIT 4 [P1837]	AD converter system of differential lock control unit is malfunctioning.	<a href="#">DLN-218. "Description"</a>
ON SW [P1838]	More than two switch inputs are simultaneously detected due to short circuit of differential lock mode switch.	<a href="#">DLN-219. "Description"</a>
POSI SW ON [P1839]	When differential lock position switch is ON, rotation difference occurs in wheel speed (rear wheel right and left).	<a href="#">DLN-221. "Description"</a>
RELAY [P1844]	Differential lock control unit detects as irregular by comparing target value with monitor value.	<a href="#">DLN-223. "Description"</a>
SOL CIRCUIT [P1847]	Malfunction is detected in differential lock control unit internal circuit.	<a href="#">DLN-224. "Description"</a>
SOL DISCONNECT [P1848]	<ul style="list-style-type: none"> <li>Differential lock solenoid internal circuit or harness is open.</li> <li>Differential lock solenoid relay does not switch to ON position.</li> </ul>	<a href="#">DLN-225. "Description"</a>
SOL SHORT [P1849]	Differential lock solenoid internal circuit or harness is shorted.	<a href="#">DLN-227. "Description"</a>
SOL CURRENT [P1850]	Differential lock solenoid relay does not switch to OFF position.	<a href="#">DLN-229. "Description"</a>
ABS SYSTEM [C1203]	Malfunction related to wheel sensor has been detected by ABS actuator and electric unit (control unit).	<a href="#">DLN-231. "Description"</a>
CAN COMM CIRCUIT [U1000]	Malfunction has been detected from CAN communication line.	<a href="#">DLN-213. "Description"</a>
NO DTC IS DETECTED. FURTHER TESTING MAY BE REQUIRED.	No malfunction has been detected.	—

### CAUTION:

If "CAN COMM CIRCUIT [U1000]" is displayed with other DTCs, first perform the trouble diagnosis for CAN communication line.



# DIFF LOCK INDICATOR LAMP INOPERATIVE

< SYMPTOM DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## SYMPTOM DIAGNOSIS

### DIFF LOCK INDICATOR LAMP INOPERATIVE

#### Inspection Procedure

INFOID:000000004929141

#### SYMPTOM:

DIFF LOCK indicator lamp does not turn ON for approx. 1 second when turning ignition switch to "ON".

#### DIAGNOSTIC PROCEDURE

#### 1. PERFORM DIFFERENTIAL LOCK CONTROL UNIT SELF DIAGNOSIS

Perform self-diagnosis. Refer to [DLN-211, "CONSULT-III Function \(DIFF LOCK\)"](#).

#### Were any DTC's displayed?

- YES >> Refer to [DLN-240, "DTC Index"](#).
- NO >> GO TO 2.

#### 2. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY AND GROUND CIRCUIT

Check the differential lock control unit for proper power and ground. Refer to [DLN-214, "Diagnosis Procedure"](#).

#### Is the inspection result normal?

- YES >> GO TO 3.
- NO >> Repair harness or connector.

#### 3. CHECK DIFF LOCK INDICATOR LAMP POWER SUPPLY

Check power supply to the combination meter (DIFF LOCK indicator lamp). Refer to [DLN-232, "Diagnosis Procedure"](#).

#### Is the inspection result normal?

- YES >> GO TO 4.
- NO >> Repair harness or connectors.

#### 4. CHECK DIFF LOCK INDICATOR LAMP CONTROL

Check the DIFF LOCK indicator lamp control circuit. Refer to [DLN-232, "Description"](#).

#### Is the inspection result normal?

- YES >> Replace the differential lock control unit. Refer to [DLN-249, "Removal and Installation"](#).
- NG >> Repair malfunctioning component.

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# DIFF LOCK INDICATOR LAMP DOES NOT TURN ON WITH DIFFERENTIAL LOCK SWITCHED ON

< SYMPTOM DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## DIFF LOCK INDICATOR LAMP DOES NOT TURN ON WITH DIFFERENTIAL LOCK SWITCHED ON

### Inspection Procedure

INFOID:000000004929142

#### SYMPTOM:

DIFF LOCK indicator lamp does not turn ON when turning differential lock mode switch to "ON" after engine start.

#### DIAGNOSTIC PROCEDURE

##### 1. CHECK DIFF LOCK INDICATOR LAMP

Confirm the DIFF LOCK indicator lamp proves out when ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Go to [DLN-241, "Inspection Procedure"](#) .

##### 2. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [DLN-211, "CONSULT-III Function \(DIFF LOCK\)"](#) .

Is any DTC detected by self-diagnosis?

YES >> Check the malfunctioning system. Refer to [DLN-240, "DTC Index"](#).

NO >> GO TO 3.

##### 3. CHECK DIFFERENTIAL LOCK MODE SWITCH OPERATION

Check differential lock mode switch. Refer to [DLN-219, "Diagnosis Procedure"](#) .

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair component, harness or connector.

##### 4. CHECK DIFFERENTIAL LOCK CONTROL UNIT POWER SUPPLY AND GROUND CIRCUIT

Check differential lock control unit power supply and ground circuit. Refer to [DLN-214, "Diagnosis Procedure"](#) .

Is the inspection result normal?

YES >> Replace the differential lock control unit. Refer to [DLN-249, "Removal and Installation"](#).

NO >> Repair harness or connector.

# DIFF LOCK INDICATOR LAMP FLASHES WHILE DRIVING

< SYMPTOM DIAGNOSIS >

[REAR FINAL DRIVE: M226 (ELD) ]

## DIFF LOCK INDICATOR LAMP FLASHES WHILE DRIVING

### Description

INFOID:000000004929143

The DIFF LOCK indicator lamp will flash once every 2 seconds when the differential lock system is in standby condition. Standby condition is the time between when the differential lock mode switch is turned ON and when the differential lock control unit sees all conditions are met to engage the differential lock. The DIFF LOCK indicator lamp should be OFF if there has been a fault detected. For more information regarding the differential lock system operation, refer to the Owner's Manual.

### Inspection Procedure

INFOID:000000004929144

#### SYMPTOM:

**DIFF LOCK indicator lamp sometimes flashes while driving.**

#### DIAGNOSTIC PROCEDURE

##### 1. CHECK SELF-DIAGNOSTIC RESULTS

Perform self-diagnosis. Refer to [DLN-211, "CONSULT-III Function \(DIFF LOCK\)"](#).

Is any malfunction detected by self-diagnosis?

YES >> Check the malfunctioning system. Refer to [DLN-240, "DTC Index"](#).

NO >> GO TO 2.

##### 2. CHECK DIFFERENTIAL LOCK MODE SWITCH

Perform trouble diagnosis for differential lock mode switch. Refer to [DLN-219, "Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> Condition is intermittent. Refer to [GI-38, "Intermittent Incident"](#).

NO >> Repair or replace malfunctioning component.

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# PRECAUTIONS

< PRECAUTION >

[REAR FINAL DRIVE: M226 (ELD) ]

## PRECAUTION

### PRECAUTIONS

#### Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000004929145

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 SR 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 SR 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.

#### PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

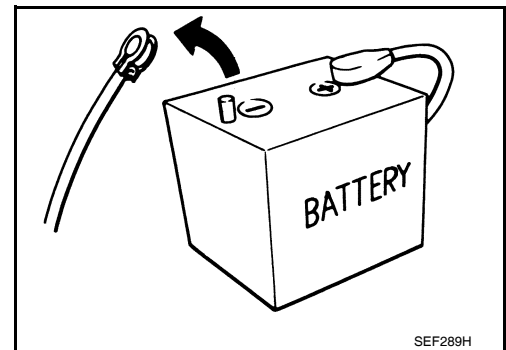
#### **WARNING:**

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

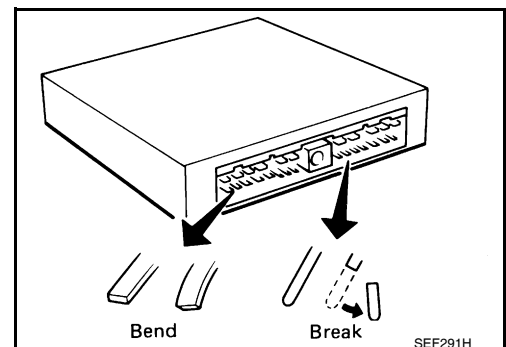
#### Precaution

INFOID:000000004929146

- Before connecting or disconnecting differential lock control unit harness connector, turn ignition switch "OFF" and disconnect the battery cable from the negative terminal. Because battery voltage is applied to differential lock control unit even if ignition switch is turned "OFF".



- When connecting or disconnecting pin connectors into or from differential lock control unit, take care not to damage pin terminals (bend or break). When connecting pin connectors make sure that there are not any bends or breaks on differential lock control unit pin terminal.

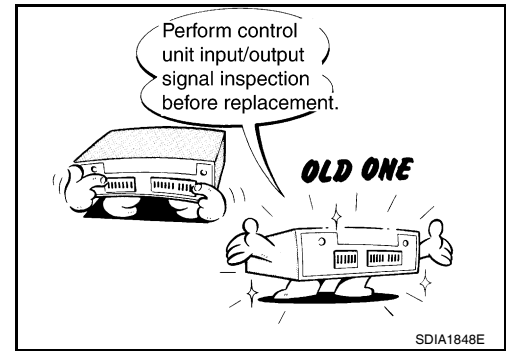


# PRECAUTIONS

< PRECAUTION >

[REAR FINAL DRIVE: M226 (ELD) ]

- Before replacing differential lock control unit, perform differential lock control unit input/output signal inspection and make sure whether differential lock control unit functions properly or not. Refer to [DLN-233, "Reference Value"](#).



## Precaution for Servicing Rear Final Drive

INFOID:000000004929147

- Before starting diagnosis of the vehicle, understand the symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When matching marks are required, be certain they do not interfere with the function of the parts they are applied to.
- Overhaul should be done in a clean work area, a dust proof area is recommended.
- Before disassembly, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or a shop cloth to prevent the entering of lint.
- Check appearance of the disassembled parts for damage, deformation, and abnormal wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- Clean and flush the parts sufficiently and blow them dry.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mating surface; then remove any moisture, oil, and foreign materials from the application and mating surfaces.
- In principle, tighten nuts or bolts gradually in several steps working diagonally from inside to outside. If a tightening sequence is specified, observe it.
- During assembly, observe the specified tightening torque.
- Add new differential gear oil, petroleum jelly, or multi-purpose grease, as specified.

# PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: M226 (ELD) ]

## PREPARATION

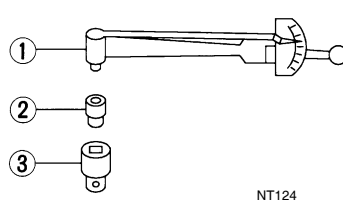
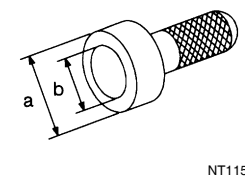
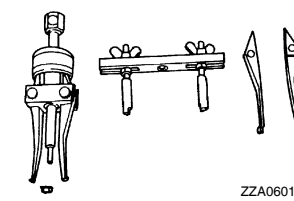
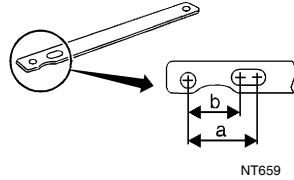
### PREPARATION

#### Special Service Tool

INFOID:000000004929148

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV40104000 ( — ) Flange wrench	Removing and installing drive pinion lock nut <b>a: 85 mm (3.35 in) dia.</b> <b>b: 65 mm (2.56 in) dia.</b>
ST33290001 (J-34286) Puller	Removing front oil seal
ST15310000 ( — ) Drift	Installing front oil seal <b>a: 96mm (3.77 in) dia.</b> <b>b: 84 mm (3.30 in) dia.</b>
ST3127S000 (J-25765-A) Preload gauge set <ol style="list-style-type: none"> <li>1. GG91030000 (J-25765) Torque wrench</li> <li>2. HT62940000 (1/2") ( — ) Socket adapter</li> <li>3. HT62900000 (3/8") ( — ) Socket adapter</li> </ol>	Inspecting drive pinion bearing preload torque and total preload torque

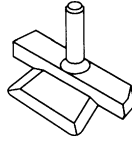
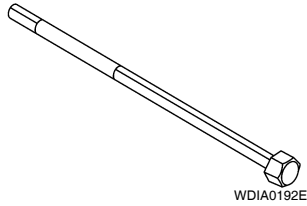


# PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: M226 (ELD) ]

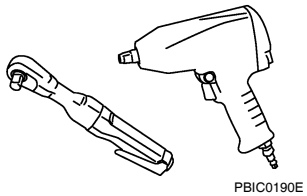
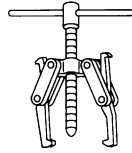
Tool number (Kent-Moore No.) Tool name	Description
— (C-4164) Adjuster tool	Removing and installing side bearing ad- juster
KV10111100 (J-37228) Seal cutter	Removing carrier cover



## Commercial Service Tool

INFOID:000000004929149

Tool name	Description
Puller	Removing companion flange
Power tool	Loosening bolts and nuts



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# DIFFERENTIAL GEAR OIL

< ON-VEHICLE MAINTENANCE >

[REAR FINAL DRIVE: M226 (ELD) ]

## ON-VEHICLE MAINTENANCE

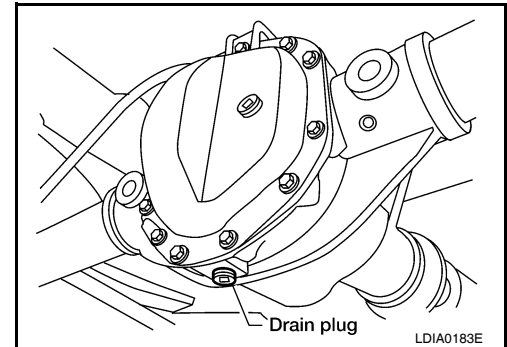
### DIFFERENTIAL GEAR OIL

#### Changing Differential Gear Oil

INFOID:000000004929150

#### DRAINING

1. Stop engine.
2. Remove the drain plug from the rear final drive assembly to drain the differential gear oil.
3. Install the drain plug with sealant applied on the threads to the rear final drive assembly. Tighten to the specified torque. Refer to [DLN-259, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#)

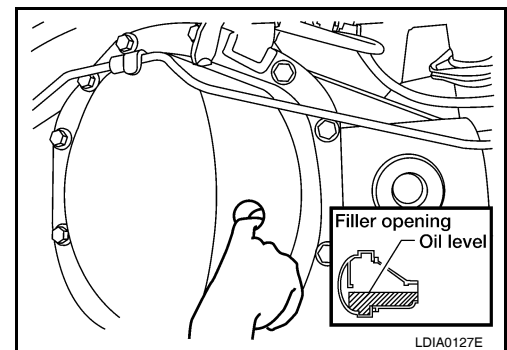


#### FILLING

1. Remove the filler plug from the rear final drive assembly.
2. Fill the rear final drive assembly with new differential gear oil until the level reaches the specified level near the filler plug hole.

**Differential gear oil grade and capacity** : Refer to [MA-10, "Fluids and Lubricants"](#).

3. Install the filler plug with sealant applied on the threads to the rear final drive assembly. Tighten to the specified torque. Refer to [DLN-259, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).



#### Checking Differential Gear Oil

INFOID:000000004929151

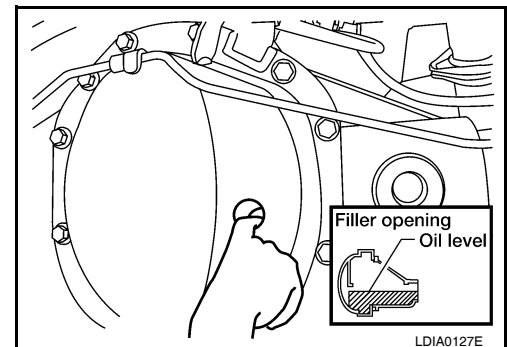
#### DIFFERENTIAL GEAR OIL LEAKAGE AND LEVEL

1. Make sure that differential gear oil is not leaking from the rear final drive assembly or around it.
2. Check the differential gear oil level from the filler plug hole as shown.

#### **CAUTION:**

**Do not start engine while checking differential gear oil level.**

3. Install the filler plug with sealant applied on the threads to the rear final drive assembly. Tighten to the specified torque. Refer to [DLN-259, "Disassembly and Assembly"](#).
  - Use High Performance Thread Sealant or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).





# DIFFERENTIAL LOCK CONTROL UNIT

< ON-VEHICLE REPAIR >

[REAR FINAL DRIVE: M226 (ELD) ]

## ON-VEHICLE REPAIR

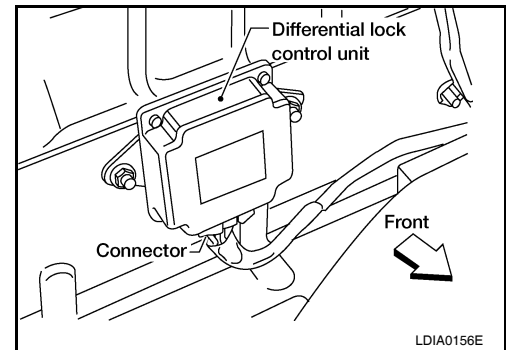
### DIFFERENTIAL LOCK CONTROL UNIT

#### Removal and Installation

INFOID:000000004929152

#### REMOVAL

1. Disconnect the battery cable from the negative terminal.
2. Remove jack and tools.
3. Remove upper bracket of center seat belt retractor and belt assembly. Refer to [SB-7, "Removal and Installation of Rear Seat Belt"](#).
4. Remove the necessary push pins and reposition rear panel out of the way. Refer to [INT-14, "Removal and Installation"](#).
5. Reposition the carpet to access differential lock control unit to disconnect connector.
6. Remove the two nuts and remove differential lock control unit.



#### INSTALLATION

Installation is in the reverse order of removal.

- Tighten the differential lock control unit nuts to the specified torque.

**Differential lock control unit nuts : 5.1 N·m (0.52 kg-m, 45 in-lb)**

# DIFFERENTIAL LOCK POSITION SWITCH

< ON-VEHICLE REPAIR >

[REAR FINAL DRIVE: M226 (ELD) ]

## DIFFERENTIAL LOCK POSITION SWITCH

### Removal and Installation

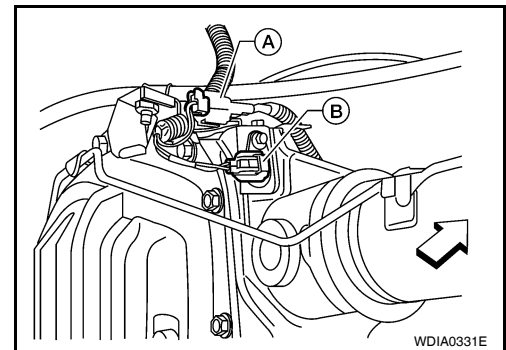
INFOID:000000004929153

#### REMOVAL

##### CAUTION:

- Be careful not to damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing rear final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from rear final drive assembly/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.

1. Drain rear final drive gear oil. Refer to [MA-26. "Changing Rear Final Drive Oil"](#).
2. Remove rear propeller shaft. Refer to [DLN-136. "Removal and Installation"](#) (2S1410), [DLN-145. "Removal and Installation"](#) (3S1410).
3. Remove both RH and LH axle shafts. Refer to [RAX-8. "Removal and Installation"](#).
4. Remove the carrier cover. Refer to [DLN-256. "Removal and Installation"](#).
5. Remove differential lock solenoid connector (B) bolt and disconnect differential lock position connector (A).

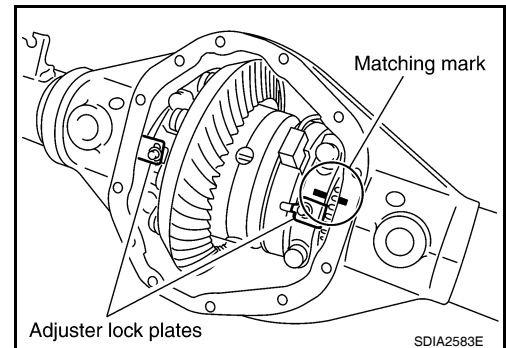


6. For installation, apply a paint matching mark on one side of side bearing cap.

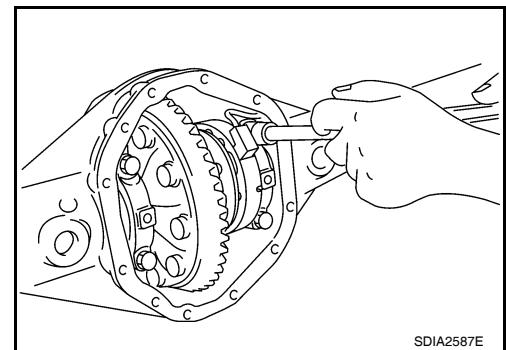
##### CAUTION:

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

7. Remove adjuster lock plates.



8. Remove side bearing caps.



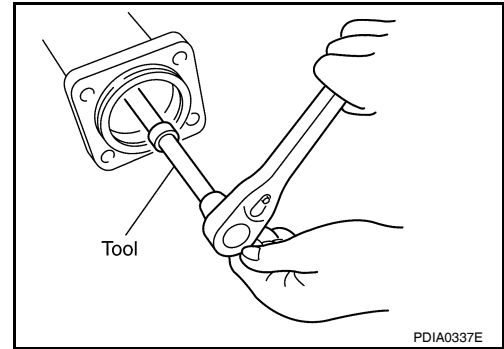
# DIFFERENTIAL LOCK POSITION SWITCH

< ON-VEHICLE REPAIR >

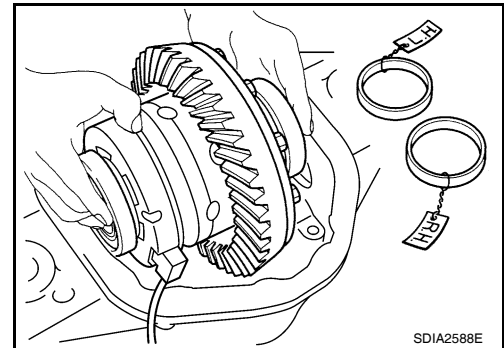
[REAR FINAL DRIVE: M226 (ELD) ]

9. Loosen the side bearing adjusters using Tool.

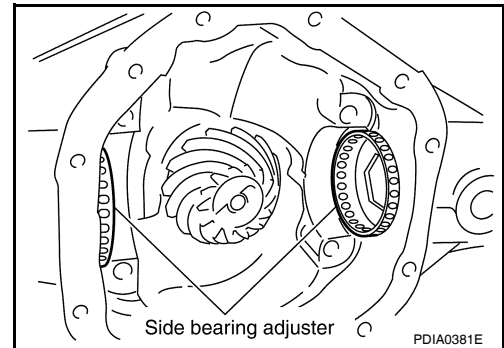
Tool number : — (C - 4164)



10. Remove the differential case assembly. Keep side bearing outer races together with inner races, do not mix them up. Also, keep side bearing adjusters together with bearing.



11. Remove side bearing adjusters from gear carrier.



12. Remove bracket for the differential lock position switch connector and bolts.  
13. Remove differential lock position switch.

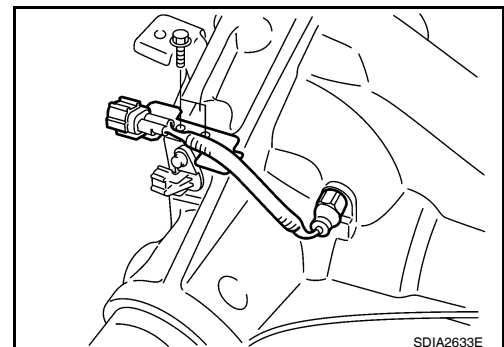
## INSTALLATION

1. Apply sealant to threads of differential lock position switch.  
• Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

### CAUTION:

Remove old sealant adhering to gear carrier and differential lock position switch. Also remove any moisture, oil, or foreign material adhering to application and gear carrier and differential lock position switch.

2. Install differential lock position switch on gear carrier and tighten differential lock position switch bolts with the specified torque. Refer to [DLN-259, "Disassembly and Assembly"](#).



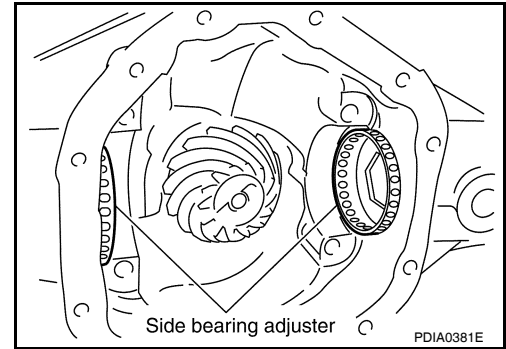
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## DIFFERENTIAL LOCK POSITION SWITCH

< ON-VEHICLE REPAIR >

[REAR FINAL DRIVE: M226 (ELD) ]

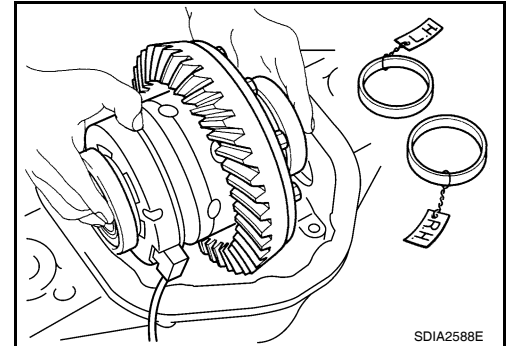
3. Install side bearing adjusters into gear carrier.



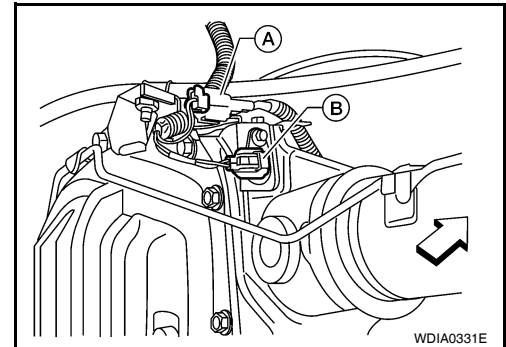
4. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into gear carrier.
5. Apply multi-purpose grease to differential lock position connector.

**CAUTION:**

**Do not reuse sensor connector.**



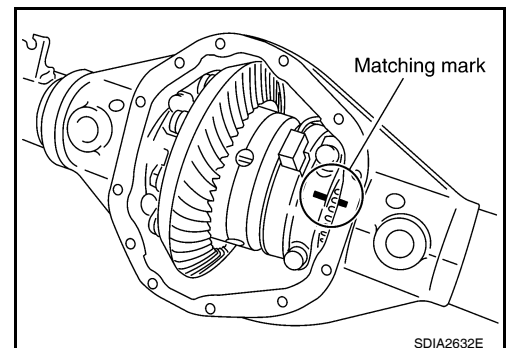
6. Connect differential lock solenoid harness (B) and differential lock position switch connector (A). Then install it to gear carrier, tighten to the specified torque. Refer to [DLN-259, "Disassembly and Assembly"](#).



7. Align paint matching mark on side bearing caps with that on gear carrier and install side bearing caps on gear carrier without tightening to specification.

**CAUTION:**

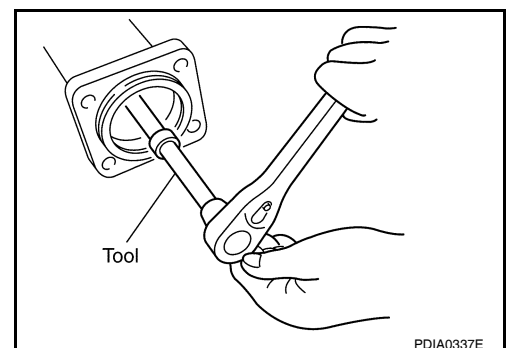
**Do not tighten at this point. This allows further tightening of side bearing adjusters.**



8. Tighten each side bearing adjusters using adjuster tool.

**Tool number** : — (C - 4164)

9. Adjusting backlash of drive gear and drive pinion. Refer to [DLN-259, "Disassembly and Assembly"](#).
10. Check total preload torque. Refer to [DLN-259, "Disassembly and Assembly"](#).
11. Check tooth contact. Refer to [DLN-259, "Disassembly and Assembly"](#).



## DIFFERENTIAL LOCK POSITION SWITCH

< ON-VEHICLE REPAIR >

[REAR FINAL DRIVE: M226 (ELD) ]

12. Apply a bead of sealant to the mating surface of the carrier cover as shown.

- Use Genuine Silicone RTV or equivalent. Refer to [GI-14. "Recommended Chemical Products and Sealants"](#).

**CAUTION:**

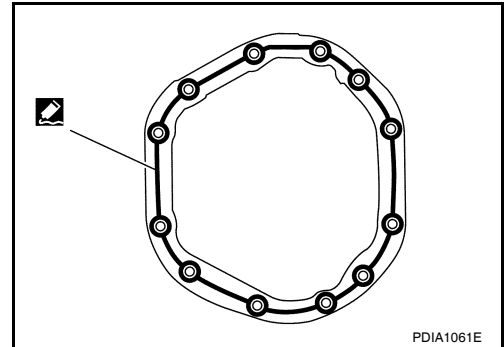
**Remove any old sealant adhering to the mating surfaces. Also remove any moisture, oil, or foreign material adhering to the application and mating surfaces.**

13. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque. Refer to [DLN-194. "Disassembly and Assembly"](#).

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

**CAUTION:**

**Fill the front final drive assembly with recommended differential gear oil. Refer to [MA-26. "Changing Rear Final Drive Oil"](#).**



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## FRONT OIL SEAL

### Removal and Installation

INFOID:000000004929154

#### REMOVAL

1. Remove rear propeller shaft. Refer to [DLN-136. "Removal and Installation"](#) (2S1410), [DLN-145. "Removal and Installation"](#) (3S1410).
2. Remove brake calipers and rotors. Refer to [BR-40. "Removal and Installation of Brake Caliper and Disc Rotor"](#).
3. Measure the total preload torque. Refer to [DLN-259. "Disassembly and Assembly"](#).

**NOTE:**

Record the total preload torque measurement.

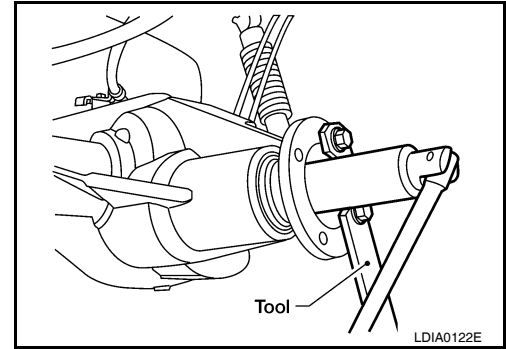
4. Remove the drive pinion nut using Tool.

**Tool number** : KV40104000 ( — )

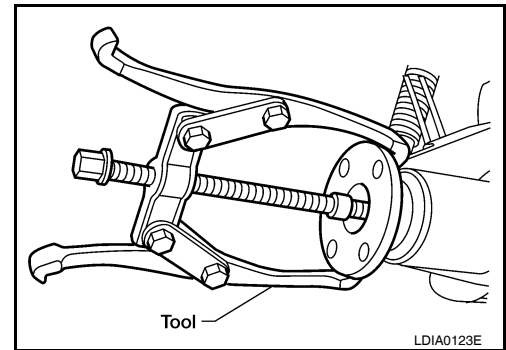
5. Put matching marks on the companion flange and drive pinion using paint.

**CAUTION:**

**Use paint to make the matching marks. Do not damage the companion flange or drive pinion.**

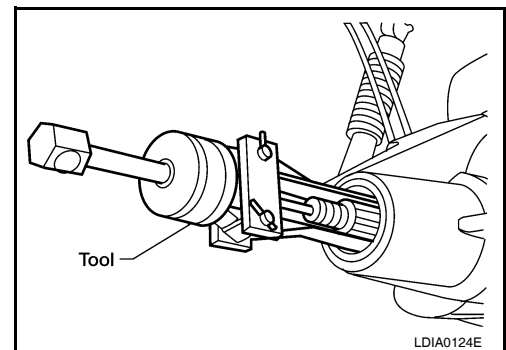


6. Remove the companion flange using suitable tool.



7. Remove oil seal/dust shield and discard.
8. Remove the front oil seal using Tool.

**Tool number** : ST33290001 (J-34286)



#### INSTALLATION

# FRONT OIL SEAL

< ON-VEHICLE REPAIR >

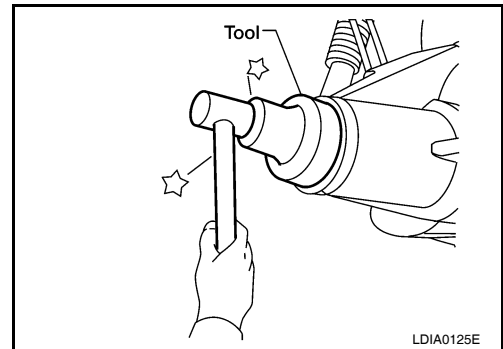
[REAR FINAL DRIVE: M226 (ELD) ]

1. Apply multi-purpose grease to the lips of the new front oil seal. Then drive the new front oil seal in evenly until it becomes flush with the gear carrier using Tool.

**Tool number** : ST15310000 ( — )

**CAUTION:**

- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips and differential gear oil to the circumference of the new front oil seal.



2. Install a new oil seal/dust shield.
3. Install the companion flange to the drive pinion while aligning the matching marks.
4. Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut and new drive pinion lock nut washer. Then adjust the drive pinion lock nut tightening torque using Tool A, and check the total preload torque using Tool B.

**Tool number**            **A:** KV40104000 ( — )  
   **B:** ST3127S000 (J-25765-A)

**Total preload torque:** Refer to [DLN-259, "Disassembly and Assembly"](#).

- The total preload torque should be within the total preload torque specification. When not replacing the collapsible spacer, it should also be equal to the measurement taken during removal plus an additional 0.56 N·m (0.06 Kg-m, 5 in-lb).
- If the total preload torque is low, tighten the drive pinion lock nut in 6.8 N·m (0.69 Kg-m, 5ft-lb) increments until the total preload torque is met.

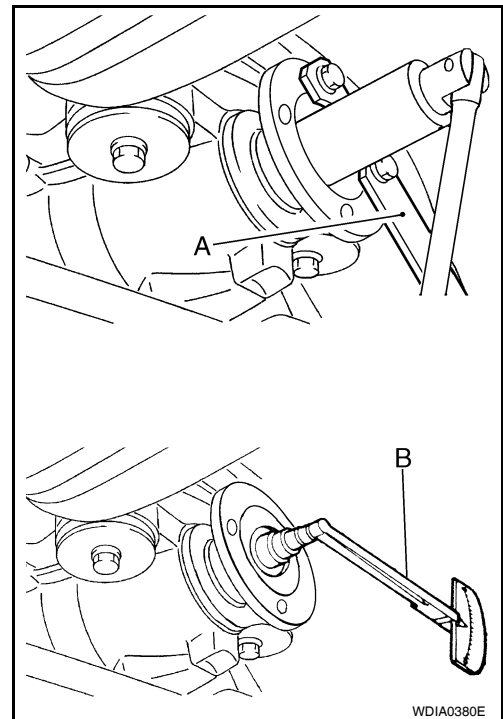
**CAUTION:**

- Do not reuse drive pinion lock nut or drive pinion lock nut washer.
- Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut.
- Adjust the drive pinion lock nut tightening torque to the lower limit first. Do not exceed the drive pinion lock nut specified torque. Refer to [DLN-259, "Disassembly and Assembly"](#).
- Do not loosen drive pinion lock nut to adjust the total preload torque. If the total preload torque exceeds the specifications, replace the collapsible spacer and tighten it again to adjust. Refer to [DLN-259, "Disassembly and Assembly"](#).
- After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.

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

**CAUTION:**

Check the differential gear oil level after installation. Refer to [MA-26, "Changing Rear Final Drive Oil"](#).



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# CARRIER COVER

< ON-VEHICLE REPAIR >

[REAR FINAL DRIVE: M226 (ELD) ]

## CARRIER COVER

### Removal and Installation

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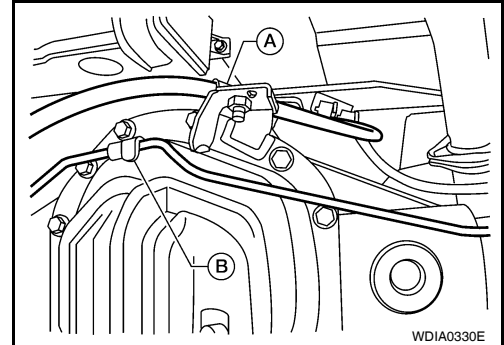
#### REMOVAL

1. Drain the differential gear oil. Refer to [DLN-248](#).
2. Disconnect the parking brake cable (A) and brake tube (B) from the carrier cover.
3. Remove the carrier cover bolts and separate the carrier cover from the gear carrier using Tool.

**Tool number** : KV10111100 (J-37228)

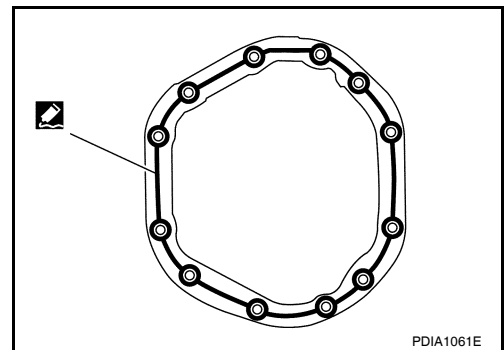
#### CAUTION:

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



#### INSTALLATION

1. Apply a bead of sealant to the mating surface of the carrier cover as shown.
  - Use Genuine Silicone RTV or equivalent. Refer to [GI-14](#), "[Recommended Chemical Products and Sealants](#)".
2. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque. Refer to [DLN-194](#), "[Disassembly and Assembly](#)".
3. Connect the parking brake cable and brake tube to the carrier cover.
4. Fill the rear final drive assembly with recommended differential gear oil. Refer to [DLN-248](#), "[Changing Differential Gear Oil](#)".





# REAR FINAL DRIVE ASSEMBLY

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: M226 (ELD) ]

## REMOVAL AND INSTALLATION

### REAR FINAL DRIVE ASSEMBLY

#### Removal and Installation

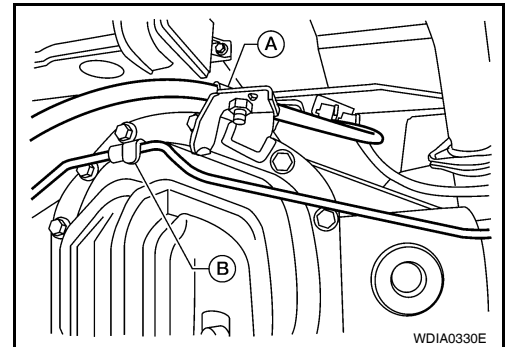
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#### REMOVAL

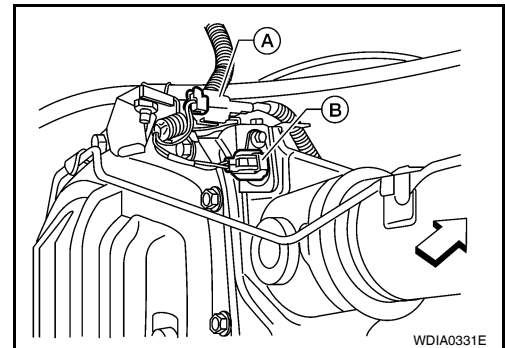
##### CAUTION:

- Do not damage spline, companion flange and front oil seal when removing propeller shaft.
- Before removing final drive assembly or rear axle assembly, disconnect ABS sensor harness connector from the assembly and move it away from final drive/rear axle assembly area. Failure to do so may result in sensor wires being damaged and sensor becoming inoperative.

1. Drain the differential gear oil. Refer to [DLN-189, "Changing Differential Gear Oil"](#).
2. Remove the rear propeller shaft. Refer to [DLN-136, "Removal and Installation"](#).
3. Remove the axle shaft. Refer to [RAX-8, "Removal and Installation"](#).
4. Disconnect the following components from the rear final drive assembly.
  - Brake tube block connectors. Refer to [BR-40, "Removal and Installation of Brake Caliper and Disc Rotor"](#).
  - ABS sensor wire harness. Refer to [BRC-252, "Removal and Installation"](#).
  - Parking brake cable (A).
  - Brake tube (B).



- Differential lock position switch harness connector (A).
- Differential lock solenoid harness connector (B).



5. Disconnect brake hose from brake tube at the mounting clip on top of rear final drive assembly. Then remove the metal clip to disconnect brake line from the mounting clip on top of the rear final drive assembly.
6. Support rear final drive using a suitable jack.
7. Remove rear shock absorber lower bolts. Refer to [RSU-10, "Removal and Installation"](#).
8. Remove leaf spring U-bolt nuts. Refer to [RSU-8, "Removal and Installation"](#).
9. Remove rear final drive assembly.

##### CAUTION:

Secure rear final drive assembly to the jack while removing it.

#### INSTALLATION

Installation is in the reverse order of removal.

##### CAUTION:

- Fill the front final drive assembly with differential gear oil after installation. Refer to [MA-26, "Changing Rear Final Drive Oil"](#).

## REAR FINAL DRIVE ASSEMBLY

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: M226 (ELD) ]

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- Bleed the air from brake system. Refer to [BR-17, "Bleeding Brake System"](#).

# REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 (ELD) ]

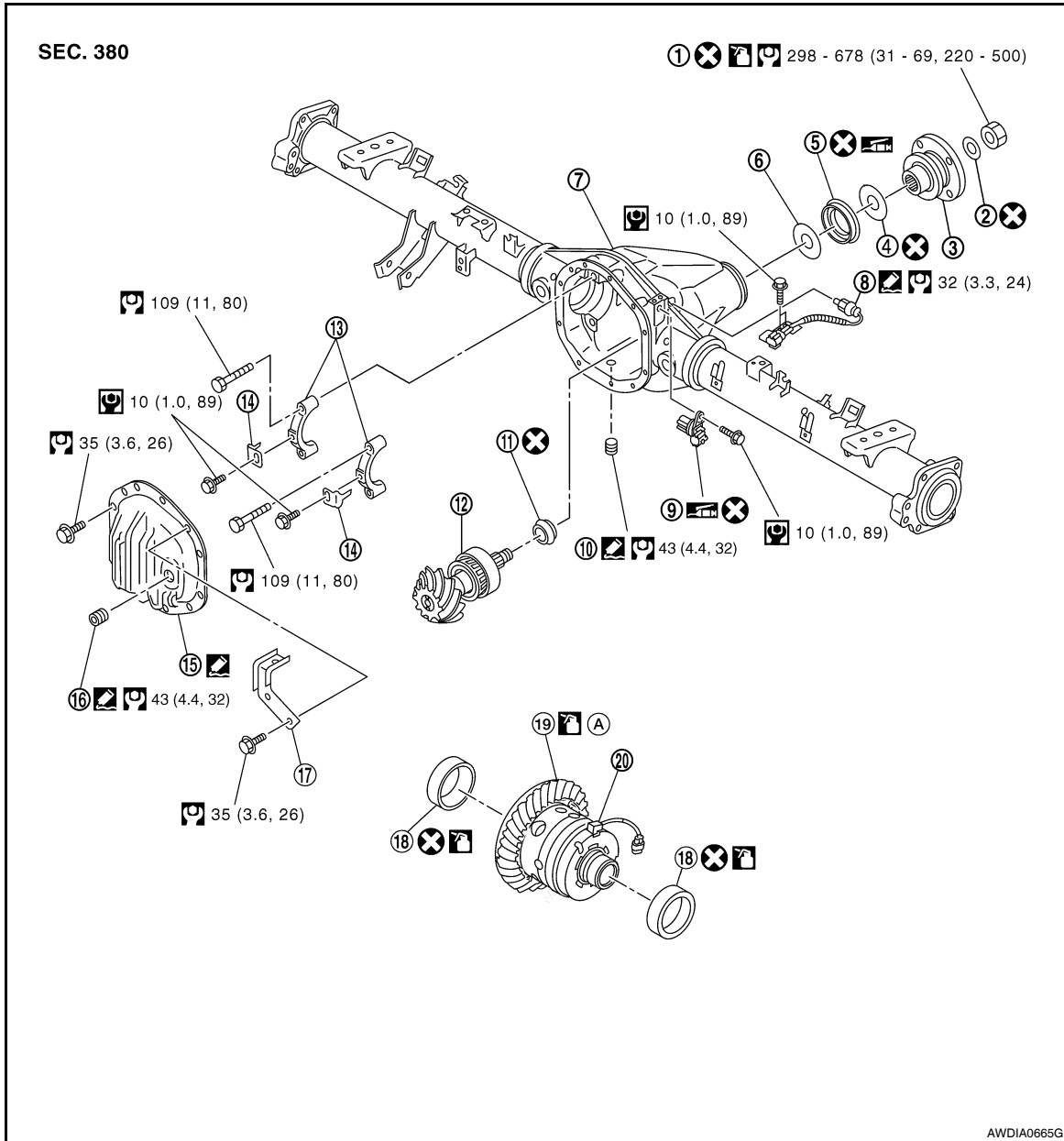
## DISASSEMBLY AND ASSEMBLY

### REAR FINAL DRIVE

#### Disassembly and Assembly

INFOID:000000004929157

#### COMPONENTS



- |  |  |   |
|--|--|---|
| 1. Drive pinion lock nut                         | 2. Drive pinion lock nut washer                  | 3. Companion flange   |
| 4. Oil seal/dust shield                          | 5. Front oil seal                                | 6. Drive pinion front bearing thrust washer (non-serviceable) |
| 7. Gear carrier (non-serviceable)                | 8. Differential lock position switch             | 9. Sensor connector   |
| 10. Drain plug (non-serviceable)                 | 11. Collapsible spacer                           | 12. Drive pinion assembly (non-serviceable)                   |
| 13. Side bearing cap (non-serviceable)           | 14. Adjuster lock plate (non-serviceable)        | 15. Carrier cover   |
| 16. Filler plug                                  | 17. Bracket                                      | 18. Side bearing  |
| 19. Differential lock solenoid (non-serviceable) | 20. Differential case assembly (non-serviceable) | A. Gear oil   |

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# REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 (ELD) ]

## INSPECTION AND ADJUSTMENT

- Drain the differential gear oil before inspection and adjustment. Refer to [DLN-189. "Changing Differential Gear Oil"](#).
- Remove and install the carrier cover as necessary for inspection and adjustment. Refer to [DLN-256. "Removal and Installation"](#).

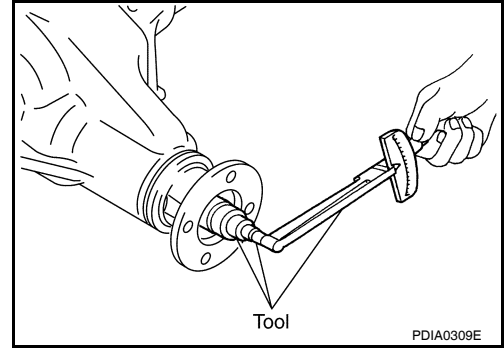
### Total Preload Torque

1. Rotate the drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
2. Rotate the drive pinion at least 20 times to check for smooth operation of the bearings.
3. Measure total preload torque using Tool. Refer to [DLN-269. "General Specification"](#).
  - If the measured value is out of the specification, check and adjust each part. Adjust the drive pinion bearing preload torque first, then adjust the side bearing preload torque.

**Tool number : ST3127S000 (J-25765-A)**

### NOTE:

**Total preload torque = Drive pinion bearing preload torque + Side bearing preload torque**



### If the total preload torque is greater than specification

- On drive pinion bearings : Replace collapsible spacer.**
- On side bearings : Loosen side bearing adjuster.**

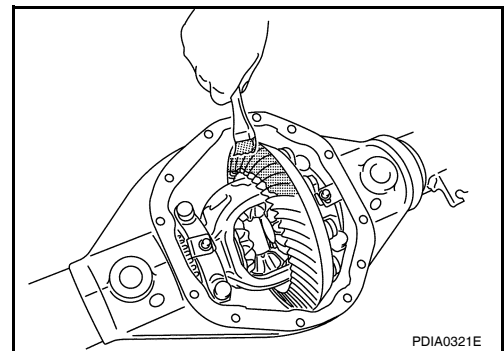
### If the total preload torque is less than specification

- On drive pinion bearings : Tighten drive pinion lock nut.**
- On side bearings : Tighten side bearing adjuster.**

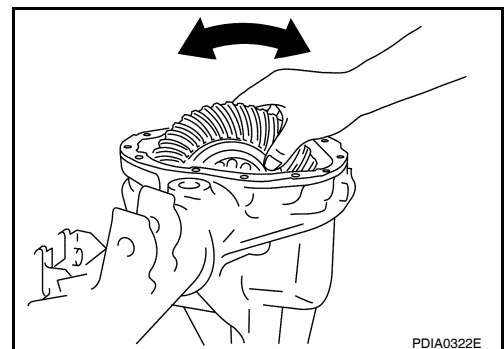
### Tooth Contact

Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion. Gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

1. Thoroughly clean drive gear and drive pinion teeth.
2. Apply red lead to the drive gear.
  - Apply red lead to both faces of three to four gears, at four locations evenly spaced on the drive gear.



3. Hold companion flange steady by hand and rotate drive gear in both directions.



# REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 (ELD) ]

Usually the pattern will be correct if washers are correctly calculated and the backlash is correct. However, in rare cases, trial and error processes may be employed to obtain a correct pattern. The tooth pattern is the best indication of how well a differential has been set up.

Heel contact

Face contact

Toe contact

Flank contact

To correct, increase thickness of drive pinion height adjusting washer in order to bring drive pinion close to drive gear.

To correct, reduce thickness of drive pinion height adjusting washer in order to make drive pinion go away from drive gear.

Correct tooth contact

When adjustment is completed, be sure to wipe off completely the red lead and oil or their equivalent.

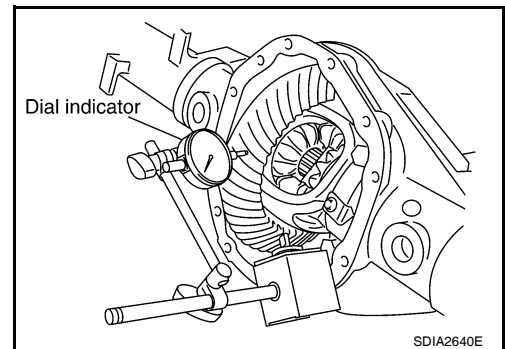
SDIA2591E

4. If outside the standard, replace the rear final drive assembly. Refer to [DLN-257. "Removal and Installation"](#).

## Backlash

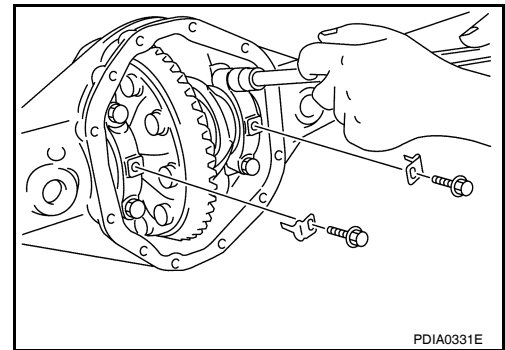
1. Fit a dial indicator to the drive gear face to measure the backlash.

**Backlash : 0.12 - 0.20 mm (0.0050 - 0.0078 in)**



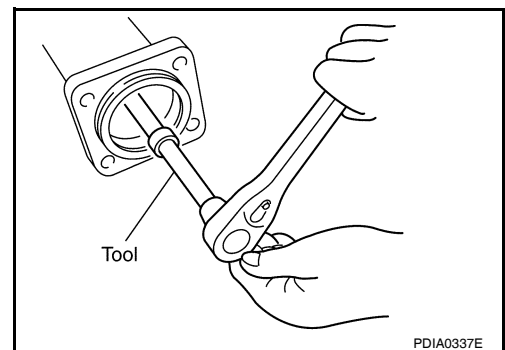
2. If the backlash is outside of the specification, adjust each side bearing side bearing adjuster.

- a. Remove adjuster lock plates.
- b. Loosen side bearing cap bolts.



- c. Tighten or loosen each side bearing adjuster using Tool.

**Tool number : — (C - 4164)**



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# REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 (ELD) ]

If the backlash is greater than specification:

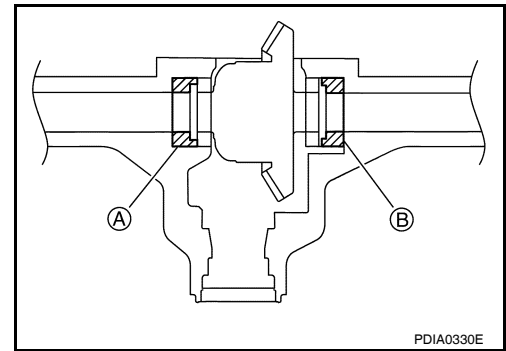
Loosen side bearing adjuster A and tighten side bearing adjuster B by the same amount.

If the backlash is less than specification:

Loosen side bearing adjuster B and tighten side bearing adjuster A by the same amount.

**CAUTION:**

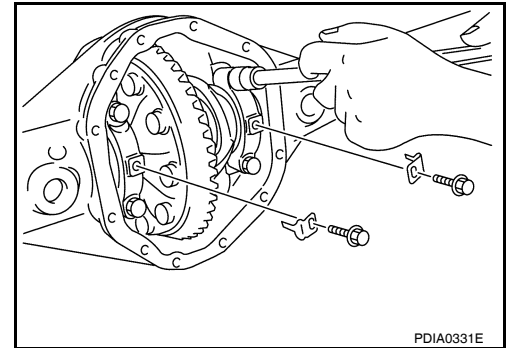
Do not change the side bearing side bearing adjusters by different amounts as it will change the side bearing preload torque.



- d. Tighten side bearing cap bolts to the specified torque.
- e. Install adjuster lock plate and tighten to the specified torque.

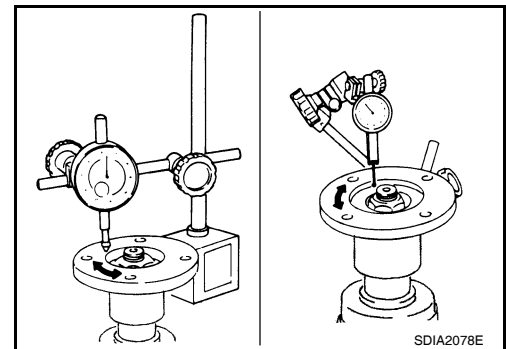
**CAUTION:**

Check tooth contact and total preload torque after adjusting side bearing adjuster. Refer to [DLN-269, "Inspection and Adjustment"](#).



## Companion Flange Runout

- 1. Rotate companion flange and check for runout on the companion flange face (inner side of the bolt holes) and companion flange inner side (socket diameter) using suitable tool. Refer to [DLN-269, "General Specification"](#).
- 2. If the runout is outside the runout limit, follow the procedure below to adjust.
  - a. Rotate the companion flange on the drive pinion by 90°, 180° and 270° while checking for the position where the runout is minimum.
  - b. If the runout is still outside of the runout limit after the companion flange has been rotated on the drive pinion, possible cause could be an assembly malfunction of drive pinion and drive pinion bearing or a malfunctioning drive pinion bearing.
  - c. If the runout is still outside of the runout limit after replacing the companion flange. Replace the rear final drive assembly. Refer to [DLN-257, "Removal and Installation"](#).



## DISASSEMBLY

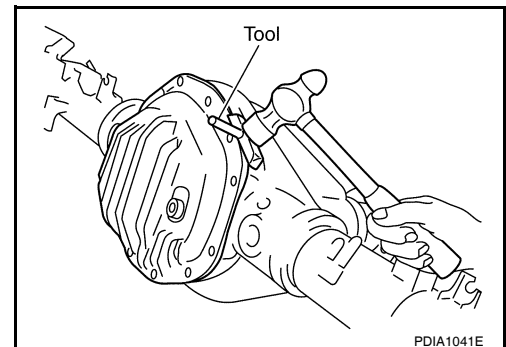
### Differential Assembly

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

Tool number : KV1011100 (J-37228)

**CAUTION:**

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

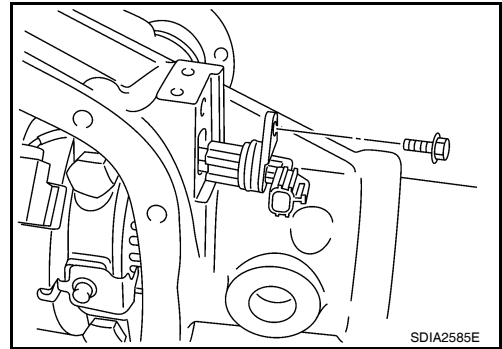


# REAR FINAL DRIVE

## < DISASSEMBLY AND ASSEMBLY >

## [REAR FINAL DRIVE: M226 (ELD) ]

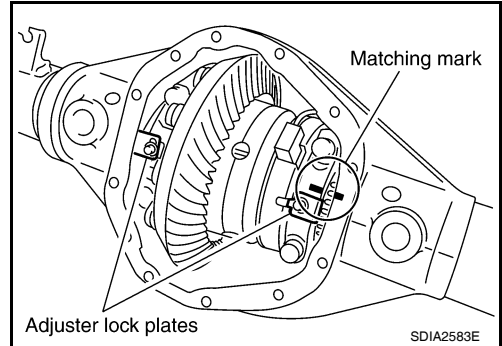
3. Remove sensor connector bolts and disconnect differential lock solenoid connector.



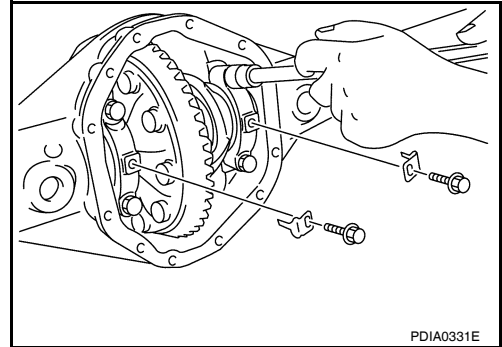
4. For proper reinstallation, paint matching mark on one side of side bearing cap.

**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.

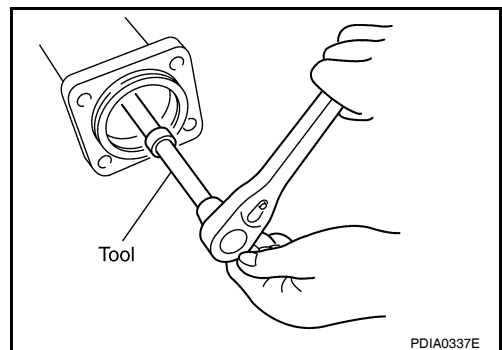


5. Remove adjuster lock plates.
6. Remove side bearing caps.



7. Loosen side bearing adjusters using Tool.

**Tool number** : — (C - 4164)



8. Remove differential lock position switch.
9. Remove differential lock position switch bracket.

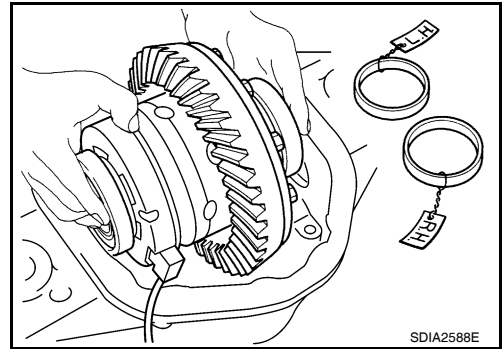
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# REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 (ELD) ]

10. Remove the differential case assembly. Label side bearing outer races to keep them together with inner races. Do not mix them up.

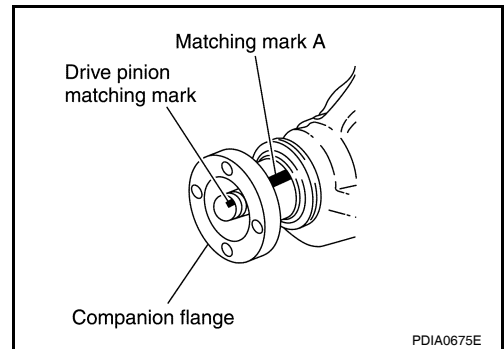


## Drive Pinion Assembly

1. Put matching marks on the companion flange at location (A) and drive pinion using paint as shown.

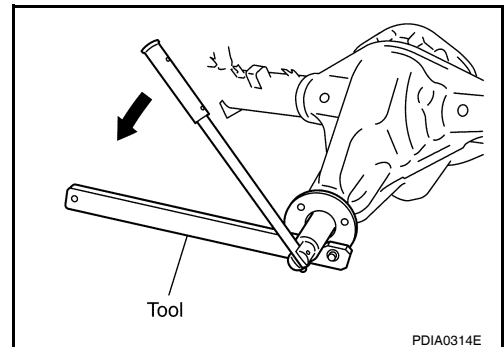
**CAUTION:**

**Use paint to make the matching marks. Do not damage the companion flange or drive pinion.**

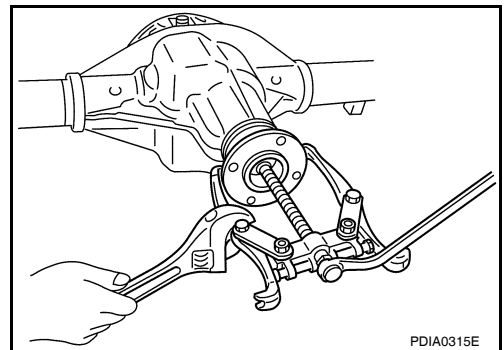


2. Remove drive pinion lock nut and washer using Tool.

**Tool number** : KV40104000 ( — )



3. Remove companion flange using a suitable tool.



4. Remove oil seal/dust shield and discard.



# REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 (ELD) ]

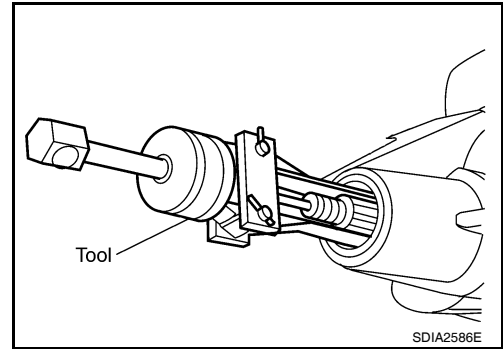
5. Remove front oil seal using Tool.

**Tool number** : ST33290001 (J-34286)

**CAUTION:**

**Do not damage gear carrier.**

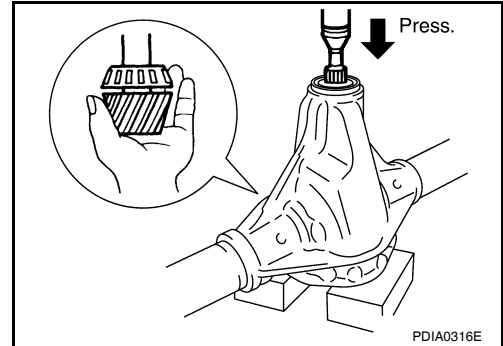
6. Remove drive pinion front bearing thrust washer.



7. Remove drive pinion assembly (with rear inner bearing race and collapsible spacer) out of gear carrier.

**CAUTION:**

**Do not drop drive pinion assembly.**



8. Remove collapsible spacer from drive pinion assembly and discard collapsible spacer.

**CAUTION:**

**Do not reuse the collapsible spacer.**

## INSPECTION AFTER DISASSEMBLY

Clean the disassembled parts. Then inspect the parts for wear or damage. If wear or damage are found, follow the measures below.

### Drive Pinion and Drive Gear

- If the gear teeth do not mesh or line-up correctly, replace with new rear final drive assembly. Refer to [DLN-257, "Removal and Installation"](#).
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new rear final drive assembly. Refer to [DLN-257, "Removal and Installation"](#).

### Bearings

- If bearings are chipped (by friction), pitted, worn, rusted, scratched mark, or unusual noise from the bearing, replace with new rear final drive assembly. Refer to [DLN-257, "Removal and Installation"](#).

### Differential Case Assembly

- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new rear final drive assembly. Refer to [DLN-257, "Removal and Installation"](#).
- If the movement is not smooth when pushing cam ring of differential case assembly by hand. Replace with new rear final drive assembly. Refer to [DLN-257, "Removal and Installation"](#).

### Differential Lock Solenoid

- If the operating part of differential lock solenoid is not smooth, perform component inspection. Refer to [DLN-211, "CONSULT-III Function \(DIFF LOCK\)"](#).

### Companion Flange

- If any chips [about 0.1mm (0.004 in)] or other damage on the companion flange surface which contacts the front oil seal lips are found, replace with new one. Refer to [DLN-254, "Removal and Installation"](#).

## ASSEMBLY

### Drive Pinion Assembly

1. Install drive pinion front bearing thrust washer.

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## REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

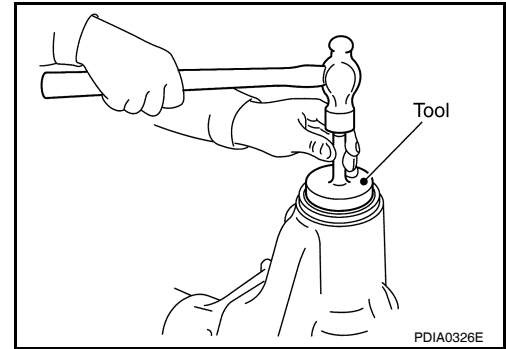
[REAR FINAL DRIVE: M226 (ELD) ]

2. Apply multi-purpose grease to new front oil seal lip. Install new front oil seal into gear carrier using Tool.

**Tool number** : ST15310000 ( — )

**CAUTION:**

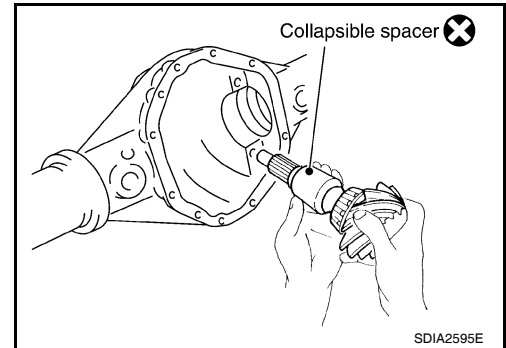
- Do not reuse front oil seal.
- Do not incline the new front oil seal when installing.
- Apply multi-purpose grease to the lips of the new front oil seal.



3. Install new collapsible spacer on drive pinion assembly. And then install drive pinion assembly into gear carrier.

**CAUTION:**

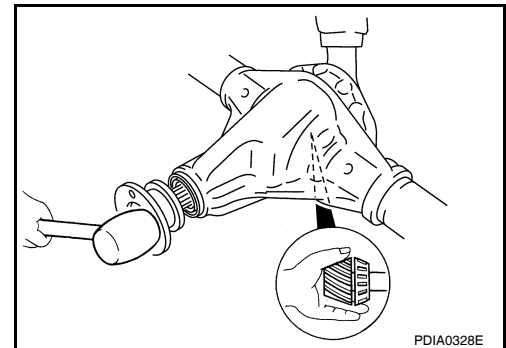
- Do not reuse collapsible spacer.
- Do not damage front oil seal.



4. Install a new oil seal/dust shield.
5. Install the companion flange onto the drive pinion while aligning the matching marks. Then tap the companion flange using suitable tool.

**CAUTION:**

**Do not damage companion flange or front oil seal.**



## REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

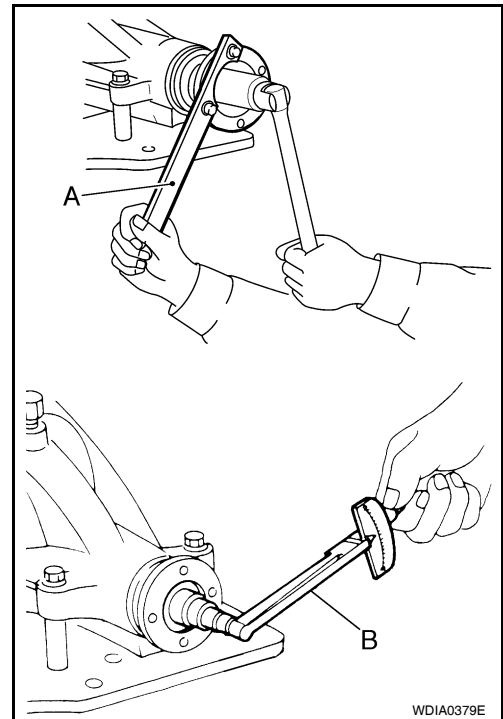
[REAR FINAL DRIVE: M226 (ELD) ]

6. Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut and new drive pinion lock nut washer. Then adjust the drive pinion lock nut tightening torque using Tool A, and check the drive pinion bearing preload torque using Tool B. Refer to [DLN-269, "General Specification"](#).

Tool number    **A: KV40104000 ( — )**  
                      **B: ST3127S000 (J-25765-A)**

**CAUTION:**

- Do not reuse drive pinion lock nut or drive pinion lock nut washer.
- Apply anti-corrosive oil to the threads of the drive pinion and the seating surface of the new drive pinion lock nut.
- Adjust the drive pinion lock nut tightening torque to the lower limit first. Do not exceed the drive pinion lock nut specified torque.
- If the drive pinion bearing preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Do not loosen drive pinion lock nut to adjust the drive pinion bearing preload torque.
- After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.



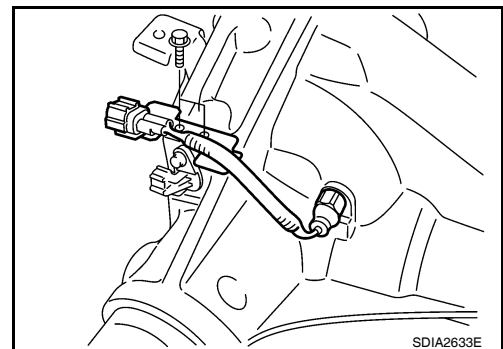
### Differential Assembly

1. Apply sealant to threads of differential lock position switch.
  - Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

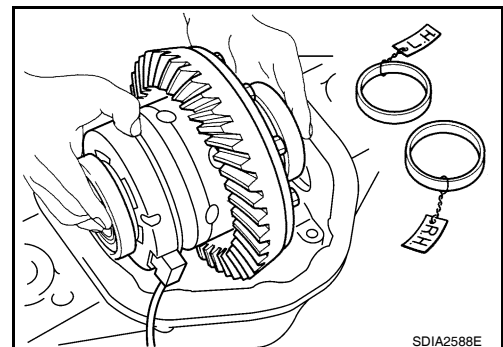
**CAUTION:**

Remove old sealant adhering to gear carrier and differential lock position switch. Also remove any moisture, oil, or foreign material adhering to application and gear carrier and differential lock position switch.

2. Install differential lock position switch on gear carrier and tighten differential lock position switch bolts to the specified torque.



3. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into gear carrier.



4. Apply multi-purpose grease to new sensor connector.

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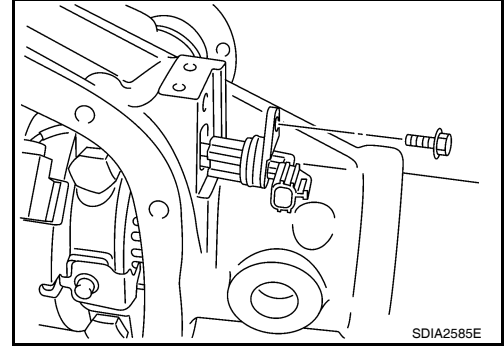
# REAR FINAL DRIVE

< DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: M226 (ELD) ]

**Do not reuse sensor connector.**

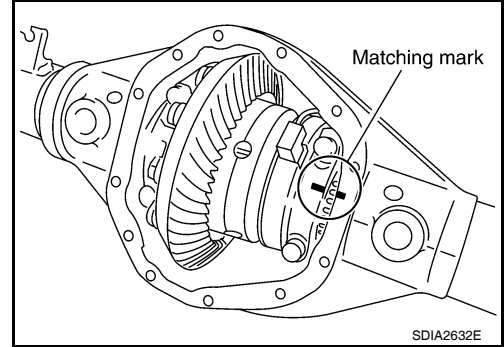
5. Connect differential lock solenoid harness to new sensor connector. Then install new sensor connector to gear carrier and tighten to the specified torque.



6. Align paint matching mark on side bearing caps with those on gear carrier and install side bearing caps on gear carrier.

**CAUTION:**

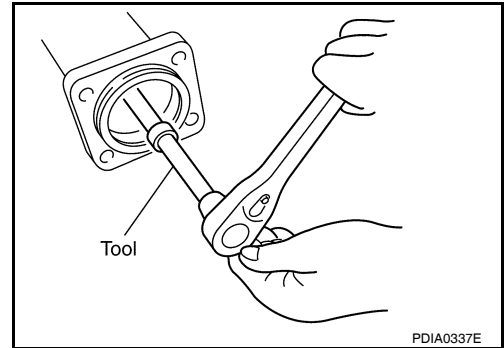
**Do not tighten side bearing cap bolts at this point. This allows further tightening of side bearing adjusters.**



7. Tighten each side bearing adjusters using adjuster tool. Perform the following adjustments.

**Tool number** : — (C - 4164)

- Adjusting backlash of drive gear and drive pinion. Refer to [DLN-269, "Inspection and Adjustment"](#).
- Check total preload. Refer to [DLN-269, "Inspection and Adjustment"](#).
- Check tooth contact. Refer to [DLN-269, "Inspection and Adjustment"](#).



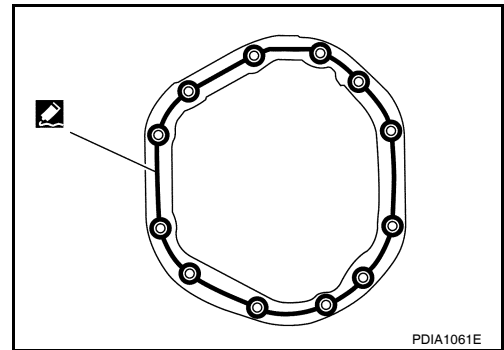
8. Apply a bead of sealant to the mating surface of the carrier cover as shown.

- Use Genuine Silicone RTV or equivalent. Refer to [GI-14, "Recommended Chemical Products and Sealants"](#).

**CAUTION:**

**Remove any old sealant adhering to the mating surfaces. Also remove any moisture, oil, or foreign material adhering to the application and mating surfaces.**

9. Install the carrier cover to the gear carrier. Tighten the bolts to the specified torque.



# SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: M226 (ELD) ]

## SERVICE DATA AND SPECIFICATIONS (SDS)

### SERVICE DATA AND SPECIFICATIONS (SDS)

#### General Specification

INFOID:000000004929158

Applied model	4WD
	VK56DE
	5A/T
	Off-road package
Final drive model	M226
Gear ratio	3.357
Number of pinion gears	2
Number of teeth (Drive gear / drive pinion)	47/14
Oil capacity (Approx.)	2.01 ℓ (4-1/4 US pt, 3-1/2 Imp pt)
Drive pinion adjustment spacer type	Collapsible

#### Inspection and Adjustment

INFOID:000000004929159

#### PRELOAD TORQUE

Unit: N·m (kg·m, in·lb)

Item	Specification
Drive pinion bearing preload torque	1.7 - 3.1 (0.18 - 0.31, 15 - 27)
Total preload torque (Total preload torque = drive pinion bearing preload torque + Side bearing preload torque)	2.38 - 4.46 (0.25 - 0.45, 21 - 39)

#### BACKLASH

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.12 - 0.20 (0.0050 - 0.0078)

#### COMPANION FLANGE RUNOUT

Unit: mm (in)

Item	Limit
Companion flange face	0.13 (0.0051) or less
Companion flange inner side	